UNITED STATES TARIFF COMMISSION

SUMMARIES OF TRADE AND TARIFF INFORMATION

Prepared in Terms of the Tariff Schedules of the United States (TSUS)

Schedule 6

Metals and Metal Products
(In 11 volumes)

VOLUME 10

Certain Electrical Appliances, Special-Industry Machinery, Machine Parts, and Electrical Apparatus

TC Publication 280
Washington, D. C.
1969

UNITED STATES TARIFF COMMISSION

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FOREWORD

In an address delivered in Boston on May 18, 1917, Frank W. Taussig, distinguished first chairman of the Tariff Commission, delineated the responsibility of the newly established Commission to operate as a source of objective, factual information on tariffs and trade. He stated that the Commission was already preparing a catalog of tariff information--

> designed to have on hand, in compact and simple form, all available data on the growth, development and location of industries affected by the tariff, on the extent of domestic production, on the extent of imports, on the conditions of competition between domestic and foreign products.

The first such report was issued in 1920. Subsequently three series of summaries of tariff information on commodities were published--in 1921, 1929, and 1948-50. The current series, entitled Summaries of Trade and Tariff Information, presents the information in terms of the tariff items provided for in the eight tariff schedules of the Tariff Schedules of the United States (abbreviated to TSUS in these volumes), which on August 31, 1963, replaced the 16 schedules of the Tariff Act of 1930.

Through its professional staff of commodity specialists, economists, lawyers, statisticians, and accountants, the Commission follows the movement of thousands of articles in international commodity trade, and during the years of its existence, has built up a reservoir of knowledge and understanding, not only with respect to imports but also regarding products and their uses, techniques of manufacturing and processing, commercial practices, and markets. Accordingly, the Commission believes that, when completed, the current series of summaries will be the most comprehensive publication of its kind and will present benchmark information that will serve many interests. This project, although encyclopedic, attempts to conform with Chairman Taussig's admonition to be "exhaustive in inquiry, and at the same time brief and discriminating in statement."

This series is being published in 62 volumes of summaries, each volume to be issued as soon as completed. Although the order of publication may not follow the numerical sequence of the items in the TSUS, all items are to be covered. As far as practicable, each volume reflects the most recent developments affecting U.S. foreign trade in the commodities included.

SUMMARIES OF TRADE AND TARIFF INFORMATION

SCHEDULE 6

Volume 10

C O N T E N T S

CONTENTS

Numerical List of TSUS Items in This Volume

INTRODUCTION

This volume is one of a series of 11 volumes of Summaries of Trade and Tariff Information on metals and metal products. It includes summaries relating to certain electrical appliances (mostly household type), special industrial machinery, certain machine parts, and electrical apparatus provided for principally in part 4, subparts E, H, and J and part 5 of Schedule 6 of the Tariff Schedules of the United States (TSUS). This volume is identified as volume 6:10. 1/

The value of apparent U.S. consumption (U.S. producers' shipments plus imports minus exports) in 1967 of the articles discussed in the 26 summaries in this volume is estimated at about $14.8 billion. This is about $0.6 billion less than the estimated value of U.S. producers' shipments of these articles in the same year because the value of U.S. exports was significantly larger than that of imports.

The total value of imports of the products covered by this volume amounted to $405 million in 1967--about 18 percent more than in 1966 ($332 million) and 46 percent more than in 1965 ($217 million). The aggregate value of the imports in 1967 accounted for about 2.7 percent of the estimated value of apparent U.S. consumption. The value of imports as used in this volume is generally the foreign market value and therefore excludes U.S. import duties, freight, and transportation insurance; if the ratio of imports to consumption were based on landed, duty-paid value of imports, the ratio would be somewhat larger--estimated at slightly more than 3 percent. The products included in this volume were imported from many countries; however, the four principal sources--Japan, West Germany, Canada, and the United Kingdom--accounted for more than two-thirds of the total.

Of the four major groups of products discussed in this volume, which are identified above, the most important in terms of the foreign value of imports in 1967 was electrical apparatus ($130.3 million, representing about 1.9 percent of the value of U.S. consumption). Next largest imports in that year were of special industrial machinery ($122.1 million, or about 7.4 percent of consumption), certain machine parts ($106.6 million, or about 2.3 percent of consumption), and certain electrical appliances, mostly household type ($45.9 million, or about 2.8 percent of consumption).

Based on imports (dutiable and duty-free) in 1967, the average ad valorem equivalent of the many rates applicable at the end of 1967 to

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1/ For this and other summary volumes, the number to the left of the colon designates the TSUS schedule involved and the number to the right of the colon indicates the sequence of the volume in the series for that schedule, as listed on p. ii in this volume for schedule 6. Volumes published heretofore are listed on the inside of the back cover.

the products covered in this volume was 11.8 percent. Duty-free imports in 1967 were valued at about $31 million, or about 8 percent of the total; duty-free imports consisted principally of U.S. goods returned, Canadian articles entered under the provisions of the Automotive Products Trade Act of 1965, and shoe machinery, which has been duty-free since adoption of the Tariff Act of 1930. Of the 82 items in the Tariff Schedules of the United States discussed in this volume (listed on page vii), 54 were the subject of concessions granted by the United States in the sixth (Kennedy) round of trade negotiations under the General Agreement on Tariffs and Trade (GATT). The great bulk of the concessions amounted to 50 percent reductions in the applicable duties. The rates of duty applicable to the other 28 TSUS items were not affected by the trade conference; however, the articles covered by 3 of these items are entitled to free entry as shoe machinery, 17 items are entitled to free entry under the provisions of the Automotive Products Trade Act of 1965, and the duty on 4 items is being reduced as the result of a trade agreement with Canada.

The total value of U.S. exports in 1967 of the articles included in this volume is estimated to have been about $1 billion, or more than twice the value of U.S. imports; exports in 1967 accounted for an estimated 6.7 percent of U.S. producers' total shipments of such articles. Among the major groups of articles considered in this volume, the largest share of the total value of exports was accounted for by electrical apparatus (37 percent), followed by certain machine parts (33 percent), special industrial machinery (23 percent), and certain electrical appliances, mostly household type (7 percent).

Appendix A to this volume reproduces pertinent segments of the Tariff Schedules of the United States Annotated (1968) relating to the items covered by this volume. It includes the general headnotes to the TSUS, the headnotes to schedule 6, the headnotes to parts 4 and 5 and subparts E, H, and J of part 5, and the individual product descriptions. The interpretive headnotes clarify the relationships between the various tariff items and define many of the terms used in the descriptions. Appendix A also gives the rates of duty applicable to the individual TSUS items, including the staged annual rate modifications that resulted from concessions granted by the United States in the sixth round of trade negotiations under the GATT. Notes in the appendix also document changes in the legal text of the tariff schedules after these schedules went into effect on August 31, 1963, including changes in the statistical annotations of items. The shaded areas in appendix A cover headnotes and TSUS items not included in the summaries in this volume.

Appendix B to this volume provides data on the value of the U.S. imports in 1967 by TSUS items included in the individual summaries of this volume. The data also show the percentage changes in imports from 1966 and the three principal countries which supplied imports in 1967.

December 1968
6:10

Commodity	TSUS item
Shavers:	
With self-contained electric motors, and parts (except blades and cutting heads)-------	683.5020, -.5040
Nonelectric, and blades and cutting heads therefor and for electric shavers---- ----------	650.77

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

The United States is probably the world's largest consumer of electric shavers and parts. In 1967 the value of apparent consumption was more than $100 million, of which 16 to 19 percent was supplied by imports. U.S. exports are much smaller than imports. U.S. production, imports, and exports of nonelectric shavers have been negligible.

Description and uses

This summary covers electric and nonelectric shavers, parts for electric shavers, and blades and cutting heads for both kinds. Safety razors and blades are covered in a separate summary in volume 6:6.

An electric shaver consists of a motor, a housing, cutting blades, and blade guards, assembled into a compact appliance. The motor either oscillates or rotates the cutting blade or blades. The blade guards prevent the skin from being cut while shaving. Electric shavers may be classified into four types, depending upon the source of power utilized in their operation. In the most common type, the source of power is the 110-volt house current supplied to the shaver through an electric cord connected to a power outlet. Another type is supplied with a rechargeable power unit, which usually comes equipped with two nickel-cadmium batteries that can normally be recharged through an electric cord connected to a 110-volt household outlet. A third type of shaver can be operated either on house current or by self-contained nickel-cadmium batteries. A fourth type uses ordinary disposable dry cell batteries as the power source.

In the early 1950's, women's electric shavers were introduced. Normally, electric shavers for women are smaller, more compact, and less expensive than the types for men.

Most nonelectric shavers are similar in appearance to electric shavers, but they are springwound or otherwise powered nonelectrically. Since nonelectric shavers are not widely used in the United States, they will not be discussed further in this summary.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 of the TSUSA-1968) are as follows:

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
683.5020 and 683.5040	Shavers, with self-contained electric motors, and parts (except blades and cutting heads).	13.75% ad val.	12% ad val.	6.5% ad val.
650.77	Nonelectric shavers, and blades and cutting heads therefor and for electric shavers.	9% ad val.	8% ad val.	4.5% ad val.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968, and modifications therein as a result of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade. Only the first and final stages of the annual rate modifications are shown above (see the TSUSA-1968 for the intermediate staged rates).

The prior rates shown in the tabulation above had remained unchanged under the TSUS from August 31, 1963, through the end of 1967. Concessions amounting to a reduction of about 50 percent in duties were granted by the United States in the Kennedy Round; the concessions are being put into effect in five annual stages--the final reductions going into effect on January 1, 1972.

U.S. consumption

The value of annual U.S. consumption of electric shavers and parts during 1958-67 increased irregularly from an estimated $65

million in 1958 to an estimated $105 million in 1967. In 1967, imports supplied about 16 percent of the value of domestic consumption (table 1).

Domestic and foreign producers of electric shavers are constantly seeking to increase their shares of the U.S. market. Their efforts are reflected in technical and design innovations in shavers marketed to provide more shaving comfort and efficiency and in increased advertising and sales effort. Electric shavers also compete with nonelectric safety razors and blades, the quality of which has improved in recent years. In 1967 the value of U.S. consumption of nonelectric safety razors and blades was about $175 million (see volume 6:6), compared with the value of consumption of electric shavers of about $105 million.

U.S. producers and producers' shipments

There are about 10 producers of electric shavers in the United States, four of which are major producers. The domestic plants of these concerns are situated principally in the middle Atlantic and New England areas.

The major producers are all diversified concerns that manufacture electrical appliances in addition to shavers. Several producers also import models of electric shavers which they do not manufacture domestically, and sell the imports along with their domestically produced shavers. A sales subsidiary of a large manufacturer of electric shavers in the Netherlands is also actively engaged in the distribution of its product in the United States.

The value of U.S. producers' shipments of electric shavers and parts increased generally from about $60 million in 1958 to about $93 million in 1967. Shipments of complete units declined from 4.9 million in 1958 to 3.7 million in 1962 and then rose to an estimated 6.2 million in 1967 (table 2). The total value of such shipments declined from $54 million in 1958 to $49 million in 1962 and then rose to an estimated $84 million in 1967. During 1965-66 ladies' shavers accounted for 38 percent of the total quantity and 25 percent of the total value; the smaller share of the total value of shipments accounted for by ladies' shavers is attributable to their lower average unit value--$8.28, compared with $16.02, the average unit value of men's shavers.

The decline in output (quantity) of electric shavers during 1960-64 was largely attributable to the introduction and consumer acceptance of stainless steel blades for safety razors, which are in direct competition with electric shavers. Manufacturers of electric shavers in the

United States and abroad reacted to the competition from safety razors and blades by developing and marketing new and improved models of electric shavers to obtain faster and closer shaves. Improvements introduced included stainless steel cutting blades, multiheads and floating heads, variable speed controls, multivoltage units, and other innovations; some shavers incorporate a special cutter to trim mustaches, sideburns, and other hair. Some companies developed rechargeable or other cordless shavers. Women's shavers were also redesigned. The value of U.S. producers' shipments of electric shavers and parts increased from about $57 million in 1964 to about $93 million in 1967, or by 65 percent; during the same time the value of U.S. producers' shipments of nonelectric safety razors and blades, as discussed in volume 6:6, rose from $147 million in 1964 to about $176 million in 1967, or by 20 percent.

U.S. exports

The value of annual U.S. exports of electric shavers, parts and blades, and cutting heads during 1965-67 (the only years for which official export data are separately available) remained constant and averaged about $5.1 million (table 3). Exports accounted for about 6.1 percent of U.S. producers' shipments in 1965, and 5.4 percent in 1967. Four countries--Canada, the United Kingdom, France, and Australia--accounted for 73 percent of the total value of U.S. exports of complete shavers during 1965-67.

Parts for electric shavers (including blades and cutting heads) accounted for 77 percent of the value of total exports; about 56 percent of the total represented exports of parts for shavers and 21 percent exports of blades and cutting heads.

Parts for electric shavers (excluding blades and cutting heads), exported separately, have largely been for assembly in U.S. subsidiary plants abroad or for foreign manufacturers having licensing arrangements with U.S. manufacturers; some of the exports have also been shipped in response to demand for electric-shaver parts by foreign manufacturers that lack the necessary equipment to produce all the components needed in the manufacture of electric shavers. In 1967 the bulk of U.S. exports of parts for electric shavers went to Canada, the United Kingdom, Italy, the Netherlands, and Australia. Most of the blades and cutting heads exported in that year went to Canada and the Netherlands. A substantial, but unknown, volume of exported parts are incorporated abroad in shavers that are subsequently imported into the United States.

U.S. imports

During 1960-67 the value of annual U.S. imports of electric shavers and parts, and blades and cutting heads rose irregularly from $7.2 million in 1960 to $16.4 million in 1967. Most of the imports in 1964-67 consisted of complete shavers (table 4). Of the total value of imports in that period, imports of complete units of electric shavers accounted for 90 percent, and those of parts, including blades and cutting heads, for the remaining 10 percent.

The substantial rise in the total value of annual U.S. imports in 1966 and 1967 compared with annual imports in preceding years is attributable largely to increased imports from the Netherlands. Imports from that country in 1966-67 accounted for 77 percent of the total value of such imports. Virtually all of the electric shavers and parts imported from the Netherlands have been produced by one concern, and such shavers have been distributed in the United States by a subsidiary of this manufacturer. Other important suppliers of complete shavers have included the United Kingdom, France, West Germany, and Switzerland. The volume of such imports from the United Kingdom rose substantially in 1966 and 1967 as the result of increased shipments from U.S. subsidiaries in that country.

In 1967 the Netherlands, the United Kingdom, and France were the principal sources of U.S. imports of blades and cutting heads imported separately. In that year, total imports of these items amounted to $840,000, equivalent to about 5 percent of the total value of U.S. imports of all the articles included in this summary.

Table 1.--Shavers and parts: U.S. producers' shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, 1958-67

Year	U.S. producers' shipments 1/	Imports 2/	Exports	Apparent consumption	Ratio of imports to consumption
	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	Percent
1958	60,235	3/	4/	4/	4/
1959	62,207	3/	4/	4/	4/
1960	55,044	7,229	4/	4/	4/
1961	63,250	8,636	4/	4/	4/
1962	54,744	7,671	4/	4/	4/
1963	59,408	7,061	4/	4/	4/
1964	56,790	6,586	4/	4/	4/
1965	82,492	8,406	5,038	85,860	10
1966	87,855	15,896	5,158	98,593	16
1967	93,492	16,442	5,066	104,868	16

1/ Data are partly estimated (see table 2).

2/ Includes imports of nonelectric shavers and blades and cutting heads therefor beginning in 1964; such imports, however, are small (see table 4).

3/ Not available; imports probably exceeded $5 million.

4/ Not available.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Note.--The ratios are based on the foreign market value of imports and essentially the U.S. factory value of consumption. If the ratios were computed on the basis of the foreign value of imports plus U.S. import duties and costs of transportation, insurance, and other handling charges to deliver the merchandise to the United States, the ratios would be higher--about 19 percent in 1967.

Table 2.--Electric shavers and parts: U.S. producers' shipments, 1958-67

Year	Electric shavers		Parts 1/	Total value
	Quantity	Value		
	1,000 units	1,000 dollars	1,000 dollars	1,000 dollars
1958	4,855	54,091	6,144	60,235
1959	5,158	54,537	7,670	62,207
1960	4,369	48,518	6,526	55,044
1961	4,567	55,639	7,611	63,250
1962	3,732	48,869	5,875	54,744
1963	3,839	53,376	6,032	59,408
1964	3,827	51,024	5,766	56,790
1965	5,702	74,117	8,375	82,492
1966	5,955	78,935	8,920	87,855
1967	2/ 6,200	2/ 84,000	9,492	93,492

1/ For each year 1958-63 shipments of parts for electric shavers were estimated by the staff of the Tariff Commission, by applying to the total values of parts reported for electric housewares and fans the ratio of shipments of electric shavers (excluding parts) to total shipments of electric housewares and fans (excluding parts). Data for shipments of parts for electric housewares and fans were unavailable for the years 1964-67; therefore the estimates for shipments of parts for electric shavers for those years were based on the ratio of shipments of parts to shipments of complete units in 1963 (11.3 percent).

2/ Estimated by assuming that shipments in 1967 increased over those in 1966 by the same percentage as 1966 shipments increased over those in 1965.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 3.--Shavers and parts: U.S. exports of domestic merchandise, by principal markets, 1965-67

Year and market	Electric shavers		Parts	Blades and cutting heads 1/	Total value
	Complete shavers				
	Quantity	Value			
	1,000 units	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars
1965:					
Canada	16	337	1,006	587	1,930
United Kingdom	20	221	425	-	646
Netherlands	1	7	422	21	450
Italy	4	40	297	-	337
Australia	18	125	53	-	178
France	6	79	145	2	226
West Germany	2	24	210	22	256
South Africa	2/	2	112	5	119
Hong Kong	6	84	2	1	87
All other	32	343	121	345	809
Total	105	1,262	2,793	983	5,038
1966:					
Canada	51	597	1,038	696	2,331
United Kingdom	23	181	740	12	933
Netherlands	1	6	481	30	517
Italy	1	7	376	2/	383
Australia	5	51	192	17	260
France	12	89	28	2	119
West Germany	2/	5	36	-	41
South Africa	2/	3	31	-	34
Hong Kong	2/	4	2	1	7
All other	20	177	85	271	533
Total	113	1,120	3,009	1,029	5,158
1967:					
Canada	27	321	1,206	596	2,123
United Kingdom	53	467	669	81	1,217
Netherlands	2/	1	211	341	553
Italy	1	8	212	-	220
Australia	-	-	201	-	201
France	6	69	60	10	139
West Germany	1	11	56	42	109
South Africa	1	28	31	2/	59
Hong Kong	1	22	2	-	24
All other	18	167	80	174	421
Total	108	1,094	2,728	1,244	5,066

1/ Data include nonelectric razors and parts thereof (except safety razors) and blades and cutting heads for electric razors. It is believed that exports of nonelectric razors and parts, if any, are negligible. 2/ Less than $500.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 4.--Shavers and parts (including blades and cutting heads): U.S. imports for consumption, by types and by principal sources, 1964-67

Year and source	Electric shavers			Blades and cutting heads 1/ (650.77)	Total value
	Complete shavers (683.5020)		Parts (683.5040)		
	Quantity	Value			
	1,000 units	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars
1964:					
Netherlands	1,458	3,813	153	410	4,376
United Kingdom	37	224	25	15	264
France	129	455	3	19	477
West Germany	166	431	178	439	1,048
Switzerland	117	275	6	13	295
All other	29	84	8	34	126
Total	1,938	5,283	373	930	6,586
1965:					
Netherlands	1,589	5,347	116	486	5,949
United Kingdom	28	187	19	11	217
France	142	536	6	27	570
West Germany	94	551	152	300	1,003
Switzerland	110	395	42	4	440
All other	64	177	20	30	227
Total	2,027	7,193	354	859	8,406
1966:					
Netherlands	2,203	11,497	67	341	11,905
United Kingdom	264	1,024	160	107	1,291
France	203	701	20	18	739
West Germany	111	537	236	25	798
Switzerland	146	788	12	2	802
All other	64	303	8	50	361
Total	2,991	14,850	503	543	15,896
1967:					
Netherlands	2,210	12,475	77	454	13,006
United Kingdom	206	921	105	182	1,208
France	142	575	21	137	733
West Germany	139	556	38	13	607
Switzerland	69	291	2/	3	294
All other	118	518	25	51	594
Total	2,884	15,336	266	840	16,442

1/ Includes nonelectric shavers, and blades and cutting heads for nonelectric and electric shavers. Imports of nonelectric shavers, and blades and cutting heads therefor are small; imports of nonelectric shavers amounted to 35 units, valued at $259, in 1964, and 22,986 units, valued at $25,991, in 1965 (the only years for which data are available). Data for 1965 are believed to be in error owing to the relative low unit values.

2/ Less than $500.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Because of rounding, figures may not add to the total shown.

Commodity	TSUS item
Hair clippers (except clippers with self-contained electric motor), and cutting blades and heads for all hair clippers	650.83, -.85
Hair clippers with self-contained electric motors, and parts thereof	683.40
Scissors with self-contained electric motors, and parts thereof	683.5060

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

The value of U.S. consumption of hair clippers, electric scissors, and parts in 1967 is estimated at nearly $13 million. Imports probably supply most of the domestic consumption of electric scissors and less than 1 percent of the domestic consumption of hair clippers. Exports, principally hair clippers, in 1967 are estimated at about a tenth of domestic production.

Description and uses

This summary covers hair clippers, both nonelectric and electric, cutting blades and heads for all hair clippers, and electric scissors and parts. It does not cover hand sheepshears, or nonelectric scissors and shears (discussed in separate summaries in volume 6:6), or shavers (discussed in a separate summary in this volume--6:10).

Nonelectric hair clippers are ordinarily operated by one hand by guiding the clipper into the hair and repeatedly squeezing the handles together; a spring forces the handles apart when the hand grip is relaxed. The hand and spring action causes a plate with sharpened teeth to cut hair by moving sideways over a stationary toothed plate. A variation of this design has a single cutting tooth which shears hair by sliding over a wide stationary toothed bottom plate.

Cutting blades in the heads of nonelectric clippers are ordinarily removable. The heads containing the blades are subassemblies of hair clippers; they are also removable from the clippers for cleaning, repairing, or refitting with sharper blades.

Hair clippers with self-contained electric motors have a small motor enclosed in a housing (which fits approximately into the palm of the hand); the motor imparts a reciprocating sideways motion to one

blade sliding over a stationary blade, both of which have cutting teeth. Clippers for cutting human hair include barbers' clippers, in common use in barber and beauty shops, and toilet clippers, similar to barbers' clippers but ordinarily smaller in size, designed primarily for use in the home. Clippers for cutting human hair are generally not as large or as powerful as those designed for the cutting of animal hair. Animal hair clippers are used extensively on farms for clipping animals, such as sheep, and, to a lesser extent, for clipping pets.

Electric scissors have self-contained electric motors similar in kind to those used in some electric shavers and hair clippers, enclosed in a housing. They cut material such as cloth by the shearing of a blade sliding against a stationary blade in short quick strokes. Electric scissors have a safety advantage over conventional scissors in that the blades are short and not pointed and the short cutting stroke lacks force unless pressure is applied by the user. Electric scissors are used most extensively in the garment industry. In recent years, however, they have become popular household articles.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 of the TSUSA-1968) are as follows:

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
	Hair clippers (except clippers with a self-contained electric motor), and cutting blades and heads for all hair clippers:			
650.83	Valued not over $1.75 per dozen.	40% ad val.	36% ad val.	20% ad val.
650.85	Valued over $1.75 per dozen.	8.5¢ ea. + 19% ad val.	7.5¢ ea. + 17% ad val.	4¢ ea. + 9.5% ad val.
683.40	Hair clippers with self-contained electric motors, and parts thereof.	20% ad val.	18% ad val.	10% ad val.
683.5060	Scissors with self-contained electric motors, and parts thereof.	13.75% ad val.	12% ad val.	6.5% ad val.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968, and modifications therein as a result of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade. Only the first and final stages of the annual rate modifications are shown above (see the TSUSA-1968 for the intermediate staged rates).

The prior rates shown in the tabulation above had remained unchanged under the TSUS from August 31, 1963, through the end of 1967. Concessions amounting to a reduction of about 50 percent in duties were granted by the United States in the Kennedy Round; the concessions are being put into effect in five annual stages--the final reductions going into effect on January 1, 1972.

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The average ad valorem equivalent of the compound rate of duty for nonelectric hair clippers and cutting blades and heads for all hair clippers valued over $1.75 per dozen (item 650.85) in effect at the end of 1967, based on dutiable imports in 1967, was 26.4 percent.

U.S. consumption and production

Although basic official statistics are not available on U.S. consumption of the articles included herein, it is estimated that the value of apparent domestic consumption was nearly $13 million in 1967, or about 15 percent above that in 1958. Trade sources indicate that U.S. production of such articles in 1967 was valued at about $13 million (table 1). Most of the output in that year consisted of electric hair clippers.

During the past decade, production of electric hair clippers and electric scissors has increased, whereas production of nonelectric hair clippers has declined. The growth in the production of electric hair clippers, especially of the type used for cutting human hair, resulted from the increase in the number of barbershops and the increased purchases of clippers by family units to offset the rising costs of barbershop haircuts. Electric clippers have replaced the nonelectric types to a large extent. Presently, the only apparent demand for nonelectric hair clippers, except for use on animals, is for use in the more expensive barbershops that feature hand-cut haircuts. The growth in the production of electric scissors, especially for home use, is attributable to the improvements in their design and efficiency and their availability at lower prices.

U.S. producers

There are about nine producers of electric hair clippers in the United States, eight of which are primarily engaged in manufacturing electric clippers for human use. Normally, these electric hair clippers for human use can, with a change of the cutting blade, be used for clipping animals, such as dogs and cats.

There are nine producers of nonelectric hair clippers, only three of which manufacture nonelectric clippers for human use. The remaining six producers manufacture nonelectric clippers for specialized types of animal clipping, such as the type of clipper used by dairymen for clipping the udders and flanks of milk cows in compliance with sanitary regulations.

The plants of the manufacturers of electric and nonelectric hair clippers are situated principally in Wisconsin and Illinois.

Practically all producers of the articles covered by this summary also manufacture other metal articles. Those producing nonelectric types of hair clippers often produce cutlery as well; those making electric hair clippers also produce other small electrical appliances.

Electric scissors, also covered in this summary, are produced by three concerns, one of which--in Illinois--accounts for the bulk of the production.

U.S. exports

Data on U.S. exports of domestic articles of the type covered by this summary were not reported separately in official U.S. Government statistics prior to 1965, and such data as are now available are limited to exports of electric clippers for cutting human or animal hair.

The value of annual exports of electric hair clippers and parts in 1965-67 averaged $1.4 million; of this total, electric clippers for human hair accounted for 71 percent. Canada was the principal market for electric clippers for both human and animal hair (table 2), accounting for 18 percent of the total export value of electric clippers for human hair and for 45 percent of the total export value of electric clippers for animal hair. Other important markets for electric hair clippers for human use during this period included the Republic of South Africa, West Germany, the United Kingdom, and Mexico. Norway, Australia, Belgium, and the United Kingdom were additional important markets for U.S.-produced electric hair clippers for use on animals.

It is estimated that annual U.S. exports of nonelectric hair clippers and parts in recent years probably have been several times as large as annual imports because of the sizable demand in undeveloped countries or remote areas of the world for such clippers and parts. On the other hand, it appears that exports of electric scissors have been thus far insignificant, since production in the United States has been relatively small.

U.S. imports

The value of aggregate imports of the articles covered by this summary increased from $178,000 in 1964 to $1,011,000 in 1967. The largest and most rapidly growing imports were those of electric scissors and parts, which rose in value from $93,000 in 1964 to $814,000 in 1967 (table 3). Switzerland supplied almost all of these imports mainly for the account of a single U.S. manufacturer of sewing aids.

The value of imports of all nonelectric hair clippers and cutting blades and heads for all hair clippers increased from $75,000 in 1964 to $105,000 in 1967. The bulk of these imports originated in West Germany and the United Kingdom; Japan supplied about 3 percent of the imports including the negligible quantity valued at not over $1.75 per dozen. Imports of electric hair clippers and parts increased in value from $10,000 in 1964 to $92,000 in 1967. The Netherlands and West Germany, each having highly developed electrical appliance industries, accounted for the great bulk of the imports during 1964-67.

Foreign production and trade

The most economically developed countries, particularly those with well-established cutlery and electrical appliance industries, such as Switzerland, Germany, the Netherlands and--more recently--Japan, produce nonelectric and electric hair clippers and electric scissors in quantities sufficient both to meet their domestic demands and to compete with the United States in many other countries.

The producing units are generally small and very competitive, but some have international affiliations for obtaining shares of available and potential export markets. Most foreign producers offer nonelectric and electric hair clippers and electric scissors which are designed and priced for the various world markets. These are generally priced below U.S. products; however, foreign consumers often show a marked preference for products of U.S. origin because of styling and technical advancements.

Table 1.--Hair clippers, electric scissors, and parts: U.S. imports for consumption and exports of domestic merchandise, 1964-67

(In thousands of dollars)

Year	Imports	Exports 1/
1964	178	2/
1965	413	1,412
1966	747	1,356
1967	1,011	1,400

1/ Data include exports of electric hair clippers and parts for use on humans and animals, but exclude exports of nonelectric hair clippers, cutting blades and heads for all hair clippers, and electric scissors.
2/ Not available.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Production data are not available. According to trade sources, the value of U.S. producers' shipments in 1967 probably exceeded $13 million. The value of U.S. consumption of hair clippers, electric scissors, and parts in 1967 is estimated at slightly less than $13 million. Imports probably supplied most of the U.S. consumption of electric scissors and parts but only a negligible portion of U.S. consumption of hair clippers and parts.

Table 2.--Electric hair clippers for animal and human hair, and parts: U.S. exports of domestic merchandise, by principal markets, 1965-67

(In thousands of dollars)

Year and market	Electric hair clippers, and parts		
	For animal hair	For human hair	Total
1965:			
Canada	187	275	462
Republic of South Africa	4	70	74
United Kingdom	45	73	118
West Germany	1	101	102
Mexico	12	86	98
Australia	17	25	42
Venezuela	3	54	57
Norway	32	-	32
All other	134	293	427
Total	435	977	1,412
1966:			
Canada	114	168	282
Republic of South Africa	1	130	131
United Kingdom	47	102	149
West Germany	5	120	125
Mexico	21	72	93
Australia	14	22	36
Venezuela	1	81	82
Norway	43	2	45
All other	65	348	413
Total	311	1,045	1,356
1967:			
Canada	243	94	337
Republic of South Africa	3	154	157
United Kingdom	37	120	157
West Germany	5	79	84
Mexico	4	72	76
Australia	44	31	75
Venezuela	1	67	68
Norway	48	1	49
All other	78	319	397
Total	463	937	1,400

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Hair clippers, electric scissors and parts: U.S. imports for consumption, by principal sources, 1964-67

(In thousands of dollars)

Year and source	Hair clippers			Electric scissors and parts (683.5060)	Total
	Nonelectric and parts 1/ (650.85)	Electric and parts (683.40)	Total		
1964:					
Switzerland	-	2/	2/	71	71
Japan	-	6	6	7	13
West Germany	54	3	57	13	70
Netherlands	-	-	-	-	-
United Kingdom	15	-	15	-	15
All other	6	1	7	2	9
Total	75	10	85	93	178
1965:					
Switzerland	-	-	-	288	288
Japan	2/	9	9	1	10
West Germany	55	10	65	20	85
Netherlands	-	-	-	-	-
United Kingdom	16	-	16	1	17
All other	9	2/	9	4	13
Total	80	19	99	314	413
1966:					
Switzerland	-	-	-	519	519
Japan	3	18	21	32	53
West Germany	46	21	67	21	88
Netherlands	-	-	-	54	54
United Kingdom	18	2	20	-	20
All other	7	5	12	1	13
Total	74	46	120	627	747
1967:					
Switzerland	2/	-	2/	642	642
Japan	7	5	12	171	183
West Germany	74	15	89	-	89
Netherlands	-	70	70	-	70
United Kingdom	12	-	12	1	13
All other	12	2	14	2/	14
Total	105	92	197	814	1,011

1/ Data include cutting blades and heads for all clippers. Data also include imports of nonelectric hair clippers and cutting blades and heads for all clippers valued at not over $1.75 per dozen (650.83) in 1965 (total valued at $375--all from Japan). There were no imports of these articles in 1964, 1966, or 1967. 2/ Less than $500.

Source: Compiled from official statistics of the U.S. Department of Commerce.

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Commodity	TSUS item
Sewing machines specially designed to join footwear soles to uppers, and parts thereof (except needles)	672.05
Shoe machinery and parts thereof	678.10

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

U.S. consumption of shoe machinery and parts, which was valued at about $25 million in 1963, is estimated to have been at least twice as large in 1967, or somewhat more than $50 million. Imports, which more than doubled from 1963 to 1967, probably supplied about 15 percent of the value of consumption in 1967. The value of U.S. imports substantially exceeded that of U.S. exports in that year.

Description and uses

This summary covers machines for shoemaking and shoe repairing, including sewing machines specially designed to join footwear soles to uppers. More than 300 different types of machines are used in the United States for producing more than 600 million pairs of shoes a year in a large number of sizes, widths, styles, shapes, materials, and colors. The machines, varying in complexity, are used to cut, press, stamp, form, tack, cement, vulcanize, mold, staple, nail, stitch, sand, and perform many other of some 100 operations in making shoes by various methods. The shoe industry is highly mechanized, with many of the machines operating at very high speeds and performing several operations simultaneously.

Related articles that are not included in this summary are heat setters used in the treatment of lasted shoe uppers made from leather or material having leather-like uppers, item 661.70 (discussed in volume 6:8); sewing machines (other than those specially designed to join footwear soles to uppers), items 672.10 and 672.15; machinery for molding or forming rubber or plastics (other than complete footwear), item 678.35; leatherworking machinery other than shoe machinery, item 678.50; shoe machinery molds for forming rubber or plastic materials, item 680.11; and certain copying lathes for making shoe lasts, item 674.42 (free of duty under temporary legislation, item 911.70). Sewing machines and copying lathes are discussed in volume 6:9, and the other articles are discussed in other summaries in this volume--6:10.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 of the TSUSA-1968) are as follows:

TSUS item	Commodity	Rate of duty
672.05	Sewing machines specially designed to join footwear soles to uppers, and parts thereof (except needles).	Free
678.10	Shoe machinery and parts thereof-------	Free

The duty-free status of shoe machinery was provided for by the Tariff Act of 1930, and this duty-free treatment was bound in 1951 as a result of a concession granted by the United States in the General Agreement on Tariffs and Trade. The tariff status of items 672.05 and 678.10 was not affected by the 1964-67 trade conference.

The United States Customs Court has held that in order for an imported article to be entered free of duty as shoe machinery it must be "used chiefly in a manufacturing operation on shoes ", C. H. Powell Co., Inc. v. United States, C.D. 2238.

U.S. consumption

The value of annual U.S. consumption of shoe machinery and parts apparently increased substantially during 1963-67. Based on official statistics on U.S. producers' shipments and U.S. foreign trade, apparent consumption was valued at about $25 million in 1963 (table 1). Although official statistics on producers' shipments have not been available since 1963, fragmentary trade data indicate that domestic consumption probably exceeded $50 million in 1967. Contributing to the growth in annual U.S. consumption was the introduction of new types of shoe machinery--for molding or forming complete footwear of rubber or plastics materials, and for increased mechanization or automation of footwear production from molded synthetic materials. The widespread use of synthetic materials as substitutes for leather and the uniformity of these materials tends to facilitate increased automation of many types of shoe machinery.

U.S. producers and producers' shipments

Although more than a score of producers manufacture shoe machinery and parts in the United States, four or five of the largest account for the great bulk of domestic production. One large company, the USM Corp. (formerly the United Shoe Machinery Corp.), makes a

complete line of shoe machinery for practically all manufacturing and repairing operations and accounts for more than half of all domestic production. This concern also manufactures various products other than shoe machinery and has shoe machinery factories in several foreign countries. Many of the smaller producers of shoe machinery have limited product lines and make machines used in only one or two shoe manufacturing processes.

Establishments that produce shoe machinery are situated principally in Massachusetts, Tennessee, and Missouri.

The value of U.S. producers' shipments of shoe machinery, as reported in the U.S. Census of Manufactures, increased from $24.2 million in 1958 to $26.8 million in 1963, or at an annual rate of increase of about 2 percent over the 5-year period. The value of producers' shipments increased at a more rapid rate after 1963 and by 1967 probably amounted to about $50 million. 1/ This growth reflects, in addition to increased prices of machinery, the introduction of new types of machines (such as injection molding machinery for producing footwear of plastics or rubber) and machinery adapted for the production of different style shoes or for modernization or greater automation of shoemaking operations.

U.S. exports

The value of U.S. exports of shoe machinery fluctuated moderately during 1963-67 and averaged $4.6 million per year (table 2). Approximately 90 percent of the value of U.S. exports during 1965-67 was accounted for by shoemaking and shoe-repairing machines; the remainder represented shoe-sole-stitching machines.

Canada has been the leading market for U.S. exports of shoe machinery in recent years, accounting for more than 30 percent of the total value of exports in the 1963-67 period. Mexico, France, and West Germany were other important export markets.

U.S. imports

The value of U.S. imports of shoe machinery, increasing each year, rose from $3.7 million in 1963 to $7.8 million in 1967 (table 1). U.S. imports supplied close to 15 percent of U.S. consumption in 1967.

1/ The value of U.S. producers' shipments includes both the value of machines sold and the value of machines leased rather than sold. Before 1955 a large part of the value of shipments represented machines leased by the largest domestic producer; since then, an increasing proportion of the value of shipments has represented shipments of machines sold outright.

SHOE MACHINERY

The bulk of the imports are classified under item 678.10 and consist of such articles as plastic-injection machines which produce a complete shoe, cementing equipment, and cutting, clicking, skiving, trimming, embossing, nailing, vulcanizing, sole press, lacing, pattern, and moist-heat-setting machinery. The bulk of the units imported consist of machines for cutting and shaping leather. These shoe machines include those which taper edges, split sheets, punch, press, or trim leather. Plastic-injection machines which mold a complete shoe account for a significant share of the value of imports, although the number of such machines imported is small. Some unusual machinery not made in the United States is imported to make certain exotic styled shoes. U.S. producers hesitate to tool up to produce such machinery because it may quickly become obsolete when fashions change.

The principal sources of imports have been West Germany and the United Kingdom (table 3).

Sewing machines used in footwear manufacture (item 672.05) represent a relatively small but rapidly increasing share of the imports considered in this summary. Annual imports of sewing machines designed to join footwear soles to uppers increased in value in 1964-67 as shown below:

Year	Value
1964	$48,000
1965	208,000
1966	781,000
1967	1,502,000

The United Kingdom and Denmark have been the principal sources of imports of sewing machines used in manufacturing shoes.

Table 1.--Shoe machinery: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1963-67

Year	U.S. producers' shipments 1/	Imports	Exports	Apparent consumption 1/	Ratio of imports to consumption 1/
	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	Percent
1963	26,798	3,662	4,963	25,497	14
1964	2/	4,318	4,893	2/	2/
1965	2/	4,828	4,167	2/	2/
1966	2/	6,589	4,128	2/	2/
1967	3/ 50,000	7,820	4,949	3/ 53,000	3/ 15

1/ Data include value of shipments of shoe machines whether sold or leased.

2/ Not available.

3/ Estimated on basis of fragmentary trade data.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 2.--Shoe machinery including sewing machines designed to join footwear soles to uppers, and parts thereof: U.S. exports of domestic merchandise, by principal markets, 1963-67

(In thousands of dollars)

Market	1963	1964	1965	1966	1967
Canada	1,814	1,745	1,226	1,411	1,948
Mexico	266	382	462	425	414
France	577	369	270	301	385
West Germany	534	336	324	333	340
United Kingdom	264	238	275	200	222
Japan	69	74	83	48	190
Dominican Republic	63	180	38	70	181
All other	1,376	1,569	1,489	1,340	1,269
Total	4,963	4,893	4,167	4,128	4,949

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Shoe machinery, including sewing machines designed to join footwear soles to uppers, and parts thereof: U.S. imports for consumption, by principal sources, 1963-67

(In thousands of dollars)

Source	1963	1964	1965	1966	1967
West Germany	1,854	2,871	3,210	3,632	3,733
United Kingdom	411	331	470	1,047	1,832
Canada	751	684	398	765	1,213
Italy	143	140	340	685	608
Denmark	108	96	132	150	162
France	40	142	231	232	131
All other	355	54	47	78	141
Total	3,662	4,318	4,828	6,589	7,820

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Machinery for processing mineral substances----------	678.20

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

Apparent U.S. consumption of mineral-processing machinery in 1967 was valued at about $344 million, of which imports accounted for about 3 percent. U.S. exports of such machinery in that year were valued at $80 million, or many times the value of imports.

Description and uses

Articles for processing mineral substances are described in the Tariff Schedules of the United States Annotated (TSUSA-1968) as:

> machinery for sorting, screening, separating, washing, crushing, grinding, or mixing earth, stone, ores, or other mineral substances in solid (including powder or paste) form; machinery for agglomerating, molding, or shaping solid mineral fuels, ceramic paste, unhardened cements, plastering materials or other mineral products in powder or paste form; machines for forming foundry molds of sand; all the foregoing and parts thereof.

The large variety of machinery and equipment covered by this summary is used principally in mining, construction, and manufacturing mineral products. Among the imported machines classified by the Bureau of Customs under item 678.20, not designated by name in the statutory description given above, are the following:

Vibrating mechanisms which facilitate the free flow of mineral substances,
Cyclone separators for use in separating mineral particles according to size,
Magnetic separators,
Asphalt plants used in highway construction,
Pug mills which shape clay for pottery use,
Certain mold presses for making clay pigeons,
Presses for compacting dry cell batteries, ceramic tile, brick, and prestressed concrete slabs,
Stationary concrete mixers,
Asbestos cleaning machines

Related articles not covered by this summary are rotary kilns (part of item 661.30) and belt and other conveyors (part of item 664.10); these articles are discussed in separate summaries in volume 6:8. The in-transit type of concrete mixers (part of item 692.16) is discussed in volume 6:11.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty (see general headnote 3 in the TSUSA-1968) applicable to machinery of the types classifiable under item 678.20 are shown below:

	Rate of duty
Prior rate (before the concessions noted below)---	10% ad val.
Concessions granted by the United States in the 1964-67 trade conference (Kennedy Round):	
First stage, effective Jan. 1, 1968----------	9% ad val.
Fifth and final stage, effective Jan. 1, 1972---	5% ad val.

The prior rate of 10 percent ad valorem had remained unchanged under the TSUS from August 31, 1963, through the end of 1967. A concession amounting to a reduction of 50 percent of the prior rate was granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade. (See the TSUSA-1968 for all the intermediate staged rates.)

U.S. consumption, producers, and producers' shipments

Apparent U.S. consumption of machinery for processing mineral substances increased from $265 million in 1965 to $344 million in 1967 (table 1). This growth reflects mostly the increase in the construction of highways and nonresidential buildings and in the production and processing of minerals.

Probably more than 300 establishments, most of them in the East North Central States, are engaged in the domestic production of machinery for processing mineral substances. Generally, each of the plants produces a limited number of types of machinery. Some of them produce a variety of models of particular types of machinery. Many plants making machinery for processing mineral substances also make other machinery or components for use in mining, in materials handling, or in processing nonmineral substances.

The value of U.S. producers' shipments of mineral-processing machinery, about a fifth of which was accounted for by exports, increased steadily from about $300 million in 1964 to about $415 million

in 1967. From data available for 1966, U.S. producers' shipments in that year, by type, were as follows:

Type	Million dollars
Mixers, pavers, and related equipment	172
Stationary crushers, pulverizers, and screeners	96
Clayworking, cementmaking, and concrete-products machinery	88
Mineral classifying, flotation, separating, concentrating, cleaning, clarifying, and related equipment	34
Total	390

U.S. exports

U.S. exports of machinery for processing mineral substances were valued at about $73 million in 1965 and about $80 million in each of the years 1966 and 1967, the only full years for which comparable data are available (table 1). During 1965-67, annual exports were many times larger than annual imports and their value was equal to about one-fifth of the estimated value of annual shipments by U.S. producers. The statistics on U.S. exports, with separate data for types of machinery and for parts, are shown in table 2. The data indicate that during 1965-67, parts constituted a third of the total value of exports and machines for grinding, pulverizing, screening, and the like (complete units) also constituted about a third of the total.

During 1965-67, Canada was by far the leading market for U.S. exports, accounting for about 30 percent of the value of exports in 1967 (table 3). Mexico, Chile, Venezuela and Peru were other important markets in that year. The worldwide scope of U.S. exports of this machinery and equipment is indicated by the fact that more than 75 countries received U.S. exports in 1967.

U.S. imports

The foreign value of U.S. imports of mineral-processing machinery, and parts thereof, increased from $5.7 million in 1964 to $12.4 million in 1966 and declined to $9.0 million in 1967 (table 4).

The volume of annual U.S. imports in 1964-67, classified by type, is shown in table 5. About half of the value of imports during this period consisted of machines for sorting, screening, separating, washing, crushing, grinding, or mixing earth, stone, ores, or other mineral substances (in solid, powder, or paste form), and parts thereof.

Some imported articles, such as certain mold presses for making clay pigeons and pug mills for shaping pottery clay, are of a special design which are not readily available from domestic sources.

West Germany and Canada have been the principal sources of the imports, accounting for more than half of the total during 1964-67. The United Kingdom, Denmark, and Sweden also were important sources of imports (table 4).

Table 1.--Machinery for processing mineral substances, and parts thereof: U.S. producers' shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, 1964-67

Year	U.S. producers' shipments 1/	Imports	Exports	Apparent consumption 1/	Ratio of imports to consumption 1/
	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	Percent
1964	300,000	5,672	2/	2/	2/
1965	330,000	7,112	72,603	264,509	2.7
1966	390,000	12,412	80,289	322,123	3.9
1967	415,000	9,021	80,488	343,533	2.6

1/ Partly estimated by the U.S. Tariff Commission staff.
2/ Comparable data not available.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Note.--The ratios of imports to consumption are based on the foreign market value of imports and essentially U.S. factory value of consumption. If the ratios were computed on the basis of foreign value of imports plus U.S. import duties and costs of transportation, insurance, and other handling to deliver the machinery to the United States, the ratios would be higher--in 1967 somewhat more than 3 percent.

Table 2.--Machinery for processing mineral substances, and parts thereof: U.S. exports of domestic merchandise, by type, 1965-67

(In thousands of dollars)

Type	1965	1966	1967
Bituminous and concrete mixers	9,771	11,351	9,348
Grinders, pulverizers, screeners, etc.:			
Portable	10,683	7,721	9,367
Stationary	14,565	18,464	19,170
Total	25,248	26,185	28,537
Machinery for forming foundry sand molds	3,288	3,265	3,630
Miscellaneous mineral working machinery and equipment (complete units)	11,193	13,277	9,900
Parts	23,103	26,211	29,073
Grand total	72,603	80,289	80,488

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Machinery for processing mineral substances, and parts thereof: U.S. exports of domestic merchandise, by principal markets, 1965-67

(In thousands of dollars)

Market	1965	1966	1967
Canada	20,386	25,296	23,796
Mexico	6,448	5,858	5,138
Chile	2,638	2,963	4,688
Venezuela	1,992	1,995	3,154
Peru	4,811	3,397	3,039
Philippines	2,282	1,534	2,929
Japan	755	1,973	2,634
Brazil	605	2,049	2,425
Bolivia	607	769	2,175
Turkey	198	1,103	1,854
All other	31,881	33,352	28,656
Total	72,603	80,289	80,488

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 4.--Machinery for processing mineral substances, and parts thereof: U.S. imports for consumption, by principal sources, 1964-67

(In thousands of dollars)

Source	1964	1965	1966	1967
West Germany	1,682	2,176	2,433	2,455
Canada	1,371	1,818	4,277	2,382
United Kingdom	797	1,058	2,200	1,439
Denmark	255	445	945	866
Sweden	173	120	351	424
All other	1,394	1,495	2,206	1,455
Total	5,672	7,112	12,412	9,021

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 5.--Machinery for processing mineral substances, and parts thereof: U.S. imports for consumption, by types, 1964-67

(In thousands of dollars)

Type	1964	1965	1966	1967
Machinery for sorting, screening, separating, washing, crushing, grinding, or mixing earth, stone, ores, or other mineral substances in solid (including powder or paste) form	1,291	1,195	1,791	2,312
Parts for the foregoing	1,215	1,925	5,841	2,567
Other machinery:				
Designed for use with ceramic paste, unhardened cements, and plastering materials	924	698	457	421
Machines for forming foundry molds of sand	265	443	721	929
Other machinery	1,013	1,267	1,748	1,849
Parts for the foregoing	964	1,584	1,854	943
Total	5,672	7,112	12,412	9,021

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Glassworking machines (other than machines for working glass in the cold) and parts	678.30
Machines for assembling electric filament and discharge lamps and electronic tubes and parts	678.32

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

The value of U.S. consumption of the machines and parts covered by this summary increased from about $40 million in 1963 to an estimated $54 million in 1967. Imports in that year probably accounted for about 6 percent of the value of consumption. Exports in 1967, much larger than imports, probably accounted for about 27 percent of domestic producers' shipments.

Description and uses

The machinery covered by this summary includes glassworking machines and parts (not including machines for working cold glass) such as those for glass rolling, blowing, drawing, and molding, and machines and parts for assembling electric filament and discharge lamps and electronic tubes. Included are machines for producing flat glass, plain or reinforced (used for such products as windows, mirrors, and laminated glass for automobiles); pressed or blown glassware articles, such as plates, cups and saucers, drinking glasses, and containers (used in packaging beverages, foods, and other products) and such specialty items as fiber glass, art, novelty, and optical glass.

This summary also includes machines for the assembly of electric filament and discharge lamps and electronic tubes. The electric filament lamp or bulb emits light when its filament is heated to incandescence by the passage of an electric current. An electric discharge lamp emits light as a result of a discharge of an electric current between two electrodes through a gas (such as argon or neon) in a tube or a bulb. The machines are used principally for automatic assembly of all components of the electric lamps and electronic tubes, for vacuumsealing, and for other operations.

Related articles not included in this summary are machines for working glass in the cold, item 674.4250 (discussed in volume 6:9);

molds for forming glass articles, item 680.15 (in this volume--6:10); furnaces and ovens or lehrs--electric, item 683.9520 (in this volume --6:10), and other than electric, item 661.30 (in volume 6:8).

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
	Glassworking machines (other than machines for working glass in the cold); machines for assembling electric filament and discharge lamps and electronic tubes; all the foregoing and parts thereof:			
678.30	Glassworking machines and parts.	11.5% ad val.	10% ad val.	5.5% ad val.
678.32	Other	10% ad val.	9% ad val.	5% ad val.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968, and modifications therein as a result of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade. Only the first and final stages of the five annual rate modifications are shown above (see the TSUSA-1968 for the intermediate staged rates). The prior rates of duty for items 678.30 and 678.32 had remained unchanged under the TSUS from August 31, 1963, through the end of 1967.

U.S. consumption

The estimated value of apparent U.S. consumption of machines for glass working and for assembling electric lamps and electronic tubes increased from nearly $40 million in 1963 to about $54 million in 1967.

The increased consumption of this machinery reflects the general increase in U.S. production of glass products--for use in construction, automobiles, glass containers (including the introduction in recent years of throwaway bottles for soft drinks), electric lamps, and numerous other products.

The development of new uses for glass (as in spacecraft, cookware, electronics, and insulation), as well as the development of new techniques for making glass, has required more glassworking machinery. For example, a new type of sheet glass, known as float glass, first produced in the United States in 1964, has been increasingly substituted for plate glass for certain applications in automobiles. Float glass is a transparent flat glass having plane and parallel surfaces comparable to those of plate glass. The parallel surfaces of float glass, however, are obtained by floating a layer of molten glass over molten tin rather than by physical grinding and polishing in the cold as in plate glass manufacture. Since the technique of producing float glass is different from that needed for producing plate glass, it requires a different type of machinery.

U.S. producers

There are 74 firms listed as producers of glass machinery in the Thomas Register of American Manufacturers. It is believed that only about 30 of these firms produce the types of glassworking machinery that are dutiable under items 678.30 and 678.32. The other firms produce articles that are classifiable as "machine tools" or "machines for working glass in the cold." Some of this machinery may also be used for working materials other than glass.

A few large manufacturers that specialize in producing glassworking machinery are believed to supply most of the domestic production. The smaller firms produce only a limited line of machinery or specialize in production of parts for glassworking machines. Some firms which manufacture glass or articles of glass have engineered highly specialized glassworking machines which they build for their own consumption. Production of glassworking machines is concentrated in the East North Central and Middle Atlantic States.

U.S. producers' shipments

The value of U.S. producers' shipments of machinery and parts for glass working and assembling electric lamps and electronic tubes increased from about $49 million in 1963 to an estimated $70 million in 1967 (table 1). The estimate for 1967 is based on data for 1963 projected through 1967, principally on the basis of the growth in U.S.

production of major glass products. Separate data on U.S. producers' shipments of almost all types of machinery covered by this summary were last reported in the 1963 U.S. Census of Manufacturers. In that year the value of shipments, by type of machinery, was as follows:

	Million dollars
Bottle-forming machines	11
Electronic tubemaking machinery, equipment, and parts	9
Other glassmaking machinery, equipment, and parts except lehrs (including an estimate by the staff of the U.S. Tariff Commission) for machinery and equipment for making incandescent lamps	29
Total	49

U.S. exports

The value of U.S. exports of the machinery considered here increased from $12 million in 1965 (the earliest year for which comparable data are available) to $19 million in 1967 (table 1). The value of exports, by type, for the years 1965-67 was as follows (in millions of dollars):

	1965	1966	1967
Glassworking machines	10.5	13.5	16.3
Machines for manufacturing and assembling electric lamps and electronic tubes.	1.9	1.9	2.4
Total	12.4	15.4	18.7

Canada was the leading market for U.S. exports, accounting for about 25 percent of the total value of exports in 1967. Japan, the United Kingdom, and Venezuela are other important export markets (table 2).

U.S. imports

The value of U.S. imports of glassworking and related machines increased from $1.8 million in 1964 to $3.2 million in 1967. The ratio of the value of imports to that of apparent consumption in 1967 is estimated at about 6 percent (table 1).

The value of imports of glassworking machines entered under item 678.30 rose from $0.4 million in 1964 to $1 million in 1967 (table 3). The value of imports of parts for these machines, larger than that of imports of complete machines, fluctuated during the 1964-67 period from $1.1 million in 1965 to $1.8 million in 1966. Imports of machines and parts of machines for assembling electric lamps and electronic tubes (item 678.32) increased from $0.1 million in 1964 to $0.9 million in 1967. It is believed that the great bulk of these imports consisted of complete machines rather than of parts.

Imports of glassworking machinery included complete sheet-glass-manufacturing plants, sheet-glass-laminating machines, glass capillary-drawing machines, machines for producing fiber glass, machines for manufacturing electric lamps, and such machinery parts as pressure rolls, baffle cams, blow head arms, toggle cylinders, and mold platen gears.

Sweden and the United Kingdom were the principal sources of imports of glassworking and related machines during 1964-67. These countries accounted for 43 and 19 percent, respectively, of the total value of U.S. imports of such machines during 1964-67. Other important sources, in recent years, have included Belgium and Luxembourg, and West Germany (table 4).

Table 1.--Glassworking machines, and machines for assembling electric lamps and electronic tubes, and parts thereof: U.S. producers' shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, 1963-67

Year	Producers' shipments	Imports	Exports	Apparent consumption	Ratio of imports to consumption
	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	Percent
1963	1/ 49,000	1,811	2/ 11,000	40,000	5
1964	3/	1,777	3/	3/	3/
1965	3/	1,550	12,408	3/	3/
1966	3/	3,278	15,413	3/	3/
1967	2/ 70,000	3,159	18,718	2/ 54,000	2/ 6

1/ Partly estimated by the staff of the U.S. Tariff Commission.
2/ Wholly estimated by the staff of the U.S. Tariff Commission.
3/ Not available.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 2.--Glassworking machines and machines for assembling electric lamps and electronic tubes, and parts thereof: U.S. exports of domestic merchandise, by principal markets, 1965-67

(In thousands of dollars)

Market	1965	1966	1967
Canada	1,420	2,326	4,575
Japan	1,430	2,198	2,251
United Kingdom	1,122	1,084	1,643
Venezuela	1,292	743	1,158
Italy	664	472	1,082
Spain	324	129	1,082
France	510	391	1,076
Mexico	1,399	1,841	1,020
All other	4,247	6,229	4,831
Total	12,408	15,413	18,718

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Glassworking machines and machines for assembling electric lamps and electronic tubes, and parts thereof: U.S. imports for consumption, by type, 1964-67

(In thousands of dollars)

Type	1964	1965	1966	1967
Glassworking machines except for working glass in the cold	392	346	1,069	1,070
Parts of above glassworking machines	1,284	1,070	1,788	1,166
Machines for assembling electric lamps and electronic tubes, and parts thereof	101	134	421	923
Total	1,777	1,550	3,278	3,159

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 4.--Glassworking machines, and machines for assembling electric lamps and electronic tubes, and parts thereof: U.S. imports for consumption, by principal sources, 1964-67

(In thousands of dollars)

Source	1964	1965	1966	1967
United Kingdom	232	232	545	868
Sweden	1,067	1,010	1,280	856
Belgium and Luxembourg	38	52	544	530
West Germany	55	56	216	280
France	7	-	190	121
Brazil	-	64	348	47
All other	378	136	155	457
Total	1,777	1,550	3,278	3,159

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Machines used for molding or otherwise forming rubber or plastics articles, and parts thereof	678.35

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

The United States is probably the world's largest consumer of machinery for molding or forming rubber or plastics. The estimated factory value of consumption in 1967 was probably about $370 million, of which somewhat more than 6 percent was accounted for by imports. The value of U.S. exports was more than twice as large as that of U.S. imports.

