In the Matter of

Certain Liquid Crystal Display Devices, Including Monitors, Televisions, and Modules, and Components Thereof

Investigation Nos. 337-TA-741 and 337-TA-749
Volume 2 of 2

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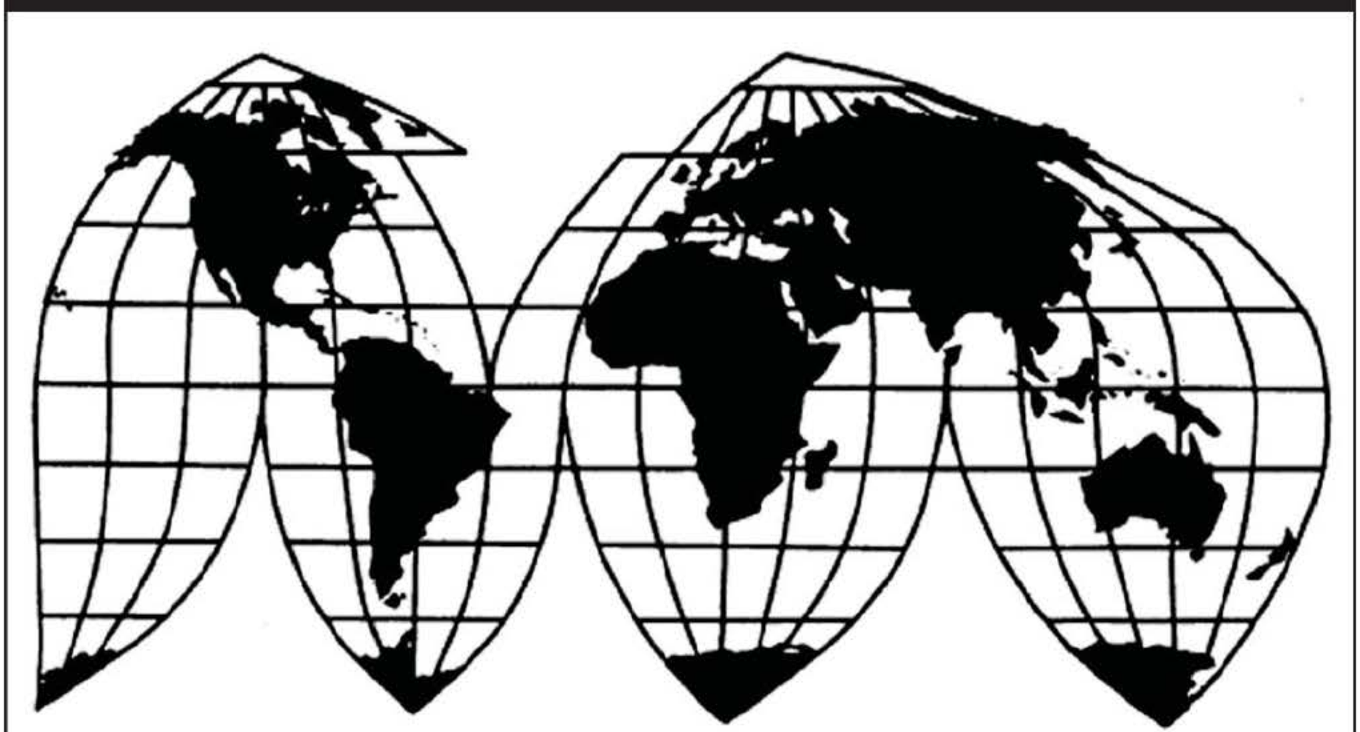
U.S. International Trade Commission



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Thomson's Position: Thomson argues that Lowe and Miyazaki are too late to be prior art, in addition to failing to disclose the claims. Thomson avers that testimony of inventor Dr. Ho, corroborated by witnessed Invention Proposal and other contemporaneous documents, demonstrates that, in connection with a program at PARC known as Copperfield, the inventors built and tested display cells meeting the elements of the asserted claims no later than December 4, 1995. (Citing CX4242C at Q. 59-81; CX-4304C at Q. 154-155; and CX-1643C) Thomson says that Dr. Ho testified that he and Dr. Crawford built embodiments of the claimed inventions by fall 1995. (Citing CX-4240C at Q. 56-58) Thomson says Dr. Ho testified that they built anisotropic smart spacers in non-active areas of quartz substrates using masks they had designed, and that their cell assembly vendor, Standish Industries, assembled their substrates into display cells using standard LCD cell assembly techniques at their request. (*Id.*, Q63-64) Thomson states that Dr. Ho testified, a technician working at his direction used PARC's masks to form data and scan lines out of opaque metal on quartz substrates. (*Id.*, Q165.) Thomson alleges that the opaque metal lines were formed using the same masks and metal used to form data and scan lines for PARC's Copperfield displays, known as Ansel displays. (*Id.*) Thomson avers that over the data and scan lines, they applied ITO, and After applying ITO, Dr. Ho used one of their Ansel "smart spacer" masks (*Id. and* CPX-5C, CPX-6C, CPX-7C, CPX-8C), to photolithographically form out of polyimide, separate anisotropic spacing elements over the opaque areas of the data and scan lines. (Citing CX-4240C at Q. 111, 165.) Thomson continues that the spacing elements included material affixing them to the substrate. (*Id.,* Q. 166) Thomson continues that they coated a second quartz substrate with ITO (*Id.*, Q. 172) and provided both substrates to Standish, a vendor used by PARC, for cell assembly at their request using standard application of an alignment layer and mechanical rubbing. (*Id.*, Qs. 165-66)

Thomson says when these display cells came back from Standish, Dr. Ho's lab technicians tested their optical properties by switching the display cells on and off to evaluate whether the anisotropic spacers caused defects in the pixels. (*Id.*, Q. 171)

Thomson alleges that Dr. Ho's testimony is corroborated by the patent's December 1995 Invention Proposal (CX-1643C) witnessed by non-inventor Russell Martin. Thomson says the Invention Proposal includes the question "Has Invention been built, made, run or tested," which was answered "Yes." (*Id.* at PARC878) Thomson contends this is consistent with the entire document. Thomson asserts that the "Smart Spacer Fabrication" section states that "[w]e have photolithographically engineered smart spacer technology for AM LCD projection light valves" and that "using negative photo-reactive polyimide and carefully designed masks, we have succeeded in building anisotropic spacers as shown in Fig. 2(a)." (*Id.* at PARC0876.) Thomson adds that the "(3) Spacer Distribution and Count" section states "[w]e minimize the number of smart spacers to ensure optimum optical performance. We have tested 1 spacer every intersection (1/1) and 1/4 (see Fig. 3(a))." (*Id.* at PARC877) Thomson reasons that in order to have tested optical performance of spacers at every intersection or fourth intersection, display cells had to have been built including substrates that were mechanically rubbed, with the substrates affixed together and filled with liquid crystal, as admitted by Dr. Lowe. (Citing Tr. at 1031:10-15.) Thomson concludes that otherwise, no optical performance tests could have been performed, (*Id.*) and this corroborates reduction to practice.

Thomson says that Dr. Ho's testimony is further corroborated by notes from the invention review panel at Xerox, known as the TAP Panel. (Citing CX-1645C; and CX-4304C at Q. 156-159) Thomson avers that these notes, dated February 20, 1996, state that the smart spacer invention "has successfully been reduced to practice." (Citing CX-1645C at PARC872)

Thomson states that the TAP Panel noted that "[t]he concepts are being pursued with a vendor (Standish) under nondisclosure agreements..." (*Id.*) Thomson contends that this corroborates Dr. Ho's testimony that substrates including anisotropic spacing elements were sent to Standish — under nondisclosure agreement — for assembly into display cells as requested. Thomson adds Dr. Ho's testimony is also corroborated by the Copperfield Program Review dated June 21, 1996. (Citing CX-1642C; and CX-4242C at Q. 89-92, 97) Thomson says this document discusses a method to "pattern polyimide spacers over the opaque regions of the active matrix where they will not affect the image, and states that "test cells ***have been*** successfully assembled using this technique." (*Id.*)

Thomson argues that while Respondents cite to *Cooper v. Goldfarb*, 154 F.3d 1321, 1330 (Fed. Cir. 1998), for the proposition that an inventor's testimony must be corroborated, they ignore *Cooper*'s discussion of the rule of reason that "the law does not impose an impossible standard of 'independence' on corroborative evidence by requiring that every point of a reduction to practice be corroborated by evidence having a source totally independent of the inventor; indeed, such a standard is the antithesis of the rule of reason." (Citing *Cooper*, at 1331) Thomson says that the Federal Circuit held that, in view of statements by the inventor explaining the importance of certain elements and discussing specific embodiments to be constructed, the evidence as a whole corroborated the inventor's reduction to practice. *Id.* Thomson contends that here the evidence of corroboration amply satisfies Federal Circuit case law.

Referring to *Reese v. Hurst*, 661 F.2d 1222, 1240 (C.C.P.A. 1981), cited by respondents, Thomson argues that the opinion acknowledges, that "the goal of corroboration is simply to establish that the inventor actually (reduced the invention to practice) and knew it would work, by proof that could not have been fabricated or falsified." Thomson states that *Reese* acknowledges that a witness signature on a corroborating document weighs against fraud. (*Id.*) Thomson asserts that here, the '063 Invention Proposal was witnessed by Russell Martin, providing independent corroboration. (Citing CX-1643C at PARC873; and CX-4240C at Q. 232) Thomson adds that Dr. Ho's testimony is independently corroborated by the TAP Panel notes and Copperfield Program Review, neither of which he authored. (Citing CX-1642C; CX-1645C; CX-4304C at Q. 156-59; and CX-4242C at Q. 89-92, 97) Thomson concludes that under a rule of reason analysis, these documents amply corroborate Dr. Ho's testimony.

Thomson argues that the display cells described by Dr. Ho and corroborated by documents met all claim limitations. (Citing CX-4242C at Q. 56-81, 89-92, 97; and CX-4303C at Q. 153-159) Thomson alleges that one substrate was divided or partitioned into light-transmissive active aperture areas and opaque non-active areas by the opaque metal data and scan lines. (Citing CX-4240C at Q. 165; CX-4242C at Q. 80; and CX-4303C at Q. 155) Thomson says that Dr. Lowe recently attempted to argue that these opaque metal lines were not data and scan lines; but he already admitted under oath they were data and scan lines, that they met the claim limitations, and that no party has required an active matrix display including multiple TFT switches to satisfy the claims. (Citing Tr. at 1037:16-1038:6, 1038:21-1039:7) Thomson alleges that the display cells also include "a plurality of spacing elements separate from one another" that are formed on the "non-active areas of said first substrate" because the spacing elements in the display cells were formed at every intersection (or every fourth intersection) of opaque data and scan lines as admitted by Dr. Lowe. (Citing CX-4242C at Q. 80; CX-4304C at Q. 155; and Tr. at 1040:10-17) Thomson continues that the spacing elements were affixed to the non-active areas of the substrate, and containing "spacing layer including an affixing layer ... the affixing layer covering at least a portion of the non-active area and remaining substantially outside of the active aperture area." (Citing CX-4240C at Q. 165, 174) Thomson says Dr. Ho testified, and Dr. Lowe admitted, that these spacing elements were anisotropic. (Citing CX-4240C at Q. 165; and Tr. at 1040:4-9.) Thomson alleges that Dr. Lowe also admitted that the standard mechanical rubbing and cell assembly performed by Standish at PARC's request met the mechanical rubbing, attachment, and uniformity limitations of the claims given the presence of the anisotropic spacers fabricated by Dr. Ho. (Citing Tr. at 1042:18-1043:6; and CX-4240C at Q. 165-66.)

Thomson adds that the inventors also reduced to practice Ansel substrates for Ansel display cells by April 22, 1996, that were sent to Standish for assembly and returned as display cells in the ordinary course of business. (Citing CX-4240C , Qs. 162, 252-55) Thomson asserts that this is corroborated by Dr. Ho's lab notebook, which confirms that he built Ansel wafers with spacers acceptable for assembly by Standish, and that substrates with unacceptable spacers he rejected for assembly by Standish. (Citing CX-1644C at PARC1366-1367) Thomson concludes that there is a corroborated April 1996 conception with diligent reduction to practice of Ansel display cells for finished monitors too, and this is prior to both Lowe and Miyazaki.

In its reply brief Thomson contends that "the consistent testimony of Dr. Ho is more than sufficient to prove reduction to practice by December 1995." Thomson urges that the TAP Panel and Copperfield Program Review documents (CX-1645C and CX-1645C) provide further unimpeachable contemporaneous corroboration. Thomson argues that while Respondents suggest that the Invention Proposal, TAP Panel, and Copperfield Program Review documents themselves require corroboration, the Federal Circuit imposes no such requirement. To support its argument Thomson points to *Mahurkar v. C.R. Bard, Inc.*, 79 F.3d 1572, 1577-78 (Fed Cir. 1996) noting that the court said, "This court does not require **corroboration** where a party seeks to prove conception through the use of physical exhibits. *Id.* The trier of fact can conclude for itself what documents show, aided by testimony as to what the exhibit would mean to one skilled in the art."

Thomson counters that it does not rely on "merely fortuitous inherency" of an affixing layer. Thomson says instead, Dr. West testified that the Invention Proposal discloses "photolithographically forming the smart spacers from a negative photo-reactive polyimide . . . that will have an adhesion layer that affixes the material to the substrate it is formed on" sufficient to withstand subsequent mechanical rubbing (Citing CX-4242C at Q. 68; and CX-1643C.) Thomson asserts that this matches the '063 patent's description of spacers made of negative photoreactive material that adheres them to the substrate. Thomson contends that Dr. West properly concludes from the Invention Proposal that the inventors had conceived and built spacing elements including an affixing layer under claims 1-4 and 8 of the '063 patent. (*Id.*)

Discussion and Conclusions: The parties dispute whether or not Lowe and Miyazaki are prior art to the '063 patent. The evidence supports findings that Lowe (RX-16) was filed on May 10, 1996, and Miyazaki (RX-12) was filed on September 5, 1996. Both filing dates precede the filing date of the '063 patent, which was April 15, 1997.

Still, this does not end the inquiry, as, in this instance, "a document is prior art only when published before the invention date." *Mahurkar v. C.R. Bard, Inc.*, 79 F.3d 1572, 1576 (Fed. Cir. 1996). The Federal Circuit has explained that "priority of invention 'goes to the first party to reduce an invention to practice unless the other party can show that it was the first to conceive the invention and that it exercised reasonable diligence in later reducing that invention to practice.'" *Id.* (quoting *Price v. Symsek*, 988 F.2f 1187, 1190 (Fed. Cir. 1993)). Therefore, to demonstrate that Lowe and Miyazaki are not prior art, Thomson must show either: (1) an earlier conception and reduction to practice; or (2) an earlier conception coupled with "reasonable diligence toward reduction to practice from a date just prior to the other party's conception to its reduction to practice." *Id.* at 1578.

"Conception is the formation 'in the mind of the inventor of a definite and permanent idea of the complete and operative invention, as it is therefore to be applied in practice.'" *Kridl v. McCormick*, 105 F.3d 1446, 1449 (Fed. Cir. 1997) (quoting *Coleman v. Dines*, 754 F.2d 353, 359 (Fed. Cir. 1985). "A conception must encompass all limitations of the claimed invention[.]" *Singh v. Brake*, 317 F.3d 1334, 1340 (Fed. Cir. 2003).

"To show actual reduction to practice, an inventor must demonstrate that the invention is suitable for its intended purpose." *Mahurkar*, 79 F.3d at 1578. "[C]onstructive reduction to practice occurs when a patent application on the claimed invention is filed." *Solvay S.A. v. Honeywell Int'l, Inc.*, 622 F.3d 1367, 1376 (Fed. Cir. 2010).

Oral testimony regarding conception, reduction to practice, and diligence must be corroborated. *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1169-1170 (Fed. Cir. 2006); *Brown v. Barbacid*, 436 F.3d 1376, 1380 (Fed. Cir. 2006); *Mahurkar*, 79 F.3d at 1577; *Price*, 988 F.2d at 1194. A "rule of reason" analysis is performed to determine corroboration, requiring "[a]n evaluation of *all* pertinent evidence...so that a sound determination of the credibility of the inventor's story may be reached." *Price*, 988 F.2d at 1195. "[C]orroboration may be provided by sufficient independent circumstantial evidence, and corroboration of every factual issue contested by the parties is not a requirement of the law." *In re Jolley*, 308 F.3d 1317, 1328 (Fed. Cir. 2002).

Thomson asserts that there was a conception and actual reduction to practice prior to both Lowe and Miyazaki; Thomson makes no claim of conception prior to Lowe and Miyazaki coupled with reasonable diligence leading to a reduction to practice after Lowe and Miyazaki. Thus, absent a showing by Thomson that the invention that is the subject of the asserted claims of the '063 patent was conceived and reduced to practice prior to the filing dates of Lowe and Miyazaki, those patents will be found to be prior art.

Thomson has produced evidence that an invention was conceived and reduced to practice prior to the filing dates of Lowe and Miyazaki. The issue is whether or not there is sufficient evidence that all of the elements of the asserted claims of the '063 patent were, in fact, conceived and reduced to practice by that apparatus as Thomson asserts. AUO's position is that Thomson's evidence fails to show that the invention included the required active aperture area, non-active area, affixing layer and mechanical rubbing, and that Thomson's evidence fails to prove that the invention was reduced to practice prior to the filing of Lowe and Miyazaki.

Dr. Jackson Ho, a named inventor on the '063 patent, testified that he and Dr. Crawford, conceived of the invention of the '063 patent prior to October 1995 and had reduced the invention to practice by the fall of 1995. (CX-4240C at Q. 57.) Dr. Ho testified that in the summer of 1995, he was conducting independent research related to Ansel wafers for use in the Copperfield display program. He said that, along with Dr. Crawford he designed the display cells, and Standish Industries, a cell assembly vendor, assembled the substrates into display cells using standard LCD cell assembly techniques. Dr. Ho testified that they had built the invention by December 4, 1995. (CX-4240C at Q. 58-64.)

To corroborate Dr. Ho's testimony, Thomson has produced the Invention Proposal (IP) submitted to the Xerox Patent Department by Dr. Ho and Dr. Crawford on January 17, 1996. Each page of the document is signed by Dr. Ho and Dr. Crawford and is witnessed by Russell Martin on January 16, 1996. (CX-1643C.)

Thomson's expert, Dr. John West, testified that the IP discusses each and every limitation of, *inter alia*, asserted independent claims 1 and 11. (CX-4242C at Q. 63, 66-79; CX-1643C.) Dr. West opined that an affixing layer is necessary to assure that the spacers withstand the aggressive mechanical rubbing process to which they will be subjected. He said, too, that "[o]ne of the material properties of structures formed from a negative photo-reactive polyimide in this way is that it will have an adhesion layer that affixes the material to the substrate it is formed on." Dr. West said that this property would have been known to a person with ordinary skill in the art. (CX-4242C at Q. 68.)

The IP describes:

> "We currently have under IP (951947) several methods to alleviate this problem, and we propose here another one based on smart spacers formed photolithographically with an organic coating such as polyimide or a deposited dielectric such as CVD oxide, nitride, and/or oxy nitride.

(CX-1643C at PARC 00000873.) The foregoing language is remarkably similar to that found in the specification:

> After coating the bottom substrate 12 with a thin coating of negative photoresist or negative UV curable polyimide, spacers are photolithographically formed in non-active areas 36 of the bottom substrate 12. Alternatively, the spacers 54 may be photolithographically formed from a deposited dielectric such as CVD oxide, nitride and/or oxy/nitride.

(JX-1 at 3:45-50.) In Section III.B.4, *supra*, I concluded that this language provides two alternatives, to wit: (1) applying the described affixing layer to the substrate and then forming the spacers photolithographically on the thin coating of affixing layer on the substrate; or (2) photolithographically forming the spacers directly on the substrate using a deposited dielectric such as CVD oxide, nitride and/or oxy/nitride. Applying that reasoning to the issue at hand, I find that the IP does, in fact, reveal the affixing layer of asserted claim 1.

The IP clearly discusses and proposes an invention that contains active and non-active areas, and it describes placing the spacer elements in a hidden position in the non-active areas of the substrate. (CX-1643C at PARC 00000873.)

Finally, I note that the IP clearly discusses that the spacers are "highly anisotropic in shape" to be compatible with the "aggressive mechanical rubbing" process of the LCD assembly. (CX-1643C at PARC 00000873.) Based upon the foregoing, I find that the IP discloses conception of each and every element of claims 1 and 11 of the '063 patent.

I turn to the issue of whether or not the admitted evidence demonstrates that the inventors reduced the invention to practice prior to the filing dates of Lowe and Miyazaki.

Dr. Ho testified that he and Dr. Crawford built embodiments of the claimed inventions by fall 1995. (CX-4240C at Q. 56-58.) The evidence is that the masks for creating the display cells were completed by October 15, 1995. (*See* CPX-005-008C (inscriptions on the physical plates).) This is consistent with Dr. Ho's memory.

Claim 1 of the '063 patent requires a separate affixing layer that covers at least a portion of the non-active area of a substrate, and a plurality of spacing elements on that same substrate. Claim 1 clearly intends for the spacing elements to be affixed to the substrate by the affixing layer, because it requires that the spacing elements and the substrate be mechanically rubbed, after which the spacing elements will serve to separate the two substrates. (JX-1 at 5:24-39.)

The IP states that the smart spacers were fabricated and describes the process followed to include: "[f]irst, the spacers are built on the substrate with photo-lithographic techniques, followed by the spin coating of the polymide [*sic*] for the alignment layer of the liquid crystal." This does not describe fabrication using an affixing layer. The "polymide" layer described in the IP is an "alignment layer" of the liquid crystal. So, while the IP includes the concept of an affixing layer, the description of the method for fabricating the display cell omits this layer. Based upon all of the foregoing, I find that the evidence supports a finding, as testified by Dr. West, Dr. Ho and corroborated by the IP, that the invention of claim 11 of the '063 patent was conceived and reduced to practice by not later than January 16, 1996, the date that the IP was witnessed by Russell Martin. I find, too, that the evidence does not support a finding that the elements of claim 1 were incorporated in their entirety in the display cells manufactured according to the process described in the IP, because the IP fails to disclose that they were made with an affixing layer[22].

Based upon the foregoing, I find that Lowe and Miyazaki are prior art to asserted claim 1; but that they are not prior art to asserted claim 11, which was conceived and reduced to practice prior to the filing dates of Lowe and Miyazaki.

2. Anticipation

a. Urabe

AUO's Position: AUO contends that Japanese Unexamined Patent Application Publication No. H2-110432 ("Urabe") relates to a liquid crystal display device for use in a projection-type display and discloses spacing elements for controlling the gap between opposing substrates. AUO says according to Urabe, rectangular-shaped composites of polyimide containing dispersed glass fibers are selectively formed in the light non-transmissive regions of the display cell and mechanically rubbed along their long axes. (Citing RX-158C at Q. 281-287; RX-22, Figs. 1A-E and 2, AUO-THO 0499923, 925)

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[22] While Thomson alleges that there was a reduction to practice in April, 1996, by sending Ansel wafers to an outside contractor for construction, the evidence does not support a finding regarding the specific elements or processes used to make the Ansel wafers on this occasion. The evidence also does not clearly indicate that the wafers were ever actually constructed on this occasion – only that they were approved as acceptable for construction. (CX-1644C at PARC1366-1367)

AUO contends that it is undisputed that Urabe discloses most of the elements of the asserted claims of the '063 patent under either side's proposed claim constructions. (Citing RX-158C at Q. 288-318) AUO asserts with respect to the independent claims 1 and 11, the only elements that Dr. West attempted to dispute as being present in Urabe are "a plurality of spacing elements separate from one another, said spacing elements being anisotropic in shape" in claim 1, and the corresponding limitation in claim 11, namely "forming a plurality of spacing elements separate from one another on the front surface and non-active areas of said first substrate, the spacing elements being anisotropic in shape."[23] (Citing Tr. 1531:10-1533:11)

AUO argues that the parties' dispute regarding the plurality limitation turns on whether Urabe's spacing elements are the glass fiber spacers labeled 4 in Figure 2 of Urabe, as Thomson contends, or are the rectangularly-shaped composites – yellow rectangles in RDX-241 -- of polyimide (labeled 5 in Urabe Figure 2) containing dispersed glass fiber spacers (labeled 4 in Urabe Figure 2), as Respondents contend. (*Comparing* RX-158C at Q. 284 *with* CX-4304C at Q. 269) AUO argues that under either contention, Urabe meets the plurality limitation, asserting that Dr. West admitted as much during cross-examination.

AUO asserts that Dr. West admitted that there are 14 such spacers shown in Figure 2, which constitutes a plurality. (Citing Tr. 1536:24-1538:3.) AUO continues, he admitted that each of those spacers in Figure 2 is physically separate from all of the others. (*Id.* at 1538:4-7.) AUO says, finally he admitted that each of those spacers is anisotropic in shape because each has a length dimension that is greater than their width dimension. (*Id.* at 1538:21-1539:11.)

AUO alleges that Dr. West also conceded that Figure 2 shows a plurality of such rectangularly-shaped composites, and that each such composite is separate from every other such

[23] AUO notes that during the cross-examination of Dr. West, these limitations were referred to by the abbreviation "the plurality limitation." (Citing Tr. 1533:12-16.) That abbreviation is also used by AUO here.

composite. (Citing Tr. 1534:20-1535:18.) AUO says next, he admitted that each of these composites is anisotropic in shape because each has a length dimension along the Y axis that is greater than the width dimension along the X axis. (Tr. 1535:19-1536:11.) AUO contends that Dr. Lowe's testimony demonstrates that the composite structure of polyimide 5 containing spacers 4 performs the function of spacing the two substrates apart from each other and providing a substantially uniform cell gap. (Citing RX-158C at Q. 284, 293, 296; and Tr. 1091:7-11) AUO concludes that under Respondents' contention about what constitutes the spacing elements in Urabe, the plurality limitation is fully met, and Dr. Lowe agrees. (Citing RX-158C at Q. 292-296, 310-312)

AUO alleges that with respect to the elements of the asserted dependent claims, there is no dispute that Urabe discloses them as well. AUO states that regardless of whose contention is correct about what constitutes the spacing elements in Urabe, Dr. West admitted that Urabe expressly discloses forming the spacers photolithographically using a mask, as called for by claims 2 and 17. (Citing Tr. 1544:13-1549:22; and RX-158C at Q. 283, 302, 318) AUO continues that Dr. West also admitted that Urabe expressly discloses preventing formation of the spacers within the active aperture area, as called for by claim 3. (Citing Tr. 1596:22-1597:8; RX-22 at AUO-THO 0499925, first column, final paragraph; and RX-158C at Q. 303) AUO adds that Dr. West admitted that Urabe expressly discloses that the spacers "extend along a first axis and along a second axis shorter than the first axis," as recited in claims 4 and 12. (Citing Tr. 1535:19-1536:11, 1538:21-1539:11; and RX-158C at Q. 304) AUO concludes that Dr. West admitted that Urabe expressly discloses rubbing the spacers along their long axis, as recited in claim 14. (Citing Tr. 1535:19-1536:11, 1539:12-1540:17; and RX-158C at Q. 316) AUO alleges that there is no dispute that the additional limitations of dependent claims 8 and 18 are met by Urabe.

In its reply brief AUO argues that it makes no difference that Urabe does not use the word "composite." AUO says that is simply Dr. Lowe's shorthand for the rectangular structures consisting of polyimide 5 containing spacers 4 shown in Figure 2 of Urabe. AUO continues that although Dr. West opined that the polyimide, alone, does not function as a spacing element or control the cell gap (Citing CX-4304C at Q. 273-275), he never squarely addressed Dr. Lowe's opinion that "[t]he structure that provides for a uniform gap between the substrates contains both polyimide and fibers or beads and the resulting cell gap is determined by the combined thickness of the polyimide and the fibers or beads that are dispersed in the polyimide." (Citing RX-158C at Q. 284; and Tr. 1091:7-11) AUO argues that Dr. Lowe's testimony regarding composite spacing elements is, therefore, unrebutted and undisputed.

AUO asserts that it does not matter that each composite comprises multiple parts because nothing in the claims or the parties' constructions requires that the spacing elements be made of one and only one material. (Citing Tr. 1050:24-1051:2, 1091:16-1092:2)

AUO next argues that Urabe's composites are formed on the non-active areas, and Thomson's argument to the contrary is contradicted by Urabe's express disclosure, as Dr. West admitted on cross-examination. (Citing RX-22 at AUO-THO 0499925, first column, second paragraph; and Tr. 1548:20-1549:22, 1552:12-21, 1596:22-1598:16) AUO concludes that Dr. Lowe's testimony that Urabe's spacers 4 are made by a mechanical process before they are dispersed in polyimide and coated on the substrate (Citing Tr. 1048:2-23, 1056:2-9) does not change the fact that the composite spacing elements are formed on the non-active areas.

AUO alleges that it has consistently been Respondents' position that Urabe's spacing elements are composites of polyimide 5 and spacers 4. (Citing AIB at 54-55) AUO says that at trial, however, Dr. West disagreed, and argued that Urabe's spacers 4, alone, correspond to the claimed spacing elements. (Citing CX-4304C at Q. 273-275) AUO says that under cross-examination about whether Urabe would nevertheless anticipate under his view of what constitutes the spacers, Dr. West admitted that Urabe anticipates.

AUO says that Thomson now takes the position that Respondents should be precluded from raising the defense of anticipation under Dr. West's interpretation of what constitutes Urabe's spacers, because they did not advance that position in their pre-trial brief. AUO argues that, in their pre-trial briefs, Respondents raised the issue of anticipation by Urabe under what they believed to be the proper interpretation of what constitutes Urabe's spacers. (Citing APHB at 90-100) AUO argues that this was more than sufficient to preserve the issue of anticipation by Urabe,[24] particularly where, as here, the evidence of anticipation under Dr. West's interpretation did not exist until his cross-examination was completed. AUO argues that respondents cannot be faulted, much less precluded, because they failed to marshal in their pre-trial brief arguments predicated on evidence that did not yet exist.

AUO contends that the spacers 4 in Urabe are anisotropic. AUO refers to the testimony of both Dr. Lowe and Dr. West, saying they testified that Urabe's spacers 4 are anisotropic. (Citing Tr. 1054:16-24, 1353:1-1354:1; and Tr. 1538:21-1539:11, 1593:15-1595:7)

AUO says that Thomson's arguments regarding dependent claims 2, 3, 12, 14 and 17 are based on the flawed notion that Urabe's spacers 4, which are made from glass fibers, are "pre-fabricated." AUO says this is incorrect and urges that the glass fibers used by Urabe only

[24] AUO cites *Certain Silicon Microphone Packages*, Inv. No. 337-TA-629, 2009 ITC LEXIS 2444 at *173 (Jan. 12, 2009) as rejecting the waiver argument, stating that a brief discussion in pre-trial brief was enough to put Complainant on notice that prior art could be asserted as an obviousness reference.

become the spacers 4, after they are dispersed in polyimide, after they are coated onto the entire surface of the substrate, and after they are formed in the desired locations of the substrate by removing them from all but the non-active area that is light non-transmissive. AUO concludes at that point, and that point only, the glass fibers could be said to be spacers.

CMI's Position: While joining in AUO's brief on anticipation, CMI submits additional argument in its reply brief.

CMI says that Thomson only disputes that Urabe discloses the plurality limitation, "a plurality of spacing elements separate from one another, said spacing elements being anisotropic in shape" for claim 1 and "forming a plurality of spacing elements separate from one another on the front surface and non-active areas of said first substrate, the spacing elements being anisotropic in shape" for claim 11.

CMI states that Thomson's arguments regarding Urabe stem from its dispute that "composite spacing elements" identified by Dr. Lowe, comprising polyimide and fibers are the spacing elements disclosed by Urabe. CMI continues that Thomson argues that the fibers alone are the spacing elements. CMI contends that this dispute is "largely irrelevant," both because Thomson must respond to Respondents' invalidity contention rather than respond to a made up preferred contention, and under either theory Urabe anticipates the '063 patent.

CMI says that if the "composite spacing elements" are recognized as the disclosed spacing elements, Thomson disputes that the fiber subparts of the composite are separate from one another, and disputes that the composite spacing elements are limited to the non-active areas. CMI concludes that Thomson disputes that the composite spacing elements perform the required spacing function.

CMI says that Thomson admits that a composite "has *multiple* parts;" but then argues that subparts are not separate from each other. CMI contends that the claim requires that the spacing elements be separate from each other, not that subparts of the spacing elements be separate from each other. CMI asserts that Thomson's theory excludes any composite spacer, since parts within a composite are not separate from each other. CMI alleges that Dr. West disagrees with Thomson's argument, admitting that the composite spacing elements are separate from each other. (Citing Tr. 1534:20-1535:18.)

CMI contends that Urabe's composite spacing elements are not formed until they are patterned in non-active areas. CMI adds that Dr. West admitted that Urabe discloses preventing the composite spacing elements from forming in active aperture areas. (Citing Tr. 1596:22-1597:8.)

CMI contends that the composite spacing elements are formed of both polyimide and fibers. CMI continues that Thomson and Dr. West dispute that the polyimide performs the spacing function, but not that the fibers do. (Citing CX-4304C at Q. 273-275) CMI says they provide no argument that the overall composite does not perform the spacing function, only addressing its subparts. CMI argues that unlike Dr. West, Dr. Lowe addressed the composite structures and opined that they perform the function of spacing the two substrates and providing a substantially uniform cell gap. (Citing RX-158C at Q. 284, 293, 296; and Tr. 1091:7-11)

CMI says that if considered the disclosed spacing elements, Thomson disputes that the fibers (subparts of the composite spacing elements) meet the plurality limitation. CMI says that Thomson disputes that the fibers are separate from one another and that they are anisotropic. CMI adds that Thomson argues that the fibers are not formed on the substrate, and as an extension of this argument, Thomson argues that the fibers are not formed using a mask as required by claims 2 and 17. CMI concludes that Thomson argues that the number and location of the fibers cannot be controlled and they could overlap the active areas. CMI says applying this argument to claim 3, Thomson disputes that the fibers are prevented from being formed in the active areas.

Thomson's argument that the fibers are not separate from each other fails for the same reason Thomson's argument that the composites are not separate spacing elements fails above. Thomson argues the fibers are connected by polyimide, but disputes that the polyimide is part of the spacing elements. Thus the fibers are separate from each other. Dr. West also testifies that the fibers are separate from each other. (AUO PTB at 54; Tr. 1536:24-1538:7.)

CMI says that Thomson states that Respondents failed to argue that the fibers were anisotropic in shape, and are therefore precluded from doing so now. CMI counters that Dr. Lowe explains that the Urabe reference discloses composite spacers to one of skill in the art. (Citing RX-158C at Q. 283) CMI argues that counsel for Thomson opened the door to considering the fibers the spacing elements by asking Dr. West about the spacers Dr. Lowe identified, soliciting Dr. West's opinion that the spacing elements are the fibers. (Citing CX-4304C at Q. 270-275) CMI adds that at trial, upon cross examination of this testimony, Dr. West admitted that the fibers were in fact anisotropic. (Citing Tr. 1538:21-1539:11)

CMI states that Thomson argues that the fibers are not formed on the substrate, nor are they formed with a mask. CMI responds that, as Urabe explains and Dr. West agrees, photolithography using a mask is used to apply and control the location of the spacers when they are formed from the fiber on the substrate. (Citing Tr. 1544:13-1549:22)

CMI says while Thomson argues that the fibers may overlap the active areas, Dr. West disagrees, testifying that Urabe discloses limiting the fibers to the non-active areas. (Citing Tr. 1596:22-1597:8) CMI contends that using photolithography and masks, Urabe teaches controlling their location to prevent them from forming in the active aperture areas.

Thomson's Position: Thomson argues that Urabe does not anticipate because it fails to disclose anisotropic spacing elements. (CX-4304C at Q. 262-286, 299-302.) Thomson says that Respondents contend that Urabe discloses "composite spacing elements" made of polyimide and pre-fabricated spacers; but Urabe makes clear that pre-fabricated spacers Urabe labeled (4), not any alleged "composite," are spacers in Urabe. (Citing CX-4304C at Q. 273-275) Thomson contends that the function performed by polyimide in Urabe is not spacing but instead is to disperse pre-fabricated spacers. (*Id.* at Q. 273) Thomson alleges that Urabe does not disclose that any area of polyimide and prefabricated spacers functions together as a "composite spacing element." (*Id.*) Thomson asserts that Dr. Lowe admits that the word "composite" is never discussed in Urabe and that Urabe instead states that pre-fabricated spacers 4 are the spacers. (Citing Tr. at 1047:9-18)

Thomson argues that "Respondents' concoction of polyimide areas as "***composite*** spacing elements" vitiates the ***separate*** spacing element limitations of the '063 claims." Thomson contends that a composite, by definition, has multiple parts. Thomson reasons that this cannot satisfy claims to separate spacing elements and is contrary to the '063 patent's use of separate spacing elements to provide precise control over the count and location of spacers. (Citing CX-4304C at Q. 278-286; and Tr. at 1050:16-1051:13.)

Thomson adds that, in Urabe the alleged "composite spacing elements" are not formed on the non-active areas as required by claim 11, but instead are formed by roll coating pre-fabricated spacers roll coated over an entire substrate and then "trying to remove the spacers from active areas." Thomson alleges that Dr. Lowe admits, "spacers are not formed anywhere near the substrate" and "couldn't possibly be formed either in or not in" the non-active areas as provided by the '063 patent. (Citing Tr. at 1048:2-23, 1056:2-9, 1591:6-21.) Thomson says in [the '063 patent], spacers of claim 11 are formed on the non-active areas as admitted by Dr. Lowe. (Citing Tr. at 1052:22-1053:1) Thomson adds that the inability to control location of spacers randomly roll coated over the substrate also means spacers will overlap active aperture areas. (Citing CX-4304C at Q. 284) Thomson alleges that Urabe discloses no method to remove spacers overlapping active aperture areas. (*Id.*) Thomson concludes that, because they will remain in the active aperture area, this will cause optical defects similar to those caused by prior art spacers described in the '063 patent. (*Id.*; and CDX-1295)

Thomson contends that Respondents also have not asserted that pre-fabricated spacers of Urabe are anisotropic spacing elements of the '063 patent. Thomson says Respondents never made that argument and failed to do so in their Pre-Trial Briefs, so they cannot argue this now. Thomson adds that Dr. Lowe asserted in his witness statement that "the fiber or bead spacers by themselves do not perform the function of a spacing element." (Citing Tr. at 1054:16-24, 1587:21-1589:14; and RX-158C at Q. 296) Thomson concludes that, as Dr. Lowe admitted at trial and Dr. West confirmed, Urabe's pre-fabricated spacers are isotropic.

Thomson argues that Urabe cannot anticipate dependent claims 2 and 17 of the '063 patent based on the pre-fabricated spacers because those claims require forming spacers using a mask. (Citing CX-4304C at Q. 287-291, 310) Thomson says that Dr. Lowe admits that spacers (4) are not formed using a mask. (Citing Tr. at 1055:13-19) Thomson contends that Urabe cannot anticipate claim 3 because pre-fabricated spacers are coated across the entire substrate, including active aperture areas and therefore they are not prevented from being formed in active aperture areas. (Citing CX-4304C at Q. 292-296) Thomson adds that Urabe does not anticipate dependent claims 4, 12 and 14, because "Respondents erroneously rely on non-existent "composite spacing elements."" (*Id.* at Qs. 297-298, 303-308) Thomson concludes that Urabe does not anticipate claims 8 and 18 for the same reasons it does not anticipate claims 1 and 11.

In its reply brief Thomson says that respondents argue for the first time that pre-fabricated spacers 4 in Urabe are spacing elements under the claims. (Citing AIB at 54) Thomson contends that Respondents never argued that these spacers satisfied the claims in their Pre-Trial Brief. (Citing APHB at 90-100) Thomson says, in fact, Respondents and their expert disclaimed the pre-fabricated spacers 4 as spacing elements in the claims. (Citing APHB at 97; and RX-158C at Q. 296) Thomson argues that this argument is waived and refuted by their briefing and expert. Thomson asserts that the pre-fabricated spacers do not satisfy the spacing elements of claims 1 and 11 or dependent claims, because, first, Dr. Lowe admitted — and Dr. West agreed — that pre-fabricated spacers are isotropic. (Citing Tr. at 1054:16-24, 1587:21-1589:14) Thomson says that although Respondents point to Dr. West discussing dimensions of pre-fabricated spacers, Dr. West specifically testified that "there's no teaching that those are anything other than isotropic." (*Id.*) Thomson says there is no teaching in Urabe to apply admittedly isotropic pre-fabricated spacers in a manner to provide any anisotropy, and that is why Dr. Lowe disavowed anticipation by the pre-fabricated spacers and confirmed that all parties agree that they are isotropic.

Thomson says that, while Respondents attempt to obfuscate the requirement by truncating the term to just "the plurality limitation," claim 11 requires "forming a plurality of spacing elements separate from one another on the front surface and non-active areas of said first substrate." Thomson argues that the pre-fabricated spacers in Urabe fail this limitation because, as Dr. Lowe admitted, "the spacers are not formed anywhere near the substrate" and "couldn't possibly be formed either in or not in" the non-active areas as provided by the '063 patent. (Citing Tr. at 1048:2-23, 1056:2-9, 1591:6-21)

Discussion and Conclusions: Based upon the evidence in the record, I find that Respondents have failed to meet their burden to prove by clear and convincing evidence that Urabe discloses each and every element of the asserted claims of the '063 patent.

The dispute here is whether or not Urabe discloses: (1) spacing elements that are formed within the non-active area of one substrate; and (2) the spacing elements of Urabe are anisotropic in shape.

First, I note that both asserted independent claims 1 and 11 require that the spacing elements be anisotropic in shape. (JX-1 at 5:31-32, 6:17-18.)

AUO's argument is that the spacing elements identified in Urabe are the rectangularly-shaped "composites – yellow rectangles in RDX-241 -- of polyimide (labeled 5 in Urabe Figure 2) containing dispersed glass fiber spacers (labeled 4 in Urabe Figure 2." Thomson contends that the spacers are the items labeled "4" in Figure 2 of Urabe.

Thomson contends that AUO failed to disclose in its pre-hearing brief that it would argue that the spacers (4) in Figure 2 of Urabe are anisotropic in shape, and that AUO has waived that argument. Based upon a review of AUO's pre-hearing brief, I concur. AUO argues in its pre-hearing brief that the dispute will turn on whether the spacing elements of Urabe are "a composite of polyimide containing dispersed fibers or beads as Respondents contend, or the fibers or beads alone as Complainants contend." (APHB at 92.) AUO fails to argue that the fibers (4) are anisotropic in shape. In fact, describing Urabe, AUO argues "... Urabe discloses combining prior art spacers with polyimide to form anisotropic spacing elements and that those anisotropic spacing elements should be mechanically rubbed along their long axes." (APHB at

96.) Clearly AUO only treated the issue of anisotropic spacers as a part of the "composite" they assert as the spacing elements.

AUO urges that it first became aware of the argument that the spacers (4) are anisotropic of themselves during Dr. West's cross-examination, and that AUO could not, therefore, have put the argument in its pre-hearing filings.

Dr. West admitted that each of the 14 spacers shown in Figure 2 has a length dimension that is greater than their width dimension. (Tr. at 1538:21-1539:11.) Urabe shows at Figure 2 a plurality of spacers labeled "4" that are, in fact longer than they are wide. (RX-22 at Figure 2.) This is evident from Figure 2 without any need for expert testimony on that point. AUO is incorrect that Dr. West admitted that the spacers in Urabe are "anisotropic." He only admitted that they have a length greater than their width.

Dr. Lowe, on the other hand, testified that the spacers 4 of Urabe are "cylindrical" in shape, and are, therefore, "isotropic" as opposed to "anisotropic." (Tr. at 1054:16-24.) Dr. West agreed that the Urabe spacers are isotropic, based upon his reading of the specification in Urabe that describes the spacers as "polymer beads, glass fibers or the like." (Tr. at 1589:2-13.) Finally, a review of Urabe supports Dr. West's testimony regarding the nature of the spacers revealed by Urabe, when it states:

> The ... liquid crystal display device of the present invention ... comprises spacers (4) composed of glass fibers, polymer beads, or the like ...

(RX-22 at AUO-THO 0499924.)

Based upon the foregoing, I find that AUO has mischaracterized the testimony and its own pre-hearing brief to argue that it first learned that Dr. West believed that the spacers (4) of Figure 2 of Urabe are anisotropic. I find that AUO has waived the argument that the spacers (4) alone are anisotropic by failing to raise it in its pre-hearing brief.

Regarding the merits of the waived argument, based upon the testimony of experts for both AUO and Thomson discussed *supra*, I find that Urabe discloses spacers that are isotropic in shape rather than anisotropic as required by claims 1 and 11.

The remaining argument on this issue is AUO's original position that Urabe discloses anisotropic spacers in the form of the rectangularly-shaped composites – yellow rectangles in RDX-241 – of polyimide (labeled 5 in Urabe Figure 2) containing dispersed glass fiber spacers (labeled 4 in Urabe Figure 2). On this point, Thomson argues persuasively that "Respondents' concoction of polyimide areas as 'composite spacing elements' vitiates the separate spacing element limitations of the '063 claims." A composite with separate parts as disclosed in Urabe cannot satisfy claims to separate spacing elements, and is contrary to the '063 patent's use of separate spacing elements to provide precise control over the count and location of spacers. (CX-4304C at Q. 278-286; Tr. at 1050:16-1051:13.)

I turn to the final point of contention, which is whether or not the spacing elements are "formed" on the non-active area of a substrate as required by independent claim 11. AUO's expert, Dr. Lowe, testified unequivocally that the spacers (4) of Urabe are not formed on the substrate. Rather, they are made mechanically and then dispersed in polyimide and then spread on the substrate in the polyimide. They are not formed photolithographically and they are dispersed over the entire substrate, including both the active and non-active areas. (Tr. at 1048:2-1049:13.)

A review of Urabe discloses that the entire substrate is coated with a material produced by dispersing spacers (4) in polyimide (5) and then using a photolithographic process, for example, to remove the spacers in the portions where the pixel electrodes are to be laid out. (RX-22 at AUO-THO 0499924.)

It is clear from reading Urabe and observing Dr. Lowe's testimony, that the spacers of Urabe are not "formed" on the substrate. They are pre-manufactured mechanically and then dispersed on the substrate. In addition, when they are initially placed on the substrate they are placed everywhere on the substrate without regard to active and non-active areas, which is contrary to the teachings of claim 11.

Respondents have failed to meet their burden to prove by clear and convincing evidence that Urabe discloses each and every element of asserted claims 1, 2, 3, 4, 11, 12, 14 or 17 and I find that Urabe does not, therefore, anticipate those claims of the '063 patent.

A patent is presumed to be valid, and each claim of a patent shall be presumed valid even though dependent on an invalid claim. 35 U.S.C. § 282. If I determined claims 1 or 11 to be anticipated and invalid, I could still find that their respective dependent claims are valid. Since, however, I have found claims 1 and 11 to be ***not*** anticipated, their respective dependent claims are necessarily not anticipated, because they depend from claims 1 or 11 and necessarily contain all of the elements of their respective independent claims. *See In re Fritch,* 972 F.2d 1260, 1266 (Fed. Cir. 1992); *In re Royka*, 490 F.2d 981, 983-985 (C.C.P.A. 1974); *see also In re Sernaker*, 702 F.2d 989, 991 (Fed. Cir. 1983) . Based upon the foregoing, I find that Urabe does not anticipate dependent claims 2-4, 8, 12, 14, 17 or 18 of the '063 patent.

b. Sugata

AUO's Position: AUO alleges that it is undisputed that U.S. Patent No. 4,568,149 ("Sugata") discloses almost all of the elements of the asserted claims of the '063 patent under either side's proposed constructions. (Citing RX-158C at Q. 344-373) AUO says the only dispute is whether Sugata's rubbing step is performed before, or after, the spacers are formed. (Citing Tr. 1558:12-1559:8)

AUO asserts that rubbing after formation of the spacers is clearly taught in Sugata's description of Figure 3(a), which Dr. West admits he did not discuss in his witness statement. (Citing Tr. 1563:24-1564:4) AUO says with reference to Figure 3(a), Sugata discloses that the spacers are formed on insulating layer 5a, which is on the electrode plate S. (Citing RX-15 at 3:47-51) AUO alleges that then, after describing the formation of all of the other structures on electrode plate S and opposite plate 7, Sugata states that an insulating film is formed on each of the electrode plates, followed by rubbing to form an alignment layer:

> Each surface of two electrode plates in contact with the liquid crystal may be coated with an insulating material. ... To the insulating film of this type, an orientation controlling treatment is applied .... As a typical process for the orientation controlling treatment, the surface of the insulating film is rubbed in one direction with a velvet or cloth.

(*Id.* at 4:31-44.) AUO says that Dr. West admits that the insulating material that is rubbed and forms an alignment layer is "over the top of everything, in contact with the liquid crystal." (Citing Tr. 1581:11-13) AUO contends that ***"Everything"*** includes the spacers, which were previously formed on a different insulating layer – layer 5a. AUO summarizes that Sugata plainly discloses the steps of: (1) forming the spacers on layer 5a, and (2) subsequently depositing insulating material over the top of everything, followed by rubbing. AUO concludes that Sugata teaches that step (1) is performed before step (2), not the reverse order, as Thomson contends. (Citing RX-158C at Q. 334-335)

AUO continues that Dr. West admits that according to Sugata, the spacers are formed on layer 5a, as described at column 3, lines 47-51, not on the insulating material that is applied over everything and then rubbed to form an alignment layer, as described at column 4, lines 31-45. (Citing Tr. 1573:22-25; RX-158C at Q. 328, 335, 340-341; and RDX-224) AUO next contends that Dr. West "implicitly admits that insulating layer 5a cannot be the insulating material, described at column 4, lines 31-45, that gets rubbed to form the alignment or orientation layer."

AUO reasons that this is inextricably so because in Figure 3(a), electrodes 4a-d, which form the picture elements, are on top of insulating layer 5a; but "as Dr. West admits", electrodes 4a-d must be "underneath," not on top of, the orientation layer. (Citing Tr. 1576:17-1577:1; RX-15 at 4:7-9; and RX-158C at Q. 338) AUO adds that Dr. West agrees that the purpose of layer 5a is to prevent short circuits (Citing Tr. 1572:23-1573:12), not to form an orientation layer. AUO reasons that, therefore, the record is clear that the insulating material that is rubbed is not, and cannot be, layer 5a on which the spacers are formed. (Citing RX-158C at Q. 339)

AUO avers that, in his witness statement, Dr. West read Sugata's disclosure at column 4, lines 31 to 45 (describing an insulating material that is rubbed) together with the disclosure at column 4, line 65 to column 5, line 4 (stating that, in Fig. 3(b), the spacers are formed on an insulating layer) to conclude that the spacers must have been formed after the rubbing step. (Citing CX-4304C at Q. 320-321) AUO argues that this is entirely unsound. AUO states that the passage from column 4, line 65 to column 5, line 4 of Sugata concerns the formation of spacers on the upper electrode plate in Figure 3(b). AUO says it does nothing to change the description of Figure 3(a), in which the spacers are formed on layer 5a on the lower electrode plate in Figure 3(a), followed by the deposition of an insulating material and rubbing to form an orientation layer. (Citing RX-158C at Q. 335, 338; RDX-226; and Tr. 1563:11-25)

In its reply brief AUO says that Thomson distorts the record by claiming that Dr. Lowe admitted that "the prior art often provided for spacers formed after the mechanical rubbing step." (Citing CIB at 46 (citing Tr. 1058:21-1059:2)) AUO contends that Dr. Lowe never said "often"; instead, he testified that "both processes were known." (Citing Tr. 1095:1-8) AUO adds that Thomson claims Respondents' argument is that "it can be inferred from Sugata that the spacing elements are formed prior to the rubbing step." (Citing CIB at 46) AUO says that Respondents do not rely on inference. Rather, Respondents' position is "Rubbing after formation of the spacers is clearly taught in Sugata's description of Figure 3(a) …." (Citing AIB at 56)

CMI's Position: While joining in AUO's argument on anticipation, CMI submits its own argument in a reply brief.

CMI says that Thomson's sole argument that the Sugata reference does not anticipate the '063 patent is that mechanical rubbing is performed before the spacers are formed. CMI asserts that this ignores or misreads the cited embodiment. CMI states that at trial it was shown that Dr. West's opinion was based on combining two distinct insulating layers disclosed by Sugata. CMI avers that Dr. West admits, he does not address this embodiment in his witness statement. (Citing Tr. 1563:24-1564:4) CMI reasons, therefore, Dr. Lowe's testimony regarding this reference, and CMI's arguments relating to it, have not been addressed or rebutted by Dr. West.

CMI avers that Dr. West admitted at trial that Sugata discloses two insulating layers. (Citing Tr. 1567:15-1568:4) CMI adds that Dr. West agreed that the spacers (6a through 6d) are formed on one of those layers, insulating layer 5a. (Citing Tr. 1573:22-1574:3) CMI says this is supported by the Sugata reference, RX-15, at 3:47-51, a disclosure Dr. West testified he did not include in his witness statement. (Citing Tr. 1582:20-24) CMI states that Dr. West further testified that insulating layer 5a could be the second insulating layer as well—the orientation layer that is subjected to mechanical rubbing. (Citing Tr. 1574:16-19) CMI says that Dr. West admitted that insulating layer 5a is taught to be underneath the picture elements (shown as 4a-4d in the figure above). (Citing Tr. 1574:20-1575:2.) CMI concludes that Dr. West explained that if insulating layer 5a were subjected to mechanical rubbing, that layer would have to be ***above*** the picture elements to function properly. (Citing Tr. 1576:17-1577:1)

CMI argues that this interpretation is not how one of ordinary skill in the art would interpret Sugata. CMI asserts that Sugata explains that insulating layer 5a is formed beneath the picture elements. (Citing RX-15 at Figure 3(a)) CMI says spacers are formed on insulating layer 5a. (RX-15 at Figure (3a).) After the picture elements are formed, an insulating film is applied on top of all of the structures and the film is mechanically rubbed. (Citing RX-158C at Q. 335) CMI reasons that since the alignment film is applied on top of the spacers and subsequently rubbed, Sugata discloses that the spacers are subjected to mechanical rubbing.

Thomson's Position: Thomson argues that Sugata does not anticipate, because the asserted claims require mechanical rubbing after formation of the spacers, and Sugata fails to disclose rubbing after spacers are formed; rather, Sugata actually discloses rubbing before spacers are formed. (Citing CX-4304C at Q. 315-321; 325-38; and CDX 1299-1302) Thomson contends that the sequence of the mechanical rubbing step is an important element of the '063 patent claims; it was added by amendment in prosecution to distinguish Hasegawa. (*Id.* at Qs. 316, 323; and JX-6 at THOM3427-31) Thomson alleges that Dr. Lowe admitted at trial that the prior art often provided for spacers formed after the mechanical rubbing step. (Citing Tr. at 1058:21-1059:2) Thomson continues that Dr. West testified that Sugata discloses that rubbing occurs before spacer formation. (Citing CX-4304C at Q. 315-321; and Tr. at 1584:23-1587:20.) Thomson says in Sugata, spacers are formed on an "insulating layer" which Sugata refers to as a film that has been subjected to an "orientation controlling treatment." (*Id.*, Q. 320; and RX-15 at 4:31-45, 4:64-5:5) Thomson avers that Dr. West testified that the reference to "orientation controlling treatment" is a reference to the insulating film having been mechanically rubbed before spacer formation. (Citing CX-4304C at Q. 319; and Tr. at 1586:9-16) Thomson concludes that Sugata discloses to one of ordinary skill that spacers are formed after the insulating film has been coated on the substrate and after the rubbing process has been performed. (*Id.*, Q. 321) Thomson argues that this is contrary to the asserted claims of the '063 patent, which require spacer formation before rubbing. Thomson alleges that Dr. Lowe admits that the orientation film that he claims is applied after the spacers are formed is not even shown in Sugata. (Citing RX-158C at Q. 336)

In its reply brief Thomson contends that Respondents focus on layer 5a to distract from the fact that they are seeking to invalidate the '063 patent based on an inferred location of a layer not shown in Sugata. (Citing Tr. at 1584:23-1586:16; and RX-158C at Q. 336) Thomson avers that Dr. West unambiguously explained at trial that the insulating film that forms the alignment layer in Sugata is "the insulating layer that they refer to all the way through, and it teaches that the insulating layer is under the spacer and rubbed before the spacers are put on." (Citing Tr. at 1586:1-19) Thomson says the experts' dispute is summarized by CDX-1299, in which each expert has shown where each believes the orientation layer is found in Sugata. (Citing CDX-1299; and "1586:20-1587:20")

Discussion and Conclusions: Based on the evidence in the record, I find that Respondents failed to offer clear and convincing evidence that Sugata anticipates any of the asserted claims of the '063 patent.

The dispute here is whether or not Sugata discloses mechanical rubbing after the spacers are formed as required by the asserted claims.

Based upon a thorough review of the evidence presented, including the Sugata reference (Exhibit RX-15), I find that Respondents have failed to meet their burden to show that Sugata discloses mechanical rubbing of the substrate and spacers after the spacers have been formed as required by the asserted claims of the '063 patent.

The parties focus on Figure 3(a) of Sugata, shown below, and language describing that figure.

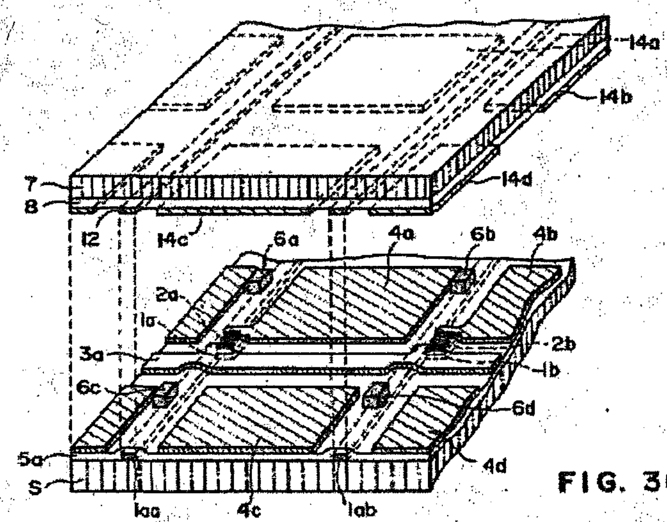

FIG. 3(a)

(RX-15 at Figure 3(a).)

Sugata reveals that "spacer members (6a, 6b, 6c and 6d) are fixed on row electrodes 1aa, 1ab ... (or on column electrodes 3a, 3b, etc., while not shown in this Figure) on the electrode plate S ***through the insulating layer 5a***." (RX-15 at 3:47-51) (Emphasis added.) The reference to fixing the spacer members "through" the insulating layer indicates that the insulating layer exists prior to the fixing of the spacer members, rather than having the insulating layer applied after the spacer members were in place. This is the only discussion of the sequence of placing the spacer members occurring in Sugata with reference to Figure 3(a).

The remaining discussion of Figure 3(a) does not reveal a sequence of events in forming spacer members or in mechanical rubbing of an insulating layer or the spacer members. That remaining discussion merely provides information about the make-up of the various elements that are included in the display cell. For example, following the description of fixing the spacer members on the row electrodes, Sugata discusses: (1) the thickness of the spacer members; (2)

the pattern, thickness and composition of the non-transmissive members; (3) the composition of the insulating material and the need to apply an orientation controlling treatment (i.e. mechanical rubbing) to the insulation material – without mention of mechanical rubbing of the spacer members; and (4) a type of liquid crystal that may be used in the invention. These various descriptions and details do not provide a sequential process for forming the display cell or any of its parts. They do not hint at mechanical rubbing of the spacer members after they have been fixed. (RX-15 at 3:52-4:63.)

Sugata describes the process shown in Figure 3(b) to include non-transmissive members and color filters are formed on the electrode plate, which are coated with an insulating layer (not shown). "Further, spacer members 6a, 6b, 6c and 6d … are disposed on the insulating layer along the non-transmissive members 12." (RX-15 at 4:64-5:4.) There is no discussion of the timing or existence of mechanical rubbing in connection with Figure 3(b).

In Sugata's claims, the only one that even approaches a sequential discussion regarding the spacer members is dependent claim 9, which limits itself to a discussion of etching – not mechanical rubbing. (RX-15 at 8:33-37.)

Finally, Dr. West unambiguously testified at trial that the insulating film that forms the alignment layer in Sugata is "the insulating layer that they refer to all the way through, and it teaches that the insulating layer is under the spacer and rubbed before the spacers are put on." (Tr. at 1586:1-1587:20; CDX-1299 (demonstrating that each expert has shown where each believes the orientation layer is found in Sugata).)

Based upon all of the foregoing, I find that Respondents have failed to meet their burden to provide clear and convincing evidence that Sugata reveals each and every element of asserted claims 1 or 11 of the '063 patent.

A patent is presumed to be valid, and each claim of a patent shall be presumed valid even though dependent on an invalid claim. 35 U.S.C. § 282. If I determined claims 1 or 11 to be anticipated and invalid, I could still find that their respective dependent claims are valid. Since, however, I have found claims 1 and 11 to be ***not*** anticipated, their respective dependent claims are necessarily not anticipated, because they depend from claims 1 or 11 and necessarily contain all of the elements of their respective independent claims. *See In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992); *In re Royka*, 490 F.2d 981, 983-985 (C.C.P.A. 1974); *see also In re Sernaker*, 702 F.2d 989, 991 (Fed. Cir. 1983) . Based upon the foregoing, I find that Sugata does not anticipate dependent claims 2-4, 8, 12, 14, 17 or 18 of the '063 patent.

c. Lowe

AUO's Position: AUO alleges that it is undisputed that the Lowe patent discloses most of the elements of the asserted claims under either side's proposed constructions. (Citing RX-158C at Q. 388-417) AUO alleges that the only disputes are: (1) whether Lowe's rear substrate 12 is divided or partitioned into "an active aperture area and a non-active area;" (2) whether the spacers 30 and 31 taught by Lowe are "separate from one another;" and (3) whether Lowe's substrates 12 and 13 form a "display cell."

AUO asserts that Lowe teaches that his display cell can be used in a flat panel display that is "transmissive, or backlit." (Citing RX-16 at 1:5-15.) AUO says that Lowe discloses that rear substrate 12 can be transparent (*Id.* at 3:15-17, 4:16-18) and can be coated with a plurality of electrodes 17 made from a transparent electrically conducting material. (*Id.* at 3:22-24, 4:22-24, 4:33-35) AUO states that Lowe further discloses that, for a high resolution display, "the pixels will be addressed by an active matrix in which each pixel is driven via an integrated circuit switch ...." (*Id.* at 4:30-32.) AUO adds that Lowe teaches that "the spacers remain sufficiently narrow in width to be hidden in the interpixel gaps" (*Id.* at 4:64-65), and that "[t]here is an advantage in positioning the spacers in the interpixel gap since they do not then interfere with or degrade the visual performance of the display." (*Id.* at 5:3-6.) AUO argues that, taken together, these passages clearly teach that the rear substrate 12 can be an active matrix array that is partitioned into an active aperture area corresponding to the plurality of transparent electrodes 17 and a non-active area corresponding to the interpixel gaps, where the data and scan lines and spacers are located and which are opaque. (Citing RX-158C at Q. 384, 390-391)

AUO says for a transmissive, backlit display, the electrodes will be transparent. (*Id.* at 1:5-15, 3:22-24, 4:22-24.) AUO alleges that Dr. West agrees that Lowe's disclosure of an active matrix necessarily means "the data and scan lines of the active matrix are opaque." (Citing CX-4304, Q. 349) AUO contends that this conclusion is reinforced by the teaching that the spacers are "hidden in the interpixel gaps," which is similar to language used to describe the non-active area in the '063 patent (Citing JX-1 at 2:37-39) and to language used by Dr. West to identify the opaque non-active area in the accused products. (Citing Tr. 235:18-236:18)

AUO argues that the '063 patent claims can be read on the Lowe patent in two ways. Regarding the first way, (i.e. that the two substrates identified in claims 1 and 11 of the '063 patent correspond to Lowe's rear substrate 12 and intermediate substrate 13) AUO alleges that Thomson and Dr. West make no argument that spacers 31 in the rear subcell are not "separate from one another." (Citing CX-4304, Q. 352)

Regarding the second way, (i.e. in which the two substrates of claims 1 and 11 of the '063 patent correspond to Lowe's front substrate 11 and rear substrate 12) AUO says that in the double cell, a substantially uniform gap is maintained between substrates 11 and 12 by the overlapping spacers 30 and 31. (Citing RX-16, Fig. 3A, 3:51-55, 6:3-5)

AUO asserts that as shown in Figure 3A, each pair of overlapping spacers 30 and 31 is separate from every other such pair, and each spacer 30 is separated from each corresponding spacer 31 by intermediate substrate 13. AUO argues that Lowe's disclosure of an additional substrate 13 does not avoid anticipation. (Citing *Orion IP, LLC v. Hyundai Motor Am.*, 605 F.3d 967, 977 (Fed. Cir. 2010) to say that the presence of functionality in the prior art reference in addition to the requirements of a claim does not avoid anticipation; and *Exergen Corp. v. Wal-Mart Stores, Inc.*, 575 F.3d 1312, 1319-20 (Fed. Cir. 2009))

AUO contends that if the Court finds that Lowe's double cell anticipates the '063 claims, then there is no need to address Thomson's alternative argument that the rear subcell is not a "display cell" as set forth in the preamble of claims 1 and 11.

In its reply brief AUO says that each of Thomson's three arguments was addressed in AUO's opening brief. (Citing AIB at 59-62.) AUO says, however, that Thomson errs in contending that the only active matrix embodiment in Lowe is one that uses reflective metal in the active aperture area. AUO asserts that although the Lowe patent discusses an example of a reflective active matrix display cell (Citing RX-16 at 4:42-47), it also discloses the use of active matrix addressing more generally. (*Id.* at 4:29-32) AUO contends that the Lowe patent includes dependent claims directed to an active matrix (claims 2, 13 and 14) and a transmissive liquid crystal display (claim 11). (Citing RX-16 at 8:31-32, 53-54, 58-61) AUO alleges that Thomson does not and cannot dispute that the active matrix substrate in a transmissive LCD is partitioned into a light-transmissive active aperture area and a non-active area (containing the opaque data and scan lines) in accordance with '063 claims 1 and 11.