Description and uses

A wide variety of machines for molding or forming plastics or rubber articles are covered by this summary. The machines generally form these articles with molds or dies and heat or pressure. The plastics-forming machines include the following types: Injection molding, blow molding, compression molding, foam molding, thermoforming, and extruding. These machines are used to produce such diverse plastics articles as trash cans, pails, baskets, building materials, packaging materials, bottles, automobile brake linings, foam coolers, and eyeglass frames. The rubber-forming machines include tire-molding and tire-recapping machines, vulcanizing presses, extruding machines, and rubber-reclaiming equipment used in the production of such articles as automobile tires, hose, tubing, belting, rainwear, washers, and sheeting. The forming of rubber articles requires techniques which differ from those necessary in forming plastics and, as a general rule, machines which form plastics are not utilized to form rubber articles, and vice versa.

This summary does not include calender rolls (items 661.40 to 661.55) and molds used for rubber or plastics material (items 680.11 and 680.12). Calender rolls are discussed in volume 6:8, and molds are discussed elsewhere in this volume (6:10).

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty (see general headnote 3 in the TSUSA-1968) applicable to machines for molding or otherwise forming rubber or plastics articles, and parts thereof (item 678.35) are shown below:

	Rate of duty
Prior rate (before the concessions noted below)--	11.5% ad val.
Concessions granted by the United States in the 1964-67 trade conference (Kennedy Round):	
First stage, effective Jan. 1, 1968----------	10% ad val.
Fifth and final stage, effective Jan. 1, 1972--	5.5% ad val.

The prior rate of 11.5 percent ad valorem for item 678.35 had remained unchanged from August 31, 1963, through the end of 1967. As a result of a concession granted by the United States in the sixth round of trade negotiations, concluded on June 30, 1967, the rate is being reduced to 5.5 percent ad valorem in five annual stages (see the TSUSA-1968 for the intermediate staged rates).

U.S. consumption

The value of apparent U.S. consumption of machinery for molding or forming plastics or rubber increased from $208 million in 1964 to $370 million in 1967 (table 1). The United States is probably the largest consumer of this type of machinery in the world. In recent years the consumption of plastics-working machinery has been larger and has grown more rapidly than that of rubber-working machinery. This trend reflects improvements in the technology of production and use of plastics, yielding a large variety of plastics and plastics articles with improved qualities. Consumer acceptance of these articles has resulted in increased production at reduced costs. Plastics have been increasingly substituted for other materials in many applications--replacing materials such as metals, wood, ceramics, natural textile fibers, and even rubber. Plastics consumption has grown most rapidly for uses in building construction, packaging, and transportation equipment.

U.S. producers and producers' shipments

According to the latest U.S. Census of Manufactures, 95 domestic establishments produced plastics-working machinery and equipment in 1963; it is believed that about 25 of the establishments accounted for the bulk of the production. Most of these establishments also made

other types of machinery, but only a few made both plastics-working and rubber-working machines. Production of rubber-working machinery was reported by 35 establishments in the 1963 census. A few large firms supplied most of this machinery, while smaller firms produced only a single type or limited line of machinery.

Some domestic producers sell imported machines as a supplement to their own product lines.

The combined factory value of U.S. manufacturers' shipments of plastics-working and rubber-working machinery rose from $214 million in 1963 to an estimated $405 million in 1967. The production of plastics- or rubber-working machinery is widespread throughout the United States and is not concentrated in any one area.

The shipments of plastics-working machinery increased at an average annual rate of 16 percent a year during 1964-67. Shipments of plastics-working and rubber-working machinery in 1963-67 are indicated below (in millions of dollars):

	1963	1964	1965	1966	1967
Plastics-working machinery and equipment	137	168	213	265	284
Rubber-working machinery and equipment	77	90	102	101	121
Total	214	258	315	366	405

U.S. exports

The factory value of U.S. exports of machines and equipment for molding or forming plastics or rubber averaged about $59 million during 1965-67--more than twice as large as the value of imports (table 1). The value of exports during 1965-67 represented 18 percent of the value of U.S. producers' shipments. More than half of the aggregate value of exports was accounted for by rubber-working machines (tire-building machines and parts made up the bulk of these exports), as indicated below (in millions of dollars):

Type of machinery	1965	1966	1967
Plastics-working machinery	25	26	26
Rubber-working machinery	37	29	33
Total	62	55	59

Canada was the principal market for U.S. exports of machinery for molding or forming plastics or rubber, accounting for 24 percent of

the total value of exports in 1967 (table 2). Other important markets were West Germany, Mexico, and the United Kingdom; the machinery was exported to more than 100 countries in 1967.

U.S. imports

The value of U.S. imports of machinery for molding or forming plastics or rubber increased from $10 million in 1964 to $24 million in 1967. Imports during 1964-67 supplied about 5 to 7 percent of apparent U.S. consumption (table 1).

The imports consisted of virtually all of the basic types of machines covered by this summary. Among the plastics-forming machinery imported, injection-molding machines and extruding machines were the more important. Imports of machinery for forming rubber articles included tire-building and tire-recapping machines, and machines for manufacturing foam rubber.

West Germany accounted for more than half the value of the imports of machinery for forming plastics or rubber during 1964-67 (table 3). Other important sources were Canada, Japan, and Italy.

Table 1.--Machines for molding rubber or plastics: U.S. producers' shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, 1964-67

Year	U.S. producers' shipments	Imports	Exports	Apparent consumption	Ratio of imports to consumption
	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	Percent
1964	257,612	10,046	59,812	207,846	5
1965	315,109	16,448	61,706	269,851	6
1966	366,314	23,063	55,557	333,820	7
1967	1/ 405,000	23,752	58,797	1/ 369,955	1/ 6

1/ Estimated by the staff of the U.S. Tariff Commission.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Note.--Calendering rolls are included in the data on shipments and consumption and possibly in those on exports, but they are not included in the data on imports. Consequently, data on imports are not strictly comparable with the other data. The ratios of imports to consumption are calculated on the basis of the foreign value of imports and essentially factory value of apparent consumption; if the duty-paid, landed values of imports were used in the computations, the ratios would be somewhat higher.

Table 2.--Machines for molding rubber or plastics: U.S. exports of domestic merchandise, by principal markets, 1964-67

(In thousands of dollars)

Market	1964	1965	1966	1967
Canada	13,702	10,827	12,780	14,077
West Germany	2,571	2,240	2,844	4,473
Mexico	4,518	6,881	4,135	4,329
United Kingdom	4,683	6,219	4,419	3,725
Japan	3,234	1,723	923	3,014
France	3,162	4,101	2,781	2,404
Belgium and Luxembourg	1,758	1,249	3,091	2,223
Italy	3,023	1,276	1,543	2,134
Spain	1,030	927	1,164	2,113
Chile	304	468	465	1,541
Republic of South Africa	2,501	1,924	1,205	1,538
Peru	462	309	807	1,271
All other	18,864	23,562	18,949	15,955
Total	59,812	61,706	55,557	58,797

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Machines for molding rubber or plastics: U.S. imports for consumption, by principal sources, 1964-67

(In thousands of dollars)

Source	1964	1965	1966	1967
West Germany	5,556	8,514	11,567	11,813
Canada	1,663	2,139	2,526	3,332
Japan	311	1,001	2,275	2,070
Italy	542	1,718	1,191	1,935
United Kingdom	545	1,050	2,188	1,560
Austria	147	350	1,159	1,102
All other	1,282	1,676	2,157	1,940
Total	10,046	16,448	23,063	23,752

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Automatic vending machines and parts thereof	678.40

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

The United States is probably the world's largest consumer of automatic vending machines and parts. In 1967 the value of apparent U.S. consumption of automatic merchandise vending machines and parts amounted to about $207 million. Imports supplied about 1 percent of this value. Exports are many times as large as imports and, in 1967, accounted for about 7 percent of the total value of U.S. producers' shipments.

Description and uses

The automatic vending machines covered by this summary are machines which sell something, usually a product or service, or both. They are usually activated by the insertion of a coin or token, and may some day be activated by special credit cards. Many, but not all, vending machines have an electrical triggering element or device. The triggering or activating mechanisms and other parts for these machines are also covered if not of a type specially provided for elsewhere in the tariff schedules.

The principal automatic vending machines considered here include those for selling products such as beverages (principally soft drinks and coffee), confections (principally candy bars), other packaged foods, and tobacco products (principally cigarettes). Such automatic vending machines may be equipped to heat or cool the product sold (such as hot chocolate, soup, cold drinks, or frozen foods).

Some automatic machines which vend services are turnstiles, and machines which issue insurance policies, stamps, or other evidences of payment for services.

The triggering mechanisms for automatic vending machines are generally calibrated to accept particular coins or tokens, and many will accept limited overpayments and make change.

Some automatic machines for vending services, some parts of automatic vending machines, and some related articles which are not covered

by this summary, all of which are coin or token operated, are the following: Locks for public lavatories and lockers, items 646.80 to 646.92 (discussed in volume 6:5); scales, item 662.30 (in volume 6:8); laundry and drycleaning equipment, items 670.40 and 670.41 (in volume 6:6); telephones, item 684.62 (in volume 6:11); radios, items 685.23 and 685.25 (in volume 6:11); juke boxes, item 685.32 (also in volume 6:11); and machines involving games of skill or chance, item 734.20 (in volume 7:4). Coin changers which do not charge a premium for the exchange are probably classified as machines not specifically provided for, item 678.50.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty (see general headnote 3 in the TSUSA-1968) applicable to imports of automatic vending machines and parts thereof (item 678.40) are shown below:

	Rate of duty
Prior rate (before the concessions noted below)---	11.5% ad val.
Concessions granted by the United States in the 1964-67 trade conference (Kennedy Round):	
First stage, effective Jan. 1, 1968----------	10% ad val.
Fifth and final stage, effective Jan. 1, 1972---	5.5% ad val.

The prior rate of 11.5 percent ad valorem became effective on July 1, 1963, as a result of a concession granted by the United States in the General Agreement on Tariffs and Trade (GATT). At that time automatic vending machines having as an essential feature an electrical element or device were dutiable under paragraph 353, and those without an electrical element or device were dutiable under paragraph 372 of the Tariff Act of 1930. With the implementation of the TSUS on August 31, 1963, automatic vending machines and parts thereof were established as a separate item dutiable at the same rate which applied to imports under paragraph 353; this rate remained unchanged through the end of 1967. As a result of a concession granted by the United States in the sixth round of trade negotiations under the GATT, the 11.5 percent rate is being reduced to 5.5 percent in five annual stages (see the TSUSA-1968 for the intermediate staged rates).

U.S. consumption

Data regarding U.S. consumption of all automatic vending machines of the type encompassed by this summary are not available as the reported data on U.S. production relates primarily to merchandise dispensing machines. Based on such limited data, apparent U.S. consumption of automatic vending machines, and parts thereof, increased from $219

million in 1965 to $235 million in 1966, and then declined to about $207 million in 1967 (table 1). The consumption of automatic vending machines has generally increased over the past decade because of the labor and other cost savings made available by this convenience type of marketing, improved packaging techniques, and the availability of better and more versatile machines. Demand for automatic vending machines has been stimulated in recent years by technological advances in packaging, refrigeration, heating, plastics, electronics, and food processing. These advances have permitted the evolution of automatic vending machines from such simple types as gum ball dispensers to the multiple-product dispensers of today. Vending machine owners and leasees have demanded more reliability and greater capacity, in addition to improved styling and design.

The use of automatic vending machines has moved far beyond its original limited field of selling soft drinks, cigarettes, candy bars, and chewing gum to selling such products as hot foods, detergents, ice, phonograph records, and packaged fresh flowers. One of the fastest growing markets for automatic machines is for selling hot food in places convenient to consumers, such as industrial and institutional cafeterias, gas stations, and motels. Furthermore the sale of nonfood articles such as toiletries, facial tissues, drug sundries, and detergents has been facilitated through the location of automatic vending machines for these articles in service stations; motels, bus, rail, and airline terminals; sports stadiums; and laundromats.

U.S. producers

In 1963 there were 158 establishments that produced automatic vending machines and parts; 24 of these establishments, all of which had 100 or more employees each, accounted for 80 percent of the total value of U.S. producers' shipments in 1963. In 1967, 36 producing companies, each reporting shipments valued at $100,000 or more of the machines covered by this summary, accounted for the bulk of the production.

Producers of automatic vending machines usually specialize in the manufacture of certain types of units, such as beverage vendors or nonfood vendors. Other articles made by these producers include music systems, icemaking machines, refrigerated storage units, and beverage coolers. Production of merchandise vending machines is concentrated in Missouri and the Northeastern and North Central States.

U.S. producers' shipments

The value of U.S. producers' shipments of automatic vending machines and parts increased from $196 million in 1963 to $249 million in 1966 and then declined to about $220 million in 1967 (table 1). Despite the decline in 1967, the total value of shipments in that year was about 12 percent larger than in 1963. The value of shipments of vending machines for confections and foods increased more rapidly than for other types--by about a third--while the value of shipments of machines vending all other merchandise (principally articles other than cigarettes) declined by about one-tenth (table 2).

Of the total value of domestic producers' shipments of automatic machines for vending merchandise, during the 5-year period 1963-67, more than half (56 percent) was for machines vending beverages, about 17 percent was for machines vending confections and foods, 12 percent for those vending other merchandise, and the remaining 15 percent for coin-operated mechanisms and other vending-machine parts.

U.S. exports

The value of U.S. exports of automatic vending machines and parts increased from $13.1 million in 1965 to $15.2 million in 1967; exports accounted for a little more than 6 percent of U.S. producers' shipments during the 3-year period (table 1). The average unit value of the exports declined from $323 in 1965 to $229 in 1967 (table 3). The value of exports of parts for these machines, including coin-operated mechanisms, accounted for about 21 percent of total exports of automatic vending machines and parts during 1965-67.

In recent years about one-third of U.S. exports of automatic vending machines and parts have gone to Canada, the largest single market (table 4). Other important export markets were West Germany, the United Kingdom, and Belgium and Luxembourg.

It is believed that by far the greatest volume of exports have consisted of machines for vending merchandise.

U.S. imports

Although the value of U.S. imports of automatic vending machines increased from about $1.2 million in 1964 to $2.2 million in 1967, imports have supplied only about 1 percent of apparent U.S. consumption (table 1). Imports have included vending machines for dispensing milkshakes, hot beverages, ice, cigarettes, post cards, phonograph records, and cold drinks. Vending machine parts and coin mechanisms have also been entered under item 678.40.

The low level of imports relative to domestic consumption and exports is attributable to the strong competitive position of the domestic industry, which benefits from a large home market; technologically advanced products; a broad product line; and the readily available servicing facilities offered to operators of such machines in the United States.

Denmark was the principal source of imports of the articles considered here during each of the years 1964-67, in the latter year supplying 40 percent of total imports (table 5). Japan, West Germany, Canada, and the United Kingdom were other important sources.

Imports of machines for vending services are believed to be very small.

Table 1.--Automatic vending machines, and parts thereof: U.S. producers' shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, 1963-67

(In thousands of dollars)

Year	Producers' shipments 1/	Imports	Exports	Apparent consumption
1963	196,278	2/	2/	2/
1964	217,154	1,159	2/	2/
1965	230,232	1,434	13,103	218,563
1966	249,209	1,895	15,862	235,242
1967	3/ 220,282	2,187	15,234	3/ 207,235

1/ The value of production data may be understated as it does not include coin operated service vending machines such as shoe shiners.
2/ Not available.
3/ Includes an estimate by the U.S. Tariff Commission staff for value of coin-operated mechanisms and other parts for vending machines.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 2.--Automatic vending machines and parts thereof: Value of U.S. producers' shipments, by principal items, 1963-67

(In thousands of dollars)

Item	1963	1964	1965	1966	1967
Complete vending machines: 1/					
For beverages	106,060	125,628	131,530	140,658	122,507
For confections and foods	29,751	32,011	36,687	45,054	39,724
For all other merchandise (principally cigarettes)	27,710	26,040	27,626	26,626	25,051
Subtotal	163,521	183,679	195,843	212,338	187,282
Coin-operated mechanisms and other vending machine parts	32,757	33,475	34,389	36,871	2/ 33,000
Grand total	196,278	217,154	230,232	249,209	220,282

1/ The figures represent factory shipments (for domestic use and export) of new coin-operated vending machines, including those shipped on consignment. The dollar values shown are f.o.b. plant after discounts and allowances.

2/ Estimated by the staff of the U.S. Tariff Commission.

Source: Data for complete vending machines, from all known domestic manufacturers as reported by the U.S. Department of Commerce in Current Industrial Reports (Series MA-35U). Data for coin-operated mechanisms and other vending machine parts, as reported by the U.S. Department of Commerce in the U.S. Census of Manufactures for 1963 and in the Annual Survey of Manufactures for 1964-66.

Table 3.--Automatic vending machines and parts thereof: U.S. exports of domestic merchandise, 1965-67

Item	1965	1966	1967
Complete machines:			
Quantity----------number of units--	32,614	51,792	50,359
Value----------1,000 dollars--	10,527	12,635	11,557
Average value per unit----------	$323	$244	$229
Parts for vending machines including coin mechanisms----------1,000 dollars--	2,576	3,227	3,677
Total value----------do--------	13,103	15,862	15,234

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 4.--Automatic vending machines and parts thereof: U.S. exports of domestic merchandise, by principal markets, 1965-67

(In thousands of dollars)

Canada----------	4,049	4,587	5,862
West Germany----------	3,653	3,559	1,859
United Kingdom----------	1,752	1,354	1,686
Belgium and Luxembourg----------	743	737	1,105
Japan----------	141	139	818
Italy----------	154	325	373
France----------	373	403	348
Spain----------	196	192	297
Sweden----------	307	313	250
All other----------	1,735	4,253	2,636
Total----------	13,103	15,862	15,234

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 5.--Automatic vending machines and parts thereof: U.S. imports for consumption, by principal sources, 1964-67

(In thousands of dollars)

Source	1964	1965	1966	1967
Denmark	655	595	897	867
Japan	118	376	519	635
West Germany	21	28	31	341
Canada	185	200	175	179
United Kingdom	134	210	222	134
All other	46	25	51	31
Total	1,159	1,434	1,895	2,187

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Tobacco leaf stripping or cutting machines; industrial cigar- or cigarette-making machines, whether or not equipped with an auxiliary packaging device, and parts of all the foregoing---	678.45

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

The value of apparent U.S. consumption of tobacco-processing machines and parts, including cigarette- or cigar-making machines, increased from about $12 million in 1963 to $15 million to $17 million in 1967. U.S. imports probably accounted for more than half of this value. The value of U.S. exports was less than half that of imports.

Description and uses

Some of the articles included in this summary are stripping and stemming machines, filler bunching machines, cigar presses, cigarette-making machines, and machines for attaching filter tips to cigarettes. Recent customs practice has been to also classify under this item machines for making pipe tobacco, chewing tobacco, and snuff.

Cigarette-making machines and related equipment are the most important types of machines covered by this summary.

Related articles for processing tobacco that are not included here are machines that convey (item 664.10), dry, cure, or roast tobacco (item 661.70). Also excluded are machines for wrapping and packaging cigarettes and cigars unless they are auxiliary to the machines manufacturing these products; separate wrapping and packaging machines are provided for in items 662.10 and 662.20. All of the aforementioned articles are discussed in summaries in volume 6:8.

U.S. tariff treatment

The current column 1 (trade-agreement) rates of duty (see general headnote 3 in the TSUSA-1968) applicable to imports of tobacco-processing machinery (item 678.45) are shown below:

	Rate of duty
Prior rate (before concessions noted below)------	12.5% ad val.
Concessions granted by the United States in the 1964-67 trade conference (Kennedy Round):	
First stage, effective Jan. 1, 1968----------	11% ad val.
Fifth and final stage, effective Jan. 1, 1972--	6% ad val.

The prior rate of 12.5 percent ad valorem, which became effective on August 31, 1963, with the adoption of the TSUS, had remained unchanged through the end of 1967. As a result, however, of a concession granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade, the rate is being reduced to 6 percent ad valorem in five annual stages (see the TSUSA-1968 for the intermediate staged rates).

U.S. consumption

The value of apparent U.S. consumption of tobacco-processing and cigar- and cigarette-making machinery and parts covered by this summary increased from about $12 million in 1963 to $15 million to $17 million in 1967 (table 1). Imports probably accounted for more than half of the value of consumption.

The growth in U.S. consumption of tobacco machinery reflects the trend in recent years in the production of cigarettes of longer than standard size and of cigarettes of various lengths fitted with filters. The consumption of tobacco-processing machinery other than for cigarettes has been constant in recent years.

U.S. producers

The Thomas Register of Manufacturers lists 25 U.S. concerns as producers of tobacco-processing machinery. Most of these concerns produce only a limited line of this type of machinery, which generally represents a small part of the firms' total output. Two large diversified companies which make industrial cigarette machines probably account for more than half of the total value of domestic production. Production of tobacco-processing machines is centered near the market for this equipment in New York, New Jersey, Pennsylvania, and Virginia.

U.S. producers' shipments

U.S. producers' shipments of tobacco machinery of the types considered in this summary rose from about $10 million in 1963 to an estimated $11 million to $13 million in 1967 (table 1). The data for 1963, as reported in the last U.S. Census of Manufactures, totaled about $13 million; this figure, however, included cigar, cigarette, and tobacco-packaging and wrapping machines not covered by this summary.

Industrial cigarette-making machines are intricate, automated, high-speed machines that are produced by only a few domestic and foreign firms. Each producer attempts to make a machine with unique patented features which are not available on his competitors' machines. Innovations such as higher operating speeds (some modern machines are capable of producing 3,000 or more cigarettes a minute), as well as changes in cigarette design, such as adding filter tips and producing longer cigarettes, tend to make existing machines obsolete, thus stimulating purchases of new machines. With the exception of the handling of leaf tobacco, most operations in the tobacco and cigarette manufacturing industry that once required hand labor have become mechanized, creating a large and growing market for tobacco-processing machinery.

U.S. exports

The value of U.S. exports of tobacco-processing machinery and parts during 1963-67 fluctuated between $5.4 million in 1965 and $3.5 million in 1966 (table 2). Canada, Mexico, West Germany, and Australia were major markets for exports of tobacco-processing machinery during 1963-67. Exports include cigar- and cigarette-making machines and parts valued at $1.3 million in 1965, $1.0 million in 1966, and $1.5 million in 1967.

U.S. imports

The value of U.S. imports of tobacco-processing machines and parts increased from $6.9 million in 1963 to $12.8 million in 1965 and then declined to $8.2 million in 1967. The total value of the parts is much greater than the total value of the machines each year (table 3). During 1964-67, imports of industrial cigarette-making machines and parts represented 92 percent of the aggregate value of all articles entered under item 678.45.

It is likely that imports accounted for at least half of the apparent domestic consumption during 1964-67--especially if the duty-paid, U.S.-landed value of imports is considered rather than the

foreign value reported in official statistics. The large share of imports in the U.S. market is attributable to the technologically advanced machines offered at favorable prices by foreign producers.

The United Kingdom and West Germany supplied 58 and 39 percent, respectively, of the total imports of tobacco-processing machinery during 1963-67 (table 4).

Table 1.--Tobacco-processing machines and parts, cigar- and cigarette-making machines and parts: U.S. producers' shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, 1963-67

(In thousands of dollars)

Year	Producers' shipments	Imports	Exports 1/	Apparent consumption	Ratio of imports to consumption
	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	Percent
1963	2/ 10,000	6,878	4,879	12,000	57
1964	3/	8,062	5,317	3/	3/
1965	3/	12,839	5,447	3/	3/
1966	3/	10,004	3,547	3/	3/
1967	4/11,000-13,000	8,187	3,903	4/15,000-17,000	4/ 48-55

1/ Data on exports are overstated since they include certain machines for processing tobacco which are not covered by item 678.45.

2/ Partly estimated by the staff of the U.S. Tariff Commission.

3/ Not available.

4/ Estimated by the staff of the U.S. Tariff Commission by projecting through 1967 the data for 1963, taking into account the growth in U.S. production of tobacco products and changes in machinery necessitated by increased use of cigarette filter tips and longer cigarettes.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Note.--The ratios are based on the foreign market value of imports and the factory value of U.S. producers' shipments. Had the ratios been computed on the basis of the foreign value of imports plus U.S. import duties and costs of transportation, insurance, and other handling to deliver them to the United States, the ratios would be higher.

Table 2.--Tobacco-processing machines and parts, cigar- and cigarette-making machines and parts: U.S. exports of domestic merchandise, by principal markets, 1963-67

(In thousands of dollars)

Market	1963	1964	1965	1966	1967
Canada	848	1,406	1,096	695	933
Mexico	192	146	155	130	409
Thailand	1	44	87	118	186
Australia	121	186	108	244	177
West Germany	286	410	150	103	165
Ghana	-	-	-	-	161
France	30	17	23	2	160
Canary Islands	6	159	142	42	128
Switzerland	61	68	293	183	122
All other	3,334	2,881	3,393	2,030	1,462
Total	4,879	5,317	5,447	3,547	3,903

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Tobacco-processing machines and parts, cigarette-making machines and parts: U.S. imports for consumption, by type, 1964-67

(In thousands of dollars)

Type	1964	1965	1966	1967
Industrial cigarette-making machines	1,020	3,149	2,625	3,234
Parts of industrial cigarette-making machines	6,429	8,069	7,064	4,367
Other tobacco-processing machines and parts	613	1,621	315	586
Total	8,062	12,839	10,004	8,187

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 4.--Tobacco-processing machines and parts, cigarette-making machines and parts: U.S. imports for consumption, by principal sources, 1963-67

(In thousands of dollars)

Source	1963	1964	1965	1966	1967
United Kingdom	4,106	4,119	7,438	5,649	5,494
West Germany	2,681	3,710	4,971	4,088	2,388
Netherlands	26	93	61	159	186
Sweden	30	81	72	35	55
Italy	-	8	185	66	50
Canada	32	1	16	-	12
Brazil	-	-	95	1/	2
All other	3	50	1	7	-
Total	6,878	8,062	12,839	10,004	8,187

1/ Less than $500.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Machines not specially provided for, and parts thereof	678.50, -.51

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

Although basic trade data, except those on U.S. imports, on the numerous and diverse types of machines covered by this summary are largely not separately reported in official statistics, it is believed that annual U.S. consumption probably amounts to hundreds of millions of dollars. Imports are believed to have accounted for less than a tenth of the aggregate value of consumption during 1964-67 of the various articles covered by this summary. It is likely that exports were of the same general magnitude as imports.

Description and uses

This summary covers a wide variety of machines and parts thereof, not specially provided for in the TSUS. Analyses of samples of import entries during 1964-67 that were classified by the U.S. Bureau of Customs under item 678.50 indicate that the following types of machines were imported in significant amounts:

Carnival and amusement park riding equipment, such as ferris wheels, merry-go-rounds, and bump-em cars
Brushmaking machines
Electric motors with enclosed speed-reducing gear systems built in as integral parts
Film cutting or perforating machines
Electronic color scanners used to produce color separations from which printing plates are made
Vibrators used for shake-testing various articles
Tablet-forming machines for making pills and tablets
Glass-etching machines
Devices that have a mechanical feature for mixing liquid fuel and air
Plastic-coating machines
Nailing tools manually operated but equipped with a mechanical spring for moving each nail into position for driving

Aluminum anodizing process line
Machines which are used for grinding various types of materials and which do not have a chief use for grinding a particular commodity or mineral substance
Wood products machinery not specially provided for in the TSUS (such as hydraulic presses used in manufacturing plywood and particle board)
Leather-working machinery not specially provided for in the TSUS (such as machines for softening, cutting, shaving, polishing, or coating leather)
Wire-working machinery not specially provided for in the TSUS (such as machines for winding coils for electric motors, for weaving Fourdrinier wire used in papermaking, for stringing piano cord wire, and for splicing, coiling, or winding wire or cable

The composition of imported articles entered under items 678.50 and 678.51 changes from year to year. This depends upon new decisions by the Customs Bureau or the Customs Courts regarding the classification of specific articles under these items for tariff purposes. It also depends on the establishment by acts of Congress of new TSUS items for specific machines previously not specially provided for (or the discontinuance of TSUS items providing for specific machines). For example, as a result of a decision (CIE 522/67) by the Bureau of Customs, effective May 29, 1967, tape players and combination machines containing tape players, previously entered under item 685.32 for phonographs, became dutiable under item 678.50 (discussed in volume 6:11).

U.S. tariff treatment

The current column 1 (trade-agreement) rates of duty (see general headnote 3 in the TSUSA-1968) applicable to imports of machines not specially provided for (items 678.50 and 678.51) are as follows:

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
678.50	Machines not specially provided for, and parts thereof.	10% ad val.	9% ad val.	5% ad val.
678.51	If Canadian article and original motor-vehicle equipment.	Free	1/	1/

1/ Duty-free status not affected by trade conference.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968, and modifications in the rate for item 678.50 as a result of a concession granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade. Only the first and final stages of the five annual rate modifications are shown above (see the TSUSA-1968 for the intermediate staged rates).

The prior rate of 10 percent ad valorem for item 678.50 had remained unchanged under the TSUS from August 31, 1963, through the end of 1967. Articles entered under item 678.51 have been duty free since January 18, 1965, pursuant to the Automotive Products Trade Act of 1965, and were not affected by the recent trade conference.

U.S. consumption

For the most part, data on U.S. consumption of the heterogeneous group of machines classified or classifiable under the TSUSA items for machines not specially provided for, and parts thereof, are not separately reported in official statistics. The value of U.S. consumption of these machines probably amounts to hundreds of millions of dollars annually and it is believed such consumption increased significantly during the 1964-67 period.

U.S. producers, producers' shipments, and exports

Machines of the many diverse types covered by this summary are probably produced by several hundred establishments in the United States.

Data are not separately reported in the official statistics regarding U.S. producers' shipments of most of the types of machines considered here; however, it is estimated that the aggregate value of shipments of all the articles considered here exceeded $500 million in 1967.

U.S. exports of machines comparable to those classifiable under items 678.50 and 678.51 are not separately reported in official statistics and there is no meaningful basis for estimating the value of such exports.

U.S. imports

The value of U.S. imports of machines not specially provided for increased from $25 million in 1964 to $68 million in 1967. West Germany, Canada, and the United Kingdom were the principal sources of imports during 1964-66; however, reflecting the U.S. Bureau of Customs decision of May 29, 1967, to classify certain tape players under item 678.50, Japan became the principal source of all imports classified under this item in 1967. The value of imports from Japan increased from $2 million in 1966 to $23 million in 1967.

Considered as a whole, imports have probably supplied less than a tenth of the aggregate value of domestic consumption of the numerous machines covered by this summary. For some types of machines, however, (such as the tape players) imports probably supply a much larger share of U.S. consumption.

Preliminary data for the first 10 months of 1968 indicate that imports of tape players and combination machines containing tape players designed for motor-vehicle installation totaled 921,000 units, valued at $21.0 million, during that period, and imports of other tape players and combination machines containing tape players amounted to 959,000 units, valued at $20.0 million. The great bulk of these imports were from Japan. Although data are not available on U.S. producers' shipments and consumption of like tape players, it is believed that imports probably account for about half of the number of such players consumed in the United States.

Imports of machines not specially provided for, and parts thereof, if Canadian articles and original motor-vehicle equipment (which have entered the United States duty free under the provisions of the Automotive Products Trade Act of 1965) have been insignificant, totaling $3,000 in 1966 and $24,000 in 1967.

Machines not specially provided for: U.S. imports for consumption, by principal sources, 1964-67

(In thousands of dollars)

Source	1964	1965	1966	1967
Japan	450	722	2,237	22,875
West Germany	7,645	8,607	12,738	17,568
United Kingdom	4,191	4,377	5,356	7,771
Canada	4,799	5,898	1/ 7,818	1/ 7,657
Italy	891	1,080	1,944	2,440
Switzerland	1,931	1,860	2,046	2,017
France	266	635	1,948	1,744
Sweden	2,515	1,595	1,764	1,115
All other	2,196	1,297	2,211	4,769
Total	24,884	26,071	38,062	67,956

1/ Data include imports valued at $3,000 in 1966 and others valued at $24,000 in 1967 that were entered free of duty under the provisions of the Automotive Products Trade Act of 1965.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Data on production, consumption, and exports of machines not specially provided for are not separately reported in the official statistics, and there is no meaningful basis for estimating such data.

Commodity	TSUS item
Molding boxes for metal foundry	680.05
Molders' patterns for the manufacture of castings	680.07
Molds other than ingot molds	680.11, -.12, -.15

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

The United States is one of the world's largest producers and consumers of molding boxes, molders' patterns, and molds; the value of U.S. consumption in 1967 is estimated at about $500 million. Imports and exports of molds have been large, but U.S. foreign trade in molding boxes and molders' patterns has been insignificant. Annual imports of molds increased in value from $6.3 million in 1963 to $18.2 million in 1967, when they were approximately equal in value to exports. In 1967, imports supplied about 5 percent of the value of apparent domestic consumption of molds.

Description and uses

Molding boxes for metal foundries are round or rectangular frames, usually of cast iron or steel. Most molding boxes have hinged sections or removable ends which facilitate the removal of molds from the boxes. Sand molds are formed in molding boxes by packing a mixture of moistened sand and clay around a pattern. When the pattern is removed, a cavity or impression is left in the sand. The cavity is subsequently filled with molten metal which solidifies to form a casting. Molders' patterns are shaped to the same configuration as that of the desired casting. These patterns are generally made from wood or some other easily worked material; where many castings of the same part will be produced, duplicate patterns are made from the original or master pattern.

Many different types of molds, which vary widely in size and complexity, are dutiable under items 680.11, 680.12, and 680.15. These molds range from simple, gravity-fed impressions that are cut in steel blocks to highly complex multiple-cavity molds for pressure casting. Molds may also incorporate heating elements and adjustable features that permit changing the size and configuration of the mold. Molds are used in producing such diverse articles as plastic toys and containers; rubber shoes and tires; concrete blocks, pipes, and poles for street lighting; ceramic tiles and plumbing fixtures; glass bottles; and metal

parts for machinery and transportation equipment, e.g., wheels, pistons, cylinder blocks, base plates, and housings. This summary does not cover ingot molds, which are classified under item 674.10 and are discussed in a summary in volume 6:9.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
680.05	Molding boxes for metal foundry.	19% ad val.	17% ad val.	9.5% ad val.
680.07	Molders' patterns for the manufacture of castings.	12.5% ad val.	11% ad val.	6% ad val.
	Molds used for rubber or plastic materials:			
680.11	Shoe machinery molds---	Free	1/	1/
680.12	Other---	11.5% ad val.	10% ad val.	5.5% ad val.
680.15	Molds used for metal (except ingot molds), for metallic carbides, for glass, or for mineral materials.	11.5% ad val.	10% ad val.	5.5% ad val.

1/ Duty-free status not affected by the trade conference.

The tabulation above shows the column 1 rates in effect prior to January 1, 1968, and modifications therein as a result of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade. Only the first and final stages of the five annual rate modifications are shown above (see the TSUSA-1968 for the intermediate staged rates).

Concessions amounting to a reduction of about 50 percent in the duties on all items considered here other than shoe machinery molds were granted by the United States in the aforementioned trade conference. The duty-free status of shoe machinery molds, established in the Tariff Act of 1930, was not affected by the trade conference. Shoe machinery

molds, however, were dutiable at 11.5 percent ad valorem during the period from August 31, 1963 (the effective date of the TSUS), to December 7, 1965 (the effective date of the Tariff Schedules Technical Amendments Act). This act restored the duty-free status of shoe machinery molds by establishing a separate item (680.11), thereby segregating such molds from other molds that remained dutiable. The U.S. Bureau of Customs practice is to classify only molds which form a complete shoe under item 680.11; molds which form rubber or plastic heels, soles, and other shoe parts are dutiable under item 680.12.

U.S. consumption

The apparent U.S. consumption in 1967 of all the articles covered by this summary is estimated to have been valued at about $500 million, about 50 percent larger than in 1963. The estimated consumption of molds other than ingot molds was valued at about $374 million in 1967, about 75 percent larger than in 1963; while the consumption of molders' patterns is estimated at $118 million, or about 10 percent more than in 1963 (table 1). Basic data on which to base an estimate of the consumption of molding boxes are not available; a substantial part of the boxes consumed are made by the consumers.

U.S. producers

It is estimated that there are 50 domestic establishments that make molding boxes, 2,000 that make patterns, and 900 that make industrial molds. These establishments are situated principally in the East North Central and Middle Atlantic states. Molding boxes are generally made in iron and steel foundries and account for a small part of the typical producer's total business. Many foundries operate captive pattern shops, where they produce at least some of the patterns they use; patterns are also produced by some casting consumers and by independent pattern shops. Metal molds are generally made in establishments that produce tools and dies and engage in specialty machining services.

U.S. producers' shipments

The value of U.S. producers' shipments of all articles covered by this summary except molding boxes for metal foundry rose from $326 million in 1963 to an estimated $493 million in 1967 (table 1). Data on producers' shipments of molding boxes for metal foundry are not segregated in official statistics; the value of shipments of such boxes have probably increased slowly since 1963. The value of producers' shipments of molders' patterns rose from $106 million in 1963 to an estimated $118 million in 1967.

U.S. producers' shipments of molds other than ingot molds have accounted for the largest part of the total value of domestic shipments of the articles covered by this summary and have shown the most rapid increase. Sand and similar molds which are produced in metal foundries for captive use only and are not articles of trade are not covered by this summary. The value of shipments of molds of the types considered here rose from $221 million in 1963 to an estimated $375 million in 1967, representing an increase of about 70 percent (table 2). In 1963, U.S. producers' shipments, by type of molds, as reported in the U.S. Census of Manufactures, were as follows:

	1,000 dollars
Industrial molds, metal:	
For molding plastics	112,679
For molding rubber products, including tire molds	35,458
For casting metals (foundry molds except ingot molds)	15,218
Other	30,266
All other	26,940
Total	220,561

Data on the distribution of shipments by type are not available for the years 1964-66 and official data for 1967 will not be available until the U.S. Census of Manufactures for that year is published. It is known, however, that there has been a large increase in recent years in U.S. producers' shipments of molds for forming plastics. The value of shipments of these molds increased from $60 million in 1958 to $113 million in 1963, and this same rate of increase probably continued during 1964-67. The growth in shipments of plastics-forming molds is attributable in part to the development of more durable and improved plastics, which have led to new uses for plastics articles and more widespread acceptance of plastics in existing applications.

U.S. exports

The value of U.S. exports of molding boxes for use in metal foundries combined with that of molds increased from $15.7 million in 1965 to $21.4 million in 1966 and then declined to $18.8 million in 1967 (table 3). Exports have consisted principally of molds for forming rubber, plastics, and metals.

Canada has been the leading market for the U.S. exports, accounting for about 60 percent of the value of total exports of molding boxes and molds during 1965-67. Other significant markets include Mexico, the United Kingdom, Argentina, France, and India.

Data on exports of molders' patterns are not reported separately in the official statistics. It is known, however, that exports of patterns are small in relation to U.S. producers' total shipments and that Canada has been the principal export market.

U.S. imports

The value of imports of the articles covered by this summary rose from about $6.4 million in 1963 to $18.5 million in 1967, representing an increase of 188 percent (table 1). Imports by item number during 1964-67 are shown in table 4. Imports of molding boxes for use in metal foundries were negligible, and their value declined from $82,000 in 1964 to $2,000 in 1967. Imports of molders' patterns (item 680.07), largely from Canada, rose from $110,000 in 1964 to $395,000 in 1966 and then declined to $299,000 in 1967; the imports were small in relation to the value of domestic consumption--less than 1 percent.

Almost 98 percent of the value of all imports during 1963-67 was accounted for by molds other than ingot molds. The aggregate value of imports of such molds rose from $6.3 million in 1963 (about 3 percent of the value of domestic consumption) to $18.2 million in 1967 (about 5 percent of consumption). Imports under item 680.12 of rubber and plastics-forming molds other than shoe machinery molds accounted for 86 percent of the total value of imports of molds in 1967; imports under item 680.15 of molds for forming metal, metallic carbides, glass, and mineral substances accounted for 11 percent of the total; and imports under item 680.11 of shoe machinery molds accounted for the remaining 3 percent (table 4).

The great bulk of the imports entered under item 680.12 consisted of injection molds for forming such plastics articles as toys, wastebaskets, soapdishes, picnic jugs and hairbrushes. The unit value of individual entries of these molds in recent years has ranged from less than $100 to more than $25,000.

Articles that have been classified under item 680.15 are molds used in forming metal automobile parts, concrete blocks and pipes, ceramic tiles, and glass containers.

In 1964-67 Canada was the principal source of all imported molds considered here, accounting for 68 to 74 percent of the total value of annual imports (table 5). Other countries that supplied significant quantities of imports were Italy, Portugal, and West Germany.

Table 1.--Molding boxes, molders' patterns, and molds: U.S. producers' shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, by type of article, 1963-67

(In thousands of dollars)

Category and type of article	1963	1964	1965	1966	1967
U.S. producers' shipments: 1/					
Molders' patterns	105,572	2/118,000	2/157,000	2/157,000	2/118,000
Molds other than ingot molds	220,561	242,972	295,360	342,283	2/375,000
Total 3/	326,133	360,972	452,360	499,283	493,000
U.S. imports:					
Molding boxes for metal foundries	4/	82	44	3	2
Molders' patterns	108	110	231	395	299
Molds other than ingot molds	6,312	8,368	11,564	14,522	18,203
Total	6,420	8,478	11,795	14,917	18,502
U.S. exports: 1/ 5/					
Molds other than ingot molds	2/ 12,000	2/ 14,000	6/ 15,748	6/ 21,444	6/ 18,843
Apparent U.S. consumption: 1/					
Molders' patterns	105,680	2/118,110	2/157,231	2/157,395	2/118,299
Molds other than ingot molds	2/214,873	2/237,340	291,176	335,361	2/374,360
Total 2/ 3/	320,553	355,450	448,407	492,756	492,659

1/ Under this category no official statistics on molding boxes for metal foundry are available.
2/ Estimated by the staff of the U.S. Tariff Commission.
3/ Excludes data for molding boxes.
4/ Not available but believed to be negligible.
5/ No official statistics on exports of molders' patterns are available.
6/ Includes minor exports of molding boxes for metal foundry.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Note.--Imports were significant in relation to U.S. consumption only for molds other than ingot molds (see table 2).

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Table 2.--Molds other than ingot molds (items 680.11, 680.12, and 680.15): U.S. producers' shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, 1963-67

Year	U.S. producers' shipments	Imports	Exports	Apparent consumption	Ratio of imports to consumption
	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	Percent
1963	220,561	6,312	1/ 12,000	1/ 214,873	1/ 2.9
1964	242,972	8,368	1/ 14,000	1/ 237,340	1/ 3.5
1965	295,360	11,564	2/ 15,748	291,176	4.0
1966	342,283	14,522	2/ 21,444	335,361	4.3
1967	1/ 375,000	18,203	2/ 18,843	1/ 374,360	1/ 4.9

1/ Estimated by the staff of the U.S. Tariff Commission.
2/ Includes minor exports of molding boxes for metal foundry.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Note.--The ratios of imports to consumption are based on the foreign market value of imports and are essentially the U.S. factory value of shipments. If the ratios were computed on the basis of foreign value of imports plus U.S. import duties and costs of transportation, insurance, and other handling to deliver the merchandise to the United States, the ratios would be larger.

Table 3.--Molding boxes for metal foundry, and molds other than ingot molds: U.S. exports of domestic merchandise, by principal markets, 1965-67

(In thousands of dollars)

Market	1965	1966	1967
Canada	8,039	13,195	11,729
Mexico	1,189	1,439	1,304
United Kingdom	1,307	756	726
India	567	228	554
Argentina	971	320	390
Brazil	253	546	387
France	603	637	310
Venezuela	265	335	264
Australia	367	259	238
All other	2,187	3,729	2,941
Total	15,748	21,444	18,843

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 4.--Molding boxes, molders' patterns, and molds: U.S. imports for consumption, by tariff description, 1964-67

TSUS item	Item description	1964	1965	1966	1967
		Quantity (units)			
680.05	Molding boxes for metal foundry	91	55	17	30
680.07	Molders' patterns for the manufacture of castings	541	1,109	1,622	84,863
	Molds used for rubber or plastics materials:				
680.11	Shoe machinery molds	10,361	7,513	(2,349	4,311
680.12	Other			(14,767	7,613
680.15	Molds for metal (except ingot molds), metallic carbides, glass, and mineral materials	6,368	8,539	14,362	28,073
		Value (1,000 dollars)			
680.05	Molding boxes for metal foundry	82	44	3	2
680.07	Molders' patterns for the manufacture of castings	110	231	395	299
	Molds used for rubber or plastics materials:				
680.11	Shoe machinery molds	7,537	10,691	(310	501
680.12	Other			(12,802	15,597
680.15	Molds for metal (except ingot molds), metallic carbides, glass, and mineral materials	831	873	1,410	2,105
	Total	8,560	11,839	14,920	18,505

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 5.--Molds (items 680.11, 680.12, and 680.15): U.S. imports for consumption by principal sources, 1964-67

(In thousands of dollars)

Source	1964	1965	1966	1967
Canada	5,705	8,493	10,684	12,783
Italy	592	826	1,210	1,327
Portugal	702	892	984	1,269
West Germany	560	640	480	928
United Kingdom	322	213	211	403
Japan	67	56	223	293
Australia	21	46	134	291
Belgium	64	72	246	274
France	64	70	146	175
All other	271	256	204	460
Total	8,368	11,564	14,522	18,203

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Taps, cocks, valves, and similar devices, and parts thereof:	
Hand-operated and check, and parts thereof	680.20, -.21, -.22, -.23
Other	680.25, -.27, -.28

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

The United States is the world's largest producer, consumer, and exporter of taps, cocks, valves, and similar devices. The value of U.S. producers' shipments of these articles increased from almost $1.3 billion in 1963 to almost $2.0 billion in 1967. The value of apparent consumption was somewhat smaller, for U.S. exports have been substantially larger than imports. Imports accounted for about 1 percent of the value of consumption in 1964-67.

Description and uses

This summary relates to taps, cocks, valves, and similar devices and parts of the foregoing. These articles, which are used to control the flow of liquids, gases, and solids, may be operated by hand; by a motor, solenoid, or clock movement; or by a device such as a spring, counterweight, float, thermostat, pressure capsule, or electronic sensing device.

The term "tap" generally refers to a screwed plug type of valve such as that used in common household faucets. Cocks are simple valves in which the fluid passage is a hole in a rotatable plug fitted in the valve body. Rotation of the plug through a right angle stops the flow by opposing it to the undrilled diameter of the plug. Cocks are used to control the flow of material within a piping system rather than at the terminal of the system. Common types of valves include gate valves, globe and angle valves, check valves, and safety valves, which vary in design and in the metals of which they are constructed in accordance with the function to be performed. Gate valves are generally regarded as free-flow valves, i.e., they are usually completely open or completely closed, and are not normally intended for throttling or regulating the volume of material passing through a piping system. Globe and angle valves are designed specifically for the purpose of controlling the volume of material in the system. Needle valves are most often used where very precise control is required. A check valve is

one which permits the material in the system to flow in only one direction. Unlike other valves, check valves generally have no external means of control, but are opened by the pressure in the system; they close automatically when the pressure drops below that for which the valve has been designed. Safety valves are designed to protect boilers and other equipment from overpressures. They open to relieve excess pressure and close automatically at predetermined pressures. A ballcock mechanism, provided for under item 680.25, is a type of float valve used in water-closet storage tanks to control the water level in the tank.

Taps, cocks, valves, and similar devices are usually constructed of iron, steel, bronze, monel, or other metals or alloys. A combination of metals may be used, such as a valve having an iron body and bronze internal parts. The choice of metal depends largely on the kind of material that will be passing through the valve. Practically any metal can be used for oil, gas, cold water, or steam systems; however, many fluids have corrosive qualities and require metals that resist corrosion. Valve sizes vary widely from very small needle and air valves to those for piping systems which are 48 inches or more in diameter.

Taps, cocks, valves, and similar devices have numerous applications. They are used in plumbing systems in homes, apartments, factories, schools, office buildings, and other public buildings; in water, gas, and oil distribution systems; in petroleum refineries, chemical plants, steam and power generating plants, and sewage disposal plants, and for many other industrial applications; in automatic washing machines and other appliances; and in ships, airplanes, and other transportation equipment.

Related articles covered in other summaries are intake and exhaust valve stems for internal combustion engines (items 660.52 to 660.55), discussed in volume 6:8; tubeless tire valve stems (items 692.27 and 692.28), in volume 6:11; and traps or U-bends such as those used in household drainage systems (these articles are classified under various items according to the material of which they are made).

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
	Taps, cocks, valves, and similar devices, however operated, used to control the flow of liquids, gases, or solids, all the foregoing and parts thereof:			
	Hand-operated and check, and parts thereof:			
680.20	Of copper	1.275¢ per lb. + 18% ad val.	1.1¢ per lb. + 16% ad val.	0.6¢ per lb. + 9% ad val.
680.21	If Canadian article and original motor-vehicle equipment.	Free	1/	1/
680.22	Other	18% ad val.	1/	1/
680.23	If Canadian article and original motor-vehicle equipment.	Free	1/	1/
	Other:			
680.25	Ballcock mechanisms, and parts.	11.5% ad val.	10% ad val.	5.5% ad val.
680.27	Other	10% ad val.	9% ad val.	5% ad val.
680.28	If Canadian article and original motor-vehicle equipment.	Free	1/	1/

1/ Tariff status of this item was not affected by the trade conference.

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The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968, and modifications therein as a result of concessions granted by the United States in the sixth round of the trade negotiations under the General Agreement on Tariffs and Trade (GATT). Concessions amounting to a reduction of about 50 percent in the duties applicable to items 680.20, 680.25, and 680.27 were granted in the trade conference. Only the first and final stages of the five annual rate modifications are shown above (see the TSUSA-1968 for the intermediate staged rates).

The duty-free status of items 680.21, 680.23, and 680.28 was provided for by the Automotive Products Trade Act of 1965. This act has permitted Canadian articles that are original motor-vehicle equipment to enter the United States free of duty since January 18, 1965. The duty-free status of these articles was not affected by the sixth round GATT negotiations. Similarly the duty status of item 680.22 was not affected by these negotiations; however, in a trade agreement with Canada (effective January 1, 1966), the United States agreed to reduce the duty on item 680.22 from 22.5 percent to 11 percent ad valorem in five annual stages. The third stage of this concession, which established a rate of 16 percent ad valorem, became effective on January 1, 1968; the fourth-stage rate (13 percent) and fifth-stage rate (11 percent) will become effective on January 1, 1969, and January 1, 1970, respectively.

The Tariff Schedules Technical Amendments Act, which became effective on December 7, 1965, revised the heading which precedes items 680.20 to 680.22 to include parts. Parts were inadvertently omitted from this heading when the Tariff Schedules of the United States were drafted; thus parts of hand-operated and check valves were dutiable under item 680.27 at 10 percent ad valorem during the period from September 1, 1963, to December 7, 1965.

In determining the tariff classification of hand-operated and check valves which are composed of two or more base metals, e.g., iron and copper, and brass or bronze alloys, the valves are classified according to the base metal which predominates by weight over each of the other base metals present. 1/

The average ad valorem equivalent of the compound rate of duty in effect on December 31, 1967, for item 680.20 based on dutiable imports in 1967 was 19.5 percent.

1/ Headnote 2, schedule 6 TSUSA-1968.

U.S. consumption

Estimated apparent U.S. consumption of taps, cocks, valves, and similar devices (hereafter collectively referred to in this summary as valves) increased in each year from an estimated $1.3 billion in 1964 to a little more than $1.8 billion in 1967 (table 1). Virtually all of the U.S. consumption was supplied by domestic production.

The continuous growth in U.S. consumption is attributable to the broad-based and consistently strong demand for valves in the construction of commercial and public buildings, the expansion and modernization of industrial plants, the construction of oil and gas pipelines, and the growing production of household appliances, industrial machinery, transportation equipment, and defense material.

U.S. producers

There are about 600 concerns in the United States that produce valves. Many of these producers are large diversified concerns that also make pipe fittings and other products that are used in conjunction with plumbing, heating, or piping systems. There are also numerous small concerns (employing fewer than 50 persons) that make limited lines of valves. Valve-manufacturing establishments are situated in all regions of the United States, however such establishments are concentrated in the East North Central and Middle Atlantic States. A number of domestic valve producers have established manufacturing facilities in foreign countries or have acquired financial interests in foreign valve-manufacturing concerns in order to participate in certain foreign markets where U.S. exports are not competitive.

In recent years many domestic valve producers, both large and small, have discontinued the operation of captive foundries where they had previously produced castings for valve bodies and other valve parts, these valve producers have found it more profitable to buy their castings from independent foundries.

U.S. producers' shipments

The value of estimated U.S. producers' shipments of valves rose steadily from almost $1.3 billion in 1963 to nearly $2.0 billion in 1967, an increase of a little more than 50 percent (table 1).

Metal valves for piping systems, other than plumbing and heating valves, represented approximately half of the total value of shipments during 1963-67. Other valves which represented a significant share of producers' shipments included valves classified as plumbers' brass goods and those used in pneumatic and hydraulic machinery. Shipments

of valves classified as plumbers' brass goods (used primarily in buildings) have increased at a relatively slow rate since 1964, owing to a slowup in residential housing construction.

U.S. exports

About 7 percent, by value, of U.S. producers' shipments of valves were exported during 1963-67 (table 1). The value of U.S. exports, which have greatly exceeded U.S. imports, increased steadily from $83 million in 1963 to $141 million in 1967.

Data on exports, by types, are shown for 1965-67 in table 2. Nonautomatic valves (including parts) of iron and steel constituted 46 percent of the total value of exports in 1967, and various types of automatic control or regulating valves accounted for an additional 28 percent. A significant proportion of U.S. exports consists of specialty valves of novel design or high quality that are not readily available from foreign sources. The advanced technology of certain domestic producers enables them to export these valves for use in chemical plants, petroleum refineries, and other industrial applications where a premium product is required. U.S. exports of standard size valves, such as those used in household plumbing systems, are small.

Major export markets during 1965-67 were Canada, the United Kingdom, Mexico, the Netherlands, Japan, and Venezuela (table 3); about 30 percent of the total value of exports during the period were destined for Canada.

U.S. imports

The value of U.S. imports of valves increased from $7.4 million in 1964 to $20.9 million in 1967. Imports account for a very small share of the value of apparent consumption; this share increased, however, from about 0.6 percent in 1964 to a little more than 1.0 percent in 1967.

The value of imports of valves, by types, during 1964-67 is shown in table 4. During 1966 and 1967, the years for which import statistics are most nearly comparable, imports of hand-operated and check valves (including parts) of copper (item 680.20) accounted for 21 percent of the total value of imports, imports of hand-operated and check valves and parts of other materials (item 680.22) accounted for 42 percent of the total, and imports of valves other than hand-operated and check valves and parts (item 680.27) accounted for 35 percent of the total.

The aggregate value of U.S. imports of all types of valves considered here, by country of origin, are shown in table 5.

A substantial share of the imports under item 680.20 (valued at $4.4 million in 1966 and about $3.5 million in 1967) have consisted of small diameter (4 inches or less), standard size, brass gate valves. Imports under this item also included brass gas cocks, hose shutoff valves, and brass spigots and faucets. Japan and Italy were the principal sources of imports under item 680.20.

Imports of hand-operated and check valves (including parts) other than of copper (item 680.22) are not only relatively large, but they have also increased more rapidly than imports of other types of valves. The value of such imports rose from $5.8 million in 1966 to $10.1 million in 1967. Comparable data for earlier years are not available because data for those years do not include parts, which represented a large share of the total in 1966 and 1967. Imports entered under item 680.22 include such diverse articles as animal-cage watering valves, valves for irrigation systems, check valves for heat exchangers, and many different types of gate valves. These valves vary considerably in size and unit value. In 1967 about 79 percent, by value, of the valves dutiable under item 680.22 were of cast iron or steel construction; the remainder consisted of articles fabricated from plastics, aluminum, wood, and other materials. A significant share of the 1964-67 imports entered under this item were produced by foreign subsidiaries or affiliates of domestic valve-producing concerns. The principal sources of these imports in 1967 were Canada, Italy, and the United Kingdom.

U.S. imports of ballcock mechanisms and parts (item 680.25) were relatively small--amounting to $255,000 in 1966 and $262,000 in 1967. Most of these imports have come from Japan. Imports of valves (including parts) other than hand-operated and check valves and ballcock mechanisms (item 680.27) were valued at $6.4 million in 1966 and $6.7 million in 1967. Valves entered under this item include units actuated by solenoids, diaphragms, magnets, pressure capsules, and other devices. Principal sources of imports under item 680.27 during 1964-67 were Canada, West Germany, the United Kingdom, and Austria.

The value of imports from Canada of valves which are duty free under the terms of the Automotive Products Trade Act (items 680.21, 680.23, and 680.28) increased from $0.2 million in 1966 to $0.3 million in 1967.

Table 1.--Taps, cocks, valves, and similar devices: U.S. producers' shipments, imports for consumption, exports of domestic merchandise, and apparent consumption 1963-67

(In thousands of dollars)

Year	U.S. producers' shipments 1/	Imports	Exports	Apparent consumption
1963	1,280,000	2/	82,854	2/
1964	1,387,000	7,369	89,771	1,305,000
1965	1,539,000	12,097	110,703	1,440,000
1966	1,762,000	17,067	128,734	1,650,000
1967	1,960,000	20,860	141,042	1,840,000

1/ Data for 1963-66 were partly estimated by the U.S. Tariff Commission staff; data for 1967 were estimated on the basis of the trend indicated for 1963-66.

2/ Data not available.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 2.--Taps, cocks, valves, and similar devices: U.S. exports of domestic merchandise, by type, 1965-67

Type	1965	1966	1967
	Quantity (1,000 units)		
Metal valves, automatic control or regulating:			
Diaphragm actuated	341	545	496
Float actuated	62	90	138
Solenoid operated	860	816	843
Not elsewhere classified (n.e.c.)	1,097	1,342	1,545
	Quantity (1,000 pounds)		
Metal valves for fluid power transfer, hydraulic or pneumatic	2,604	3,436	3,630
Plumbing and heating valves	1,242	2,219	2,055
Plumbing fixture fittings, n.e.c	3,988	5,206	5,588
Valves, nonautomatic, cocks, and similar fittings, n.e.c., and valve parts:			
Of iron or steel	21,341	30,658	34,433
Of nonferrous metal	4,404	5,654	6,270
Of nonmetallic material other than rubber, ceramics, or glass	990	850	813
	Value (1,000 dollars)		
Metal valves, automatic control or regulating:			
Diaphragm actuated	9,626	11,002	11,182
Float actuated	1,089	1,264	1,343
Solenoid operated	8,708	7,150	7,845
Not elsewhere classified (n.e.c.)	15,430	17,068	18,722
Metal valves for fluid power transfer, hydraulic or pneumatic	8,334	10,310	10,918
Plumbing and heating valves	2,759	3,928	3,682
Plumbing fixture fittings, n.e.c	5,539	6,972	7,950
Valves, nonautomatic, cocks, and similar fittings, n.e.c., and valve parts:			
Of iron or steel	49,011	60,075	65,415
Of nonferrous metal	7,624	8,562	10,952
Of nonmetallic material other than rubber, ceramics, or glass	2,583	2,403	3,033
Total	110,703	128,734	141,042

Source: Compiled from official statistics of the U.S. Department of Commerce.