Thomson's Position: Thomson contends that the asserted claims require "at least one of the substrates divided into a light-transmissive area that does not overlap an area where data and scan lines cross over in the display cell, and an opaque area." Thomson says that Respondents cite to statements in Lowe that there is "a transparent front substrate 11 and a transparent or opaque rear substrate 12," and that "the inner surface of the rear substrate is coated with an electrode material 17 which can be transparent or opaque, reflective or light absorbing, depending on the particular liquid crystal effect employed." (Citing RX-16 at 4:16-25.) Thomson asserts that Respondents provide no explanation as to how these citations divide or partition at least one substrate into light-transmissive active aperture areas defined by an opaque non-active area. (Citing CX-4304C at Q. 346) Thomson avers that Dr. West's opined that one would not read these passages to necessarily disclose division of one of the substrates into active aperture areas and non-active areas. (*Id.*, Qs. 347-348) Thomson states that according to Lowe, the first substrate 11 is always transparent with a transparent electrode material 16 coated on its inner surface. (Citing RX-16 at 4:22-25) Thomson says this substrate is not divided into light-transmissive areas and opaque areas. (Citing CX-4304C at Q. 348) Thomson continues that Lowe then discloses that the second substrate 12 can be wholly transparent or wholly opaque. (Citing RX-16 at 4:18-20) Thomson argues there is no disclosure to divide the second substrate 12 into active aperture areas or a "light-transmissive area that does not overlap an area where data and scan lines intersect" and non-active areas that are opaque. (Citing CX-4304C at Q. 348) Thomson adds there is no disclosure to divide the second substrate into visible and non-visible parts of a pixel under Respondents' construction. (*Id.*) Thomson concludes that although Lowe mentions an active matrix, the embodiment referenced by Lowe lacks light-transmissive active aperture areas because it uses highly reflective metal such as aluminum, and does not teach partitioning a substrate according to claims of the '063 patent. (*Id.*, Q. 349)

Thomson contends that Lowe also fails to anticipate because spacers 30 and 31 are not "a plurality of spacing elements separate from one another." Spacers 30 and 31 are aligned spacers in the finished display cell. (Citing CX-4304C at Q. 352) Thomson reasons that this is necessary because spacer 30 only maintains the distance between substrate 11 and flexible membrane 13, and spacer 31 only maintains distance between substrate 12 and flexible membrane 13. (*Id.*) Thomson concludes that to maintain the uniform distance between the outer substrates 11 and 12, which Lowe points to as the first and second substrates in the '063 patent, spacers 30 and 31 are combined. (*Id.*)

Thomson alleges that Dr. Lowe newly asserts that spacers 31 alone are a plurality of separate spacing elements. (Citing CX-4304C at Q. 353) Thomson argues that spacers 31 alone do not meet the claims because intermediate substrate 13 must be clamped and held in tension between spacers 30 and 31. (Citing CX-4304C at Q. 355; and RX-16 at 6:2-10) Thomson adds that the compartment between substrates 12 and 13, on its own, will not absorb all light and function as a display cell. (Citing CX-4304C at Q. 355; and RX-16 at 6:18-39.)

In its reply brief Thomson says that Respondents argue that because Lowe mentions an active matrix display in a laundry list of substrate and array combinations, that Lowe must disclose partitioning of the '063 patent. (Citing AIB at 59-60) Thomson avers that Dr. West testified that Lowe does not disclose a substrate partitioned according to the '063 patent and it is not inherent because the combinations, including the one used by Lowe throughout the patent, do not meet the partitioning element. (Citing CX-4304C at Q. 346-348) Thomson says Respondents also focus on the requirement that spacing elements, either spacers 31 alone or spacers 30 and 31 combined, be "separate from one another." Thomson argues that Spacers 31, even if separate, do not function to maintain a substantially uniform cell gap because Lowe requires an intermediate substrate clamped between two spacers to maintain uniformity. (Citing CX-4304C at Q. 352-55)

Thomson argues that Spacers 30 and 31 are not separate because the spacers must be paired with one another to maintain uniformity. (*Id.*)

Discussion and Conclusions: Based on the evidence in the record, I find that Respondents have failed to offer clear and convincing evidence that Lowe anticipates any of the asserted claims of the '063 patent.

In Section IV.B.1 *supra*, I found that Lowe is prior art to asserted claim 1; but that it is not prior art to asserted claim 11, which was conceived and reduced to practice prior to the filing date of Lowe.

I begin by considering the merits of whether or not clear and convincing evidence establishes that Lowe anticipates each and every element of asserted claim 1 of the '063 patent. The dispute is whether or not Lowe reveals: (1) one of said two substrates divided into an active aperture area and a non-active area; (2) a plurality of spacing elements separate from one another; and (3) that the plurality of separate spacer elements function to maintain a substantially uniform cell gap between the two substrates that correspond to those of the '063 patent.

First, I find that Respondents have not established by clear and convincing evidence that either of the two substrates in Lowe are divided between an active and non-active area as construed herein. The detailed description of the preferred embodiments in Lowe reveals "a transparent front substrate 11 and a transparent or opaque rear substrate 12." Lowe discloses that the rear substrate is "coated with an electrode material 17 which can be transparent or opaque, reflective or light absorbing, depending on the particular liquid crystal effect employed." There is no discussion of dividing a substrate into light transmissive and opaque areas as required by the '063 patent. (RX-16 at 3:15-25, 4:16-25.) Dr. West's credible testimony accurately describes the foregoing provisions of Lowe and confirms that there is no disclosure of dividing the second substrate into visible and non-visible parts of a pixel. He also said that Lowe's disclosure of active matrix can be, and specifically is, used in a manner that does not require partitioning into light transmissive active aperture areas and opaque non-active areas. He detailed how Lowe teaches that the substrate is transparent; but the electrodes of the active matrix are opaque, and the substrate is not partitioned. (CX-4304C at Q. 346-349; CDX 1307, 1308, 1309.)

Regarding the requirement in the '063 patent for a plurality of spacing elements separate from one another, I made clear in Section III.B.6, *supra*, that the structures are not physically connected to one another. In Lowe the spacing elements are stacked one on top of the other; but they are separated by a thin film. Thus, they are not "directly" or "physically" connected to one another, and this element is met. (RX-16 at Figure 3(a), 3:51-55, Figure 2; 4:49-53.)

Regarding the third and final contested element, however, AUO has failed to provide clear and convincing evidence of disclosure by Lowe. When arguing the construction to be given to the terms "a plurality of spacing elements separate from one another" and "spacing elements" in claims 1 and 11 respectively, AUO argued persuasively that a person of ordinary skill in the art would have known at the time the '063 patent application was filed that the function of the spacing elements would be carried out by placing the elements in contact with the surfaces of the two substrates to be maintained at a substantially uniform distance from one another. As a result, in Section III.B.6, *supra*, I construed the term in the context of the asserted claims of the '063 patent (as AUO urged) to mean "two or more structures, not physically connected to one another, which structures serve to substantially uniformly separate two substrates, said structures formed on one of said two substrates and contacting the second substrate."

The two substrates of Lowe that correspond to the substrates of claim 1 of the '063 patent are those designated as the "front substrate" and "rear substrate." Lowe clearly does not teach that the separate structures that serve as spacing elements are formed on one of said two substrates and contacting the second substrate. Lowe discloses instead that the structure of its invention is quite different from that of the '063 patent's invention. Lowe describes a very thin intermediate film or substrate placed between the front substrate and the rear substrate.[25] (RX-16 at 3:17-18, Figure 4, 3:56-61.) The spacing elements, stacked one upon the other with the thin intermediate film or substrate separating them, serve, respectively, to provide a gap between one of the front substrate or the rear substrate and the intermediate film or substrate. The separate spacing elements do not contact both the front and rear substrate. The "uniform spacing" that is maintained is not between the front and rear substrates as contemplated in the '063 patent; but between one of the front or rear substrates and the third substrate which is a thin film. (CX-4304C at Q. 362; RX-16 at 4:16-20, 5:61-6:6.)

In fact, Lowe claims in independent claim 1:

A liquid crystal display cell ... comprising:

> at least two compartments, each separated by means of a thin transparent membrane held in tension by at least one peripheral adhesive seal, and maintained in precise spatial separation by means of accurately positioned spacers, and in which the membrane is substantially thinner than the thickness of each of said compartments ...

(RX-16 at 8:20-28.) Reference to the same two compartment structure separated by the thin membrane is repeated throughout the claims of Lowe. (*See, e.g.*, RX-16 at 8:66-9:5, 9:16-23, 9:33-39, 10:7-13, 10:23-31, 10:39-48.)

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[25] AUO does not argue that the thin film third susbtrate combined with one of the front or rear substrates would result in a complete liquid crystal display cell, and I find that such a combination would not result in a complete liquid crystal display cell, because Lowe makes it clear that the front and rear substrates are necessary to achieve a complete liquid crystal display cell.

Based upon the foregoing, I find that Respondents have failed to meet their burden to provide clear and convincing evidence that Lowe discloses each and every element of asserted claim 1.

I have already found that Lowe is not prior art to independent claim 11 of the '063 patent. Nevertheless, if one were to find that Lowe is prior art to claim 11 of the '063 patent, the facts and logic that resulted in my finding that Lowe does not anticipate claim 1 of the '063 patent would apply equally to claim 11. The elements of claim 11 do not materially differ from claim 1 as to the three disputed elements treated in this section. It would, then, be my finding that Respondents have failed to meet their burden to provide clear and convincing evidence that Lowe discloses each and every element of asserted claim 11 of the '063 patent.

A patent is presumed to be valid, and each claim of a patent shall be presumed valid even though dependent on an invalid claim. 35 U.S.C. § 282. If I determined claims 1 or 11 to be anticipated and invalid, I could still find that their respective dependent claims are valid. Since, however, I have found claims 1 and 11 to be ***not*** anticipated, their respective dependent claims are necessarily not anticipated, because they depend from claims 1 or 11 and necessarily contain all of the elements of their respective independent claims. *See In re Fritch,* 972 F.2d 1260, 1266 (Fed. Cir. 1992); *In re Royka*, 490 F.2d 981, 983-985 (C.C.P.A. 1974); *see also In re Sernaker*, 702 F.2d 989, 991 (Fed. Cir. 1983) . Based upon the foregoing, I find that Lowe does not anticipate dependent claims 2-4, 8, 12, 14, 17 or 18 of the '063 patent.

d. Miyazaki

AUO's Position: AUO alleges that Thomson does not dispute that Miyazaki anticipates claims 11, 12, 14, 17 and 18 of the '063 patent. AUO says it is undisputed that Miyazaki discloses almost all of the elements of asserted claims 1-4 and 8 of the '063 patent under either side's proposed claim constructions. (Citing RX-158C at Q. 437-453) AUO argues that Thomson's purported distinction is that Miyazaki's affixing layer does not remain "substantially outside of the active aperture area," as recited in '063 claim 1. AUO says that Thomson argues that this distinction exists because Miyazaki's red color filter 32R, which it calls the affixing layer, covers the red subpixels in the active aperture area. (Citing CX-4304C at Q. 376, 382)

AUO says that Thomson's argument ignores its own proposed construction for "affixing layer," which is "material that attaches the spacing elements to a substrate." (Citing JX-37, Ex. A at 2) AUO contends that Miyazaki's red color filter 32R, regardless of its location, is not an "affixing layer" at all because it does not attach the spacing elements to the substrate. AUO elaborates, the Miyazaki patent figures and Thomson's own demonstratives clearly show that the filter 32R is ***separate from*** the spacers 33 and does not attach the spacers 33 to the substrate. (Citing RX-12, Figs. 24-25, 31-32; and CDX-1323) AUO asserts that layer 32R is patterned and etched to form two separate structures: red color filters 32R and the bottom layer of the spacers 33. AUO says whereas the red color filters 32R are formed over the active aperture areas, the spacers 33 are formed over the light-shielding layer 36. (Citing RX-12 at Figs. 24-25, 31-32; 7:11-19; 20:13-32; 22:23-33; and 23:21-23) AUO says that the bottom layer of spacer 33 is separate from the red color filter 32R in the same way that the spacing elements in the '063 patent are separate from one another: they have been formed from a single layer of material, but are patterned and etched to form separate structures. AUO reasons that the affixing layer in Miyazaki's stacked color filter is outside the active aperture area. (Citing Tr. 1064:1-22)

AUO says that Miyazaki discloses an alternative method for forming spacers, in which the spacers are patterned from a coating of unpigmented resin in a separate step performed *after* the red, green and blue color filter layers have been formed. (Citing RX-12 at 7:66-8:11; RX-

158C at Q. 434-436; RDX-228; and Tr. 1068:13-24) AUO alleges that Thomson and its expert do not dispute that, when Miyazaki's spacers are made using this alternative method, the affixing layer remains "substantially outside of the active aperture area." (Citing JX-1 at 5:33-34.) AUO says that Thomson argues, incorrectly, that this alternative spacer formation method cannot be used to make the spacers shown in Figures 24-25 and 31-32 of Miyazaki. (Citing CX-4304C at Q. 385; and CDX-1332)

AUO contends that Miyazaki's disclosure of an alternative spacer formation method is not limited to a particular embodiment and can be used as an alternative way to form the spacers in any of the disclosed embodiments, including those shown in Figures 24 and 31. (Citing RX-12 at 7:66-8:11; and Tr. 1094:11-13) AUO says the first method of making the spacers has the advantage of reducing the number of masking steps; but Miyazaki plainly discloses that the spacers "may be formed otherwise by use of a resin containing no pigment after providing the color layer without being formed simultaneously with the color layer." (Citing RX-12 at 8:1-3) AUO argues that the fact that this alternative method is taught as less than optimal does not avoid anticipation. AUO cites *Billups-Rothenberg, Inc. v. Associated Reg'l and Univ. Pathologists, Inc.*, 642 F.3d 1031, 1038-39 (Fed. Cir. 2011) to say a reference is no less anticipatory if, after disclosing the invention, the reference then disparages it.

In its reply brief AUO denies that Dr. Lowe admitted that the spacers in Miyazaki's Figures 24 and 31 were made in a particular way using stacked construction. (Referring to Tr. 1062:25-1066:17) AUO counters that when Thomson showed Dr. Lowe page 120 of his witness statement (RX-158C), he explained that the modified versions of Figures 24 and 31 in RDX-228 are "just following the words in the Miyazaki patent" where "Miyazaki states that instead of using the color filter there, you can use another layer." (Citing Tr. 1068:13-24.)

Thomson's Position: Thomson argues that Miyazaki does not anticipate at least claims 1-4 and 8. Thomson says that claim 1 requires "the spacing layer including an affixing layer ... the affixing layer covering at least a portion of the non-active area and remaining substantially outside of the active aperture area." (Citing CX-4304C at Q. 367-393) Thomson asserts that Miyazaki's alleged affixing layer does not remain substantially outside of the active aperture area; rather the affixing layer in Miyazaki covers the entire substrate. (*Id.*, Qs. 376-382) Thomson continues that the alleged spacing elements in Miyazaki relied upon by Dr. Lowe are formed at the same time as the R, G and B portions of the color filter, with the three layers 32R, 32G and 32B sequentially deposited on the substrate 30 to form both color resist portions of the color filter and the spacing elements. (Citing CX-4304C at Q. 376, 380; and RX-12 at 7:7-31) Thomson states that the affixing layer (32R) is not kept out of the active aperture area because one third of all subpixels on the color filter will be covered by the 32R resist. (Citing CX-4304C at Q. 381) Thomson alleges that Dr. Lowe admitted that the material he was accusing of being the affixing layer is in the active aperture area. (Citing Tr. at 1062:12-16)

Referring to Dr. Lowe's position that Miyazaki discloses an alternative embodiment where spacers in some embodiments are formed of a single unpigmented material, Thomson contends that this argument was not contained in Dr. Lowe's expert report. (CX-4304C at Q. 381, 383) Thomson admits that Dr. Lowe's report did include a chart that string cited this material; but asserts that Dr. Lowe never contended that material was an alternative way to make the specific spacers at-issue in Figures 24 and 31. Thomson argues that the spacers formed in the alternative embodiment are not anisotropic, rather they are pillar-shaped isotropic spacers. (Citing CX-4304C at Q. 383-385; and RX-12 at 10:54-59) Thomson adds that the spacers in Figure 24 and 31, upon which Dr. Lowe relies, are formed from the same stacked construction that includes an affixing layer across the entire substrate, as discussed above; they are not formed using Dr. Lowe's alternative embodiment. (Citing CX-4304C at Q. 383-392) Thomson concludes that Dr. Lowe admitted that the spacers in Figures 24 and 31 were made in a particular way using stacked construction. (Citing Tr. at 1062:25-1066:17)

Discussion and Conclusions: Based on the evidence in the record, I find that Respondents have failed to offer clear and convincing evidence that Miyazaki anticipates any of the asserted claims of the '063 patent.

In Section IV.B.1 *supra*, I found that Miyazaki is prior art to asserted claim 1; but that it is not prior art to asserted claim 11, which was conceived and reduced to practice prior to the filing date of Miyazaki.

I find that Miyazaki does not disclose an affixing layer as required by asserted claim 1 of the '063 patent. Contrary to AUO's contentions, Miyazaki does not use the term "affixing" to describe the placement of the spacers 33 in the substrate 30 of the Miyazaki invention. Instead, Miyazaki discloses "forming" stacked spacers on the substrate 30. The term "stacked" in this context derives from the source of the spacers, which is three "color" layers of red green and blue (33R, 33G and 33B). (RX-12 at Figure 1, 7:16-19.) In describing the technique used to construct the stacked spacers, Miyazaki teaches:

> For Green and Blue color layers 32G and 32B are repeatedly disposed in the portion where color layers are to be provided and color layers 22G, (sic) 32B are repeatedly formed in the portion where the pillar-shaped spacer 33 is to be provided by repeating the same processes. Then, these color layers are respectively baked at 230° for 60 minutes. The color layers 32R, 32G, 32B and the pillar-shaped spacer 33 are thus formed.

(RX-12 at 7:24-31, Figure 1.)[26] The process described does not involve an affixing layer, and Figures 24, 31 and 19 clearly lack any reference to or showing of an affixing layer.

Based upon the foregoing I conclude that the Respondents have failed to meet their burden to prove by clear and convincing evidence that that Miyazaki discloses each and every element of claim 1 of the '063 patent.

I have found that Miyazaki is not prior art to asserted claim 11 of the '063 patent. Nevertheless, assuming *arguendo* that Miyazaki is prior art to claim 11, I will treat the merits of AUO's claim that it anticipates claims 11, 12, 14, 17 and 18.

Claim 11 does not require an affixing layer. Thomson claims, however, that any alleged spacer elements do not lie substantially outside the active aperture area as required by the second element of claim 11. Thomson incorrectly identifies layer 32R as an alleged "affixing layer." The color layers of Miyazaki that comprise the stacked spacing elements are, in fact, identified as 32R, 32B and 32G in Figures 1, 19, 24 and 25. The spacing elements are clearly shown to be outside of the active aperture area (i.e. ***in*** the "non-active" areas of the first substrate). There appears to be no further dispute regarding whether or not the elements of claim 11 are taught. Therefore, if Miyazaki is found to be prior art to claim 11, I would find that Miyazaki anticipates claim 11 and renders it invalid.

I turn to claim 12, which depends from claim 11 and requires that the spacing elements extend along a first axis and along a second axis shorter than the first axis. I note that this element is met by Miyazaki's description of the spacing elements as described in the discussion of Figure 21, which states that the spacer 33 "takes an elliptical shape having a minor diameter of

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[26] While AUO invokes Figures 24, 25, 31 and 32 in its argument, Miyazaki refers back to Figure 1 to reveal the method of construction of the display cell and the spacers. The somewhat torturous route is Figure 31 referring to Figure 24, which in turn refers to Figure 19. Finally, Figure 19 refers the reader to Figure 1. (RX-12 at 22:18-21, 18:33-38, 15:38-48, 65-67.)

7μm and a major diameter of 14 μm …" (RX-12 at 16:22-24, Figure 21.) I conclude that clear and convincing evidence shows that Miyazaki teaches the limitation of the element contained in claim 12 of the '063 patent, rendering it invalid.

Claim 14, which depends from claim 11 via claim 12, and requires that the spacing elements be rubbed along the first (i.e. long) axis. Miyazaki discloses this element when it describes "[r]eferring to FIG. 15, the direction of the major diameter of the spacer 33 of the opposite substrate 30 shown in FIG. 24 is coincident with the orientation direction (orientation direction), and there decreases a probability of being broken by the rubbing." (RX-12 at 19:15-19.) The evidence is clear and convincing that this disclosure by Miyazaki anticipates claim 14 and renders it invalid.

Claim 17 depends from claim 11 and requires that the forming step comprises photolithographically forming the spacing elements having the anisotropic shape using a mask. Dr. Lowe testified for AUO that in his opinion, Miyazaki discloses this element. He referred to a chart attached to his expert report for reference. In that chart, he identifies Miyazaki, column 8:6-9 to support his opinion. (RX-158C at Q. 466; RX-8 at pp. 21-22.) A reading of Miyazaki in context, however, reveals that the lines cited by Dr. Lowe refer to preparation of the "desired area for forming the spacer" being irradiated. There is no mention of forming the spacer itself by photolithography. Miyazaki actually describes a much different process for forming the spacers at 7:16-8:14, which includes the language cited, *supra*, at 7:24-31. (RX-12 at 7:16-8:14.) I find that the record cited by AUO lacks clear and convincing evidence that Miyazaki discloses each and every element of dependent claim 17.

Finally, claim 18 depends from claim 11 and teaches that the display cell is a liquid crystal display cell and further comprises providing a liquid crystal layer interposed between the first and second substrates. There appears to be no dispute that Miyazaki discloses a liquid crystal display cell with a liquid crystal layer interposed between the first and second substrates. This process is described in detail in Miyazaki and results in the creation of a liquid crystal display device (i.e. cell) with liquid crystal located between the two substrates 11 and 30. (*See, e.g.*, RX-12 at 6:28-8:35.)

Based upon all of the foregoing, I find that Miyazaki has not been shown by clear and convincing evidence to disclose each and every element of claim 1, and it has not been shown by clear and convincing evidence to be prior art to claim 11.

A patent is presumed to be valid, and each claim of a patent shall be presumed valid even though dependent on an invalid claim. 35 U.S.C. § 282. If I determined claims 1 or 11 to be anticipated and invalid, I could still find that their respective dependent claims are valid. Since, however, I have found claims 1 and 11 to be ***not*** anticipated, their respective dependent claims are necessarily not anticipated, because they depend from claims 1 or 11 and necessarily contain all of the elements of their respective independent claims. *See In re Fritch,* 972 F.2d 1260, 1266 (Fed. Cir. 1992); *In re Royka*, 490 F.2d 981, 983-985 (C.C.P.A. 1974); *see also In re Sernaker*, 702 F.2d 989, 991 (Fed. Cir. 1983) . Based upon the foregoing, I find that Miyazaki does not anticipate dependent claims 2-4, 8, 12, 14, 17 or 18 of the '063 patent.

Based upon the foregoing, assuming *arguendo* that Miyazaki was found to be prior art to claim 11, then I would find that Miyazaki anticipates each and every element of claims 11, 12, 14 and 18 and renders them invalid.

3. Obviousness

a. Urabe In Combination With Tsuboyama

AUO's Position: AUO argues that the asserted claims of the '063 patent would have been obvious in view of Urabe (RX-22) alone, or in combination with U.S. Patent No. 4,775,225 ("Tsuboyama") (RX-18). AUO begins by saying the only dispute regarding anticipation of the asserted claims by Urabe is whether the spacing elements in Urabe are a composite of polyimide containing dispersed fibers, as Respondents contend, or just the fibers, as Thomson contends. AUO says regardless of the outcome of this dispute, however, it would have been obvious to one of ordinary skill in the art to use polyimide alone, without dispersed fibers, to form Urabe's rectangular spacing structures. AUO contends that forming spacing elements from polyimide was well-known prior to the filing date of the '063 patent and is taught, for example, by Tsuboyama. AUO asserts therefore, that one of ordinary skill in the art with knowledge of both references would know that Urabe's rectangular structures could be made of polyimide alone, without fibers, and would make that substitution in Urabe in order to provide a simpler, less costly and cleaner process. (Citing RX-158C at Q. 515, 530-535) AUO contends that with that "simple and obvious substitution of materials -- polyimide alone for polyimide with dispersed fibers -- each and every element of the asserted claims of the '063 patent is met in the same way as described above with respect to anticipation by Urabe." (Citing RX-158C at Q. 515-516) AUO alleges that Dr. West admitted on cross-examination that he does not know of any reason why instead of using polyimide with dispersed spacers, as disclosed in Urabe, one could not use polyimide alone as the spacer material and obtain the very same result. (Citing Tr. 1549:23-1550:17.)

AUO asserts that Tsuboyama discloses a liquid crystal device having two substrates (called first and second base plates in Tsuboyama), and spacers between the substrates. (Citing RX-18, Abstract, 2:34-46) AUO says that examples 1-23 of Tsuboyama disclose detailed process steps for forming the spacers and the rest of the display cell. (Citing RX-18 at 8:25-9:36; and RX-158C at Q. 525) AUO says in Examples 1-23, Tsuboyama teaches to form the spacers from polyimide, for example, "PIQ" produced by Hitachi Kasei Kogyo K.K. (Citing RX-18 at 8:35-38; and RX-158C at Q. 526)

AUO argues that for a hypothetical person having ordinary skill in the art in 1997 with access to both the Urabe and Tsuboyama references, it would have been obvious to substitute the polyimide material disclosed in Tsuboyama for the polyimide containing dispersed fibers disclosed in Urabe. (Citing RX-158C at Q. 530; and *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1242 (Fed. Cir. 2010)) AUO states that a hypothetical skilled artisan would understand that Tsuboyama's polyimide spacer material could be used to form a layer that is sufficiently thick to satisfy Urabe's requirements for cell gap spacing. (Citing RX-158C at Q. 527, 533) AUO continues that Tsuboyama teaches forming spacers that provide cell gap spacing (liquid crystal layer thickness) of less than 10 microns, using a polyimide or other material that does not contain dispersed fibers or beads. (Citing RX-18 at 3:64, 4:52-65, 8:35-52) AUO says Urabe teaches that the cell gap spacing should be 4 to 6 microns for a twisted nematic liquid crystal cell and about 2 microns for a ferroelectric liquid crystal cell. (Citing RX-22 at AUO-THO 0499923, second column)

AUO argues that the interrelated teachings of the prior art and the demands of an efficient and workable manufacturing process would have provided a strong motivation to substitute the polyimide of Tsuboyama for the dispersion of Urabe, making the fibers or beads unnecessary.

(Citing RX-158C at Q. 532, 534) AUO asserts that first, by substituting Tsuboyama's spacer material for Urabe's, one of ordinary skill in the art could save processing steps and material by eliminating the dispersed glass fibers or polymer beads disclosed in Urabe. (Citing RX-158C at Q. 533) AUO says second, there would be a clear advantage to eliminating the fibers or beads from the manufacturing process because the fibers or beads may contaminate the clean room environment. (Citing RX-158C at Q. 535) AUO concludes that one of ordinary skill in the art would see a clear advantage to eliminating these small particles from the process.

AUO says that Thomson argues that the substitution of Tsuyboyama is contrary to Urabe's teaching to use conventional spacers. (Citing CDX-1345 to 1347) AUO argues that Urabe does not teach the use of conventional spacers. AUO says that, just like the '063 patent, Urabe addresses the problems with conventional ball or fiber spacers that are randomly distributed on the substrate, including degradation of the projected image caused by spacers in the active pixel area. (*Comparing* RX-22 at AUO-THO 0499924 *with* JX-1 at 2:6-17) AUO asserts that nearly ten years earlier than the '063 filing date, Urabe proposes the same solution as the '063 patent, namely using photolithography to selectively position spacers in the non-active areas of the substrate. (*Comparing* RX-22 at AUO-THO 0499924, second column, first two paragraphs *with* JX-1 at 2:45-47) AUO contends that by 1997, one of ordinary skill in the art would readily recognize that the dispersed fibers are not essential to Urabe's objective of improving contrast and display quality by selectively positioning spacers in the light non-transmissive regions, and that Urabe's objectives could be accomplished by using polyimide, alone, without the dispersed fibers. (Citing RX-158C at Q. 530-535; and Tr. 1549:23-1550:17)

Next, AUO addresses Thomson's argument that Urabe does not have stripe electrodes, and therefore "it lacks the high sensitivity to surface unevenness that is a motivation for

Tsuboyama's spacers." (Citing CDX-1348) AUO counters that Respondents are not suggesting that one of ordinary skill in the art would substitute Tsuboyama's spacers for the spacers of Urabe. AUO says, rather, Respondents maintain that Tsuboyama's spacer material, namely polyimide alone, could be used to form the spacers disclosed in Urabe. AUO alleges that Dr. West agrees with Respondents (Citing Tr. 1549:23-1550:17), and so does Dr. Lowe. (Citing RX-158C at Q. 515, 530)

AUO addresses Thomson's argument regarding the process by which Dr. Lowe reached his opinions. AUO avers that there is no evidence that Dr. Lowe failed to consider the scope and content of the art or the problems to be solved. AUO says that the testimony Thomson cites (Tr. 922:25-923:12, 924:7-12) says no such thing, and Dr. Lowe's witness statement demonstrates just the opposite. (Citing RX-158C at Q. 282, 326, 521, 532, 540)

Thomson's Position: Thomson argues that a person having ordinary skill in the art at the time of the inventions would not be moved to combine either Urabe in view of Tsuboyama. Thomson argues that first, Respondents' combinations are deficient because they admittedly arise out of hindsight, and they are not the product of independent expert opinion. Thomson says that Dr. Lowe did not develop the constructions used, or locate the winnowed small handful of prior art used for obviousness, or consider the issues of the scope and content of the art or the problems to be solved. (Citing Tr. at 922:25-923:12; 924:7-12) Thomson alleges that instead, together with Respondents' lawyers, Dr. Lowe took a winnowed handful of art that the lawyers chose and looked with counsel to make combinations. (Citing Tr. at 930:5-934:16) Thomson points to "mistakes in their efforts as noted by Dr. West." (Citing Tr. at 1071:12-1073:18) Thomson contends this is not independent expert opinion or a proper obviousness analysis, and the defects apply to both combinations. Thomson argues that *KSR* teaches "a fact finder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon ex post reasoning." (Citing *KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (U.S.,2007); and *MEMS Technology Berhad v. International Trade Com'n*, 2011 WL 2214091 (Fed. Cir. 2011))

Thomson adds that, even if combined, these combinations fail to disclose all elements of the claims. Thomson says that Tsuboyama is directed to improving the performance of a passive matrix ferroelectric display by fabricating projections on a base plate that serve as spacers to control thickness of a liquid crystal layer. (Citing CX-4304C at Q. 395) Thomson states that the projections are formed on top of an orientation controlling film using photolithography. (*Id.*) Thomson continues that the insulating orientation controlling film formed over the entire substrate serves to temper topological irregularity occurring at the edge of the transparent row and column electrodes used to address ferroelectric material. (*Id.*) Thomson asserts that this minimizes defects in the ferroelectric film and improves optical performance. (*Id.*) Thomson says the projections formed on top of the orientation controlling layer also consist of an insulating material and are controlled to be formed in gaps between row or column electrodes. (*Id.*) Thomson concludes that these projection spacers control ferroelectric film thickness improving optical performance.

Thomson argues that Respondents, incorrectly, use hindsight to substitute the spacing layer of Tsuboyama for the alleged "composite spacing elements" in Urabe, which as discussed above are not spacing elements. Thomson begins, substituting Tsuboyama's spacing layer for alleged "composite spacing elements" of Urabe would be directly contrary to Urabe's teachings. (Citing CX-4304C at Q. 402) Thomson says the problem Urabe solved was how to use pre-fabricated spacers in high resolution displays. (*Id.*) Thomson continues that Urabe specifically taught that pre-fabricated spacers were effective, and the novelty of Urabe was how to optimize them. (*Id.*, Q. 403) Thomson reasons that in light of Urabe's disclosure, one would not be led to remove spacers 4 and substitute the spacing layer of Tsuboyama. (*Id.*) Thomson adds that one would not be led to combine Tsuboyama's high electrode density passive matrix ferroelectric liquid crystal displays having a bistability or monodomain highly sensitive to defects in liquid crystal orientation or alignment layer, with Urabe, which is an active matrix display without high density stripe electrodes that does not have sensitivity to surface unevenness. (*Id.*, Q. 404) Thomson says even combined, this would not result in all claim elements. (*Id.*, Q. 405) Thomson contends that under a proper reading of Tsuboyama and Figure 3A, the layer Respondents seek to substitute into Urabe consists of a single material extending across an entire substrate, and are not separate spacing elements, because they are all interconnected. (*Id.*) Thomson concludes that the spacing layer will have an affixing layer covering the entire substrate including the active aperture areas. (*Id.*)

In its reply brief Thomson argues that Respondents' combinations are unreliable and use improper hindsight. Thomson alleges that Dr. Lowe admitted he had misread Tsuboyama, reversing the order in which key elements were formed. (Citing Tr. at 1071:12-1073:18) Thomson says that Dr. Lowe tried to come up with a new reason to use Tsuboyama but remained incorrect. Thomson says that Respondents argue that Urabe and Tsuboyama should be combined because Urabe does not disclose conventional spacers, but instead polyimide composite spacers. Thomson counters that Urabe never discusses "composite spacers." Thomson says Urabe is directed to an allegedly novel way to optimize use of pre-fabricated conventional spacers. (Citing CX-4304C at Q. 423-438) Thomson says it is erroneous to ignore Urabe's express teachings to use pre-fabricated spacers, the thrust of his disclosure. (Citing *Genetics Institute, LLC v. Novartis Vaccines and Diagnostics, Inc.*, 2011 WL 3672474, at *12 (Fed. Cir. 2011))

Discussion and Conclusions: Based on the evidence in the record, I find that Respondents have failed to meet their burden to demonstrate by clear and convincing evidence that Urabe combined with Tsuboyama renders obvious asserted claims 1 and 11 of the '063 patent.