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Table 3.--Taps, cocks, valves, and similar devices: U.S. exports of domestic merchandise, by principal markets, 1965-67

(In thousands of dollars)

Market	1965	1966	1967
Canada	31,942	39,992	41,828
United Kingdom	5,566	7,329	7,973
Mexico	3,383	5,610	7,895
Netherlands	7,069	6,195	5,953
Japan	4,925	4,804	5,932
Venezuela	7,480	6,041	5,818
Italy	2,970	3,946	5,125
West Germany	3,536	4,026	4,662
France	2,849	3,379	3,931
India	3,220	4,190	2,904
Belgium and Luxembourg	1,674	1,810	2,680
Australia	2,238	3,543	2,469
All other	33,851	37,869	43,872
Total	110,703	128,734	141,042

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 4.--Taps, cocks, valves, and similar devices: U.S. imports for consumption, by TSUS items, 1964-67 1/

TSUS item 2/	1964	1965	1966	1967
	Quantity (1,000 pounds)			
680.20	3,798	4,189	5,688	3,974
680.21			1	32
680.22	2,370	2,574	6,474	13,846
680.23			6	90
	Value (1,000 dollars)			
680.20	2,471	2,881	4,405	3,467
680.21			1	22
680.22	1,556	1,667	5,794	10,095
680.23			13	145
680.25	183	216	255	262
680.27	3,159	7,333	6,396	6,721
680.28			203	148
Total	7,369	12,097	17,067	20,860

1/ Except for item 680.25, data for individual TSUS items in 1964 and 1965 are not fully comparable with those shown for 1966 and 1967 because of changes in the coverage of the items resulting from enactment of the Tariff Schedules Technical Amendments Act on Dec. 7, 1965. The totals shown, however, are comparable.

2/ For a description of the items shown, see the section on U.S. tariff treatment.

No quantity data are available for items 680.25, 680.27, and 680.28.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 5.--Taps, cocks, valves, and similar devices: U.S. imports for consumption, by principal sources, 1964-67

(In thousands of dollars)

Source	1964	1965	1966	1967
Canada	2,072	3,870	5,372	6,722
Italy	1,093	2,254	2,797	4,304
West Germany	774	1,342	1,871	2,615
Japan	2,120	2,259	2,836	2,513
United Kingdom	432	1,267	1,784	1,983
All other	878	1,105	2,407	2,723
Total	7,369	12,097	17,067	20,860

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Antifriction balls and rollers	680.30
If Canadian article and original motor-vehicle equipment	680.31
Ball or roller bearings including such bearings with integral shafts, and parts thereof:	
Ball bearings with integral shafts	680.33
If Canadian article and original motor-vehicle equipment	680.34
Other	680.35
If Canadian article and original motor-vehicle equipment	680.36

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

The United States is the world's largest producer, consumer, exporter, and importer of antifriction ball and roller bearings and parts. The value of U.S. consumption in 1967 was about $1.2 billion. Exports substantially exceed imports and consist primarily of replacement bearings for U.S.-made equipment and bearings of sizes and types not manufactured in other countries. In 1967 roller bearings and parts accounted for more than three-fifths of the value of total U.S. exports, while ball bearings and parts accounted for almost three-fourths of the value of total U.S. imports. Imports of all bearings and parts, which have increased steadily in recent years, supplied about 5 percent of domestic consumption in 1967.

Description and uses

This summary covers ball and roller bearings and their parts. These bearings, known as antifriction bearings, are manufactured in a range of standard types and sizes, which provides for a wide variety of applications and for convenient replacement. They are used in almost all equipment and machinery in which motion is involved. The automotive industry is the largest single user of ball and roller bearings. Such bearings are also used extensively in farm machinery, aircraft, electric motors, and generators. Bearings are also important components of missles, torpedoes, submarines, bombsights, tracking devices, and electronic and communication equipment.

Bearings usually consist of an inner ring or race, an outer ring or race, a ball or roller complement, and a separator or retainer

sometimes referred to as a cage. Ball bearings are normally used in applications of high speed and light or moderate load-carrying capacity. For a given set of dimensions and a given degree of precision, ball bearings are generally less expensive than roller types. They usually require less precision in mounting and alinement than roller bearings. Radial and thrust are the principal types of ball bearings.

Roller bearings usually support larger loads than ball bearings and have greater capacity to carry shock and impact loads. Owing to greater friction between rollers, roller bearings are limited to lower speeds. Depending upon construction, roller bearings may take radial load, thrust load, or both; however, they are not generally as versatile as ball bearings in supporting large combined loads. The principal types of roller bearings are tapered, cylindrical, spherical or self-alining, thrust, and needle.

This summary does not include the bushing type of bearings, which are classified under many different items in the tariff schedules, most often as parts of the products for which they are destined.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
680.30	Antifriction balls and rollers.	4¢ per lb. + 12.5% ad val.	3.5¢ per lb. + 11% ad val.	2¢ per lb. + 6% ad val.
680.31	If Canadian article and original motor-vehicle equipment. 2/	Free	1/	1/
	Ball or roller bearings including such bearings with integral shafts, and parts thereof:			
680.33	Ball bearings with integral shafts.	12% ad val.	10.5% ad val.	6% ad val.
680.34	If Canadian article and original motor-vehicle equipment. 2/	Free	1/	1/
680.35	Other	3.4¢ per lb. + 15% ad val.	3¢ per lb. + 13.5% ad val.	1.7¢ per lb. + 7.5% ad val.
680.36	If Canadian article and original motor-vehicle equipment. 2/	Free	1/	1/

1/ Duty-free status not affected by trade conference.
2/ See headnote 2, part 6B, schedule 6 of TSUSA-1968.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968, and modifications therein as a result of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade. Only the first and final stages of the five annual rate modifications are shown above (see the TSUSA-1968 for the intermediate staged rates). The prior rates of duty had remained unchanged under the TSUS from August 31, 1963, through the end of 1967.

The duty-free treatment of antifriction bearings and parts which are Canadian articles and for original motor-vehicle equipment (items 680.31, 680.34, and 680.36) was established pursuant to a concession granted by the United States in the United States-Canadian agreement signed in January 1965, under the authority of the Automotive Products Trade Act of 1965 (19 U.S.C. 2022) (APTA). From August 31, 1963, through January 17, 1965, imports of such bearings and parts presently classifiable under item 680.31 had been dutiable under items 680.30, and those currently classifiable under items 680.34 and 680.36 had been dutiable under item 680.35.

Item 680.33 was established by Public Law 89-241 as item 680.34, but was redesignated as item 680.33 by Public Law 89-283, effective for statistical purposes on December 20, 1965. Imports presently classifiable under item 680.33 had been dutiable under item 680.35.

The ad valorem equivalents of the compound rates of duties in effect in 1967, applicable to items 680.30 and 680.35, based on dutiable imports in 1967, were 17.4 and 16.7 percent, respectively.

U.S. consumption

The value of apparent U.S. consumption of antifriction bearings and parts increased from $603 million in 1958 to $1,296 million in 1966 (table 1). Consumption declined to $1,233 million in 1967, reflecting a 14-percent decline in automobile production, as well as decreases in the level of construction machinery and electric motor shipments. In addition, the rate of increase in the output of other principal bearing-consuming industries to meet defense requirements was lower. In 1967 the value of U.S. consumption of roller bearings exceeded that of ball bearings by about $80 million.

About 40 percent of total domestic consumption is used by the automotive industry, about 15 percent by farm machinery manufacturers, and about 10 percent by the aircraft industry.

U.S. producers

According to industry sources, about 85 companies, employing 61,500 workers, produce ball or roller bearings in about 125 plants. Many of these concerns produce both ball and roller bearings, although some produce only ball bearings and others produce only roller bearings. A few producers account for the bulk of domestic production. The principal manufactures are situated in the northeastern quadrant of the United States--Connecticut, Illinois, Indiana, Michigan, New Hampshire, New Jersey, New York, Ohio, and Pennsylvania being the principal producing States. Some of the manufacturers have plants, subsidiaries, or affiliates in one or more foreign countries.

Eight producers specialize in the manufacture of miniature and instrument ball bearings and about 10 independent companies manufacture only balls. Imports of these ball bearings are believed to be large, in relation to the domestic output of similar products.

U.S. producers' shipments

The value of U.S. producers' shipments of antifriction bearings and parts increased from $637 million in 1958 to $1,331 million in 1966, but declined to $1,263 million in 1967 (table 1). Generally, output has followed the trend of automotive production. Defense requirements in recent years have added to the rising volume of shipments.

Annual domestic shipments of roller bearings have consistently exceeded those of ball bearings; in 1967, the value of the output of roller bearings amounted to $598 million, that of ball bearings totaled $480 million, and that of balls, rollers, and other parts amounted to $185 million. The number of ball bearings manufactured annually, however, exceeds the number of roller bearings produced by a ratio of about 4 to 3. In terms of units, about 30 percent of the total annual shipments of roller bearings have been tapered roller bearings 2 to 4 inches in outside diameter, sizes commonly used in the production of automobiles.

U.S. exports

The value of U.S. exports has increased in each of the last 9 years, rising from $36.9 million in 1958 to $88.3 million in 1967 (table 1). Although exports have grown at a somewhat slower rate than imports, they have exceeded imports substantially throughout the 1958-67 period. Exports consist primarily of replacement bearings of U.S.-made equipment and bearings of sizes and types not manufactured in other countries. In 1967, roller bearings and parts accounted for more than 60 percent of total U.S. exports.

During 1964-67 by far the largest export market was Canada, accounting for about a third of the total exports (table 2). Mexico, the United Kingdom, France, and Australia have also been important markets.

U.S. imports

The value of U.S. imports of ball and roller bearings and parts rose from $2.8 million in 1958 to $57.8 million in 1967 (table 1). Although the value of U.S. imports has increased in each of the last 6 years and was more than five times as large in 1967 as in 1961, the

increase in imports was equal to only about a tenth of the increase in domestic production over the same period. A substantial part of the imports have consisted of ball bearings (valued at about $39.5 million in 1967). Imports under items 680.30 and 680.35 accounted for 93 percent of the total in 1967 (table 3). In addition, imports valued at about $2.1 million entered free of duty from Canada under items 680.31, 680.34, and 680.36.

Japan has been the principal source of imports, accounting for about half of all imports in recent years (table 4). The United Kingdom, West Germany, and Canada have also been important sources. In 1967 the unit value of all imports averaged $1.72 per pound; that of imports from Japan, the principal supplier, averaged $1.80 per pound.

The ratio of annual imports to annual consumption, based on value, increased from 0.5 percent in 1958 to 4.7 percent in 1967. Since producers' shipments and exports are reported in units and imports are reported in pounds, comparable data are not available for computing ratios on the basis of quantity; however, it is believed that if such data were available, the ratios based on quantity would be substantially higher than those based on value.

Ball and roller bearings of most types and sizes (except special precision products) are imported, and they are like and directly competitive with those produced domestically. Generally, prices of imports are considerably lower than domestic prices of comparable articles.

Table 1.--Antifriction bearings and parts: U.S. producers' shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, 1958-67

Year	U.S. producers' shipments	Imports	Exports	Apparent consumption	Ratio of imports to consumption
	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	Percent
1958	636,777	2,790	36,897	602,670	0.5
1959	904,588	10,398	41,919	873,067	1.2
1960	836,201	10,206	55,696	790,711	1.3
1961	799,732	10,123	56,713	753,142	1.3
1962	937,862	16,276	62,210	891,928	1.8
1963	959,203	19,390	64,605	913,988	2.1
1964	1,087,142	24,255	81,319	1,030,078	2.4
1965	1,230,000	33,403	81,519	1,181,884	2.8
1966	1,330,568	51,636	86,625	1,295,579	4.0
1967	1,263,000	57,835	88,275	1,232,560	4.7

Source: Data on producers' shipments as reported by the Antifriction Bearings Manufacturers Association; import and export data compiled from official statistics of the U.S. Department of Commerce.

Note.--Imports are reported in pounds while production and exports are reported in units; therefore, value is the only basis for comparison. The ratios of imports to consumption are based on the foreign market value of imports and essentially the U.S. factory value of consumption. If the ratios were computed on the basis of the foreign value of imports plus U.S. import duties and costs of transportation, insurance, and other handling to deliver the merchandise to the United States, the ratios would be higher.

Table 2.--Antifriction bearings and parts: U.S. exports of domestic merchandise, by principal markets, 1964-67

(In thousands of dollars)

Market	1964	1965	1966	1967
Canada	23,130	24,969	28,962	34,545
Mexico	4,083	5,138	5,610	5,837
United Kingdom	6,022	5,145	4,998	5,677
France	6,754	5,888	5,253	4,737
Australia	5,952	4,662	3,298	4,483
Brazil	2,967	2,780	4,750	2,682
West Germany	3,416	3,091	3,101	2,474
Italy	3,045	2,105	2,716	2,464
India	3,238	3,938	2,715	2,284
Japan	1,287	1,274	1,834	1,978
Republic of South Africa	2,003	1,854	1,449	1,771
Venezuela	1,942	1,954	1,710	1,673
Belgium and Luxembourg	1,997	2,374	1,365	1,626
Argentina	1,577	1,864	1,413	1,214
All other	13,906	14,483	17,451	14,830
Total	81,319	81,519	86,625	88,275

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Antifriction bearings and parts: U.S. imports for consumption, by TSUS items, 1964-67

TSUS item	1964	1965	1966	1967
	Quantity (1,000 pounds)			
680.30	2,181	3,031	4,450	5,896
680.31 1/			43	153
680.33 2/	9,985	13,516	2,342	2,283
680.34 3/			840	810
680.35			19,748	23,982
680.36 3/			362	591
Total	12,166	16,547	27,785	33,715
	Value (1,000 dollars)			
680.30	1,675	2,603	3,670	4,769
680.31 1/			59	196
680.33 2/	22,580	30,800	1,962	1,998
680.34 3/			839	876
680.35			44,598	48,990
680.36 3/			508	1,006
Total	24,255	33,403	51,636	57,835

1/ Included with item 680.30 prior to Dec. 20, 1965.

2/ Item established as 680.34, effective Dec. 7, 1965; formerly included with item 680.35. Item number was redesignated 680.33, without change in content, effective Dec. 20, 1965.

3/ Included with item 680.35 prior to Dec. 20, 1965.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 4.--Antifriction bearings and parts: U.S. imports for consumption by principal sources, 1964-67

(In thousands of dollars)

Source	1964	1965	1966	1967
Japan	13,753	16,970	25,743	28,587
United Kingdom	1,664	3,408	7,888	8,329
West Germany	3,901	4,914	6,265	7,353
Canada	2,471	3,611	5,656	6,711
Sweden	479	582	894	1,855
France	473	1,403	1,681	1,511
Switzerland	514	822	1,104	1,206
All other	1,000	1,693	2,405	2,283
Total	24,255	33,403	51,636	57,835

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Gear boxes and other speed changers and parts	680.45, -.47, -.48
Pulleys, pillow blocks, and shaft couplings and parts	680.50
Torque converters and parts	680.52
Chain sprockets, clutches, and universal joints and parts	680.54

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

The United States is a major consumer, producer, and exporter of power transmission equipment of the kinds covered by this summary. U.S. consumption in 1967 is estimated at about a billion dollars, of which imports accounted for less than 1 percent. U.S. exports are many times larger than imports and during 1965-67 represented about 8 percent of the value of U.S. producers' shipments.

Description and uses

This summary covers the power transmission equipment enumerated above and parts of such equipment. Excluded are certain articles related to power transmission equipment: ball and roller bearings (items 680.30 to 680.36), discussed elsewhere in this volume (6:10); plain shaft bearings and bushings (these articles are generally dutiable as parts of the products in which they are used and are classifiable under many items); power transmission chains (items 652.12 to 652.18), in volume 6:7; and electromagnetic couplings and clutches (items 682.90 and 682.91), discussed elsewhere in this volume. Also excluded from this summary are articles which are parts of the following: agricultural or horticultural machinery and implements (item 666.00), in volume 6:8; motor vehicles (692.24 to 692.45, and 692.55), volume 6:11; aircraft (694.60), volume 6:11; and bicycles (item 732.36), volume 7:4.

Power transmission equipment is used to transmit power from an external power source to one or more machines or for transmitting power from an internal power source to various parts of the same machine. In addition to serving as links between power sources (such as electric motors and internal combustion engines) and the machines they drive, certain articles of power transmission equipment, such as gears and speed changers, are used to control the speed and torque of the delivered power. Power transmission equipment of the type considered here is essential to the operation of conveyors, machine tools, sawmills, papermills, pumps, compressors, fans, and numerous other machines.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
	Gear boxes and other speed changers with fixed, multiple, or variable ratios; pulleys, pillow blocks, and shaft couplings; torque converters; chain sprockets; clutches; and universal joints; all the foregoing (except parts of agricultural or horticultural machinery and implements provided for in item 666.00 and parts of motor vehicles, aircraft, and bicycles) and parts thereof:			
	Gear boxes and other speed changers, and parts thereof:			
680.45	Fixed ratio speed changers, multiple and variable ratio speed changers each ratio of which is selected by manual manipulation, and parts thereof.	9% ad val.	8% ad val.	4.5% ad val.
680.47	Other speed changers	$2.25 each + 35% ad val.	$2.02 each + 31.5% ad val.	$1.12 each + 17.5% ad val.
680.48	Other parts	45% ad val.	40% ad val.	22.5% ad val.

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
	Gear boxes and other speed changers with fixed, multiple, or variable ratios, etc.--Continued:			
680.50	Pulleys, pillow blocks, shaft couplings, and parts thereof.	15% ad val.	1/	1/
680.52	Torque converters, and parts thereof.	9% ad val.	8% ad val.	4.5% ad val.
680.54	Chain sprockets, clutches, universal joints, and parts thereof.	15% ad val.	1/	1/

1/ The tariff status of this item was not affected by the trade conference.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968, and modifications therein as a result of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade (GATT).

Concessions amounting to a reduction of 50 percent in the duties applicable to items 680.45, 680.47, 680.48, and 680.52 were granted in the aforementioned negotiations. Only the first and final stages of the five annual rate modifications are shown above (see the TSUSA-1968 for the intermediate staged rates).

The duty status of items 680.50 and 680.54 was not affected by the sixth round negotiations under the GATT; however, as a result of an agreement with Canada providing certain compensatory concessions (Presidential Proclamation 3694 of December 27, 1965), the United States agreed to reduce the rate of duty on these items from 19 percent to 9.5 percent ad valorem in five annual stages. The third stage of this concession, which established a rate of 13 percent ad valorem, became effective on January 1, 1968; the fourth and fifth stages, which will reduce the rate to 11 percent, and 9.5 percent ad valorem, will become effective on January 1, 1969, and January 1, 1970, respectively.

The Tariff Schedules Technical Amendment Act (TAA), which became effective on December 7, 1965, revised the coverage of the items considered here by excluding articles which are parts of the agricultural and horticultural machinery and implements provided for in item 666.00. This change restored the duty-free status that had applied to such articles prior to the adoption of the revised tariff schedules on August 31, 1963. The TAA also expanded the coverage of item 680.45 to include multiple ratio speed changers, each ratio of which is selected by manual manipulation, thereby restoring the lower rates applicable to these speed changers before August 31, 1963. During the period from August 31, 1963, to December 7, 1965, such speed changers were dutiable under item 680.47 at $2.25 each plus 35 percent ad valorem.

The average ad valorem equivalent of the compound rate of duty in effect on December 31, 1967, for item 680.47, based on dutiable imports during 1967, was 36.5 percent.

U.S. consumption

The value of apparent U.S. consumption of power transmission equipment of the types covered by this summary is estimated to have risen from about $800 million in 1965 to about $1.0 billion in 1967 (table 1).

The growth in consumption is largely attributable to increased investment in new industrial plants and equipment and modernization and expansion of existing plants. The growth of U.S. industrial capacity in recent years was stimulated by the 7-percent investment tax credit legislation and the U.S. Treasury Department's issuance

of revised depreciation schedules for tax purposes for capital equipment. Both of these stimuli were applied in 1962; however, the investment tax credit was suspended in October 1966 and remained so until July 1967.

U.S. producers

There are an estimated 500 domestic establishments which produce one or more articles of power transmission equipment that are within the scope of this summary. Establishments which account for about 75 percent of the value of total industry shipments of these articles are situated in the East North Central and Middle Atlantic States. Many of the large producers of the power transmission equipment considered here also produce similar articles for use in automobiles, trucks, tractors, farm machinery, and off-the-highway motor vehicles.

U.S. producers' shipments

The value of U.S. producers' shipments of all types of power transmission equipment considered in this summary is estimated to have risen from about $690 million in 1963 to about $1.1 billion in 1967 (table 1).

U.S. producers' shipments of speed changers, industrial high-speed drives, and gears (other than marine, automobile, truck, bus, and aircraft) increased in value from $333 million in 1963 to $515 million in 1966. The last year for which detailed data on shipments of certain other types of mechanical power transmission equipment are available is 1963. In that year U.S. producers' shipments of this equipment, by types, were valued as follows:

	1,000 dollars
Clutches (friction type and hydraulic, including hydraulic couplings)	35,170
Flexible couplings (except hydraulic)	27,042
Universal joints	29,242
Sprockets	29,019
Pulleys	17,563
Sheaves (single and multiple drive)	20,814
Marine gear transmissions (less than 600 horsepower)	11,153
Other mechanical power transmission equipment (except aircraft, automobile, truck, and bus) (estimated)	185,000
Total (estimated)	355,000

U.S. exports

The value of U.S. exports of power transmission equipment, including parts of agricultural machinery and parts of bearings, which are not covered by this summary, increased from about $74 million in 1965 to $84 million in 1967 (table 1). During each year of the 1965-67 period, exports accounted for about 8 percent of the value of U.S. producers' total shipments. During 1965-67 approximately 5 percent, by value, of U.S. exports of the articles considered here consisted of flexible couplings (other than hydraulic), 20 percent was comprised of speed changers, industrial high-speed drives, and gears; and the remaining 75 percent consisted of power transmission equipment not elsewhere classified in the official statistics.

Canada is the principal export market for power transmission equipment, accounting for 45 percent of the total value of U.S. exports of such equipment during 1965-67. Other important export markets during this period were the United Kingdom, Japan, Mexico, and West Germany (table 2).

U.S. imports

The value of U.S. imports of power transmission equipment rose annually from $3.6 million in 1964 to $6.6 million in 1967 (table 1), representing an increase of 83 percent. Despite this large rise, imports in 1967 were still insignificant in relation to U.S. producers' total shipments.

Imports of fixed ratio speed changers, multiple and variable ratio speed changers each ratio of which is selected by manual manipulation, and parts thereof (item 680.45) accounted for more than 50 percent of the value of imports of power transmission equipment in 1966 and 1967 (table 3). Articles entered under item 680.45 have ranged from small speed changers, used in record players and dictation machines, to large units used in mining machinery and ship propulsion systems. The United Kingdom, West Germany, and Japan were the principal sources of these imports in 1967.

Other articles that have been imported in significant amounts are pulleys, pillow blocks, and shaft couplings (item 680.50) and chain sprockets, clutches, and universal joints (item 680.54). Typical articles imported under these provisions include pulleys for use with ski lifts and industrial machinery; pillow blocks which are designed for use with ball bearings (these units are imported both with and without the bearings); chain sprockets for use with chain saws, conveyors, and ore crushers; and clutches for use with sewing machines and machine tools. The great bulk of the imports entered under items 680.50 and 680.54 were supplied by the United Kingdom, Canada, West Germany, and Japan.

U.S. imports during 1964-67 of the power transmission equipment considered here, by principal sources, are shown in table 4.

Table 1.--Certain power transmission equipment: U.S. producers' shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, 1963-67 1/

(In thousands of dollars)

Year	U.S. producers' shipments 2/	Imports	Exports	Apparent consumption 2/
1963	690,000	3/	3/	3/
1964	750,000	3,590	3/	3/
1965	870,000	4,841	74,074	801,000
1966	1,000,000	5,760	79,457	926,000
1967	1,100,000	6,569	84,480	1,022,000

1/ Data on U.S. producers' shipments include parts of agricultural machinery and off-the-highway motor vehicles that are not included in the import data; exports include parts of agricultural equipment and parts of bearings, which are not included in this import data. The effect of these inclusions is that the value of U.S. producers' shipments and that of exports are somewhat overstated in relation to imports.

2/ Partly estimated by the staff of the U.S. Tariff Commission.

3/ Not available.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 2.--Certain power transmission equipment: U.S. exports of domestic merchandise, by principal markets, 1965-67

(In thousands of dollars)

Market	1965	1966	1967
Canada	31,990	36,919	37,176
United Kingdom	6,591	7,539	8,592
Japan	3,965	2,554	4,166
Mexico	2,565	2,682	3,313
West Germany	3,044	2,022	3,072
Australia	2,230	2,426	2,881
France	1,873	3,068	2,701
Sweden	1,959	2,585	2,187
Belgium and Luxembourg	2,108	1,827	2,004
Italy	1,557	2.365	1,979
Netherlands	656	1,053	1,321
India	1,589	983	1,119
Republic of South Africa	1,219	959	1,028
All other	12,728	12,475	12,941
Total	74,074	79,457	84,480

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Certain power transmission equipment: U.S. imports for consumption, by TSUS items, 1964-67 1/

(In thousands of dollars)

TSUS item 2/	1964	1965	1966	1967
680.45	804	1,371	3,049	3,399
680.47	247	280	63	128
680.48	60	92	18	119
680.50	1,406	1,921	1,711	1,821
680.52	36	37	32	28
680.54	1,037	1,140	887	1,074
Total	3,590	4,841	5,760	6,569

1/ The data shown for 1964 and 1965 are not fully comparable with those for 1966 and 1967 because the coverage of the items was changed with the implementation of the Tariff Schedules Technical Amendments Act on Dec. 7, 1965.

2/ For a description of these items, see the section on U.S. tariff treatment.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 4.--Certain power transmission equipment: U.S. imports for consumption, by principal sources, 1964-67

(In thousands of dollars)

Source	1964	1965	1966	1967
United Kingdom	873	2,000	2,309	2,100
West Germany	443	509	685	1,273
Canada	1,663	1,466	937	1,064
Japan	326	379	443	953
All other	285	487	1,386	1,179
Total	3,590	4,841	5,760	6,569

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Lubrication fittings	680.57, -.58
Cast-iron rollers for machines	680.60
Kits containing three or more replacement parts for the repair of brake cylinders, internal combustion engine pumps, or carburetors	680.70
Machinery parts not containing electrical features and not specially provided for	680.90, -.91

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

The United States is a large producer and consumer of the heterogeneous group of articles considered here. Although data on production, consumption, and exports of these articles are not separately reported in the official statistics, it is known that annual production and consumption have amounted to many millions of dollars and have increased during the 1964-67 period. Aggregate imports of the articles in question were valued at $1.9 million in 1966 and $2.8 million in 1967. Exports probably exceeded imports in each of the years 1964-67.

Description and uses

Lubrication fittings (items 680.57 and 680.58) include such devices as oil cups, grease cups, and certain oilers. They are machine parts which serve as a reservoir for storing and delivering lubricants to those areas of the machine that require lubrication. Most machinery, including electrical machinery, utilizes lubrication fittings.

As indicated by its description in the TSUSA-1968, item 680.60, which covers certain cast-iron rollers, is restricted to those units that are nonmalleable, not alloyed, and subsequent to casting have not been advanced beyond simple cleanup operations that are generally performed in the foundry where they are produced. Furthermore, at the time of entry the rollers considered here must not be dedicated to use on a particular type of machine; otherwise they would be dutiable as a part of the machine in question, e.g., metal rolling mills--item 674.20 (discussed in volume 6:9), machinery for grinding mineral substances--item 678.20 (volume 6:10), and machinery for preparing and manufacturing food--item 666.25 (volume 6:8). Cast-iron rollers are used in machinery for processing ores, metals, paper, textiles, grains, and other commodities.

Kits each containing three or more replacement parts, however provided for elsewhere in the tariff schedules, packaged for the repair of hydraulic brake master or wheel cylinders or for the repair of internal combustion engine pumps or carburetors (item 680.70) usually contain the components required in overhauling the aforementioned assemblies. Components contained in these kits include such articles as gaskets, washers, springs, floats, needle valves, and diaphragms. They are generally used in automotive repair shops and by individual automobile owners in the repair of imported motor vehicles.

Machinery parts not containing electrical features and not specially provided for (items 680.90 and 680.91) are comprised of articles that can be recognized as being parts of machines but the type of machine for which they are intended is not apparent. This provision could embrace a large variety of articles including, for example, certain levers and handgrips, safety guards, baseplates, coin chutes, hubs, spindles, wheels, and retaining rings. It is evident from the diverse nature of this residual class of articles that, collectively, they have numerous and varied uses.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
680.57	Lubrication fittings-----	19% ad val.	17% ad val.	9.5% ad val.
680.58	If Canadian article and original motor-vehicle equipment.	Free	1/	1/
680.60	Cast-iron (except malleable cast-iron) rollers for machines, not alloyed and not advanced beyond cleaning, and machined only for the removal of fins, gates, sprues, and risers or to permit location in finishing machinery.	3% ad val.	2.5% ad val.	1.5% ad val.
680.70	Kits, each containing three or more replacement parts however provided for elsewhere in the schedules, put up and packaged for the repair of hydraulic-brake master or wheel cylinders or for the repair of internal-combustion engine pumps or carburetors.	10% ad val.	9% ad val.	5% ad val.
680.90	Machinery parts not containing electrical features and not specially provided for.	19% ad val.	17% ad val.	9.5% ad val.
680.91	If Canadian article and original motor-vehicle equipment.	Free	1/	1/

1/ Duty-free status not affected by the trade conference.
2/ Rate effective Jan. 1, 1971.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968, and modifications therein as a result of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade. Concessions amounting to a reduction of 50 percent in the duties applicable to items 680.57, 680.60, 680.70, and 680.90 were granted in the aforementioned negotiations. Only the first and final stages of the annual rate modifications are shown above (see the TSUSA-1968 for the intermediate staged rates).

The Automotive Products Trade Act (APTA) of 1965 established items 680.58 and 680.91; this act has permitted Canadian articles that are original motor-vehicle equipment to enter the United States duty-free on and after January 18, 1965.

The Tariff Schedules Technical Amendments Act (TAA), which became effective on December 7, 1965, provided for the establishment of the present tariff descriptions for items 680.60 and 680.70. Entries under the present item 680.60 consist of certain rough nonmalleable cast-iron rollers which had been dutiable at 3 percent ad valorem prior to the adoption of the TSUS on August 31, 1963. The TAA specifically restored the pre-TSUS rate to imported cast-iron rollers which, after being finished in the United States, are used in machines for preparing grain for human food and animal feeds. During the August 31, 1963-December 6, 1965, period such rollers were dutiable under item 666.25 at 11.5 percent ad valorem.

Prior to the adoption of the TSUS, kits containing parts for use in the repair or overhaul of brake cylinders, carburetors, fuel pumps, and water pumps were generally dutiable as automobile parts at 8.5 percent ad valorem. After adoption of the TSUS but prior to the establishment of item 680.70, it was necessary to classify each of the different parts in a repair kit separately (e.g., springs were dutiable at the rate for springs, washers at the rate for washers, gaskets at the rate for gaskets, and so forth). The rate of 10 percent ad valorem initially provided by item 680.70 was an estimated weighted average of the various rates applicable to the components of repair kits prior to the adoption of the TSUS.

Consumption, production, and exports

Data on production, consumption, and exports of the miscellaneous articles considered in this summary are not separately reported in the official statistics, and there is no adequate basis for estimating such data. It is known, however, that annual U.S. production and consumption of these articles have amounted to many millions of dollars and that they increased during 1964-67 because of the growth that has occurred in the principal markets for these articles--machinery manufacturing and automotive maintenance and repair.

Miscellaneous machinery parts are produced in hundreds of establishments that specialize in the manufacture of machinery parts, as well as in the plants that make complete machines. Producing establishments are probably situated principally in the East North Central States. In most producing establishments, production of the articles considered here is believed to account for only a minor part of their total output.

U.S. imports

The total value of U.S. imports of the articles covered by this summary increased from about $1.9 million in 1966 to $2.8 million in 1967 (table 1). Comparable data on imports for prior years are not available.

The value of imports of lubrication fittings (item 680.57) increased annually from $47,000 in 1964 to $213,000 in 1967. The principal sources of these imports in 1967 were Italy and West Germany.

Imports of cast-iron rollers for machines (item 680.60) and kits for the repair of brake cylinders or internal combustion engine pumps or carburetors (item 680.70) were not separately reported in official statistics prior to December 7, 1965. Imports of cast-iron rollers, 90 percent of which originated in the United Kingdom, declined in value from $442,000 in 1966 to $398,000 in 1967. Imports of the repair kits considered here increased from $634,000 in 1966 to $862,000 in 1967. Since the great bulk of these kits contain replacement parts for imported motor vehicles, the principal suppliers of imported motor vehicles (West Germany, the United Kingdom, and Japan) have also been the principal suppliers of the repair kits.

The value of imports of machinery parts not containing electrical features and not specially provided for (item 680.90) increased from $0.8 million in 1966 to $1.3 million in 1967. Canada and the United Kingdom supplied the bulk of the imports entered under this provision during 1966-67. The product mix of these imports probably varies significantly from year to year owing to the diverse nature of the articles considered here and the fact that this residual class of articles is particularly susceptible to changes in classification practices.

Imports of the miscellaneous machinery parts entered under the APTA provisions (items 680.58 and 680.91) were insignificant during 1966-67.

Table 1.--Miscellaneous machinery parts: U.S. imports for consumption, by TSUS items, 1966 and 1967 1/

(In thousands of dollars)

TSUS item 2/	1966	1967
680.57	110	213
680.58	3/	1
680.60	442	398
680.70	634	862
680.90	753	1,304
680.91	3/	6
Total	1,939	2,784

1/ Imports entered under item 680.57 in 1964 and 1965 were valued at $47,000 and $62,000, respectively. Comparable data for the other items are not available for 1964 and 1965.

2/ For a description of these items, see the section on U.S. tariff treatment.

3/ Less than $500.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 2.--Miscellaneous machinery parts: U.S. imports for consumption, by principal sources, 1966 and 1967

(In thousands of dollars)

Source	1966	1967
United Kingdom	893	1,007
West Germany	469	671
Canada	313	525
Japan	74	172
Italy	22	139
France	93	76
All other	75	194
Total	1,939	2,784

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Electric transformers---	682.05, -.07, -.65 (pt.)

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

The United States is the world's largest consumer and producer of electric transformers. The value of apparent U.S. consumption in 1967 was estimated at about $1.3 billion, of which imports accounted for about 2 percent. During 1964-67 the value of exports (slightly more than 3 percent of domestic producers' shipments) was substantially larger than the value of imports, although the value of annual imports increased more than threefold, while that of exports remained almost unchanged.

Description and uses

This summary covers electric transformers of all kinds but does not cover parts thereof. Transformers are used in electrical circuits, principally for raising or lowering the voltage. In electronic circuits, transformers frequently couple successive circuits while conditioning an electronic signal.

Some of the principal types of transformers are power, distribution, certain power regulators and boosters, specialty, instrument, and meter, and transformers used in electronic applications. Transformers range in size and price from tiny coupling transformers used in electronic circuits priced at less than a cent to huge power transformers priced at many thousands of dollars. Power transformers, those rated at more than 500 kilovolt-amperes (kva), 1/ are used primarily to step up the voltage of a primary generating source to a level suitable for economical transmission of the current over a distance through a conductor or to step down the transmission voltage to a level suitable for local distribution lines. Distribution transformers, normally rated below 500 kva, provide for local distribution

1/ The tariff schedules provide a standard by which all imported transformers may be segregated as to performance characteristics in kva. Headnote 2 to part 5 of schedule 6 of the TSUSA-1968 states that the rated kva of a transformer is the kilovolt-ampere output on a continuous duty basis at the rated secondary voltage (or amperage, when applicable) and at the rated frequency without exceeding the rated temperature limitations.

of electric power, frequently stepping down distribution line voltage to that required by the consumer. The power regulators and boosters considered here stabilize within prescribed limits transmission and distribution line voltage when required. Most other transformers used in powerline applications are classed as specialty transformers, for which there are a great variety of designs and uses. These include certain street and airport lighting transformers, signaling and doorbell transformers, control transformers used for the operation of heating and air-conditioning equipment, machine-tool control transformers, and various types of transformers used for industrial electronics, welding, and therapeutic devices.

The bulk of the power, distribution, and specialty transformers are rated at more than 1 kva and thus are of a type provided for under item 682.07 of the TSUSA-1968. Many instrument and meter transformers and most transformers used in electronic applications would be rated (if rated in kva) at less than 1 kva and, consequently, are of a type provided for under item 682.05. Many specialty transformers are rated at less than 1 kva.

Instrument and meter transformers are principally used to step down a high voltage to facilitate the use of voltage in making various electrical measurements. Many instrument and meter transformers operate at powerline frequencies. Transformers used in electronic applications are generally designed to operate at frequencies much higher than those of powerlines. Examples of the electronic type of transformers are radio-frequency, intermediate-frequency, pulse, and audio transformers. The principal use of the electronic type of transformers is for the transfer between electronic circuits of an electronic signal (consisting of a certain band of frequencies) with optimum selectivity and minimum loss of signal strength.

Transformer parts and transformer-related articles such as coils, cores, chokes, inductors, and ballasts (item 682.60), induction coils of the type used in automotive ignition applications (item 683.60), certain regulators (items 686.22 to 686.24), and electrical connection and circuit protection apparatus (item 685.90) are discussed in other summaries in this volume (6:10).

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
	Transformers:			
682.05 1/	Rated at less than 1 kva.	12.5% ad val.	2/	2/
682.07 1/	Other	12.5% ad val.	11% ad val.	6% ad val.
682.65 (pt.)	If Canadian article and original motor-vehicle equipment. 3/	Free	2/	2/

1/ Became effective Jan. 1, 1968. Formerly part of item 682.10.
2/ Duty status not affected by trade conference.
3/ See headnote 2, part 6B, schedule 6, TSUSA-1968.

The tabulation above shows the rates of duty in effect prior to January 1, 1968, and modifications therein as a result of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade. Only the first and final stages of the five annual rate modifications are shown above (see the TSUSA-1968 for the intermediate staged rates).

The prior rate shown for items 682.05 and 682.07 was that for item 682.10, which was deleted when items 682.05 and 682.07 were established as a result of the trade conference. The prior rate had remained unchanged from August 31, 1963, through the end of 1967. The duty-free status of item 682.65 was established retroactive to January 18, 1965, pursuant to the Automotive Products Trade Act of 1965 (Public Law 89-283).

U.S. consumption

The value of apparent U.S. consumption of all types of electric transformers increased from about $775 million in 1964 to an estimated $1.3 billion in 1967 (table 1). Power and distribution transformers represented about 60 percent of the value of total consumption of transformers, including power regulators and boosters, during 1964-67.

The increased consumption of electric transformers has resulted from the growth in consumption of electric power (aided by the downward trend of prices of electricity over the years) by home consumers, commercial establishments, industry, and Government. To meet the demand, electric utilities have procured more and larger power and distribution transformers. The expansion of industrial facilities with increased use by industry of electrically powered equipment and electronic instruments has further augmented the demand for transformers.

The growing demand by home consumers for such electronic products as television sets, radios, phonographs, and tape recorders, as well as the increased use of electronic devices in Government space and defense programs, has been largely responsible for the rapid rise in the consumption of specialty transformers and transformers of the electronic type.

U.S. producers

U.S. producers of power, distribution, and specialty transformers operated 177 establishments and employed 33,365 persons in 1963. Most of these establishments produced specialty transformers. Relatively few establishments produced power and distribution transformers. The manufacture of power, distribution, and specialty transformers was concentrated in the Northeast and North Central States. In 1963, States with the largest numbers of transformer-producing plants were California (30), Illinois (20), New York (14), and Pennsylvania (14). Shipments of transformers represented 92 percent of the value of total shipments by transformer producers in 1963. Secondary products made by these concerns consisted mainly of electrical measuring instruments and coils, and devices for electronic applications, including transformers, reactors, and chokes.

Transformers for electronic equipment are manufactured by many firms engaged in the production of electronic equipment or components thereof incorporating transformers. In 1963 about 200 concerns specialized to the extent of 75 percent or more in the production of transformer-associated components; they employed 18,362 persons. In addition to transformers, these producers manufactured coils, reactors, and chokes for electronic applications.

U.S. producers' shipments

The value of U.S. producers' shipments of transformers increased from about $718 million in 1963 to an estimated $1.3 billion in 1967 (table 1). The value of shipments of each of the principal classes of transformers shown in table 2 was approximately 50 percent larger in 1966 than in 1963, except for the electronic class, which was about 87 percent larger.

Power and distribution transformers, the production of which requires a large capital investment, are manufactured by very few firms. Production of these transformers is significantly affected by general business conditions and particularly by building construction. During 1963-67 the demand for these large transformers was very strong. In anticipation of continued strong demand, U.S. producers are currently expanding their capacity to produce transformers.

Specialty transformers are often produced by the same manufacturers that make power and distribution transformers. Unlike power transformers and, to a lesser degree, distribution transformers, specialty transformers are frequently mass-produced, for they are simpler in design and require fewer man-hours per unit in production. Capital investment for the production of specialty transformers, as well as for instrument and meter transformers, is considerably less than that required for power and distribution transformers.

Specialty, instrument, and meter transformers are also produced by manufacturers of transformers used for incorporation into electronic equipment. Transformers of the electronic type are usually quite small, but, as with large power transformers, their production is labor-intensive. The annual production of the electronic type of transformers grew rapidly during 1964-66 as a result of the increased production of radio, television, radar, and telemetry apparatus in those years.

U.S. exports

The value of annual U.S. exports of transformers fluctuated in a narrow range of from $31 to $35 million during 1964-67. During that period exports of power, distribution, and specialty transformers generally declined, whereas instrument transformers, transformers of the electronic type, and regulators generally increased (table 3). Canada has been the principal export market, but some less developed countries, especially in Latin America, are also important markets (table 4). The value of U.S. exports of transformers was small in relation to U.S. producers' shipments (about 3.2 percent in 1964-67). The value of exports exceeded the value of imports; however, this favorable balance of trade rapidly diminished during 1964-67.

U.S. imports

The value of U.S. imports of transformers rose from $5.6 million in 1964 to $25.0 million in 1967. The rate of increase slowed significantly in 1967; annual imports had approximately doubled in 1965 and 1966. The value of imports of transformers in all import classes increased from 1964 to 1966, but in 1967 the value of imports of the

smallest transformers (less than 1 kva) and that of the largest transformers (over 10,000 kva) declined (table 5). The decline in the value of imports of transformers of less than 1 kva in 1967 is attributed in part to a decline in the number of radio and television receivers produced in the United States in that year. The decline in the value of imports of transformers over 10,000 kva is attributed to short-term fluctuations in deliveries of these high-priced articles, which require a long lead time for production.

Imports of the larger transformers are produced by well-established foreign manufacturers. Imports of smaller transformers, such as those used in consumer electronic equipment are frequently produced by foreign subsidiaries of domestic producers of consumer electronic equipment. Certain foreign manufacturers of transformers are furnished parts by domestic manufacturers for assembly abroad and return to the United States. Imports containing U.S. goods and meeting the provisions of item 807.00 of the TSUS are assessed duty on the value of the product less the value of U.S. components. In 1967, transformers accounting for 46 percent of the value of imports contained some U.S.-made parts qualifying for duty-free entry under item 807.00. The value of such parts in that year was about 6 percent of the total value of all the transformers imported.

The principal source of U.S. imports of transformers is Canada (table 6). Nearly 80 percent of the value of transformers imported from Canada in 1967 represented transformers containing some components of U.S. manufacture. The value of the U.S. goods returned under item 807.00 that year was about 8 percent of the total value of imports of transformers from Canada. Other major sources of imports were Japan, Italy, the United Kingdom, and Taiwan. Virtually all of the transformers imported from Taiwan in 1967 were of the electronic type, containing approximately 30 percent, by value, of U.S. goods returned.

Imports of transformers from Canada considered here do not include those intended for use as original motor-vehicle equipment. Such imports are not segregated in official statistics and are believed to be small.

Table 1.--Electric transformers: U.S. producers' shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, by types, 1963-67

(Value in millions of dollars)

Year	Value				Ratio (percent) of imports to consumption 1/
	Producers' shipments 1/	Imports 2/	Exports	Apparent consumption 1/	
	Power and distribution transformers				
1963	434.0	3/ 2.9	18.3	418.6	0.7
1964	501.0	2.0	21.7	481.3	.4
1965	578.0	2.9	19.4	561.5	.5
1966	661.0	12.4	16.1	657.3	1.9
1967	745.0	12.9	14.6	743.3	1.7
	Other transformers 4/				
1963	284.0	5/	5/	5/	5/
1964	300.0	3.6	9.7	293.9	1.2
1965	380.0	7.4	15.5	371.9	2.0
1966	475.0	11.0	18.1	467.9	2.4
1967	525.0	12.1	19.6	517.5	2.3
	All transformers				
1963	718.0	5/	5/	5/	5/
1964	801.0	5.6	31.4	775.2	0.7
1965	958.0	10.3	34.9	933.4	1.1
1966	1,136.0	23.4	34.2	1,125.2	2.1
1967	1,270.0	25.0	34.2	1,260.8	2.0

1/ Partly estimated by the staff of the U.S. Tariff Commission, except 1967 data, which were wholly estimated.

2/ Separation of imports of power and distribution transformers from other transformers was approximated; those rated at more than 50 kva were classed as power and distribution transformers.

3/ Includes imported parts of power and distribution transformers for January-August 1963, the total value of which is believed to be small.

4/ Specialty transformers, instrument and meter transformers, the electronic type of transformers, power regulators and boosters, welding transformers, and transformers not specified by kind.

5/ Not available.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Note.--The cost of U.S. import duties and costs of transportation, insurance, and other handling are not included in the value of imports. If such costs were included, the ratios of the value of imports to consumption would be higher.

Table 2.--Electric transformers: U.S. producers' shipments, by types, 1963-66

(In millions of dollars)

Type	1963	1964	1965	1966
Power and distribution	434.5	501.3	578.3	660.7
Specialty 1/	65.8	70.0	80.0	95.0
Power regulators and boosters	50.4	60.0	65.0	75.0
Electronic 1/	141.6	140.0	205.0	265.0
All other 1/	26.1	30.0	30.0	40.0
Total	718.4	801.3	958.3	1,135.7

1/ Data for 1964-66 were estimated in part by the staff of the U.S. Tariff Commission.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 3.--Electric transformers: U.S. exports of domestic merchandise, by types, 1964-67

(In millions of dollars)

Type	1964	1965	1966	1967
Power and distribution:				
500 kva and under	8.3	7.7	8.1	6.8
501 kva to 10,000 kva	5.0	4.1	4.2	3.0
10,000 kva and over	8.4	7.6	3.8	4.8
Specialty	3.7	3.2	3.6	3.4
Instrument	1.2	1.3	1.6	1.8
Electronic 1/	2.5	4.5	6.1	5.8
Regulators	2.3	3.6	4.1	5.5
Other transformers	-	2.9	2.7	3.1
Total	31.4	34.9	34.2	34.2

1/ Estimated by the staff of the U.S. Tariff Commission.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 4.--Electric transformers: U.S. exports of domestic merchandise, by principal markets, 1964-67

(In millions of dollars)

Market	1964	1965	1966	1967
Canada	3.7	5.5	6.8	7.3
Venezuela	2.7	3.3	2.6	3.4
Brazil	.2	.2	.8	2.6
Philippine Republic	1.7	1.6	1.3	1.7
Colombia	1.0	.3	.8	1.2
Taiwan	.3	.4	.2	1.2
United Kingdom	.3	1.0	.7	1.0
Korean Republic	.1	.1	.6	1.0
France	.5	1.0	1.3	1.0
Mexico	.6	.7	.9	.9
India	3.4	4.6	1.6	.2
All other	16.9	16.2	16.6	12.7
Total	31.4	34.9	34.2	34.2

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 5.--Electric transformers: U.S. imports for consumption, by types, 1964-67

(In thousands of dollars)

Type	1964	1965	1966	1967
Less than 1 kva	2,856	4,988	8,159	7,838
1 kva to 50 kva	697	2,364	2,806	4,280
Over 50 kva to 10,000 kva	844	1,053	2,746	6,762
Over 10,000 kva	1,189	1,866	9,673	6,126
Total	5,586	1/ 10,272	1/ 23,384	1/ 25,006

1/ Imports of transformers from Canada considered here do not include those intended for use as original motor-vehicle equipment. Such imports are not segregated in official statistics and are believed to be small.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 6.--Electric transformers: U.S. imports for consumption, by principal sources, 1964-67

(In thousands of dollars)

Source	1964	1965	1966	1967
Canada	1,187	1/ 3,143	1/ 4,196	1/ 10,291
Japan	2,760	4,389	6,958	5,495
Italy	20	649	1,699	2,226
United Kingdom	342	82	147	1,560
Taiwan	-	446	773	1,222
West Germany	416	401	892	996
France	146	392	1,588	704
Sweden	462	340	3,594	687
Switzerland	105	157	584	547
Mexico	2	3	129	540
Australia	3	114	2,534	481
All other	143	156	290	257
Total	5,586	10,272	23,384	25,006

1/ Imports of transformers from Canada considered here do not include those intended for use as original motor-vehicle equipment. Such imports are not segregated in official statistics and are believed to be small.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Electric motors, generators, motor-generators, converters, rectifiers, and inductors, and parts of all the foregoing	682.20, -.25, -.30, -.40, -.50, -.52, -.55, -.60, -.65 (pt.)

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

The United States is probably the world's largest consumer and producer of electric motors, generators, rectifiers, and related apparatus. The value of apparent U.S. consumption in 1967 is estimated at $3.2 billion. Exports exceed imports by a substantial margin. Although the value of annual imports of articles considered here nearly tripled between 1964 and 1967, it was still relatively small in the latter year, when it constituted less than 2 percent of the total value of apparent consumption.

Description and uses

Electric motors.--Electric motors are devices which transform electrical energy into mechanical energy. The motors are commonly classified as fractional horsepower motors (less than 1 hp.), integral horsepower motors (1 hp. or more), and land transportation motors. Fractional horsepower motors are frequently used in toys, home appliances, such as home laundry equipment and refrigerators, clocks, fans, and power tools, and as positioning and control devices in industry. Integral horsepower motors are used primarily in industry as prime movers for machine tools, for materials-moving equipment, and for electric power-generating equipment. Electric land transportation motors are generally used in trains, certain buses, and special-purpose vehicles.

Electric generators.--Electric generators are devices which transform mechanical energy into electrical energy; they are a principal source of electricity. A generator is ordinarily classified according to its electrical power output, normally in terms of kilowatts, and frequently by the type of prime mover used to drive the generator. Common forms of prime movers used are turbines, internal-combustion engines, and electric motors. In addition to those used in fixed power installations, many are used on moving vehicles such as automobiles, trucks, aircraft, and boats as sources of power; however,

those generators (and alternators) used as battery-charging devices in conjunction with electrical systems of internal-combustion engines are classified under item 683.60 of the TSUSA-1968 and discussed in another summary in this volume (6:10). Audio-frequency and radio-frequency signal generators, which are used principally in electronic applications, are classified under item 688.40 of the TSUSA-1968 and are discussed in volume 6:11.

Converters.--Other articles which are similar to generators and which are covered by this summary are rotary converters and frequency converters. A rotary converter converts alternating current (AC) energy to direct current (DC) energy or DC energy to AC energy (an inverted converter). Frequency converters are used to change a current from a given frequency to a current of another desired frequency. The bulk of these articles are used in industrial applications to convert available sources of power to the types of power required by plant equipment.

Rectifiers and rectifying apparatus.--Rectifiers and rectifying apparatus generally convert AC energy to DC energy, and vary in complexity from a single component, such as a silicon-controlled rectifier, to devices consisting of certain combinations of components (such as tubes, transistors, capacitors, resistors, and diodes) in such apparatus as battery chargers and DC power supplies. Static converters, which, unlike rotary converters, do not have moving parts and which convert AC to DC current, are also included in this summary.

Inductors, ballasts, coils, and chokes.--Inductors, ballasts, coils, and chokes function primarily as inductors, devices which add the element of inductance to electric or electronic circuits. 1/ The simplest form of inductor is a coil of wire through which a changing current is passed. Devices such as ballasts and chokes perform a particular function requiring inductance. A fluorescent lamp ballast limits the flow of current to a fluorescent lamp while providing sufficient voltage to light the lamp. A choke resists the changes in a changing current. One of the many applications of chokes is in smoothing the transition from AC current to DC current in rectifying apparatus. Other forms of inductors are the windings in such devices as transformers, generators, and motors.

A commutator is a device that reverses electric current. It is used in certain motors and generators which require polarity reversals for proper operation. Commutators are also used in certain rectifying apparatus.

1/ Inductance is the property of an electric circuit by which a varying current in it produces a varying magnetic field that induces varying voltages in the same circuit or in a nearby circuit.

Parts of all of the articles discussed heretofore in this summary, as well as parts of transformers, are all covered by this summary.

Certain articles that are normally associated with the items discussed herein, but are included in other summaries in this volume (6:10) are transformers (682.05 and 682.07), and starting motors and battery-charging generators used in the electrical system of internal-combustion engines (683.60). Other related items not included here are engines and turbines of a type used as prime movers for generators when not classifiable as entireties with the engines or turbines; they are discussed in volume 6:8. Certain semi-conductor devices such as diodes and transistors (item 687.60) which may be used as rectifying apparatus, as well as certain reactors used in protecting electrical circuits (685.90), are discussed in volume 6:11.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
	Generators, motors, motor-generators, converters (rotary or static), rectifiers and rectifying apparatus, and inductors; all the foregoing which are electrical goods, and parts thereof and of transformers:			
	Motors:			
	Of under 1/40 horsepower:			
682.20	Synchronous, valued not over $4.00 each.	50% ad val.	45% ad val.	25% ad val.
682.25	Other	12.5% ad val.	1/	1/
682.30	Of 1/40 or more but not over 1/10 horsepower.	12.5% ad val.	11% ad val.	6% ad val.
682.40	Of over 1/10 but under 200 horsepower.	8.5% ad val.	7.5% ad val.	5% ad val.
682.50	Of 200 or more horsepower.	12.5% ad val.	11% ad val.	6% ad val.
682.52	Commutators	10% ad val.	9% ad val.	5% ad val.
682.55	Parts of motors of under 1/40 horsepower.	50% ad val.	45% ad val.	25% ad val.
682.60	Generators, motor-generators, and rotating converters, rectifiers and rectifying apparatus, inductors, and parts of all the foregoing and of transformers.	15% ad val.	13% ad val.	7.5% ad val.

See footnote at end of table.

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
	Generators, motors, motor-generators, etc.--Con.			
682.65	The above articles and electric transformers if produced in Canada for use as original motor-vehicle equipment.	Free	1/	1/

1/ Item not negotiated in trade conference.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968, and modifications therein as a result of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade. Only the first and final stages of the annual rate modifications are shown above (see the TSUSA-1968 for the intermediate staged rates).

The prior rates shown in the tabulation had remained unchanged except for items 682.20, 682.40, and 682.52, from August 31, 1963, through the end of 1967. The Tariff Schedules Technical Amendments Act of 1965 (TAA) limited the coverage of item 682.20, synchronous motors of under 1/40 horsepower, to such motors valued at not over $4.00 each and created a new provision, item 682.52, commutators, dutiable at 10 percent ad valorem effective December 7, 1965. Prior to the implementation of the TAA, all synchronous motors of under 1/40 horsepower were dutiable at 50 percent ad valorem, a weighted average of three compound rates formerly applicable; all commutators were dutiable under item 682.60 at 15 percent ad valorem. The changes reflected the weighted average of the various rates applicable to synchronous motors of under 1/40 horsepower valued at more than $4.00 each and of commutators under the old schedules. Item 682.40, motors of over 1/10 horsepower but under 200 horsepower, was dutiable at 9.5 percent ad valorem from August 31, 1963, to January 1, 1964, and was then reduced to 8.5 percent ad valorem as a result of a compensatory concession to the United Kingdom (see general headnote 3(f) of the TSUSA-1968).

Concessions amounting to a reduction of about 50 percent in duties were granted by the United States on all of the items included herein except items 682.25 and 682.65. The concessions are being put into effect in five annual stages.

U.S. consumption

The value of apparent U.S. consumption of all the articles covered by this summary increased from about $2.4 billion in 1965 to an estimated $3.2 billion in 1967 (table 1). Electric motors, including fractional horsepower motors and generators (except parts), which accounted for about 70 percent of the total value of consumption of all the articles covered herein (including parts) rose from about $1.4 billion in 1963 to an estimated $2.3 billion in 1967. Fractional horsepower motors, which accounted for about 42 percent of the value of apparent domestic consumption of all electric motors and generators in 1967, increased in value from $611 million in 1963 to an estimated $952 million in 1967.

The estimated value of apparent domestic consumption of the remaining articles covered by this summary--rectifying apparatus, inductors, ballasts, coils, chokes, parts thereof, and parts of transformers--increased from approximately $684 million in 1965 to an estimated $963 million in 1967. The increased consumption of these items is concurrent with the growth of the electrical and electronic industries (and the demands on those industries by the military), other industries, and the home consumer.

The rise in aggregate domestic consumption of motors and generators and the other electrical apparatus noted above is attributed to the growth of the U.S. population and the U.S. economy, the increased mechanization and electrification of industrial, commercial, and home services, and the downward trend over the years in the price of electricity. The U.S. demand for this equipment has been so large in recent years that domestic producers of motors and generators have undertaken substantial expansion of their capacity to produce.

U.S. producers

There were 384 establishments primarily engaged in manufacturing electric motors and generators in 1963. These establishments, which employed 94,170 workers, were situated primarily in the Northeast and the North Central States, principally Ohio, Wisconsin, New York, New Jersey, and Pennsylvania. Motors and generators represented 81 percent of the value of total shipments of these establishments. Secondary products consisted mainly of speed changers, industrial high-speed drives, and gears. About 46 percent of the establishments specialized in producing fractional horsepower motors and 32 percent in producing integral horsepower motors and generators (except land transportation types).

U.S. producers' shipments

The value of annual U.S. producers' shipments of the electrical apparatus covered by this summary rose from about $2.1 billion in 1963 to nearly $3.4 billion in 1967 (table 1). The value of domestic producers' shipments was only slightly more than that of apparent U.S. consumption, for U.S. exports were larger than U.S. imports and both were small relative to the value of U.S. consumption or production.

The value of shipments of electric motors and generators, the bulk of which consisted of fractional horsepower motors and integral horsepower motors and generators (except those used in land transportation applications), rose rapidly during the 1963-66 period (table 2). Shipments of all the other apparatus included in this summary (including parts of motors, generators, and transformers) also increased rapidly in value during that period.

U.S. exports

The value of annual U.S. exports of electric motors, generators, and rectifying apparatus increased irregularly from $181 million in 1965 to $184 million in 1967 (table 1). Data compiled from statistics for 1963-64 are not directly comparable with those compiled for 1965-67. Data on exports of electric motors, generators, and rectifiers, by types, are shown in table 3. U.S. exports consisted chiefly of large motors and generators and parts thereof.

Exports in 1967 accounted for about 5 percent of the value of U.S. producers' shipments and had a value more than three times that of imports. Principal markets were Canada, Mexico, Australia, and Japan. Exports to Canada in 1967 comprised more than 20 percent by value of total U.S. exports of these articles (table 4).

U.S. imports

The aggregate value of U.S. imports of electric motors, generators, and rectifying apparatus, and parts thereof and of transformers, has increased from $18.1 million in 1964 to $52.2 million in 1967 (table 1). The value of U.S. imports of electric motors was $26.8 million in 1967, or more than double the value in 1964 (table 5). The bulk of the imports of electric motors consisted of fractional horsepower motors, which accounted for about 65 percent of the total value of U.S. imports of electric motors in 1967. Motors for toys are believed to be a major type of imported fractional horsepower motors. Such motors are frequently classified as nonsynchronous motors and are commonly less than 1/40 horsepower. More than 90 percent, by value, of the imports in

that class were obtained from Japan in 1967. The principal source of the larger motors was the United Kingdom.

The value of annual U.S. imports of electric generators, motor-generators, and rotary converters increased from $0.8 million in 1964 to $5.6 million in 1967 (table 6). Electric generators of less than 10,000 kilowatts comprised the bulk of imports of generators, accounting for more than half of the total of such imports in 1967.

The value of annual U.S. imports of rectifiers, inductors, ballasts, commutators, parts thereof, and parts of electric transformers, motors, and generators increased from $5.7 million in 1964 to $19.8 million in 1967 (table 7). Articles utilizing coils--such as inductors, ballasts, and parts of electric transformers, motors, and generators--comprised more than 75 percent of the total value of such imports during 1964-67. The chief suppliers were Japan and Canada.

Imports of all items included herein accounted for less than 2 percent of domestic consumption during 1964-67. The principal suppliers were Japan, the United Kingdom, and Canada (table 8).

Imports of electric motors, generators, and rectifiers from Canada intended for use as original motor-vehicle equipment are not segregated in official statistics and have not been estimated for inclusion in the data in this summary. The value of such imports could have been as high as $564,871 in 1966 and $1,032,203 in 1967.

Table 1.--Electric motors, generators, rectifiers, and related apparatus: U.S. producers' shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, by principal types, 1963-67

(Value in millions of dollars)

Year	Value				Ratio (percent) of imports to consumption
	U.S. producers' shipments 1/	Imports	Exports 1/	Apparent consumption	
	Fractional horsepower motors				
1963	620	2.6	11.6	611.0	0.4
1964	663	8.1	13.7	657.4	1.2
1965	768	15.5	11.6	771.9	2.0
1966	853	17.5	14.0	856.5	2.0
1967	2/ 950	17.4	15.5	951.9	1.8
	Electric motors (less fractional horsepower motors) and generators				
1963	904	1/ 3.5	79.1	828.4	0.4
1964	973	4.3	96.9	880.4	.5
1965	1,100	6.1	117.8	988.3	.6
1966	1,282	10.0	99.6	1,192.4	.8
1967	2/ 1,400	15.0	112.5	1,302.5	1.2
	Rectifiers, converters, inductors, related equipment, and parts of transformers and all the foregoing 1/				
1963	566	3/	3/	3/	3/
1964	582	5.7	3/	3/	3/
1965	729	7.1	51.9	684.2	1.0
1966	910	10.8	59.5	861.3	1.3
1967	2/ 1,000	19.8	56.5	963.3	2.1
	Total of all above				
1963	2,091	3/	3/	3/	3/
1964	2,218	18.1	3/	3/	3/
1965	2,597	28.7	181.3	2,444.4	1.2
1966	3,045	38.3	173.1	2,910.2	1.3
1967	2/ 3,350	52.2	184.4	3,217.8	1.6

1/ Partly estimated by the staff of the U.S. Tariff Commission.
2/ Estimated by the staff of the U.S. Tariff Commission.
3/ Available data insufficient to allow a meaningful estimate.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Note.--Because of rounding, figures may not add to the totals shown.

Table 2.--Electric motors, generators, rectifiers, and related apparatus: U.S. producers' shipments, by types, 1963-66

(In millions of dollars)

Type	1963	1964	1965	1966
Electric motors and generators, except parts thereof:				
Fractional horsepower motors	620.3	663.3	768.3	852.9
Integral horsepower motors and generators except land transportation motors	380.2	416.3	499.8	570.7
Land transportation motors and generators 1/	72.0	76.0	89.0	83.0
Prime-mover generator sets except steam or hydraulic turbine	104.6	106.5	104.3	182.2
Generators used with steam or hydraulic turbines 1/	92.0	95.0	98.0	109.0
Motor generator sets and other rotating equipment	246.2	270.8	273.8	299.9
Motors and generators not specified by kind	9.4	8.7	34.7	36.7
Total	1,524.7	1,636.6	1,867.9	2,134.4
All other apparatus and parts of motors, generators, and transformers: 2/				
Coil windings	45.6	50.1	64.2	83.4
Low-frequency chokes	19.1	18.0	25.6	33.5
Radio-frequency chokes	10.8	10.2	14.4	18.9
Coils used in television receivers	65.9	61.9	87.9	115.2
Balun coils	4.6	4.3	6.1	8.0
Static power supply converters	63.2	65.1	89.2	123.0
Inductive delay lines	8.9	9.1	12.5	17.3
Fluorescent ballasts	93.3	96.4	106.6	130.1
Transformer parts	39.9	42.6	47.8	58.3
Rectifying apparatus	86.9	89.1	116.0	129.0
Motor and generator parts	127.6	135.6	158.4	193.3
Total	565.8	582.4	728.7	910.0

1/ Estimated by the staff of the U.S. Tariff Commission.

2/ Data for 1964-66 were estimated by the staff of the Tariff Commission based on 1963 census data and projected on the basis of trends of related data in the subsequent years.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

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Table 3.--Electric motors, generators, and rectifying apparatus: U.S. exports of domestic merchandise, by types, 1963-67

(In thousands of dollars)

Type	1963	1964	1965	1966	1967
Electric motors:					
Fractional horsepower motors	11,589	13,749	11,648	13,981	15,463
Other motors 1/	32,925	32,115	33,216	30,420	32,901
Electric generators 1/	11,975	27,187	34,434	24,910	19,571
Motor generator sets	34,179	37,055	49,461	43,256	58,269
Rotating converters	5,696	2,997	2,053	1,847	2,496
Rectifiers and rectifying apparatus 1/	2/	2/	22,495	25,727	18,497
Ballasts	2,501	2,791	3,478	3,288	3,155
Inductors and parts of transformers 1/	3,311	4,370	4,536	5,190	5,718
Parts of motors and generators 1/	13,094	16,449	20,026	24,518	28,348
Total	2/	2/	181,347	173,137	184,418

1/ Partly estimated by the staff of the U.S. Tariff Commission.
2/ Available data are insufficient to allow a meaningful estimate.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 4.--Electric motors, generators, and rectifiers: U.S. exports, by principal markets, 1965-67

(In thousands of dollars)

Market	1965	1966	1967
Canada	32,352	39,464	38,140
Mexico	8,950	8,715	14,598
Australia	7,639	4,654	8,443
Japan	7,901	10,919	7,302
Brazil	7,863	7,692	6,731
South Viet-Nam	4,112	5,449	6,349
Spain	6,085	6,336	5,772
United Kingdom	6,963	6,052	5,600
France	4,902	5,594	5,255
All other	94,580	78,262	86,228
Total	181,347	173,137	184,418

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 5.--Electric motors: U.S. imports for consumption, by TSUSA items, 1964-67

TSUSA item	Description	1964	1965	1966	1967
		Quantity (1,000 units)			
	Electric motors:				
682.2000	Synchronous, of under 1/40 hp., valued not over $4.00 each	1/ 15.0	1/ 22.0	101.6	106.7
682.2500	Other motors of under 1/40 hp	25,602.3	37,122.0	38,295.4	27,334.0
682.3000	Of 1/40 or more but not over 1/10 hp	1,301.0	1,133.1	1,059.0	963.1
682.4020	Of over 1/10 but less than 1 hp	501.1	1,317.9	1,353.9	1,516.5
682.4040	Of 1 or more but less than 20 hp	26.1	40.4	53.9	79.1
682.4060	Of 20 or more but less than 200 hp	4.1	7.6	6.5	10.4
682.5000	Of 200 hp. or more	2/ 129.7	2/ 2.5	.5	1.3
	Total	27,579.2	39,645.4	40,870.8	30,011.1
		Value (1,000 dollars)			
	Electric motors:				
682.2000	Synchronous, of under 1/40 hp., valued not over $4.00 each	1/ 45.4	1/ 55.7	188.8	233.3
682.2500	Other motors of under 1/40 hp	5,342.0	10,239.9	10,387.1	6,970.9
682.3000	Of 1/40 or more but not over 1/10 hp	1,243.2	1,975.5	2,123.9	2,636.1
682.4020	Of over 1/10 but less than 1 hp	1,500.4	3,208.1	4,798.5	7,589.6

See footnotes at end of table.

Table 5.--Electric motors: U.S. imports for consumption, by TSUSA items, 1964-67--Continued

TSUSA item	Description	1964	1965	1966	1967
		Quantity (1,000 units)			
682.4040	Of 1 or more but less than 20 hp	1,617.7	1,984.8	2,970.8	3,917.3
682.4060	Of 20 or more but less than 200 hp	1,263.4	2,323.9	2,316.7	3,526.7
682.5000	Of 200 hp. or more	2/ 623.8	2/ 648.2	1,368.6	1,971.8
	Total	11,635.8	20,436.1	24,154.3	26,845.8
		Unit value			
	Electric motors:				
682.2000	Synchronous, of under 1/40 hp., valued not over $4.00 each	1/ $3.03	1/ $2.53	$1.86	$2.18
682.2500	Other motors of under 1/40 hp	.21	.28	.27	.26
682.3000	Of 1/40 or more but not over 1/10 hp	.96	1.74	2.01	2.74
682.4020	Of over 1/10 but less than 1 hp	2.99	2.43	3.54	5.00
682.4040	Of 1 or more but less than 20 hp	62.00	49.00	55.00	49.50
682.4060	Of 20 or more but less than 200 hp	305.00	308.00	359.00	338.49

See footnotes at end of table.

Table 5.--Electric motors: U.S. imports for consumption, by TSUSA items, 1964-67--Continued

TSUSA item	Description	1964	1965	1966	1967
		Unit value			
682.5000	Of 200 hp. or more	2/	2/	2,860.00	1,561.21

1/ Data include imports of all synchronous motors of under 1/40 hp. in 1964 and through Dec. 7, 1965.
2/ Statistics for 1964 and 1965 are believed to be incorrect.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Imports of electric motors, generators, and rectifiers from Canada intended for use as original motor-vehicle equipment are not segregated in official statistics and have not been estimated for inclusion in the data in this summary. The value of such imports could have been as high as $564,871 in 1966 and $1,032,203 in 1967.

Table 6.--Electric generators: U.S. imports for consumption, by TSUSA items, 1964-67

(In thousands of dollars)

TSUSA item	Description	1964	1965	1966	1967
	Electric generators:				
682.6010	Of less than 10,000 kw	344.3	648.4	1,156.4	3,003.2
682.6020	Of 10,000 kw. or more, but not over 40,000 kw	178.8	82.9	865.7	1,216.9
682.6030	Of more than 40,000 kw	57.1	162.7	1,095.1	805.8
682.6040	Motor-generators and rotating converters	175.9	242.3	225.9	559.9
	Total	756.1	1,136.3	3,343.1	5,585.8

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Imports of electric motors, generators, and rectifiers from Canada intended for use as original motor-vehicle equipment are not segregated in official statistics and have not been estimated for inclusion in the data in this summary. The value of such imports could have been as high as $564,871 in 1966 and $1,032,203 in 1967.

Table 7.--Rectifiers and rectifying apparatus, inductors, ballasts, commutators, parts thereof, and parts of electric transformers, motors, and generators: U.S. imports for consumption, by TSUSA items, 1964-67

(In thousands of dollars)

TSUSA item	Description	1964	1965	1966	1967
682.6050	Rectifiers and rectifying apparatus	987	1,284	2,286	3,139
	Inductors, ballasts, commutators, parts thereof, and parts of electric transformers, motors, generators, and rectifying apparatus:				
682.5200	Commutators	1/	1/ 17	1,157	878
682.5500	Parts of motors of under 1/40 hp	96	70	140	95
682.6060	Inductors, ballasts, parts thereof, and parts of electric transformers, motors, and generators	2/ 4,655	2/ 5,713	7,220	15,668
	Total	5,738	7,084	10,803	19,780

1/ Data were not separately compiled until Dec. 7, 1965.
2/ Data include imports of commutators in 1964 and through Dec. 7, 1965.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Imports of electric motors, generators, and rectifiers from Canada intended for use as original motor-vehicle equipment are not segregated in official statistics and have not been estimated for inclusion in the data in this summary. The value of such imports could have been as high as $564,871 in 1966 and $1,032,203 in 1967.

Table 8.--Electric motors, generators, and rectifiers: U.S. imports for consumption, by principal sources, 1964-67

(In thousands of dollars)

Source	1964	1965	1966	1967
Japan	7,076	13,289	15,805	13,905
United Kingdom	5,906	7,430	9,211	13,552
Canada	1,495	1,923	3,766	9,376
West Germany	1,523	2,101	3,252	4,394
Sweden	83	238	1,206	3,713
Switzerland	450	766	773	1,542
Denmark	538	609	856	707
France	210	270	334	644
Hong Kong	49	324	342	626
Yugoslavia	397	1,201	729	453
All other	403	506	2,026	3,300
Total	18,130	28,657	38,300	52,212

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Imports of electric motors, generators, and rectifiers from Canada intended for use as original motor-vehicle equipment are not segregated in official statistics and have not been estimated for inclusion in the data in this summary. The value of such imports could have been as high as $564,871 in 1966 and $1,032,203 in 1967.

Commodity	TSUS item
Permanent magnets, excluding ferrites; magnetic work holders, and electromagnetic devices-----	682.70, -.71, -.80, -.90, -.91

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

The United States is probably the world's largest consumer and producer of magnets and magnetic articles. The value of its consumption of metallic permanent magnets alone in 1967 is estimated at about $46 million, of which about 4 to 5 percent was accounted for by imports; imports exceeded exports in that year. The value of the annual U.S. production and consumption of other magnetic articles such as work holders and electromagnetic articles (other than those employing ceramic magnets) also amounts to many millions of dollars annually, but no official data on the production and consumption, or on the exports, of such articles are available.

Description and uses

A magnet is a material which attracts a mass of iron, and which also reacts to the magnetic field of an electric-current-carrying conductor placed near it. A permanent magnet maintains it magnetism without external influence. An electromagnet becomes magnetic only when influenced by the magnetic field of a current-carrying conductor; such a magnet ceases to be magnetic when the flow of current through the conductor is stopped.

Permanent magnets covered by this summary are of the metallic type as opposed to the ceramic (ferrite) type. The bulk of the permanent metallic magnets, called Alnico, consist of a combination of aluminum, nickel, cobalt, iron, and other additives. Such magnets are produced by placing the alloy in a magnetic field during heat treatment. The alloys, which can be formed only by casting or sintering, are hard and are difficult to machine except by grinding. The principal permanent ceramic type of magnet, barium ferrite, is discussed in the summary on ceramic magnets and the like (item 535.12), in volume 5:3. Item 535.12 also covers other magnetic articles, such as ferrites, used in cores for television yokes (Treasury Decision 56372(24)).

Permanent magnets of the metallic type (item 682.70) are used in a large number of applications such as telephones, microphones, loudspeakers, motors, generators, magnetos, meters, microwave tubes, cloud chambers, latches, switches, toys, conveyors, separators, and chucks. The use of permanent magnets is expanding as smaller and more powerful permanent magnets replace bulky electromagnets which require electric current and generate heat.

Magnetic work holders (item 682.80) consist of permanent magnets or electromagnets used to hold articles undergoing processing. Chucks, clamps, and vises in many different shapes are common forms of magnetic work holders.

Electromagnets (item 682.90) consist of an iron or mild steel core which is magnetized by passing an electric current through an electrical conductor normally wound around it. When energized, the iron or steel core (which may be laminated or solid) should become quickly and fully magnetized when a current is passed through the conductor, and it must be quickly and fully demagnetized when the current in the conductor is turned off. Common forms of electromagnets are electromagnetic clutches, couplings, brakes, solenoids, and lifting heads. In electromagnets, as in permanent magnets, metallic as well as ceramic materials may be used as cores. This summary is limited to metallic types, as previously mentioned.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
	Magnets; chucks, clamps, vises and similar work holders, all the foregoing which are magnetic; electromagnetic clutches and couplings; electromagnetic brakes; electromagnetic lifting heads; all the foregoing and parts thereof (except ceramic magnets and magnetic articles equipped with ceramic magnets):			
682.70	Permanent magnets----	16% ad val.	14% ad val.	8% ad val.
682.71	If Canadian article and original motor-vehicle equipment. 1/	Free	2/	2/
682.80	Work holders and parts thereof.	15% ad val.	13% ad val.	7.5% ad val.
682.90	Other----------	11.5% ad val.	10% ad val.	5.5% ad val.
682.91	If Canadian article and original motor-vehicle equipment. 1/	Free	2/	2/

1/ See headnote 2, part 6B, schedule 6, TSUSA-1968.
2/ Duty-free status not affected by the trade conference.

The tabulation above shows the column 1 rates of duty that had been in effect under the TSUS prior to January 1, 1968, and modifications therein as a result of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement

on Tariffs and Trade. Only the first and final stages of the five annual rate modifications are shown above (see the TSUSA-1968 for the intermediate staged rates).

The prior rates shown for items 682.80 and 682.90 had remained unchanged under the TSUS from August 31, 1963, through 1967. Effective December 7, 1965, however, the rate of duty applicable to item 682.70 was reduced from 18 percent ad valorem to 16 percent ad valorem and the description of items 682.80 and 682.90 was modified to include parts; these changes resulted from the enactment of the Tariff Schedules Technical Amendments Act of 1965. The revised rate for item 682.70 was a weighted average of various rates which had been applied to permanent magnets prior to the adoption of the revised tariff schedules of August 31, 1963. The duty-free status of items 682.71 and 682.91 was established, effective January 18, 1965, pursuant to the Automotive Products Trade Act of 1965.

U.S. consumption

The United States is probably the world's largest consumer of magnets and magnetic articles. U.S. consumption is believed to have increased rapidly during recent years in view of the rapid expansion of U.S. production of numerous articles using permanent magnets or electromagnetic devices. It is estimated that in 1967 the value of U.S. consumption of permanent metallic magnets alone was about $46 million. Most of this value represents Alnico magnets, which are used in loudspeakers, in miscellaneous holding applications, in recording and indicating meters and instruments, in electron tubes and devices, and in many motors and generators.

Annual U.S. consumption of magnetic work holders and electromagnetic devices such as clutches and couplings, brakes, and lifting heads and parts is probably valued at many additional millions of dollars; however, there are no data available on which to base a reasonably accurate estimate of the value of U.S. consumption of these articles.

U.S. producers and producers' shipments

The bulk of the U.S. output of permanent magnets of metal is accounted for by about 10 producers, of which about seven specialize in the production of Alnico magnets. Some of the producers of metal magnets also manufacture permanent ceramic magnets and electromagnets from ceramic as well as from metallic materials. The producers are situated mostly in seven States in the north central and northeast regions of the United States. The number of producers of magnetic work holders and of electromagnetic devices is considerably larger;

these producers, situated in many States, also produce a wide range of other products.

In 1963, U.S. producers' shipments of permanent magnets of metal were valued at $36.7 million, according to the U.S. Census of Manufactures for that year (table 1); on the basis of trade data, about $28 million of this total represented Alnico magnets. Judging from trade data, it is believed that the value of U.S. producers' shipments of metallic permanent magnets in 1965 was about $40 million, and in 1967, $44 million. The growth of U.S. production has been slowed in recent years by the competition from imports and by the substitution of permanent ceramic magnets for permanent metallic magnets in some applications, particularly for loudspeakers and electronic devices.

U.S. producers' shipments of magnetic work holders and electromagnetic devices undoubtedly are large and increasing, judging from large growth in the numerous applications of these devices. The production and use of magnetic work holders and electromagnetic devices has increased with their improved design and with the general increase in automation of U.S. industry. Magnetic devices are especially suited for concentration of iron ore, for machining operations, material moving, and many other industrial operations. Data on the value of annual production (or producers' shipments) of such magnetic devices are not segregated in official statistics.

U.S. exports

The value of annual U.S. exports of permanent magnets, electromagnets, and electromagnetic appliances increased from $3.6 million in 1965 to $4.4 million in 1967 (table 1). These totals include both permanent metal and ceramic magnets, as well as electromagnets and electromagnetic devices with ceramic or metal magnet components; for this reason the export data are not comparable with data on producers' shipments and imports presented elsewhere in this summary. The data do, however, indicate a rising value of exports of the magnet industry. Permanent magnets (including ceramic magnets, which are not covered in this summary) accounted for about 22 percent of the total value of exports in 1967.

Canada was the principal market for the magnetic devices exported, accounting for approximately 38 percent of such exports in 1967 (table 2). The United Kingdom was the second largest market, receiving approximately 18 percent.

U.S. imports

The value of total U.S. imports of magnets and magnetic articles discussed herein increased from $1.5 million in 1964 to $3.8 million in 1967 (table 1). In 1967, permanent magnets (item 682.70 and 682.71) accounted for about 54 percent of the value of total U.S. imports, whereas magnetic work holders and parts (item 682.80) accounted for 9 percent, and other magnets (excluding ceramic types) and electromagnetic devices (items 682.90 and 682.91) accounted for 37 percent.

The principal source of the magnetic devices was Japan, which supplied more than 35 percent of such imports in 1967 (table 3). A large amount of the Japanese-made magnets was supplied to U.S. manufacturers of loudspeakers which are used in consumer electronic products. These magnets are rudimentary, cost but a few cents each, and are frequently shipped as unmagnetized rods, then cut to length and magnetized by the U.S. loudspeaker manufacturer. The vigorous steel and electronics industries in Japan enjoy large Japanese and other foreign markets for these magnets because of the attractive prices at which they are offered for sale. Many foreign magnets also enter the United States as parts of finished articles such as consumer electronic products, communications devices, toys, and motors.

The principal sources of magnetic work holders were the United Kingdom, the Netherlands, and Switzerland. Magnetic and electromagnetic chucks constituted the bulk of the imports in this class.

Other magnets (excluding ceramic), parts thereof, parts of permanent magnets, and electromagnetic devices and parts thereof were imported chiefly from Germany, Canada, and Japan. Electromagnetic clutches and brakes used in controlling such devices as air conditioners and machines make up a large portion of the imports.

The value of annual U.S. imports of magnets and magnetic articles is believed to be small in relation to that of U.S. producers' shipments (probably not more than 5 percent of the value of U.S. consumption), except for permanent magnets for use in loudspeakers, which probably account for a much larger but unknown percentage of the value of U.S. consumption of these articles. The value of magnets imported as parts of assembled apparatus is also believed to be substantial. Data on such imports, however, are not segregated in official statistics.

U.S. imports of magnets and magnetic articles from Canada under the duty-free provisions of the Automotive Products Trade Act of 1965 have been negligible.

Table 1.--Metal magnets and magnetic articles: U.S. producers' shipments, imports for consumption, and exports of domestic merchandise, by types, 1964-67

(In thousands of dollars)

Item	1964	1965	1966	1967
U.S. producers' shipments: 1/				
Permanent magnets of metal 2/	3/	40,000	3/	44,000
U.S. imports:				
Permanent magnets of metal (682.70)	622	749	1,799	2,020
When produced in Canada and imported for use as original motor-vehicle equipment (682.71)	4/	4/ -	-	-
Work holders and parts (682.80)	139	141	333	355
Electromagnets and electromagnetic devices (682.90) 5/	713	1,442	884	1,390
When produced in Canada and imported for use as original motor-vehicle equipment (682.91)	4/	4/ -	1	10
Total	1,474	2,332	3,017	3,775
U.S. exports: 6/				
Permanent magnets (metallic and ceramic)	3/	849	1,046	973
Electromagnets and electromagnetic appliances	3/	2,743	3,117	3,453
Total	3/	3,592	4,163	4,426

1/ No data on producers' shipments of magnetic work holders and electromagnetic devices are available.

2/ Data for 1965 and 1967 estimated by the staff of the U.S. Tariff Commission--for 1965 on the basis of trade data on production and for 1967 on the basis of the trend of U.S. producers' sales of equipment incorporating permanent magnets. Alnico magnets comprised an estimated 76 to 82 percent of the total value.

3/ Not available.

4/ Not separately available in 1964. Provisions became effective Dec. 20, 1965, retroactive to Jan. 18, 1965. Compilation of data commenced in December 1965.

5/ Includes electromagnetic clutches and couplings, brakes, and lifting heads and parts (with metallic cores only).

6/ Includes both metallic and ceramic permanent magnets and electromagnets and electromagnetic appliances with either cores of metal or of ceramic magnets; hence these data are not strictly comparable with data on U.S. producers' shipments or U.S. imports covered by this summary.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Note.--U.S. producers' shipments of permanent magnets of metal were valued at $36.7 million in 1963. In addition to the value of U.S. producers' shipments of permanent magnets of metal, shipments of magnetic work holders and electromagnetic devices probably amounted to many more millions of dollars annually.

Table 2.--Magnets, electromagnets, and electromagnetic appliances: U.S. exports of domestic merchandise, by principal markets, 1965-67 1/

(In thousands of dollars)

Market	1965	1966	1967
Canada	1,098	1,830	1,701
United Kingdom	214	313	799
Mexico	321	268	300
Italy	414	186	208
West Germany	259	184	177
Sweden	77	57	154
France	170	225	145
Japan	119	148	143
India	130	84	73
Netherlands	93	128	63
Australia	79	89	57
Republic of South Africa	69	123	51
All other	549	528	555
Total	3,592	4,163	4,426

1/ Data in this table are not comparable with those on imports in that, for exports, no distinction is drawn between metallic and ceramic (ferrite) magnetic materials.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Magnets and magnetic articles: U.S. imports for consumption, by principal sources, 1964-67

(In thousands of dollars)

Source	1964	1965	1966	1967
Japan	696	507	1,354	1,329
West Germany	189	420	539	759
United Kingdom	283	324	383	511
Italy	6	5	380	423
Switzerland	26	190	52	237
Canada	148	740	42	186
France	68	102	102	172
Netherlands	30	27	92	74
Hong Kong	7	3	31	23
Sweden	14	9	13	13
Denmark	4	3	4	8
Mexico	-	-	12	7
All other	3	2	13	33
Total	1,474	2,332	3,017	3,775

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Primary cells and batteries, and parts	682.95
Storage batteries and parts	683.10, -.11, -.15, -.16

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

U.S. consumption of electric primary cells and storage batteries (including parts), the largest in the world, was valued at about $936 million in 1967. During 1963-67, imports supplied about 2 percent or less of annual consumption. U.S. exports were larger than imports in each of those years.

Description and uses

A cell or a battery is a device for converting chemical energy directly into electrical energy and thus serves as a source of direct current. A primary cell, in general practice, is not recharged, so that the chemically reacting parts require replacement. A storage cell or battery (also known as a secondary cell or battery), however, may be recharged by reversing the direction of current through the battery, a process which restores the chemically reacting parts.

One type of primary cell or battery is the dry cell, in which the liquid electrolyte is absorbed in a powder to form a moist paste. The most common dry cell is the zinc-carbon type used in flashlights, transistor radios, and toys, among many other devices. Other dry cells or batteries include the following: Mercury cells, used in hearing aids, lighting devices, photographic equipment, transistor radios, missiles and satellites, instruments and computers, and clocks and watches; alkaline-manganese batteries, used in industrial flashlights; and the silver-zinc cells, used in hearing aids and cordless power tools. Another type of primary cell is the wet cell, in which the electrolyte is liquid; this type, able to handle high current loads, is used extensively in railway systems for signal service and track-circuit service.

The most common storage battery is the lead-acid type, with sulfuric acid as the electrolyte and lead and lead dioxide as the electrodes. Used mostly in automotive vehicles, the lead-acid type is also used in hospitals and other public facilities, for standby emergency power, in telephone and telegraph service, in fire-alarm systems, and in railway signaling, rural lighting, and marine craft. Another is the alkaline type of storage battery; the more important kinds

(distinguished by the active materials used) are (1) the nickel-iron battery, commonly known as the Edison cell--especially suited for heavy-duty industrial and railway uses, as in industrial trucks, tractors, mine locomotives, and shuttle cars; (2) the nickel-cadmium battery, including both hermetically sealed and vented cells, used in electric toothbrushes, shavers, and knives, in standby services as in diesel-engine starting, emergency lighting, marine power systems, railway car lighting, and special military and aerospace applications, where a high rate of discharge is required; and (3) the silver oxide-zinc battery with relatively higher watt-hour capacity than most secondary cells--used in portable photographic and sound equipment, model boats and planes, and special military applications.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
682.95	Primary cells and primary batteries, and parts thereof.	17.5% ad val.	15.5% ad val.	8.5% ad val.
	Storage batteries and parts:			
683.10	Lead-acid type, and parts.	17% ad val.	15% ad val.	8.5% ad val.
683.11	If Canadian article and original motor-vehicle equipment.	Free	1/	1/
683.15	Other	16% ad val.	14% ad val.	8% ad val.
683.16	If Canadian article and original motor-vehicle equipment.	Free	1/	1/

1/ Duty-free status not affected by the trade conference.

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6:10

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968; those prior rates had remained unchanged under the TSUS from August 31, 1963, through the end of 1967, except for the rates on items 683.11 and 683.16, as noted below. The tabulation also shows modifications of those rates that resulted from concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade; only the first and final stages of the five annual rate modifications are shown above (see the TSUSA-1968 for the intermediate staged rates). Item 683.11 (formerly part of item 683.10) and item 683.16 (formerly part of item 683.15) were established as a result of the Automotive Products Trade Agreement with Canada with respect to articles entered on or after January 18, 1965; the duty-free status on these two items was not affected by the trade negotiations.

Some batteries imported for U.S. Government use are entered free of duty under one of the special provisions in items 832.00, 833.00, 834.00, and 836.00 of the TSUSA-1968. Batteries are also entered duty free under item 864.05, for the purpose of exportation, after being repaired, altered, or processed.

U.S. producers

There were 252 domestic establishments in 1963 that were engaged in the production of storage batteries; of these establishments, a fourth were in the North Central States (principally Illinois, Indiana, and Michigan), another fourth in the Western States (primarily California), and a fifth in the Northeastern States (mainly Pennsylvania, New Jersey, and New York). Comparatively small groups of the establishments accounted for large portions of total shipments of storage batteries in 1963, as indicated in the following: five establishments, for 21 percent of total shipments; 18 establishments, for 44 percent; and 47 establishments, for 75 percent.

Primary batteries (dry and wet) were produced by 46 establishments in 1963; of these, 14 establishments were in the Northeastern States and the rest were in the North Central, Southern, and Western States. In 1963, only 13 establishments accounted for 68 percent of the total producers' shipments of primary batteries, and 22 establishments, for 96 percent of the total.

Some of the larger domestic establishments have foreign subsidiaries or affiliates that produce batteries and parts, and such subsidiaries or affiliates supplied some of the primary and storage batteries and parts imported during 1963-67.

The sale of batteries has been an important source of income to most of the domestic producers of primary and storage batteries.

U.S. consumption and producers' shipments

The value of apparent total U.S. consumption of primary and storage batteries increased steadily from 1963 to 1967; it was about $936 million in 1967, or more than a third larger than in 1963 (table 1). In each year during 1963-67, about seven-tenths of the total consumption consisted of storage batteries. From 1963 to 1967, however, the consumption of primary batteries grew more rapidly (an average of 11 percent a year) than did consumption of storage batteries (7 percent a year).

The value of total U.S. producers' shipments was slightly larger than total apparent consumption in each year during 1963-67. After deducting exports, domestic producers' shipments supplied the great bulk of U.S. consumption of batteries; in 1963-67 they supplied 96 to 97 percent of the consumption of primary batteries and about 99 percent of that of storage batteries (table 1). Total U.S. producers' shipments of batteries (primary and storage types, including parts) were estimated at $947 million in 1967, or 36 percent more than in 1963.

U.S. exports

Total annual U.S. exports of primary and storage batteries, and parts thereof, were equal to 2 to 3 percent of annual producers' shipments during 1963-67 (table 1). Total annual exports were generally larger than annual imports during 1963-67. The value of total U.S. exports of batteries increased from $16.6 million in 1963 to $30.2 million in 1966, or by 82 percent; in 1967 it decreased to $27.5 million. Storage batteries made up the bulk of the total exports in each year during 1963-67, except in 1965, when primary batteries made up the larger portion. Annual exports of storage batteries during 1963-67 were substantially larger than imports thereof.

The principal markets for the U.S. exports of batteries during 1963-67 were, for storage batteries, Canada (23 to 42 percent of the annual totals), and to a lesser extent the Netherlands, Venezuela, and Mexico (table 2), and for primary batteries, Canada and the Republic of Korea, and on a smaller scale, Equador, Peru, and the United Kingdom (table 3).

U.S. imports

The total value of U.S. imports of primary and storage batteries and parts thereof was equivalent to about 2 percent of apparent U.S. consumption in each year during 1963-67 (table 1). Total imports rose from $10.6 million in 1963 to $17.9 million in 1966, or by 70 percent, then dropped to $16.2 million in 1967. Primary batteries

made up 52 to 65 percent of the total annual imports of all batteries during 1963-67 (table 1). Storage batteries other than the lead-acid type accounted for the greater part of the imports of storage batteries in 1963 and 1967 (table 4).

The principal sources of battery imports during 1963-67 were Japan and Hong Kong (table 5); West Germany and Canada were other important sources. The most important sources of imports, by type of battery were, in 1963, Japan for primary batteries, and France and West Germany for storage batteries; in 1967, they were Japan and Hong Kong for primary batteries, and West Germany, Japan, and Canada, for storage batteries (table 4).

Beginning in 1965, the imports from Canada included storage batteries entered free of duty as original motor-vehicle equipment, under the Automotive Products Trade Agreement (APTA) between the United States and that country. The imports of storage batteries from Canada in 1963-67, including those under the APTA, are tabulated below for comparison (in thousands of dollars):

Duty status and type	1963	1964	1965	1966	1967
Duty-free, under APTA:					
Lead-acid type	1/	1/	52	302	545
Other storage types	1/	1/	48	6	45
Total	1/	1/	100	308	590
Other:					
Lead-acid type	471	282	599	342	372
Other storage types	12	68	76	358	567
Total	483	350	675	700	939
Grand total	483	350	775	1,008	1,529

1/ Not applicable.

Duty-free imports during 1963-67 also included primary and storage batteries entered for U.S. Government use, and a smaller amount entered to be processed under bond for exportation after being repaired, altered, or processed. The total value of such duty-free imports grew from about $132,000 in 1963 to $790,000 in 1967.

Table 1.--Primary and storage batteries, including parts: U.S. producers' shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, 1963-67

(In thousands of dollars)

Year	Producers' shipments	Imports	Exports	Apparent consumption
	Primary batteries			
1963	191,624	6,826	6,283	192,000
1964	203,598	8,246	6,781	205,000
1965	221,091	7,381	12,091	216,000
1966	263,635	10,391	11,592	262,000
1967	1/ 294,000	8,463	10,307	292,000
	Storage batteries			
1963	504,492	3,746	10,286	498,000
1964	519,901	4,868	11,933	513,000
1965	610,182	6,229	9,575	607,000
1966	612,869	7,538	18,645	602,000
1967	1/ 653,000	7,776	17,213	644,000
	Primary and storage batteries, combined			
1963	696,116	10,572	16,569	690,000
1964	723,499	13,114	18,714	718,000
1965	831,273	13,610	21,666	823,000
1966	876,504	17,929	30,237	864,000
1967	1/ 947,000	16,239	27,520	936,000

1/ Estimated by the staff of the U.S. Tariff Commission.

Source: U.S. producers' shipments, exports, and imports, from official statistics of the U.S. Department of Commerce, except as noted.

Note.--The ratio of annual imports (based on foreign value) to annual consumption (based largely on f.o.b. factory value) ranged as follows during 1963-67: For primary batteries, from 2.9 to 4.0 percent; for storage batteries, from 0.8 to 1.3 percent; and for both types combined, from 1.5 to 2.1 percent. The ratios would be somewhat higher if they were based on landed, duty-paid values of imports.

Table 2.--Storage batteries: U.S. exports of domestic merchandise, by principal markets, 1963-67

(In thousands of dollars)

Market	1963	1964	1965	1966	1967
Canada	2,692	2,981	2,201	5,949	7,288
Netherlands	181	127	338	848	742
Venezuela	706	669	568	760	675
Mexico	471	659	769	861	583
West Germany	310	308	283	628	553
Italy	272	423	305	621	431
Republic of the Philippines	464	545	179	481	406
Republic of Korea	352	415	372	848	369
Republic of South Africa	153	190	213	296	257
France	156	266	254	437	238
South Viet-Nam	82	206	151	555	106
All other	4,447	1/ 5,144	3,942	2/ 6,361	3/ 5,565
Total	10,286	11,933	9,575	18,645	17,213

1/ Includes exports valued at 514 thousand dollars to the Congo.
2/ Includes exports valued at 509 thousand dollars to Japan.
3/ Includes exports valued at 355 thousand dollars to Japan.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Primary batteries: U.S. exports of domestic merchandise, by principal markets, 1963-67

(In thousands of dollars)

Market	1963	1964	1965	1966	1967
Canada	415	560	1,535	1,709	1,790
Republic of Korea	96	221	1,472	959	909
Ecuador	468	711	665	596	678
Turkey	82	185	282	534	672
United Kingdom	141	107	733	1,225	643
Mexico	187	246	639	480	622
Australia	97	36	254	428	392
West Germany	211	171	638	380	381
Thailand	42	80	229	303	367
Venezuela	245	299	319	336	283
Peru	665	1,077	555	577	239
Panama	306	354	414	401	198
Republic of the Philippines	416	490	159	122	95
All other	2,912	2,244	4,197	3,542	1/ 3,038
Total	6,283	6,781	12,091	11,592	10,307

1/ Includes exports to Japan, valued at 315 thousand dollars.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 4.--Primary and storage batteries, and parts thereof: U.S. imports for consumption, by types and by principal sources, 1963 and 1967

(In thousands of dollars)

Source	Primary cells and batteries and parts	Storage batteires and parts			Grand total
		Lead-acid	Other	Total	
	1963				
Japan	5,062	167	17	184	5,246
Hong Kong	1,094	5	1	6	1,100
West Germany	80	176	767	943	1,023
Canada	409	471	12	483	892
Sweden	1/	34	629	663	663
United Kingdom	72	175	91	266	338
France	30	1	1,060	1,061	1,091
All other	79	137	3	140	219
Total	6,826	1,166	2,580	3,746	10,572
	1967				
Japan	4,298	1,548	176	1,724	6,022
Hong Kong	3,298	-	2	2	3,300
West Germany	42	323	1,519	1,842	1,884
Canada	219	917	612	1,529	1,748
Sweden	1	95	1,259	1,354	1,355
United Kingdom	141	172	722	894	1,035
France	28	11	191	202	230
All other	436	216	13	229	665
Total	8,463	3,282	4,494	7,776	16,239

1/ Less than $500.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 5.--Primary and storage batteries, and parts thereof: U.S. imports for consumption, by principal sources, 1963-67

(In thousands of dollars)

Source	1963	1964	1965	1966	1967
Japan	5,246	6,243	5,941	7,230	6,022
Hong Kong	1,100	1,797	1,668	3,275	3,300
West Germany	1,023	816	1,670	1,997	1,884
Canada	892	578	885	1,119	1,748
Sweden	663	868	814	1,399	1,355
United Kingdom	338	911	1,379	1,580	1,035
France	1,091	1,431	627	412	230
All other	219	470	626	917	665
Total	10,572	13,114	13,610	17,929	16,239

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Vacuum cleaners and floor polishers with self-contained electric motors, and parts thereof	683.30

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

The United States is the world's largest consumer of vacuum cleaners and probably also of floor polishers. Apparent U.S. consumption of household and commercial types of these articles in 1967 was valued at more than a quarter of a billion dollars--more than four-fifths of the total accounted for by vacuum cleaners and parts. The domestic producers, favored by a large domestic market and employing mass production techniques, are in a strong competitive position. Imports account for about 1 percent of the total consumption, while exports are several times as large as imports. Some of the large producers have subsidiaries in foreign countries; exports of vacuum cleaner parts for assembly in the plants of these subsidiaries have increased in recent years.

Description and uses

The vacuum cleaners and floor polishers covered by this summary are appliances with self-contained electric motors, of types used in households, hotels, restaurants, offices, schools, or hospitals (but not including factory or other industrial appliances). 1/ Parts for such appliances are also covered, but not general-purpose motors and parts which are specifically provided for elsewhere in the TSUS. In practice, many machines of the household type are used in commercial establishments, and vice versa; and some machines of the commercial type are used in factories.

Vacuum cleaners.--The most common types of vacuum cleaners used in recent years in households or commercial establishments are floor

1/ Industrial appliances are classified in item 678.50 (machines not especially provided for, and parts thereof) and are dutiable at 9 percent ad valorem. Industrial vacuum cleaners are machines especially designed for processing materials or for use in connection with manufacturing operations (for example, vacuum cleaning of fibers in textile plants or recovering flux flour in metal-welding operations).

models of canister or tank types. In these types, the main unit containing the motor, air suction pump, and dirt receptacle is relatively stationary in use, while the cleaning nozzle, connected to the canister or tank by a length of flexible tube, is moved by the operator over the surface being cleaned. These types of cleaners are versatile, usable for cleaning rugs and carpets as well as smooth-surfaced floors, stairways, under furniture, and--with suitable attachments--curtains, walls, and so forth. The nozzle for these types of cleaners is generally fitted with a fixed rather than a revolving brush (such as is used on upright models), and, because of this, these cleaners are not the most efficient for removing deep-seated or threadlike dirt from rugs or carpets. The most common canister or tank type of cleaners, weighing from 12.5 to 23.5 pounds each, are powered by electric motors of 0.66 to 1.25 horsepower. Heavy-duty cleaners of the commercial type are equipped with motors up to 7.5 horsepower.

The upright type of floor vacuum cleaner was the most common type used in the United States until the mid-1950's. The upright type differs from the canister or tank type in that the whole unit of the former is moved over the floor surface being cleaned, and one end of the relatively large dirt receptacle is usually attached to the upright handle; moreover, the nozzle at the floor surface is equipped with a revolving brush or brushes that help loosen the dirt in the surface being cleaned. Upright models are used mostly for cleaning rugs and carpets. The common upright models in use weigh as much as the canister or tank models, but their motors are somewhat smaller. In recent years, less expensive lightweight upright vacuum cleaners have been introduced weighing 6.75 to 9.5 pounds each, compared with regular or standard upright cleaners weighing 13.25 to 27.4 pounds. The lightweight types, equipped with small motors, generally do not have a revolving brush in the cleaning nozzle and are used principally for light cleaning functions, such as removing loose dirt from the surface of rugs.

A small number of vacuum cleaners used are portable hand-held types weighing about 4 to 5 pounds each. These units are used principally for such applications as cleaning upholstery and automobile interiors. In the last several years a large number of miniature cleaners, known as vacuum brushes (almost all imported from Japan) have been marketed in the United States. These miniature units, about the size of flashlights and powered by ordinary flashlight dry cells, retail at about $1.98 or more each. They are too small to be of much practical use other than for brushing clothes or cleaning car upholstery; for these purposes, the suction orifice is ringed with fixed brushes. 1/

1/ If the vacuum brush contains a light, as the bulk of them do, it is considered as more than a vacuum cleaner, for tariff purposes, and is classified under item 683.32, dutiable at 10.5 percent ad valorem.

Various other special-purpose vacuum cleaners are used, such as those designed for picking up sawdust or dirt in workshops, garages, or basements; vacuum cleaners for grooming animals; and combination vacuum cleaners and floor polishers.

Vacuum cleaners, especially the more expensive models, are usually supplied with attachments or accessories--some of the more common ones covered by the price of the vacuum cleaners, and other, more special ones, at extra cost. The various attachments or accessories include nozzles especially designed for cleaning rugs, smooth floors or walls, upholstery, or draperies; dusting brush; radiator or crevice tool; flexible hose; extension tube or wand; and various attachments for blowing, spraying, and beating.

The central vacuuming system is a new concept in the cleaning of floors and rugs, especially so for households. It has been in use for some time in commercial establishments such as hotels, but not until recently has it gained wide acceptance among home builders, and to a lesser degree among retail dealers. The central vacuum cleaning system consists of a centrally located vacuum pump (usually located in the basement, utility room, or, with a little weather protection, outside the building), with outlets at various places for connecting flexible hose, cleaning tools, and attachments. The U.S. Bureau of Customs has not had occasion to rule on whether central vacuum cleaning systems are classifiable under item 683.30. 1/

Floor polishers.--The principal functions of a floor polisher are applying, polishing, and buffing floor wax by means of electrically driven rotary disc brushes and buffing pads. The weight of the machine with its motor rests wholly or partly on one or (more commonly) two revolving brushes or pads. Many floor polishers perform additional functions, such as scrubbing, removing water or detergents, vacuuming, and rug shampooing. Machines capable of scrubbing, as well as polishing, are equipped with a water tank and are designed to feed water to the scrubbing-brush fibers; they require special scrubbing brushes, or combination scrubbing and polishing brushes. Other items often supplied with the machines, or separately at extra cost, include steel-wool pads, felt buffing pads, lambs' wool buffing pads (for higher polish), wax-removal pads, liquid or paste waxes, detergent dispensers, and rug-shampooing attachments.

1/ It is the opinion of a New York customs official responsible for vacuum cleaners that the central vacuum cleaning system would be classifiable under item 683.30 if it is imported as a complete unit. If not imported as a complete unit, the parts would be classifiable under item 683.30 unless specially provided for elsewhere in the schedules.

Electric floor polishers and combination floor scrubbers and polishers of the types covered by this summary weigh from about 9 pounds to more than 100 pounds each, and they are powered by electric motors ranging from about 1/4-horsepower to as much as 1-1/2-horsepower. The household type of floor polishers ranges in weight from about 9 pounds to 25 pounds; units with plastic parts (such as handles and housings) weigh several pounds less. The larger units are used in commercial establishments. Some units are especially designed; for example, machines for use in hospitals are designed to minimize noise and air contamination.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
	Vacuum cleaners and floor polishers with self-contained electric motors, of types used in the household, hotels, restaurants, offices, schools, or hospitals (but not including factory or other industrial appliances), and parts thereof:			
683.30	Vacuum cleaners, floor polishers, and parts thereof.	13.75% ad val.	12% ad val.	6.5% ad val.

The tabulation above shows the column 1 rate of duty in effect prior to January 1, 1968, and modifications therein as a result of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade. Only the first and final stages of the five annual rate modifications are shown above (see the TSUSA-1968 for the intermediate staged rates).

The prior rate shown in the tabulation had remained unchanged under the TSUS from August 31, 1963, through the end of 1967. A

concession amounting to about a 50-percent reduction in duty was granted by the United States in the aforementioned trade conference concluded on June 30, 1967.

U.S. consumption

The estimated apparent U.S. consumption (by households and commercial establishments) in 1967 was valued at about $302 million (factory value), of which about $255 million, or more than 80 percent, was accounted for by vacuum cleaners and parts (table 1).

The following data, partly estimated, indicate the approximate growth during 1958-67 in the U.S. consumption of the articles covered by this summary (in millions of dollars, factory value):

	1958	1963	1966	1967
Vacuum cleaners, parts, and attachments	161	199	257	255
Floor polishers, parts, and attachments	38	42	46	47
Total	199	241	303	302

The consumption of vacuum cleaners and parts was about 60 percent larger in 1967 than in 1958, and that of floor polishers and parts was about 25 percent larger.

The growth in the use of vacuum cleaners and floor polishers in the United States in recent years is attributable principally to the increasing number of households and to the high standard of living, which has resulted in some households using a second vacuum cleaner--often a lightweight model--to supplement a standard heavier model. The declines in the cost of electricity and, since about 1960, in the prices of these articles, are other influencing factors. The domestic market, especially for vacuum cleaners, is nearly saturated. According to trade reports, more than four-fifths of the homes in the United States with electricity are using vacuum cleaners. The ratio of sales for replacement of used household vacuum cleaners to total sales has increased from about 42 percent in 1964 to about 65 percent in 1967.

U.S. producers

In 1967 at least 18 U.S. producers manufactured vacuum cleaners, of which at least 13 also manufactured floor polishers. At least five of the largest producers manufacture vacuum cleaners or floor polishers in foreign plants owned by them or their subsidiaries. Several other

concerns, without foreign manufacturing facilities, have foreign marketing facilities.

The bulk of the domestic production of vacuum cleaners and floor polishers is concentrated in the hands of a small number of large producers. In 1958, according to the U.S. Bureau of the Census, 27 establishments in the United States were engaged primarily in the manufacture of vacuum cleaners for household use. The five largest of these accounted for 86 percent of the value of shipments of all products sold by the household vacuum cleaner industry. In 1963, the latest year for which such data are available, 34 establishments were engaged principally in manufacturing household vacuum cleaners; the five largest establishments continued to dominate domestic production. Similar data for floor polishers are not available.

U.S. producers' shipments

The factory value of U.S. producers' shipments of vacuum cleaners, floor polishers, and parts thereof, for household and commercial use increased from about $197 million in 1958 to an estimated $311 million in 1967, representing an increase of about 60 percent. U.S. producers' shipments for specified years, by type of article, are shown below (in millions of dollars, factory value):

	1958	1963	1966	1967
Vacuum cleaners, parts, and attachments:				
Household type	156	183	234	230
Commercial type	10	19	34	33
Total	166	202	268	263
Floor polishers, parts, and attachments:				
Household type	19	29	32	33
Commercial type	12	14	15	15
Total	31	43	47	48
Grand total	197	245	315	311

The trend of U.S. producers' shipments is similar to that of apparent U.S. consumption inasmuch as U.S. imports and exports are relatively small. However, shipments, which include those for export, are a little larger than U.S. consumption because exports are considerably larger than imports. About nine-tenths of the total shipments of vacuum cleaners and parts, and about seven-tenths of the total shipments of floor polishers and parts, consist of household types; the remaining shipments consist of commercial types.

Most U.S. manufacturers that produce household floor polishers do not produce other types of floor polishers. Floor polishers of the household type are produced for the most part by large firms which manufacture related articles such as vacuum cleaners and other appliances. On the other hand, many of the producers of commercial or industrial floor polishers are small companies which manufacture only floor polishers or related machines such as machines for sanding or surfacing floors.

According to the U.S. Census of Manufactures, the number of all employees at U.S. establishments engaged primarily in producing household vacuum cleaners, parts, and attachments averaged 5,330 in 1958 and 5,682 in 1963. A large part of the commercial vacuum cleaners and of both household and commercial floor polishers are also produced by these establishments.

U.S. establishments producing vacuum cleaners and floor polishers are situated principally in the Northeastern and Middle Atlantic States.

Trade data on U.S. producers' shipments (sales) of the household type of vacuum cleaners and floor polishers (complete units only) are given in table 2, together with official data on the factory value of shipments of whole units, parts, and attachments. Most household vacuum cleaners and floor polishers are sold by manufacturers directly to retail outlets.

The average retail value per unit of household vacuum cleaners rose from $88.60 in 1958 to a peak of $94.00 in 1960 and then declined to $74.00 in 1967. The average unit value of household floor polishers declined from $49.00 in 1958 to $42.50 in 1960 and to $40.00 in 1963, 1964, and 1965 but increased to $43.00 in 1967. These changes reflect both changes in unit prices and changes in the product mix. The 16-percent decline in the average retail value of vacuum cleaners and the 12-percent decline in the average retail value of floor polishers from 1958 to 1967 are attributable both to an increase in the proportion of less expensive lightweight models marketed and to a reduction in unit prices. Price reductions were stimulated by intense competition among producers and were achieved partly by increased use of plastic parts and components.

U.S. exports

The value of U.S. exports of household vacuum cleaners, parts, and attachments (the only type for which export data are available) increased from $4.9 million in 1958 to $9.8 million in 1967 (table 3).

The value of exports increased from about 3 percent of the total value of U.S. shipments of household vacuum cleaners and parts in 1958

to about 4.2 percent of estimated U.S. shipments in 1967. U.S. exports are several times larger than imports (table 1).

Exports of household vacuum cleaners, parts, and attachments increased by a little more than 90 percent from 1958 to 1967. The average unit value of complete units exported declined from $35.49 in 1958 to $32.07 in 1967. The proportion of the total value of exports that was accounted for by parts and attachments (accessories) increased from 24 percent in 1958 to about 53 percent in 1967. This proportion, much larger than the approximately 10 percent of the total needed for repairs or replacement of wornout parts and attachments, includes many parts for assembly in foreign plants of U.S. producers or their subsidiaries. Although official statistics on exports of the commercial type of vacuum cleaners, parts, and attachments are not available, it is believed that the value of exports of these articles in 1967 constituted 4 to 5 percent of the value of U.S. producers' shipments, the same as for the household type.

Data on U.S. exports of floor polishers were first segregated beginning with 1965 and are limited to the number of units and the value of complete floor polishers of the household type; data for exports of floor polisher parts and attachments, as such, are not segregated. In 1967, exports of household floor polishers amounted to 33,967 complete units, with a total value of $1.1 million and an average of $31.38 per unit (table 4).

The vacuum cleaners and floor polishers produced for export to Europe are specially designed to fit electrical systems with alternating current of 50 cycles per second used there, rather than the 60-cycle current used in the United States; machines designed for 60-cycle current would operate more slowly on 50 cycle current. In recent years, more than half of the U.S. exports of household vacuum cleaners, parts, and attachments have gone to Canada (where several U.S. concerns have subsidiary plants and where 60-cycle electrical current prevails). Other foreign markets of significance were France, Belgium and Luxembourg, and Australia (table 3). In 1967 most of the exports to France and Australia consisted of parts and attachments.

Approximately 25 percent, by value, of the household floor polishers exported during 1967 went to the Philippines and Venezuela. Canada was also a principal market.

U.S. exports are greatly affected by the existence in foreign countries of producing plants owned or controlled by U.S. producing concerns. By supplying foreign markets from foreign plants rather than U.S. plants, these concerns can (by exporting parts for assembly abroad) reduce the payment of import duties imposed by foreign countries on their imports of the complete vacuum cleaners and floor polishers.

The Canadian import duty on household vacuum cleaners and floor polishers is 20 percent ad valorem; parts of vacuum cleaners and floor polishers are dutiable at the same rate as the complete units. U.S. exports to Canada of these articles accounted for more than 60 percent of the total U.S. exports of the articles covered by this summary. 1/

A large part of U.S. exports consist of parts and attachments for assembly in the foreign plants of U.S. concerns. The volume of sales in foreign markets is considerably smaller than that in the United States. As a result, large investments in foreign countries in parts-producing facilities are not always economically feasible.

U.S. imports

The value of U.S. imports of household and commercial types of vacuum cleaners, floor polishers, and parts, was about $3.4 million in 1967, up from $2.3 million in 1966. The value of imports, even if the foreign value were increased to approximate duty-paid landed value, is relatively small--no more than about 1 percent of the value of U.S. consumption and much smaller than that of U.S. exports (table 1).

About half of the total value of imports of vacuum cleaners and parts in 1967 was accounted for by imports from Japan; an additional third of the total came from the United Kingdom (table 5). The imports from Japan consisted, in part, of very small vacuum brushes operated by dry cells of the flashlight type with an average foreign unit value of only $1.37; U.S. production of such units is virtually nil.

The value of imports of floor polishers and parts was $189,000 in 1967, down approximately 22 percent from that of $243,000 in 1966. Almost 70 percent of the total value of the imports of household floor polishers in 1967 was accounted for by imports from Canada. Those from Ireland accounted for an additional 9 percent of the total (table 6).

Import data available during the past several years indicate that imports of vacuum cleaners and floor polishers have always been small in comparison with apparent consumption in the United States. This is attributable principally to (1) the strong competitive position of the domestic industry benefiting from a large home market, (2) the attractive design, efficiency, and competitive prices of domestic machines, (3) the fact (which works both ways) that floor polishers and vacuum cleaners

1/ The duties imposed on imports of vacuum cleaners, floor polishers, and parts by other principal countries to which U.S. exports flow are as follows: Australia--35 percent ad valorem on vacuum cleaners and floor polishers, France--17.8 percent and 15 percent ad valorem on vacuum cleaners and floor polishers, respectively, and Belgium and Luxembourg--13.8 percent ad valorem on both vacuum cleaners and floor polishers. As far as these countries are concerned, the ad valorem rate for the complete unit also applies to parts imported individually.

(other than the very small battery-operated units) produced in almost all foreign countries must be specially adapted to 60-cycle electrical current if exported to the United States, and (4) the readily available servicing facilities for domestically manufactured vacuum cleaners and floor polishers. Although the U.S. import duty of 13.75 percent ad valorem, in effect for 7 years prior to 1968, is also somewhat of a deterrent to imports, it is a relatively small factor.