In Section IV.B.2.a *supra*, I found that Urabe fails to anticipate either asserted claim 1 or asserted claim 11 of the '063 patent. First, I found that AUO has waived its argument that the spacers (4) of Urabe Figure are anisotropic of themselves. I also found that the spacers formed as a composite could not satisfy claims to separate spacing elements, and would be contrary to the '063 patent's use of separate spacing elements to provide precise control over the count and location of spacers. Finally, I found that Urabe does not disclose spacing elements that are anisotropic in shape as required by asserted claims 1 and 11, and does not reveal that the spacing elements are "formed" on the non-active area of a substrate as required by independent claim 11. My findings and reasoning on those issues are reaffirmed here.

In order for the combination of Urabe in light of Tsuboyama to render obvious asserted claims 1 and 11 of the '063 patent, Respondents must first demonstrate that a person of ordinary skill in the art would be moved to combine those references. Then, Tsuboyama would have to disclose the elements missing from Urabe, as described *supra*.

I begin by considering whether or not AUO has established by clear and convincing evidence that a person having ordinary skill in the art at the time of the '063 patent's invention would have been moved to combine Urabe and Tsuboyama to solve the problems addressed in the '063 patent.

Dr. Lowe, AUO's expert, testified that one of ordinary skill in the art would consider the teachings of both Urabe and Tsuboyama, because both references have the objective of improving contrast and image quality in a liquid crystal display cell by eliminating orientation or alignment defects caused by spacers located in the active area of the display. He testified that Tsuboyama teaches forming spacers having a thickness of less than 10 microns, using a polyimide or other material that does not contain dispersed fibers or beads, and Urabe teaches that the cell gap spacing should be 4 to 6 microns for a twisted nematic liquid crystal cell and about 2 microns for a ferroelectric liquid crystal cell. (RX-158C, Qs. 532, 533)

Dr. Lowe also testified that by substituting Tsuboyama's spacer material for Urabe's, one of ordinary skill in the art could save processing steps and material by eliminating the dispersed glass fibers or polymer beads disclosed in Urabe. Dr. Lowe continued that Tsuboyama teaches that polyimide or other spacing material can be put down in a sufficiently thick layer that it satisfies the requirements of Urabe. He opined that it would be much easier and less costly for one of ordinary skill in the art to use a fluid coating alone rather than dispersing beads or fibers in the fluid and then coating it on the substrate to form the spacer. (*Id.* at Q. 533)

I find that Dr. Lowe's testimony establishes a credible basis for his opinion that a person having ordinary skill in the art would be motivated to combine Urabe and Tsuboyama to solve the problems addressed by the '063 patent regarding the placement of spacers. (RX-158C, Qs. 532, 533)

I turn to the merits of whether or not Urabe combined with Tsuboyama renders asserted claims 1 and 11 invalid as obvious.

Tsuboyama clearly discloses spacing elements that are anisotropic in shape. (RX-18 at 4:66-5:7, 5:18-33, Figures 3a, 3b, 5 and 6.)

Tsuboyama, however, does not teach either "separate" spacing elements or forming spacing elements on the "non-active" areas of the substrate. First, "base plates" in Tsuboyama are not partitioned into an "active aperture area" and a "non-active area." It describes:

> A liquid crystal device shown in FIGS. 3A and 3B comprises a base plate 301 (preferably of flexible glass or flexible plastic) and a base plate 302 (preferably a glass plate). On the base plate 301 are successively disposed transparent electrodes 303 in the form of stripes and an orientation controlling film 304 of an insulating material applied as a coating thereon. On the other hand, on the base plate 302 are successively disposed transparent electrodes 305 crossing the transparent electrodes 303 at right angles spacers 307 disposed thereon and formed of an insulating material and an orientation controlling film 306 of an insulating material applied as a coating thereon and subjected to a uniaxial orientation treatment (rubbing, etc.) in the direction indicated by a two-headed arrow 312.

(RX-18 at 4:37-51.) A similar description of the construct of the base plate appears at column 7, lines 33-39 and 51-55. It is clearly entirely transparent, as are the stripe electrodes placed upon its surface. There is no partition of a "non-active area" as contemplated by asserted claims 1 and 11 of the '063 patent. Therefore, the spacing elements placed in the gaps between the stripe electrodes are not formed in a "non-active area." In fact, Tsuboyama specifically provides that the spacing elements be larger in diameter than the gap and, thus, intrude into the area of the stripe electrodes. (RX-18 at 7:45-50.)

Finally, I note that the spacing elements in Tsuboyama are specifically described as "formed of an insulating material." Those spacers are illustrated in Figure 3A as part of a film covering the entire base plate area, and they are connected as part of that coating. They are not, therefore, "separate" as contemplated in the '063 patent. (RX-18 at Figure 3A, 4:46-47.)

Based upon all of the foregoing, I find that Respondents have failed to meet their burden to demonstrate by clear and convincing evidence that Urabe combined with Tsuboyama render obvious asserted claims 1 and 11 of the '063 patent.

A patent is presumed to be valid, and each claim of a patent shall be presumed valid even though dependent on an invalid claim. 35 U.S.C. § 282. If I determined claims 1 or 11 to be invalid as obvious, I could still find that their respective dependent claims are valid. Since, however, I have found claims 1 and 11 to be ***not*** invalid as obvious, their respective dependent claims are necessarily not invalid, because they depend from claims 1 or 11 and necessarily contain all of the elements of their respective independent claims. *See In re Fritch,* 972 F.2d 1260, 1266 (Fed. Cir. 1992); *In re Royka*, 490 F.2d 981, 983-985 (C.C.P.A. 1974); *see also In re Sernaker*, 702 F.2d 989, 991 (Fed. Cir. 1983) . Based upon the foregoing, I find that Urabe in light of Tsuboyama does not render obvious dependent claims 2-4, 8, 12, 14, 17 or 18 of the '063 patent.

b. Sugata In Combination With Tsuboyama

AUO's Position: AUO argues that, as discussed above, Sugata teaches anisotropically-shaped spacers that are subjected to mechanical rubbing, but does not expressly disclose rubbing along the long axis (X direction) of the spacers, as required by Respondents' construction for the mechanical rubbing limitations. AUO asserts that at the time the '063 patent was filed, it would have been obvious to combine the teachings of Sugata and Tsuboyama, such that the anisotropic spacers disclosed in Sugata are rubbed along their long axes, in order to obtain a further improvement in the alignment of the liquid crystal, as taught by Tsuboyama. (Citing RX-158C at Q. 536)

AUO contends that a primary objective of both Sugata and Tsuboyama is to provide spacers that do not disturb the alignment or orientation of the liquid crystal molecules in the active area of the display. (Citing RX-158C at Q. 540) AUO says that Sugata described this objective as desiring "to provide a liquid crystal display panel in which alignment or orientation of liquid crystal molecules is not disturbed on an image display surface." (Citing RX-15 at 2:54-57) AUO continues that Tsuboyama similarly states that his invention provides a liquid crystal device "which is free of orientation or alignment defects over the whole area of the device despite spacers which are present" within the liquid crystal. (Citing RX-18 at 2:35-38) AUO says that Sugata teaches that orientation defects can be avoided by locating the spacers in light non-transmissive areas of the display panel. (Citing RX-15 at 6:49-52) AUO states that Tsuboyama teaches that alignment and orientation defects can be avoided by providing rectangular spacers that are narrow in a direction perpendicular to the rubbing direction, in other words, the spacers are anisotropic in shape and rubbed along their long axes. (Citing RX-18 at Fig. 3B (two-headed arrow 312 showing the rubbing direction along long axis b of spacers 307), 2:46-50, 4:49-51, 4:66-5:6)

AUO contends that one of ordinary skill in the art who was following the teachings of Sugata would be interested in additional steps that could be taken to avoid defects in the alignment or orientation of the liquid crystal molecules in the image display area in the vicinity of the spacers. AUO says such a skilled artisan would recognize that, in addition to locating the spacers in the light non-transmissive areas of the display panel, as taught by Sugata, a further improvement could be achieved by rubbing along the long axis of the spacers, as taught by Tsuboyama. (Citing RX-158C at Q. 542) AUO reasons in this way, the "occurrence of orientation or alignment defects can be completely avoided." (Citing RX-18 at 5:4-6) AUO argues that the addition of this feature would require no structural modification to the embodiment shown in Figure 3(a) of Sugata, which has rectangular spacers that are all oriented with their long axes in the same direction.

AUO argues that Tsuboyama repeatedly emphasizes the shape and orientation of the spacers relative to the rubbing direction. (Citing RX-18 at 2:46-50, 4:49-51, 4:66-5:6, 5:24-35, 5:40-50, 6:13-18, 8:53-55, 10:40-45.) AUO reasons that Tsuboyama's disclosures would be meaningless, if the spacers were not formed before the rubbing step.

Thomson's Position: Thomson says that, based on the testimony of AUO's expert, Dr. Lowe[27], the only teaching Respondents seek to substitute into Sugata from Tsuboyama is the rubbing direction. (Citing 4304C at Q. 415-416) Thomson argues that one of ordinary skill in the art would not be led to combine Sugata and Tsuboyama because, as with Urabe, the method disclosed by Tsuboyama is directed at a passive matrix display using liquid crystal modes highly sensitive to alignment defects. (*Id.*, Q. 419) Thomson asserts that Sugata is directed to an active matrix display that does not use highly sensitive liquid crystal modes. (*Id.*) Thomson adds that Sugata does not use high density stripe electrodes responsible for surface unevenness discussed in Tsuboyama. (*Id.*)

Thomson contends, even if combined, Tsuboyama fails to remedy Sugata's failure to show rubbing after forming spacers; rather, Tsuboyama allegedly discloses the direction of orientation of the liquid crystals relative to the spacers. (*Id.* Q. 419) Thomson says this does not suggest any reason to alter Sugata's rubbing prior to spacer formation. (*Id.*) Thomson continues that in Dr. West's opinion, one would recognize that one could rub the alignment layer of Sugata prior to forming spacers so that when spacers were formed, the orientation of the liquid crystal would be identical to Tsuboyama's orientation. (*Id.* Q. 422) Thomson argues that hindsight combination of Sugata with Tsuboyama still results in rubbing before formation of spacers and does not meet "mechanical rubbing" elements.

In its reply brief regarding the combination of Sugata and Tsuboyama, Thomson counters

[27] Citng CX-4304C at Q. 439

that Sugata does not teach rubbing after spacing elements are formed, and this combination fails to remedy this because Respondents throughout the case only sought to combine Sugata with a rubbing direction of Tsuboyama. (Citing CX-4304C at Q. 439-446) Thomson says that Respondents apparently now attempt to combine Sugata with the rubbing direction and sequence of Tsuboyama. Thomson assert that Respondents do not cite testimony from Dr. Lowe to support this argument, because he never attempted to combine the references as Respondents now attempt. (*Id.*) Thomson avers that Dr. West provided unrebutted testimony that this combination would not render the asserted claims obvious and would still teach rubbing prior to forming spacers regardless. (Citing CX-4304C at Q. 445-446)

Discussion and Conclusions: Based on the evidence in the record, I find that Respondents have produced clear and convincing evidence that Sugata in light of Tsuboyama renders obvious all of the elements of asserted claims 1, 2, 3, 4, 8, 11, 12, 14 and 18 of the '063 patent. Respondents have failed to provide clear and convincing evidence that Sugata in light of Tsuboyama renders obvious each and every element of asserted claim 17 of the '063 patent.

In Section IV.B.2.b *supra*, I found that Respondents failed to show by clear and convincing evidence that Sugata discloses mechanical rubbing of the substrate and spacers after the spacers have been formed as required by the asserted claims of the '063 patent.

First, I consider whether or not AUO has provided clear and convincing evidence that a person of ordinary skill in the art would be moved to combine Sugata and Tsuboyama at the time of the '063 patent's invention. Dr. Lowe testified that a person of ordinary skill in the art would have been moved to combine Sugata and Tsuboyama, because they relate to similar subject matter and a primary objective of both references is to provide spacers that do not disturb alignment or orientation of the liquid crystal molecules in the active area of the display. (RX-158C at Q. 536, 540.)

Dr. Lowe's testimony regarding the similar objectives of Sugata and Tsuboyama is supported by the language of Tsuboyama, which states "[t]he present invention further provides a liquid crystal device showing good bistabilty and which is free of orientation or alignment defects over the whole area of the device despite spacers which are present within the ferroelectric liquid crystal." (RX-18 at 2:34-38.) One of Sugata's objectives is quite similar, "[a]nother object of the present invention is to provide a display cell which keeps constant a very small gap between electrode plates and gives display of good gradation and responsiveness thereby to provide a liquid crystal display panel in which alignment or orientation of liquid crystal molecules is not disturbed on an image display surface, and which shows excellent display characteristics." (RX-15 at 2:51-58.)

Thomson urges that the references would not be combined, in part because the method disclosed by Tsuboyama is directed to a passive matrix display using liquid crystal modes highly sensitive to alignment defects, and Sugata is directed to an active matrix display that does not use highly sensitive liquid crystal modes. The '063 patent's detailed description of preferred embodiments clearly states:

> The present invention is not limited to only the assembly of liquid crystal display cells but is also applicable to the assembly of any display cell having a bottom substrate 12 and a top substrate 14 that should remain closely and uniformly spaced apart such as field emitting displays (FED's), electroluminiesce, etc.

(JX-1 at 3:27-32.) The foregoing passage does not limit itself to any particular type of FED or other display.

I concur with AUO's position that a person of ordinary skill in the art at the time of the invention of the '063 patent would be moved to combine Sugata and Tsuboyama to achieve the purposes of the '063 patent's invention, especially as those two references discuss placement and the methods of forming spacing elements within the display cell.

Next, based upon the evidence before me, I find that Tsuboyama discloses mechanical rubbing of the substrate and spacing elements after the spacing elements have been formed on the substrate. Referring to Figure 10, Tsuboyama describes:

> Further, also on the other transparent base plate 82, transparent stripe electrodes 104 and an insulating film 106 are formed, and spacers (not shown) are similarly formed in such an arrangement as to cover the gaps between the stripe electrodes. Then, one or both of the base plates 81 and 82 provided with the stripe electrodes 103 and 104 are subjected to a uni-axial orientation treatment such as rubbing, as desired.

(RX-18 at 7:51-58, Figure 10) Clearly, Tsuboyama reveals mechanical rubbing after the spacing elements have been formed on the substrate.

It is also clear that Tsuboyama teaches that alignment and orientation defects can be avoided by providing rectangular spacers that are narrow in a direction perpendicular to the rubbing direction, in other words, the spacers are anisotropic in shape and rubbed along their long axes. (*See, e.g.,* RX-18 at Figures 3B, 5 and 6 (two-headed arrow 312 showing the rubbing direction along long axis b of spacers 307), 4:49-51, 4:66-5:6.)

Sugata also clearly teaches that the spacing elements are ***not*** formed within the active area of the substrate. For example, Sugata reveals "spacer members are disposed along the non-transmissive members." (RX-15 at 3:32-33, 3:37-38.) Regarding Figure 3a, shown *supra*, Sugata also describes:

> In the liquid crystal display panel, spacer members 6a, 6b, 6c, 6d ... are fixed on row electrodes 1aa, 1ab ... (or on column electrodes 3a, 3b, etc., while not shown in this Figure) on the electrode plate S through the insulating layer 5a.

(RX-15 at 3:47-51, Figure 3a.) Sugata, thus, describes the spacer members as being fixed in the non-active area of the substrate.

Regarding asserted claim 17, which depends from claim 11, I find that the record lacks clear and convincing evidence that Sugata in light of Tsuboyama discloses that the spacing elements are photolithographically formed. AUO's evidence on this point is the conclusory testimony of Dr. Lowe that Sugata teaches that the spacer members are photolithographically formed. (RX-158C at Q. 373.) He makes no reference to any particular language in Sugata to support his opinion.[28]

Examining Sugata, I find the following language referring to Figure 3:

> Spacer members 6a, 6b, 6c, 6d, ...etc. may be formed by vapor deposition, sputtering and the like with a mask having a predetermined pattern, or by forming a uniform film having a thickness substantially equally to that of the liquid crystal layer by vapor deposition, sputtering coating or the like ***and then patterning the film through etching of portions other than those forming spacers.***

(RX-15 at 5:44-51) (Emphasis added.) While this language refers to "etching," it does not specify a type of etching, nor does it reveal photolithographically forming the spacing elements, and there is no clear and convincing evidence offered to support a finding that it discloses that particular method.

I note that the evidence is undisputed that Sugata reveals each and every one of the remaining elements of the asserted claims of the '063 patent. (*See* RX-158C, Qs. 319-333, 344-373 and RX-6)

Based upon all of the foregoing, I find that Respondents have produced clear and convincing evidence that Sugata in light of Tsuboyama renders obvious all of the elements of asserted claims 1, 2, 3, 4, 8, 11, 12, 14 and 18 of the '063 patent. Respondents have failed to

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[28] Thomson makes no effort to rebut Dr. Lowe's opinion on this point. Thomson focuses on the argument that Tsuboyama does not reveal the proper sequence of mechanical rubbing. (CX-4304C at Q. 442-446; CDX-1351.)

provide clear and convincing evidence that Sugata in light of Tsuboyama renders obvious each and every element of asserted claim 17 of the '063 patent.

4. Secondary Considerations

Thomson's Position: Thomson argues that secondary considerations support nonobviousness. Thomson asserts that there is ample evidence of commercial success of the claimed inventions in view of Respondents' widespread infringement. Thomson says that photolithographically formed anisotropic spacers located in non-active areas are important to a successful display cell in manufacturing and in the field. Thomson continues that these spacers are critical to proper manufacturing and utility in the field of display cells at issue. Thomson alleges that Dr. Lowe admits that no one would ever form a display without such spacers and that yield is very important to companies like AUO. (Citing CX-4304C at Q. 449-451; RX-636C at Q. 21-23; RX-554C at Q. 260 and CX-4348C, 341:21-23) Thomson says that Dr. Wagner confirmed, stating that manufactures "live or die. They need high yield or else they will go under" and "[yield] is of central importance." (Citing CX-4345C, 107:21-108:6) Thomson adds there is no evidence of simultaneous invention. Thomson says that Respondents rely on Urabe, Tsuboyama, Miyazaki and Lowe for simultaneous invention. (Citing CX-4304C at Q. 452-453) Thomson counters that none of these references anticipates and two of the references are after the '063 patent's invention. (*Id.*)

In its reply brief Thomson says that Respondents argue that secondary considerations do not support non-obviousness, arguing there is no showing that the claimed invention increases yield. (AUO Br. at 130.) But Dr. Lowe admitted that their spacers function to maintain a uniform cell gap (Tr. at 1350:7-20, 1351:5-1352:4) and that uniformity provided by spacers is "critical" to good yield which is "very important" to manufacture of flat panel displays. (Tr. at

1352:5-15.) Dr. Wagner admitted that manufacturers "live or die" based on their yield. (CX-4345C at 107:21-108:6.)

AUO's Position: AUO argues that it has "presented a prima facie case of invalidity", placing the burden on Thomson to go forward with rebuttal evidence, which may include evidence of secondary considerations of non-obviousness. (Citing *Pfizer Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1360 (Fed. Cir. 2007))

AUO argues that Thomson's assertions regarding secondary considerations are unsupported by the evidence and fail to rebut Respondents' strong showing of obviousness. AUO says that Thomson asserts commercial success, citing widespread infringement and Respondents' products in this investigation. (Citing CX-4304C at Q. 449) AUO counters that Thomson has adduced no evidence demonstrating a nexus between the alleged commercial success and the features that allegedly distinguish the claimed invention from the prior art. AUO cites *Tokai Corp. v. Easton Enters., Inc.*, 632 F.3d 1358, 1370 (Fed. Cir. 2011) to support its position that such evidence is required.

AUO says that Thomson argues that spacers are critical to the proper manufacturing and utility of the display cells, citing the testimony of Respondents' experts regarding the importance of manufacturing yield. AUO says that the cited testimony fails to satisfy Thomson's evidentiary burden, because it does not demonstrate that the commercial success of the accused products is attributable to features not found in the prior art. AUO states for example, Thomson makes no showing that the commercial success of Respondents' products is due to a feature not found in either Urabe or Sugata, each of which discloses the spacers that Thomson claims are critical to manufacturing yield.

AUO argues that obviousness of the claimed invention is supported by the fact that, contemporaneously with the work of the '063 inventors, many others in the field of liquid crystal displays independently developed the same ideas. (Citing RX-158C at Q. 544) AUO asserts that Respondents' evidence demonstrates that the invention was not beyond the level of ordinary skill in the art and provides strong support for the conclusion that the invention would have been obvious. AUO cites *Ecolochem, Inc. v. S. Cal. Edison Co.*, 227 F.3d 1361, 1379 (Fed. Cir. 2000) to say that the fact of near-simultaneous invention, though not determinative of statutory obviousness, is strong evidence of what constitutes the level of ordinary skill in the art.

Discussion and Conclusions: Respondents have put forth a *prima facie* case of obviousness, for asserted claims 1, 2, 3, 4, 8, 11, 12, 14, and 18. I find that Thomson has failed to offer sufficient evidence of secondary considerations to overcome the obviousness showing.

Thomson argues that photolithographically formed anisotropic spacers located in non-active areas are critical to proper manufacturing and utility in the field of display cells at issue. Thomson offers no evidence to demonstrate a nexus between the asserted innovations of the '063 patent and any specific indicia of commercial success. Dr. West's testimony is silent on this point. (CX-4304C at Q. 447-454.) Dr. West offers no financial data to support the argument that the accused products are commercially successful, nor evidence establishing the nexus between the claimed invention and the alleged commercial success; instead, he merely claims that the use of the claimed spacers is "very important to manufacture of flat panel displays, which depends on yield." (*Id.*) In fact, Dr. West provides no figures that reflect an increase in sales or yield based upon the claimed invention of the '063 patent. Dr. West's unsupported conclusory testimony is insufficient to establish commercial success.

In addition Thomson's commercial success argument depends on a finding that the accused products infringe the asserted claims of the '063 patent. As discussed in detail in Section VI.B *infra*, I have found that Thomson failed to prove infringement of the '063 patent by any of the accused products. Therefore, Thomson's commercial success argument necessarily fails.

C. The '006 Patent

1. Anticipation

a. Matsumoto

Qisda/BenQ's Position: Qisda/BenQ contends that Japanese Patent Application S63-239421 ("Matsumoto") anticipates asserted claims 4, 7, and 14 of the '006 patent.

Qisda/BenQ asserts that the inclined optical axis of the compensating means in the only claim element that Dr. Escuti disputes is disclosed by Matsumoto. (Citing CX-4305C at Q. 158-228.) Qisda/BenQ argues that Matsumoto clearly discloses the inclined optical axis claim limitation. (Citing RX-157C at Q. 286; RX-73.) Qisda/BenQ notes that Matsumoto explains that "it is preferable to incline the optical axis" under some circumstances. (Citing RX-157C at Q. 287-288; RX-73.)

Qisda/BenQ claims that Dr. Escuti's interpretation of Matsumoto is inconsistent with the specification and claims of Matsumoto. (Citing RX-73; RX-157C at Q. 281-284.) Qisda/BenQ asserts that Dr. Escuti conflates the two distinct and very different meanings of the word "normal," and tries to apply them interchangeably to the term "main viewing angle." (Citing CX-4305C at Q. 190, 209-214.)

Qisda/BenQ notes that Thomson asserted the same position put forth by Dr. Escuti during reexamination of the '006 patent. (Citing RX-81.) According to Qisda/BenQ, the Patent Office rejected this position, and instead found claims 4 and 14 anticipated by Matsumoto. (Citing RX-82.)

Qisda/BenQ claims that Matsumoto discloses the remaining elements of claim 4 under both parties' claim constructions. (Citing RX-157C at Q. 268-311.) Qisda/BenQ asserts that Matsumoto discloses the additional limitation of claim 7, namely a pair of uniaxial birefringent plates having parallel faces, the plates having orthogonal optical axes. (Citing RX-157C at Q. 314-320; RX-73.) Qisda/BenQ claims that Matsumoto discloses the remaining elements of claim 14 under both parties' claim constructions. (Citing RX-157C at Q. 254-333.)[29]

Thomson's Position: Thomson contends that Matsumoto does not clearly disclose all of the limitations of any of the asserted claims of the '006 patent.

Thomson argues that Matsumoto fails to disclose an inclined optical axis because Matsumoto teaches that the optical axis has no inclination with respect to the normal. (Citing CX-4305C at Q. 158-216.) Rather, Thomson asserts that Matsumoto teaches that the optical axis is perpendicular to the display aligned with the principal viewing angle of the display. (*Id.*) Thomson argues that its position is consistent with the disclosure in Dr. Yeh's textbook. (Citing JX-19; CX-4305C at Q. 213.)

Thomson claims that Qisda/BenQ cannot meet its clear and convincing burden because there are four different translations of Matsumoto in the record that are each substantially different. (Citing CX-96; CX-97; CX-98; RX-73.) Thomson asserts that the translation relied upon by Qisda/BenQ is substantively different than the other translations in the record, thereby calling into question Qisda/BenQ's invalidity argument. (Citing CX-4305C at Q. 199-207.)

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[29] I note that in their reply briefs, AUO and CMI provide arguments supporting Qisda/BenQ's invalidity positions with respect to each of the asserted prior art references. (*See* ARB at 51-60; CMRB at 42-45.)

Thomson asserts that Matsumoto does not disclose the requirement in claim 4 that "said parallel faces are parallel to said main faces." (Citing CX-4305C at Q. 217-228.) Thomson claims that because the polarizer, substrate, and liquid crystal layer in Matsumoto are all parallel to one another, the faces of the optical element cannot be parallel to the main faces of the liquid crystal layer. (Citing CX-4305C at Q. 222.) Thomson argues that Matsumoto does not anticipate claim 14 for the same reason, as claim 14 requires that the first birefringent layer be parallel to the main faces of the liquid crystal layer.

Thomson claims that Matsumoto fails to anticipate claim 7 because there is no disclosure of orthogonal optical axes. (Citing CX-4305C at Q. 229-236.) Thomson notes that Dr. Yeh relies on an inherency argument; but Thomson argues that there is no requirement of orthogonal optical axes. (Citing CX-4305C at Q. 235.)

Discussion and Conclusions: Based on the evidence in the record, I find that Respondents have offered clear and convincing evidence that Matsumoto anticipates claims 4 and 14 of the '006 patent. I further find that Respondents have failed to offer clear and convincing evidence that Matsumoto anticipates claim 7 of the '006 patent.

Before addressing the substance of Matsumoto, I must address Thomson's assertion that because there are four different translations of Matsumoto in the record, there is no clear evidence of invalidity. Thomson does not offer evidence that any one of the four translations is more accurate than the others. Thomson's expert relies on one translation, the Isomichi translation, while Respondents' expert relies on a different translation, the Inoue-Herrera translation. (CX-4305C at Q. 166-168.) Both the Isomichi translation and the Inoue-Herrera translation are certified translations of the Matsumoto reference. (CX-96; RX-73.)

I do not concur with Thomson's assertion that the mere fact that there are four different translations of Matsumoto in the record demonstrates that Respondents cannot meet their burden on invalidity. Because neither side offers evidence to discredit either of the certified translations relied upon by the experts, I will look to both the Isomichi translation and the Inoue-Herrara translation in my analysis of Matsumoto.

Claim 4 is the first asserted claim. It depends from claim 3, which in turn depends from claim 1. Thus, Respondents must demonstrate that Matsumoto discloses the elements of claims 1, 3, and 4 in order to show anticipation of claim 4. The parties dispute whether or not Matsumoto discloses the limitation from claim 1 of the '006 patent that requires "the optical axis of said uniaxial compensating means with negative birefringence have an inclination with respect to the normal (Z) to the main faces of said layer." The parties agree that the language "with respect to the normal (Z) to the main faces of said layer" refers to the direction that is perpendicular to the plane of the liquid crystal layer. (RX-157C at Q. 278, 280; CX-4305C at Q. 164-165.) Thus, the claim language requires that the optical axis is inclined with respect to the direction perpendicular to the plane of the liquid crystal layer.

I find that Matsumoto clearly discloses this claim element. In the Inoue-Herrara translation, claim 1 of Matsumoto discloses, inter alia, "an optical element, the optical axis direction of which is set to an angle of 0°-30° from the direction perpendicular to the substrates and which has optical anisotropy with the opposite sign as the optical anisotropy of the liquid crystal material[.]" (RX-73 at AUO-THO 0179479.) In the Isomichi translation, claim 1 of Matsumoto discloses, *inter alia*, "wherein the liquid crystal display device comprises an optical element whose optical anisotropy is of a different sign from the topical anisotropy of the liquid crystal material disposed between the pair of polarizing films so that the direction of its optical axis is set at 0°-30° from the direction perpendicular to the substrates." (CX-96 at THOM00064416.)

In addition, the specification of Matsumoto contains the following passage from the Inoue-Herrara translation:

> The direction of the optical axis of the optical element may be perpendicular to the substrate if a sufficient electrical field can be applied to the liquid crystal layer so that the liquid crystal molecules stand approximately perpendicularly to the substrate, but it is preferable to incline the optical axis if a sufficiently high voltage cannot be applied due to multiplex driving or other limitations arising from the driving circuit. However, when this angle is 30° or higher, the tinting of the light-shielding segment becomes severe, which makes it impossible to achieve sufficiently high contrast, so this is avoided.

(RX-73 at AUO-THO 0179481.) The same passage from the Isomichi translation reads:

> The direction of the optical axis of the optical element may be perpendicular to the substrates when a sufficient electric field is applied to the liquid crystal layer and the liquid crystal molecules are standing substantially perpendicular to the substrates, but the optical axis is preferably tilted when a sufficiently high voltage cannot be applied due to multiplex driving or other drive circuit related restrictions. Allowing this angle to be 30° or greater, however, should be avoided, as it would intensify the coloring of the light-shielding segment, and make it impossible to achieve a sufficiently high contrast.

(CX-96 at THOM00064420.)

The above-quoted language from both Matsumoto translations demonstrates that Matsumoto discloses that the optical axis of the "optical element" (i.e. the uniaxial compensating means) is set at an angle ranging from 0° to 30° from the "direction perpendicular to the substrates" (i.e. the normal to the main faces of the liquid crystal layer). (RX-157C at Q. 282, 288.) This disclosure is sufficient to meet the inclined optical axis limitation of claim 1. (*Id.*)

Dr. Escuti opines that claim 1 of Matsumoto does not clearly disclose the inclined optical axis limitation of claim 1 because the claim language in the Isomichi translation is not clear. (CX-4305C at Q. 202.) Specifically, Dr. Escuti states that the reference to "its optical axis is set at 0°-30° from the direction perpendicular to the substrates" does not identify whether the claim is addressing the optical axis of the liquid crystal material or the optical axis of the optical element. (*Id.*) Because the claim could be referring to the optical axis of the liquid crystal material, Dr. Escuti opines that this is not a clear disclosure of the inclined optical axis element. (*Id.*)

I do not concur with Dr. Escuti's opinion. I find that the language of claim 1 from the Isomichi translation – "wherein the liquid crystal display device comprises an optical element whose optical anisotropy is of a different sign from the topical anisotropy of the liquid crystal material disposed between the pair of polarizing films so that the direction of its optical axis is set at 0°-30° from the direction perpendicular to the substrates" – clearly refers to the optical axis of the optical element, and not the optical axis of the liquid crystal material. (CX-96 at THOM00064416.) Moreover, claim 4 of Matsumoto depends from claim 1 and discusses "said optical element's optical axis," thereby referring back to the optical axis from claim 1 and providing additional support that the optical axis discussed in claim 1 is the optical axis of the optical element. (*Id.* at THOM00064417.)

The parties dispute whether or not Matsumoto discloses the limitation added by claim 4 that recites "said parallel faces are parallel to said main faces." The "said parallel faces" language is a reference to claim 3, which requires "said compensating means comprises a birefringent plate with parallel faces." The "said main faces" language is a reference to the main faces of the liquid crystal layer. Thus, claim 4 requires the compensating means to be parallel to the liquid crystal layer.

I find there is clear evidence that Matsumoto discloses the limitation of claim 4. Matsumoto discloses figures in the application. (*See* RX-73; CX-96.) Figure 1 of Matsumoto is described as a cross-sectional view of a basic example of the present invention, while Figures 2-4 are described as cross-sectional views of other examples of the invention. (*Id.*) In each of these figures, the optical element is shown lying parallel to the plane of the liquid crystal layer. (*Id.*; RX-157C at Q. 301-302.)

In addition, Matsumoto discusses the relationship between the product of the optical anisotropy and thickness of the optical element and the product of the optical anisotropy and thickness of the liquid crystal layer, and how it is most effective if those two products approximately equal. (RX-73 at AUO-THO 0179481; CX-96 at THOM00064419.) As Dr. Yeh explains, these equations presented in Matsumoto only work if the liquid crystal layer is parallel to the optical element. (RX-157C at Q. 304.)

Thomson and its expert dispute that the optical element in Matsumoto is parallel to the liquid crystal layer. Dr. Escuti focuses on the fourth embodiment in Matsumoto, which is the embodiment that Dr. Yeh relies upon to show the inclined optical axis limitation from claim 1. (CX-4305C at Q. 219.) Dr. Escuti opines that the fourth embodiment requires that the optical element is tilted by 15° as compared to the liquid crystal layer. (*Id.* at Q. 222-223.)

Dr. Escuti's opinion is based on the incorrect assumption that the "principal visual angle" must be perpendicular to the main faces of the liquid crystal material. (*Id.* at Q. 190, 222-223.) I find that Dr. Escuti's position is incorrect for all of the reasons described in Dr. Yeh's credible testimony. (RX-157C at Q. 305-311.) Specifically, Dr. Yeh notes that Dr. Escuti's position is contrary to the plain language of claims 1 and 4 of Matsumoto, which allows the main viewing angle to be something other than perpendicular to the main faces of the liquid crystal material. (*Id.* at Q. 306-307.) Dr. Yeh explains that Dr. Escuti's conclusion that the optical element in Matsumoto is tilted goes against common sense design principles for providing compensation.

(*Id.* at Q. 308-311.) Moreover, Dr. Escuti's position that the fourth embodiment of Matsumoto discloses an optical element that is tilted at an angle compared to the liquid crystal layer finds no support in any of the figures of Matsumoto. (*See* CX-96; RX-73.)

Beyond the above-described arguments, Thomson offers no argument that Matsumoto does not anticipate claim 4. Respondents offer undisputed evidence in the form of expert testimony from Dr. Yeh that all of the limitations of claim 4 are disclosed in Matsumoto. (RX-157C at Q. 268-311.) I find that Respondents have offered clear and convincing evidence that Matsumoto anticipates claim 4 of the '006 patent, regardless of whether the Inoue-Herrara translation or the Isomichi translation is relied upon.

The next asserted claim is claim 7, which depends from claims 1 or 2. Claim 7 requires that the "compensating means comprises a pair of uniaxial birefringent plates, each of said birefringent plates having parallel faces, said birefringent plates having orthogonal optical axes." The parties dispute whether or not this limitation is present in Matsumoto.

I find that Respondents failed to offer clear and convincing evidence that Matsumoto anticipates claim 7 of the '006 patent. In testifying that this element is met by Matsumoto, Dr. Yeh states that "[a] person of ordinary skill in the art would understand that when two optical elements are utilized, the second optical element is ***usually*** rotated 90 degrees around the z-axis relative to the first element..." (RX-157C at Q. 317) (emphasis added). Dr. Yeh adds that "based on my experience with compensating films 90 degrees is the most popular choice for the arrangement of two compensating elements." (*Id.* at Q. 318.)

It appears that Dr. Yeh's opinion is that the "orthogonal optical axes" limitation is inherently present in Matsumoto, as he cites to no place in Matsumoto that expressly discloses this limitation. (RX-157C at Q. 317-320.) A prior art reference may inherently disclose a claim limitation if the claim limitation is necessarily present in the prior art reference. *Trintec Indus., Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 1295 (Fed. Cir. 2002) ("Inherent anticipation requires that the missing descriptive material is 'necessarily present,' not merely probably or possibly present, in the prior art.") (citation omitted). Dr. Yeh's testimony does not establish that the "orthogonal optical axes" limitation is ***necessarily*** present; at most, his testimony establishes that it is ***usually*** present. (*See* CX-4305C at Q. 234-235.) Such testimony is insufficient to find the limitation is inherently disclosed in Matsumoto.

The last asserted claim is claim 14. Respondents' expert Dr. Escuti opines that Matsumoto does not anticipate claim 14 for the reasons already addressed *supra* with respect to claims 1 and 4. (CX-4305C at Q. 237-240.) For all of the reasons discussed with respect to claims 1 and 4, I do not concur with Dr. Escuti's opinion regarding claim 14. Based on the credible testimony of Dr. Yeh, I find that Respondents have offered clear and convincing evidence that Matsumoto anticipates claim 14. (RX-157C at Q. 321-332.)

Based on the foregoing, I find that Respondents have offered clear and convincing evidence that Matsumoto anticipates claims 4 and 14 of the '006 patent.

b. Scheuble

Qisda/BenQ's Position: Qisda/BenQ contends that asserted claims 4, 7, and 14 are anticipated by U.S. Patent No. 6,327,010 ("Scheuble").

Qisda/BenQ notes that Thomson argues that Scheuble fails to disclose the following limitations of claim 4: "uniaxial;" "inclined optical axis;" "plate;" and "compensation layer has parallel faces." (Citing CX-4305C at Q. 244-319.) Qisda/BenQ asserts that Scheuble expressly discloses a "uniaxial, optically negative compensation layer." (Citing RX-75; RX-157C at Q.

350-357.) Qisda/BenQ argues that this disclosure is sufficient to demonstrate that the "uniaxial" limitation is satisfied. (*Id.*)

Qisda/BenQ states that Scheuble discloses an "inclined optical axis" when it states that the "optical axis corresponding to this lowest refractive index can form an angle of 2° less than γ less than 60° with the surface of said second substrate." (Citing RX-157C at Q. 374-375; RX-75 at 10:47-51, Abstract.) Qisda/BenQ asserts that Scheuble discloses the "plate" element under both parties' constructions. (Citing RX-157C at Q. 377-379, 381; RX-75 at 8:58-67.)

Qisda/BenQ asserts that Scheuble discloses a birefringent plate with parallel faces, as recited in claim 3. Qisda/BenQ claims that this is disclosed when Scheuble recites "the liquid-crystalline compensation layer and the liquid-crystal layer serving for information display are arranged between plane-parallel substrates provided with alignment layers." (Citing RX-157C at Q. 378-379; RX-75 at 4:9-12.)

Qisda/BenQ claims that Scheuble discloses all of the limitations of claim 7. Specifically, Qisda/BenQ states that Scheuble discloses use of a Babinet-Soleil compensator, which is formed by two juxtaposed birefringent plates with perpendicular optical axes. (Citing RX-157C at Q. 369-371; RX-75 at 3:43-48.)

Qisda/BenQ argues that Scheuble anticipates claim 14. According to Qisda/BenQ, Scheuble discloses the "first birefringent layer" under both parties' constructions. (Citing RX-157C at Q. 403; RX-75 at 3:48-51.)

Thomson's Position: Thomson contends that Scheuble fails to anticipate any of the asserted claims of the '006 patent.

Thomson claims that Scheuble discloses a very different compensation scheme than found in the '006 patent. According to Thomson, Scheuble discloses compensating the LCD when little or no voltage is applied to the liquid crystal. (Citing CX-4305C at Q. 247.) Thomson claims that in that state, the liquid crystal molecules remain twisted, and they do not have either a positive uniaxial property or an optical axis under either proposed claim construction. (*Id.*) As a result, Thomson believes that a compensator with a negative uniaxial property will not compensate the liquid crystal layer. (*Id.*)

Thomson argues that Scheuble does not disclose uniaxial compensation. (Citing CX-4305C at Q. 271; RX-75.) Thomson points to all of the portions of Scheuble relied on by Qisda/BenQ and asserts that none of those portions actually disclose uniaxial compensation as required by claims 4, 7, or 14 of the '006 patent. (Citing CX-4305C at Q. 269-298; RX-75.)

Thomson asserts that Scheuble fails to disclose the additional elements required by claim 3. (Citing CX-4305C at Q. 299-310.) Thomson asserts that Scheuble fails to disclose the additional element of claim 4. (Citing CX-4305C at Q. 311-317.) Thomson asserts that Scheuble does not disclose the additional element of claim 7 because there is no disclosure of orthogonal optical axes. (Citing CX-4305C at Q. 320-331.) For the reasons already described with respect to claims 1 and 4, Thomson argues that Scheuble does not anticipate claim 14. (Citing CX-4305C at Q. 332-337.)

Discussion and Conclusions: Based on the evidence in the record, I find that Respondents have failed to offer clear and convincing evidence that Scheuble anticipates any of the claims of the '006 patent.

I find that Respondents have failed to offer clear and convincing evidence that Scheuble anticipates claim 4. Claim 4 depends from claim 3. Claim 3 requires that the compensating means comprises "a birefringent plate with parallel faces." I did not construe "plate," but the parties offered proposed constructions for the term. Thomson asserts that "plate" means "a layer of optical compensation material." (CIB at 69.) Respondents assert that "plate" means "a smooth, flat, relatively thin rigid body of uniform thickness." (AIB at 103-104.) I find that under either proposed construction, a "plate" must be a solid, and not a liquid.

To meet claim 3, Dr. Yeh cites to column 4, lines 9-12 of Scheuble. (RX-157C at Q. 379.) That passage recites:

> The liquid-crystalline compensation layer and the liquid-crystal layer serving for information display are arranged between plane-parallel substrates provided with alignment layers.

(RX-75 at 4:9-12.)

Dr. Escuti testified that "[t]he indication that the two substrates include alignment layers, however, indicates that the liquid-crystalline compensation layer is in fact a liquid, since alignment layers...are not used with solid materials. (CX-4305C at Q. 303.) Dr. Escuti also explains that Scheuble discusses alignment layers with respect to Figure 21(a), also indicating that the compensation layer is a liquid. (*Id.* at Q. 306.) I find that Dr. Yeh does not provide any adequate rebuttal to this testimony. (*See* RX-157C at Q. 379-381.)

Dr. Yeh also opines that "Scheuble...discloses that glass substrates may be used at the end of column 8." (RX-157C at Q. 381.) Scheuble includes the following disclosure at the end of column 8:

> The compensation layer shown in FIG. 17 comprises 8 cells having a thickness of 2 .mu.m and filled with the same liquid crystal as the addressable liquid-crystal layer. However, an arrangement of this type is generally not preferred due to the large number of substrates and alignment layers required in practice, with the disadvantage on the one hand of the high cost of producing the system and on the other hand the significantly reduced overall transmission due to the large number of glass substrates and alignment layers.

(RX-75 at 8:58-67.)

As Dr. Escuti notes, the glass substrates referred to in this passage are not compensation layers; they are glass substrates that enclose liquid compensation layers. (CX-4305C at Q. 309.) Thus, I find that the above-quoted passage does not support Respondents' position. Therefore, I find that Respondents have failed to offer clear and convincing evidence that Scheuble discloses a "plate" as required by claim 3.

I find that Respondents have failed to offer clear and convincing evidence that Scheuble anticipates claim 7. Claim 7 depends from claims 1 or 2 and requires that the compensating means "comprises a pair of uniaxial birefringent plates..." Dr. Yeh relies on Scheuble's disclosure of the use of one or more compensation layers. For the reasons discussed *supra* with respect to claim 4, I find that the compensation layers of Scheuble are not "plates" required by claim 7. (CX-4305C at Q. 320.)

I find that Respondents have failed to offer clear and convincing evidence that Scheuble anticipates claim 14. Claim 14 requires "means for providing a voltage across the liquid crystal layer." The '006 patent specification describes the "present invention" in the following manner:

> The present invention relates to electrically controlled electro-optical devices that enable the display of images, directly by transmission on a panel that modulates light or indirectly by projection on a screen. The invention relates more particularly to devices making use of a liquid crystal placed between two crossed polarizers and having a twisted nematic structure when there is no modulating electrical field. In this configuration, ***the transparency can be made to decrease when the liquid crystal cell is subjected to an increasing electrical voltage.***

(JX-4 at 1:8-18.) Thus, I find that claim 14 requires the compensation to be performed when there is a voltage provided to the liquid crystal layer. Dr. Escuti refers to this as a "normally white display." (CX-4305C at Q. 246.)

Dr. Escuti testified that unlike the '006 patent, Scheuble discloses a compensation scheme where "the compensation layers...are compensating the entire birefringence of the liquid crystal layer when no or negligible voltage is supplied in a normally black display cell." (CX-4305C at Q. 336.) Dr. Escuti therefore opined that Scheuble is teaching "a fundamentally different compensation scheme from that claimed in claimed [*sic*] 14[.]" (*Id.*)

Dr. Yeh opined that Scheuble discloses a normally white display, as is found in the '006 patent. Dr. Yeh cited to the portion of Scheuble that he claims discloses the normally white display. (RX-157C at Q. 365-366.) The portion of Scheuble relied on by Dr. Yeh is describing a "Conventional TN display," as opposed to a "Display according to the invention." (*Id.*) Scheuble makes clear that the portion of the specification relied on by Dr. Yeh is distinguishing the electrooptical systems according to the invention from conventional systems. (RX-75 at 16:55-60; CX-4305C at Q. 277-278.) Therefore, this portion of Scheuble relied on by Dr. Yeh does not support the conclusion that the invention in Scheuble may be used with normally white displays. (*Id.*)

Based on the foregoing, I find that Respondents failed to offer clear and convincing evidence that Scheuble anticipates any of the asserted claims of the '006 patent.

c. Arakawa

Qisda/BenQ's Position: Qisda/BenQ contends that asserts claims 4, 7, and 14 of the '006 patent are anticipated by U.S. Patent No. 5,189,538 ("Arakawa").

Qisda/BenQ notes that Dr. Escuti testified that Arakawa fails to disclose the following elements of claim 4: "uniaxial," "inclined optical axis," "layer of twisted nematic liquid crystal," "plate," and "compensation layer has parallel faces." (Citing CX-4305C at Q. 345-377.) Qisda/BenQ asserts that Dr. Escuti is wrong on all counts.

Qisda/BenQ states that Arakawa discloses both uniaxial and biaxial compensators, thereby meeting both parties' constructions. (Citing RX-157C at Q. 430-431.) Qisda/BenQ claims that one of ordinary skill in the art reading Arakawa would understand Arakawa to disclose a uniaxial compensator. (Citing RX-157C at Q.430-433; RX-74 at 1:67-2:37, 4:35-37, 8:48-51.)

Qisda/BenQ asserts that the compensator in Arakawa is film (A), and that Arakawa teaches that film (A) has an optical axis that can be tilted at different angles relative to the normal. (Citing RX-157X at Q. 440-443, 446-447.) For example, Qisda/BenQ cites to a portion of Arakawa that allegedly discloses that film (A) has at least one optic axis at an angle of not more than 45 degrees with respect to the normal. (Citing RX-74 at 1:67-2:37.)

Qisda/BenQ argues that Arakawa discloses "twisted nematic liquid crystal" when it states that "the present invention provides liquid crystal display using twisted or super twisted nematic liquid crystals." (Citing RX-74 at 3:67-4:5; RX-157C at Q. 421.) Qisda/BenQ argues that there is no justification for Dr. Escuti's opinion that Arakawa is limited to normally black displays. (Citing CX-4305C at Q. 346; RX-157C at Q. 435.) Qisda/BenQ asserts that Arakawa's disclosure of an "analyzer" discloses the presence of a second polarizer to one of ordinary skill in the art. (Citing RX-74 at 7:52-58; RX-157C at Q.424-428.)

Qisda/BenQ contends that Arakawa discloses the additional limitation of claim 7 because Arakawa discloses that film (A) can be composed of two films with optical axes at right angles. (Citing RX-157C at Q. 453; RX-74 at 2:29-33, 8:48-51.) Qisda/BenQ argues that Arakawa anticipates claim 14 for all of the reasons discussed with respect to claim 4. (Citing RX-157C at Q. 460-469, 471-478.)

Thomson's Position: Thomson contends that Arakawa does not anticipate any of the asserted claims of the '006 patent.

Thomson argues that Arakawa fails to disclose the two polarizers required by claim 1. (Citing CX-4305C at Q. 350.) Thomson states that Dr. Yeh refers to the "analyzer" in Arakawa as the second polarizer, but this is a reference to the first polarizer shown in Figure 1. (Citing CX-4305C at Q. 355.)

Thomson claims that Arakawa fails to disclose a "uniaxial compensating means with negative birefringence" under either side's constructions. Thomson argues that film (A) of Arakawa is not capable of performing a compensating function by itself. (Citing CX-4305C at Q. 364; RX-74 at 6:37-41, 9:60-10:4; CX-4093.) Thomson argues that Arakawa does not disclose that film (A) is uniaxial negatively birefringent with an inclined optical axis. (Citing CX-4305C at Q. 373.) Thomson also claims that Arakawa teaches a compensation technique that is contrary to the technique described and claimed in the '006 patent. (Citing CX-4305C at Q. 377.)

With regard to claim 14, Thomson adds that Arakawa fails to disclose perpendicular polarization directions. (Citing CX-4305C at Q. 381.) Thomson notes that Qisda/BenQ raises an inherency argument; but Arakawa does not necessarily disclosed crossed polarizers. (Citing CX-4305C at Q. 382.)

Discussion and Conclusions: Based on the evidence in the record, I find that Respondents have failed to offer clear and convincing evidence that Arakawa anticipates any of the asserted claims of the '006 patent.

Asserted claims 4 and 7 both depend from claim 1. Claim 1 includes the requirement that there is "a layer of twisted nematic liquid crystal placed between two polarizers[.]" Asserted claim 14 also requires a layer of twisted nematic liquid crystal placed between a first and second polarizer.

I find that Arakawa fails to clearly disclose the use of two polarizers. Figure 1 of Arakawa, which is "a schematic view of a liquid crystal display cell in accordance with one embodiment of the present invention," only shows the use of a single polarizing sheet:

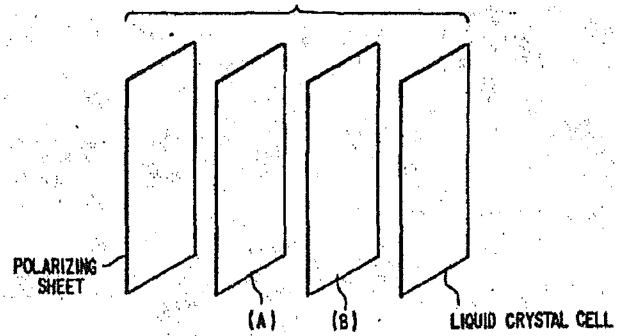

FIG. 1

(RX-74 at 2:63-65, Fig. 1.) Likewise, all of the claims of Arakawa only disclose the use of one polarizing sheet. (RX-74 at 10:10-65.)

Dr. Yeh cites to the following passage from Arakawa to support his opinion that Arakawa discloses the use of two polarizers:

> When biaxially stretched polystyrene film was inserted between an STN liquid crystal cell and an analyzer with the above-obtained stretched PC film being used as a protective film of a polarizing sheet of an analyzer side on the side to the liquid cell, the viewing angle greatly increased, and the displayed image could be clearly seen even at an inclination of 50° C. or more.

(RX-74 at 7:52-58.)

Dr. Yeh testified that the "analyzer" disclosed above serves as the second polarizer. (RX-157C at Q. 425-426.) Dr. Yeh also cites to his textbook as evidence that one of ordinary skill in the art would understand that a second polarizer is commonly referred to as an analyzer. (*Id.* at Q. 427-428.)

Dr. Escuti testified that he does not believe that Arakawa discloses the use of two polarizers. Dr. Escuti provided the following testimony as support for his opinion:

> First of all, the reference to an analyzer in Arakawa is a reference to the polarizer shown in Figure 1. Second of all, it is not the case that a birefringent optical system necessarily requires two polarizers. Arakawa therefore does not inherently disclose two polarizers. Third, the examples in Arakawa use a polarized laser as the light source, so the reference to an analyzer does not indicate two polarizers.

(CX-4305C at Q. 355.) Dr. Escuti added that the evidence supports the conclusion that the Arakawa compensation scheme only requires one polarizer. (*Id.* at Q. 358.)

I concur with Dr. Escuti that there is no indication in Arakawa that two polarizers are necessary to practice the disclosed invention. (RX-74; CX-4305C at Q. 353, 358.) I find that the passage relied on by Dr. Yeh does not clearly disclose the use of two polarizers. First, while Dr. Yeh asserts that the reference to an "analyzer" shows that there are two polarizers, I find that such a disclosure is not found in Arakawa and is not clear based on Dr. Yeh's testimony and his reference to his own textbook. (RX-157C at Q. 426-428.) Second, even if an "analyzer" could be considered a polarizer, I find that the above-quoted passage from Arakawa is ambiguous regarding whether or not two polarizers are actually used, and this ambiguity is further supported by the experts' differing opinions on what the passage at issue actually discloses. (RX-157C at Q. 425; CX-4305C at Q. 355.)

I find that Arakawa fails to disclose the "uniaxial compensating means with negative birefringence" of claims 4 and 7 and the "birefringent layer…that…provides uniaxial negative birefringence" of claim 14. Arakawa discloses the use of film (A) and film (B) as compensators; but film (B) is clearly identified as "having a positive uniaxially birefringence," meaning it cannot meet the negative birefringence requirement. (RX-74 at 3:54-56, 10:21-23.) Dr. Yeh therefore relies on film (A) as meeting this claim limitation. (*See, e.g.*, RX-157C at Q. 431-434.) Dr. Yeh points to the following passage in Arakawa as support for the position that Arakawa discloses these limitations:

> Film (A) according to the present invention, which has an optic axis perpendicular to the film surface, has a birefringence of approximately zero, i.e., a retardation of nearly zero, in the direction perpendicular to the surface and, therefore, it takes place birefringence properties with an inclined incident beam while varying its retardation.

(RX-74 at 3:30-36.)

I construed "uniaxial" to mean "having a single optical axis." In construing "uniaxial," I concurred with Respondents' position that light will not experience birefringence if it is traveling along the optical axis. (RX-157C at Q. 45, 52; Tr. at 374:13-17.) I find that Arakawa's disclosure that film (A) has a birefringence of "approximately zero" along the optic axis is contrary to the adopted construction of "uniaxial" and contrary to Respondents' arguments supporting that construction.

In addition, I find that Respondents failed to demonstrate that film (A) alone provides the claimed compensation required by the '006 patent. As Dr. Escuti notes, film (A) does not perform the compensating function itself; instead, the compensation is only performed by the combination of film (A) and film (B). (RX-74 at 6:37-41, 9:60-10:4; CX-4305C at Q. 367.) This is further emphasized in the prosecution history of Arakawa, where the applicant stated the following:

> As set forth in the present specification, an object of the present invention is to remove the viewing angle dependence of a liquid crystal display, that is, to decrease the relation between retardation and viewing angle of the film. The present invention achieves these objects by the use of a film (A) in combination with a film (B). The single use of a film (A) or a film (B) cannot achieve an enlargement of the viewing angle of a liquid crystal display (LCD) as shown the comparative example of the present specification.

(CX-4093 at THOM00128310-11.)

Based on the foregoing, I find that Respondents have failed to offer clear and convincing evidence that Arakawa anticipates any of the asserted claims of the '006 patent.

d. Kataoka

Qisda/BenQ's Position: Qisda/BenQ contend that Japanese Unexamined Patent Application Publication 04-120512 ("Kataoka") anticipates claims 4, 7, and 14 of the '006 patent.

Qisda/BenQ notes that Thomson argues that Kataoka does not disclose the "inclined optical axis" element. (Citing CX-4305C at Q. 416-419.) Qisda/BenQ argues that one of ordinary skill in the art would understand that the "certain angle" described in Kataoka is describing the inclination of the optical axis. (Citing RX-157C at Q. 502; RX-76 at 5.)

Qisda/BenQ argues that Kataoka discloses the requirements of claim 7. (Citing RX-157C at Q. 512.) Qisda/BenQ asserts that a person of ordinary skill in the art would understand the description of the use of the compensation layers disclosed in Kataoka to disclose the limitation of claim 7. (Citing RX-157C at Q. 511-516.) Qisda/BenQ argues that all of the limitations of claim 14 are found in Kataoka for all of the reasons raised with respect to claim 4.

Thomson's Position: Thomson contends that Kataoka fails to anticipate any of the asserted claims of the '006 patent.

Thomson claims that Kataoka fails to disclose a "layer of twisted nematic liquid crystal" because Kataoka repeatedly indicates that the type of display that is being compensated is an STN display, not a TN display. (Citing RX-76.) Thomson claims that Kataoka lacks a compensating means with negative birefringence because Kataoka discloses use of a compensation sheet with positive birefringence. (Citing CX-4305C at Q. 411.) Thomson argues that Kataoka also lacks the uniaxial and inclined optical axis elements. (Citing CX-4305C at Q. 411, 417-418.)

With regard to claim 7, Thomson states that Qisda/BenQ makes an inherency argument. Thomson argues that Dr. Yeh's expert report demonstrates that the two compensating elements in Kataoka will not necessarily have orthogonal optical axes. (Citing CX-4305C at Q. 421; RX-69 at 106.)

With regard to claim 14, Thomson asserts that Kataoka fails to disclose crossed polarizers. (Citing CX-4305C at Q. 425.) Thomson states that Dr. Yeh relies on inherency, but his opinion is contradicted by a passage in his book that acknowledges that STN displays do not have crossed polarizers. (Citing CX-4305C at Q. 427.)

Discussion and Conclusions: Based on the evidence in the record, I find that Respondents failed to offer clear and convincing evidence that Kataoka anticipates any of the asserted claims of the '006 patent.

The parties dispute whether or not Kataoka discloses "a layer of twisted nematic liquid crystal," which is required by each asserted claim. I construed "twisted nematic liquid crystal" to mean "liquid crystal with a twist angle of approximately 90 degrees." In opining that this limitation is disclosed in Kataoka, Dr. Yeh relies on Kataoka's disclosure of supertwisted nematic crystal. (RX-157C at Q. 486-487; CX-4305C at Q. 405.) As I made clear in addressing the construction of "twisted nematic liquid crystal," the adopted construction does not cover supertwisted nematic crystal.

Dr. Yeh relies on other portions of Kataoka in the event that Thomson's construction is adopted. He cites to a line in Kataoka that states, "[i]n addition to STN-LCD, this invention may also be used in other types of LCD." (RX-76 at 8; RX-157C at Q. 490.) I find that this statement is insufficient to conclude that Kataoka necessarily discloses "twisted nematic liquid crystal," as there are many other types of LCDs besides twisted nematic and supertwisted nematic. (CX-4305C at Q. 406.)

Dr. Yeh also cites to two more passages from Kataoka, opining that while they don't expressly disclose twisted nematic liquid crystal, "[o]ne of ordinary skill in the art would understand that this statement in Kataoka makes clear that the compensator in Kataoka could be utilized in twisted nematic liquid crystal displays in addition to the super twisted nematic liquid crystal." (RX-157C at Q. 492.) I do not concur that with Dr. Yeh that the cited statements include any indication that the invention of Kataoka could be used with twisted nematic liquid crystal. Moreover, the fact that the invention "could" be used with twisted nematic liquid crystal is not enough to demonstrate an inherent disclosure of twisted nematic liquid crystal. *Trintec Indus*, 295 F.3d at 1295 ("Inherent anticipation requires that the missing descriptive material is 'necessarily present,' not merely probably or possibly present, in the prior art.") (citation omitted). Therefore, I find that Kataoka lacks a clear disclosure of "twisted nematic liquid crystal."

The parties dispute whether or not Kataoka discloses a compensating layer with uniaxial negative birefringence, as required by each of the asserted claims. Kataoka discloses the following:

> In order to overcome the disadvantages of the 2-layer cell system, people have proposed a method in which the liquid crystal cell for optical compensation is substituted with a polymer sheet have the same optical characteristics as those of said liquid crystal cell. However, the polymer sheet having said optical characteristics (hereinafter referred to as phase difference compensating sheet) must have birefringence characteristics matching those of the liquid crystals, and a high transparency.

(RX-76 at 2.)

Both Dr. Yeh and Dr. Escuti agree that the liquid crystals of Kataoka have a positive birefringence. (RX-157C at Q. 495; CX-4305C at Q. 411.) The experts disagree on what Kataoka means when it says that the compensating sheet must have birefringence characteristics "matching" those of the liquid crystals. Dr. Yeh opines that "matching" means that the compensating sheet must provide "an approximately equal birefringence of the opposite sign, so that the two birefringences approximately cancel out." (RX-157C at Q. 495.) Dr. Escuti opines that "matching" means that "the compensation sheet has the same optical and birefringence characteristics as the super-twisted nematic liquid crystal material." (CX-4305C at Q. 411.) At best, I find that the quoted passage is ambiguous in its disclosure of the birefringence characteristics of the compensating sheet. Based on this ambiguity, I find that there is no clear and convincing disclosure of uniaxial negative birefringence.

Dr. Yeh cites to another passage in Kataoka that discloses that the compensation sheet is made of "slender rod-shaped or disk-shaped molecules." (RX-157C at Q. 497.) Without any explanation, Dr. Yeh testifies that "[o]ne of ordinary skill in the art would understand this reference to disk-shaped molecules as a reference [to] negative birefringenet [*sic*] material." (*Id.*) Dr. Escuti disputes this opinion. (CX-4305C at Q. 414.) I find that Dr. Yeh's conclusory assertion is insufficient to demonstrate the clear disclosure of uniaxial negative birefringence in Kataoka. *Motorola, Inc. v. Interdigital Tech. Corp.*, 121 F.3d 1461, 1473 (Fed. Cir. 1997) ("An expert's conclusory testimony, unsupported by the documentary evidence, cannot supplant the requirement of anticipatory disclosure in the prior art reference itself.")

The parties further dispute whether or not Kataoka discloses "uniaxial negative birefringence," as Thomson claims that Kataoka lacks any disclosure of the uniaxial component of the claim limitation. Respondents cite to Dr. Yeh's testimony to meet this claim limitation, but Dr. Yeh does not address how Kataoka discloses the "uniaxial" component. (RX-157C at Q. 493-497; CX-4305C at Q. 415.) Based on this complete lack of evidence on the "uniaxial" limitation, I find that Respondents failed to offer clear and convincing evidence that Kataoka discloses uniaxial negative birefringence.

Based on the foregoing, I find that Respondents failed to offer clear and convincing evidence that Kataoka anticipates any of the asserted claims of the '006 patent.

2. Obviousness

Qisda/BenQ's Position: Qisda/BenQ contends that if Matsumoto, Scheuble, Arakawa, and/or Kataoka are not found to anticipate the asserted claims of the '006 patent, any one of these references, alone or in combination, render the claims obvious.

Qisda/BenQ asserts that there is ample rationale to combine these references. (Citing RX-157C at Q. 530-532.) Qisda/BenQ claims that any of one the references alone with the knowledge of one of ordinary skill in the art would render the asserted claims obvious. Qisda/BenQ claims that to the extent that Arakawa does not disclosure two polarizers, it would have been obvious to use two polarizers. (Citing RX-157C at Q. 535.) Qisda/BenQ argues that to the extent that Arakawa and Kataoka are only found to disclose STN displays, it would have been obvious to apply their disclosed compensation schemes to TN displays. (Citing RX-157C at Q. 533.) Qisda/BenQ claims that to the extent that Thomson argues that Scheuble, Arakawa, and Kataoka are limited to normally black displays, it would have been obvious to apply their disclosed compensation schemes to normally white displays. (Citing RX-157C at Q. 534.)

Qisda/BenQ argues that there is no evidence of secondary considerations. Qisda/BenQ claims that the allegedly new advantages described in the '006 patent were in fact widely known in the art, as evidenced by Matsumoto, Arakawa, Scheuble, and Kataoka. (Citing RX-157C at Q. 539.)

Qisda/BenQ notes that Thomson asserts that widespread use of Fuji WV film as compensation film is evidence of commercial success and copying. Qisda/BenQ rejects this argument, stating that the adoption of the Fuji WV film over the simple inclined compensator of the '006 patent demonstrates that any advantages over the prior art provided by the alleged invention of the '006 patent were far less significant than those provided by the Fuji WV film. (Citing RX-157C at Q. 540.)

Thomson's Position: Thomson contends that Matsumoto, Arakawa, Scheuble, and/or Kataoka do not render the asserted claims of the '006 patent obvious.

Thomson argues that Dr. Yeh never explains how the prior art references should be combined to arrive at the claimed inventions. Thomson points to Dr. Escuti's opinion that the four prior art references do not render the asserted claims obvious. (Citing CX-4305C at Q. 439-440.)