Table 1.--Electric vacuum cleaners and floor polishers and parts, household and commercial types: 1/ U.S. producers' shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, 1963, 1966, and 1967

Year and type of article	Producers' shipments (factory value)	Imports	Exports 2/	Apparent consumption	Ratio of imports to consumption
1963:	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	Percent
Vacuum cleaners and parts:					
Household	183,138	2,086	5,245	199,000	1.0
Commercial and industrial	18,996	3/	3/	3/	3/
Floor polishers and parts:					
Household	29,363	181	3/	4/ 42,000	5/
Commercial and industrial	13,588	3/	3/	3/	3/
1966:					
Vacuum cleaners and parts:					
Household	233,910	2,008	12,572	257,359	.8
Commercial and industrial	34,013				
Floor polishers and parts:					
Household	6/32,300	243	1,766	45,732	.5
Commercial and industrial	6/14,955				
1967:					
Vacuum cleaners and parts:					
Household	6/230,000	3,163	11,170	255,393	1.2
Commercial and industrial	6/33,400				
Floor polishers and parts:					
Household	6/32,900	189	1,560	46,737	5/
Commercial and industrial	6/15,200				

Footnotes on following page.

Footnotes for table 1--Continued

1/ Does not include central systems; the factory value of U.S. shipments of such systems, including parts and attachments, amounted to $3.9 million in 1963.

2/ Data for 1966 and 1967 include estimates for exports of commercial vacuum cleaners and parts and commercial floor polishers and parts; the estimates are based on the ratios of U.S. producers' shipments of vacuum cleaners (and parts) of the household type to those of the commercial type, and of such shipments of the household type of floor polishers and parts to the commercial type of floor polishers and parts in the respective years.

3/ Not available.

4/ Partly estimated.

5/ Less than 0.05 percent.

6/ Estimated on basis of data on U.S. producers' shipments of the household type of machines for 1963 from the U.S. Census of Manufactures and subsequent trade data on retail value of U.S. factory shipments (shown in table 2). Data on producers' shipments of the commercial type of machines for years after 1963 were estimated by assuming the same relationship of shipments of such machines to shipments of the household type of machines as in 1963.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Note.--Although census statistics on producers' shipments cover industrial as well as machines of the household and commercial type, the volume of shipments covering special industrial types (such as machines for cleaning or processing textile fiber in textile mills) is probably very small. Import and export data for 1963, which exclude the commercial type of machines, are not strictly comparable with data for 1966 and 1967.

Table 2.--Electric household vacuum cleaners and floor polishers: U.S. producers' shipments, as reported by the U.S. Department of Commerce and by Merchandising Week, 1958 and 1963-67

Product and year	U.S. Department of Commerce		Merchandising Week (data for complete units only)		
	Quantity, complete units only	Factory value of complete units, attachments, and parts	Quantity	Retail value 1/	Average retail value
Vacuum cleaners:	1,000 units	1,000 dollars	1,000 units	1,000 dollars	
1958	3,233	155,571	3,295	291,937	$88.60
1963	3,938	183,138	4,246	326,973	77.01
1964	2/	193,457	4,507	329,011	73.00
1965	2/	221,248	5,107	398,346	78.00
1966	2/	233,910	5,583	429,868	77.00
1967	2/	3/ 230,000	5,720	423,280	74.00
Floor polishers:					
1958	724	19,489	725	35,525	49.00
1963	1,393	29,363	1,048	41,900	40.00
1964	2/	3/ 33,400	1,191	47,640	40.00
1965	2/	3/ 33,100	1,181	47,240	40.00
1966	2/	3/ 32,300	1,124	46,076	41.00
1967	2/	3/ 32,900	1,093	46,986	43.00

1/ Based on suggested retail prices; does not take account of discounts from list prices.

2/ Not available.

3/ Estimated by the staff of the U.S. Tariff Commission.

Source: U.S. Department of Commerce data for 1958 and 1963 from the U.S. Census of Manufactures; U.S. Department of Commerce data for other years (available for household vacuum cleaners only) from Annual Survey of Manufactures, except data for 1967 on household vacuum cleaners and for 1964-67 on household floor polishers, which are estimated on the basis of trends shown in Merchandising Week, Jan. 29, 1968.

Table 3.--Electric household vacuum cleaners and parts and accessories: U.S. exports of domestic merchandise, by principal markets, 1958 and 1963-67

Market	1958	1963	1964	1965	1966	1967
	Number of complete units					
Canada	97,378	47,038	61,221	89,434	102,769	93,016
France	274	4,482	7,587	15,741	14,266	7,248
Belgium and Luxembourg	118	18,428	22,087	16,855	21,122	18,869
Australia	48	1,032	-	3,733	3,025	333
Venezuela	985	1,509	3,064	2,953	5,786	4,676
Mexico	830	598	368	545	699	582
United Kingdom	29	235	8,695	724	-	829
West Germany	264	3,973	7,221	7,683	877	1,478
Spain	-	792	590	495	1,366	2,952
All other	5,210	10,563	15,748	18,559	19,132	14,220
Total	105,136	88,650	126,581	156,722	169,042	144,203
	Value of complete units (1,000 dollars)					
Canada	3,396	1,690	2,261	3,637	3,514	3,126
France	10	128	219	504	372	215
Belgium and Luxembourg	4	488	594	498	543	474
Australia	2	42	-	147	94	22
Venezuela	47	48	106	107	157	140
Mexico	26	30	14	29	28	22
United Kingdom	1	7	261	42	-	51
West Germany	9	89	125	274	33	52
Spain	-	25	20	16	40	74
All other	236	386	548	659	595	449
Total	3,731	2,933	4,148	5,913	5,376	4,625
	Value of parts and accessories (1,000 dollars)					
Canada	991	1,795	1,383	2,136	3,070	3,156
France	-	10	23	115	1,639	1,231
Belgium and Luxembourg	2	43	87	11	-	-
Australia	-	150	278	500	291	330
Venezuela	2	15	29	144	69	-
Mexico	152	133	186	142	157	111
United Kingdom	2	10	7	31	79	74
West Germany	-	101	339	85	93	40
Spain	-	2	-	-	-	-
All other	38	53	97	296	202	183
Total	1,187	2,312	2,429	3,460	5,600	5,125

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Table 3.--Electric household vacuum cleaners and parts and accessories: U.S. exports of domestic merchandise, by principal markets, 1958 and 1963-67--Continued

Market	1958	1963	1964	1965	1966	1967
	Total value (1,000 dollars)					
Canada	4,387	3,485	3,644	5,772	6,585	6,282
France	10	138	241	620	2,011	1,446
Belgium and Luxembourg	6	531	681	509	543	474
Australia	2	192	278	647	384	352
Venezuela	49	63	135	251	226	140
Mexico	177	162	201	171	185	133
United Kingdom	4	17	268	74	79	125
West Germany	9	190	464	359	126	92
Spain	-	27	20	16	40	74
All other	275	440	645	954	798	632
Total	4,919	5,245	6,577	9,373	10,976	9,750
	Unit value (per complete unit)					
Canada	$34.88	$35.93	$36.93	$40.66	$34.19	$33.60
France	38.22	28.55	28.82	32.04	26.07	29.66
Belgium and Luxembourg	37.23	26.49	26.90	29.56	25.71	25.12
Australia	39.83	40.73	-	39.41	31.07	66.07
Venezuela	47.51	32.09	34.57	36.31	27.13	29.94
Mexico	31.10	49.85	38.89	53.20	40.06	37.80
United Kingdom	34.48	29.79	30.01	58.01	-	61.51
West Germany	33.95	22.35	17.28	35.65	37.63	35.18
Spain	-	31.57	33.90	32.32	29.28	25.07
All other	45.30	36.54	34.80	35.50	31.09	31.58
Average	35.49	33.09	32.77	37.73	31.80	32.07

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Because of rounding, figures may not add to the totals shown.

Table 4.--Electric household floor waxers and polishers, excluding parts: U.S. exports of domestic merchandise, by principal markets, 1965-67 1/

Market	1965	1966	1967
	Quantity (units)		
Philippines	5,090	5,347	6,810
Venezuela	3,738	4,843	3,555
Canada	3,339	9,250	5,375
Mexico	1,054	1,756	1,302
Colombia	-	1,751	2,835
Costa Rica	2,222	2,693	2,090
Australia	479	1,760	951
Japan	-	817	555
Netherlands	-	-	870
All other	11,555	12,848	9,624
Total	27,477	41,065	33,967
	Value (1,000 dollars)		
Philippines	112	128	136
Venezuela	121	156	130
Canada	181	263	121
Mexico	49	81	71
Colombia	-	39	51
Costa Rica	52	60	45
Australia	14	49	35
Japan	-	48	35
Netherlands	-	-	34
All other	399	384	408
Total	928	1,208	1,066
	Unit value		
Philippines	$22.00	$23.94	$19.97
Venezuela	32.37	32.21	36.57
Canada	54.21	28.43	22.51
Mexico	46.49	46.13	54.53
Colombia	-	22.27	17.99
Costa Rica	23.40	22.28	21.53
Australia	29.23	27.84	36.80
Japan	-	58.75	63.06
Netherlands	-	-	39.08
All other	34.53	29.88	42.39
Average	33.78	29.41	31.38

1/ Export data for the years prior to 1965 are not available.

Source: Compiled from official statistics of the U.S. Department of Commerce.

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Table 5.--Vacuum cleaners and parts, with self-contained electric motors, household and commercial types: U.S. imports for consumption, by principal sources, 1966 and 1967

Year and source	Complete units			Parts (value)	Total value
	Number	Value	Unit value		
	Thousands	1,000 dollars		1,000 dollars	1,000 dollars
1966:					
Japan 1/	223	433	$1.94	137	570
United Kingdom	77	1,020	13.25	43	1,063
Canada	1	26	33.70	184	210
Italy	17	58	3.41	13	71
All other	2	38	16.06	56	94
Total	320	1,575	4.92	433	2,008
1967:					
Japan 1/	761	1,444	$1.90	139	1,583
United Kingdom	63	978	15.52	44	1,022
Canada	5	251	50.20	109	360
Hong Kong 2/	51	60	1.17	18	78
Italy	6	20	3.33	1	21
All other	3/	26	56.48	73	99
Total	885	2,779	3.14	384	3,163

1/ Imports included many small vacuum cleaners (brushes) operated by dry cells of the flashlight type. In 1967, imports of such battery-operated vacuum cleaners amounted to 68,554 units, valued at $94,109, with a unit value of $1.37.

2/ Imports included articles similar to those described in footnote 1 amounting to 6,936 units, valued at $9,266, with a unit value of $1.34. (There were no imports from Hong Kong in 1966.)

3/ Less than 500 units.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 6.--Electric household floor waxers and polishers, including parts: U.S. imports for consumption, by principal sources, 1958 and 1963-67

(In thousands of dollars)

Source	1958	1963	1964	1965	1966	1967
Canada	14	15	45	94	121	124
Ireland	-	45	27	58	116	17
Switzerland	-	1	3	-	-	16
United Kingdom	25	70	8	7	4	15
Japan	-	6	2/	1	2	9
Hong Kong	-	-	-	-	-	6
West Germany	20	2/	1	2/	-	1
Italy	-	42	26	2/	-	2/
All other	-	2	3	-	2/	1
Total	59	181	113	160	243	189

1/ Separate data for parts are unavailable.
2/ Less than $500.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Electromechanical kitchen and household appliances, with self-contained motors, and parts thereof----------	683.32

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

The United States is the world's largest consumer of electromechanical kitchen and household appliances. Apparent U.S. consumption of these articles in 1967 was valued at more than a quarter of a billion dollars. The domestic producers, favored by a large domestic market and employing mass-production techniques, are in a strong competitive position. Imports account for about 2 percent of total consumption, and exports are more than twice the size of imports. Several large producers have subsidiaries in foreign countries.

Description and uses

The electromechanical kitchen and household appliances with self-contained electric motors covered by this summary are appliances of types used in homes, hotels, restaurants, offices, schools, and hospitals (but they do not include factory or other industrial appliances). Parts for such appliances are also covered, except general-purpose motors and parts, which are specifically provided for elsewhere in the TSUS.

The electromechanical appliances considered in this summary include, among others, food mixers (portable and stand types), food waste disposers, can openers, blenders and juicers, ice crushers, knife sharpeners, soda fountain dispensers, steam pressure sterilizers designed for use in hospitals to sterilize instruments and supplies, ice cube makers and storers, humidifiers, various polishers, battery-operated hair brushes, beauty and manicuring sets, and the household type of automatic fish feeders.

This summary does not include electric toothbrushes, which are dutiable under item 750.40; industrial electromechanical appliances (such as dough kneaders) and pie- and pastry-molding machines, which are chiefly used in bakeries and are dutiable under item 666.25; or household and commercial vacuum cleaners and floor polishers, which are dutiable under item 683.30.

ELECTROMECHANICAL HOUSEHOLD MACHINES NOT ELSEWHERE ENUMERATED

U.S. tariff treatment

The current column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
683.32	Electromechanical appliances, with self-contained electric motors, of types used in the household, hotels, restaurants, offices, schools, or hospitals,1/ and parts thereof.	12% ad val.	10.5% ad val.	6% ad val.

1/ Not including factory or other industrial appliances, electric vacuum cleaners, floor polishers and parts, or electrothermic appliances.

The tabulation above shows the column 1 rate of duty in effect prior to January 1, 1968, and modifications therein as a result of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade. Only the first and final stages of the five annual rate modifications are shown above (see the TSUSA-1968 for the intermediate staged rates).

The prior rates shown in the tabulation above had remained unchanged under the TSUS from August 31, 1963, through the end of 1967. Concessions amounting to a reduction of 50 percent in duties were granted by the United States in the Kennedy Round.

U.S. consumption

The value of estimated U.S. consumption increased from $249 million in 1965 (the earliest year for which both import and export data are available) to $272 million in 1966, and to $274 million in 1967, or by about 10 percent from 1965 to 1967. Of the total for 1967, probably about $220 million, or 80 percent, was accounted for by household electromechanical appliances.

ELECTROMECHANICAL HOUSEHOLD MACHINES NOT ELSEWHERE ENUMERATED

The growth in the use of electromechanical kitchen and household appliances in the United States in recent years is attributable principally to the increasing number of households and the more extensive use of these appliances as laborsaving devices. The decline in the cost of electricity and, since about 1960, in the prices of these appliances are other influencing factors.

U.S. producers

In 1967 at least 100 U.S. producers manufactured one or more of the types of household and commercial electromechanical appliances and parts discussed in this summary.

Some manufacturers of major kitchen and household appliances account for only a few of the items which are discussed in this summary, such as food waste disposals, humidifiers, and dehumidifiers. These articles are produced by them in addition to such appliances as refrigerators, washers, and dryers. The bulk of electromechanical appliances, however, are manufactured by diversified concerns that manufacture all, or almost all of the appliances discussed in this summary. Approximately six concerns dominate the manufacturing and sales of electromechanical appliances in the United States.

Many concerns, particularly the largest, produce electromechanical appliances and parts in foreign plants owned by them or their subsidiaries. Other concerns, without foreign manufacturing facilities, have foreign marketing facilities.

The domestic producers of household and commercial electromechanical appliances are situated principally in the East North Central and Northeastern States; however, there is a market trend toward relocating or establishing new production facilities in other areas of the United States.

U.S. production

The value of U.S. producers' shipments (factory value) of household and commercial electromechanical appliances and parts (excluding parts for household appliances) increased from about $204 million in 1963 to an estimated $282 million in 1967, or by about 40 percent (table 1).

The value of producers' shipments of household electromechanical appliances (excluding parts) increased from about $130 million in 1963 to $193 million in 1966 (the latest year for which data are available). In 1963, household electromechanical appliances represented 64 percent--

and in 1966, 68 percent--of the total value of U.S. producers' shipments of electromechanical appliances (table 2). Commercial types of electromechanical appliances and parts, excluding food waste disposers, humidifiers, and dehumidifiers, were valued at $59.7 million in 1963, or about 30 percent of the total value of domestic producers' shipments. The value of annual producers' shipments of household humidifiers and dehumidifiers in 1966-67, as estimated by the staff of the U.S. Tariff Commission on the basis of available trade data, was $20 million, of which humidifiers probably accounted for about 70 percent. Separate data for U.S. producers' shipments of commercial electromechanical appliances and parts in 1964-67 are not available.

Domestic producers' shipments of specific types of household electromechanical appliances in 1966 are discussed below, in order of value.

Food mixers.--Producers' shipments of food mixers in 1966, were valued at $47.8 million, representing an increase of 28 percent over the value in 1963 of $37.5 million. The share of the total value of shipments of food mixers accounted for by portable types (hand-held) in 1963-66 was about 60 percent. This high proportion reflects both the convenience and the lower retail price of portable food mixers in comparison with stand type. 1/

Food waste disposers.--The value of producers' shipments of food waste disposers increased from $34.4 million in 1963 to $36.5 million in 1966, or by 6 percent. An important factor affecting the rate of production and shipment of these articles is the number of housing starts and the types of construction (i.e., single family versus multiple occupancy dwelling units) in the Nation.

Electric can openers and blenders.--Between 1963 and 1966, the value of producers' shipments of electric can openers and blenders showed greater individual increases than any of the other appliances in table 2 (except ice crushers). The value of producers' shipments of can openers increased from $25.4 million in 1963 to $41.7 million in 1966, or by 64 percent. The value of producers' shipments of blenders increased from $19.7 million in 1963 to about $54.3 million in 1966, or 175 percent. These appliances now constitute important kitchen aids in many homes.

Electric ice crushers and knife sharpeners.--The value of producers' shipments of ice crushers rose from $502,000 in 1963 to about $3 million in 1966, or by 500 percent. The value of producers' shipments of knife

1/ In 1966 the average retail prices of mixers of the stand type and portable (hand-held) food mixers were $30.00 and $10.00, respectively; in 1963 these prices were $38.00 and $15.00, respectively.

sharpeners declined steadily from about $2 million in 1963 to $305,000 in 1966. Shipments of individual knife sharpeners have declined during the past several years, presumably as a result of the growing popularity of electric can openers with built-in knife sharpeners.

Other appliances.--Producers' shipments of electromechanical appliances such as drink mixers, whippers, juicers, grinders, slicers, and choppers declined in value from $10.7 million in 1963 to $9.3 million in 1966, or by 13 percent.

U.S. exports

Total U.S. exports of household and commercial electromechanical appliances and parts increased from about $14.1 million in 1965 to $16.5 million in 1966, but declined to $15.6 million in 1967, when they accounted for about 6 percent of estimated U.S. producers' shipments (table 3).

U.S. exports of household types of appliances and parts in 1967 were valued at $13.1 million, or about 80 percent of the total (table 4). The exports included 673,000 units, valued at $9.9 million, and parts valued at $3.2 million. The principal export markets were Canada, Venezuela, and the United Kingdom. Data on exports in 1958 and 1963-67 of electric household food mixers, blenders, and juicers, excluding parts (the only types of electromechanical appliances for which separate export data are available for years prior to 1965) are given in table 5.

U.S. exports of commercial types of appliances and parts in 1967 were valued at $2.5 million (table 4). The principal markets for these appliances were Canada and the United Kingdom.

Foreign consumers of electromechanical appliances have shown a preference for products of U.S. origin because of their design and quality. However, competition in foreign markets from foreign manufacturers is increasing .

U.S. imports

The value of U.S. imports of kitchen and household electromechanical appliances and parts increased from about $4.6 million in 1964 to $7.2 million in 1967, or by more than 55 percent. The value of imports, even if the foreign value were increased to approximate the duty-paid landed value, is relatively small--no more than 2 percent of the value of estimated U.S. consumption and much smaller than that of U.S. exports (table 1).

ELECTROMECHANICAL HOUSEHOLD MACHINES NOT ELSEWHERE ENUMERATED

Almost 50 percent of the total value of imports of household and commercial electromechanical appliances and parts in 1967 was accounted for by imports from Japan; an additional 26 percent of the total came from Switzerland (table 6). The imports from Japan consisted largely of novelty items (i.e., battery-operated appliances such as bar drink mixers, back scratchers, shoe polishers, pepper mills, and card shufflers, among others), most of which have a low unit value; domestic production of such items is small. The imports from Switzerland consisted largely of high-quality electromechanical appliances and parts, an undetermined share of which consisted of appliances and parts manufactured by the Swiss subsidiaries of two large U.S. appliance manufacturers. The Netherlands and West Germany were other principal sources of imports, but the value of imports from each of these countries was much smaller than that of imports from either Japan or Switzerland.

Import data available for recent years indicate that imports of household and commercial electromechanical appliances and parts have been small in comparison with U.S. production. This is attributable to (1) the strong competitive position of the domestic industry benefiting from a large home market, (2) the attractive design, efficiency, and competitive prices of domestic merchandise, and (3) the readily available servicing facilities for domestically manufactured electromechanical appliances.

Table 1.--Electromechanical appliances and parts, household and commercial types: 1/ U.S. producers' shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, 1963-67

Year	U.S. producers' shipments	Imports	Exports	Apparent consumption	Ratio of imports to consumption
	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	Percent
1963	2/ 203,768	3/	3/	3/	3/
1964	4/ 226,000	4,576	3/	3/	3/
1965	4/ 257,000	5,800	14,064	4/ 249,000	4/ 2
1966	4/ 282,000	6,372	16,469	4/ 272,000	4/ 2
1967	5/ 282,000	7,162	15,625	5/ 274,000	5/ 2

1/ No separate data are available on U.S. producers' shipments of parts for household types of electromechanical appliances.

2/ Includes U.S. producers' shipments of electromechanical appliances valued as follows: Household--130,100 thousand dollars, commercial and parts (excluding commercial waste disposers, humidifiers, and dehumidifiers)--59,700 thousand dollars, and household humidifiers and dehumidifiers--14,000 thousand dollars. The value of producers' shipments of household humidifiers and dehumidifiers is estimated by the staff of the U.S. Tariff Commission on the basis of available trade data.

3/ Not separately reported.

4/ Estimated on the basis of the value of U.S. producers' shipments in 1963. Producers' shipments of household electromechanical appliances (excluding parts) were valued at 164,000 thousand dollars in 1964, 158,000 thousand dollars in 1965, and 193,000 thousand dollars in 1966. The value of producers' shipments of commercial electromechanical appliances and parts in 1964-67 is not separately reported.

5/ Estimated by assuming the same value of U.S. producers' shipments in 1967 as in 1966.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

ELECTROMECHANICAL HOUSEHOLD MACHINES
NOT ELSEWHERE ENUMERATED

Table 2.--Household electromechanical appliances: 1/ U.S. producers' shipments, 1963-66

Item	1963	1964	1965	1966	Percentage change, 1966 over 1963
	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	
Food mixers:					
Stand	14,994	16,481	19,578	20,458	+36.4
Portable	22,457	20,900	27,289	27,298	+21.6
Total	37,451	37,381	46,867	47,756	+27.5
Disposers, food waste	34,376	33,700	35,300	36,500	+6.2
Can openers	25,401	33,397	33,538	41,738	+64.3
Blenders	19,694	22,554	31,098	54,253	+175.5
Ice crushers	502	3,081	2,292	2,996	+496.8
Knife sharpeners	1,967	1,191	641	305	-84.5
Other appliances 2/	10,673	32,661	8,410	9,332	-12.6
Total, all appliances	130,064	163,965	158,146	192,880	+48.3

1/ The value of producers' shipments of household electromechanical appliances for 1963 and 1964-66 are not strictly comparable because the 1964-66 data exclude establishments with shipments valued at less than 100 thousand dollars, whereas data for 1963 included such establishments. The effect of this change, based on an analysis of data received from small establishments for 1963, is less than 1 percent in total value. It is less than 3 percent for each of the specific products listed above.

This table excludes the value of producers' shipments of household humidifiers and dehumidifiers. The value of shipments of these articles is estimated by the U.S. Tariff Commission staff to have been 14,000 thousand dollars in 1963, 16,000 thousand dollars in 1964, 18,000 thousand dollars in 1965, and 20,000 thousand dollars in 1966 and in 1967, based on available trade data.

2/ Includes drink mixers, whippers, juicers, grinders, slicers, and choppers, among others.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 3.--Electromechanical appliances, household and commercial types, and parts: U.S. exports of domestic merchandise, by specified type, 1965-67 1/

Type	1965	1966	1967
	Quantity (units) 2/		
Household mixers, blenders, and juicers	258,828	414,376	355,431
Can openers, including knife sharpener combinations	42,834	62,023	59,631
Other electromechanical household appliances	187,308	244,132	258,197
	Value (1,000 dollars)		
Household mixers, blenders, and juicers	4,150	5,705	5,564
Can openers, including knife sharpener combinations	467	655	610
Other electromechanical household appliances	3,044	3,662	3,703
Parts for household electromechanical appliances	3,585	4,280	3,201
Parts for commercial electromechanical appliances	2,818	2,167	2,547
Total	14,064	16,469	15,625

1/ Not separately reported for earlier years.
2/ There are no meaningful quantity data on exports of parts of the appliances included in this table.

Source: Compiled from official statistics of the U.S. Department of Commerce.

ELECTROMECHANICAL HOUSEHOLD MACHINES
NOT ELSEWHERE ENUMERATED

Table 4.--Electromechanical appliances, household and commercial types, and parts: U.S. exports of domestic merchandise, by principal markets, 1967

Market	Household electromechanical appliances		Parts for household electromechanical appliances	Commercial electromechanical appliances and parts	Total value
	Quantity	Value			
	1,000 units	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars
Canada	324	4,486	1,882	1,067	7,435
Venezuela	74	1,149	378	71	1,598
United Kingdom	38	571	316	160	1,047
Peru	29	468	40	-	508
Mexico	12	212	47	97	356
Australia	16	184	63	84	331
France	19	197	70	52	319
Panama	16	275	-	21	296
West Germany	8	117	-	122	239
Republic of South Africa	9	154	33	-	187
Spain	5	124	-	16	140
Ecuador	7	133	-	-	133
Belgium and Luxembourg	5	60	-	33	93
All other	111	1,747	372	824	2,943
Total	673	9,877	3,201	2,547	15,625

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 5.--Electric household food mixers, blenders, and juicers, excluding parts: U.S. exports of domestic merchandise, by principal markets, 1958 and 1963-67

Market	1958	1963	1964	1965	1966	1967
	Quantity (1,000 units)					
Canada	139	76	59	117	162	160
Venezuela	40	34	59	49	109	65
Peru	12	21	30	28	41	28
Panama	3	2	3	4	7	14
Mexico	11	4	5	7	7	9
Colombia	24	13	16	-	8	8
Ecuador	2	3	4	3	7	7
Republic of South Africa	7	5	6	5	4	6
United Kingdom	1	1	1/	1/	17	10
All other	22	37	32	46	52	48
Total	261	196	214	259	414	355
	Value (1,000 dollars)					
Canada	1,880	892	751	1,611	2,255	2,279
Venezuela	836	700	1,157	809	1,081	1,011
Peru	214	456	505	429	570	445
Panama	49	46	62	68	142	259
Mexico	209	88	121	155	136	159
Colombia	419	320	308	-	157	147
Ecuador	48	58	84	71	121	133
Republic of South Africa	142	95	105	130	73	106
United Kingdom	4	10	5	12	182	97
All other	503	623	649	865	988	928
Total	4,304	3,288	3,747	4,150	5,705	5,564

1/ Less than 500 units.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 6.--Electromechanical household and commercial appliances, and parts: U.S. imports for consumption, by principal sources, 1964-67

(In thousands of dollars)

Source	1964	1965	1966	1967
Japan	1,729	2,391	2,896	3,375
Switzerland	1,701	2,493	1,977	1,876
Netherlands	224	181	377	964
West Germany	243	337	406	276
Hong Kong	37	89	210	153
United Kingdom	114	82	212	150
France	471	130	147	107
Canada	22	31	56	84
Italy	10	27	61	80
All other	25	39	30	97
Total	4,576	5,800	6,372	7,162

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Electrical starting and ignition equipment for internal combustion engines and generators and cutouts for use therewith	683.60, -.61

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

The United States is the world's largest consumer and producer of electrical equipment for internal combustion engines. The value of apparent U.S. consumption in 1967 is estimated at about $825 million, of which imports accounted for about 2 percent. U.S. imports have increased substantially since the implementation of the Automotive Products Trade Act of 1965 (APTA). U.S. exports, much larger than imports, represented about 7 percent of the value of U.S. producers' shipments during 1965-67.

Description and uses

Electrical equipment for internal combustion engines included in this summary consists of certain articles which generate and deliver the energy necessary to ignite the fuel-air mixture in the combustion chamber(s) of the engine. Two basic systems used in ignition are the electrical-spark system such as that used in most gasoline engines and a sustained-heat system used in certain engines of the fuel-injection type such as the diesel and the gas-turbine engines.

The electrical-spark system, which is most often used in automobile engines, utilizes a battery (discussed in a separate summary in this volume--6:10) and a generator (or an alternator) to provide the source of low voltage used in the ignition system; in other applications such as most aircraft, boat, and lawnmower engines, an ignition magneto or a magneto-generator is used. A magneto is roughly equivalent to a generator and an ignition coil in that it provides a source of low voltage as well as the means for producing the high voltage necessary to produce a spark for ignition. The magneto, when actuated by mechanical movement of the magneto shaft, generates a high initial ignition voltage. The mechanical movement of the magneto shaft is accompanied by the compression of a fuel-air mixture in a combustion chamber of the engine. In a generator system, a starter or cranking motor, usually powered by a battery, provides the power to compress the fuel-air mixture.

A distributor and spark plug(s) are required for ignition of the fuel-air mixture in a magneto system or a generator-ignition-coil system. The distributor generally contains the contacts used to distribute the ignition voltage to the spark plug(s) and frequently houses the breaker points and capacitor (condenser) used in generating the high voltage. The spark plug(s) provides the fixed gap in the combustion chamber across which the high voltage from the distributor jumps and, in so doing, ignites the fuel-air mixture. Ignition wiring sets which convey the high-voltage current used in ignition sets are discussed in a summary in volume 6:11.

A sustained-heat system of ignition, such as in a diesel engine, normally functions by injecting a fuel-air mixture into a hot combustion chamber, where it is heated further to ignition by compression of the mixture. In such systems the mixture is initially ignited from an external source such as from a rudimentary, one-shot spark system. In some such engines a device known as a glow plug is used to preheat the air prior to mixing of the air with combustible fuel. Sustained operation of the engine, however, is a function of the timely injection and compression of the fuel-air mixture. Such operation is typical of diesel, gas turbine, and jet engines.

This summary also covers those generators and alternators used to charge a battery; equipment such as that used for lighting purposes only is discussed in a separate summary in this volume (6:10). Most battery-charging generators are equipped with cutouts which disconnect the generator from the battery at low speeds when the battery may tend to drive the generator as a motor because of a voltage differential.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
683.60	Ignition magnetos, magneto-generators, ignition coils, starter motors, spark plugs, glow plugs, and other electrical starting and ignition equipment for internal combustion engines; generators and cut-outs for use in conjunction therewith; all the foregoing and parts thereof.	8.5% ad val.	7.5% ad val.	4% ad val.
683.61	If Canadian article and original motor-vehicle equipment. 2/	Free	1/	1/

1/ Duty-free status not affected by the trade conference.
2/ See headnote 2, part 6B, schedule 6, TSUSA-1968.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968, and modifications therein as a result of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade. Only the first and final stages of the five annual rate modifications are shown above (see the TSUSA-1968 for intermediate staged rates).

The prior rate shown for item 683.60 remained unchanged under the TSUS from August 31, 1963, through the end of 1967. A concession amounting to a reduction of about 50 percent in the duty for this item was granted by the United States in the trade conference. Item 683.61 was made applicable to imports entered on or after January 18, 1965, pursuant to the provisions of the APTA. This act permits Canadian articles that are original motor-vehicle equipment to enter the United States duty free.

U.S. consumption

The value of apparent domestic consumption of electrical equipment for internal combustion engines increased from $762 million in 1965 to an estimated $825 million in 1967 (table 1). The increase is attributed to the increased demand for motor vehicles, boats, aircraft, lawnmowers, and other articles using internal combustion engines and ignition equipment. The increased demand stems largely from the increase in population in the United States and the rise in its income and standard of living.

U.S. producers

In 1963 there were 182 establishments primarily engaged in the manufacture of electrical equipment for internal combustion engines (including electrical harnesses and voltage regulators, which are not included in this summary). Six of these establishments each employed 1,000 or more workers and together accounted for about 70 percent of the total value of domestic shipments of electrical equipment for internal combustion engines. Most of these establishments were owned by the major U.S. motor-vehicle manufacturers, to which they supplied ignition equipment. Producers of such equipment are largely concentrated in Michigan, Ohio, Illinois, and Indiana.

The 182 establishments accounted for about 93 percent of the total value of U.S. producers' shipments of electrical equipment for internal combustion engines.

U.S. producers' shipments

The value of U.S. producers' shipments of electrical equipment for internal combustion engines rose from $668 million in 1963 to an estimated $870 million in 1967. The value of annual shipments of all major types of ignition equipment increased each year between 1963 and 1966, except that of shipments of battery-charging generators, as indicated in the following tabulation based on official statistics of the U.S. Department of Commerce (in millions of dollars):

Item	1963	1964	1965	1966
Battery-charging generators	159	151	202	189
Starting motors	135	144	174	184
Spark plugs	144	154	165	180
Other electrical ignition equipment	115	117	134	149
Components and parts for ignition equipment	115	133	134	150
Total	668	699	809	852

U.S. exports

The value of U.S. exports of electrical equipment for internal combustion engines increased from $56 million in 1965 (the first year for which comparable data are available) to $66 million in 1966, then declined to $62 million in 1967 (table 1). The value of U.S. exports during these years substantially exceeded the value of U.S. imports. The value of exports during 1965-67 by type of electrical equipment for internal combustion engines, insofar as it is identified in official U.S. statistics, is shown in table 2.

U.S. exports of electrical equipment for internal combustion engines were shipped principally to Canada (table 3). The Canadian share of the total value of such exports increased from 25 percent in 1965 to 37 percent in 1967. The presence in Canada of manufacturing facilities wholly or partly owned by the major U.S. motor-vehicle manufacturers, the United States-Canadian Automotive Agreement, and the APTA, which permits duty-free trade of original motor-vehicle equipment between the United States and Canada, have been largely responsible for the rapid increase in U.S. exports to Canada.

U.S. imports

The value of annual U.S. imports of electrical equipment for internal combustion engines increased from $6.1 million in 1964 to $16.7 million in 1967, or by an annual rate of increase of about 40 percent (table 1). During the 1964-67 period, annual U.S. imports of battery-charging generators tripled in value to $1.5 million; starter motors tripled to $1.7 million; spark plugs almost doubled to $4.8 million; and the total of other electrical equipment for internal combustion engines such as magnetos, ignition coils, distributors, and parts more than doubled to $5.3 million (table 4). Since January 18, 1965, an increasingly large percentage of the articles considered here have been imported from Canada under the duty-free provisions of the APTA. In 1967 such entries were valued at $3.3 million, or about 20 percent of the value of total imports of such equipment.

A large part of the U.S. imports of electrical equipment for internal combustion engines are used in the United States in foreign-brand automobiles and are not interchangeable with the equipment for automobiles produced in North America. West Germany has been the principal source of U.S. imports of electrical equipment for internal combustion engines during 1964-67 (table 5), as well as of complete foreign-brand automobiles. Japan, which has become the second largest source of foreign-brand automobiles in recent years, has also markedly increased its exports of electrical equipment for such automobiles to the United States. In contrast, French exports of automobiles and such equipment to the United States have declined. The large increase

in U.S. imports from Canada of electrical equipment for internal combustion engines is attributable both to the interchangeability of parts between the automobiles produced in the two countries and the duty-free trade between them in this equipment for use as original motor-vehicle equipment.

Table 1.--Electrical equipment for internal combustion engines: U.S. producers' shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, 1963-67

Year	Producers' shipments 1/	Imports	Exports	Apparent consumption	Ratio of imports to consumption
	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	Percent
1963	667,748	2/	2/	2/	2/
1964	699,328	6,120	2/	2/	2/
1965	808,914	8,989	56,079	761,824	1.2
1966	852,239	12,643	66,333	798,549	1.6
1967	3/ 870,000	16,663	62,093	825,000	2.0

1/ Data for years except 1963 are partly estimated by the staff of the U.S. Tariff Commission.
2/ Not available.
3/ Estimated by the staff of the U.S. Tariff Commission.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 3.--Electrical equipment for internal combustion engines: U.S. exports of domestic merchandise, by principal markets, 1965-67

(In thousands of dollars)

Market	1965	1966	1967
Canada	14,080	20,671	22,859
Mexico	3,419	4,128	3,737
Venezuela	2,966	3,103	3,162
Belgium and Luxembourg	1,473	1,672	2,014
West Germany	2,810	1,682	1,786
United Kingdom	1,763	1,897	1,691
Japan	2,678	2,173	1,470
Australia	1,680	1,134	1,164
France	1,629	1,980	1,049
Argentina	1,413	1,646	853
Italy	2,269	1,511	555
All other	19,899	24,737	21,753
Total	56,079	66,333	62,093

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 4.--Electrical equipment for internal combustion engines: U.S. imports for consumption, by TSUSA items, 1964-67

TSUSA item	Description	1964	1965	1966	1967
		Quantity (1,000 units) 1/			
683.6020	Battery-charging generators	54	83	111	136
683.6040	Starter motors	93	62	92	184
683.6060	Spark plugs	17,538	14,782	22,921	24,699
		Value (1,000 dollars)			
683.6020	Battery-charging generators	494	842	1,328	1,543
683.6040	Starter motors	528	863	1,368	1,732
683.6060	Spark plugs	2,590	2,892	3,569	4,782
683.6080	Other except APTA 2/	2,508	4,293	4,237	5,327
683.6100	APTA 2/	-	99	2,141	3,279
	Total	6,120	8,989	12,643	16,663
		Average unit value			
683.6020	Battery-charging generators	$9.12	$10.14	$12.00	$11.32
683.6040	Starter motors	5.68	13.98	14.95	9.40
683.6060	Spark plugs	.15	.20	.16	.19

1/ There are no quantity data available for TSUSA items 683.6080 and 683.6100.

2/ APTA denotes those articles covered by the provisions of the Automotive Products Trade Act of 1965; data for 1964 and 1965 are incomplete, for the articles so covered were not segregated in the official statistics until December 1965. The aggregate value of imports of all TSUSA items in this table under APTA in 1965 was 696 thousand dollars.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 5.--Electrical equipment for internal combustion engines: U.S. imports for consumption, by principal sources, 1964-67

(In thousands of dollars)

Source	1964	1965	1966	1967
West Germany	2,565	3,579	4,323	5,858
United Kingdom	1,685	2,451	2,976	3,433
Canada:				
APTA 1/	-	2/ 99	2,141	3,279
Other	318	854	536	827
Japan	633	1,012	1,865	2,525
France	729	723	487	409
All other	190	271	315	332
Total	6,120	8,989	12,643	16,663

1/ APTA denotes those articles covered by the provisions of the Automotive Products Trade Act of 1965.

2/ Data compiled are for part of December 1965 and are not comparable with those for 1966 and 1967. The aggregate value of imports under APTA from Canada in 1965 was about 696 thousand dollars.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Electric lighting equipment designed for motor vehicles, and parts thereof----------	683.65, -.66

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

The value of U.S. consumption of motor-vehicle electric lighting equipment increased from about $130 million to $140 million in 1963 to about $175 million to $185 million in 1965 and declined to about $161 million in 1967, partly reflecting the trend in motor-vehicle production during 1963-67. It is likely that both exports and imports increased annually throughout the period. In 1967, exports amounted to $11.1 million and the value of imports was $5.6 million, or nearly 4 percent of the value of U.S. consumption.

Description and uses

This summary covers the basic electric lighting equipment used in the manufacture of motor vehicles, including both complete and partial assemblies of such equipment, and the individual parts of such equipment (except lamp bulbs, wiring, switches and sockets, and glass lenses). The following articles, among others, are considered to be basic electric lighting equipment for motor vehicles and, as such, are included herein: Headlights, directional lights when combined with other lighting equipment, parking lights, brake lights, backup lights, luggage compartment lights, glove compartment lights, instrument panel lights, and interior passenger lights. Not included in this summary are lights which are considered to be accessories, rather than parts, of motor vehicles. Such accessory lighting, if in chief value of base metal, is classified under item 653.39 (in volume 6:7).

The most common individual parts of motor-vehicle lighting equipment observed in international commerce are housings, bezels, and plastic lenses. Housings generally serve as reflectors for the lamp bulb and hold the bulb socket in place. Bezels usually hold the lenses in place and also serve a decorative purpose. The housings and bezels are usually made of base metal, most frequently of sheet metal stampings or of zinc die castings; some bezels, in recent years, have been made of plastics. Most bezels, whether of metal or of plastics, are chrome plated before assembly. Lenses of plastics generally protect the bulb and housing from the weather and may color or diffuse the light from the lamp bulb.

A directional signal lighting apparatus, when not combined with other motor-vehicle lighting equipment, is classified as a visual signaling apparatus under items 685.70 and 685.71; it is covered in a separate summary in volume 6:11. Glass lenses (items 545.61 to 545.64) for motor-vehicle lighting equipment are included in a separate summary in volume 5:4. Lamp bulbs (items 686.60, 686.61, 686.80, and 686.81), switches and sockets (items 685.90 and 685.91), and wiring (items 688.04 to 688.07 and 688.12 to 688.16) imported separately for use in motor-vehicle lighting equipment are covered in separate summaries in volume 6:11.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
683.65	Electric lighting equipment designed for motor vehicles, and parts thereof.	8.5% ad val.	7.5% ad val.	4% ad val.
683.66	If Canadian article and original motor-vehicle equipment. 2/	Free	1/	1/

1/ Duty-free status not affected by trade conference.
2/ See headnote 2, part 6B, schedule 6, TSUSA-1968.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968, and modifications therein as a result of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade. Only the first and final stages of the five annual rate modifications are shown above (see the TSUSA-1968 for the intermediate staged rates).

The prior rate for item 683.65 was unchanged from the effective date of the item, December 7, 1965, until the end of 1967; it was established under the provisions of the Tariff Schedules Technical Amendments Act of 1965. From August 31, 1963, through December 6, 1965, articles of the type currently classifiable under item 683.65 were dutiable at 19 percent ad valorem under the provisions of item 653.40 if in chief value of base metal, or at 24 percent ad valorem under item 545.67 if in chief value of glass.

The duty-free treatment for items imported under item 683.66 was established pursuant to the Automotive Products Trade Act of 1965 (APTA). From August 31, 1963, through January 17, 1965, imports of such articles were dutiable under items 545.67 and 653.40.

U.S. producers

The articles covered by this summary are probably produced by more than 100 establishments situated throughout the country but mainly in the northeastern quadrant of the United States. Production is concentrated in Ohio, Indiana, Illinois, and Michigan. Complete assemblies of the lighting equipment herein considered are probably made by more than 30 companies, including some manufacturers of motor vehicles and some large manufacturers of other electrical equipment. The larger companies produce this equipment at more than one location. The individual parts are produced by a large number of smaller companies, many of which may concentrate on die-casting, metal-stamping, or plastics-forming operations.

U.S. consumption

The value of apparent U.S. consumption of the motor-vehicle electric lighting equipment included in this summary increased from about $130 million to $140 million in 1963, to about $175 million to $185 million in 1965, and declined to about $161 million in 1967 (table 1). The consumption of these articles is affected to a great extent by the level of production of motor vehicles; only a small portion of this equipment is used for replacement purposes. Another important factor in the level of consumption is the number of lights used in each motor vehicle; this number varies from year to year and from model to model in the same year. In general the amount of lighting equipment used in each vehicle has been increasing in recent years, but not enough to offset the decline in motor-vehicle production during 1966 and 1967.

U.S. producers' shipments

The value of U.S. producers' shipments of motor-vehicle electric lighting equipment increased from about $137 million in 1963 to an estimated $182 million in 1965, then declined to about $167 million in 1967. More than 90 percent of such shipments were made to motor-vehicle manufacturers.

U.S. exports

The value of U.S. exports of motor-vehicle electric lighting equipment increased from $6.9 million in 1965 to $11.1 million in 1967

(table 2); the share of U.S. producers' shipments that was exported increased from 4 percent in 1965 to 7 percent in 1967. Exports consisted mainly of motor-vehicle electric lighting equipment and parts, for use on the North American type of motor vehicles. The value of exports to Canada increased from $5.6 million in 1965 to $9.7 million in 1967, when they accounted for 87 percent of such exports to all countries. Exports of replacement parts to Canada were probably very small in relation to the volume of parts shipped to Canada as original motor-vehicle equipment and therefore entitled to duty-free entry in accordance with the United States-Canadian automotive agreement. Exports to other countries--of which Mexico, the Philippines, and Venezuela were the next largest markets--were probably primarily replacement parts for the North American type of vehicles already in those countries.

U.S. imports

The value of U.S. imports increased from $3.3 million in 1966 to $5.6 million in 1967; the ratio of the value of imports to the value of consumption increased at the same time from 1.9 percent to 3.5 percent. Imports from Canada, which were responsible for most of the increase in total imports between 1966 and 1967, rose in value from $1.2 million in 1966 to $2.6 million in 1967 (table 3). Duty-free imports under the APTA accounted for most of this trade, rising in value from $0.5 million in 1965 to $2.5 million in 1967. The value of West German imports also grew rapidly between 1966 and 1967, increasing from $0.9 million to $1.5 million. The next largest suppliers in these years were the United Kingdom, Japan, France, and Italy. Nearly all of the imports from Canada were of electric lighting equipment to be used in the manufacture of new motor vehicles in the United States, whereas imports from other countries were generally replacement parts for use on motor vehicles originally manufactured abroad.

Table 1.--Motor-vehicle electric lighting equipment, and parts thereof: U.S. producers' shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, 1963-67

Year	Producers' shipments 1/	Imports	Exports	Apparent consumption	Ratio of imports to consumption
	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	Percent
1963	137,100	2/	2/	2/	2/
1964	152,500	2/	2/	2/	2/
1965	182,000	2/	6,900	2/	2/
1966	181,100	3,300	9,000	175,400	1.9
1967	3/ 166,900	5,600	11,100	161,400	3.5

1/ Data for 1964-66 were estimated on the basis of the trend indicated by shipments data (from the Annual Survey of Manufactures, published by the U.S. Bureau of the Census) for a somewhat larger group of articles; in 1963, shipments of the lighting equipment covered by this summary accounted for about 90 percent of the shipments in the more inclusive group.

2/ Not available.

3/ Estimated on the basis of the value of motor-vehicle lighting equipment used per vehicle during 1963-66 and the number of vehicles produced in 1967.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Note.--The ratios of imports to consumption are based on the foreign market value of imports and essentially U.S. factory value of shipments. If the ratios were computed on the basis of foreign value of imports plus U.S. import duties and costs of transportation, insurance, and other handling to deliver the merchandise to the United States, the ratios would be higher.

Table 2.--Motor-vehicle electric lighting equipment, and parts thereof: U.S. exports of domestic merchandise, by principal markets, 1965-67

(In thousands of dollars)

Market	1965	1966	1967
Canada	5,611	7,740	9,669
Mexico	149	193	189
Philippine Republic	84	103	171
Venezuela	113	87	116
All other	894	901	956
Total	6,851	9,024	11,101

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Motor-vehicle electric lighting equipment, and parts thereof: U.S. imports for consumption, by principal sources, 1966 and 1967

(In thousands of dollars)

Source	1966	1967
Canada 1/	1,188	2,643
West Germany	877	1,493
United Kingdom	486	581
Japan	447	541
France	128	155
Italy	89	108
All other	100	100
Total	3,315	5,621

1/ Included in the data shown are duty-free imports from Canada under the provisions of the Automotive Products Trade Act of 1965. The imports amounted to 1,135 thousand dollars in 1966, and to 2,513 thousand dollars in 1967; in 1965 such imports amounted to 518 thousand dollars.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Portable electric lamps with self-contained electric source, and parts thereof:	
Flashlights and parts thereof	683.70
Other	683.80

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

The United States is one of the world's largest consumers and producers of flashlights and portable electric lamps with self-contained electric source. In 1967 the value of apparent consumption amounted to an estimated $35 million to $38 million, of which somewhat more than 11 percent was accounted for by imports. The value of U.S. exports was somewhat smaller than that of imports during 1963-67.

Description and uses

This summary covers portable electric lamps with a self-contained electric source, and parts thereof. The lamps range from small and inexpensive flashlights to large expensive portable lighting units powered by rechargeable nickel-cadmium batteries for use in hospital operating rooms, hydro stations, railway control centers, auditorium exits, and other places that must be illuminated in event of power failure. 1/

A flashlight (item 683.70) is essentially a lightweight device that can be used in one hand, the switch being turned on and off by the thumb. It usually consists of a case with dry cells, a reflector with a lamp bulb, and a pushbutton, spring type of switch which enables the user to flash the light on and off. Some flashlights are powered by a rechargeable nickel-cadmium battery or a hand-driven generator.

Flashlights produced in the United States may be classified for discussion purposes in five major categories: (1) General purpose, (2) industrial, (3) pen light and novelty, (4) all other civilian types, and (5) military types. General purpose flashlights are those designed for light duty use. The industrial type is usually designed for specialized industrial service and is normally manufactured of heavier

1/ The units are often equipped with solid-state switching devices and with automatically regulated constant voltage chargers.

gage materials and more ruggedly built than the general purpose flashlight; it may or may not be waterproof, shockproof, or have other special features. Pen light types are generally small flashlights--so designated because they are about the size of a fountain pen. Most of the pen light types are suitable for only light service or intermittent use and are frequently sold as novelty items. Military flashlights are those built to military specifications for specialized service.

All portable lamps, other than the flashlights described above, with a self-contained electric source are classified for tariff purposes under item 683.80. Such articles, in addition to the emergency lighting equipment previously mentioned, include battery-operated hand lanterns, blinking lights, miners' cap lights, portable search lights, inspection lights for use in industrial establishments, night lights (designed to light automatically when lifted off a surface and switch off when set down again), floating lights (used to mark fishing nets or lobster traps), and novelty lamps. The power for these lamps is supplied by various types of batteries, such as dry cells, rechargeable nickel-cadmium cells, steel-alkaline batteries, or lead-acid batteries. Battery chargers or rectifiers used to recharge the batteries are classifiable as rectifiers and rectifying equipment (item 682.60) discussed in a separate summary in this volume (6:10).

Cordless lamps (rechargeable and nonrechargeable battery-operated types) for patio, garden, and general outdoor use are relative newcomers in the portable electric lighting field. Present disadvantages of cordless lamps are the small amount of light given off and the relatively short life of the batteries (15 to 50 hours), but such lamps are suitable for applications where high energy levels or long life are not required, or in emergency situations.

Related articles not included in this summary are covered in separate summaries as follows: Illuminating articles of base metal (items 653.30, 653.35, 653.37, and 653.39), which include movable electric lamps without a self-contained electric source, are discussed in a summary in volume 6:7; electric filament lamps (lamp bulbs), electric discharge lamps, arc lamps, and electric luminescent lamps (items 686.30 to 687.30), in volume 6:11; electric primary cells and storage batteries (items 682.95 to 683.16), in volume 6:10; and photographic flashlighting apparatus (item 722.72), in volume 7:3.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 of the TSUSA-1968) are as follows:

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
	Portable electric lamps with self-contained electrical source, and parts thereof:			
683.70	Flashlights and parts thereof.	35% ad val.	1/	1/
683.80	Other	13.75% ad val.	1/	1/

1/ Duty status was not affected by trade conference.

The current rate of duty applicable to flashlights and parts (item 683.70) of 35 percent ad valorem was provided for in the Tariff Act of 1930 as originally enacted and has remained unchanged under the TSUS. The current rate of duty applicable to portable lamps and parts other than flashlights (item 683.80) of 13.75 percent ad valorem has been in effect since June 6, 1951, as a result of a concession granted by the United States under the General Agreement on Tariffs and Trade and has remained unchanged.

U.S. consumption

The value of apparent U.S. consumption of portable electric lamps with self-contained electric source, and parts thereof, has increased from about $30 million in 1964 to an estimated $35 million to $38 million in 1967 (table 1). Imports probably supplied 11 to 12 percent of this total.

U.S. producers

At least 75 U.S. firms are equipped to produce various types of portable electric lamps with self-contained electric source; practically all of the flashlights are produced by eight firms. Some firms produce only flashlights or lanterns and other types of portable electric lamps; others make dry cell batteries and related articles in addition to

portable electric lamps. Still other concerns produce portable electric lamps, or components (e.g., plastic flashlight cases), in conjunction with other plastic articles. Although the large corporate entities which produce lamps obtain substantial income from the sale thereof, that income generally constitutes a small part of their total revenue. There are some producers, however, for which portable electric lamps account for a substantial part of their sales and several producers for which such lamps account for their total sales.

The plants of the domestic industry producing portable electric lamps are situated principally in the Middle Atlantic, East North Central, and New England States.

U.S. producers' shipments

The value of U.S. producers' shipments of all lamps of the types covered by this summary rose from $26.3 million in 1963 to an estimated $34 million to $38 million in 1967 (table 1).

Most of the shipments consist of flashlights and hand lanterns. In 1963 and 1964, the latest years for which detailed data on shipments are available, flashlights and hand lanterns accounted for 76 to 80 percent of the total value.

In 1964, 91 percent of the total value of shipments of flashlights and lanterns were of civilian types, and the remainder were of military types. Of the four major categories of flashlights of civilian types, general purpose flashlights accounted for 51 percent of total domestic shipments; industrial types, for 14 percent; pen light and novelty, for 8 percent; and all other types, for 27 percent.

U.S. exports

Exports of all portable lamps and parts were valued at $2.7 million in 1965 and $2.8 million in 1966 and in 1967. Of the total exports during 1965-67, exports of complete units accounted for 75 percent of the value, and parts, for the remaining 25 percent (table 2). For exports of complete units only, the value rose from about $1 million in 1963 to about $2 million in 1967.

Canada has been by far the major market for exports of portable lamps with self-contained electric source, and parts thereof. Mexico, the Republic of Korea, Chile, the Netherlands, Venezuela and Peru were also important markets in 1967. The average unit value of portable lamps exported during 1965-67 ranged from $1.91 in 1966 to $2.37 in 1967, reflecting the preponderance of low-priced flashlights, lanterns, and other types of portable lamps. The average unit value of exports to Chile and

Peru, however, was considerably higher than the average for total exports; exports to those countries were most likely highpowered, durable flashlights, lanterns, and other portable electric lamps--probably types used in mining (miners' cap lamps) or in other special commercial applications.

U.S. imports

The value of annual U.S. imports of all portable electric lamps and parts covered by this summary fluctuated during 1963-67 from $2.9 million in 1964 to about $4.0 million in 1966; it was $3.3 million in 1967 (table 3). It is estimated that imports of these articles supplied about 11 percent of domestic consumption during 1963-67. Of the total value of such imports in that period, imports of flashlights and parts (item 683.70) accounted for 53 percent, and imports of other portable lamps and parts (item 683.80), primarily battery-powered hand lanterns, for the remaining 47 percent.

Hong Kong and Japan were the principal sources of imports of flashlights and parts during all the years covered by this summary, Hong Kong accounting for 76 percent of the total value, and Japan, for 20 percent. The imports from Hong Kong increased in value from $1.5 million in 1963 to $1.6 million in 1966, and those from Japan increased from $191,000 in 1963 to $499,000 in 1966. In 1967, imports from these two countries declined. Other sources of supply included France and West Germany.

The increase in U.S. imports of flashlights and parts from Hong Kong and Japan resulted from expanded production facilities, increased competition for foreign markets on the part of producers in those countries, and the relative low unit value of such imports compared with the prices of similar domestically produced articles.

The value of imports of other portable lamps and parts (item 683.80) increased from an estimated $1.7 million in 1963 to $1.9 million in 1966 and then declined to $1.4 million in 1967. During 1963-67, the share of the total value of imports accounted for by Hong Kong increased from 50 percent in 1963 to 92 percent in 1967, whereas in the same period the share of the total accounted for by Japan declined from 37 percent to 6 percent.

Although some of the imported portable electric lamps (such as the few imported from France, Switzerland, and West Germany) are of a quality comparable to that of the standard portable electric lamps (principally hand lanterns) generally produced in the United States, the great bulk of the imports consist of articles of rather lightweight construction and mediocre quality. Most imported lamps are sold in discount and variety stores at prices lower than those charged for the U.S. products.

Table 2.--Portable electric lamps with self-contained electric source, and parts: U.S. exports of domestic merchandise, by principal markets, 1965-67

Market	Complete units		Parts	Total value
	Quantity	Value		
	1,000 units	1,000 dollars	1,000 dollars	1,000 dollars
1965:				
Canada	288	589	371	960
Mexico	43	118	41	159
Republic of Korea	1/	2	2	4
Chile	7	68	52	120
Netherlands	62	96	31	127
Venezuela	46	128	6	134
Peru	9	59	50	109
United Kingdom	29	111	12	123
All other	397	799	116	915
Total	881	1,970	681	2,651
1966:				
Canada	556	851	290	1,141
Mexico	84	194	41	235
Republic of Korea	14	24	3	27
Chile	20	94	68	162
Netherlands	77	145	3	148
Venezuela	62	78	1	79
Peru	10	73	38	111
United Kingdom	27	95	5	100
All other	325	692	124	816
Total	1,175	2,246	573	2,819
1967:				
Canada	363	719	422	1,141
Mexico	61	151	58	209
Republic of Korea	18	151	14	165
Chile	15	90	46	136
Netherlands	63	87	3	90
Venezuela	32	79	11	90
Peru	6	40	45	85
United Kingdom	28	70	14	84
All other	273	646	181	827
Total	859	2,033	794	2,827

1/ Less than 500 units.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Portable electric lamps with self-contained electric source, and parts: U.S. imports for consumption, by types and by principal sources, 1963-67

(In thousands of dollars)

Source	1963	1964	1965	1966	1967
	Flashlights and parts (item 683.70)				
Hong Kong	1,453	1,186	1,234	1,581	1,377
Japan	191	244	492	499	376
France	2	6	10	4	79
West Germany	24	42	34	28	30
All other	55	4	6	6	7
Total	1,725	1,482	1,776	2,118	1,869
	Other portable electric lamps and parts (item 683.80) 1/				
Hong Kong	1/	1,351	1,314	1,753	1,318
Japan	1/	53	93	77	88
France	1/	2/	-	2/	-
West Germany	1/	4	1	3	3
All other	1/	27	4	34	23
Total	3/ 1,670	1,435	1,412	1,867	1,432
	Portable electric lamps and parts, total 4/				
Hong Kong	2,290	2,537	2,548	3,334	2,695
Japan	809	297	585	576	464
France	3	6	10	4	79
West Germany	27	46	35	31	33
All other	266	31	10	40	30
Total	3,395	2,917	3,188	3,985	3,301

1/ Not available.
2/ Less than $500.
3/ Estimated by the staff of the U.S. Tariff Commission.
4/ Data are partly estimated.