Thomson states that Dr. Yeh is incorrect to claim that it would have been obvious to use a compensation scheme for an STN display with a TN display, because TN and STN are fundamentally different modes of operation that employ different compensation techniques. (Citing CX-4305C at Q. 444.) Thomson states that Dr. Yeh is also incorrect to claim that it would be obvious to use a compensation scheme for a normally black display with a normally white display, because compensation of a normally black display is fundamentally different from compensation of a normally white display. (Citing CX-4305C at Q. 446.) Thomson states that Dr. Yeh claims that it would have been obvious to add a second polarizer to Arakawa; but Thomson asserts that the reflective LCD in Arakawa does not require two polarizers. (Citing

CX-4305C at Q. 448.) Thomson adds that it would not be obvious to use crossed polarizers as required by claim 14. (*Id.*)

Thomson claims that secondary considerations support a finding of non-obviousness. Thomson claims that the '006 patent is widely licensed and is considered one of Thomson's key patents in its LCD licensing program. Thomson argues that the widespread infringement of the '006 patent through the use of the Fuji WV film is evidence of industry acceptance and the success of the invention of the '006 patent. (Citing CX-4305C at Q. 451.) Finally, Thomson asserts that the '006 patent provided a solution to the long-felt problem of poor viewing angles for a TN display. (*Id.*)

Discussion and Conclusions: Based on the evidence in the record, I find that Respondents have failed to offer clear and convincing evidence that any of the asserted claims in the '006 patent are obvious.

Respondents assert that any of the four prior art references relied upon for anticipation would render the claims obvious. Respondents rely on Dr. Yeh's testimony, yet Dr. Yeh does not offer any specific combinations of references that would render the claims obvious or explain which elements from each prior art references would be combined to form the claimed inventions. (RX-157C at Q. 529-532.) Instead, he merely makes the general assertion that the four references, alone or in combination, render the claims obvious. (*Id.*)

I find that Dr. Yeh's failure to provide specific and detailed testimony on obviousness dooms Respondents' obviousness argument. The Federal Circuit has stated that "[i]t is not our task, nor is it the task of the district court, to attempt to interpret…general testimony to determine whether a case of invalidity has been made out[.]" *Schumer v. Lab. Computer Sys., Inc.*, 308 F.3d 1304, 1316 (Fed. Cir. 2002). The court further explained that "to accept…generalized testimony as evidence of invalidity is improper." *Id.*; *see also Koito Mfg. Co. v. Turn-Key-Tech, LLC*, 381 F.3d 1142, 1152 (Fed. Cir. 2004) ("General and conclusory testimony...does not suffice as substantial evidence of invalidity.") I find that the generalized testimony from Dr. Yeh is insufficient to demonstrate obviousness.

Dr. Yeh also provides testimony on specific claim limitations that he believes are obvious. According to Dr. Yeh, if Thomson's construction of twisted nematic liquid crystal is adopted, then any references that disclose use of super-twisted nematic liquid crystal would still render the claims obvious because it would be obvious to use a compensation technique designed for a super-twisted nematic liquid crystal display in a twisted nematic liquid crystal display. (RX-157C at Q. 533.) Dr. Escuti responds that compensation techniques for twisted nematic and super-twisted nematic displays are very different and not interchangeable. (CX-4305C at Q. 444.)

I have construed "twisted nematic liquid crystal" in a way that excludes super-twisted nematic liquid crystal. The experts offered competing opinions on whether or not it would be obvious to use compensation techniques designed for super-twisted nematic displays with twisted nematic displays. Dr. Yeh offers no outside support for his opinion on this issue. (RX-157C at Q. 533.) I find that the lack of outside support for Dr. Yeh's opinion combined with the contrary opinion from Dr. Escuti means that Respondents cannot meet their burden to demonstrate that it would have been obvious to one of ordinary skill in the art to use compensation techniques designed for super-twisted nematic displays with twisted nematic displays.

Dr. Yeh provides his opinion that it would have been obvious to one of ordinary skill in the art to use compensation techniques designed for normally black displays with normally white displays. (RX-157C at Q. 534.) Dr. Escuti provides a contrary opinion. (CX-4305C at Q. 445-446.) Dr. Yeh offers no outside support for his opinion on this issue. (RX-157C at Q. 534.) I find that the lack of outside support for Dr. Yeh's opinion combined with the contrary opinion from Dr. Escuti means that Respondents cannot meet their burden to demonstrate that it would have been obvious to one of ordinary skill in the art to use compensation techniques designed for normally black displays with normally white displays.

Dr. Yeh opines that if Arakawa is found to only disclose one polarizer, it would have been obvious to one of ordinary skill in the art to use two polarizers because in most birefringent systems, you need a first and second polarizer. (RX-157C at Q. 535.) Dr. Escuti opines that not all LCDs require two polarizers. (CX-4305C at Q. 448.) According to Dr. Escuti, one of ordinary skill in the art would not use a second polarizer simply because a display is an LCD display. (*Id.*) In view of the fact that I found that Arakawa did not clearly disclose the use of two polarizers, I concur with Dr. Escuti's opinion that not all LCDs require two polarizers. Therefore, I find that it would not have been obvious to one of ordinary skill in the art to add a second polarizer to the Arakawa reference.

Based on the foregoing, I find that Respondents failed to offer clear and convincing evidence that the asserted claims of the '006 patent are obvious

Because I have found that Respondents have failed to make a *prima facie* showing of obviousness, it is unnecessary to examine the alleged evidence of secondary considerations. Assuming *arguendo* that Respondents had offered a *prima facie* showing of obviousness, I find that the alleged secondary considerations would not be sufficient to overcome such a showing.

Thomson argues that the '006 patent has been widely licensed to industry, and is one of Thomson's key patents in its LCD licensing program. (CIB at 100.) I find that the fact that the

'006 patent has been widely licensed as part of a larger LCD patent portfolio, alone, does not demonstrate the non-obviousness of the '006 patent. "A nexus between the merits of the claimed invention and the evidence of secondary considerations is required in order for the evidence to be given substantial weight in an obviousness decision." *Simmons Fastener Corp. v. Illinois Tool Works, Inc.*, 739 F.2d 1573, 1575 (Fed. Cir. 1984). Thomson's only attempt to demonstrate the required nexus is an unsupported claims that the '006 patent is one of the key patents in the portfolio. (CIB at 100.) Such attorney argument is insufficient to demonstrate the required nexus between the licensing activity and the merits of the claimed invention.

Thomson next asserts that the alleged widespread use of the Fuji WV film is evidence of the non-obviousness of the '006 patent. Thomson's argument presumes that the accused products in this investigation infringe the '006 patent. (CX-4305C at Q. 452.) Because I have concluded in Section VI.C *infra*, that the accused products do not infringe the '006 patent, this argument fails. In addition, Thomson relies on Dr. Escuti's testimony to demonstrate the widespread use of the Fuji WV film. (*Id.*) I find that Dr. Escuti's unsupported claim of widespread use is insufficient to prove non-obviousness.

Finally, Thomson claims that the '006 patent solved a long-felt problem of poor viewing angles for a TN display. (CIB at 100.) Again, Thomson relies on Dr. Escuti's unsupported claim that there was a long-felt need to solve the problem addressed by the '006 patent. (CX-4305C at Q. 452.) I find that Dr. Escuti's unsupported and conclusory testimony is insufficient to prove non-obviousness.

D. The '556 Patent

1. Takizawa, Alone or in Combination With Possin

CMI's Position: CMI contends that U.S. Patent No. 5,483,082 to Takizawa ("Takizawa"), alone or in combination with U.S. Patent No. 5,041,888 to Possin ("Possin"), renders claim 3 obvious.

CMI contends that Thomson only contests that three limitations are disclosed by Takizawa and/or Takizawa in combination with Possin: (1) "forming a plurality of etch stoppers…using a second mask;" (2) "etching at least one of the passivation layer and the gate insulating layer to form at least one second via hole;" and (3) "wherein an etching rate of the passivation layer is at least an etching rate of the gate insulating layer." (Citing CX-4306C at Q. 96, 108, 110.) CMI argues that all three elements are disclosed in the proposed obviousness combination.

CMI states that Thomson argues that Takizawa fails to disclose "forming a plurality of etch stoppers…using a second mask" because more than one mask could be used to form the etch stoppers, and, alternatively, a "maskless technique" could be used. (Citing CX-4306C at Q. 100, 103.) CMI asserts that Dr. Parsons admitted during the hearing that one of ordinary skill in the art, reading Takizawa, would understand that one mask could be used to form the etch stoppers. (Citing Tr. at 1621:22-1622:3, 1624:14-19.) CMI states that Dr. Howard also testified that one of ordinary skill in the art would understand Takizawa as teaching using one mask to form the etch stoppers. (Citing RX-159C at Q. 232, 234, 239.) CMI argues that Dr. Parsons' opinion that that "maskless" techniques could be used in Takizawa is meritless because Dr. Parsons admitted that Takizawa does not describe any maskless techniques. (Citing Tr. at 1623:2-10.)

CMI states that Thomson argues that the "etching at least one of the passivation layer and the gate insulating layer to form at least one second via hole" limitation is missing because the "contact hole" 32d shown in Takizawa is too big to qualify as the "second via hole." (Citing Tr. at 1618:11-1619:5.) CMI argues that it also asserted that contact hole 32a meets the "second via hole" limitation, and Dr. Parsons agreed. (Citing RX-159C at Q. 245; Tr. at 1656:3-21.) CMI asserts that Dr. Parsons' opinion is based on Figure 9D of Takizawa. (Citing Tr. at 1658:22-1659:17, 1714:23-1715:5.) CMI argues that precedent holds that patent drawings do not define precise proportions of the elements they disclose, and may not be relied upon to show particular sizes if the specification is silent on the issue. Therefore, CMI claims that Dr. Parsons' argument fails as a matter of law.

CMI asserts that Takizawa discloses the "wherein an etching rate of the passivation layer is at least an etching rate of the gate insulating layer" limitation because it specifically teaches that the via hole through the gate insulating and passivation layers should be "taper etched," and the via hole will be used for electrical connections. (Citing RX-159C at Q. 246.) CMI claims that because Takizawa discloses using an isotropic etch that will cause undercut if the underlying gate insulating layer etches faster than the passivation layer, one of ordinary skill in the art would know that the etching rate of the passivation layer must be at least the etching rate of the gate insulating layer to achieve a tapered etch and avoid undercut. (Citing RX-159C at Q. 246, 247.) CMI argues that Dr. Parsons' opinion that this limitation is not disclosed by Takizawa is undermined by his own testimony at the hearing. (Citing CX-4306C at Q. 115, 121; Tr. at 1716:20-1718:2, 1718:4-1719:3.)

CMI claims that Possin explicitly discloses choosing etching rates to avoid undercut in precisely the same way that the '556 patent does. (Citing RX-159C at Q. 252-254.) Therefore, CMI argues that the etching rate limitation is met because Takizawa expressly discloses etching through the passivation layer and gate insulating layer to form a tapered via, and Possin expressly discloses specific etch rate ratios when etching through two layers to avoid undercut. (Citing RX-46 at 3:13-22.) CMI claims that one of ordinary skill in the art would be motivated to combine the references because both references discuss etching vias to ensure good connections. (Citing RX-45 at 15:54-61, RX-159C at Q. 257.)[30]

Thomson's Position: Thomson contends that Takizawa, either alone or in combination with Possin, fails to render claim 3 obvious.

Thomson asserts that Takizawa fails to disclose use of a second mask. According to Thomson, the purported second masking step does not mention the use of a mask to form etch stoppers. (Citing RX-45 at 15:11-16.) Thomson states that Dr. Howard concedes that the TFT disclosed in Takizawa could be manufactured using non-masked-based techniques. (Citing RX-159C at Q. 233.) Thomson states that Dr. Parsons testified that one of ordinary skill in the art would recognize that the failure to disclose the use of a single mask means that either multiple masks or a maskless technique could be used. (Citing Tr. at 1623:14-1624:2, 1698:1-22.)

Thomson argues that Takizawa fails to disclose "etching at least one of the passivation layer and the gate insulating layer to form at least one second via hole..." Thomson states that contact hole 32a in Takizawa cannot be the second via hole because Dr. Howard already identifies it as the first via hole. (Citing RX-159C at Q. 241.) Thomson claims that contact hole 32d cannot serve as the second via hole because it is not even a via hole. (Citing Tr. at 1702:24-1703:2.)

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[30] In its reply brief, AUO argues that the combination of Takizawa and Possin renders claim 3 obvious. (ARB at 72-74.)

Thomson argues that Takizawa fails to disclose the etching rate limitation of claim 3 because Takizawa is insufficient to guide one of ordinary skill in the art to the material and etching parameter considerations necessary to achieve etch rate control. (Citing CX-4306C at Q. 111.) According to Thomson, Takizawa does not provide the disclosures necessary to allow one of ordinary skill in the art to implement etch rate control to allow taper etching without undercut. (Citing Tr. at 1703:18-1705:6, 1705:17-1706:10; CX-4306C at Q. 111-114, 118, 121-122.)

Thomson argues that Possin does not disclose the etching rate limitation. Thomson asserts that Possin does not identify taper etching, much less taper etching without undercut. (Citing CX-4306C at Q. 138; Tr. at 1706:24-1707:7, 1708:3-12.) Thomson argues that there is no reason to combine Takizawa and Possin because they are directed to fundamentally different TFT manufacturing methods. (Citing CX-4306C at Q. 143.)

Discussion and Conclusions: Based on the evidence in the record, I find that Respondents failed to offer clear and convincing evidence that claim 3 is rendered obvious by Takizawa alone, or the combination of Takizawa and Possin.

The parties dispute whether or not Takizawa discloses the element of claim 1 requiring "forming a plurality of etch stoppers over the plurality of gate electrodes using a second mask[.]" Specifically, the parties dispute whether or not Takizawa discloses use of a second mask. Respondents' expert Dr. Howard cites to the following portion of Takizawa as allegedly disclosing the use of a second mask:

> Then, on the insulating film 14, the non-doped i-type a-Si layer 16, and the protecting film 18 of SiO.sub.2 film or SiN film are formed in the stated order respectively in a 20 nm-thickness and a 150 nm-thickness by plasma CVD (FIGS. 4A to 4D).
>
> Then, the protecting film 18 except a part thereof on the TFT channel unit is etched off using hydrofluoric acid buffer or others. That is, the protecting film 18

> is left only above the gate electrode 12a of the TFT unit to form the channel protecting film 18a (FIGS. 5A to 5D).

(RX-45 at 15:6-16; RX-159C at Q. 239.) Dr. Howard states that "etching off all but a part thereof discloses the use of photolithography and a mask." (RX-159C at Q. 239; *see also id.* at Q. 232.)

I concur with Thomson's expert Dr. Parsons that "[t]here is no disclosure of the use of a second mask in the section from the Takizawa patent" quoted above. (CX-4306C at Q. 100.) Dr. Howard contends that the fact that Takizawa discloses etching off all but a part of the protecting film indicates the use of a single mask; but Dr. Parsons offers his opinion that that language does not clearly indicate the use of a single mask. (*Id.* at Q. 103-105.) Dr. Parsons states that the etch stoppers disclosed in Takizawa could possibly be formed using multiple masks or with a maskless technique. (*Id.*) In view of Dr. Parsons' credible testimony that the cited passage of Takizawa does not necessarily disclose the use of a single mask to form the etch stoppers, I cannot find that there is clear and convincing evidence that the second mask limitation is disclosed in Takizawa.

CMI points to Dr. Parsons' testimony on cross examination as allegedly undermining his opinion that Takizawa fails to disclose the use of a second mask:

> Q. But you agree, sir, that based on the description of the etch stopper in the '082 patent, one of ordinary skill would also understand that a mask could be used to form the etch stopper, correct?
>
> A. One of ordinary skill could presume that one or more masks was used.

(Tr. at 1621:22-1622:3.)

> Q. Okay. And is it also your understanding, sir, that such persons reading the '082 back in the 1995 time frame would understand that either one or more than one mask could also be used to form etch stoppers?
>
> A. Yes, I think that's true.

(*Id.* at 1624:14-19.)

These alleged admissions are not "fatal" to Thomson's argument, as CMI contends. (CMIB at 57.) Claim 1 requires the use of a single mask to form the etch stoppers – "forming a plurality of etch stoppers…using a second mask." Dr. Parsons' testimony shows that he acknowledges that one of ordinary skill in the art would understand that one ***or more masks could*** be used to form the etch stoppers in Takizawa. This testimony does not demonstrate that Takizawa clearly and necessarily discloses the use of a single mask to form the etch stoppers.

The parties dispute whether or not Takizawa discloses the step of "etching at least one of the passivation layer and the gate insulating layer to form at least one second via hole" found in claim 2. Dr. Parsons' basis for opining that the "second via hole" limitation is not met is that contact hole 32d of Takizawa is too big to be a "via hole." (CX-4306C at Q. 109; Tr. at 1700:10-1701:22.) Dr. Parsons asserts that a via hole "is known in the art to be a tiny hole," and that contact hole 32d of Takizawa is not a tiny hole. (CX-4306C at Q. 109.)

Dr. Parsons acknowledged that Takizawa is silent with regard to the dimensions of the contact holes. (Tr. at 1660:9-14.) Thus, Dr. Parsons' opinion is based on the proportions of the contact holes as shown in the figures of Takizawa. I find that this opinion regarding the dimensions of the contact holes does not comport with the Federal Circuit's statement that "it is well established that patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue." *Hockerson-Halberstadt, Inc. v. Avia Group Int'l, Inc.*, 222 F.3d 951, 956 (Fed. Cir. 2000). Because Dr. Parsons cannot rely on the patent figures to determine the dimensions of the contact holes, I do not find Dr. Parsons' opinion on this issue to be persuasive. Because this was the only argument Thomson offered related to the "second via hole" limitation, I find that

Respondents have demonstrated that Takizawa discloses the claimed second via hole. (RX-159C at Q. 245.)

The parties dispute whether or not Takizawa discloses the limitation of claim 3 requiring "an etching rate of the passivation layer is at least an etching rate of the gate insulating layer." I find that Takiazawa does not clearly disclose or suggest this limitation. The '556 patent describes the problem that arises when the etching rate of the gate insulating layer is greater than the etching rate of the passivation layer:

> However, if the etching rate of the passivation layer 70 is slower than the etching rate of the gate insulating layer 56, then a step 610 forms at the interface between the passivation layer 70 and the gate insulating layer 56 as shown in FIG. 7. Since the sidewall section 608 is etched at a faster rate than the sidewall section 606, the sidewall section 608 forms a smaller angle 602 with respect to the substrate surface and is etched further along the horizontal direction than the sidewall section 606. Thus, the step 610 is formed by the passivation layer 70 immediately above the gate insulating layer 56. When the step 610 is formed, the ITO layer 172 as shown in FIG 5 forms a step coverage over the passivation layer 70, the gate insulating layer 56 and the gate line portion 556. A break in the ITO layer 172 step coverage can easily occur creating an open circuit between the ITO layer 172 and the gate line portion 556.

(JX-3 at 4:42-56.) Figure 7 depicts this problem:

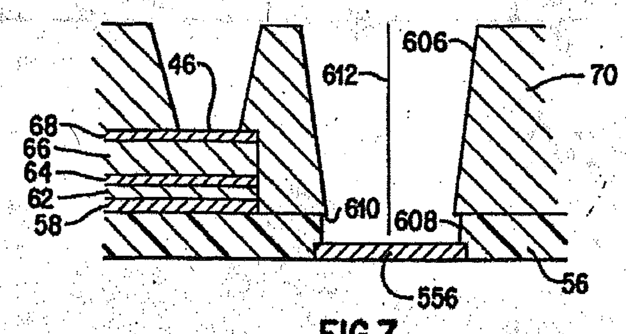


FIG.7

(*Id.* at Fig. 7.) The parties refer to the step, show as item 610 in Figure 7, as undercut. (*See, e.g.*, CX-4306C at Q. 114; RX-159C at Q. 246.)

Dr. Howard does not cite any portion of Takizawa that expressly addresses etching rates, but he claims that Takizawa nonetheless discloses this claim limitation. (RX-159C at Q. 246.) Specifically, Dr. Howard states that Takizawa discloses: the use of a wet etch to etch through both passivation and gate insulators; that the vias should be tapered; and that the vias are for electrical connections. (*Id.*; RX-45 at 15:47-64.) According to Dr. Howard, one of ordinary skill in the art would know from these disclosures that the passivation layer must etch at least as fast as the gate insulating layer to achieve a tapered etch and avoid undercut. (RX-159C at Q. 246.)

I find that Dr. Howard fails to adequately explain how one of ordinary skill in the art, reading the disclosure of Takizawa, would know the relative etch rates of the passivation layer and the gate insulating layer. (CX-4306C at Q. 120.) As Dr. Parsons notes, the fact that there is a tapered etch in Takizawa does not support Respondents' position, because the '556 patent demonstrates that undercut can still be a problem with a tapered etch. (*Id.* at Q. 121; JX-3 at Fig. 7.) In addition, Dr. Parsons explains that Takizawa discloses lists of different materials that may be used for the gate insulating layer and passivation layer. (CX-4306C at Q. 122.) Dr. Parsons notes that each of these materials will have a different etching rate, meaning that the relative etching rates will be affected by the user's choice of material. (*Id.* at Q 118, 122.) Yet, Takizawa provides no discussion of relative etching rate or the importance of choosing a combination of materials for the gate insulating layer and passivation layer that will avoid undercut. (*Id.*)

Respondents also contend that Possin discloses the etching rate limitation of claim 3. As Dr. Howard states, "Possin discusses the necessity of avoiding undercutting when etching two layers at once using the same etch." (RX-159C at Q. 252.) Specifically, Possin discloses:

> High etch rates are undesirable because the a-Si and SiN layers are sometimes etched in the same masking step. If the SiN layer etches faster than the a-Si, the

> SiN layer will be undercut beneath the a-Si layer; this undercutting can cause step coverage problems when subsequent layers of material, such as the source and drain metallization layer and a passivation layer, are deposited. A faster SiN etch rate relative to silicon is also undesirable where design constraints and fabrication processes require only the silicon to be etched and for the etch to stop at the underlying nitride layer.

(RX-46 at 3:11-22; *see also* RX-159C at Q. 252.)

I find that this disclosure in Possin addresses the same problem addressed in the '556 patent specification and claim 3, *i.e.* undercut caused by a lower layer having a greater etching rate than an upper layer. Still, because I have concluded *supra* that Takizawa fails to disclose "forming a plurality of etch stoppers…using a second mask," I find that Takizawa, alone or in combination with Possin, fails to render claim 3 obvious. *Hearing Components*, 600 F.3d at 1373-1374; *Velander*, 348 F.3d at 1363.

2. The '036 Application In View of the '888 Patent

CMI's Position: CMI contends that Japanese Patent Application Publication No. 64-76036 ("Wakai") in combination with Possin renders claim 3 obvious under Thomson's proposed constructions for "etch stopper," "source electrode," "drain electrode," and "portion of."

CMI notes that Thomson only contests that three limitations are disclosed by the combination of Wakai and Possin: (1) "forming a plurality of etch stoppers…using a second mask;" (2) "forming over the substrate a passivation layer having at least one first via hole using a fourth mask;" (3) "wherein an etching rate of the passivation layer is at least an etching rate of the gate insulating layer." (Citing CX-4306C at Q. 216; RX-159C at Q. 224-258.)

CMI asserts that Thomson's arguments with respect to "forming a plurality of etch stoppers…using a second mask" are the same as those offered for Takizawa. (Citing CX-4306C at Q. 219, 221-222.) CMI states that these arguments fail for the same reasons as discussed with respect to Takizawa. (Citing RX-159C at Q. 309.)

CMI states that Thomson's argument with regard to the "forming over the substrate a passivation layer having at least one first via hole using a fourth mask" limitation should be rejected as Wakai discloses the use of a mask to form vias in the passivation layer similarly to its disclosures regarding "etch stoppers" under Thomson's construction and the teachings of Takizawa. (Citing RX-159C at Q. 311.)

CMI asserts that Wakai describes forming a via through the passivation and gate insulating layers, and that it would have been obvious to one of ordinary skill in the art to avoid undercut by controlling the etch rate ratio of those two layers. (Citing RX-159C at Q. 316.) Alternatively, CMI claims that the combination of Wakai and Possin discloses the etch rate limitation. (Citing RX-159C at Q. 319-321.) CMI claims that there is a motivation to combine the two references because both patents discuss etching vias to ensure good connections. (Citing RX-159C at Q. 319, 321; CX-4306C at Q. 115.)

Thomson's Position: Thomson contends that the combination of Wakai and Possin do not render claim 3 obvious.

Thomson claims that the purported second masking step of Wakai does not mention the use of a mask. (Citing RX-41 at 5.) Thomson further claims that Wakai does not disclose the use of a fourth mask. (Citing RX-41 at 1.) Thomson notes that Dr. Parsons testified that the failure to disclose the use a single mask means that a single mask was not used. (Citing Tr. at 1623:14-1624:2, 1698:1-22.)

Thomson asserts that Wakai does not disclose the etching rate element because it does not disclose etch rate control, taper etching, or undercut avoidance. (Citing CX-4306C at Q.

CMI's Position: CMI contends that Thomson's assertions regarding secondary considerations are unsupported and fail to rebut the strong showing of obviousness.

CMI claims that Thomson's alleged evidence of commercial success fails because Thomson did not demonstrate a nexus between the alleged commercial success and the features that allegedly distinguish the claimed invention from the prior art. (Citing CX-4306C at Q. 344.) CMI further claims that, contemporaneously with the work of the inventors of the '556 patent, many others in the field of liquid crystal displays independently developed the same ideas. (Citing RX-159C at Q. 381; RX-555C at Q. 42-43.) CMI claims that this shows that the invention was not beyond the level of ordinary skill in the art and provides strong support for the conclusion that the invention would have been obvious.

Discussion and Conclusions: Because I have already concluded that Respondents failed to demonstrate a *prima facie* case of obviousness, it is unnecessary to address secondary considerations.

Assuming *arguendo* that Respondents put forth a *prima facie* case of obviousness, I find that Thomson has failed to offer sufficient evidence of secondary considerations to overcome the obviousness showing.

Thomson offers two arguments in support of its claim that secondary considerations support a finding of non-obviousness. First, Thomson claims that the 5-mask process claimed in the '556 patent is commercially successful due to Respondents' use of the patented process. (CIB at 130.) This claim is wholly unsupported, as the only evidence relied upon by Thomson to demonstrate commercial success is the conclusory testimony of Dr. Parsons. (CX-4306C at Q. 344.) Dr. Parsons offers no financial data to back up the statement that Respondents' processes are commercially successful or no evidence establishing the nexus between the claimed invention and the alleged commercial success; instead, he merely claims that the 5-mask process is "widely used." (*Id.*) Such unsupported testimony is insufficient to establish commercial success. Moreover, Thomson's reliance on Respondents' processes is misplaced, as I have concluded in Section VI.D *infra*, that none of Respondents' processes infringe the '556 patent.

Second, Thomson asserts that the fact that the '556 patent is cited on the face of at least 55 issued U.S. patents supports a finding of non-obviousness. (CMIB at 130-131.) Thomson believes that this fact shows that "inventors and patent examiners alike recognized the importance of the ['556 patent] and its influence on subsequent inventions." (*Id.*; CX-4306C at Q. 344.) Thomson cites no case law relying on the number of times a patent has been cited during the prosecution of other patents as an indicator of non-obviousness. (*Id.*) Prior art patents are cited during prosecution for many reasons, and it does not necessarily demonstrate the alleged importance of the invention disclosed therein. For example, a prior art patent may be cited during prosecution to demonstrate the flaws in the prior art that the claimed invention overcomes. In that instance, the citation of the prior art patent provides no indication regarding the non-obviousness of the cited patent. I find that the fact that the '556 patent has been cited on the face of at least 55 issued U.S. patents is irrelevant with regard to the issue of secondary considerations.

E. The '674 Patent

1. Anticipation

a. Fujitsu

CMI's Position: CMI contends that Japanese Published Patent Application No. JP 06-130415A ("Fujitsu") anticipates claims 1, 7, 8, 14, 16, 17, and 18 of the '674 patent.

CMI asserts that the parties agree that Fujitsu discloses all of the limitations of the independent asserted claims of the '674 patent except for a second patterned conductive layer of a "highly conductive metal" that includes the N conductive lines, or data lines, and the "electrode wiring." (Citing RX-393C at Q. 121-160, 187-220; RDX-428; CX-4307C at Q. 53; RX-326C.) CMI states that Thomson's arguments boil down to the following assertions: (1) that titanium was not sufficiently conductive for the device to operate; and (2) the "drain bus lines" and "electrode wiring" are not in the same patterned layer as the structures they serve to connect. (Citing CX-4307C at Q. 56, 60.)

CMI notes that Dr. Hatalis testified that titanium can be considered highly conductive under either proposed construction of "highly conductive metal." (Citing RX-393C at Q. 130-131; JX-37 at 24.) CMI states that Dr. Parsons offers no evidence that titanium was not sufficiently conductive for signals to "traverse the layer, line or component within the switching period of related switching elements and without significant delay due to capacitance." (Citing CX-4307C at Q. 56.) CMI argues that if Dr. Parsons' assertion is accepted, then the only conclusion that could be reached is that the TFT-LCD device disclosed in Fujitsu would not actually operate.

CMI argues that Fujitsu discloses the claimed "second patterned conductive layer" of the asserted claims. (Citing RX-393C at Q. 142-149; RX-325 at 10-11.) CMI asserts that Dr. Parsons is wrong to state that the drain bus lines and the electrode wiring are not disclosed in the second patterned conductive layer. (Citing CX-4307C at Q. 57.) CMI claims that Dr. Parsons undercut his own opinion when he testified that he does not see any evidence that one of ordinary skill in the art would read the figures in Fujitsu as disclosing the drain bus lines and electrode wiring formed in different layers. (Citing RX-393C at Q. 145-146; Tr. at 1693:4-8.)

Thomson's Position: Thomson contends that Fujitsu fails to anticipate any of the asserted claims of the '674 patent.

Thomson claims that Fujitsu does not disclose forming the "drain bus lines" in the same patterned conductive layer as the "drain electrode," "source electrode," and "opposing electrode" as required by the claims of the '674 patent. (Citing CX-4307C at Q. 53, 57-61.) Thomson states that the Fujitsu explicitly discloses that the electrodes are formed in the same metal film, but there is no such disclosure regarding the drain bus lines. (Citing CX-4307C at Q. 53, 57-61; RX-325.) Thomson notes that Respondents rely on Figures 1 and 2 of Fujitsu to show that the drain bus lines are formed in the same layer; but Thomson claims that those figures do not indicate the layer in which the drain bus lines are formed. (Citing RX-325 at Figs. 1-2; CX-4307C at Q. 60.)

Thomson argues that Fujitsu fails to disclose use of a highly conductive metal in the second patterned conductive layer. Thomson states that Fujitsu discloses the use of titanium. (Citing RX-325; CX-4307C at Q. 55.) According to Thomson, a person of ordinary skill in the art would not consider titanium to be a highly conductive metal because the conductivity of titanium is more than 10 times smaller than the conductivity of aluminum. (Citing CX-4307C at Q. 55-56.)

Thomson argues that Fujitsu fails to disclose where the second contact lead and the second electrode are joined. (Citing RX-325; CX-4307C at Q. 62-72.) Thomson states that the cross-section figures of Fujitsu show the relative locations of the source electrode and the opposing electrode formed on the substrate, but do not show the electrode wiring connecting the two electrodes. (Citing RX-325 at Figs. 3-4.)

Discussion and Conclusions: Based on the evidence in the record, I find that CMI has failed to offer clear and convincing evidence that Fujitsu anticipates any of the asserted claims of the '674 patent.

Independent claims 1 and 16 of the '674 patent both require "a second patterned conductive layer that comprises highly conductive metal other than indium tin oxide." I construed "highly conductive metal" to mean "a metal that is sufficiently conductive that signals can traverse the layer, line, or component within the switching period of related switching elements and without significant delay due to capacitance; aluminum, certain alloys of aluminum, and certain other metals are highly conductive metals in nearly all contexts, while less conductive metals may be highly conductive at lower switching speeds."

CMI asserts that the titanium film disclosed in Fujitsu constitutes the "second patterned conductive layer" of claims 1 and 16. (CMIB at 90; RX-393C at Q. 149.) The parties and their experts dispute whether or not titanium is a "highly conductive metal." (RX-393C at Q. 130-131, 149; CX-4307C at Q. 55-56.)

I find that there is clear and convincing evidence that the titanium film in Fujitsu constitutes "a second patterned conductive layer that comprises highly conductive metal other than indium tin oxide." Dr. Hatalis opined that titanium is a "highly conductive metal," stating "[t]itanium is less conductive than some metals, such as aluminum, but it is more conductive than other metals suggested by the '674 patent, including ITO." (RX-393C at Q. 130; *see also id.* at Q. 131, 149.) Dr. Parsons agreed that it was possible to use titanium in the data line for some TFT LCDs. (Tr. at 531:16-532:3.)

In addition, the specification expressly identifies titanium as a metal that may be used for the scan lines and data lines: "various conductive materials could be used in the scan lines and data lines, including but not limited to Al, ITO, MoTa, Cr, MoCr, Ta, Cu, Ti, TiN, and organic conductive materials." (JX-2 at 12:55-58.) Thomson argues that this passage is not relevant because it only addresses "conductive materials," as opposed to ***highly*** conductive metals. (CIB at 141-142; CRB at 70.) I do not find Thomson's argument persuasive, as the '674 patent claims make clear that the scan lines and data lines are to be formed from a highly conductive metal. (*See generally* JX-2.) Thus, it follows that identifying titanium as a metal that may be used for the scan lines and data lines equates to identifying titanium as a highly conductive metal.