Source: Except as noted, compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Industrial and laboratory electric furnaces and ovens, electric heating equipment, and electric welding and related equipment and cutting apparatus---	683.90, -.95

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

The United States is probably the world's largest consumer and producer of electric industrial furnaces and welding and related equipment. The value of apparent consumption has been increasing annually and in 1967 was an estimated $426 million, of which imports accounted for almost 3 percent. The value of annual U.S. exports has substantially exceeded that of U.S. imports and in 1967 constituted an estimated 13 percent of the value of U.S. producers' shipments.

Description and uses

This summary covers several types of electric industrial and laboratory equipment for heating, melting, baking, welding, brazing, soldering, or cutting materials. Such electric equipment is used widely in many phases of industrial processing from raw materials to finished products.

Industrial and laboratory electric furnaces and ovens are chambers heated electrically for applying high temperatures to metals and other materials. An electric oven differs from an electric furnace in that an oven is generally used for baking and drying materials, whereas a furnace is used for melting or heating for other purposes. The basic methods used in the furnaces and ovens for converting electricity to heat are (1) arc, (2) resistance, and (3) induction. Heat is generated in an arc type of furnace or oven by an electric arc between electrodes, one of which may be the material to be heated. In the resistance type of equipment, heat is obtained by passing electric current through the material to be heated or through a heating element in proximity to the material. The induction type of electrical heating utilizes a changing electromagnetic field produced by passing a changing electric current through a coil, thereby inducing a current in the material to be heated.

ELECTRIC INDUSTRIAL FURNACES AND WELDING AND RELATED EQUIPMENT

Electric induction and dielectric 1/ heating equipment consists of various devices, other than furnaces and ovens, used to treat materials by heating. Induction heating equipment operates on the same principal as an induction furnace (described previously), the difference being the absence of a chamber or container, the requisite for a furnace. In dielectric heating certain materials are heated by being subjected to a changing electric field. Heating results from the dissipation of energy in the reversal of the polarization of the molecules of the material caused by the changes in the electric field. Induction heating is used primarily in the treatment of metals; dielectric heating is used in treating plastics, rubber, paper, textiles, and other materials which are poor conductors of electric current.

Electric welding, brazing, and soldering machines are devices used to join two surfaces, usually of metal. An electric welding machine welds by heating the two surfaces to a temperature at which fusion occurs. An electric arc welding machine heats by passing an electric arc between electrodes, one of which may be the abutting surfaces to be joined. The electrode of the arc welding machine may be consumable or nonconsumable. Consumable electrodes (items 653.10 and 653.15) frequently provide the filler metal which completes the weld (see separate summary in volume 6:7). A resistance welding machine joins two surfaces by applying an electric current which generates the heat of fusion at the point of contact of the surfaces to be joined through the high electrical resistance at the joint. Resistance welding is frequently done without a filler.

Electric welding is also accomplished by apparatus employing either an electron beam, a laser beam, or ultrasonic vibrations. These relatively new, costly, and sophisticated operations are limited at present to special applications requiring very close control of heating.

Electric cutting apparatus raises the temperature of a surface to the heat of fusion and employs a means for removal of the melted material. A metal or another material may be cut by means of an electric arc, electron beam, or laser beam.

Electric brazing and soldering is similar to welding except that a filler metal is always used, and the surfaces to be joined are abutted but not heated to their heat of fusion. Brazing and soldering are frequently used to join dissimilar metals. In brazing, the filler used is often a copper or silver alloy; in soldering, a tin or lead alloy filler is used. A brazed joint has less strength and requires lower applied temperatures than a welded joint. There is practically

1/ Dielectric--a nonconductor of direct current.

no strength in a solder joint, except from mechanical joining which is often done before soldering. A solder joint, however, provides good electrical contact and is liquid- and gas-tight. Both brazing and soldering may be performed in appropriate furnaces (electric or other).

Certain industrial and laboratory electrical apparatus similar in some respects to the items included herein, but covered in other summaries, are the following: Certain electrically heated equipment for the treatment of materials by a process involving a change of temperature, items 661.65 and 661.70--in volumes 6:7 and 6:8, respectively; electric instantaneous or storage water heaters and immersion heaters, electric soil-heating apparatus and electric space-heating apparatus, and electric heating resistors other than those of carbon (items 684.10 to 684.50), in this volume (6:10); industrial machinery for preparing or manufacturing food or drink (item 666.25), in volume 6:8; and machines for working hot glass (item 678.30), in this volume (6:10).

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
	Industrial and laboratory electric furnaces and ovens; electric induction and dielectric heating equipment; electric welding, brazing, and soldering machines and apparatus and similar articles for cutting, and parts thereof:			
683.90	Welding machines and apparatus, and parts thereof.	8.5% ad val.	7.5% ad val.	4% ad val.
683.95	Other	10.5% ad val.	9% ad val.	5% ad val.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968, and modifications therein as a result of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade. Only the first and final stages of the five annual rate modifications are shown above (see the TSUSA-1968 for the intermediate staged rates). The prior rates shown had remained unchanged under the Tariff Schedules of the United States from August 31, 1963, through the end of 1967.

U.S. consumption

The value of apparent U.S. consumption of all equipment covered by this summary increased from about $365 million in 1965 to an estimated $426 million in 1967 (table 1). The bulk of the equipment was supplied by domestic production, a large part of the value being accounted for by electric welding and related equipment.

U.S. consumption of this electrical equipment has grown because of its many advantages, including ease of its use, cleanliness relative to fuel-fired types, absence of combustion problems, close control permitted where desired, and high temperatures obtainable. The declining cost of electrical power, as well as many technological advances, has also been an important factor.

U.S. producers

In 1963, the latest year for which Census of Manufactures data are available, 238 establishments employing a total of 12,000 workers produced furnaces and ovens, both electric and fuel-fired. These establishments were situated mostly in the Northeast and North Central states. Many of the large firms that produce electric furnaces and ovens are diversified to the extent that they also produce fuel-fired furnaces and ovens. About 40 percent of the total value of shipments in 1963 was accounted for by 11 establishments, each employing more than 250 workers. The number of establishments specializing in the manufacture of electric furnaces and ovens in that year is unknown, but such articles accounted for about 65 percent of the total value of shipments by the 238 establishments. Data pertaining to fuel-fired furnaces are not included in this summary.

In 1963, electric welding apparatus was produced in 149 establishments employing 9,629 workers. These establishments were situated principally in the Northeast and North Central states. Nearly half of the total value of shipments in 1963 was accounted for by eight establishments, each employing 250 or more workers. Many of the 149 establishments specialized in producing metal arc welding electrodes, for which data are not included in this summary.

U.S. producers' shipments

The value of U.S. producers' shipments of all equipment covered by this summary increased from $304 million in 1963 to an estimated $480 million in 1967 (table 1). The value of annual U.S. producers' shipments during 1963-67 was larger than the value of annual apparent U.S. consumption because the value of U.S. exports substantially exceeded that of U.S. imports. Electric welding, soldering, brazing, and cutting equipment and parts accounted for more than 60 percent of the value of shipments, or $298 million, in 1966 (table 2). In that year, about 12 percent, by value, of U.S. producers' shipments of electric welding equipment was exported. The value of U.S. producers' shipments of electric furnaces and heating equipment amounted to an estimated $153 million in 1966. The value of shipments of electric furnaces (as well as the value of U.S. exports and imports thereof) is understated because large furnaces are often constructed on the furnace site from component parts; thus, while the value of components dedicated for use as parts of a furnace are included in the data, other components, such as motors and conveyors, not necessarily classified as parts of such furnaces, are not included, nor are construction and assembly costs included.

U.S. exports

The value of annual U.S. exports of the equipment covered by this summary increased from $52 million in 1965 to $63 million in 1967 (table 1); exports represented about 13 percent of the value of U.S. producers' shipments during 1965-67.

The principal export market was Canada, which accounted for about 23 percent of the total value of exports in 1967 (table 3); Japan and the United Kingdom were the next largest markets, accounting for 9 and 7 percent, respectively, of the total value. Mexico, the Netherlands, France, and Italy were additional major markets for this equipment. Among the significant foreign markets for U.S.-produced electrical equipment of the types covered by this summary, only West Germany exported more to the United States, in terms of value, than it imported from the United States.

The technology of heat-treating and joining materials by electrical methods is highly advanced in the United States, as evidenced by the large U.S. exports of electric furnaces and welding equipment. Many of the large U.S. manufacturers of heat-treating and welding equipment have foreign subsidiaries producing this equipment. The subsidiaries, in addition to supplying equipment to foreign markets, are customers for U.S.-produced equipment and also recipients of technological information from their U.S.-based parent companies.

U.S. imports

The value of U.S. imports of the articles covered by this summary rose from $4.3 million in 1964 to $9.9 million in 1967 (table 4). The value of annual imports of electric welding and related equipment (items 683.9000 and 683.9540) rose from $1.3 million to $4.1 million in 1964-67, and that of annual imports of electric furnaces and related heating equipment (items 683.9520 and 683.9560) increased from $3.0 to $5.8 million in the same period.

The principal source of all imports covered by this summary was West Germany, which accounted for about 30 percent of the total value during 1967 (table 5). Switzerland (which accounted for about 15 percent), Canada, the United Kingdom, and Sweden were other major suppliers.

U.S. imports, although increasing rapidly, have remained small in comparison with U.S. producers' shipments or U.S. exports. The ratio of U.S. imports to apparent domestic consumption has increased since 1965 (the first year for which comparable data are available). In 1967, imports of electric furnaces, ovens, and heating equipment accounted for about 3 percent of the value of apparent domestic consumption of such equipment, and imports of welding and related equipment, considered separately, accounted for approximately 1 percent of the value of the apparent U.S. consumption of such articles.

Table 1.--Electric industrial furnaces and welding and related equipment: U.S. producers' shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, 1963-67

Year	Producers' shipments 1/	Imports	Exports	Apparent consumption	Ratio of imports to consumption
	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	Percent
1963	304,036	2/	2/	2/	2/
1964	351,100	4,290	2/	2/	2/
1965	410,600	6,130	51,625	365,105	1.7
1966	451,100	8,501	58,559	401,042	2.1
1967	3/ 480,000	9,851	63,394	426,457	2.3

1/ Data do not include the value of electric furnaces and ovens constructed on site; data are partly estimated by the staff of the U.S. Tariff Commission.

2/ Not available.

3/ Estimated by the staff of the U.S. Tariff Commission.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Note.--The cost of U.S. import duties and costs of transportation, insurance, and other handling are not included in the value of imports. If such costs were included, the ratios of the value of imports to consumption would be higher.

Table 2.--Electric industrial furnaces and welding and related equipment: U.S. producers' shipments and U.S. exports, by types, 1963-67

(In millions of dollars)

Item	1963	1964	1965	1966	1967
U.S. producers' shipments: 1/					
Arc welding machines, components, and accessories, except electrodes	104.5	129.8	167.9	179.2	2/
Resistance welders, components, and accessories, and electrodes	68.3	83.2	88.2	100.6	2/
Electric welding apparatus not specified by kind, soldering and brazing machines 3/	13.6	14.6	16.6	18.5	2/
Electric industrial furnaces and ovens, metal processing	44.7	48.5	62.9	77.8	2/
High-frequency induction and dielectric heating equipment and parts, attachments and components; and parts for electric furnaces and ovens 3/	72.9	75.0	75.0	75.0	2/
Total	304.0	351.1	410.6	451.1	480.0
U.S. exports:					
Arc welding equipment, parts, and accessories	2/	2/	23.0	25.3	27.5
Resistance welding equipment, parts, and accessories	2/	2/	8.8	10.7	11.0
Electric furnaces, ovens, and parts	2/	2/	15.8	18.8	20.9
Electric induction and dielectric heating equipment and soldering irons and parts	2/	2/	4.0	3.8	4.0
Total	2/	2/	51.6	58.6	63.4

1/ Data do not include the value of electric furnaces and ovens constructed on site.

2/ Not available.

3/ Partly estimated by the staff of the U.S. Tariff Commission.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 3.--Electric industrial furnaces and welding and related equipment: U.S. exports, by principal markets, 1965-67

(In thousands of dollars)

Market	1965	1966	1967
Canada	13,376	16,058	14,573
Japan	3,116	2,368	5,552
United Kingdom	3,216	3,642	4,654
Mexico	2,864	2,928	3,430
Netherlands	2,348	2,578	3,362
France	2,231	3,114	2,629
Italy	1,388	2,558	2,482
India	2,176	1,544	2,034
West Germany	1,916	2,517	1,591
Australia	2,043	1,849	1,439
Venezuela	1,657	1,764	1,398
Belgium and Luxembourg	1,032	1,121	924
All other	14,262	16,518	19,326
Total	51,625	58,559	63,394

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 4.--Electric industrial furnaces and welding and related equipment: U.S. imports for consumption, by TSUSA items, 1964-67

(In thousands of dollars)

TSUSA item	Description	1964	1965	1966	1967
683.9000	Welding apparatus and parts	996	876	2,158	3,296
683.9520	Furnaces, ovens, and parts	2,570	3,734	5,280	4,839
683.9540	Brazing and soldering machines, and parts	290	916	655	760
683.9560	Induction and dielectric heating equipment, cutting apparatus and parts	434	604	408	957
	Total	4,290	6,130	8,501	9,851

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Because of rounding, figures may not add to the totals shown.

Table 5.--Electric industrial furnaces and welding and related equipment: U.S. imports for consumption, by principal sources, 1964-67

(In thousands of dollars)

Source	1964	1965	1966	1967
West Germany	1,724	1,771	2,864	2,949
Switzerland	526	396	1,006	1,625
Canada	386	641	1,033	1,082
United Kingdom	280	531	678	1,331
Sweden	359	1,067	785	953
Norway	13	646	1,270	92
Japan	187	182	227	359
France	234	140	212	291
All other	581	756	426	1,169
Total	4,290	6,130	8,501	9,851

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Electrothermic appliances and parts thereof:	
Electric flatirons (travel type and other)----	684.10, -.15
Toasters, waffle irons, skillets, ovens, stoves, coffee makers, and other portable electrothermic kitchen and household appliances----------	684.20
Electric heating resistors other than those of carbon, and certain other electrothermic appliances not elsewhere enumerated----------	684.50(pt.)

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

The United States is probably the world's largest consumer and producer of household and kitchen electrothermic appliances and parts. In 1967 the total value of U.S. consumption of the electrothermic appliances covered by this summary probably amounted to more than $450 million, of which U.S. imports accounted for about 3 percent. The value of U.S. exports is larger than that of U.S. imports.

Description and uses

This summary covers, with exceptions noted herein, electrothermic appliances of types used in households, kitchens (including kitchens of schools and such commercial establishments as hotels, restaurants, offices, or hospitals), and such commercial establishments as beauty parlors, and parts of all the foregoing. The electrothermic appliances include, among others, flatirons, hair dryers and other hairdressing appliances, coffee makers, toasters, skillets, and electric heating resistors other than those of carbon. The commercial electrothermic appliances include, among others, nonportable deep fat fryers, coffee machines, hot food server units, and food warmers. The commercial types of equipment are for the most part larger and sturdier than similar types of appliances used in the home. A few of the appliances, such as hair dryers and rotisseries, are equipped with an electric motor in addition to a heating device.

In recent years there has been a significant trend among manufacturers toward the use of solid-state controls in electrothermic appliances. Solid-state controls, such as diodes, transistors, and silicon control rectifiers, are used in circuits designed to regulate the amount of electrical energy the heating element receives, thus providing virtually infinite variations in heat control for such appliances

as hair dryers, frying pans, and so forth. Unlike older, more conventional controls, solid-state controls allow new, more compact styling in electrothermic appliances through more sophisticated circuitry which permits greater miniaturization; since solid-state controls do not employ moving parts, they also eliminate most internal appliance wear. Other recent technical developments in the field of electrothermic appliances include, for example, flatirons provided with double-coated nonstick sole plate, automatic power spray, water window, fabric dial, and temperature guide for modern textile fabrics; also, travel irons made adaptable for use with the different voltages available in foreign countries.

This summary does not include the following related articles: Nonportable electric cooking stoves and ranges, and parts thereof, which are classified under item 684.30; electric furnaces, heaters and nonportable kitchen and household ovens, and parts thereof, which are classified under item 684.40 and 684.41; all the foregoing articles are discussed in separate summaries in this volume (6:10). Electric blankets, chiefly in item 363.85, are discussed in a summary in volume 3:5.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 of the TSUSA-1968) are as follows:

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
	Electric flatirons:			
684.10	Travel type	11.5% ad val.	10% ad val.	5.5% ad val.
684.15	Other	34% ad val.	30.5% ad val.	17% ad val.
684.20	Toasters, waffle irons, skillets, ovens, stoves, coffee makers, and other portable electrothermic kitchen and household appliances.	17% ad val.	15% ad val.	8.5% ad val.
684.50	Hair dryers, hair curlers, and other electric hairdressing appliances and nonportable electrothermic kitchen and household appliances (except cooking stoves, ranges, ovens and space heating apparatus, furnaces, electric instantaneous or storage water heaters and immersion heaters, electric soil heating apparatus, and parts thereof) electric heating resistors other than those of carbon, and parts of articles enumerated in this column.	11.5% ad val.	10% ad val.	5.5% ad val.

The tabulation above shows the column 1 rates in effect prior to January 1, 1968, and modifications therein as a result of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade. Only the first and final stages of the five annual rate modifications are shown above (see the TSUSA-1968 for the intermediate staged rates).

The prior rates shown in the tabulation had remained unchanged under the TSUS from August 31, 1963, through the end of 1967. Concessions amounting to a reduction of about 50 percent in duties were granted by the United States in the Kennedy Round.

U.S. consumption

The value of apparent U.S. consumption of the appliances covered by this summary increased from $373 million in 1963 to an estimated $457 million in 1967 (table 1). Almost all of the value of consumption was accounted for by domestic production. The growth in consumption is attributable to the rise in the number of U.S. households and the increase in their income. It is also attributable to the downward trend over the years in the cost of electricity.

U.S. producers

In 1967 at least 300 U.S. producers manufactured one or more of the types of household and commercial electrothermic appliances and parts discussed in this summary.

Approximately seven concerns dominate the manufacturing and sales of electrothermic appliances in the United States. These large manufacturers are all diversified concerns which manufacture all, or almost all, of the appliances covered by this summary. Most of the remaining manufacturers of electrothermic appliances are concerns which specialize in the production of only one, or perhaps two, of these appliances.

Many producers, particularly the largest, manufacture electrothermic appliances and parts in foreign plants owned by them or their subsidiaries. Several foreign subsidiaries of large domestic manufacturers export parts for electrothermic appliances to the parent organization in the United States for assembly into complete units. Several domestic manufacturers without foreign manufacturing facilities have foreign marketing facilities.

The domestic producers of household and commercial electrothermic appliances are not concentrated in any particular geographical area of the United States; however, they are situated primarily in the New England, Midwestern, and Southern States.

U.S. producers' shipments

The factory value of U.S. producers' shipments of household and commercial electrothermic appliances not elsewhere enumerated (excluding the value of parts shipped separately but including electric controls) was about $380.8 million in 1963 (table 1); thereafter the value of shipments (partly estimated) increased in each year during 1964-67 except 1965, and in 1967 amounted to an estimated $463 million. The decline in 1965 reflects principally a substantial reduction in the shipments of hair dryers (table 2).

In 1963, according to data from the U.S. Census of Manufactures on producers' shipments, household types of appliances, including electric controls shipped separately, accounted for $353.5 million, while commercial types accounted for the remaining $27.2 million. The latest official statistics on the value of U.S. producers' shipments of electrothermic appliances, by types (as shown in table 2), are those for 1966. Among the leading types of household appliances shipped in that year, in the order of value of shipments, were electric flatirons, complete units (valued at $106.3 million), automatic coffee makers ($51.4 million), curling irons, hand and face dryers, and other electric appliances ($40.7 million), automatic toasters ($37.2 million), electric hair dryers ($35.9 million), and electric frying pans ($29.5 million). These six types of appliances accounted in 1966 for about 70 percent of the total value of producers' shipments of all types of appliances covered by this summary.

U.S. exports

During 1965-67, the latest years for which comparable data are available, the value of U.S. exports of the articles covered by this summary rose from $13.7 million in 1965 to $18.9 million in 1967 (table 3). The value of annual U.S. exports, which has exceeded that of annual U.S. imports, constituted about 4 percent of U.S. producers' shipments during 1965-67.

Canada accounted for about 41 percent of the total value of U.S. exports in 1965, and 44 percent in 1967. Other important markets were Venezuela, the United Kingdom, and Australia.

U.S. imports

The value of U.S. imports of electrothermic appliances and parts considered here increased by more than 200 percent during 1964-67, the period for which the most nearly comparable data are available. The value of imports rose from $4.0 million in 1964, the first calendar year after the adoption of the new TSUS, to $12.8 million in 1967

(table 4). The value of imports in 1967 probably accounted for about 3 percent of the value of apparent U.S. consumption. U.S. imports of household and commercial electrothermic appliances and parts, although increasing, are small in comparison with U.S. production or consumption. This is attributable to (1) the strong competitive position of the domestic industry benefiting from a large home market, (2) the attractive design, efficiency, and competitive prices of domestic merchandise, (3) the fact that electrothermic appliances produced in almost all foreign countries must be specially adapted to 60-cycle electrical current if exported to the United States, and (4) the readily available servicing facilities for domestically manufactured electrothermic appliances.

The United Kingdom and Japan were the principal sources of imports during 1964-67. Imports from the United Kingdom consisted almost entirely of parts for portable electrothermic appliances. Most of these parts were imported by two large domestic manufacturers of portable electrothermic appliances from their subsidiaries or licensees in the United Kingdom. Imports of electrothermic appliances and parts from Japan have generally consisted of either specialty articles, such as electric rice or egg cookers, or the more inexpensive types of electric tea kettles and coffee brewers.

Canada, West Germany, Denmark, and Norway were other important sources of U.S. imports of the articles covered by this summary. Imports from Canada have consisted mostly of completed units of electrothermic appliances which were manufactured in the Canadian subsidiaries of several large domestic manufacturers of appliances, whereas imports from Norway have consisted largely of parts for electrothermic appliances. Imports from West Germany have consisted largely of completed units of electrothermic appliances. These appliances, in addition to some parts, have been largely for the account of the U.S. subsidiary of a large West German manufacturer of appliances. Imports from Denmark consisted mainly of dryers, curlers, and other hairdressing appliances.

Table 1.--Electric flatirons (except parts) and other electrothermic kitchen and household appliances not elsewhere enumerated: U.S. producers' shipments, imports for consumption, and exports of domestic merchandise, 1963-67

Item and year	U.S. producers' shipments 1/	Imports	Exports 2/	Apparent consumption	Ratio of imports to consumption
	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	Percent
Electric flatirons (complete units):					
1963	70,838	55	1,267	69,626	3/
1964	74,642	184	1,594	73,232	3/
1965	89,245	181	1,630	87,796	3/
1966	106,273	170	1,818	104,625	3/
1967	4/115,000	216	1,932	4/113,300	3/
All other electrothermic and household appliances and parts:					
1963	309,925	1,492	7,676	303,741	3/
1964	311,863	3,844	8,868	306,839	1.3
1965	279,581	5,116	12,118	272,579	1.9
1966	321,789	6,573	15,253	313,109	2.1
1967	4/348,000	12,631	16,945	4/343,700	3.7
Total:					
1963	380,763	1,547	8,943	373,367	3/
1964	386,505	4,028	10,462	380,071	1.1
1965	368,826	5,297	13,748	360,375	1.5
1966	428,062	6,743	17,071	417,734	1.6
1967	4/463,000	12,847	18,877	4/457,000	2.8

1/ Data on U.S. producers' shipments for 1963 are not strictly comparable with those for 1964-66. Data for 1964-66 exclude establishments with shipments valued at less than $100,000, whereas data for 1963 include such establishments. The effect of this change, based on the analysis of data received from small establishments for 1963, is less than 1 percent of total value. See table 2 for data on types of appliances covered in 1963 and 1965-66. Data on shipments for 1964-66 partly estimated by the staff of the U.S. Tariff Commission.

2/ Data for appliances other than flatirons for 1965-67 not strictly comparable with data for 1963-64, because of a change in classification of some items.

3/ Less than 0.05 percent.

4/ Estimated by the staff of the U.S. Tariff Commission.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Note.--The ratios of imports to consumption are based on the foreign market value of imports and essential U.S. factory value of shipments. If the ratios were computed on the basis of the foreign value of imports plus U.S. import duties and costs of transportation, insurance, and other handling to deliver the merchandise to the United States, the ratios would be higher.

Due to variations in the coverage of the statistical classifications used in compiling and reporting U.S. producers' shipments, imports, and exports of the articles considered in this summary, the data shown for U.S. producers' shipments and exports are not fully comparable with the data shown for imports.

Table 2.--Specified electrothermic appliances not elsewhere enumerated, and parts, household and commercial types: U.S. producers' shipments, 1963, 1965, and 1966 1/

(In thousands of dollars)

Article	1963	1965	1966
Household electrothermic appliances:			
Electric flatirons (complete units only)	70,838	89,245	106,273
Electric hair dryers	84,840	32,053	35,918
Automatic coffee makers	51,843	36,911	51,404
Automatic toasters	33,342	36,155	37,160
Electric frying pans (skillets) 2/	23,445	34,913	29,522
Rotisseries and broilers (table)	10,654	14,488	17,443
Waffle irons, sandwich grills, griddles and combinations	12,311	16,447	19,705
Ovens (small) and roasters (with or without broiler attachments)	3,833	4,516	5,556
Deep fat fryers 2/	3,543	5,088	5,330
Corn poppers	3,068	3,757	3,791
Hot plates and disc stoves (1,650 watts or less) except built-in units	3,298	2,513	3,633
Curling irons, hand and face dryers, and other electric appliances	22,218	32,611	40,746
Pressure cookers, casseroles, nonautomatic toasters and coffee makers, automatic saucepans, hot trays and food warmers, and other household electric cooking and heating appliances 2/	23,418	17,629	25,281
Electric controls for frying pans and other household cooking appliances shipped separately	6,889	3/ 8,600	3/ 9,400
Total	353,540	4/ 334,926	4/ 391,162
Commercial electrothermic appliances:			
Griddles, toasters, deep fat fryers, coffee makers, and other commercial cooking equipment	16,712	3/ 20,800	3/ 22,700
Hot food server units, steam tables, and other commercial food warming equipment	10,511	3/ 13,100	3/ 14,200
Total 5/	27,223	3/ 33,900	3/ 36,900
Grand total	380,763	4/ 368,826	4/ 428,062

1/ Data for 1963 are not strictly comparable with those for 1965-66. Data for 1965-66 exclude establishments with shipments valued at less than $100,000, whereas data for 1963 include such establishments. The effect of this change, based on the analysis of data received from small establishments for 1963, is less than 1 percent of total value.

2/ Excludes covers and controls shipped separately.

3/ Estimated by the staff of the U.S. Tariff Commission.

4/ Excludes electric controls for household cooking appliances shipped separately.

5/ Data exclude parts for commercial electrothermic appliances.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Note.--This table excludes an undetermined amount of electrothermic appliances and parts which are within the scope of this summary, but for which data are not available. On the other hand, the table includes under ". . . other household electric cooking and heating appliances" an undetermined value of producers' shipments of some articles which are not covered by this summary, among which are immersion heaters, faucet attachment water heaters, steam radiators, and vibrators.

Table 3.--Electrothermic household and commercial appliances not elsewhere enumerated, and parts: U.S. exports of domestic merchandise, by types and by principal markets, 1965-67

(In thousands of dollars)

Type and market	1965	1966	1967
Electric flatirons (complete units): 1/			
Canada	431	272	576
Japan	33	67	187
Venezuela	129	175	148
Belgium	102	166	125
United Kingdom	8	69	101
All other	927	1,069	795
Total	1,630	1,818	1,932
Electrothermic household appliances and parts: 2/			
Canada	4,226	5,912	5,684
Venezuela	703	951	982
United Kingdom	355	598	852
Australia	615	398	750
Mexico	249	272	206
All other	2,476	2,584	3,531
Total	8,624	10,715	12,005
Electrothermic commercial appliances and parts: 3/			
Canada	995	1,704	2,093
United Kingdom	398	391	346
Japan	145	135	224
Sweden	141	114	222
Venezuela	407	203	146
All other	1,408	1,991	1,909
Total	3,494	4,538	4,940
Grand total	13,748	17,071	18,877

1/ Data include automatic and non-automatic household and travel types.

2/ Data include such appliances as steam cabinets, deodorizers, vaporizers, and heaters for motor vehicles, and parts for the foregoing, which are not covered by this summary; however, the value of U.S. exports of these articles is not believed to be a significant part of the total value of exports of electrothermic appliances as shown in this table.

3/ Data include an undetermined amount of exports of commercial types of electrothermic appliances, such as electronic ovens, and other commercial cooking equipment and parts for the foregoing, which are not covered by this summary.

Source: Compiled from official statistics of the U.S. Department of Commerce.

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Table 4.--Electrothermic household and commercial appliances not elsewhere enumerated, and parts: U.S. imports for consumption, by types, and by principal sources, 1964-67

(In thousands of dollars)

Type and source	1964	1965	1966	1967
Electric flatirons (complete units) (items 684.10 and 684.15):				
Japan	154	154	147	189
West Germany	15	21	15	19
All other	15	6	8	8
Total	184	181	170	216
Portable electrothermic appliances (item 684.20):				
Japan	673	775	1,124	1,375
Canada	119	138	267	359
Hong Kong	4	8	90	304
All other	81	119	133	114
Total	877	1,040	1,614	2,152
Electric hairdressing appliances (item 684.5020):				
Denmark	15	32	232	4,326
Japan	51	550	543	1,667
West Germany	37	117	354	244
Switzerland	67	205	199	174
All other	439	162	327	671
Total	609	1,066	1,655	7,082
Other electrothermic appliances and parts (items 684.5030 and 684.5050): 1/				
United Kingdom	1,383	2,015	1,993	2,102
Norway	461	497	720	432
West Germany	140	143	162	223
Canada	195	122	241	181
All other	179	233	188	459
Total	2,358	3,010	3,304	3,397
Grand total	4,028	5,297	6,743	12,847

1/ Includes nonportable household and commercial appliances, electric heating resistors other than those of carbon, and parts for all the foregoing.

Source: Compiled from official statistics of the U.S. Department of Commerce.

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Commodity	TSUS item
Electric cooking stoves and ranges, and parts thereof	684.30
Electric furnaces, heaters, and ovens, and parts thereof	684.40
If Canadian article and original motor-vehicle equipment	684.41

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968).

U.S. trade position

The United States is the world's largest producer and consumer of electric kitchen and household cooking and heating equipment. The factory value of apparent U.S. consumption in 1967 exceeded $437 million. In recent years, U.S. imports have accounted for less than 1 percent of domestic consumption of these articles, while exports (mostly parts) have been several times as large as imports. A substantial portion of exports, however, consist of component parts exported to foreign subsidiaries of U.S. concerns.

Description and uses

The electric cooking stoves and ranges, furnaces, heaters, and ovens, and parts thereof, covered by this summary are of the type (mostly nonportable) 1/ used in household and commercial establishments such as homes, hotels, restaurants, offices, schools, and hospitals. The types of electric heaters included are immersion heaters, portable space heaters, central-heating furnaces, electric water heaters, the sauna-bath type of heaters, and automobile engine heaters including those (item 684.41) imported free of duty from Canada under the Automotive Products Trade Agreement. Certain heating equipment (item 683.95) of the industrial type or the laboratory type is excluded and is discussed in a separate summary in this volume (6:10).

In the conventional electric cooking stoves and ranges, radiant heat is applied to the surface of food; the surface heats up and the heat is then absorbed and conducted throughout the food until it is cooked to the degree desired. Generally, all types of electric

1/ This summary does not include portable kitchen or household ovens or stoves covered by item 684.20.

household cooking stoves and ranges used in the United States are designed for 120/240 volt, 60-cycle, 3-wire, single-phase alternating current operation; they are manufactured in three basic widths: 24, 30, and 36 inches.

The most common type of electric cooking unit is the freestanding range, an assembly consisting of electrically heated surface units and one or more ovens. Some freestanding ranges feature electrically heated surface units, a large lower oven, and an eye-level upper oven. Such ranges have the advantage of the built-in appearance but do not require the added expense of installation (remodeling of kitchen cabinets, and so forth) that the built-in models require in replacement sales. The eye-level range, in some form now in virtually every domestic manufacturers' line, accounts for an increasing volume of business, which is currently estimated at 30 to 40 percent of industry unit sales.

Other types of household cooking ranges include the drop-in range, the slide-in range, and the counter-mounted surface assembly with wall-mounted oven.

Commercial cooking equipment (which is generally used in hotels, restaurants, offices, schools, and hospitals) is larger and more rugged than household cooking equipment and is produced in various standard and special purpose models.

In recent years a substantial amount of research and development work has been devoted to electronic ovens. In electronic cooking, ultra-high-frequency radio waves are used to produce heat throughout the entire mass of food, thus permitting faster cooking. One disadvantage of electronic cooking is that it will not brown food as desired in roasts and baked goods; for this reason, some of the larger manufacturing concerns have been working on the development of combination electronic and conventional electric ranges. Presently, electronic ranges are being widely used for precooked and prepared frozen foods for in-plant feeding in hospitals, schools, and other institutions.

The electric water heaters discussed in this summary consist of the portable immersion types, the household types (usually ranging from 20 to 60 gallon capacities), and the commercial types (60 to 120 gallon capacities).

Three types of tanks are used in the manufacture of household and commercial water heaters. The most common type is the so-called glass-lined tank, which is suitable for heating with electricity, oil, or gas, for water temperatures up to 160°. Stone-lined and copper-lined tanks, the other types, are preferable to the glass -lined in areas where the water is strongly corrosive, or for water temperatures above 160°.

The electric heating equipment discussed in this summary includes the more common types of equipment such as portable space heaters, wall heaters, baseboard heaters, electric warm air furnaces, and immersion heaters (including automobile-engine heaters, as well as those used to heat or boil small quantities of water). In addition, this summary includes the newer types of electric heating equipment, such as electric heating cables and electric boilers.

Electric heating cables are specially insulated resistance heating wires imbedded in wall board or in a vinyl wall covering which is applied like wall paper. Heat rays travel from the cable at the speed of light in straight lines without warming the air. However, objects in the room are warmed by absorbing the energy in the rays.

Electric boilers provide heat hydronically, that is, by circulating hot water or steam, and eliminate the need for massive heating apparatus. The boiler is only slightly larger than an attache case. The hot water is delivered to baseboard units, which are placed at the base of the room walls, or to wall panels.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 of the TSUSA-1968) are as follows:

TSUS item	Commodity	Prior rate	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			First stage, effective Jan. 1, 1968	Final stage, effective Jan. 1, 1972
684.30	Electric cooking stoves and ranges, and parts thereof.	8% ad val.	7% ad val.	4% ad val.
684.40	Electric furnaces, heaters, and ovens, and parts thereof.	10% ad val.	9% ad val.	5% ad val.
684.41	If Canadian article and original motor-vehicle equipment.	Free	1/	1/

1/ Duty-free status not affected by the trade conference.

The tabulation above shows the column 1 rates in effect prior to January 1, 1968, and modifications therein as a result of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade. Only the first and

final stages of the five annual rate modifications are shown above (see the TSUSA-1968 for the intermediate staged rates).

Except for item 684.41, the prior rates shown in the tabulation above had remained unchanged under the TSUS from August 31, 1963, through the end of 1967. The duty-free item 684.41 became effective January 18, 1965, as a result of the Automotive Products Trade Act of 1965 (Public Law 89-283). Except for that item, concessions amounting to a reduction of about 50 percent in duties were granted by the United States in the Kennedy Round on all of the remaining items.

U.S. consumption

The value of apparent consumption of kitchen and household cooking and heating equipment (excluding automobile heaters) has risen from a little more than $302 million in 1958 to almost $492 million in 1966 and then declined to a little less than $438 million in 1967 (table 1). Domestic production supplies practically all of this consumption. The decline in consumption in 1967 probably reflects the slump in U.S. housing construction.

U.S. producers

In 1967 at least 45 manufacturers produced electric kitchen and household cooking stoves and ranges, and approximately 230 manufacturers produced one or more types of electrical heating equipment. For the most part, the manufacturers of electric kitchen and household cooking equipment also manufacture other major kitchen and household appliances, but few of them are engaged in the production of electrical heating equipment. The manufacturers of electrical heating equipment generally limit their entire production to heating apparatus and normally manufacture a variety of this type of equipment.

The larger manufacturers of electric kitchen and household cooking stoves and ranges, as well as the larger manufacturers of electrical heating equipment, also have manufacturing facilities in foreign plants owned by them or their subsidiaries; some of the other domestic concerns without foreign manufacturing facilities have foreign marketing facilities. Domestic manufacturers of electrical kitchen and household cooking and heating equipment are located primarily in the North Central States, principally in Illinois and Ohio.

U.S. production

The value of U.S. producers' shipments of the articles covered in this summary increased from a little more than $308 million in 1958 to about $500 million in 1966 and then declined to a little less than

$445 million in 1967 (table 2). Shipments of electric ranges and stoves accounted for the bulk of the total shipments during this period.

Shipments of electric cooking stoves and ovens, and parts were valued at $217 million (household types--$204 million, commercial types --$13 million) in 1958 and an estimated $310 million (household types-- $280 million, commercial types--$30 million) in 1967, representing an increase of 43 percent. The average retail unit value of household electric cooking stoves and ranges, according to official trade data, declined from $266 in 1958 to $221 in 1967. The decline reflects price reductions stimulated by intense competition and by market saturation; it also reflects cost savings made possible by improved methods of production.

The value of U.S. producers' shipments of electric water heaters and parts increased from $62 million in 1958 to an estimated $75 million in 1967. Such shipments are largely dependent on new construction; however, the replacement market is growing. Based on trade data, the average retail unit value of electric water heaters declined from $105 in 1958 to $80 in 1963; thereafter the average unit value increased and by 1967 amounted to $88.

Significant among the increases in producers' shipments of electric heating equipment has been the growth in shipments of air space heaters (portable and fixed). The value of producers' shipments of such heaters increased from $27 million in 1958 to an estimated $59 million in 1967. The increase partly reflects the growing demand for supplemental heating equipment in homes, particularly in new additions.

In recent years the sale of electric cooking and heating equipment has taken an increasing share of the U.S. market for all cooking and heating equipment, displacing equipment utilizing other sources of heat. This is a result both of the aggressive promotional efforts of the electric utility companies and of popular innovations such as electric cooking stoves with self-cleaning ovens, electronic ranges, electric heat pumps, 1/ and portable and nonportable space-heating

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1/ The electric heat pump provides heating and cooling in a single system. This system utilizes ducts; however, the pump can be installed outside the house, in the attic or the cellar, or even in a closet. The heat pump removes heat from the house in the summer and exhausts it outdoors. In the winter, it reverses the procedure and extracts heat from the outside air and circulates it inside the house. Since the pump transfers rather than generates heat, it generally results in lower operating costs than other types of electric heating. A unique feature of the heat pump is the fact that one thermostat setting can maintain the desired temperature all during the year. Data on production of heat pumps are not included in this summary but are in a separate summary in volume 6:8.

devices. The growth in sales of electric heating equipment is also attributable, at least in part, to better built and better insulated dwelling units and to the low price of electrical energy. In 1968 there were almost 2.5 million U.S. homes completely heated with electricity, in comparison with about 300,000 such homes in 1956. In 1968, 622,000 apartment units were also heated with electricity.

U.S. exports

The value of U.S. exports of electric household cooking stoves and ranges and parts thereof increased from about $6.8 million in 1958 to $7.7 million in 1967 (table 3). However, the value of exports of complete units of household cooking stoves and ranges declined from $2.7 million in 1958 to $2.2 million in 1967, while that of exports of parts for electric household cooking stoves and ranges increased from $4.1 million in 1958 to $5.5 million in 1967. In 1967 the Bahamas, Venezuela, and El Salvador were the principal markets for complete electric ranges and stoves, and Canada, the United Kingdom, and West Germany were the principal markets for electric range parts.

The decline in the value of U.S. exports of complete units of household electric cooking stoves and ranges largely reflects the decline in the value of U.S. exports of electric cooking equipment to Canada--from $580,000 in 1958 to $68,000 in 1967. This decline reflects not only increased Canadian production, but also the increasing Canadian preference for gas cooking stoves and ranges rather than electric models, as a result of the completion of pipelines which have made natural gas available to the principle Canadian population centers. Also, the substantial Canadian import duty on electric cooking stoves and ranges is an impediment to increased sales of U.S. equipment.

The value of total U.S. exports of parts for household electric cooking stoves and ranges increased from $4.1 million in 1958 to $5.5 million in 1967. Although the value of U.S. exports to Canada of parts for household electric cooking stoves and ranges also declined (from $3.2 million in 1958 to $2.2 million in 1967), the decline was offset by increased exports of these articles to the United Kingdom, West Germany, Japan, the Philippine Republic, and other markets. Some of the countries to which parts are being exported are increasingly self-reliant manufacturers of consumer durables, including household electric cooking stoves and ranges, and therefore are importing parts only to the extent of securing specialized components. Such parts are currently either cheaper or more readily available in the United States.

Available trade data indicate that there is a large and growing market for commercial cooking stoves and ranges of U.S. origin in many countries which are experiencing rapid growth in hotel and restaurant

construction. Most of these countries do not have the facilities to manufacture the specialized or particular cooking equipment required for commercial establishments. Although separate data are not available on exports of commercial cooking equipment, the value of such exports in 1967 probably did not exceed $3.8 million. 1/

Meaningful export data for electric heating equipment are unavailable except for household electric water heaters. The value of U.S. exports of household electric water heaters declined from $1.3 million (excluding parts) in 1958 to $1.0 million (including parts) in 1967 (table 4). This decline in the value of U.S. exports was largely the result of decreased exports to Canada and probably reflects both increased Canadian production of electric water heaters and the growing preference for gas-fired appliances in Canada.

U.S. exports of electric kitchen and household cooking and heating equipment are also greatly affected by the existence in foreign countries of manufacturing facilities owned or controlled by U.S. producers. Thus, by supplying the foreign markets from plants owned or controlled by U.S. manufacturers rather than directly from the parent company in the United States, these concerns can often take advantage of lower foreign production costs, lower transportation costs, and improved servicing facilities.

U.S. imports

The value of total U.S. imports of electric kitchen and household cooking and heating equipment ranged during 1958-67--from $1.4 million in 1958 to $2.0 million in 1966 (table 5). U.S. imports supply a very minor part of U.S. consumption. The value of U.S. imports of electric kitchen and cooking stoves and ranges and parts thereof increased from $88,000 in 1958 to $652,000 in 1965 and then declined to $217,000 in 1967. Except in 1967, when Japan became the largest supplier, Canada supplied the bulk of the imports of this equipment in all of the years covered by this summary. Imports from Canada, however, fluctuated greatly during these years, totaling $73,000 in 1958, $589,000 in 1965, and $94,000 in 1967. These imports from Canada are largely imports of component parts from U.S. subsidiaries in Canada. Imports of electric kitchen and household cooking stoves and ranges and parts thereof from countries other than Canada are largely of a specialized nature and have generally been insignificant.

1/ Export data on commercial electric cooking stoves and ranges are included in a classification which also includes electric food-warming equipment; food-warming equipment is not included in this summary. The value of U.S. exports of commercial electric cooking and food-warming equipment totaled $3.8 million in 1967. The proportion of this total accounted for by cooking equipment is unknown, and such data are not included in those shown in this summary.

The value of U.S. imports of electric heating equipment and parts was $1.8 million in 1958, $1.0 million in 1964, and $1.6 million in 1967. In 1967 Canada, West Germany, and Japan accounted for approximately 80 percent of the total value of U.S. imports. In general, imports tend to supplement rather than displace articles of domestic manufacture. Imports of electric heating equipment are largely of particular types which are designed by or for users, for specialized operations.

Table 1.--Electric kitchen and household cooking and heating equipment: U.S. producers' shipments, imports for consumption, and exports of domestic merchandise, 1958 and 1963-67

(In thousands of dollars)

Year	Producers' shipments 1/	Imports	Exports 2/	Apparent consumption 1/
1958	308,354	1,862	8,069	302,147
1963	427,715	1,647	5,634	423,728
1964	440,226	1,395	7,105	434,516
1965	475,655	1,921	7,614	469,962
1966	498,029	2,005	8,242	491,792
1967	444,839	1,779	8,768	437,850

1/ Data somewhat understated owing to lack of data on some parts, automobile heaters, and certain electric heating resistors.

2/ Data somewhat understated, principally owing to exclusion of automobile heaters and parts.

Source: Except as noted in tables 2, 4 and 5, data compiled from official statistics of the U.S. Department of Commerce.

Table 2.--Electric kitchen and household cooking and heating equipment: U.S. producers' shipments, 1/ 1958 and 1963-67

(In thousands of dollars)

Article	1958	1963	1964	1965	1966	1967 2/
Electric cooking stoves and ovens:						
Household	203,748	282,083	294,728	324,871	332,131	280,500
Commercial	13,015	2/ 16,556	2/ 16,700	2/ 24,000	2/ 29,000	30,000
Total	216,763	298,639	311,428	348,871	361,131	310,500
Electric water heaters:						
Complete units	56,849	61,408	66,797	65,992	65,574	65,750
Parts	5,458	8,510	2/ 9,300	2/ 9,200	2/ 9,100	9,100
Total	62,307	69,918	76,097	75,192	74,674	74,850
Air space heaters:						
Fixed	9,703	29,542	30,322	31,164	33,275	34,915
Portable	16,881	22,472	22,379	20,428	23,403	24,574
Total	26,584	52,014	52,701	51,592	56,678	59,489
Warm air furnaces	2,700	7,144	3/	3/	5,546	3/
Grand total	308,354	427,715	440,226	475,655	498,029	444,839

1/ Represents the factory value of shipments of (1) complete electric household ranges and ovens and surface cooking unit equipment, and parts; (2) electric commercial cooking stoves, ranges, ovens, and broilers (including commercial electronic stoves and ovens), and parts; and (3) electric water heaters and parts, portable and fixed air space heaters and electric warm air furnaces. Data exclude shipments of automobile heaters, electric cable systems for heating and various types of electric heating resistors other than those of carbon.

2/ Estimated on the basis of data from trade and other sources.

3/ Insufficient data available to make a reliable estimate.

Source: Except as noted, data were compiled from official statistics of the U.S. Department of Commerce.

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Table 3.--Electric household cooking stoves and ranges and parts thereof: U.S. exports of domestic merchandise, by principal markets, 1958 and 1963-67

(In thousands of dollars)

Item and market	1958	1963	1964	1965	1966	1967
Electric household cooking stoves and ranges:						
Bahamas	23	28	114	127	139	203
Venezuela	95	37	107	220	292	190
El Salvador	49	98	126	156	138	182
Costa Rica	61	114	192	195	150	139
West Germany	5	36	100	51	76	134
Peru	203	245	141	123	164	109
United Kingdom	20	7	30	73	90	90
Guatemala	119	62	113	125	86	80
Philippines	55	108	178	121	97	80
All other	1/ 2,043	824	922	900	1,076	2/ 1,016
Total	2,673	1,559	2,023	2,091	2,308	2,223
Electric range parts:						
Canada	3,160	2,257	2,821	2,445	2,233	2,180
United Kingdom	3	35	19	117	694	999
West Germany	1	9	71	297	182	586
Japan	-	49	153	113	230	272
Philippines	54	186	94	215	293	243
Mexico	89	69	158	109	120	161
Republic of South Africa	282	252	255	249	111	153
Australia	11	47	89	47	99	130
Venezuela	33	17	44	44	143	108
New Zealand	123	224	200	200	95	97
Brazil	1	32	33	17	85	76
Peru	17	30	27	55	28	67
All other	358	284	431	619	596	424
Total	4,132	3,491	4,395	4,527	4,909	5,496
Grand total	6,805	5,050	6,418	6,618	7,217	7,719

1/ Includes exports to Canada valued at 580 thousand dollars.
2/ Includes exports to Canada valued at 68 thousand dollars.

Source: Compiled from official statistics of the U.S. Department of Commerce.

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Table 4.--Electric household instantaneous or storage water heaters: 1/ U.S. exports of domestic merchandise, by principal markets, 1958 and 1963-67

(In thousands of dollars)

Market	1958	1963	1964	1965	1966	1967
Canada	404	99	65	121	108	143
Bahamas	40	35	58	76	88	117
Thailand	2	7	13	45	24	68
Bermuda	25	40	42	35	47	46
Guatemala	37	26	30	33	28	38
Australia	-	2	2/	1	49	36
Panama	1	20	15	12	27	33
El Salvador	15	13	21	27	15	27
Chile	6	-	1	8	13	27
Saudi Arabia	6	3	11	21	18	26
Switzerland	-	4	2/	1	5	24
Dominican Republic	8	15	29	22	16	21
Peru	21	6	9	5	13	21
Philippines	13	7	9	23	26	21
All other	686	307	384	566	548	401
Total	1,264	584	687	996	1,025	1,049

1/ Parts and accessories are included for 1965-67; similar data are not available for years prior to 1965.

2/ Less than $500.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 5.--Electric kitchen and household cooking stoves and ranges and parts thereof and electric furnaces, heaters, and ovens, and parts thereof, other than the industrial types: U.S. imports for consumption, by principal sources, 1958 and 1964-67

(In thousands of dollars)

Item and source	1958	1964	1965	1966	1967
Electric kitchen and household cooking stoves and ranges, and parts thereof:					
Japan	1/	91	54	59	100
Canada	73	241	589	421	94
Italy	-	-	1/	-	8
United Kingdom	8	1/	3	9	7
West Germany	6	15	5	15	6
All other	1	9	1	5	2
Total	88	356	652	509	217
Electric furnaces, heaters, and ovens, and parts thereof: 2/					
Canada	195	303	3/ 389	3/ 566	3/ 758
West Germany	583	80	136	117	242
Japan	41	363	296	330	225
Finland	-	61	77	121	176
United Kingdom	184	74	164	88	88
Sweden	252	133	142	195	32
Denmark	1/	7	25	1	15
All other	519	18	40	77	26
Total	1,774	1,039	1,269	1,495	1,562
Electric kitchen and household cooking and heating equipment, and parts thereof:					
Canada	268	544	978	987	852
Japan	41	454	350	389	325
West Germany	589	95	141	132	248
Finland	-	61	77	124	176
United Kingdom	192	75	167	97	95
Sweden	252	135	142	195	33
Denmark	1/	7	25	1	15
Italy	-	-	1/	-	10
All other	520	24	41	80	25
Total	1,862	1,395	1,921	2,005	1,779

1/ Less than $500. 2/ Except for 1958, data exclude industrial types.
3/ Includes automotive heaters that were entered free of duty under the APTA valued at 3 thousand dollars in 1965, 46 thousand dollars in 1966, and 114 thousand dollars in 1967.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Because of rounding, figures may not add to the totals shown.

A P P E N D I X A

Tariff Schedules of the United States Annotated (1968): General headnotes and rules of interpretation, and excerpts relating to the items included in this volume.

NOTE: The shaded areas in this appendix cover headnotes and TSUS items not included in the summaries in this volume.

GENERAL HEADNOTES AND RULES OF INTERPRETATION

1. Tariff Treatment of Imported Articles. All articles imported into the customs territory of the United States from outside thereof are subject to duty or exempt therefrom as prescribed in general headnote 3.

2. Customs Territory of the United States. The term "customs territory of the United States", as used in the schedules, includes only the States, the District of Columbia, and Puerto Rico.

3. Rates of Duty. The rates of duty in the "Rates of Duty" columns numbered 1 and 2 of the schedules apply to articles imported into the customs territory of the United States as hereinafter provided in this headnote:

(a) Products of Insular Possessions.

(i) Except as provided in headnote 6 of schedule 7, part 2, subpart E, [and] except as provided in headnote 4 of schedule 7, part 7, subpart A, articles imported from insular possessions of the United States which are outside the customs territory of the United States are subject to the rates of duty set forth in column numbered 1 of the schedules, except that all such articles the growth or product of any such possession, or manufactured or produced in any such possession from materials the growth, product, or manufacture of any such possession or of the customs territory of the United States, or of both, which do not contain foreign materials to the value of more than 50 percent of their total value, coming to the customs territory of the United States directly from any such possession, and all articles previously imported into the customs territory of the United States with payment of all applicable duties and taxes imposed upon or by reason of importation which were shipped from the United States, without remission, refund, or drawback of such duties or taxes, directly to the possession from which they are being returned by direct shipment, are exempt from duty.

(ii) In determining whether an article produced or manufactured in any such insular possession contains foreign materials to the value of more than 50 percent, no material shall be considered foreign which, at the time such article is entered, may be imported into the customs territory from a foreign country, other than Cuba or the Philippine Republic, and entered free of duty.

(b) Products of Cuba. Products of Cuba imported into the customs territory of the United States, whether imported directly or indirectly, are subject to the rates of duty set forth in column numbered 1 of the schedules. Preferential rates of duty for such products apply only as shown in the said column 1. 1/

(c) Products of the Philippine Republic.

(i) Products of the Philippine Republic imported into the customs territory of the United States, whether imported directly or indirectly, are subject to the rates of duty which are set forth in column numbered 1 of the schedules or to fractional parts of the rates in the said column 1, as hereinafter prescribed in subdivisions (c)(ii) and (c)(iii) of this headnote.

(ii) Except as otherwise prescribed in the schedules, a Philippine article, as defined in subdivision (c)(iv) of this headnote, imported into the customs territory of the United States and entered on or before July 3, 1974, is subject to that rate which results from the application of the following percentages to the most favorable rate of duty (i.e., including a preferential rate prescribed for any product of Cuba) set forth in column numbered 1 of the schedules:

(A) 20 percent, during calendar years 1963 through 1964,

(B) 40 percent, during calendar years 1965 through 1967,

(C) 60 percent, during calendar years 1968 through 1970,

(D) 80 percent, during calendar years 1971 through 1973,

(E) 100 percent, during the period from January 1, 1974, through July 3, 1974.

(iii) Except as otherwise prescribed in the schedules, products of the Philippine Republic, other than Philippine articles, are subject to the rates of duty (except any preferential rates prescribed for products of Cuba) set forth in column numbered 1 of the schedules.

(iv) The term "Philippine article", as used in the schedules, means an article which is the product of the Philippines, but does not include any article produced with the use of materials imported into the Philippines which are products of any foreign country (except materials produced within the customs territory of the United States) if the aggregate value of such imported materials when landed at the Philippine port of entry, exclusive of any landing cost and Philippine duty, was more than 20 percent of the appraised customs value of the article imported into the customs territory of the United States.

(d) Products of Canada.

(i) Products of Canada imported into the customs territory of the United States, whether imported directly or indirectly, are subject to the rates of duty set forth in column numbered 1 of the schedules. The rates of duty for a Canadian article, as defined in subdivision (d)(ii) of this headnote, apply only as shown in the said column numbered 1.

(ii) The term "Canadian article", as used in the schedules, means an article which is the product of Canada, but does not include any article produced with the use of materials imported into Canada which are products of any foreign country (except materials produced within the customs territory of the United States), if the aggregate value of such imported materials when landed at the Canadian port of entry (that is, the actual purchase price, or if not purchased, the export value, of such materials, plus, if not included therein, the cost of transporting such materials to Canada but exclusive of any landing cost and Canadian duty) was --

(A) with regard to any motor vehicle or automobile truck tractor entered on or before December 31, 1967, more than 60 percent of the appraised value of the article imported into the customs territory of the United States; and

(B) with regard to any other article (including any motor vehicle or automobile truck tractor entered after December 31, 1967), more than 50 percent of the appraised value of the article imported into the customs territory of the United States.

1/ By virtue of section 401 of the Tariff Classification Act of 1962, the application to products of Cuba of either a preferential or other reduced rate of duty in column 1 is suspended. See general headnote 3(e), infra. The provisions for preferential Cuban rates continue to be reflected in the schedules because, under section 401, the rates therefor in column 1 still form the bases for determining the rates of duty applicable to certain products, including "Philippine articles".

APPENDIX A

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1968)

General Headnotes and Rules of Interpretation

(e) Products of Communist Countries. Notwithstanding any of the foregoing provisions of this headnote, the rates of duty shown in column numbered 2 shall apply to products, whether imported directly or indirectly, of the following countries and areas pursuant to section 401 of the Tariff Classification Act of 1962, to section 231 or 257(e)(2) of the Trade Expansion Act of 1962, or to action taken by the President thereunder:

Albania
Bulgaria
China (any part of which may be under Communist domination or control)
Cuba 1/
Czechoslovakia
Estonia
Germany (the Soviet zone and the Soviet sector of Berlin)
Hungary
Indochina (any part of Cambodia, Laos, or Vietnam which may be under Communist domination or control)
Korea (any part of which may be under Communist domination or control)
Kurile Islands
Latvia
Lithuania
Outer Mongolia
Rumania
Southern Sakhalin
Tanna Tuva
Tibet
Union of Soviet Socialist Republics and the area in East Prussia under the provisional administration of the Union of Soviet Socialist Republics.

(f) Products of All Other Countries. Products of all countries not previously mentioned in this headnote imported into the customs territory of the United States are subject to the rates of duty set forth in column numbered 1 of the schedules.

(g) Effective Date; Exceptions - Staged Rates of Duty. Except as specified below or as may be specified elsewhere, pursuant to section 501(a) of the Tariff Classification Act of 1962 (P.L. 87-456, approved May 24, 1962), the rates of duty in columns numbered 1 and 2 become effective with respect to articles entered on or after the 10th day following the date of the President's proclamation provided for in section 102 of the said Act. If, in column numbered 1, any rate of duty or part thereof is set forth in parenthesis, the effective date shall be governed as follows:

(i) If the rate in column numbered 1 has only one part (i.e., 8¢ (10%) per lb.), the parenthetical rate (viz., 10¢ per lb.) shall be effective as to articles entered before July 1, 1964, and the other rate (viz., 8¢ per lb.) shall be effective as to articles entered on or after July 1, 1964.