Thomson also offers Dr. Parsons' opinion that titanium is not a "highly conductive metal." (CX-4307C at Q. 55-56.) Dr. Parsons' basis for this opinion is that "[t]he conductivity of titanium is more than 10 times smaller than the conductivity of aluminum, which is used as the highly conductive metal in the preferred embodiment of the ['674] patent." (*Id.* at Q. 55.) I find that the fact that titanium may be less conductive than aluminum does not mean it cannot serve as a "highly conductive metal." Nothing in the adopted construction of "highly conductive metal" would preclude titanium simply because it is less conductive than aluminum.

Claim 1 of the '674 patent requires: "the second patterned conductive layer including the N conductive lines and the first and second contact leads and the second electrode of each unit of cell circuitry." Claim 16 of the '674 patent requires "the second patterned conductive layer including the N data lines and the first and second contact leads and the second electrode of each unit of cell circuitry." Thomson asserts that Fujitsu fails to disclose forming the N conductive lines (or N data lines) in the same patterned conductive layer as the first and second contact leads and the second electrode. (CX-4307C at Q. 53.)

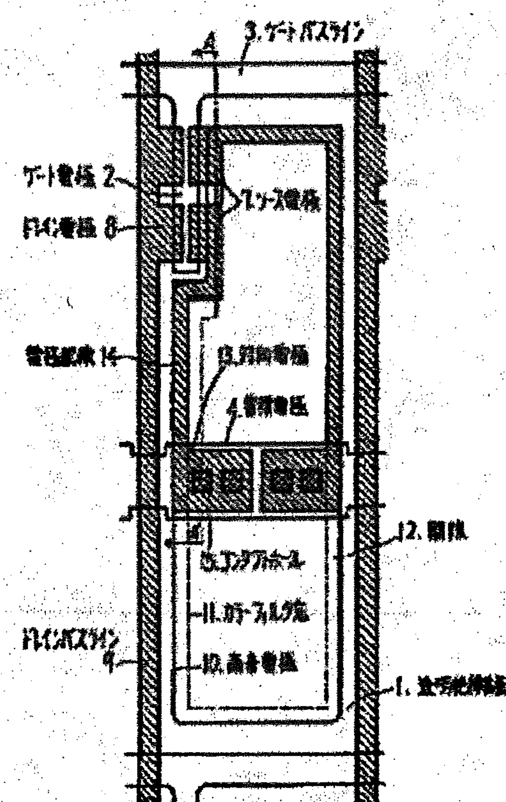
I find that Fujitsu lacks clear and convincing evidence that the N conductive lines or N data lines are formed in the same layer as the first and second contact leads and the second electrode. CMI identifies the first and second contact leads as the drain and source electrodes in Fujitsu, respectively. (CMIB at 93.) CMI identifies the second electrode as the opposing electrode in Fujitsu. (*Id.*) CMI identifies the N conductive lines or N data lines as the drain bus lines in Fujitsu. (*Id.*)

Dr. Hatalis opines that the drain bus lines are in the same layer as the drain and source electrodes and the opposing electrode because all of those elements are "shown with a continuous and consistent shading" in Figure 1 of Fujitsu. (RX-393C at Q. 143, 145.) Dr. Hatalis also opines that if these elements are not in the same layer, then Fujitsu would fail to disclose how these structures would be in electrical contact with each other. (*Id.* at Q. 146.) Dr. Hatalis believes that this is inconsistent with the rest of the disclosure, because Fujitsu describes contact holes used to connect the second patterned conductive layer to the third patterned conductive layer. (*Id.*) Finally, Dr. Halatis believes that the argument that the drain bus lines are not in the same layer is contrary to the stated goal of Fujitsu, which is to minimize cost and complexity. (*Id.*)

Dr. Parsons opines that Fujitsu fails to offer clear and convincing evidence that the drain bus lines are in the same layer as the drain and source electrodes and opposing electrode. (CX-4307C at Q. 57.) Dr. Parsons notes that Fujitsu explicitly lists the items that are in the second patterned conductive layer, and does not mention the drain bus lines. (*Id.*) Dr. Parsons testifies that the fact that the shading is consistent in Figure 1 does not indicate that all of the elements are in the same layer. (*Id.* at Q. 60.) According to Dr. Parsons, Figure 1 "is an overhead view that shows a shaded region to indicate the area of the pixel that is covered by metal." (*Id.*) Dr. Parsons adds that at the time of the '674 patent, it was advantageous to form different elements out of different metal layers. (*Id.*)

Fujitsu does not expressly state that the drain bus lines are formed in the same layer as the drain and source electrodes and opposing electrode. (RX-325.) Dr. Hatalis infers this from Figure 1, which is described as a "plan view[] of the electrode wiring portion in the present invention." (RX-325 at CMI-741-00600697.) Figure 1 depicts the following:

FIG. 1
Description of principles of present Invention (Part I)



(RX-325 at CMI-741-00600702.)

The source and drain electrodes are items 7 and 8, respectively. (*Id.*) The opposing electrode is item 13. (*Id.*) The drain bus line is item 9. (*Id.*) The only evidence actually found in Fujitsu that CMI relies upon to show that the drain bus line is in the same layer as the identified electrodes is the fact that the shading for all of those elements is "continuous and consistent" in Figure 1. (RX-393C at Q. 143, 145.) I do not find that the shading of Figure 1, on its own without any further explanation, provides the necessary clear and convincing evidence to conclude that the drain bus line is in the same layer as the other elements. Figure 1 is far from clear regarding the various layers of the device, and, without more, I cannot find that particular elements are within the same layer based on Figure 1.

Other than Figure 1, CMI is relies on Dr. Hatalis' expert opinion regarding why he believes that it makes sense for all of those elements to be found in the same layer. (*Id.* at Q. 145-146.) Thomson counters with testimony from Dr. Parsons regarding why Fujitsu fails to clearly disclose that the drain bus line is in the same layer as the drain and source electrodes and opposing electrode. (CX-4307C at Q. 57-60.)

I am left with an ambiguous figure in Fujitsu and testimony from both experts regarding why this limitation is or is not disclosed in Fujitsu. (RX-325 at CMI-741-00600702; RX-393C at Q. 143-146; CX-4307C at Q. 57-60.) This does not lead to a conclusion that there is clear and convincing evidence that the limitation at issue is disclosed by Fujitsu. *Colorado v. New Mexico*, 467 U.S. 310, 316 (1984) (describing the clear and convincing standard as requiring evidence that "could place in the ultimate factfinder an abiding conviction that the truth of its factual contentions are 'highly probable.'") Therefore, I find that CMI failed to offer clear and convincing evidence that Fujitsu discloses N conductive lines or N data lines in the second patterned conductive layer.

Claims 1 and 16 also require that "the second contact lead and the second electrode [are] joined in the second patterned conductive layer." Thomson asserts that Fujitsu fails to disclose that the second contact lead and the second electrode are joined in the second patterned conductive layer. (CX-4307C at Q. 70-71.) CMI claims that this limitation is met by the following disclosure in Fujitsu: "the source electrode 26 and the opposing electrode 27 are connected by an electrode wiring that is formed on the gap between the pixel electrode and the color filter window." (RX-325 at CMI-741-00600699.) In addition, CMI again relies on the "continuous and consistent" shading of Figure 1 and Dr. Hatalis' reasoning for why it makes sense that the electrode wiring is found in the second patterned conductive layer. (RX-393C at Q. 141-146.)

I find that there is no clear and convincing evidence in the record that Fujitsu discloses that the second contact lead and second electrode are joined in the second patterned conductive layer. The above-quoted passage addressing the electrode wiring does not state that the electrode wiring is in the same layer as the source electrode and opposing electrode. (CX-4307C at Q. 71.) Besides this inconclusive passage, there is only the ambiguous Figure 1 of Fujitsu and the competing, inconclusive, views of the experts. For the same reasons as discussed with respect to the N conductive lines and N data lines limitations, I find that CMI failed to offer clear and convincing evidence showing that Fujitsu discloses "the second contact lead and the second electrode being joined in the second patterned conductive layer."

Based on the foregoing, I find that CMI failed to prove that Fujitsu anticipates any of the asserted claims of the '674 patent.

b. Casio

CMI's Position: CMI contends that U.S. Patent No. 5,734,455 ("Casio") anticipates claims 1, 7, 8, 9, 14, 16, 17, and 18 of the '674 patent.

CMI states that Thomson only disputes that two limitations of independent claims 1 and 16 are missing from Casio – data lines in the second patterned conductive layer and a third patterned conductive layer of ITO. (Citing CX-4307C at Q. 136, 142; RX-393C at Q. 240-274, 285-313; RDX-429.) CMI contends that both of these arguments are without merit.

CMI argues that Casio discloses the claimed second conductive layer. (Citing RX-393C at Q. 255; RX-328.) CMI claims that if the conductive lines were not in the same patterned layer as the contact leads of the TFTs, additional electrical connections would need to be specified. (Citing RX-393C at Q. 257.) CMI asserts that Casio does not specify any such additional connections. CMI claims that if the data lines and the drain electrodes were in different layers, it would require a more complex device structure, possibly with additional contact holes that are not disclosed. (Citing RX-393C at Q. 258.)

CMI argues that Casio contains several different disclosures regarding the formation of a pixel electrode from a third patterned conductive layer. (Citing RX-328; RX-393C at Q. 266.) CMI states that Dr. Hatalis testified that one of ordinary skill in the art would read Casio as disclosing that ITO can be used to form the pixel electrodes if transparent structures are desired. (Citing RX-393C at Q. 266-268.) CMI asserts that Thomson is wrong to argue that Dr. Hatalis improperly relies on multiple embodiments disclosed in Casio. According to CMI, Casio's first three embodiments build on one another and share the same structures. (Citing Tr. at 1685:21-1687:21.) CMI states that Dr. Parsons does not dispute that Casio teaches the use of ITO for a pixel electrode, and even the suitability of ITO for a desired application, just like the '674 patent. (Citing CX-4307C at Q. 144; Tr. at 1685:3-15.)

CMI asserts that Casio anticipates dependent claim 9, which requires that the highly conductive metal is aluminum. (Citing RX-393C at Q. 274.) CMI states that the first embodiment of Casio teaches using an aluminum film to form transistor electrodes and metal lines. (Citing RX-393C at Q. 274; RX-328 at 8:6-8.) According to CMI, Casio discloses both the use of a highly conductive metal in the second patterned conductive layer (chromium "or the like"), as well as the use of an aluminum film in the first patterned conductive layer to form the gate line and gate electrodes. (Citing RX-393C at Q. 274.)

Thomson's Position: Thomson contends that Casio fails to anticipate any of the asserted claims in the '674 patent.

According to Thomson, Respondents primarily rely on the third embodiment of Casio to disclose most of the claim limitations, but they also pick disparate elements from the first embodiment to combine with the third embodiment. (Citing CX-4307C at Q. 126-132.) Thomson argues that mixing and matching embodiments in one reference is not permitted in an anticipation analysis.

Thomson argues that Casio does not disclose forming the "data line" in the same patterned conductive layer as the "drain electrode," "source electrode," and "first capacitor electrode." (Citing CX-4307C at Q. 135-139.) Thomson states that the three electrodes are disclosed in Casio as being formed from the same metal film, but there is no disclosure of forming the data lines using that same metal film. (Citing RX-328 at 18:31-34.)

Thomson argues that Casio does not disclose forming the third patterned conductive layer from a layer of ITO. (Citing CX-4307C at Q. 140-144.) Thomson states that Dr. Hatalis relies on the first embodiment of Casio to meet this limitation. Thomson asserts that the first embodiment describes a completely different structure from the third embodiment that Respondents rely on for the other claim limitations. (Citing CX-4307C at Q. 143-144.) Thomson argues that it is not proper for Dr. Hatalis to use the disclosure of ITO from the first embodiment with the different structure disclosed in the third embodiment.

Thomson states that claim 9 adds the further limitation that the highly conductive metal is aluminum. Thomson claims that Respondents rely on the first embodiment of Casio, which discloses forming aluminum as the reflective material at the bottom of the substrate. (Citing RX-328 at 8:6-8.) Thomson asserts that the '674 patent requires that the highly conductive metal be used in the second patterned conductive layer, not the first. Therefore, Thomson believes that the limitation of claim 9 is not disclosed in Casio. (Citing CX-4307C at Q. 146-148.)

Discussion and Conclusions: Based on the evidence in the record, I find that CMI has failed to offer clear and convincing evidence that Casio anticipates any of the asserted claims of the '674 patent.

The parties dispute whether or not Casio discloses the limitation of claims 1 and 16 requiring "a third patterned conductive layer over the second insulating layer; the third patterned conductive layer being a layer of indium tin oxide." To meet this limitation, Dr. Hatalis points to pixel electrodes, which are identified as item 213 in Figure 7 of Casio. (RX-393C at Q. 266.)

Figure 7 depicts the third embodiment disclosed in Casio. (RX-328 at 17:59-61.) The description of Figure 7 of Casio states that "[t]his pixel electrode 213 consists of a metal film for reflecting light, e.g., an Al alloy having a high reflectance. That is, the pixel electrode 213 also serves as a reflecting film, with its front surface (reflecting surface) being formed into an almost mirror surface." (RX-328 at 18:16-20.)

Nowhere in the description of Figure 7 is there a disclosure of the pixel electrode being formed from indium tin oxide. Dr. Hatalis instead relies on the disclosure from the first embodiment of Casio, which states that "[a] plurality of transparent pixel electrodes 13, each consisting of ITO or the like...are arranged on the inner surface..." (RX-328 at 7:23-26.) Dr. Hatalis also relies on the fact that Casio states that the second embodiment contains elements from the first embodiment, and that the third embodiment contains elements from the second embodiment:

> Since the remaining structures of the second embodiment are the same as those of the first embodiment, the same reference numerals in the second embodiment denote the same parts as in the first embodiment, and a description thereof will be omitted.

(RX-328 at 15:21-25.)

> Since the remaining structures of the third embodiment are the same as those of the second embodiment, the same reference numerals in the third embodiment denote the same parts as in the second embodiment, and a description thereof will be omitted.

(*Id.* at 18:1-6.)

I find that the fact that Casio states that some of the same elements found in the first and second embodiments may also be present in the third embodiment is irrelevant because it is clear that the pixel electrode from the first embodiment has changed in the third embodiment. The pixel electrodes in the first and third embodiments are not labeled with the same reference numerals, indicating that the pixel electrode from the first embodiment does not carry over to the third embodiment. While Casio states that the pixel electrode of the first embodiment may be made of indium tin oxide, the third embodiment states that the pixel electrode should be made from a metal film for reflecting light. Dr. Hatalis acknowledged the difference between indium tin oxide and a metal film for reflecting light when he testified:

> If one wanted to make a display in which the pixel electrode reflected light, one could use a reflective metal to form the top pixel electrodes. However, if one wanted to use the structures disclosed in the Casio reference to make an array in which the pixel electrodes were light transmissive, one could use ITO to form the pixel electrodes, as taught in column 7, lines 23-24.

(RX-393C at Q. 268.) Dr. Parsons also testified regarding the difference between indium tin oxide and the reflective metal disclosed in the third embodiment. (CX-4307C at Q. 142-144.)

The Federal Circuit has explained that for a prior art reference to be anticipatory, it "must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements 'arranged as in the claim.'" *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008) In *Net MoneyIN*, the Federal Circuit emphasized that a prior art reference needed to disclose all of the elements as "arranged in the claim." The court held that "it is not enough that the prior art reference...includes multiple, distinct teachings that the artisan might somehow combine to achieve the claimed invention." *Id.* at 1371.

Likewise, in *Litecubes, L.L.C. v. Northern Light Prods., Inc.*, the court rejected an anticipation argument where the defendant "attempt[ed] to pick and choose characteristics of the separate invention embodiments in the [prior art] reference and compare them to the individual claims." 2005 WL 2144574, at *4 (E.D. Mo. Aug. 2, 2005). The court held that because the prior art reference "does not disclose every element, *as they are arranged* in the [asserted] patent," the anticipation argument fails. *Id.*; *see also Advanced Cardiovascular Sys., Inc. v. SciMed Life Sys.*, 63 F. Supp. 2d 1064, 1073 (N.D. Cal. 1999) (stating that "anticipation cannot be proven by cobbling together disparate elements in a prior art reference.")

I find that the current situation is analogous to the above-described case law. It is clear that CMI attempts to make an anticipation argument by taking the device disclosed in the third embodiment of Casio and modifying it to include the pixel electrode made from indium tin oxide from the first embodiment. (RX-393C at Q. 266-268; CX-4307C at Q. 142-144.) Such mixing and matching of elements from different embodiments of the same prior art reference is not permissible in asserting anticipation. Based on the foregoing, I find that CMI failed to offer clear and convincing evidence that Casio anticipates any of the asserted claims of the '674 patent.

2. Obviousness

a. Claim 9

CMI's Position: CMI contends that claim 9 is rendered obvious by any one of the following combinations: Fujitsu in combination with the knowledge of one of ordinary skill in the art; Fujitsu in combination with U.S. Patent No. 5,621,556 ("the '556 patent"); or Fujitsu in combination with U.S. Patent No. 5,483,082 ("the '082 patent").

Claim 9 requires that the highly conductive metal is aluminum. CMI asserts that aluminum is a well-known metal commonly used for electrodes and conductive lines, particularly in TFTs. (Citing RX-393C at Q. 163.) CMI relies on the testimony of Dr. Hatalis to assert that it would have been within the knowledge of one of ordinary skill in the art to use aluminum as the highly conductive metal. (Citing RX-393C at Q. 163-166.)

CMI argues that the combination of Fujitsu and the '556 patent renders claim 9 obvious. (Citing RX-393C at Q. 169.) CMI states that the '556 patent is directed to TFT design for active matrix liquid crystal displays, and discloses using aluminum to form the second metal layer. (Citing RX-393C at Q. 169; JX-3 at 1:16-18, 3:43-48.)

CMI argues that the combination of Fujitsu and the '082 patent renders claim 9 obvious. (Citing RX-331; RX-393C at Q. 172.) CMI states that the '082 patent discloses using a metal film of aluminum to form a second patterned conductive layer. (Citing RX-331 at 2:51-63.) CMI states that one of ordinary skill in the art would have been motivated to replace the titanium used in Fujitsu with the aluminum used in the '082 patent due to availability, conductivity, manufacturability, and cost. (Citing RX-393C at Q. 166.)

According to CMI, Dr. Parsons offers only conclusory testimony to rebut the assertion that one of ordinary skill in the art would have a reason to combine Fujitsu with either the '556 patent or the '082 patent. (Citing CX-4307C at Q. 99.) CMI claims that Dr. Hatalis offered credible testimony regarding why there is a sufficient reason to combine any of the references with Fujitsu. (Citing RX-393C at Q. 166, 172.)

Thomson's Position: Thomson contends that none of the asserted combinations renders claim 9 obvious.

Thomson argues that because Fujitsu fails to anticipate claim 1, claim 9 is not rendered obvious in view of Fujitsu in combination with additional prior art. In addition, Thomson argues that it would not have been obvious to use aluminum as the highly conductive metal because the inventors used an innovative aluminum metallization process to form the top capacitor electrode in the same layer as the first and second contact leads, thereby eliminating a step in the manufacturing process. (Citing CX-4307C at Q. 88-94.) Thomson asserts that neither the '556 patent nor the '082 patent discloses using aluminum to form a single metal structure that serves as both the second contact lead and the second electrode. (Citing CX-4307C at Q. 98-101.)

Discussion and Conclusions: Based on the evidence in the record, I find that CMI has failed to offer clear and convincing evidence that claim 9 of the '674 patent is obvious in view of the prior art.

Claim 9 depends from claim 1 and adds the requirement that the highly conductive metal is aluminum. CMI relies on Fujitsu to disclose all of the limitations of claim 1. (CMIB at 109-113.) In Section IV.E.1.a *supra*, I have concluded that CMI failed to offer clear and convincing evidence that Fujitsu discloses all of the limitations of claim 1. Thus, it follows that CMI's obviousness argument with regard to claim 9 fails for the same reasons as described with respect to the anticipation analysis for Fujitsu.

b. Claim 11

CMI's Position: CMI contends that claim 11 is rendered obvious by the following prior art combinations: (1) Fujitsu and the knowledge of one of ordinary skill in the art; (2) Fujitsu and the '556 patent; (3) Fujitsu and U.S. Patent No. 5,153,754 ("the '754 patent"); (4) Casio and the knowledge of one of ordinary skill in the art; (5) Casio and the '556 patent; and (6) Casio and the '754 patent.

CMI argues that the limitation added by claim 11 was well known by one of ordinary skill in the art by 1995. (Citing RX-393C at Q. 174-176.) CMI claims that this assertion is supported by the testimony of Dr. Yao, one of the inventors on the '556 patent. (Citing JX-53C at 179:23-180:10.) CMI claims that Dr. Parsons offers no rebuttal to Dr. Hatalis' opinion on this issue. (Citing CX-4307C at Q. 111, 153.)

CMI claims that the '556 patent discloses the limitation of claim 11. (Citing RX-393C at Q. 177, 278.) CMI states that the '556 patent teaches the use of sublayers in the second patterned conductive layer made of titanium tungsten, a refractory metal. (Citing RX-393C at Q. 177, 278; JX-3 at 3:43-48.) CMI notes that the '556 and '674 patents disclose nearly identical structures, were both developed at Xerox PARC, and are both directed to TFT structures.

CMI claims that the '754 patent discloses the limitation of claim 11. (Citing RX-393C at Q. 181, 279; RX-335.) CMI states that the '754 patent discloses a TFT structure using multiple metal layers for the second patterned conductive layer. (Citing RX-393C at Q. 181.) CMI asserts that there are many reasons why one would use a multilayer approach in the second patterned conductive layer, and the '754 patent suggested and taught a solution that was within the technical grasp of one of ordinary skill in the art. (Citing RX-393C at Q. 174-176.) CMI argues that Dr. Parsons' testimony regarding why one of ordinary skill in the art would not combine Fujitsu or Casio with the '556 patent or '754 patent is conclusory and reflects a misunderstanding of the law of obviousness. (Citing CX-4307C at Q. 115.)

Thomson's Position: Thomson contends that claim 11 is not obvious in view of the prior art combinations asserted by CMI.

Thomson argues that because claim 1 is not anticipated by Fujitsu or Casio, claim 11 is not rendered obvious. Thomson argues that it would not have been obvious to one of ordinary skill in the art to use a refractory metal to protect aluminum or other highly conductive metals when forming the second contact lead connected to the second electrode in the second patterned conductive layer. (Citing CX-4307C at Q. 111-113, 152-155.) Thomson asserts that neither the '556 patent nor the '754 patent disclose the required element of using a refractory metal to form a single metal structure that serves as both the second contact lead and the second electrode. (Citing CX-4307C at Q. 114-117, 156-159.)

Discussion and Conclusions: Based on the evidence in the record, I find that CMI has failed to offer clear and convincing evidence that claim 11 of the '674 patent is obvious in view of the prior art.

Claim 11 depends from claim 1 and states that "the second patterned conductive layer includes first and second sublayers; the first sublayer including highly conductive metal; the second sublayer including a refractory metal different than the highly conductive metal." CMI relies on Fujitsu or Casio to disclose all of the limitations of claim 1. (CMIB at 113-118.) In Section IV.E.1.a-b *supra*, I have concluded that CMI failed to offer clear and convincing evidence that Fujitsu or Casio discloses all of the limitations of claim 1. Thus, it follows that CMI's obviousness argument with regard to claim 11 fails for the same reasons as described with respect to the anticipation analysis for Fujitsu and Casio.

c. **Claim 13**

CMI's Position: CMI contends that either Fujitsu or Casio in combination with one of the following renders claim 13 obvious: (1) the knowledge of one of ordinary skill in the art; (2) the '556 patent; (3) an article entitled "A New Digital Detector for Projection Radiography" ("the Lee reference"); or (4) '082 patent.

CMI argues that a tapered via hole was a well-known technique in the art for decades. (Citing RX-393C at Q. 183, 281.) CMI states that Dr. Hatalis explained that it would have been more difficult to form such an opening without a tapered profile, because a tapered profile is a natural result from wet or certain plasma etching processes that are used to create the opening. (Citing RX-393C at Q. 183, 281.) CMI points to the testimony of Dr. Yao, an inventor on the '556 patent, who stated that a tapered via hole was "a fact of life" of the etching process. (Citing JX-53C at 181:23-182:24.) CMI therefore asserts that claim 13 would have been obvious based on the combination of either Fujitsu or Casio and the knowledge of one of ordinary skill in the art.

CMI argues that claim 13 is rendered obvious by the combination of Fujitsu or Casio and the '556 patent. (Citing RX-393C at Q. 184, 282.) CMI states that the '556 patent teaches forming a tapered via hole to connect the pixel electrode to the second patterned conductive layer, which offered a more stable structure resistant to breakage. (*Id.*)

CMI argues that claim 13 is rendered obvious by the combination of Fujitsu or Casio and the Lee reference. (Citing RX-393C at Q. 185, 283.) CMI states that the Lee reference is directed to active-matrix TFT-LCD design. (*Id.*) According to CMI, the Lee reference discloses using a tapered edge when forming the via that connects the mushroom pixel electrode to the second patterned conductive layer. (*Id.*)

CMI argues that claim 13 is rendered obvious by the combination of Fujitsu or Casio and the '082 patent. (Citing RX-393C at Q. 186, 284.) CMI states that the '082 patent includes the same inventor who authored Fujitsu. (Citing RX-331.) CMI claims that if one were concerned about the via structure in Fujitsu or Casio, seeking another disclosure by the same author would be a natural next step. CMI asserts that the '082 patent is directed to active-matrix TFT-LCD design. (Citing RX-393C at Q. 186, 284.)

Thomson's Position: Thomson contends that CMI has failed to demonstrate that claim 13 is rendered obvious by any of the asserted combinations of prior art.

Thomson states that claim 13 depends from claim 1. According to Thomson, both Fujitsu and Casio lack elements from claim 1. Thomson asserts that none of the combinations of prior art meet all of the limitations of claim 1. Therefore, Thomson argues that CMI failed to prove that claim 13 is obvious.

Discussion and Conclusions: Based on the evidence in the record, I find that CMI has failed to offer clear and convincing evidence that claim 13 of the '674 patent is obvious in view of the prior art.

Claim 13 depends from claim 1 and states that "the second insulating layer has an edge around the opening defined therein; the edge having a tapered profile." CMI relies on Fujitsu alone, or Casio alone, to disclose all of the limitations of claim 1. (CMIB at 118-121.) In Section IV.E.1.a-b *supra*, I have concluded that CMI failed to offer clear and convincing evidence that either Fujitsu or Casio discloses all of the limitations of claim 1. Thus, it follows that CMI's obviousness argument with regard to claim 13 fails for the same reasons as described with respect to the anticipation analysis for Fujitsu and Casio.

d. The '556 Patent

CMI's Position: CMI contends that claims 1, 7, 8, 9, 11, 13, 14, 16, 17, and 18 of the '674 patent are obvious in view of the '556 patent.

CMI states that the parties agree that there is only one structure from the '674 patent, a capacitive element, that is not also disclosed in the '556 patent. (Citing CX-4307C at Q. 168-171.) CMI states that because Thomson only disputes that the '556 patent discloses a capacitive element, it is undisputed that the '556 patent discloses all of the other limitations of claims 1, 7, 8, 9, 11, 13, 14, 16, 17, and 18 of the '674 patent. (Citing RX-393C at Q. 339-375.)

CMI claims that it would be possible to make a slight modification to the structure disclosed in the '556 patent to result in the claimed structure of the '674 patent. Specifically, CMI claims that adding an extra electrode in the first patterned conductive layer using the first masking step would result in the claimed structure of the '674 patent. (Citing RX-393C at Q. 319.) CMI asserts that if one of ordinary skill in the art sought to use the disclosure of the '556 patent to design a functioning TFT-LCD product, one would have had a reason to add a storage capacitor. (Citing CX-4244C at Q. 57, 168; RX-393C at Q. 18, 334.) According to CMI, forming a storage capacitor using metal in the first patterned conductive layer was well known and practiced in the art. (Citing RX-393C at Q. 345.)

Thomson's Position: Thomson contends that CMI failed to demonstrate that any of the asserted claims of the '674 patent are rendered obvious in view of the '556 patent.

Thomson asserts that adding a metal structure underneath the pixel via is not a simple or obvious way to make a supplemental capacitor structure. (Citing CX-4307C at Q. 168-195.) Thomson claims that it would not be obvious to integrate a capacitor with the other elements of the '556 patent's array circuitry. (*Id.*) Thomson avers that adding a metal structure so close to the gate electrode would cause problems with short circuits because of the difficulties of etching such small gaps in the metal layer. (*Id.*) Further, Thomson claims that the '556 patent teaches away from providing a storage capacitor underneath the pixel via because it discloses a supplemental capacitor in the form of a metal electrode over the gate electrode. (Citing CX-4307C at Q. 172-182.)

Discussion and Conclusions: Based on the evidence in the record, I find that CMI has failed to offer clear and convincing evidence that any of the asserted claims of the '674 patent are obvious in view of the '556 patent.

The parties agree that the '556 patent lacks the "capacitive element" required by independent claims 1 and 16. (RX-393C at Q. 333-334; CX-4307C at Q. 168.) Dr. Hatalis offers the opinion that the device disclosed in the '556 patent could be modified to include the "capacitive element" required by the asserted claims of the '556 patent:

> [T]he difference between the '556 reference and the '674 patent is that the '556 reference does not disclose a second metal structure in the first patterned conductive layer that would form the bottom electrode of the storage capacitor structure described in the '674 patent. Therefore, my opinion...is that it would have been obvious to one of ordinary skill in the art that one could make such a modification to the disclosure of the '556 reference to create a storage capacitor.

(RX-393C at Q. 334.) CMI argues that the knowledge to make the modification was possessed by one of ordinary skill in the art, or it could have come from Fujitsu, Casio, or the Lee reference. (CMIB at 124.)

Dr. Hatalis explained that his proposed modification would add an additional metal electrode in the first patterned conductive layer to form the "capacitive element." (RX-393C at Q. 344-345.) Dr. Hatalis believes that one of ordinary skill in the art would have been motivated to make this modification because it would have been the "simplest, most logical way" to use the process described in the '556 patent to create a TFT-LCD product. (*Id.* at Q. 348.)

Dr. Parsons opined that the modification proposed by Dr. Hatalis would not be a simple and obvious way to add a storage capacitor to the structure disclosed in the '556 patent. Specifically, Dr. Parsons explains:

> Simply adding a metal structure underneath the pixel via is not a simple and obvious way to make a storage capacitor. In order for the storage capacitor to function, the additional metal must contact a common line. Dr. Hatalis' modification does not show a common line to be used and it is not obvious how such a common line would be integrated with the other elements of the array circuitry. In addition, Dr. Hatalis' modification places the additional "small metal structure" close to the gate electrode, which may cause problems with short circuits because it is difficult to etch such small gaps in the metal layer.

(CX-4307C at Q. 171.) Dr. Hatalis' testimony does not address the problems with the proposed modification of the '556 patent raised by Dr. Parsons. (RX-393C at Q. 344-348.)

I find that CMI has failed to meet its burden to demonstrate obviousness based on the '556 patent. Dr. Hatalis' testimony contains little more than conclusory allegations of obviousness and fails to identify any supporting evidence for his opinions regarding the knowledge of one skilled in the art. (*See* RX-393C at Q. 344-348.) Dr. Hatalis testifies that the structure of the device disclosed in the '556 patent could be modified, and that such a modification would be known to one of ordinary skill in the art. (*Id.*) CMI offers no evidence beyond Dr. Hatalis' conclusory opinion that such a modification would be successful, or that one of ordinary skill in the art would possess the knowledge to make such a modification. In view of Dr. Parsons' testimony that the proposed modification would not be as easy and straightforward as Dr. Hatalis claims it would be, I find that CMI has failed to meet its burden on obviousness. *PharmaStem*, 491 F.3d at 1360 ("the burden falls on the patent challenger to show by clear and convincing evidence that a person of ordinary skill in the art would have had reason to attempt to make the composition or device, . . . and would have had a reasonable expectation of success in doing so.")

e. The Lee Reference

CMI's Position: CMI contends that the Lee reference renders asserted claims 1, 7, 8, 9, 11, 13, 14, 16, 17, and 18 obvious.

CMI notes that the Lee reference was cited during the prosecution of the '674 patent. (Citing JX-7.) CMI states that the Examiner rejected claims based on the Lee reference, and the applicants amended the claims in light of the rejection. Specifically, CMI asserts that the claims were amended to require a second patterned conductive layer that "comprises highly conductive metal other than indium tin oxide" and "the third patterned conductive layer being a layer of indium tin oxide." (Citing JX-7 at 159.) CMI states that besides the "second patterned conductive layer" and "third patterned conductive layer" limitations, there is no dispute that the Lee references discloses all of the other limitations of claims 1, 7, 8, 14, 16, 17, and 18 of the '674 patent. (Citing RX-393C at Q. 388-436.)