(ii) If the rate in column numbered 1 has two or more parts (i.e., 5¢ per lb. + 50% ad val.) and has a parenthetical rate for either or both parts, each part of the rate shall be governed as if it were a one-part rate. For example, if a rate is expressed as "4¢ (4.5¢) per lb. + 8% (9%) ad val.", the rate applicable to articles entered before July 1, 1964, would be "4.5¢ per lb. + 9% ad val."; the rate applicable to articles entered on or after July 1, 1964, would be "4¢ per lb. + 8% ad val.".

(iii) If the rate in column numbered 1 is marked with an asterisk (*), the foregoing provisions of (i) and (ii) shall apply except that "January 1, 1964" shall be substituted for "July 1, 1964", wherever this latter date appears.

1/ In Proclamation 3447, dated February 3, 1962, the President, acting under authority of section 620(a) of the Foreign Assistance Act of 1961 (75 Stat. 445), as amended, prohibited the importation into the United States of all goods of Cuban origin and all goods imported from or through Cuba, subject to such exceptions as the Secretary of the Treasury determines to be consistent with the effective operation of the embargo.

4. Modification or Amendment of Rates of Duty. Except as otherwise provided in the Appendix to the Tariff Schedules --

(a) a statutory rate of duty supersedes and terminates the existing rates of duty in both column numbered 1 and column numbered 2 unless otherwise specified in the amending statute;

(b) a rate of duty proclaimed pursuant to a concession granted in a trade agreement shall be reflected in column numbered 1 and, if higher than the then existing rate in column numbered 2, also in the latter column, and shall supersede but not terminate the then existing rate (or rates) in such column (or columns);

(c) a rate of duty proclaimed pursuant to section 336 of the Tariff Act of 1930 shall be reflected in both column numbered 1 and column numbered 2 and shall supersede but not terminate the then existing rates in such columns; and

(d) whenever a proclaimed rate is terminated or suspended, the rate shall revert, unless otherwise provided, to the next intervening proclaimed rate previously superseded but not terminated or, if none, to the statutory rate.

5. Intangibles. For the purposes of headnote 1 --

(a) corpses, together with their coffins and accompanying flowers,
(b) currency (metal or paper) in current circulation in any country and imported for monetary purposes,
(c) electricity,
(d) securities and similar evidences of value, and
(e) vessels which are not "yachts or pleasure boats" within the purview of subpart D, part 6, of schedule 6,

are not articles subject to the provisions of these schedules.

6. Containers or Holders for Imported Merchandise. For the purposes of the tariff schedules, containers or holders are subject to tariff treatment as follows:

(a) Imported Empty: Containers or holders if imported empty are subject to tariff treatment as imported articles and as such are subject to duty unless they are within the purview of a provision which specifically exempts them from duty.

(b) Not Imported Empty: Containers or holders if imported containing or holding articles are subject to tariff treatment as follows:

(i) The usual or ordinary types of shipping or transportation containers or holders, if not designed for, or capable of, reuse, and containers of usual types ordinarily sold at retail with their contents, are not subject to treatment as imported articles. Their cost, however, is, under section 402 or section 402a of the tariff act, a part of the value of their contents and if their contents are subject to an ad valorem rate of duty such containers or holders are, in effect, dutiable at the same rate as their contents, except that their cost is deductible from dutiable value upon submission of satisfactory proof that they are products of the United States which are being returned without having been advanced in value or improved in condition by any means while abroad.

(ii) The usual or ordinary types of shipping or transportation containers or holders, if designed for, or capable of, reuse, are subject to treatment as imported articles separate and distinct from their contents. Such holders or containers are not part of the dutiable value of their contents and are separately subject to duty upon each and every importation into the customs territory of the United States unless within the scope of a provision specifically exempting them from duty.

(iii) In the absence of context which requires otherwise, all other containers or holders are subject to the same treatment as specified in (ii) above for usual or ordinary types of shipping or transportation containers or holders designed for, or capable of, reuse.

7. Commingling of Articles. (a) Whenever articles subject to different rates of duty are so packed together or mingled that the quantity or value of each class of articles cannot be readily ascertained by customs officers (without physical segregation of the shipment or the contents of any entire package thereof), by one or more of the following means:

(I) sampling,

(II) verification of packing lists or other documents filed at the time of entry, or

(III) evidence showing performance of commercial settlement tests generally accepted in the trade and filed in such time and manner as may be prescribed by regulations of the Secretary of the Treasury,

the commingled articles shall be subject to the highest rate of duty applicable to any part thereof unless the consignee or his agent segregates the articles pursuant to subdivision (b) hereof.

(b) Every segregation of articles made pursuant to this headnote shall be accomplished by the consignee or his agent at the risk and expense of the consignee within 30 days (unless the Secretary authorizes in writing a longer time) after the date of personal delivery or mailing, by such employee as the Secretary of the Treasury shall designate, of written notice to the consignee that the articles are commingled and that the quantity or value of each class of articles cannot be readily ascertained by customs officers. Every such segregation shall be accomplished under customs supervision, and the compensation and expenses of the supervising customs officers shall be reimbursed to the Government by the consignee under such regulations as the Secretary of the Treasury may prescribe.

(c) The foregoing provisions of this headnote do not apply with respect to any part of a shipment if the consignee or his agent furnishes, in such time and manner as may be prescribed by regulations of the Secretary of the Treasury, satisfactory proof --

(I) that such part (A) is commercially negligible, (B) is not capable of segregation without excessive cost, and (C) will not be segregated prior to its use in a manufacturing process or otherwise, and

(II) that the commingling was not intended to avoid the payment of lawful duties.

Any article with respect to which such proof is furnished shall be considered for all customs purposes as a part of the article, subject to the next lower rate of duty, with which it is commingled.

(d) The foregoing provisions of this headnote do not apply with respect to any shipment if the consignee or his agent shall furnish, in such time and manner as may be prescribed by regulations of the Secretary of the Treasury, satisfactory proof --

(I) that the value of the commingled articles is less than the aggregate value would be if the shipment were segregated;

(II) that the shipment is not capable of segregation without excessive cost and will not be segregated prior to its use in a manufacturing process or otherwise; and

(III) that the commingling was not intended to avoid the payment of lawful duties.

Any merchandise with respect to which such proof is furnished shall be considered for all customs purposes to be dutiable at the rate applicable to the material present in greater quantity than any other material.

(e) The provisions of this headnote shall apply only in cases where the schedules do not expressly provide a particular tariff treatment for commingled articles.

8. Abbreviations. In the schedules the following symbols and abbreviations are used with the meanings respectively indicated below:

$	-	dollars
¢	-	cents
%	-	percent
+	-	plus
ad val.	-	ad valorem
bu.	-	bushel
cu.	-	cubic
doz.	-	dozen
ft.	-	feet
gal.	-	gallon
in.	-	inches
lb.	-	pounds
oz.	-	ounces
sq.	-	square
wt.	-	weight
yd.	-	yard
pcs.	-	pieces
prs.	-	pairs
lin.	-	linear
I.R.C.	-	Internal Revenue Code

9. Definitions. For the purposes of the schedules, unless the context otherwise requires --

(a) the term "entered" means entered, or withdrawn from warehouse, for consumption in the customs territory of the United States;

(b) the term "entered for consumption" does not include withdrawals from warehouse for consumption;

(c) the term "withdrawn for consumption" means withdrawn from warehouse for consumption and does not include articles entered for consumption;

(d) the term "rate of duty" includes a free rate of duty; rates of duty proclaimed by the President shall be referred to as "proclaimed" rates of duty; rates of duty enacted by the Congress shall be referred to as "statutory" rates of duty; and the rates of duty in column numbered 2 at the time the schedules become effective shall be referred to as "original statutory" rates of duty;

(e) the term "ton" means 2,240 pounds, and the term "short ton" means 2,000 pounds;

(f) the terms "of", "wholly of", "almost wholly of", "in part of" and "containing", when used between the description of an article and a material (e.g., "furniture of wood", "woven fabrics, wholly of cotton", etc.), have the following meanings:

(I) "of" means that the article is wholly or in chief value of the named material;

(II) "wholly of" means that the article is, except for negligible or insignificant quantities of some other material or materials, composed completely of the named material;

(III) "almost wholly of" means that the essential character of the article is imparted by the named material, notwithstanding the fact that significant quantities of some other material or materials may be present; and

(IV) "in part of" or "containing" mean that the article contains a significant quantity of the named material.

With regard to the application of the quantitative concepts specified in subparagraphs (II) and (IV) above, it is intended that the de minimis rule apply.

APPENDIX A

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1968)

General Headnotes and Rules of Interpretation

10. General Interpretative Rules. For the purposes of these schedules --

(a) the general, schedule, part, and subpart headnotes, and the provisions describing the classes of imported articles and specifying the rates of duty or other import restrictions to be imposed thereon are subject to the rules of interpretation set forth herein and to such other rules of statutory interpretation, not inconsistent therewith, as have been or may be developed under administrative or judicial rulings;

(b) the titles of the various schedules, parts, and subparts and the footnotes therein are intended for convenience in reference only and have no legal or interpretative significance;

(c) an imported article which is described in two or more provisions of the schedules is classifiable in the provision which most specifically describes it; but, in applying this rule of interpretation, the following considerations shall govern:

(i) a superior heading cannot be enlarged by inferior headings indented under it but can be limited thereby;

(ii) comparisons are to be made only between provisions of coordinate or equal status, i.e., between the primary or main superior headings of the schedules or between coordinate inferior headings which are subordinate to the same superior heading;

(d) if two or more tariff descriptions are equally applicable to an article, such article shall be subject to duty under the description for which the original statutory rate is highest, and, should the highest original statutory rate be applicable to two or more of such descriptions, the article shall be subject to duty under that one of such descriptions which first appears in the schedules;

(e) in the absence of special language or context which otherwise requires --

(i) a tariff classification controlled by use (other than actual use) is to be determined in accordance with the use in the United States at, or immediately prior to, the date of importation, of articles of that class or kind to which the imported articles belong, and the controlling use is the chief use, i.e., the use which exceeds all other uses (if any) combined;

(ii) a tariff classification controlled by the actual use to which an imported article is put in the United States is satisfied only if such use is intended at the time of importation, the article is so used, and proof thereof is furnished within 3 years after the date the article is entered;

(f) an article is in chief value of a material if such material exceeds in value each other single component material of the article;

(g) a headnote provision which enumerates articles not included in a schedule, part, or subpart is not necessarily exhaustive, and the absence of a particular article from such headnote provision shall not be given weight in determining the relative specificity of competing provisions which describe such article;

(h) unless the context requires otherwise, a tariff description for an article covers such article, whether assembled or not assembled, and whether finished or not finished;

(ij) a provision for "parts" of an article covers a product solely or chiefly used as a part of such article, but does not prevail over a specific provision for such part.

11. Issuance of Rules and Regulations. The Secretary of the Treasury is hereby authorized to issue rules and regulations governing the admission of articles under the provisions of the schedules. The allowance of an importer's claim for classification, under any of the provisions of the schedules which provide for total or partial relief from duty or other import restrictions on the basis of facts which are not determinable from an examination of the article itself in its condition as imported, is dependent upon his complying with any rules or regulations which may be issued pursuant to this headnote.

12. The Secretary of the Treasury is authorized to prescribe methods of analyzing, testing, sampling, weighing, gauging, measuring, or other methods of ascertainment whenever he finds that such methods are necessary to determine the physical, chemical, or other properties or characteristics of articles for purposes of any law administered by the Customs Service.

General statistical headnotes:

1. Statistical Requirements for Imported Articles. Persons making customs entry or withdrawal of articles imported into the customs territory of the United States shall complete the entry or withdrawal forms, as provided herein and in regulations issued pursuant to law, to provide for statistical purposes information as follows:

(a) the number of the Customs district and of the port where the articles are being entered for consumption or warehouse, as shown in Statistical Annex A of these schedules;

(b) the name of the carrier or the means of transportation by which the articles were transported to the first port of unloading in the United States;

(c) the foreign port of lading;

(d) the United States port of unlading;

(e) the date of importation;

(f) the country of origin of the articles expressed in terms of the designation therefor in Statistical Annex B of these schedules;

(g) a description of the articles in sufficient detail to permit the classification thereof under the proper statistical reporting number in these schedules;

(h) the statistical reporting number under which the articles are classifiable;

(ij) gross weight in pounds for the articles covered by each reporting number when imported in vessels or aircraft;

(k) the net quantity in the units specified herein for the classification involved;

(l) the U.S. dollar value in accordance with the definition in Section 402 or 402a of the Tariff Act of 1930, as amended, for all merchandise including that free of duty or dutiable at specific rates; and

(m) such other information with respect to the imported articles as is provided for elsewhere in these schedules.

8. Statistical Annotations. (a) The statistical annotations to the Tariff Schedules of the United States consist of --

(i) the 2-digit statistical suffixes,
(ii) the indicated units of quantity,
(iii) the statistical headnotes and annexes, and
(iv) the italicized article descriptions.

(b) The legal text of the Tariff Schedules of the United States consists of the remaining text as more specifically identified in headnote 10(a) of the general headnotes and rules of interpretation.

(c) The statistical annotations are subordinate to the provisions of the legal text and cannot change their scope.

9. Statistical Reporting Number. (a) General Rule: Except as provided in paragraph (b) of this headnote, and in the absence of specific instructions to the contrary elsewhere, the statistical reporting number for an article consists of the 7-digit number formed by combining the 6-digit item number with the appropriate 2-digit statistical suffix. Thus, the statistical reporting number for live monkeys dutiable under item 100.95 is "100.9520".

(b) Wherever in the tariff schedules an article is classifiable under a provision which derives its rate of duty from a different provision, the statistical reporting number is, in the absence of specific instructions to the contrary elsewhere, the 7-digit number for the basic provision followed by the item number of the provision from which the rate is derived. Thus, the statistical reporting number of mixed apple and grape juices, not containing over 1.0 percent of ethyl alcohol by volume, is "165.6500-165.40".

4. Abbreviations. (a) The following symbols and abbreviations are used with the meanings respectively indicated below:

s. ton	-	*short ton*
C.	-	*one hundred*
Cwt.	-	*100 lbs.*
mg.	-	*milligram*
M.	-	*1,000*
bd. ft.	-	*board feet*
M. bd. ft.	-	*1,000 board feet*
mc.	-	*millicurie*
cord	-	*128 cubic feet*
square	-	*amount to cover 100 square feet of surface*
sup. ft.	-	*superficial foot*
oz.	-	*ounces avoirdupois*
fl. oz.	-	*fluid ounce*
oz. troy	-	*troy ounce*
pf. gal.	-	*proof gallon*

(b) An "X" appearing in the column for units of quantity means that no quantity (other than gross weight) is to be reported.

(c) Whenever two separate units of quantity are shown for the same article, the "v" following one of such units means that the value of the article is to be reported with that quantity.

APPENDIX A

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1968)

HISTORICAL NOTES

Amendments and Modifications

PROVISIONS	
Gen Hdnte 3(a)(i)	Language "Except as provided in headnote 6 of schedule 7, part 2, subpart E," added; language "except that all articles" deleted and language "except that all such articles" inserted in lieu thereof. Pub. L. 89-805, Secs. 1(a), (c), Nov. 10, 1966, 80 Stat. 1521, 1522, effective date Jan. 1, 1967.
	Language "Except as provided in headnote 4 of schedule 7, part 7, subpart A," added. Pub. L. 89-806, Secs. 2(b), (c), Nov. 10, 1966, 80 Stat. 1523, effective date March 11, 1967.
Gen Hdnte 3(d), (e), (f) and (g)	Headnotes 3(d), (e), and (f) redesignated as headnotes 3(e), (f), and (g), respectively, and new headnote 3(d) added. Pub. L. 89-285, Secs. 401(a), 403, Oct. 21, 1965, 79 Stat. 1021, 1022; entered into force Oct. 22, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68.
Gen Hdnte 6(b)(i)	Language "and containers of usual types ordinarily sold at retail with their contents," added. Pub. L. 89-241, Secs. 2(a), 4, Oct. 7, 1965, 79 Stat. 933, 934, effective date Dec. 7, 1965.

SCHEDULE 6.-METALS AND METAL PRODUCTS

SCHEDULE 6. - METALS AND METAL PRODUCTS

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Part 1 - Metal-Bearing Ores and Other Metal-Bearing Materials

Part 2 - Metals, Their Alloys, and Their Basic Shapes and Forms
- A. Precious Metals
- B. Iron or Steel
- C. Copper
- D. Aluminum
- E. Nickel
- F. Tin
- G. Lead
- H. Zinc
- J. Beryllium, Columbium, Germanium, Hafnium, Indium, Magnesium, Molybdenum, Rhenium, Tantalum, Titanium, Tungsten, Uranium, and Zirconium
- K. Other Base Metals

Part 3 - Metal Products
- A. Metallic Containers
- B. Wire Cordage; Wire Screen, Netting and Fencing; Bale Ties
- C. Metal Leaf and Foil; Metallics
- D. Nails, Screws, Bolts, and Other Fasteners; Locks, Builders' Hardware; Furniture, Luggage, and Saddlery Hardware
- E. Tools, Cutlery, Forks and Spoons
- F. Miscellaneous Metal Products
- G. Metal Products Not Specially Provided For

Part 4 - Machinery and Mechanical Equipment
- A. Boilers, Non-Electric Motors and Engines, and Other General-Purpose Machinery
- B. Elevators, Winches, Cranes, and Related Machinery; Earth-Moving and Mining Machinery
- C. Agricultural and Horticultural Machinery; Machinery for Preparing Food and Drink
- D. Pulp and Paper Machinery; Bookbinding Machinery; Printing Machinery
- E. Textile Machines; Laundry and Dry Cleaning Machines; Sewing Machines
- F. Machines for Working Metal, Stone, and Other Materials
- G. Office Machines
- H. Other Machines
- J. Parts of Machines

Part 5 - Electrical Machinery and Equipment

Part 6 - Transportation Equipment
- A. Rail Locomotives and Rolling Stock
- B. Motor Vehicles
- C. Aircraft and Spacecraft
- D. Pleasure Boats; Floating Structures

Schedule 6 headnotes:

1. This schedule does not cover —

   (i) chemical elements (except thorium and uranium) and isotopes which are usefully radioactive (see part 13B of schedule 4);

   (ii) the alkali metals, i.e., cesium, lithium, potassium, rubidium, and sodium (see part 2A of schedule 4); or

   (iii) certain articles and parts thereof, of metal, provided for in schedule 7 and elsewhere.

2. For the purposes of the tariff schedules, unless the context requires otherwise —

   (a) the term "precious metal" embraces gold, silver, platinum and other metals of the platinum group (iridium, osmium, palladium, rhodium, and ruthenium), and precious-metal alloys;

   (b) the term "base metal" embraces aluminum, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, calcium, chromium, cobalt, columbium, copper, gallium, germanium, hafnium, indium, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, rhenium, the rare-earth metals (including scandium and yttrium), selenium, silicon, strontium, tantalum, tellurium, thallium, thorium, tin, titanium, tungsten, uranium, vanadium, zinc, and zirconium, and base-metal alloys;

   (c) the term "metal" embraces precious metals, base metals, and their alloys; and

   (d) in determining which of two or more equally specific provisions for articles "of iron or steel", "of copper", "of aluminum", or "of" other base metals applies to an article containing two or more base metals and wholly or in chief value thereof, the classification shall be made according to the base metal which predominates by weight over each of the other base metals rather than according to the base metal in chief value.

Schedule 6 statistical headnote:

1. When refined or smelted products are withdrawn for exportation from bonded smelting or refining warehouses established under section 312, Tariff Act of 1930, as amended, that part of each such product which enters into a bonded smelting or refining warehouse as metal-bearing material without the payment of duty thereon, must be reported separately on the warehouse withdrawal form (CF 7512) to show the statistical reporting number for the imported metal-bearing material as reported on the warehouse entry form (CF 7501).

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty	
				1	2
		Subpart E. - Tools, Cutlery, Forks and Spoons			
		Subpart E headnotes:			
		1. Except for blow and other torches (items 649.31 and 649.32), abrasive wheels mounted on frameworks (item 649.39), tool tips and forms for making tool tips (item 649.53), sewing sets, pedicure or manicure sets, or combinations thereof (items 651.11 and 651.13), and except for knives, forks, spoons, and ladles, all the foregoing which are kitchen or table ware of precious metal, this subpart covers only articles with a blade, working edge, working surface or other working part of -- (i) base metal; (ii) metallic carbides on a support of base metal; (iii) natural or synthetic precious or semiprecious stones on a support of base metal; or (iv) abrasive materials on a support of base metal, provided that the articles have other functioning or working elements such as cutting teeth, edges, grooves, or flutes.			
		2. In determining the length of files and rasps (items 649.01-.07, inclusive), the tang (if any) should not be included.			
		3. The provisions for "interchangeable tools for hand tools or for machine tools" cover interchangeable tools which are designed to be fitted to hand tools or machine tools and which cannot be used independently, and include, but are not limited to, interchangeable tools for pressing, stamping, drilling, tapping, threading, boring, broaching, milling, cutting, dressing, mortising or screw-driving, but do not include saw blades, knives, or cutting blades, and do not include holding or operating devices even if attached to such interchangeable tools.			
		4. For the purposes of determining the rate of duty applicable to sets provided for in item 651.75, a specific rate of duty or a compound rate of duty for any article in the set shall be converted to its ad valorem equivalent rate, i.e., the ad valorem rate which, when applied to the full value of the article determined in accordance with section 402 or 402a of this Act, would provide the same amount of duties as the specific or compound rate.			
		5. Cases, boxes, or containers of types ordinarily sold at retail with the tools or other articles provided for in this subpart are classifiable with such articles if imported therewith.			

Item	Stat. Suffix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		Knives, spoons, and ladles, etc. (con.):			
		Forks (con.):			
		With their handles (con.):			
650.45		With rubber or plastics handles		1.8¢ each + 11% ad val.	6¢ each + 45% ad val.
	20	*Table forks (including table serving forks)*	*No.*		
	40	*Other*	*No.*		
		Other:			
650.47	00	Barbecue forks with wood handles	No.	1.8¢ each + 11% ad val.	6¢ each + 45% ad val.
650.49		Other		0.9¢ each + 16.5% ad val.	8¢ each + 65% ad val.
	20	*Table forks (including table serving forks)*	*No.*		
	40	*Other*	*No.*		
		Spoons and ladles:			
650.51	00	With sterling silver handles	No.	23% ad val.	65% ad val.
650.53	00	With silver-plated handles	No.	18.5% ad val.	50% ad val.
		With stainless steel handles:			
650.54	00	Spoons valued under 25 cents each, not over 10.2 inches in over-all length	No.	17% ad val.	40% ad val.
650.55	00	Other	No.	15% ad val.	40% ad val.
650.56		With base metal (except stainless steel) or nonmetal handles		17% ad val.	40% ad val.
	20	*Tablespoons and table ladles*	*No.*		
	40	*Other*	*No.*		
650.57	00	Other	No.	20% ad val.	65% ad val.
		Carving and butcher steels, with or without their handles:			
650.61	00	With rubber or plastics handles	No.	1.6¢ each + 11% ad val.	6¢ each + 45% ad val.
650.63	00	With wood handles	No.	3.5¢ each + 16.5% ad val.	8¢ each + 45% ad val.
650.65	00	Other	No.	4.5¢ each + 11% ad val.	16¢ each + 45% ad val.
		Razors and non-electric shavers, blades and cutting heads therefor and for electric shavers, and other parts:			
		Safety razors, and handles and frames therefor:			
650.71	00	Valued not over 50 cents each	No.	1.6¢ each + 4% ad val.	10¢ each + 30% ad val.
650.73	00	Valued over 50 cents each	No.	7.5% ad val.	10¢ each + 30% ad val.
650.75	00	Safety razor blades	No.	0.18¢ each + 5% ad val.	1¢ each + 30% ad val.
650.77	00	Non-electric shavers, and blades and cutting heads therefor and for electric shavers	X.	8% ad val.	27.5% ad val.
		Razors other than safety razors, and parts therefor:			
650.79	00	Valued not over $3 per dozen	No.	13.5¢ each + 13% ad val.	30¢ each + 50% ad val.
650.81	00	Valued over $3 per dozen	No.	1¢ each + 9% ad val.	05¢ each + 30% ad val.
		Hair clippers (except clippers with a self-contained electric motor), and cutting blades and heads for all hair clippers:			
650.83	00	Valued not over $1.75 per dozen	No.	36% ad val.	15¢ each + 45% ad val.
650.85	00	Valued over $1.75 per dozen	No.	7.5¢ each + 17% ad val.	20¢ each + 45% ad val.

APPENDIX A

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1968)

STAGED RATES AND HISTORICAL NOTES

Notes p. 6
Schedule 6,
Part 3

Staged Rates

Modifications of column 1 rates of duty by Pres. Proc. 3822 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19002 (con.):

TSUS item	Prior rate	Rate of duty, effective with respect to articles entered on and after January 1 --				
		1968	1969	1970	1971	1972
650.09	1¢ each + 12.5% ad val.	0.9¢ each + 11% ad val.	0.8¢ each + 10% ad val.	0.7¢ each + 8.5% ad val.	0.6¢ each + 7% ad val.	0.5¢ each + 6% ad val.
650.12	1¢ each + 17.5% ad val.	0.9¢ each + 15.5% ad val.	0.8¢ each + 14% ad val.	0.7¢ each + 12% ad val.	0.6¢ each + 10% ad val.	0.5¢ each + 8.5% ad val.
650.13	1¢ each + 12.5% ad val.	1.1¢ each + 11% ad val.	1¢ each + 10% ad val.	0.8¢ each + 8.5% ad val.	0.7¢ each + 7% ad val.	0.6¢ each + 6% ad val.
650.17	4¢ each + 17.5% ad val.	3.6¢ each + 15.5% ad val.	3¢ each + 14% ad val.	2.8¢ each + 12% ad val.	2.4¢ each + 10% ad val.	2¢ each + 8.5% ad val.
650.19	2¢ each + 12.5% ad val.	1.8¢ each + 11% ad val.	1.6¢ each + 10% ad val.	1.4¢ each + 8.5% ad val.	1.2¢ each + 7% ad val.	1¢ each + 6% ad val.
650.21	1¢ each + 17.5% ad val.	0.9¢ each + 15.5% ad val.	0.8¢ each + 14% ad val.	0.7¢ each + 12% ad val.	0.6¢ each + 10% ad val.	0.5¢ each + 8.5% ad val.
650.31	0.8¢ each + 10% ad val.	0.8¢ each + 9% ad val.	0.7¢ each + 8% ad val.	0.6¢ each + 7% ad val.	0.5¢ each + 6% ad val.	0.4¢ each + 5% ad val.
650.35	8¢ each + 17.5% ad val.	7¢ each + 15.5% ad val.	6¢ each + 14% ad val.	5¢ each + 12% ad val.	4¢ each + 10.5% ad val.	4¢ each + 8.5% ad val.
650.37	1¢ each + 12.5% ad val.	0.9¢ each + 11% ad val.	0.8¢ each + 10% ad val.	0.7¢ each + 8.5% ad val.	0.6¢ each + 7% ad val.	0.5¢ each + 6% ad val.
650.39	1¢ each + 12.5% ad val.	0.9¢ each + 11% ad val.	0.8¢ each + 10% ad val.	0.7¢ each + 8.5% ad val.	0.6¢ each + 7% ad val.	0.5¢ each + 6% ad val.
650.42	1¢ each + 17.5% ad val.	0.9¢ each + 15.5% ad val.	0.8¢ each + 14% ad val.	0.7¢ each + 12% ad val.	0.6¢ each + 10% ad val.	0.5¢ each + 8.5% ad val.
650.43	4¢ each + 12.5% ad val.	3.5¢ each + 11% ad val.	3¢ each + 10% ad val.	2.8¢ each + 8.5% ad val.	2.4¢ each + 7% ad val.	2¢ each + 6% ad val.
650.45	2¢ each + 12.5% ad val.	1.8¢ each + 11% ad val.	1.6¢ each + 10% ad val.	1.4¢ each + 8.5% ad val.	1.2¢ each + 7% ad val.	1¢ each + 6% ad val.
650.47	2¢ each + 12.5% ad val.	1.8¢ each + 11% ad val.	1.6¢ each + 10% ad val.	1.4¢ each + 8.5% ad val.	1.2¢ each + 7% ad val.	1¢ each + 6% ad val.
650.49	1¢ each + 17.5% ad val.	0.9¢ each + 15.5% ad val.	0.8¢ each + 14% ad val.	0.7¢ each + 12% ad val.	0.6¢ each + 10% ad val.	0.5¢ each + 8.5% ad val.
650.51	25% ad val.	22% ad val.	20% ad val.	17% ad val.	15% ad val.	12.5% ad val.
650.53	21% ad val.	18.5% ad val.	16.5% ad val.	14.5% ad val.	12.5% ad val.	10.5% ad val.
650.55	17% ad val.	15% ad val.	13.5% ad val.	11.5% ad val.	10% ad val.	8.5% ad val.
650.57	22.5% ad val.	20% ad val.	18% ad val.	15.5% ad val.	13% ad val.	11% ad val.
650.61	2¢ each + 12.5% ad val.	1.8¢ each + 11% ad val.	1.6¢ each + 10% ad val.	1.4¢ each + 8.5% ad val.	1.2¢ each + 7% ad val.	1¢ each + 6% ad val.
650.63	4¢ each + 17.5% ad val.	3.6¢ each + 15.5% ad val.	3¢ each + 14% ad val.	2.8¢ each + 12% ad val.	2.4¢ each + 10% ad val.	2¢ each + 8.5% ad val.
650.65	4¢ each + 12.5% ad val.	3.5¢ each + 11% ad val.	3¢ each + 10% ad val.	2.8¢ each + 8.5% ad val.	2.4¢ each + 7% ad val.	2¢ each + 6% ad val.
650.71	2¢ each + 5% ad val.	1.8¢ each + 4% ad val.	1.5¢ each + 4% ad val.	1.4¢ each + 3% ad val	1.2¢ each + 3% ad val	1¢ each + 2.5% ad val.
650.73	8.5% ad val.	7.5% ad val.	6.5% ad val.	5.5% ad val.	5% ad val.	4% ad val.
650.75	0.2¢ each + 6% ad val.	0.18¢ each + 5% ad val.	0.16¢ each + 4.5% ad val.	0.14¢ each + 4% ad val.	0.12¢ each + 3.5% ad val.	0.1¢ each + 3% ad val
650.77	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.	4.5% ad val.
650.79	15¢ each + 15% ad val.	13.5¢ each + 13% ad val.	12¢ each + 12% ad val.	10.5¢ each + 10% ad val	9¢ each + 9% ad val	7.5¢ each + 7.5% ad val.
650.81	15¢ each + 10% ad val.	13¢ each + 9% ad val.	12¢ each + 8% ad val.	10¢ each + 7% ad val.	9¢ each + 6% ad val.	7¢ each + 5% ad val.
650.83	40% ad val.	36% ad val.	32% ad val.	28% ad val.	24% ad val.	20% ad val.
650.85	8.5¢ each + 19% ad val.	7.5¢ each + 17% ad val.	6.8¢ each + 15% ad val.	5.9¢ each + 13% ad val.	5.1¢ each + 11% ad val.	4¢ each + 9.5% ad val.
650.87	1.75¢ each + 22.5% ad val.	1.57¢ each + 20% ad val.	1.4¢ each + 18% ad val.	1.24¢ each + 15.5% ad val.	1.05¢ each + 13% ad val.	0.87¢ each + 11% ad val.
650.89	7.5¢ each + 22.5% ad val.	6.75¢ each + 20% ad val.	6¢ each + 18% ad val.	5.25¢ each + 15.5% ad val.	4.5¢ each + 13% ad val.	3.75¢ each + 11% ad val.
651.01	38% ad val.	34% ad val.	30% ad val.	26.5% ad val.	22.5% ad val.	19% ad val.
651.03	25.5% ad val.	22.5% ad val.	20% ad val.	17.5% ad val.	15% ad val.	12.5% ad val.
651.04	19% ad val	17% ad val.	15% ad val.	13% ad val	11% ad val.	9.5% ad val.

STAGED RATES AND HISTORICAL NOTES

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Statistical Notes--(con.)

PROVISION	Effective date
50.11--See Other Amendments and Modifications	
20--Knives valued under 25 cents each transferred from 927.5140 & 927.6140	Oct. 12, 1967
Disc. (transferred to 650.1000 & 650.1800)	Jan. 1, 1968
40--Disc. (transferred to 650.1800)	do
50.12--See other Amendments and Modifications	
00--Estab. (transferred from 650.1120pt & 40)	Jan. 1, 1968
50.38--See Other Amendments and Modifications	
00--Estab. (transferred from 650.3920pt)	Jan. 1, 1968
50.39--See Other Amendments and Modifications	
00--Estab. (transferred from 650.3920pt & 40)	Jan. 1, 1968
20--Forks valued under 25 cents each transferred from 927.5060 & 927.6060	Oct. 12, 1967
Disc. (transferred to 650.3800 & 650.3900)	Jan. 1, 1968
40--Disc. (transferred to 650.3900)	do
50.40--See Other Amendments and Modifications	
00--Estab. (transferred from 650.4180pt)	Jan. 1, 1968
50.41--See Other Amendments and Modifications	
20--Forks valued under 25 cents each transferred from 927.5180 & 927.6180	Oct. 12, 1967
Disc. (transferred to 650.4000 & 650.4200)	Jan. 1, 1968
40--Disc. (transferred to 650.4200)	do
50.42--See Other Amendments and Modifications	
00--Estab. (transferred from 650.4120pt & 40)	Jan. 1, 1968
50.43--	
00--Estab. (transferred from 650.4320 & 40)	Jan. 1, 1968
20--Disc. (transferred to 650.4300)	do
40--Disc. do	do
50.54--See Other Amendments and Modifications	
00--Estab. (transferred from 650.5520pt)	Jan. 1, 1968
50.55--See Other Amendments and Modifications	
00--Estab. (transferred from 650.5520pt & 40)	Jan. 1, 1968
20--Spoons valued under 25 cents each transferred from 927.5240 & 927.6240	Oct. 12, 1967
Disc. (transferred to 650.5400 & 650.5500)	Jan. 1, 1968
40--Disc. (transferred to 650.5500)	do
50.77--	
00--Estab. (transferred from 650.7720 & 40)	Jan. 1, 1966
20--Disc. (transferred to 650.7700)	do
40--Disc. do	do
51.15--See Other Amendments and Modifications	
00--Estab. (transferred from 651.2400pt)	Dec. 7, 1965
51.33--See Other Amendments and Modifications	
00--Estab. (transferred from 651.4720pt-651.5500pt)	Dec. 7, 1965

PROVISION	Effective date
Hdng.	
651.50--See Other Amendments and Modifications for additional language covering items 651.30-651.55	Jan. 1, 1968
651.75--See Other Amendments and Modifications	
00--Disc. (transferred to 651.7520, 40 & 60)	May 1, 1966
10--Estab. (transferred from 651.7520 & 40pt)	Jan. 1, 1968
20--Estab. (transferred from 651.7500pt)	May 1, 1966
Disc. (transferred to 651.7510)	Jan. 1, 1968
30--Estab. (transferred from 651.7540pt)	do
40--Estab. (transferred from 651.7500pt)	May 1, 1966
Disc. (transferred to 651.7510 & 30)	Jan. 1, 1968
60--Estab. (transferred from 651.7500pt)	May 1, 1966
Subpt F--See Other Amendments and Modifications for clarifying language covering items 652.12-652.35	
652.10--See Other Amendments and Modifications	
00--Estab. (transferred from 652.0900pt)	Dec. 20, 1965
652.33--See Other Amendments and Modifications	
00--Estab. (transferred from 652.3800pt)	Dec. 7, 1965
652.39--See Other Amendments and Modifications	
00--Estab. (transferred from 652.1280pt-652.3800pt)	Dec. 20, 1965
652.40--See Other Amendments and Modifications	
00--Disc. (transferred to 652.4100 & 652.4200)	Dec. 7, 1965
652.41--See Other Amendments and Modifications	
00--Estab. (transferred from 652.4000pt)	Dec. 7, 1965
652.42--See Other Amendments and Modifications	
00--Estab. (transferred from 652.4000pt)	Dec. 7, 1965
652.65--	
00--Estab. (transferred from 652.6520 & 40)	Jan. 1, 1968
20--Disc. (transferred to 652.6500)	do
40--Disc. do	do
652.76--See Other Amendments and Modifications	
00--Estab. (transferred from 652.7500pt)	Dec. 20, 1965
652.84--See Other Amendments and Modifications	
00--Estab. (transferred from 652.8600pt)	Dec. 20, 1965
652.86--See Other Amendments and Modifications	
00--Springs and leaves for springs, not Canadian original motor-vehicle equipment, transferred to 652.8400	Dec. 20, 1965
652.88--See Other Amendments and Modifications	
00--Estab. (transferred from 652.8700pt)	Dec. 7, 1965
652.89--See Other Amendments and Modifications	
00--Hair springs, not Canadian original motor-vehicle equipment, transferred to 652.8600; springs and leaves for springs, n.e.s., transferred to 652.8800 and 652.8840	Dec. 20, 1965

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		PART 4. - MACHINERY AND MECHANICAL EQUIPMENT			
		Part 4 headnotes:			
		1. This part does not cover -- (i) bobbins, spools, cops, tubes, and similar holders; (ii) belts and belting; (iii) machine clothing, other than card clothing provided for in items 670.52 and 670.54; (iv) articles of textile materials; articles of stone, of ceramic ware, of glass, or of other materials provided for in schedule 5; or articles of leather or of fur on the skin; or (v) articles and parts of articles specifically provided for elsewhere in the schedules.			
		2. Unless the context requires otherwise, and subject to headnote 1 to subpart A of this part, a multi-purpose machine is classifiable according to its principal purpose, but if such a machine is not described in a superior tariff heading as to its principal purpose, or if it has no one principal purpose, it is classifiable in subpart H of this part as a machine not specially provided for.			
		3. An electric motor or other power unit imported with a machine is classifiable with such machine as an entirety if fitted thereto when imported, or, if the machine or its framework is designed to receive the power unit, or if the shipment includes a common base designed to receive both the power unit and the machine.			
		Subpart A. - Boilers, Non-Electric Motors and Engines, and Other General Purpose Machinery			
		Subpart A headnote:			
		1. A machine or appliance which is described in this subpart and also is described elsewhere in this part is classifiable in this subpart.			
660.10	00	Steam and other vapor generating boilers (except central heating hot water boilers capable also of producing low pressure steam), and parts thereof	X	11.5% ad val.	45% ad val.
660.15	00	Economizers, superheaters, soot removers, gas recoverers, and auxiliary plants for use with steam and other vapor generating boilers; condensers for vapor engines and power units; all of the foregoing and parts thereof	X	12.5% ad val.	45% ad val.

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
670.90	00	Cordage machines and parts thereof..................	X.......	10.5% ad val.	35% ad val.
		Sewing machines and parts thereof, including furniture specially designed for such machines:			
672.05	00	Sewing machines specially designed to join footwear soles to uppers, and parts thereof (except needles)..................	X.......	Free	Free
		Sewing machines other than those in item 672.05:			
672.10	00	Valued not over $10 each..................	No.......	6.5% ad val.	15% ad val.
672.15		Valued over $10 each..................	....	9% ad val.	30% ad val.
	20	*Specially designed for industrial or commercial use..................*	*No.*		
	40	*Other..................*	*No.*		
		Parts:			
672.20	00	Needles..................	M.......	67¢ per 1,000 + 15% ad val.	$1.[illegible] per 1,000 + 40% ad val.
672.22	00	Shuttles..................	No.......	21.5% ad val.	35% ad val.
672.25		Other..................	....	9% ad val.	40% ad val.
	80	*Parts of metal..................*	*X*		
	90	*Other..................*	*X*		

Subpart F. - Machines for Working Metal, Stone, and Other Materials

Subpart F headnotes:

1. For the purposes of this subpart --
   (a) the term "machine tool" means any machine used for shaping or surface-working --
      (i) metals (including metallic carbides);
      (ii) stone, ceramics, concrete, asbestos-cement and like mineral materials, or glass in the cold, or
      (iii) wood, cork, bone, hard rubber or plastics, or other hard materials,
   whether by cutting away or otherwise removing the material or by changing its shape or form without removing any of it, but does not include rolling mills (item 674.20) or the hand-directed or -controlled tools provided for in items 674.60 and 674.70 of this subpart and in item 683.20 of part 5 of this schedule, and
   (b) the term "metal-working" includes metallic-carbide-working.

Subpart F statistical headnote:

1. For the purposes of this subpart --
(a) "drilling machines" means those machines which are specially designed for the primary purpose of cutting an initial hole in metal; and
(b) "metal-cutting machine tools" means those machine tools which shape or surface-work metal by removing metal in the form of [illegible] and similar form,

Item	Stat. Suffix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		Calculating machines; accounting machines, cash registers, postage-franking machines, ticket-issuing machines, and similar machines, all the foregoing incorporating a calculating mechanism:			
676.15	00	Accounting, computing, and other data-processing machines	No.	10% ad val.	35% ad val.
676.20		Calculating machines specially constructed for multiplying and dividing		9% ad val.	35% ad val.
	20	*Ten-key keyboard, printing*	No.		
	40	*Ten-key keyboard, non-printing*	No.		
	60	*Rotary, full keyboard*	No.		
	80	*Other*	No.		
676.22	00	Cash registers	No.	9% ad val.	35% ad val.
676.23		Adding machines		11% ad val.	35% ad val.
		Electric:			
	20	*Ten-key keyboard*	No.		
	40	*Other*	No.		
		Nonelectric:			
	70	*With keyboard of 10 or more keys*	No.		
	80	*Other*	No.		
676.25	00	Other	No.	9.5% ad val.	35% ad val.
676.30		Office machines not specially provided for		9% ad val.	35% ad val.
	20	*Office copying machines*	No.		
	30	*Data processing machines*	No.		
	50	*Other*	No.		
		Parts of the foregoing:			
676.50	00	Typewriter parts	X	17% ad val.	45% ad val.
676.52	00	Other	X	9.5% ad val.	35% ad val.
		Subpart H. - Other Machines			
678.10	00	Shoe machinery and parts thereof	X	Free	Free
678.20		Machinery for sorting, screening, separating, washing, crushing, grinding, or mixing earth, stone, ores, or other mineral substances in solid (including powder or paste) form; machinery for agglomerating, molding, or shaping solid mineral fuels, ceramic paste, unhardened cements, plastering materials or other mineral products in powder or paste form; machines for forming foundry molds of sand; all the foregoing and parts thereof		9% ad val.	35% ad val.
	10	*Machinery for sorting, screening, separating, washing, crushing, grinding, or mixing earth, stone, ores, or other mineral substances in solid (including powder or paste) form*	No.		
	20	*Parts for the foregoing*	X		
		Other:			
	30	*Designed for use with ceramic paste, unhardened cements, and plastering materials*	No.		
	40	*Machines for forming foundry molds of sand*	No.		
	50	*Other machinery*	No.		
	60	*Parts for the foregoing*	X		
		Glass-working machines (other than machines for working glass in the cold); machines for assembling electric filament and discharge lamps and electronic tubes; all the foregoing and parts thereof:			
678.30		Glass-working machines and parts thereof		10% ad val.	35% ad val.
	20	*Machines*	No.		
	40	*Parts*	X		
678.32	00	Other	X	9% ad val.	35% ad val.

Item	Stat Suffix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
678.35	00	Machines used for molding or otherwise forming rubber or plastics articles, and parts thereof	X	10% ad val.	35% ad val.
678.40	00	Automatic vending machines, and parts thereof	X	10% ad val.	35% ad val.
678.45		Tobacco leaf stripping or cutting machines; industrial cigar- or cigarette-making machines, whether or not equipped with an auxiliary packaging device; all the foregoing and parts thereof		11% ad val.	35% ad val.
	20	*Industrial cigarette-making machines*	No.		
	40	*Parts of the foregoing*	X		
	60	*Other*	X		
678.50		Machines not specially provided for, and parts thereof		9% ad val.	35% ad val.
		Tape players and combination machines containing tape players, nspf:			
	20	*Designed exclusively for motor-vehicle installation*	No.		
	40	*Other*	No.		
	60	*Other*	X		
678.51	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	X	Free	
		Subpart J. - Parts of Machines			
680.05	00	Molding boxes for metal foundry	No	17% ad val.	45% ad val.
680.07	00	Molders' patterns for the manufacture of castings	No	11% ad val.	50% ad val.
		Molds of types used for metal (except ingot molds), for metallic carbides, for glass, for mineral materials, or for rubber or plastics materials:			
		Molds used for rubber or plastics materials:			
680.11	00	Shoe machinery molds	No	Free	Free
680.12	00	Other	No	10% ad val.	35% ad val.
680.15	00	Other	No	10% ad val.	35% ad val.
		Taps, cocks, valves, and similar devices, however operated, used to control the flow of liquids, gases, or solids, all the foregoing and parts thereof:			
		Hand-operated and check, and parts thereof:			
680.20	00	Of copper	Lb	1.1¢ per lb. + 16% ad val.	3¢ per lb. + 45% ad val.
680.21	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	Lb	Free	
680.22		Other		16% ad val.	45% ad val.
	20	*Of iron or steel*	Lb.		
	40	*Other*	Lb.		
680.23	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	Lb	Free	
		Other:			
680.25	00	Ballcock mechanisms, and parts	X	10% ad val.	35% ad val.
680.27	00	Other	X	9% ad val.	35% ad val.
680.28	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	X	Free	
680.30		Antifriction balls and rollers		3.5¢ per lb. + 11% ad val.	10¢ per lb. + 45% ad val.
	20	*Balls*	Lb.		
	40	*Rollers*	Lb.		
680.31	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	Lb	Free	

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty	
				1	2
		Ball or roller bearings, including such bearings with integral shafts, and parts thereof:			
680.33	00	Ball bearings with integral shafts	Lb.	10.5% ad val.	35% ad val.
680.34	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	Lb.	Free	
680.35		Other		3¢ per lb. + 13.5% ad val.	10¢ per lb. + 45% ad val.
	20	*Ball bearings and parts (including parts for articles provided for in item 680.33)*	*Lb.*		
	30	*Tapered roller bearings and parts*	*Lb.*		
	50	*Spherical roller bearings and parts*	*Lb.*		
	60	*Other bearings and parts*	*Lb.*		
680.36	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	Lb.	Free	
680.40	00	Forged steel grinding balls	Lb.	10.5% ad val.	27.5% ad val.
		Gear boxes and other speed changers with fixed, multiple, or variable ratios; pulleys, pillow blocks, and shaft couplings; torque converters; chain sprockets; clutches; and universal joints; all the foregoing (except parts of agricultural or horticultural machinery and implements provided for in item 666.00 and parts of motor vehicles, aircraft, and bicycles) and parts thereof:			
		Gear boxes and other speed changers, and parts thereof:			
680.45	00	Fixed ratio speed changers, multiple and variable ratio speed changers each ratio of which is selected by manual manipulation, and parts thereof	X	8% ad val.	27.5% ad val.
680.47	00	Other speed changers	No.	$2.02 each + 31.5% ad val.	$4.50 each + 65% ad val.
680.48	00	Other parts	X	40% ad val.	65% ad val.
680.50	00	Pulleys, pillow blocks, shaft couplings, and parts thereof	X	13% ad val.	45% ad val.
680.52	00	Torque converters, and parts thereof	X	8% ad val.	27.5% ad val.
680.54	00	Chain sprockets, clutches, universal joints, and parts thereof	X	13% ad val.	45% ad val.
680.57	00	Lubrication fittings	X	17% ad val.	45% ad val.
680.58	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	X	Free	
680.60	00	Cast-iron (except malleable cast-iron) rollers for machines, not alloyed and not advanced beyond cleaning, and machined only for the removal of fins, gates, sprues, and risers or to permit location in finishing machinery	Lb.	2.5% ad val.	10% ad val.
680.70	00	Kits, each containing three or more replacement parts however provided for elsewhere in the schedules, put up and packaged for the repair of hydraulic-brake master or wheel cylinders or for the repair of internal-combustion engine pumps or carburetors	No.	9% ad val.	35% ad val.
680.90	00	Machinery parts not containing electrical features and not specially provided for	X	17% ad val.	45% ad val.
680.91	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	X	Free	

APPENDIX A
TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1968)

STAGED RATES AND HISTORICAL NOTES

Notes p. 3
Schedule 6,
Part 4

Staged Rates

Modifications of column 1 rates of duty by Pres. Proc. 3822 (Kennedy Round), Dec 16, 1967, 32 F.R. 19002 (con.):

TSUS item	Prior rate	Rate of duty, effective with respect to articles entered on and after January 1 --				
		1968	1969	1970	1971	1972
670.54	25% ad val.	22% ad val.	20% ad val.	17% ad val.	15% ad val.	12.5% ad val.
670.56	20% ad val.	25% ad val.	22% ad val.	19.5% ad val.	16.5% ad val.	14% ad val.
670.58	$1 per 1,000 + 30% ad val.	90¢ per 1,000 + 27% ad val.	80¢ per 1,000 + 24% ad val.	70¢ per 1,000 + 21% ad val.	60¢ per 1,000 + 18% ad val.	50¢ per 1,000 + 15% ad val.
670.60	75¢ per 1,000 + 25% ad val.	67.5¢ per 1,000 + 22% ad val.	60¢ per 1,000 + 20% ad val.	52.5¢ per 1,000 + 17% ad val.	45¢ per 1,000 + 15% ad val.	37¢ per 1,000 + 12.5% ad val.
670.62	$1.15 per 1,000 + 40% ad val.	$1.03 per 1,000 + 36% ad val.	92¢ per 1,000 + 32% ad val.	80¢ per 1,000 + 28% ad val.	69¢ per 1,000 + 24% ad val.	57¢ per 1,000 + 20% ad val.
670.64	75¢ per 1,000 + 20% ad val.	67¢ per 1,000 + 18% ad val.	60¢ per 1,000 + 16% ad val.	52¢ per 1,000 + 14% ad val.	45¢ per 1,000 + 12% ad val.	37¢ per 1,000 + 10% ad val.
670.66	24% ad val.	21.5% ad val.	19% ad val.	16.5% ad val.	14% ad val.	12% ad val.
670.68	35% ad val.	31% ad val.	28% ad val.	24% ad val.	21% ad val.	17.5% ad val.
670.70	20% ad val.	18% ad val.	16% ad val.	14% ad val.	12% ad val.	10% ad val.
670.72	21¢ per 1,000 + 25.5% ad val.	18.5¢ per 1,000 + 22.5% ad val.	16¢ per 1,000 + 20% ad val.	14¢ per 1,000 + 17.5% ad val.	12¢ per 1,000 + 15% ad val.	10¢ per 1,000 + 12.5% ad val.
670.90	12% ad val.	10.5% ad val.	9.5% ad val.	8% ad val.	7% ad val.	6% ad val.
671.10	7.5% ad val.	6.5% ad val.	6% ad val.	5% ad val.	4% ad val.	3.5% ad val.
672.15	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
672.20	75¢ per 1,000 + 20% ad val.	67¢ per 1,000 + 18% ad val.	60¢ per 1,000 + 16% ad val.	52¢ per 1,000 + 14% ad val.	45¢ per 1,000 + 12% ad val.	37¢ per 1,000 + 10% ad val.
672.22	24% ad val.	21.5% ad val.	19% ad val.	16.5% ad val.	14% ad val.	12% ad val.
672.25	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
674.10	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.	4.5% ad val.
674.20	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
674.30	20% ad val.	18% ad val.	16% ad val.	14% ad val.	12% ad val.	10% ad val.
674.32	12% ad val.	10.5% ad val.	9.5% ad val.	8% ad val.	7% ad val.	6% ad val.
674.35	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
674.40	11.5% ad val.	10% ad val.	9% ad val.	8% ad val.	6.5% ad val.	5.5% ad val.
674.42	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
674.50	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
674.51	3% ad val.	2% ad val.	1.5% ad val.	1% ad val.	0.5% ad val.	Free
674.52	20% ad val.	18% ad val.	16% ad val.	14% ad val.	12% ad val.	10% ad val.
674.53	14% ad val.	12.5% ad val.	11% ad val.	9.5% ad val.	8% ad val.	7% ad val.
674.55	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
674.56	19% ad val.	17% ad val.	15% ad val.	13% ad val.	11% ad val.	9.5% ad val.
674.60	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
674.70	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.	4.5% ad val.
674.75	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.	4.5% ad val.
674.80	19% ad val.	17% ad val.	15% ad val.	13% ad val.	11% ad val.	9.5% ad val.
674.90	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.	4.5% ad val.
676.07	11.5% ad val.	10% ad val.	9% ad val.	8% ad val.	6.5% ad val.	5.5% ad val.
676.10	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
676.12	8.5% ad val.	7.5% ad val.	6.5% ad val.	5.5% ad val.	5% ad val.	4% ad val.
676.15	11.5% ad val.	10% ad val.	9% ad val.	8% ad val.	6.5% ad val.	5.5% ad val.
676.20	10.5% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
676.22	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
676.25	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
676.45	11% ad val.	9.5% ad val.	8.5% ad val.	7.5% ad val.	6.5% ad val.	5.5% ad val.
676.50	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
676.52	19% ad val.	17% ad val.	15% ad val.	13% ad val.	11% ad val.	9.5% ad val.
676.54	11% ad val.	9.5% ad val.	8.5% ad val.	7.5% ad val.	6.5% ad val.	5.5% ad val.
678.20	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
678.30	11.5% ad val.	10% ad val.	9% ad val.	8% ad val.	6.5% ad val.	5.5% ad val.
678.32	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
678.35	11.5% ad val.	10% ad val.	9% ad val.	8% ad val.	6.5% ad val.	5.5% ad val.
678.40	11.5% ad val.	10% ad val.	9% ad val.	8% ad val.	6.5% ad val.	5.5% ad val.

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Staged Rates

Modifications of column 1 rates of duty by Pres. Proc. 3822 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19002 (con.):

TSUS item	Prior rate	Rate of duty, effective with respect to articles entered on and after January 1 --				
		1968	1969	1970	1971	1972
678.45	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
678.50	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
680.05	19% ad val.	17% ad val.	15% ad val.	13% ad val.	11% ad val.	9.5% ad val.
680.07	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
680.12	11.5% ad val.	10% ad val.	9% ad val.	8% ad val.	6.5% ad val.	5.5% ad val.
680.15	11.5% ad val.	10% ad val.	9% ad val.	8% ad val.	6.5% ad val.	5.5% ad val.
680.20	1.275¢ per lb. + 18% ad val.	1.1¢ per lb. + 16% ad val.	1¢ per lb. + 14% ad val.	0.8¢ per lb. + 12.5% ad val.	0.7¢ per lb. + 10.5% ad val.	0.6¢ per lb. + 9% ad val.
680.25	11.5% ad val.	10% ad val.	9% ad val.	8% ad val.	6.5% ad val.	5.5% ad val.
680.27	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
680.30	4¢ per lb. + 12.5% ad val.	3.5¢ per lb. + 11% ad val.	3¢ per lb. + 10% ad val.	2.8¢ per lb. + 8.5% ad val.	2.4¢ per lb. + 7% ad val.	2¢ per lb. + 6% ad val.
680.33	12% ad val.	10.5% ad val.	9.5% ad val.	8% ad val.	7% ad val.	6% ad val.
680.35	3.4¢ per lb. + 15% ad val.	3¢ per lb. + 13.5% ad val.	2¢ per lb. + 12% ad val.	2¢ per lb. + 10.5% ad val.	2¢ per lb. + 9% ad val.	1.7¢ per lb. + 7.5% ad val.
680.40	12% ad val.	10.5% ad val.	9.5% ad val.	8% ad val.	7% ad val.	6% ad val.
680.45	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.	4.5% ad val.
680.47	$2.25 each + 35% ad val.	$2.02 each + 31.5% ad val.	$1.80 each + 28% ad val.	$1.57 each + 24.5% ad val.	$1.35 each + 21% ad val.	$1.12 each + 17.5% ad val.
680.48	45% ad val.	40% ad val.	36% ad val.	31% ad val.	27% ad val.	22.5% ad val.
680.52	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.	4.5% ad val.
680.57	19% ad val.	17% ad val.	15% ad val.	13% ad val.	11% ad val.	9.5% ad val.
680.60	3% ad val.	2.5% ad val.	2% ad val.	2% ad val.	1.5% ad val.	1.5% ad val.
680.70	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
680.90	19% ad val.	17% ad val.	15% ad val.	13% ad val.	11% ad val.	9.5% ad val.

Other Amendments and Modifications

	PROVISION
Part 4--Headnote 1(iv) ("Jacquard cards") deleted and headnotes 1(v) and 1(vi) redesignated as headnotes 1(iv), 1(v), and 1(vi)	Language "or in agricultural or horticultural machinery or implements provided for in item 666.00" added to article description. Pub. L. 89-241, Secs. 3(a), 49(c), Oct. 7, 1965, 79 Stat. 933, 941, effective date Dec. 7, 1965.
660.43, 660.45, 660.47, 660.51, 660.53, 660.55, 660.56, 660.86	Items 660.43, 660.45, 660.47, 660.51, 660.53, 660.55, and 660.86 added. Pub. L. 89-283, Secs. 401(a), 405(d), Oct. 21, 1965, 79 Stat. 1021, 1023; entered into force Dec. 20, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68; effective with respect to articles entered on and after Jan. 18, 1965.
660.90--Item 660.90 (column 1 rate--12% ad val.; column 2 rate--35% ad val.) deleted and items 660.92 and 660.94 and heading immediately preceding item 660.92 added in lieu thereof. Pub. L. 89-241, Secs. 2(a), 36(c), Oct. 7, 1965, 79 Stat. 933, 940, effective date Dec. 7, 1965.	
660.93--Items 660.93 and 660.95 added. Pub. L. 89-283, Secs. 401(a), 405(d), Oct. 21, 1965, 79 Stat. 1021, 1023, entered into force Dec. 20, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68, effective with respect to articles entered on and after Jan. 18, 1965.	
661.09--Item 661.10 (column 1 rate--14% ad val.; column 2 rate--35% ad val.) deleted and new items 661.09 and 661.10 and heading immediately preceding item 661.09 added in lieu thereof. Pub. L. 89-241, Secs. 2(a), 47, Oct. 7, 1965, 79 Stat. 933, 943, effective date Dec. 7, 1965.	

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Other Amendments and Modifications--(con.)

PROVISION

661.11--Items 661.11, 661.13, 661.16, 661.21, and 661.36 added.
661.13 Pub. L. 89-283, Secs. 401(a), 405(d), Oct. 21, 1965,
661.16 79 Stat. 1021, 1025, entered into force Dec. 20,
661.21 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965
661.36 Supp., p. 68; effective with respect to articles entered on and after Jan. 18, 1965.

661.65--Language "shoe machinery," added to heading immediately
661.70 preceding item 661.65. Pub. L. 89-241, Secs. 2(a), 45(b), Oct. 7, 1965, 79 Stat. 933, 942, effective date Dec. 7, 1965.

661.92--Item 661.92 (column 1 rate--11.5% ad val.; column 2
661.95 rate--35% ad val.) deleted and new items 661.92 and 661.95 and heading immediately preceding item 661.92 added in lieu thereof. Pub. L. 89-241, Secs. 2(a), 48(a), Oct. 7, 1965, 79 Stat. 933, 943, effective date Dec. 7, 1965.

661.93--Items 661.93 and 661.96 added. Pub. L. 89-283,
661.96 Secs. 401(a), 405(d), Oct. 21, 1965, 79 Stat. 1021, 1025, entered into force Dec. 20, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68; effective with respect to articles entered on and after Jan. 18, 1965.

662.10--Column 1 rate of duty of 9% ad val. reduced to 8% ad val.
on Jan. 1, 1967. General headnote 3(g).

662.36--Item 662.36 added. Pub. L. 89-283, Secs. 401(a), 405(d), Oct. 21, 1965, 79 Stat. 1021, 1025, entered into force Dec. 20, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68, effective with respect to articles entered on and after Jan. 18, 1965.

662.45--Language ", self-contained, having a capacity over 5 gallons;" deleted from article description and language "(except sprayers, self-contained, having a capacity not over 5 gallons)" inserted in lieu thereof. Pub. L. 89-241, Secs. 2(a), 10(b), Oct. 7, 1965, 79 Stat. 933, 93", effective date Dec. 7, 1965.

662.51--Items 662.51 and 664.11 added. Pub. L. 89-283, Secs.
664.11 401(a), 405(d), Oct. 21, 1965, 79 Stat. 1021, 1025, entered into force Dec. 20, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68, effective with respect to articles entered on and after Jan. 18, 1965.

Subpt C--Language "(except item 688.40)" added. Pub. L. 89-241,
hdnte 1 Secs. 2(a), 49(a), Oct. 7, 1965, 79 Stat. 933, 943, effective date Dec. 7, 1965.

666.00--Language "milking machines, on-farm equipment for the handling or drying of agricultural or horticultural products," added to article description. Pub. L. 89-241, Secs. 2(a), 49(b), Oct. 7, 1965, 79 Stat. 933, 943, effective date Dec. 7, 1965.

672.05--Language ", and parts thereof (except needles)" added to article description. Pub. L. 89-241, Secs. 2(a), 45(c), Oct. 7, 1965, 79 Stat. 933, 943, effective date Dec. 7, 1965.

678.51--Item 678.51 added. Pub. L. 89-283, Secs. 401(a), 405(d), Oct. 21, 1965, 79 Stat. 1021, 1025; entered into force Dec. 20, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68; effective with respect to articles entered on and after Jan. 18, 1965.

PROVISION

680.10--Item 680.10 (column 1 rate--11.5% ad val.; column 2
680.11 rate--35% ad val.) deleted and items 680.11 and
680.12 680.12 and heading immediately preceding item 680.11 added in lieu thereof. Pub. L. 89-241, Secs. 2(a), 45(d), Oct. 7, 1965, 79 Stat. 933, 943, effective date Dec. 7, 1965.

680.20--Language ", and parts thereof" added to heading im-
680.22 mediately preceding item 680.20. Pub. L. 89-241, Secs. 2(a), 50(b), Oct. 7, 1965, 79 Stat. 933, 944, effective date Dec. 7, 1965.

680.21--Items 680.21, 680.23, 680.28, and 680.31 added.
680.23 Pub. L. 89-283, Secs. 401(a), 405(d), Oct. 21,
680.28 1965, 79 Stat. 1021, 1025; entered into force
680.31 Dec. 20, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68; effective with respect to articles entered on and after Jan. 18, 1965.

680.34--Item 680.35 (column 1 rate--3.4¢ per lb. + 15% ad
680.35 val; column 2 rate--10¢ per lb. + 45% ad val.) deleted and new items 680.34 and 680.35 and heading immediately preceding item 680.34 added in lieu thereof. Pub. L. 89-241, Secs. 2(a), 36(d), Oct. 7, 1965, 79 Stat. 933, 940, effective date Dec. 7, 1965.

680.33--Item 680.34 redesignated as item 680.33 and new items
680.34 680.34 and 680.36 added. Pub. L. 89-283, Secs.
680.36 401(a), 405(d), Oct. 21, 1965, 79 Stat. 1021, 1025; entered into force Dec. 20, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68; effective with respect to articles entered on and after Jan. 18, 1965.

680.45--Language "all the foregoing and parts thereof (ex-
680.47 cept parts of motor vehicles, aircraft, and
680.48 bicycles)" deleted from heading preceding item
680.50 680.45 and language "all the foregoing (except
680.52 parts of agricultural or horticultural machinery
680.54 and implements provided for in item 666.00 and parts of motor vehicles, aircraft, and bicycles) and parts thereof" inserted in lieu thereof. Pub. L. 89-241, Secs. 2(a), 49(d), Oct. 7, 1965, 79 Stat. 933, 943, effective date Dec. 7, 1965.

680.45--Language "multiple and variable ratio speed changers each ratio of which is selected by manual manipulation," added to article description. Pub. L. 89-241, Secs. 2(a), 51, Oct. 7, 1965, 79 Stat. 933, 944, effective date Dec. 7, 1965.

680.58--New item 680.58 added. Pub. L. 89-283, Secs. 401(a), 405(d), Oct. 21, 1965, 79 Stat. 1021, 1025; entered into force Dec. 20, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68; effective with respect to articles entered on and after Jan. 18, 1965.

680.60--Added as original item 680.58. Pub. L. 89-241, Secs. 2(a), 48(b), Oct. 7, 1965, 79 Stat. 933, 943, effective date Dec. 7, 1965.
Redesignated as new item 680.60. Pub. L. 89-283, Secs. 401(a), 405(d), Oct. 21, 1965, 79 Stat. 1021, 1025; entered into force Dec. 20, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68; effective with respect to articles entered on and after Jan. 18, 1965.

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Other Amendments and Modifications--(con.)

PROVISION

680.70--Added as item 680.59. Pub. L. 89-241, Secs. 2(a), 36(c), Oct. 7, 1965, 79 Stat. 933, 940, effective date Dec. 7, 1965.
Redesignated as item 680.70. Pub. L. 89-283, Secs. 401(a), 405(d), Oct. 21, 1965, 79 Stat. 1021, 1025; entered into force Dec. 20, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68; effective with respect to articles entered on and after Jan. 18, 1965.

PROVISION

680.90--Original item 680.60 redesignated as item 680.90. Pub. L. 89-283, Secs. 401(a), 405(d), Oct. 21, 1965, 79 Stat. 1021, 1025; entered into force Dec. 20, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68; effective with respect to articles entered on and after Jan. 18, 1965.

680.91--Item 680.91 added. Pub. L. 89-283, Secs. 401(a), 405(d), Oct. 21, 1965, 79 Stat. 1021, 1025; entered into force Dec. 20, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68; effective with respect to articles entered on and after Jan. 18, 1965.

Statistical Notes

PROVISION	Effective date
660.40--See Other Amendments and Modifications	
00--Piston-type engines to be installed in agricultural or horticultural machinery transferred from 660.4200 and 660.4450	Dec. 7, 1965
660.43--See Other Amendments and Modifications	
00--Estab. (transferred from 660.4840pt)	Dec. 20, 1965
660.44--	
10--Disc. (transferred to 660.4410)	Jan. 1, 1966
15--Estab. (transferred from 660.4410 & 301)	do
20--Disc. (transferred to 660.4415)	do
30--Articles subject to Automotive Products Trade Act (APTA) transferred to 660.4500	Dec. 20, 1965
660.45--See Other Amendments and Modifications	
00--Estab. (transferred from 660.4430pt)	Dec. 20, 1965
660.46--	
00--Articles subject to APTA transferred to 660.4700	Dec. 20, 1965
660.47--See Other Amendments and Modifications	
00--Estab. (transferred from 660.4660pt)	Dec. 20, 1965
660.50--	
00--Unit of quantity changed from "X" to "lb."	Dec. 7, 1965
Articles subject to APTA transferred to 660.5100	Dec. 20, 1965
660.51--See Other Amendments and Modifications	
00--Estab. (transferred from 660.5000pt)	Dec. 20, 1965
660.52--	
00--Certain articles transferred to 680.7000	Dec. 20, 1965
Articles subject to APTA transferred to 660.5300	do
660.53--See Other Amendments and Modifications	
00--Estab. (transferred from 660.5200pt)	Dec. 20, 1965

PROVISION	Effective date
660.54--	
00--Articles subject to APTA transferred to 660.5600	Dec. 20, 1965
660.55--See Other Amendments and Modifications	
00--Estab. (transferred from 660.5400pt)	Dec. 20, 1965
660.56--See Other Amendments and Modifications	
00--Estab. (transferred from 660.5500pt)	Dec. 20, 1965
660.90--See Other Amendments and Modifications	
20--Disc. (transferred to 660.9400)	Dec. 7, 1965
40--Disc. (transferred to 660.9420)	do
60--Disc. (transferred to 660.9200 & 660.9410)	do
80--Disc. (transferred to 660.9202, 660.9480 & 680.70001)	do
660.92--See Other Amendments and Modifications	
00--Estab. (transferred from 660.9060pt & 80pt)	Dec. 7, 1965
Articles subject to APTA transferred to 660.9300	Dec. 20, 1965
660.93--See Other Amendments and Modifications	
00--Estab. (transferred from 660.9200pt)	Dec. 20, 1965
660.94--See Other Amendments and Modifications	
20--Estab. (transferred from 660.9040pt)	Dec. 7, 1965
Articles subject to APTA transferred to 660.9400	Dec. 20, 1965
40--Estab (transferred from 660.9250pt & 60pt)	Dec. 7, 1965
Articles subject to APTA transferred to 660.9500	Dec. 20, 1965
80--Estab (transferred from 660.9080pt)	Dec. 7, 1965
Articles subject to APTA transferred to 660.9520	Dec. 20, 1965
660.95--See Other Amendments and Modifications	
00--Estab. (transferred from 660.9420pt, 40pt & 60pt)	Dec. 20, 1965
661.00--See Other Amendments and Modifications	
00--Estab (transferred from 661.1000pt)	Dec. 7, 1965

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PROVISION	Effective date
661.10--See Other Amendments and Modifications	
00--Blowers for pipe organs transferred to 661.0800	Dec. 7, 1965
Articles subject to APTA transferred to 661.1300	Dec. 20, 1965
661.11--See Other Amendments and Modifications	
00--Estab. (transferred from 661.1600pt)	Dec. 20, 1965
661.12--See Other Amendments and Modifications	
00--Estab. (transferred from 661.1220pt, 40pt & 60pt)	Dec. 20, 1965
661.16--See Other Amendments and Modifications	
00--Estab. (transferred from 661.1500pt)	Dec. 20, 1965
661.20--	
20--Articles subject to APTA transferred to 661.1300	Dec. 20, 1965
40-- do	do
661.21--See Other Amendments and Modifications	
00--Estab. (transferred from 661.2020pt & 40pt)	Dec. 20, 1965
661.30--	
10--Disc. (transferred to 661.3525)	Jan. 1, 1968
20--Disc. do	do
25--Estab. (transferred from 661.3510 & 20)	do
30--Disc. (transferred to 661.3546)	do
40--Disc. do	do
45--Estab. (transferred from 661.3530 & 40)	do
661.36--See Other Amendments and Modifications	
00--Estab. (transferred from 661.3510pt-50pt)	Dec. 20, 1965
661.65--See Other Amendments and Modifications	
661.70--See Other Amendments and Modifications	
661.92--See Other Amendments and Modifications	
00--Estab. (transferred from 661.9500pt)	Dec. 7, 1965
661.93--See Other Amendments and Modifications	
00--Estab. (transferred from 661.9200pt)	Dec. 20, 1965
661.95--See Other Amendments and Modifications	
00--Cast-iron parts, not advanced, for filtering and purifying machinery transferred to 661.9200	Dec. 7, 1965
661.98--See Other Amendments and Modifications	
00--Estab. (transferred from 661.9500pt)	Dec. 20, 1965
662.10--See Other Amendments and Modifications	
664.20--	
40--Disc. (transferred to 662.2070)	Jan. 1, 1968
60--Disc. do	do
70--Estab. (transferred from 662.2032 & 60)	do
662.39--See Other Amendments and Modifications	
00--Estab. (transferred from 662.3500pt)	Dec. 20, 1965
662.45--See Other Amendments and Modifications	
662.50--	
00--Estab. (transferred from 662.5040 & 60)	Jan. 1, 1968
20--Disc. (transferred to 662.5006)	do
40--Disc. do	do
662.61--See Other Amendments and Modifications	
00--Estab. (transferred from 662.6040pt)	Dec. 20, 1965

PROVISION	Effective date
664.05--	
40--Disc. (transferred to 664.0565)	Jan. 1, 1968
60--Disc. do	do
65--Estab. (transferred from 664.0540 & 60)	do
664.10--	
35--Estab. (transferred from 664.1040pt)	Jan. 1, 1968
40--Disc. (transferred to 664.1036 & 45)	do
45--Estab. (transferred from 664.1040pt)	do
664.11--See Other Amendments and Modifications	
00--Estab. (transferred from 664.1040pt & 60pt)	Dec. 20, 1965
666.00--See Other Amendments and Modifications	
670.14--	
00--Unit of quantity changed from "No." to "X"	Jan. 1, 1967
670.40--	
10--Estab. (transferred from 670.4020pt & 40pt)	Jan. 1, 1968
30--Disc. (transferred to 670.4010 & 20)	do
32--Estab. (transferred from 670.4020)	do
40--Disc. (transferred to 670.4030 & 50)	do
50--Estab. (transferred from 670.4040pt)	do
670.42--	
00--Disc. (transferred to 670.4120 & 40)	Jan. 1, 1968
80--Estab. (transferred from 670.4100pt)	do
40--Estab. do	do
670.43--	
30--Estab. (transferred from 670.4340pt)	Jan. 1, 1968
40--Disc. (transferred to 670.4330, 50, 60 & 70)	do
50--Estab. (transferred from 670.4340pt)	do
60--Estab. do	do
70--Estab. do	do
672.05--See Other Amendments and Modifications	
00--Parts for sewing machines specially designed to join footwear soles to uppers transferred from 672.2000-672.2540	Dec. 7, 1965
674.42--See Other Amendments and Modifications (item 911.70)	
674.50--See Other Amendments and Modifications (item 911.70)	
00--Tool holders for certain copying lathes for making shoe lasts temporarily transferred to 911.7000	Dec. 7, 1965
674.61--See Other Amendments and Modifications (item 911.70)	
00--Cast-iron parts, not advanced, for certain copying lathes for making shoe lasts temporarily transferred to 911.7000	Dec. 7, 1965
674.62--See Other Amendments and Modifications (item 911.70)	
60-80--Parts for certain copying lathes for making shoe lasts temporarily transferred to 911.7000	Dec. 7, 1965

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PROVISION	Effective date
678.23--	
60--Disc. (transferred to 678.2320 & 90).....	Jan. 1, 1968
70--Estab. (transferred from 678.2320pt).....	do
80--Estab. do	do
678.32--	
30--Estab. (transferred from 678.3040pt).....	Jan. 1, 1968
40--Disc. (transferred to 678.3030 & 60).....	do
50--Estab. (transferred from 678.3040pt).....	do
678.32--	
00--Estab. (transferred from 678.3220 & 40)....	Jan. 1, 1966
20--Disc. (transferred to 678.3200).....	do
40--Disc. do	do
678.50--	
00--Disc. (transferred to 678.5020, 40 & 60)...	Jan. 1, 1968
20--Estab. (transferred from 678.5000pt).....	do
40--Estab. do	do
60--Estab. do	do
678.51--See Other Amendments and Modifications	
00--Estab. (transferred from 678.5000pt).....	Dec. 20, 1965
680.10--See Other Amendments and Modifications	
00--Disc. (transferred to 680.1100 & 680.1200).....	Dec. 7, 1965
680.11--See Other Amendments and Modifications	
00--Estab. (transferred from 680.1000pt).....	Dec. 7, 1965
680.18--See Other Amendments and Modifications	
00--Estab. (transferred from 680.1000pt).....	Dec. 7, 1965
680.20--See Other Amendments and Modifications	
680.21--See Other Amendments and Modifications	
00--Estab. (transferred from 680.2000pt).....	Dec. 20, 1965
680.22--See Other Amendments and Modifications	
680.23--See Other Amendments and Modifications	
00--Estab. (transferred from 680.2220pt & 40pt).....	Dec. 20, 1965
680.27--	
00--Articles subject to APTA transferred to 680.2800.....	Dec. 20, 1965
680.28--See Other Amendments and Modifications	
00--Estab. (transferred from 680.2700pt).....	Dec. 20, 1965
680.30--	
20--Articles subject to APTA transferred to 680.3100.....	Dec. 20
40-- do	
680.31--See Other Amendments and Modifications	
00--Estab. (transferred from 680.3020pt 40pt).....	
680.33--See Other Amendments and Modifications	
00--Estab. (transferred from 680.3520pt).....	Dec. 20, 1965
680.34--See Other Amendments and Modifications	
00--Estab. (transferred from 680.3520pt).....	Dec. 20, 1965

PROVISION	Effective date
680.35--See Other Amendments and Modifications	
20--Certain bearings transferred to 680.3300; articles subject to APTA transferred to 680.3400 & 680.3600.....	Dec. 20, 1965
30--Estab. (transferred from 680.3540pt).....	Jan. 1, 1968
40--Certain bearings transferred to 680.3300; articles subject to APTA transferred to 680.3400 & 680.3600.....	Dec. 20, 1965
Disc. (transferred to 680.3530, 50 & 60)...	Jan. 1, 1968
50--Estab. (transferred from 680.3540pt).....	do
60--Estab. do	do
680.36--See Other Amendments and Modifications	
00--Estab. (transferred from 680.3520pt & 40pt).....	Dec. 20, 1965
Hdng.	
680.45--See Other Amendments and Modifications for clarifying language covering items 680.45-680.54	
680.45--See Other Amendments and Modifications	
00--Certain articles transferred from 680.4700.....	Dec. 7, 1965
680.50--See Other Amendments and Modifications	
680.54--See Other Amendments and Modifications	
680.58--See Other Amendments and Modifications	
00--Estab. (transferred from 680.5700pt).....	Dec. 20, 1965
680.60--See Other Amendments and Modifications	
00--Certain machinery parts, n.s.p.f., transferred to 680.7000, 680.9000 & 680.9100.....	Dec. 20, 1965
680.70--See Other Amendments and Modifications	
00--Estab. (transferred from 660.5200pt, 660.9080pt & various other provisions....	Dec. 20, 1965
680.90--See Other Amendments and Modifications	
00--Estab. (transferred from 680.6000pt).....	Dec. 20, 1965
680.91--See Other Amendments and Modifications	
00--Estab. (transferred from 680.6000pt).....	Dec. 20, 1965

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty	
				1	2
		PART 5. - ELECTRICAL MACHINERY AND EQUIPMENT			
		Part 5 headnotes: 1. This part does not cover -- (i) electrical insulators or insulating materials (classifiable in other schedules according to materials of which made); (ii) certain carbons, electrodes, and brushes provided for in part 1E of schedule 5; (iii) ceramic electrical ware (part 2D of schedule 5); (iv) electric blankets and other electrically warmed bedding (see part 5B of schedule 3); (v) washing machines, ironing machines, sewing machines, and other machines provided for in parts 4 or 6 of this schedule; or (vi) electrical instruments and apparatus provided for in schedule 7. 2. For the purposes of this part (items 682.05 and 682.07), the rated kva of a transformer is the kilovolt-ampere output on a continuous duty basis at the rated secondary voltage (or amperage, when applicable) and at the rated frequency without exceeding the rated temperature limitations.			
		Part 5 statistical headnotes: *1. For statistical reporting purposes in this part (item 686.40), "audio machines" are those machines designed specifically for recording, reproducing, or recording and reproducing frequencies in the sound spectrum only.* *2. For statistical reporting purposes in this part (item 686.40), "video machines" are those designed specifically for recording or recording and reproducing video signals. An audio track may or may not be included on the recording medium.*			

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1968)

SCHEDULE 6. - METALS AND METAL PRODUCTS
Part 5. - Electrical Machinery and Equipment

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty	
				1	2
		Generators, motors, motor-generators, converters (rotary or static), transformers, rectifiers and rectifying apparatus, and inductors; all the foregoing which are electrical goods, and parts thereof:			
		Transformers:			
682.05	00	Rated at less than 1 kva	No.	12.5% ad val.	35% ad val.
682.07		Other		11% ad val.	35% ad val.
	20	*Rated at 1 kva or more, but not over 50 kva*	*No.*		
	40	*Rated over 50 kva, but not over 10,000 kva*	*No.*		
	60	*Rated over 10,000 kva*	*No.*		
		Motors:			
		Of under 1/40 horsepower:			
682.20	00	Synchronous, valued not over $4 each	No.	45% ad val.	90% ad val.
682.25	00	Other	No.	12.5% ad val.	35% ad val.
682.30	00	Of 1/40 or more but not over 1/10 horsepower	No.	11% ad val.	35% ad val.
682.40		Of over 1/10 but under 200 horsepower		7.5% ad val.	35% ad val.
	20	*Of less than 1 horsepower*	*No.*		
	40	*Of 1 horsepower or more, but less than 20 horsepower*	*No.*		
	60	*Of 20 horsepower and over, but less than 200 horsepower*	*No.*		
682.50	00	Of 200 or more horsepower	No.	11% ad val.	35% ad val.
682.52	00	Commutators	No.	9% ad val.	35% ad val.
682.55	00	Parts of motors of under 1/40 horsepower	X	45% ad val.	90% ad val.
682.60		Other		13% ad val.	35% ad val.
		Generators:			
	10	*Of less than 10,000 kilowatts*	*No.*		
	20	*Of 10,000 kilowatts or more, but not over 40,000 kilowatts*	*No.*		
	30	*Of more than 40,000 kilowatts*	*No.*		
	40	*Motor-generators, and rotating converters*	*No.*		
	50	*Rectifiers and rectifying apparatus*	*X*		
	60	*Other, including parts of the foregoing*	*X*		

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty	
				1	2
682.65	00	Any article described in the foregoing items 682.05 to 682.60, inclusive (except 682.50), if Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6).....	X.....	Free	
		Magnets; chucks, clamps, vises and similar work holders, all the foregoing which are magnetic; electro-magnetic clutches and couplings; electro-magnetic brakes; electro-magnetic lifting heads; all the foregoing and parts thereof:			
682.70	00	Permanent magnets.....	X.....	14% ad val.	45% ad val.
682.71	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6).....	X.....	Free	
682.80	00	Work holders and parts thereof.....	X.....	13% ad val.	30% ad val.
682.90	00	Other.....	X.....	10% ad val.	35% ad val.
682.91	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6).....	X.....	Free	
682.95	00	Primary cells and primary batteries, and parts thereof.....	X.....	15.5% ad val.	35% ad val.
		Storage batteries and parts thereof:			
683.10	00	Lead-acid type storage batteries, and parts thereof.....	X.....	15% ad val.	40% ad val.
683.11	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6).....	X.....	Free	
683.15	00	Other.....	X.....	14% ad val.	40% ad val.
683.16	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6).....	X.....	Free	
683.20		Hand-directed or -controlled tools with self-contained electric motor, and parts thereof.....	.....	10.5% ad val.	35% ad val.
	20	*Tools*.....	*No.*		
	40	*Parts*.....	*X*		
		Vacuum cleaners, floor polishers, food grinders, and mixers, juice extractors and other electro-mechanical appliances, all the foregoing with self-contained electric motors, of types used in the household, hotels, restaurants, offices, schools, or hospitals (but not including factory or other industrial appliances or electro-thermic appliances), and parts thereof:			
683.30		Vacuum cleaners, floor polishers, and parts thereof.....	.....	12% ad val.	35% ad val.
		Vacuum cleaners:			
	10	*Portable, hand-held type*.....	*No.*		
	30	*Other*.....	*No.*		
	40	*Parts of vacuum cleaners*.....	*X*		
	60	*Other*.....	*X*		
683.32	00	Other.....	X.....	10.5% ad val.	40% ad val.
		Shavers, hair-clippers, and scissors, all the foregoing with self-contained electric motors, and parts thereof:			
683.40	00	Hair-clippers and parts thereof.....	X.....	18% ad val.	45% ad val.
683.50		Other.....	.....	12% ad val.	35% ad val.
	20	*Shavers*.....	*No.*		
	40	*Parts of shavers*.....	*X*		
	60	*Other*.....	*X*		

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
683.60		Ignition magnetos, magneto-generators, ignition coils, starter motors, spark plugs, glow plugs, and other electrical starting and ignition equipment for internal combustion engines; generators and cut-outs for use in conjunction therewith; all the foregoing and parts thereof	.....	7.5% ad val.	35% ad val.
	20	*Battery charging generators*	No.		
	40	*Starter motors*	No.		
	60	*Spark plugs*	C.		
	80	*Other*	X		
683.61	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	X.....	Free	
683.65	00	Electric lighting equipment designed for motor vehicles, and parts thereof	X.....	7.5% ad val.	25% ad val.
683.66	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	X.....	Free	
		Portable electric lamps with self-contained electrical source, and parts thereof:			
683.70	00	Flashlights and parts thereof	No.....	35% ad val.	35% ad val.
683.80	00	Other	X.....	13.75% ad val.	40% ad val.
		Industrial and laboratory electric furnaces and ovens; electric induction and dielectric heating equipment; electric welding, brazing, and soldering machines and apparatus and similar articles for cutting, and parts thereof:			
683.90	00	Welding machines and apparatus, and parts thereof	X.....	7.5% ad val.	35% ad val.
683.95		Other	.....	9% ad val.	35% ad val.
	20	*Furnaces and ovens, and parts*	X		
	40	*Electric brazing and soldering machines, and parts*	X		
	60	*Other*	X		
		Electric instantaneous or storage water heaters and immersion heaters; electric soil heating apparatus, and electric space heating apparatus; electric hair dryers, hair curlers, and other electric hair dressing appliances; electric flatirons; electro-thermic kitchen and household appliances; electric heating resistors other than those of carbon; all the foregoing and parts thereof:			
		Flatirons:			
684.10	00	Travel type	No.....	10% ad val.	35% ad val.
684.15	00	Other	No.....	30.5% ad val.	40% ad val.
684.20	00	Toasters, waffle irons, skillets, ovens, stoves, coffee makers and other portable electro-thermic kitchen and household appliances	No.....	15% ad val.	40% ad val.
		Other:			
684.30	00	Cooking stoves and ranges, and parts thereof	X.....	7% ad val.	35% ad val.
684.40	00	Furnaces, heaters, and ovens, and parts thereof	X.....	9% ad val.	35% ad val.
684.41	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	X.....	Free	
684.50		Other	.....	10% ad val.	35% ad val.
	20	*Dryers, curlers, and other hair dressing appliances*	X		
	30	*Electro-thermic kitchen and household appliances (nonportable)*	No.		
	50	*Other*	X		

APPENDIX A

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1988)

STAGED RATES AND HISTORICAL NOTES

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Staged Rates

Modifications of column 1 rates of duty by Pres. Proc. 3694 (Canadian Compensation), Dec. 27, 1965, 3 CFR, 1965 Supp., p. 85, as modified by Pres. Proc. 3818, Nov. 6, 1967, 32 F.R. 15667:

TSUS item	Prior rate	Rate of duty, effective with respect to articles entered on and after January 1 --				
		1968	1967	1970	1971	1972
685.42	15% ad val.	14% ad val.	13% ad val.	1/	1/	1/

1/ See Kennedy Round staged rates, infra.

Modifications of column 1 rates of duty by Pres. Proc. 3822 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19002:

TSUS item	Prior rate	Rate of duty, effective with respect to articles entered on and after January 1 --				
		1968	1969	1970	1971	1972
682.07	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
682.20	50% ad val.	45% ad val.	40% ad val.	35% ad val.	30% ad val.	25% ad val.
682.30	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
682.40	8.5% ad val.	7.5% ad val.	7% ad val.	6.5% ad val.	5.5% ad val.	5% ad val.
682.50	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
682.52	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
682.55	50% ad val.	45% ad val.	40% ad val.	35% ad val.	30% ad val.	25% ad val.
682.60	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
682.70	16% ad val.	14% ad val.	12.5% ad val.	11% ad val.	9.5% ad val.	8% ad val.
682.80	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
682.90	11.5% ad val.	10% ad val.	9% ad val.	8% ad val.	6.5% ad val.	5.5% ad val.
682.95	17.5% ad val.	15.5% ad val.	14% ad val.	12% ad val.	10% ad val.	8.5% ad val.
683.10	17% ad val.	15% ad val.	13.5% ad val.	11.5% ad val.	10% ad val.	8.5% ad val.
683.15	16% ad val.	14% ad val.	12.5% ad val.	11% ad val.	9.5% ad val.	8% ad val.
683.20	11.75% ad val.	10.5% ad val.	9% ad val.	8% ad val.	7% ad val.	5.5% ad val.
683.30	13.75% ad val.	12% ad val.	11% ad val.	9.5% ad val.	8% ad val.	6.5% ad val.
683.32	12% ad val.	10.5% ad val.	9.5% ad val.	8% ad val.	7% ad val.	6% ad val.
683.40	20% ad val.	18% ad val.	16% ad val.	14% ad val.	12% ad val.	10% ad val.
683.50	13.75% ad val.	12% ad val.	11% ad val.	9.5% ad val.	8% ad val.	6.5% ad val.
683.60	8.5% ad val.	7.5% ad val.	6.5% ad val.	5.5% ad val.	5% ad val.	4% ad val.
683.65	8.5% ad val.	7.5% ad val.	6.5% ad val.	5.5% ad val.	5% ad val.	4% ad val.
683.90	8.5% ad val.	7.5% ad val.	6.5% ad val.	5.5% ad val.	5% ad val.	4% ad val.
683.95	10.5% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
684.10	11.5% ad val.	10% ad val.	9% ad val.	8% ad val.	6.5% ad val.	5.5% ad val.
684.15	34% ad val.	30.5% ad val.	27% ad val.	23.5% ad val.	20% ad val.	17% ad val.
684.20	17% ad val.	15% ad val.	13.5% ad val.	11.5% ad val.	10% ad val.	8.5% ad val.
684.30	8% ad val.	7% ad val.	6% ad val.	5.5% ad val.	4.5% ad val.	4% ad val.
684.40	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
684.50	11.5% ad val.	10% ad val.	9% ad val.	8% ad val.	6.5% ad val.	5.5% ad val.
684.62	17.5% ad val.	15% ad val.	13% ad val.	12% ad val.	10% ad val.	8.5% ad val.
684.64	14% ad val.	12.5% ad val.	11% ad val.	9.5% ad val.	8% ad val.	7% ad val.
684.70	15% ad val.	13% ad val.	12% ad val.	10% ad val.	8% ad val.	6.5% ad val.
685.10	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
685.20	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
685.23	12.5% ad val.	12% ad val.	11.5% ad val.	11% ad val.	10.5% ad val.	10.0% ad val.
685.26	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
685.30	13.75% ad val.	12% ad val.	11% ad val.	9.5% ad val.	8% ad val.	6.5% ad val.
685.32	13.5% ad val.	12% ad val.	10% ad val.	9% ad val.	8% ad val.	6.5% ad val.
685.40	11.5% ad val.	10% ad val.	9% ad val.	8% ad val.	6.5% ad val.	5.5% ad val.
685.42	15% ad val.	14% ad val.	13% ad val.	10.5% ad val.	9.5% ad val.	7.5% ad val.

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Staged Rates

Modifications of column 1 rates of duty by Pres. Proc. (Kennedy Round), , 32 F.R. (con.):

TSUS item	Prior rate	Rate of duty, effective with respect to articles entered on and after January 1 --				
		1968	1969	1970	1971	1972
685.50	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
685.60	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
685.70	8.5% ad val.	7.5% ad val.	6.5% ad val.	5.5% ad val.	5% ad val.	4% ad val.
685.80	12.5% ad val.	12% ad val.	11% ad val.	11% ad val.	10% ad val.	10% ad val.
685.90	12.5% ad val.	13.5% ad val.	14% ad val.	12% ad val.	10% ad val.	8.5% ad val.
686.10	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
686.22	8.5% ad val.	7.5% ad val.	6.5% ad val.	5.5% ad val.	5% ad val.	4% ad val.
686.24	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
686.40	8% ad val.	7% ad val.	6% ad val.	5.5% ad val.	4.5% ad val.	4% ad val.
686.50	8% ad val.	7% ad val.	6% ad val.	5.5% ad val.	4.5% ad val.	4% ad val.
686.60	8% ad val.	7% ad val.	6% ad val.	5.5% ad val.	4.5% ad val.	4% ad val.
686.70	36% ad val.	32% ad val.	28.5% ad val.	25% ad val.	21.5% ad val.	18% ad val.
686.80	8% ad val.	7% ad val.	6% ad val.	5.5% ad val.	4.5% ad val.	4% ad val.
686.90	8% ad val.	7% ad val.	6% ad val.	5.5% ad val.	4.5% ad val.	4% ad val.
687.10	8% ad val.	7% ad val.	6.5% ad val.	6% ad val.	5.5% ad val.	5% ad val.
687.20	11.5% ad val.	10% ad val.	9% ad val.	8% ad val.	6.5% ad val.	5.5% ad val.
687.30	8% ad val.	7% ad val.	6.5% ad val.	6% ad val.	5.5% ad val.	5% ad val.
687.50	30% ad val.	27% ad val.	24% ad val.	21% ad val.	18% ad val.	15% ad val.
687.60	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
688.04	17% ad val.	15% ad val.	13.5% ad val.	11.5% ad val.	10% ad val.	8.5% ad val.
688.08	15% ad val.	15% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
688.12	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
688.15	17% ad val.	15% ad val.	13.5% ad val.	11.5% ad val.	10% ad val.	8.5% ad val.
688.20	15% ad val.	15% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
688.25	12% ad val.	10.5% ad val.	9.5% ad val.	8% ad val.	7% ad val.	6% ad val.
688.35	18% ad val.	17% ad val.	15% ad val.	13.5% ad val.	11.5% ad val.	10% ad val.
688.40	11.5% ad val.	10% ad val.	9% ad val.	8% ad val.	6.5% ad val.	5.5% ad val.

Other Amendments and Modifications

PROVISION

Part 5--Language "and other electrical articles" following "apparatus" hdnte 1 (vi) deleted. Pub. L. 89-241, Secs. 2(a), 36(f)(1), Oct. 7, 1965, 79 Stat. 933, 940, effective date Dec. 7, 1965.

Part 5--Headnote 2 added. Pres. Proc. 3822 (Kennedy Round), hdnte 2 Dec. 16, 1967, 32 F.R. 19002, effective date Jan. 1, 1968.

682.05--Item 682.10 (column 1 rate--12.5% ad val.; column 2 rate--35% 682.07 ad val.) deleted and items 682.05 and 682.07 and heading 682.10 immediately preceding item 682.05 added in lieu thereof. Pres. Proc. 3822 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19002, effective date Jan. 1, 1968.

682.20--Language ", valued not over $4 each" added to article description. Pub. L. 89-241, Secs. 2(a), 52(a), Oct. 7, 1965, 79 Stat. 933, 944, effective date Dec. 7, 1965.

682.40--Column 1 rate of duty of 9.5% ad val. reduced to 8.5% ad val. on Jan. 1, 1964. General headnote 3(g).

682.52--Item 682.52 added. Pub. L. 89-241, Secs. 2(a), 52(b), Oct. 7, 1965, 79 Stat. 933, 944, effective date Dec. 7, 1965.

PROVISION

682.65--Item 682.65 added. Pub. L. 89-283, Secs. 401(a), 405(b), Oct. 21, 1965, 79 Stat. 1021, 1024; entered into force Dec. 20, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68; effective with respect to articles entered on and after Jan. 18, 1965.

Article description for item 682.65 modified by deleting "682.10" and inserting "682.05" in lieu thereof. Pres. Proc. 3822 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19002, effective date Jan. 1, 1968.

682.70--Language "; all the foregoing and parts thereof" 682.80 added to heading immediately preceding item 682. 682.90 Pub. L. 89-241, Secs. 2(a), 36(f)(2), Oct. 7, 19 79 Stat. 933, 940, effective date Dec. 7, 1965.

682.70--Column 1 rate of duty of 18% ad val. reduced to 16 ad val. Pub. L. 89-241, Secs. 2(a), 36(g), Oct. 1965, 79 Stat. 933, 940, effective date Dec. 7, 1965.

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Other Amendments and Modifications--(con.)

PROVISION

682.71--Item 682.71 added. Pub. L. 89-283, Secs. 401(a), 405(d), Oct. 21, 1965, 79 Stat. 1021, 1025; entered into force Dec. 20, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68; effective with respect to articles entered on and after Jan. 18, 1965.

682.80--Language "and parts thereof" added to article description. Pub. L. 89-241, Secs. 2(a), 36(f)(3), Oct. 7, 1965, 79 Stat. 933, 940, effective date Dec. 7, 1965.

682.91--Items 682.91, 683.11, 683.16, and 683.61 added. Pub. L. 683.11 89-283, Secs. 401(a), 405(d), Oct. 21, 1965, 79 Stat. 1021, 683.16 1025; entered into force Dec. 20, 1965, by 683.61 Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68; effective with respect to articles entered on and after Jan. 18, 1965.

683.65--Item 683.65 added. Pub. L. 89-241, Secs. 2(a), 36(h), Oct. 7, 1965, 79 Stat. 933, 941, effective date Dec. 7, 1965.

683.66--Items 683.66, 684.41, 684.63, and 684.71 added. Pub. L. 684.41 89-283, Secs. 401(a), 405(d), Oct. 21, 1965, 79 Stat. 1021, 684.63 1025; entered into force Dec. 20, 1965, by 684.71 Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68; effective with respect to articles entered on and after Jan. 18, 1965.

685.22--Item 685.22 (column 1 rate--12.5% ad val., column 2 rate--35% 685.23 ad val.) deleted and items 685.23 and 685.25 and heading 685.25 immediately preceding item 685.23 added in lieu thereof. Pres. Proc. (Kennedy Round), 32 F.R. , effective date Jan. 1, 1968.

685.40--Items 685.40 (column 1 rate--11.5% ad val.; column 2 rate-- 685.42 35% ad val.) and 685.42 (column 1 rate--15% ad val.; column 2 rate--30% ad val.) and heading immediately preceding item 685.40 deleted and new item 685.40 added in lieu thereof. Pub. L. 89-241, Sec. 53, Oct. 7, 1965, 79 Stat. 944, effective date Oct. 8, 1965.

685.42--Item 685.50 (column 1 rate--15% ad val., column 2 rate--35% 685.50 ad val.) deleted and new items 685.42 and 685.50 and heading immediately preceding item 685.42 added in lieu thereof. Pres. Proc. 3694, Dec. 27, 1965, 3 CFR, 1965 Supp., p. 89, effective date Jan. 1, 1966.

685.55--Item 685.55 added. Pub. L. 89-283, Secs. 401(a), 405(b), Oct. 21, 1965, 79 Stat. 1021, 1024; entered into force Dec. 20, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, entered on and after Jan. 18, 1965.

685.71--Items 685.71, 685.81, 685.91, and 686.11 added. Pub. L. 685.81 89-283, Secs. 401(a), 405(d), Oct. 21, 1965, 79 Stat. 685.91 1021, 1025; entered into force Dec. 20, 1965, by 686.11 Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68; effective with respect to articles entered on and after Jan. 18, 1965.

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686.20--Item 686.20 (column 1 rate--15% ad val.; column 2 686.22 rate--35% ad val.) deleted and items 686.22 and 686.24 686.24 and heading immediately preceding item 686.22 added in lieu thereof. Pub. L. 89-241, Secs. 2(a), 36(i), Oct. 7, 1965, 79 Stat. 933, 941, effective date Dec. 7, 1965.

686.23--Items 686.23, 686.61, and 686.81 added. Pub. L. 686.61 89-283, Secs. 401(a), 405(d), Oct. 21, 1965, 79 686.81 Stat. 1021, 1025; entered into force Dec. 20, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68; effective with respect to articles entered on and after Jan. 18, 1965.

687.10--Column 1 rate of duty of 9% ad val. reduced to 8% ad val. on Jan. 1, 1964. General headnote 3(g).

687.50--Column 1 rate of duty of 9% ad val. reduced to 8% ad val. on Jan. 1, 1964. General headnote 3(g).

687.50--Items 687.50 (column 1 rate--12% ad val.; column 2 687.60 rate--35% ad val.) and 687.60 (column 1 rate--12.5% ad val.; column 2 rate--35% ad val.) deleted and new items 687.50 and 687.60 added in lieu thereof. Pub. L. 89-241, Secs. 2(a), 54(a), Oct. 7, 1965, 79 Stat. 933, 944, effective date Dec. 7, 1965.

687.51--Items 687.51 and 687.61 added. Pub. L. 89-283, 687.61 Secs. 401(a), 405(d), Oct. 21, 1965, 79 Stat. 1021, 1025; entered into force Dec. 20, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68; effective with respect to articles entered on and after Jan. 18, 1965.

688.04--Original item 688.05 (column 1 rate--15% ad val.; 688.05 column 2 rate--35% ad val.) deleted and items 688.06 688.04 and 688.06 and heading immediately preceding item 688.04 added in lieu thereof. Pub. L. 89-241, Secs. 2(a), 55, Oct. 7, 1965, 79 Stat. 933, 945, effective date Dec. 7, 1965.

688.08--New items 688.08, 688.07, and 688.16 added. 688.07 Pres. Proc. 3743, Sept. 8, 1966, 3 CFR, 1966 688.16 Comp., p. 74, entered into force Sept. 9, 1966, and effective with respect to articles entered on and after Jan. 18, 1965.

688.12--Item 688.12 added. Pub. L. 89-241, Secs. 2(a), 56(j), Oct. 7, 1965, 79 Stat. 933, 941, effective date Dec. 7, 1965.

688.13--Items 688.13 and 688.41 added. Pub. L. 89-283, 688.41 Secs. 401(a), 405(d), Oct. 21, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68; effective with respect to articles entered on and after Jan. 18, 1965.

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1968)

STAGED RATES AND HISTORICAL NOTES

Notes p. 4
Schedule 6,
Part 5

Statistical Notes

PROVISION	Effective date
682.05--See Other Amendments and Modifications	
00--Estab.(transferred from 682.1020).....	Jan. 1, 1968
682.07--See Other Amendments and Modifications	
20--Estab.(transferred from 682.1040).....	Jan. 1, 1968
40--Estab.(transferred from 682.1060).....	do
60--Estab.(transferred from 682.1080).....	do
682.10--See Other Amendments and Modifications	
20--Disc.(transferred to 682.0500).....	Jan. 1, 1968
40--Disc.(transferred to 682.0720).....	do
60--Disc.(transferred to 682.0740).....	do
80--Disc.(transferred to 682.0760).....	do
682.20--See Other Amendments and Modifications	
00--Synchronous motors valued $4 and over transferred to 682.2500.....	Dec.20, 1965
682.30--	
00--Articles subject to Automotive Products Trade Act (APTA) transferred to 682.6500.....	Dec.20, 1965
682.40--See Other Amendments and Modifications	
682.52--See Other Amendments and Modifications	
00--Estab.(transferred from 682.6060pt).....	Dec. 7, 1965
682.60--	
10--Articles subject to APTA transferred to 682.6500.....	Dec.20, 1965
50-- do	do
60-- do	do
682.65--See Other Amendments and Modifications	
00--Estab.(transferred from 682.1020pt-682.4060pt & 682.5200pt-682.6060pt).....	Dec.20, 1965
682.70--See Other Amendments and Modifications	
00--Parts of electro-magnetic equipment transferred from various provisions.....	Dec. 7, 1965
682.71--See Other Amendments and Modifications	
00--Estab.(transferred from 682.7000pt).....	Dec.20, 1965
682.80--See Other Amendments and Modifications	
00--Parts of electro-magnetic equipment transferred from various provisions.....	Dec. 7, 1965
682.90--See Other Amendments and Modifications	
00--Parts of electro-magnetic equipment transferred from various provisions.....	Dec. 7, 1965
682.91--See Other Amendments and Modifications	
00--Estab.(transferred from 682.9000pt).....	Dec.20, 1965
683.10--	
00--Articles subject to APTA transferred to 683.1100.....	Dec.20, 1965
683.11--See Other Amendments and Modifications	
00--Estab.(transferred from 683.1000pt).....	Dec.20, 1965
683.16--See Other Amendments and Modifications	
00--Estab.(transferred from 683.1500pt).....	Dec.20, 1965
683.30--	
10--Estab.(transferred from 683.3015 & 25pt)..	Jan. 1, 1968
15--Estab.(transferred from 683.3020pt).....	Sept.1, 1964
Disc.(transferred to 683.3010 & 30).....	Jan. 1, 1968
20--Disc.(transferred to 683.3015 & 25).....	Sept.1, 1964
25--Estab.(transferred from 683.3020pt).....	do
Disc.(transferred to 683.3010 & 30).....	Jan. 1, 1968
30--Estab.(transferred from 683.3015 & 25pt)..	do

PROVISION	Effective date
683.60--	
20--Articles subject to APTA transferred to 683.6100.....	Dec.20, 1965
40-- do	do
60-- do	do
80-- do	do
683.61--See Other Amendments and Modifications	
00--Estab.(transferred from 683.6020pt-80pt)..	Dec.20, 1965
683.65--See Other Amendments and Modifications	
00--Estab.(transferred from 653.4060pt & 90pt).....	Dec. 7, 1965
Articles subject to APTA transferred to 683.6600.....	Dec.20, 1965
683.66--See Other Amendments and Modifications	
00--Estab.(transferred from 683.6500pt).....	Dec.20, 1965
684.41--See Other Amendments and Modifications	
00--Estab.(transferred from 684.4000pt).....	Dec.20, 1965
684.50--	
30--Estab.(transferred from 684.5040pt & 60pt).....	Jan. 1, 1966
40--Disc.(transferred to 684.5030 & 50).....	do
50--Estab.(transferred from 684.5040pt & 60pt).....	do
60--Disc.(transferred to 684.5030 & 50).....	do
684.68--See Other Amendments and Modifications	
00--Estab.(transferred from 684.6200pt).....	Dec.20, 1965
684.71--See Other Amendments and Modifications	
00--Estab.(transferred from 684.7010pt-50pt)..	Dec.20, 1965
684.80--	
05--Estab.(transferred from 685.8020pt).....	Jan. 1, 1967
10--Estab. do	do
20--Disc.(transferred to 685.8005-35).....	do
30--Estab.(transferred from 685.8030pt).....	do
45--Estab. do	do
685.20--See Other Amendments and Modifications	
05--Estab.(transferred from 685.2260pt).....	Jan. 1, 1967
Disc.(transferred to 685.2580).....	Jan. 1, 1968
15--Estab.(transferred from 685.2220pt).....	July 1, 1966
Disc.(transferred to 685.2320).....	Jan. 1, 1968
20--Articles subject to APTA transferred to 685.6500.....	Dec.20, 1965
Disc.(transferred to 685.2215 & 25).....	July 1, 1966
25--Estab.(transferred from 685.2220pt).....	do
Disc.(transferred to 685.2250 & 35).....	Jan. 1, 1967
40--Estab.(transferred from 685.2225pt).....	do
Disc.(transferred to 685.2340).....	Jan. 1, 1968
55--Estab.(transferred from 685.2220pt).....	Jan. 1, 1967
Disc.(transferred to 685.2350).....	Jan. 1, 1968
60--Disc.(transferred to 685.2540).....	do
65--Disc.(transferred to 685.2205 & 10).....	Jan. 1, 1967
70--Estab.(transferred from 685.2260pt & 80)..	do
Disc.(transferred to 685.2560).....	Jan. 1, 1968
80--Disc.(transferred to 685.2270).....	Jan. 1, 1967
685.24--See Other Amendments and Modifications	
30--Estab.(transferred from 685.2216).....	Jan. 1, 1968
40--Estab.(transferred from 685.2230).....	do
60--Estab.(transferred from 685.2245).....	do

A P P E N D I X B

Value of U.S. imports for consumption, by TSUS items included in the individual summaries of this volume, total and from the 3 principal suppliers, 1967.

Appendix B

Value of U.S. imports for consumption, for TSUS items covered by each summary in this volume, total and from the three countries that are the principal suppliers, 1967

(In thousands of dollars. The dollar value of imports shown is defined generally as the market value in the foreign country and therefore excludes U.S. import duties, freight, and transportation insurance)

Summary title and page; TSUS item	All countries		First supplier		Second supplier		Third supplier	
	Amount in 1967	Percent change from 1966	Country	Value	Country	Value	Country	Value
Shavers (p. 3)								
650.77	840	+55	Netherlands	453	U. K.	182	France	137
683.5020	15,336	+3	Netherlands	12,475	U. K.	922	France	574
683.5040	266	-47	U. K.	105	Netherlands	77	W. Germany	38
Hair clippers and electric scissors (p. 13)								
650.83	-	-	-	-	-	-	-	-
650.85	105	+41	W. Germany	73	U. K.	12	Japan	7
683.40	92	+101	Netherlands	70	W. Germany	15	Japan	5
683.5060	814	+30	Switzerland	642	Japan	171	U. K.	1
Shoe machinery (p. 23)								
672.05	1,502	+92	U. K.	1,177	Denmark	145	France	91
678.10	6,318	+9	W. Germany	3,656	Canada	1,212	U. K.	655
Machinery for processing mineral substances (p. 29)								
678.20	9,021	-27	W. Germany	2,455	Canada	2,382	U. K.	1,439
Glassworking and related machines (p. 35)								
678.30	2,236	-22	Sweden	856	Belg.& Lux.	528	U. K.	410
678.32	923	+119	U. K.	458	Netherlands	339	W. Germany	88
Machines for molding or forming rubber or plastics (p. 43)								
678.35	23,752	+3	W. Germany	11,813	Canada	3,332	Japan	2,070
Automatic vending machines (p. 49)								
678.40	2,187	+15	Denmark	867	Japan	635	W. Germany	341
Tobacco processing machines (p. 57)								
678.45	8,187	-18	U. K.	5,494	W. Germany	2,388	Netherlands	186
Machines, not specially provided for (p. 65)								
678.50	67,931	+78	Japan	22,875	W. Germany	17,568	U. K.	7,771
678.51	24	+725	Canada	24	-	-	-	-
Molding boxes, molders' patterns and molds (p. 71)								
680.05	2	-26	Canada	2	Japan	1/	-	-
680.07	299	-24	Canada	153	U. K.	69	Japan	33
680.11	501	+62	Canada	169	Italy	105	W. Germany	75
680.12	15,597	+22	Canada	11,790	Portugal	1,204	Italy	987
680.15	2,105	+49	Canada	823	Italy	235	W. Germany	202

See footnotes at end of table

Appendix B

Value of U.S. imports for consumption, for TSUS items covered by each summary in this volume, total and from the three countries that are the principal suppliers, 1967

(In thousands of dollars. The dollar value of imports shown is defined generally as the market value in the foreign country and therefore excludes U.S. import duties, freight, and transportation insurance)

Summary title and page; TSUS item	All countries		First supplier		Second supplier		Third supplier	
	Amount in 1967	Percent change from 1966	Country	Value	Country	Value	Country	Value
Taps, cocks, valves, and similar devices (p. 81)								
680.20	3,467	-21	Japan	1,553	Italy	933	Yugoslavia	219
680.21	22	+2100	Canada	22	-	-	-	-
680.22	10,096	+74	Canada	4,631	Italy	3,279	U. K.	699
680.23	145	+1015	Canada	145	-	-	-	-
680.25	262	+3	Japan	183	Canada	50	U. K.	22
680.27	6,721	+5	W. Germany	2,050	Canada	1,602	U. K.	1,150
680.28	148	+27	Canada	148	-	-	-	-
Antifriction bearings and parts (p. 93)								
680.30	4,769	+30	Japan	1,827	U. K.	875	Ireland	769
680.31	195	+236	Canada	195	-	-	-	-
680.33	1,998	+2	Japan	1,333	Canada	254	Belg.& Lux.	185
680.34	875	+4	Canada	875	-	-	-	-
680.35	48,990	+10	Japan	25,427	U. K.	7,375	W. Germany	6,584
680.36	1,006	+98	Canada	1,006	-	-	-	-
Certain power transmission equipment (p. 103)								
680.45	3,399	+11	U. K.	1,214	W. Germany	737	Japan	511
680.47	128	+103	U. K.	47	France	25	Canada	15
680.48	119	+561	U. K.	60	W. Germany	43	Canada	15
680.50	1,821	+6	U. K.	568	Canada	427	Japan	348
680.52	28	-12	Canada	10	U. K.	9	W. Germany	4
680.54	1,074	+21	W. Germany	339	Canada	304	U. K.	202
Miscellaneous machinery parts (p. 113)								
680.57	213	+94	Italy	86	W. Germany	45	Canada	45
680.58	1	+93	Canada	1	-	-	-	-
680.60	398	-10	U. K.	368	W. Germany	30	-	-
680.70	862	+36	W. Germany	454	U. K.	219	Japan	63
680.90	1,304	+73	Canada	455	U. K.	397	W. Germany	142
680.91	6	+1356	Canada	6	-	-	-	-
Electric transformers (p. 119)								
682.05	7,838	-4	Japan	4,275	Canada	1,307	Taiwan	1,222
682.07	17,168	+13	Canada	8,984	Italy	2,177	U. K.	1,456
682.65pt.	2/	2/	2/	2/	-	-	-	-
Electric motors, generators, rectifiers, and related apparatus (p. 129)								
682.20	233	+23	Japan	225	Canada	5	W. Germany	2
682.25	6,971	-33	Japan	5,899	Hong Kong	484	W. Germany	212
682.30	2,636	+24	Japan	1,181	W. Germany	744	France	164
682.40	15,034	+49	U. K.	10,650	Japan	1,109	Canada	935
682.50	1,972	+44	Sweden	836	U. K.	640	Canada	228
682.52	878	-24	Denmark	517	W. Germany	341	Canada	9
682.55	96	-31	Japan	45	Canada	25	France	18
682.60	24,392	+90	Canada	7,974	Japan	5,343	Sweden	2,740
682.65	1,032	+83	Canada	1,032	-	-	-	-

See footnotes at end of table.

Appendix B

Value of U.S. imports for consumption, for TSUS items covered by each summary in this volume, total and from the three countries that are the principal suppliers, 1967

(In thousands of dollars. The dollar value of imports shown is defined generally as the market value in the foreign country and therefore excludes U.S. import duties, freight, and transportation insurance)

Summary title and page; TSUS item	All countries		First supplier		Second supplier		Third supplier	
	Amount in 1967	Percent change from 1966	Country	Value	Country	Value	Country	Value
Metal magnets and magnetic articles (p. 147)								
682.70	2,020	+12	Japan	1,190	Italy	372	U. K.	242
682.71	-	-	-	-	-	-	-	-
682.80	355	+7	U. K.	149	Netherlands	50	Japan	49
682.90	1,390	+57	W. Germany	692	Switzerland	202	France	150
682.91	10	+900	Canada	10	-	-	-	-
Electric primary cells and storage batteries (p. 157)								
682.95	8,463	-19	Japan	4,298	Hong Kong	3,298	Canada	218
683.10	2,737	+3	Japan	1,548	Canada	372	W. Germany	323
683.11	545	+80	Canada	545	-	-	-	-
683.15	4,448	-2	W. Germany	1,518	Sweden	1,259	U. K.	723
683.16	45	+650	Canada	45	-	-	-	-
Vacuum cleaners and floor polishers (p. 167)								
683.30	3,353	+49	Japan	1,591	U. K.	1,038	Canada	484
Electro-mechanical household machines, not elsewhere enumerated (p. 185)								
683.32	7,162	+12	Japan	3,375	Switzerland	1,876	Netherlands	964
Electrical equipment for internal combustion engines (p. 197)								
683.60	13,384	+27	W. Germany	5,858	U. K.	3,433	Japan	2,525
683.61	3,279	+53	Canada	3,279	-	-	-	-
Motor-vehicle electric lighting equipment (p. 209)								
683.65	3,107	+43	W. Germany	1,493	U. K.	582	Japan	541
683.66	2,513	+121	Canada	2,513	-	-	-	-
Portable electric lamps with self-contained electric source (p. 215)								
683.70	1,869	-12	Hong Kong	1,377	Japan	376	France	79
683.80	1,432	-23	Hong Kong	1,318	Japan	88	Canada	9
Electric industrial furnaces and welding and related equipment (p. 223)								
683.90	3,296	+53	W. Germany	601	Austria	540	Sweden	485
683.95	6,556	+3	W. Germany	2,348	Switzerland	1,289	U. K.	857
Electrothermic appliances not elsewhere enumerated (p. 233)								
684.10	210	+30	Japan	187	W. Germany	19	Hong Kong	3
684.15	6	-33	Canada	3	Japan	2	Spain	1
684.20	2,152	+33	Japan	1,375	Canada	359	Hong Kong	304
684.5020	7,082	+328	Denmark	4,326	Japan	1,667	Italy	418
684.5050	3,286	+2	U. K.	2,102	Norway	432	W. Germany	218
Certain electric cooking and heating equipment (p. 243)								
684.30	217	-57	Japan	100	Canada	94	Italy	8
684.40	1,448	3/	Canada	644	W. Germany	242	Japan	225
684.41	114	+148	Canada	114	-	-	-	-
684.5030	111	+42	Italy	84	Canada	10	Switzerland	7

1/ Less than $500.
2/ This item is applicable to electric transformers, motors, generators, and rectifiers. In 1967 most of the imports are believed to be motors, generators and rectifiers. See the following summary.
3/ Decrease of less than 0.5 percent.

Source: Compiled from official statistics of the U.S. Department of Commerce.

December 1968
6:10

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2	3	Paper and Related Products I
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7	7	Rubber and Plastics Products
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