CMI argues that Figure 4 of the Lee reference discloses the second patterned conductive layer of the '674 patent. (Citing RX-393C at Q. 398.) CMI states that the drain lines, source metal, and drain metal in the Lee reference are all formed in the same layer, over the first insulating layer and below the second insulating layer. (*Id.*) CMI claims that the top electrode is formed in a sublayer of the second patterned conductive layer. (*Id.*) According to CMI, the '674 patent expressly allows for a layer that may include two or more layers within it, referred to as sublayers. (Citing JX-2 at 4:41-43, 15:38-42.)

CMI argues that it would have been obvious to one of ordinary skill in the art to use ITO as the material forming the "mushroom electrode" in the Lee reference. (Citing RX-393C at Q. 403.) CMI claims that ITO was a well-known metal for blocking charges from received rays, which is necessary for X-ray sensor arrays like those disclosed in the '674 patent and the Lee reference. (*Id.*)

CMI states that while the Lee reference does not disclose the metal used to form the "mushroom electrode," it does disclose that the metal needs to block charges from injecting into the x-ray material above the array. (Citing RX-330 at 6.) According to CMI, the '674 patent also provides that the choice of material for the conductive element may depend on its charge-blocking function. (Citing JX-2 at 2:62-63.) CMI argues that this demonstrates that ITO is consistent with the use disclosed in the Lee reference.

CMI further claims that combining the Lee reference with other references disclosing ITO as the conductive element would render the limitation obvious. (Citing RX-393C at Q. 403.) Specifically, CMI identifies the '556 patent and the '880 patent as prior art references that disclose the use of ITO. (Citing RX-393C at Q. 403-404; JX-3; RX-334.)

Thomson's Position: Thomson contends that CMI failed to demonstrate that any of the asserted claims of the '674 patent are rendered obvious in view of the Lee reference.

Thomson states that the Lee reference was cited during the prosecution of the '674 patent, reviewed by the Examiner, and even served as the basis for an Office Action. (Citing CX-4307C at Q. 207; CDX-1498; JX-7 at THOM00003701.) Thus, Thomson argues that CMI faces an enhanced burden to prove that the '674 patent is obvious in view of the Lee reference.

Thomson argues that the Lee reference fails to disclose the following limitation: "a second patterned conductive layer that comprises highly conductive metal other than indium tin oxide." (Citing CX-4307C at Q. 213-217.) Thomson asserts that the Lee reference does not disclose the material used to form the "top electrode," which is what CMI refers to as the second electrode of the asserted claims. (*Id.*) Thomson states that CMI relies on the Lee reference's disclosure that the device can be used "to capture an image at 1280 x 1536 resolution;" but Thomson argues that a person of ordinary skill in the art would not infer that this requires highly conductive metal. (Citing CX-4307C at Q. 214-217.)

Thomson next argues that the Lee reference does not disclose the source metal and drain metal being formed in the same layer as the top electrode, nor does it disclose the drain metal connected to the top electrode in the same metal layer. (Citing RX-330 at Fig. 4; CX-4307C at Q. 218-225.) Thomson states that the Lee reference also does not disclose the "N conductive lines" being formed in the same layer as the drain metal and the top electrode. (*Id.*) Thomson claims that the use of the word "tied" in the Lee reference suggests an interface between two separate layers. (*Id.*)

Thomson asserts that CMI admits that the Lee reference fails to disclose the material used to form the "mushroom electrode," which is the structure that CMI believes is the "third patterned conductive layer" of the '674 patent. Thomson notes that the claims require the "third patterned conductive layer" to be made from ITO. Thomson states that CMI attempts to supply the missing ITO through combination with the '556 patent and the '880 patent, but those references does not supply the other elements that the Lee reference fails to disclose. (Citing CX-4307C at Q. 226-229.)

Thomson notes that claim 9 of the '674 patent requires that the highly conductive metal in the second patterned conductive layer be aluminum. Thomson states that CMI's proposed combinations using the Lee reference to meet this requirement fail because none of the references disclose the "second patterned conductive layer" and "third patterned conductive layer" requirements. Further, Thomson argues that it would not have been obvious for one of ordinary skill in the art to use aluminum as claimed in the '674 patent. (Citing CX-4307C at Q. 88-94, 98-99.)

Discussion and Conclusions: Based on the evidence in the record, I find that CMI has failed to offer clear and convincing evidence that any of the asserted claims of the '674 patent are obvious in view of the Lee reference.

The Lee reference was cited during the prosecution of the '674 patent, meaning that CMI's burden to prove invalidity based on the Lee reference is "especially difficult." *Hewlett-Packard Co.*, 909 F.2d at 1467. In particular, the Examiner rejected the proposed claims as anticipated or obvious in view of the Lee reference. (JX-7 at THOM00003700-03.) In response to the rejection, the applicants amended the claims to add the requirements that second patterned conductive layer be formed from a highly conductive metal "other than indium tin oxide" and that the third patterned conductive layer is "a layer of indium tin oxide." (*Id.* at THOM0003723.) In making the amendments, the applicants explained that the Lee reference "does not teach or suggest an ITO conductive element contacting an exposed part of a highly conductive non-ITO electrode as claimed." (*Id.* at THOM0003716.) The applicants noted that they found no disclosure regarding the materials used in the Lee reference. (*Id.*) After the amendment, the Examiner allowed the claims. (*Id.* at THOM00003734.)

I find that CMI failed to demonstrate that the Lee reference either discloses or renders obvious the following claim limitation: "a second patterned conductive layer that comprises highly conductive metal other than indium tin oxide." Dr. Hatalis essentially ignores the full text of this claim limitation, as he only offers the opinion that the alleged second patterned conductive layer of the Lee reference is a layer of highly conductive metal. (RX-393C at Q. 400.) Dr. Hatalis says nothing about the fact that the claim requires a "highly conductive metal other than indium tin oxide." (*Id.*) I find nothing in the Lee reference that provides an indication that the alleged second patterned conductive layer is made from a highly conductive metal ***other than indium tin oxide***, and CMI fails to present a coherent argument regarding why this claim limitation is found in the Lee reference. (RX-330; CX-4307C at Q. 213, 217; CMIB at 130-131.)

Further, I find that CMI failed to demonstrate by clear and convincing evidence that the alleged second patterned conductive layer in the Lee reference is made from a highly conductive metal, regardless of the requirement concerning indium tin oxide. CMI relies on the opinion of Dr. Hatalis for this claim element. (CMIB at 131.) Dr. Hatalis states that "[s]ince Lee discloses an embodiment from an actual working X-ray device, the drain and source metals, or first and second contact leads, must be formed of a highly conductive metal to perform their functions." (RX-393C at Q. 392.) In addition, Dr. Hatalis points to Figure 6 of the Lee reference, which shows an x-ray image with a resolution of 1,280 x 1,536 that was captured with the device disclosed in the Lee reference. (RX-393C at Q. 392, 400; RX-330 at Fig. 6.) Dr. Hatalis opines that "[a]s Fig. 6 shows, the embodiment disclosed in the Lee reference was able to capture an image at 1,280 x 1,536 resolution, meaning that the embodiment must have comprised working TFT structures with source and drain metals of a 'highly conductive metal' as defined in the '674 patent." (RX-393C at Q. 392.)

I construed "highly conductive metal" to mean "a metal that is sufficiently conductive that signals can traverse the layer, line, or component within the switching period of related switching elements and without significant delay due to capacitance; aluminum, certain alloys of aluminum, and certain other metals are highly conductive metals in nearly all contexts, while less conductive metals may be highly conductive at lower switching speeds." I find Dr. Hatalis' testimony to be conclusory and incomplete. He fails to explain why the fact that the Lee reference discloses a working x-ray device, or the fact that the x-ray device can capture an image with a resolution of 1,280 x 1,536 necessarily leads to the conclusion that the "highly conductive metal" limitation is satisfied. (RX-393C at Q. 392, 400.) Such conclusory testimony is not sufficient to meet the clear and convincing standard required to find a patent invalid.

Furthermore, Dr. Parsons offers testimony that the aspects of the Lee reference relied upon by Dr. Hatalis do not necessarily lead to the conclusion that the metal at issue is a "highly conductive metal" because there is no indication that the x-ray image is collected quickly. (CX-4307C at Q. 217.) As Dr. Parsons explains, "the high conductivity is needed in the gate and data lines to achieve high speed image collection or display." (*Id.*) This is consistent with the adopted construction of "highly conductive metal," which is concerned with transmission speed of signals.

Based on the foregoing, I find that CMI failed to demonstrate that any of the asserted claims of the '674 patent are obvious in view of the Lee reference.

f. Secondary Considerations

Thomson's Position: Thomson contends that evidence of secondary considerations supports a finding of non-obviousness. Thomson cites Respondents' alleged infringement and Thomson's purchase of the '674 patent from Xerox PARC as evidence of commercial success. Thomson further points to the fact that the '674 patent is cited on the face of at least 41 issued U.S. patents. (Citing CX-4307C at Q. 236.) Finally, Thomson asserts that the innovative structure of the '674 patent solved a long-felt need in the art. (*Id.*)

CMI's Position: CMI contends that Thomson offers conclusory testimony regarding secondary considerations that is insufficient to overcome CMI's showing of obviousness.

CMI asserts that Thomson is incorrect to state that the '674 patent has been included in at least 83 revenue-generating licenses. According to CMI, Thomson only claims that 72 of its portfolio licenses include any rights to the '67' patent, and only 25 licenses were executed after the '674 patent was acquired from Xerox PARC. (Citing RX-626C at Q. 106-108.) Of those 25 licenses, Thomson states that all except 4 provide that the license is contingent upon the licensee practicing the patent. (Citing RX-626C at Q. 109-110.) CMI argues that Thomson has not offered any evidence that the licensees are practicing the '674 patent, or that any licensees have specifically sought a license to the '674 patent itself.

CMI argues that Thomson cannot use the alleged commercial success of Respondents' products because Respondents are not infringing the '674 patent. Even if Respondents' products infringed, CMI claims that Thomson has not shown that any commercial success is due to the patented features.

CMI asserts that the fact that the '674 patent is cited on the face of at least 41 issued U.S. patents is irrelevant to the non-obviousness of the '674 patent. CMI claims that the fact that the '674 patent is cited on other patents does not demonstrate praise by others.

Finally, CMI argues that Dr. Parsons' testimony regarding long-felt need is wholly conclusory. CMI claims that several prior art references already taught the alleged advantages shown in the '674 patent. (Citing RX-393C at Q. 443.)

Discussion and Conclusions: Because I have already concluded that CMI failed to demonstrate a *prima facie* case of obviousness, it is unnecessary to address secondary considerations.

Assuming *arguendo* that CMI put forth a *prima facie* case of obviousness, I find that Thomson has failed to offer sufficient evidence of secondary considerations to overcome the obviousness showing.

Thomson argues that Respondents' infringement of the '674 patent is evidence of commercial success. (CIB at 150; CRB at 77.) Thomson fails to introduce any evidence supporting this alleged commercial success, such as evidence demonstrating the amount of products sold or the revenue generated by Respondents. (*Id.*) An unsupported assertion that Respondents' products are commercially successful will not suffice.

Thomson argues that its purchase of the '674 patent from Xerox PARC is evidence of commercial success. (CIB at 150-151.) Thomson devotes a single sentence to this argument, and fails to explain why the purchase of the '674 patent should serve as evidence of commercial success. I do not find that Thomson's purchase of the patent constitutes evidence of commercial success.

Thomson asserts that the '674 patent has been cited on the face of at least 41 issued U.S. patents. For the reasons described in Section IV.D.3 *supra*, I do not find that this fact supports a finding of non-obviousness.

Finally, Thomson asserts that the innovative structure of the '674 patent solved a long-felt need in the art. To support this claim, Thomson cites to the testimony of Dr. Parsons. (CMIB at 151.) Dr. Parsons goes into no detail regarding this issue, merely asserting without explanation that the innovative structure of the '674 patent solved a long-felt need in the art. (CX-4307C at Q. 236.) Dr. Parsons does not even describe the long-felt need that was satisfied by the '674 patent. (*Id.*) Such conclusory testimony is insufficient to support a finding of non-obviousness.[31]

F. The '941 Patent[32]

1. Anticipation

a. Baba

MStar's Position: MStar contends that Japanese Patent Application Publication No. H2-70186 ("Baba") anticipates asserted claims 1 and 4.

MStar states that Thomson disputes whether or not Baba meets the claim limitation that the ft/za ratio for the apparatus be reduced from that for a display of the same signal on a CRT. MStar states that the dispute with respect to the ft/za limitation boils down to whether za for a CRT (for use in the comparison with the Baba apparatus) should be 100 (i.e. the number of lines in a field) or 200 (i.e. the number of lines in two fields). (Citing Tr. at 1764:7-1765:14.) MStar argues that the za should be 100 because every 100 lines of the of the input video signal lead to 100 lines being scanned onto the display, while in the Baba matrix, the same 100 lines lead to 200 lines being lit up on the display. (Citing Tr. at 1761:21-1762:10.)

MStar argues that Thomson's position that the za should be 200 is incorrect. According to MStar, Mr. Ferraro's testimony actually supports MStar's position. (Citing Tr. at 1767:8-10, 1767:23-1776:6; RX-646.) Further, MStar claims that a book authored by Mr. Ferraro supports MStar's position. (Citing Tr. at 1769:4-8.) MStar asserts that Thomson applies the ft/za

[31] In its reply brief, Thomson raises an argument regarding the licensees' alleged use of the '674 patent. (CRB at 77.) Because this argument was not raised in Thomson's initial brief, it has been waived pursuant to Ground Rule 11.1.

[32] MStar objects to my ruling at the hearing excluding evidence related to the ViewFrame II+2. (MIB at 77-83.) For the reasons stated at the hearing, I reaffirm my ruling with regard to the ViewFrame II+2. (Tr. at 31:23-34:1.)

limitation one way for invalidity, and another way for infringement. Either way, MStar claims that Baba discloses the ft/za limitation.

MStar states that Thomson also disputes that Baba satisfies the claim limitation of the number of active lines of pixels displayed in the Baba apparatus is greater than the number of lines of pixels in the input video signal to be displayed. (Citing CX-4308C at Q. 207-210.) MStar argues that during any given interval, the Baba apparatus displays twice the number of active lines as it receives in the input video signal for that interval. Thus, MStar asserts that the Baba apparatus meets the claim requirement of a number of control lines in the matrix display greater than the number of lines of pixels in the input video signal. (Citing RX-160 at Q. 188; RX-168.) MStar states that Thomson's expert conceded that line doubling meets this claim limitation. (Citing Tr. at 1760:14-25.)

Thomson's Position: Thomson contends that Baba fails to anticipate any of the asserted claims of the '941 patent.

Thomson argues that Baba does not disclose "the number of control lines of the matrix display being greater than the number of lines of the video signal to be displayed." Thomson asserts that in Baba, the number of lines displayed on the matrix display is the same as the number of lines of the input video signal to be displayed. (Citing CX-4308C at Q. 208.) Thomson argues that this is due to the fact that the '941 patent dictates that the number of lines associated with an interlaced video signal is the number of lines in a frame, and not a field. (Citing CX-4308C at Q. 24.) Thomson asserts that this is supported by Mr. Ferraro's book. (Citing RX-646 at 54.)

Thomson argues that Baba fails to disclose the element "so that a ratio ft/za is reduced from the ratio required for a cathode ray tube." Thomson asserts that two of the three experts who have opined on Baba agree that in Baba the ratio ft/za is increased, not decreased. (Citing CX-4313C at 211:20-212:11.) Thomson states that this is because under either party's construction, za remains the same. (Citing CX-4308C at Q. 202.) Thomson states that while za stays the same, ft is increased: Baba discloses an input ft of 6.72 MHz and an output ft of 10.06 MHz. (Citing CX-4308C at Q. 197.)

Discussion and Conclusions: Based on the evidence in the record, I find that MStar has failed to offer clear and convincing evidence that Baba anticipates any of the asserted claims of the '941 patent.

Baba discloses a method and apparatus for converting an interlaced signal into a progressive signal to be displayed on a matrix display. (RX-168; CX-4308C at Q. 190; RX-160 at Q. 168.) The parties dispute whether or not Baba discloses the ft/za limitation of claims 1 and 4. In claim 1, the ft/za limitation recites:

> so that a ratio ft/za is reduced from the ratio required for a cathode ray tube, where ft is a clock frequency for signal processing and for controlling the display, and za represents the number of lines to be displayed.

Similarly, claim 4 recites:

> such that a ratio ft/za is reduced from the ratio required for a cathode ray tube, where ft is a clock frequency for signal processing and for controlling the display, and za represents the number of lines to be displayed.

The parties and their experts agree on the ft values for both ratios. Specifically, the parties agree that the input clock rate is 6.72 MHz and the output clock rate is 10.06 MHz. (RX-160 at Q. 190; CX-4308C at Q. 197.)

The parties disagree on the za value for the ft/za ratio "required for a cathode ray tube." The experts both note that Baba does not disclose a vertical resolution, so Thomson's expert Mr. Ferraro assumes a standard 320x200 resolution interlaced input video signal, while Respondents' expert Dr. Drabik assumes an input signal having X lines, and the Baba apparatus displaying 2X lines on the matrix display. (CX-4308C at Q. ; RX-160 at Q. 190.) Dr. Drabik states that the ft/za ratio required for the cathode ray tube is 6.72 MHz/X, and that the ft/za ratio for the Baba matrix display is 10.06 MHz/2X. (RX-160 at Q. 190.) This results in a ratio comparison of 6.72 to 5.03, and would satisfy the ft/za requirement in the claims. (*Id.*) On the other hand, Mr. Ferraro testified that the ft/za ratio required for the cathode ray tube is 6.72 MHz/200, and that the ft/za ratio for the Baba matrix display is 10.06 MHz/200. (CX-4308C at Q. 197.) This results in a situation where the ft/za ratio goes up, and not down, as the claim requires. (*Id.*)

I find Thomson's position to be more persuasive. The za value is defined by the claims as "the number of lines to be displayed." Under Baba, the number of lines to be displayed would be the same for the CRT or the matrix display. (CX-4308C at Q. 197-204.)

Baba discloses the use of an interlaced analog video signal. (RX-168; RX-160 at Q. 169.) A video signal can be interlaced or progressive. The two techniques can be explained as follows:

> Interlacing is a technique for transmitting video signals that is still widely used with many CRT-based televisions. Interlacing reduces the data transfer rate of a video signal by splitting up each frame, or image, to be displayed into two fields. Each field contains half the lines of the full frame: one field contains the odd lines, while the next contains the even ones. The cathode ray gun first paints the odd field on the phosphor on the inside of the screen, and then – before the image can fade – paints the even field. A non-interlaced video signal is known as a progressive video signal. In a progressive video signal, all the lines of an input frame are provided in a single frame.

(CX-4308C at Q. 24; *see also* RX-160 at Q. 42-44.)

The parties both rely on a book entitled "Programmer's Guide to the EGA and VGA Cards," which was authored by Mr. Ferraro, for an understanding of interlaced signals. (RX-646.) The book explains that "[i]n an interlaced display, alternative scan lines are updated every frame. In a noninterlaced display, every scan line is updated every frame." (RX-646 at MS0209638.) The book provides the following description of interlaced signals:

> In the interlaced mode, as the frame at *time* = *t* is displayed, only the even scan lines are updated. **The odd scan lines still contain the data from the frame that was displayed at *time* = *t* – *1*...**Similarly, as the frame at *time* = *t* + *1* is displayed, only the odd scan lines are updated. **The even scan lines still contain the data from the frame that was displayed at time *t*.**

(*Id.*) (emphasis added).

Even though only half of the lines in an interlaced display are updated during a specific time period, the "number of lines to be displayed" include both the odd and even lines, as the set of lines that is not updated during the specified period is still displayed. (CX-4308C at Q. 197-204; RX-646 at MS0209638.) Therefore, I find that the proper za value for the ratio required for a cathode ray tube in Baba is 200 or "2X." Using that za value, Baba fails to disclose the ft/za limitations of claims 1 and 4. (CX-4308C at Q. 197.)

b. Tachiuchi

MStar's Position: MStar contends that an article entitled "A Color LCD Controller" ("Tachiuchi") anticipates asserted claims 1 and 4.

MStar states that Thomson argues that Tachiuchi fails to disclose "the number of control lines of the matrix display being greater than the number of lines of the video signal to be displayed." (Citing CX-4308C at Q. 237-238.) MStar asserts that in making this argument, Thomson reads out the word "control" from the claim language. (Citing CX-4308C at Q. 238.) MStar claims that because the language "the number of control lines of the matrix display" should be construed to refer to each of the independently-controllable lines for subpixels, Tachiuchi discloses the claim limitation. (Citing RX-160 at Q. 246-251, 255, 257.)

Thomson's Position: Thomson contends that Tachiuchi does not anticipate any of the asserted claims of the '941 patent.

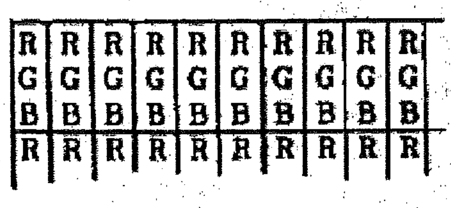
Thomson asserts that Tachiuchi fails to disclose the "second rate" limitations of claims 1 and 4. Thomson argues that the second rate in Tachiuchi is the same as the first rate, and is not determined by the factors required in claims 1 and 4. (Citing CX-4308C at Q. 232.)

Thomson asserts that Tachiuchi also does not disclose "the number of control lines of the matrix display being greater than the number of lines of the video signal to be displayed so that a ratio ft/za is reduced from the ratio required for cathode ray tube." Thomson claims that Tachiuchi discloses an interlaced input video signal and discarding the lines from one field, so it does not result in upscaling for the same reasons as discussed with respect to Baba. (Citing CX-4308C at Q. 236.) Thomson further claims that the horizontal stripe layout does not result in upscaling because the red, green, and blue elements together constitute a single pixel, and the combination of those pixels forms a control line. (Citing CX-4308C at Q. 237.) According to Thomson, a color LCD utilizing the Tachiuchi invention would display the same number of lines as a CRT displaying the same input video signal. (Citing CX-4308C at Q. 241.)

Discussion and Conclusions: Based on the evidence in the record, I find that MStar failed to offer clear and convincing evidence that Tachiuchi anticipates any of the asserted claims of the '941 patent.

Tachiuchi is a 1987 technical journal article that discloses "a color LCD controller which is compatible with CRT based softwares [*sic*], and also an interface that is suitable for color LCD." (RX-204 at 359.) The parties dispute whether or not Tachiuchi discloses the requirement from claims 1 and 4 that "the number of control lines of the matrix display being greater than the number of lines of the video signal to be displayed."

Dr. Drabik opines that this limitation is met because there is three times the number of lines of physical pixels on the display as there are in the input video signal containing active portions. (RX-160 at Q. 255.) Dr. Drabik makes clear that "[t]he physical pixels correspond to color subpixels." (*Id.*) Specifically, Dr. Drabik points to the disclosure in Tachiuchi where the color LCD display has a horizontal stripe layout. (*Id.* at Q. 248.) That layout is shown below, with "R" standing for red, "G" standing for green, and "B" standing for blue:



(b) Horizontal stripe layout

(RX-204 at 362.) Dr. Drabik treats each color subpixel line as a separate line to reach the result that the LCD display has three times the amount of lines than the number of lines of the video signal to be displayed. (RX-160 at Q. 246-248, 255.)

Mr. Ferraro offers a contrary opinion, stating that "[t]he red, green, and blue elements together constitute a single pixel, and the combination of such pixels forms a control line, whether the pixels are in the same line or different sub-lines." (CX-4308C at Q. 237.) Mr. Ferraro opines that the number of lines of pixels on the matrix display is the same as the number of lines in the input video signal. (*Id.* at Q. 238.) Mr. Ferraro notes that "Dr. Drabik is saying, in effect, that this element is met without any upscaling, simply by displaying an input video signal on a color LCD with the same resolution." (*Id.*; *see also id.* at Q. 241.)

I find that MStar has failed to produce clear and convincing evidence that Tachiuchi discloses the claim limitation "the number of control lines of the matrix display being greater than the number of lines of the video signal to be displayed." I construed "the number of control lines of the matrix display" to mean "the number of lines in the input video signal containing picture information." MStar bases its argument on the position that each line of the red, green, and blue subpixels in Tachiuchi should count as a separate line, meaning that there are three times the amount of control lines of the matrix display. I do not concur. Based on Mr. Ferraro's testimony, I find that each grouping of red, blue, and green subpixels constitutes a control line of the matrix display, meaning that above-quoted claim limitation is not satisfied. (CX-4308C at Q. 237.) Moreover, Mr. Ferraro correctly observes that accepting Dr. Drabik's position would allow the claim limitation in question to be satisfied without any upscaling, a position that appears contrary to the claims of the '941 patent. (*Id.* at Q. 241.)

Based on the foregoing, I find that MStar has failed to offer clear and convincing evidence that claims 1 or 4 are anticipated by Tachiuchi.

c. Hara

MStar's Position: MStar contends that U.S. Patent No. 5,103,309 ("Hara") anticipates the asserted claims of the '941 patent.

MStar states that Thomson disputes whether or not Hara meets the "second rate" limitation. MStar states that Thomson argues that because the "second rate" in Hara is equal to the "first rate," the number of pixels displayed and the time available do not "determine" the "second rate." (Citing RX-160 at Q. 285.) MStar argues that if the second rate can be calculated from specifying just the number of pixels displayed and the time available, then the second rate is a function of (and thus "determined by") those variables. MStar asserts that Hara meets the "second rate" limitation. (Citing RX-160 at Q. 285-286.)

Thomson's Position: Thomson contends that Hara does not anticipate any of the asserted claims of the '941 patent.

Thomson argues that Hara does not disclose the "first rate" limitations of claims 1 and 4 because the first rate is dictated by the characteristics of bus 10, and does not correspond to the density of picture information contained in the active portions. (Citing CX-4308C at Q. 252; Tr. at 1801:16-1803:12.) Thomson argues that Hara does not disclose the "second rate" limitations of claims 1 and 4 because the second rate is also determined by the characteristics of bus 10, and not the density of picture information to be displayed, the time available for display, or any other characteristic of the input video signal. (Citing CX-4308C at Q. 255; Tr. at 1801:16-1803:12.)

Discussion and Conclusions: Based on the evidence in the record, I find that MStar failed to offer clear and convincing evidence that Hara anticipates any of the asserted claims of the '941 patent.

Hara is cited on the face of the '941 patent. (JX-5.) Thomson argues that Hara fails to disclose the "first rate" limitation of claims 1 and 4. Claim 1 requires:

> scanning and storing in memory active portions of an input video signal at a first rate which corresponds to the density of picture information contained in the active portions

Similarly, claim 4 requires:

> active portions of an input video signal having active and inactive portions provided from a picture source containing picture information in the active parts are stored at a first rate which corresponds to the density of picture information contained in the active portions and to the duration of the active portions of the video signal

Respondents' expert Dr. Drabik does not expressly address the "first rate" limitation in his witness statement, but instead refers to his claim chart. (*See generally* RX-160 at Q. 258-290; CX-4308C at Q. 253; RDX-545.) Dr. Drabik's claim chart cites various portions of Hara as disclosing the above-quoted first rate limitation, but the claim chart fails to provide an adequate and thorough explanation regarding how those quoted portions of Hara read on the claim language. (*See* RDX-545 at 41-42.) Moreover, MStar's brief asserts, without citing to an evidence, that "[t]he rate at which picture information is stored in memory [in Hara] corresponds to the number of pixels to be sampled from the active portion of the input video signal." (MIB at 70.)

Dr. Drabik appears to focus on the following language from Hara:

> Assuming now that a limit in the frequency of the signal which can be transferred through the first bus 10 is 12.5 MHZ, the pixel number in the horizontal direction amounts to approximately 670 at maximum if the above solution method is introduced (in case that rest of the horizontal blanking period is 16% of the horizontal scanning period).

(RX-179 at 4:49-55.) Mr. Ferraro offered credible testimony that this passage does not disclose the "first rate" limitation in claims 1 and 4 because Hara does not disclose how the rate "corresponds to the density of picture information contained in the active portions." (CX-4308C at Q. 252.) As Mr. Ferraro notes, it appears that the rate chosen in Hara is selected based on the maximum throughput permitted by first bus 10. (*Id.*)

To find a patent invalid, the challenger must offer clear and convincing evidence. This is a difficult burden to meet. Relying on the expert's claim chart herein, that does not include any detailed or thorough discussion of how the prior art discloses the claim limitations in question, is not adequate to meet this high burden. Based on the lack of evidence offered by MStar and the credible rebuttal testimony offered by Thomson, I find that MStar has failed to offer clear and convincing evidence that Hara anticipates asserted claims 1 and 4 of the '941 patent.

2. Obviousness

MStar's Position: MStar contends that asserted claims 1 and 4 are obvious in view of U.S. Patent No. 4,860,246 ("Inoue") in combination with Hara.

MStar asserts that Thomson does not dispute that Inoue discloses all of the limitations of the asserted claims except for the requirement that the number of active lines displayed exceeds the number of lines in the input video signal. (Citing CX-4308C at Q. 257-263; RX-160 at Q. 310-320; Tr. at 1745:16-20.) MStar claims that Hara discloses this limitation, and that the combination of Inoue and Hara would yield the claimed invention disclosed in the '941 patent. (Citing RX-160 at Q. 310-323.) MStar argues that one of ordinary skill in the art would look to both Inoue and Hara to solve the problems addressed in the '941 patent. (Citing RX-160 at Q. 317-318.) MStar argues that one of ordinary skill in the art would have been motivated to combine the two references because they reflect complementary uses for exploiting the blanking period of an input video signal. (Citing RX-160 at Q. 314-315.)

MStar asserts that Thomson is wrong to argue that Inoue teaches away from upscaling. (Citing CX-4308C at Q. 267.) MStar states that the language that Thomson refers to merely indicates that an object of Inoue is to decrease the rate at which data is transmitted. MStar claims that Thomson asserts that combining Inoue and Hara would not result in an ft/za ratio reduction. (Citing CX-4308C at Q. 267.) MStar argues that this is incorrect, because Hara teaches increasing za, while Inoue teaches decreasing ft, leading to a reduction in the ft/za ratio.

MStar disputes Thomson's evidence of secondary considerations of non-obviousness. MStar argues that Thomson's evidence of alleged widespread licensing is not sufficient because there is no nexus between the alleged success of Thomson's licensing program and the claimed invention of the '941 patent. (Citing RX-160 at Q. 327-328.) MStar disputes Thomson's claim that the '941 patent provided a solution to a long-felt need for LCD monitors to upscale input signals. (Citing CX-4308C at Q. 295.) According to MStar, many prior art references, including Hara, Baba, and Tachiuchi, already disclosed means of upscaling input signals.

Thomson's Position: Thomson contends that the combination of Inoue and Hara does not render the asserted claims obvious.

According to Thomson, Inoue does not disclose scaling. (Citing CX-4308C at Q. 262.) Thomson asserts that Inoue and Hara teach away from each other. (Citing CX-4308C at Q. 266; Tr. at 1804:5-1806:3.) Thomson states that Inoue teaches away from upscaling because it states that its object is to change the format of a signal "while containing the same data." (Citing CX-4308C at Q. 267.) Thomson further states that Hara teaches away from changing the first or second rates, because it is geared towards a system in which there is a "limit in the frequency of the signal." (Citing CX-4308C at Q. 268.) Thomson argues that any combination of the two references would be unpredictable and beyond the skill of one of ordinary skill in the art. (Citing CX-4308C at Q. 267-268; Tr. at 1804:5-1806:3.)

Thomson asserts that the combination of Inoue and Hara fails to disclose all of the elements of either claim 1 or claim 4. (Citing CX-4308C at Q. 265.) Thomson states that neither reference discloses the effect of the combination on ft/za, even if such a combination were possible. (*Id.*)

Thomson argues that secondary considerations support the non-obviousness of the '941 patent. Thomson claims that the '941 patent has been widely licensed in the industry, and is one of Thomson's key patents in its LCD licensing program. Thomson contends that the '941 patent provided a solution to a long-felt need in that the invention allows for LCD displays that can upscale video signals to match the native resolution of the display while minimizing the amount of memory required to do so. (Citing CX-4308C at Q. 295.) Thomson notes that Realtek's own vice president testified that scaling is an important feature of Realtek's LCD controllers. (Citing Tr. at 1276:17-25.)

Discussion and Conclusions: Based on the evidence in the record, I find that MStar failed to offer clear and convincing evidence that asserted claims 1 and 4 of the '941 patent are obvious in view of Inoue combined with Hara.

Inoue relates to translating a video signal that is intended to be displayed on CRT display so that the signal may be displayed on an LCD display:

> The present invention relates to interface devices in which the format of an input signal is converted and temporarily stored in memory for subsequent reading out. More particularly, the invention relates to interface devices for the translation of a video data output signal from a computer which is intended for display on a cathode ray tube into a signal which is suitable for use with liquid crystal displays (LCD).

(RX-173 at 1:9-16.) Hara relates to upscaling an image for display on a matrix display through using the inactive time associated with the horizontal and vertical blanking periods:

> The display apparatus according to the present invention has the particular advantages as follows. That is, since the time period corresponding to both the horizontal and vertical blanking time periods of the television image is added to the time period during which the television signal is effective, the overall information amount can be increased without increasing the peak information transmission amount per unit time, the data can be effectively transported to the screen having a relative large pixel quantity, as compared with the information amount contained in the television image, and therefore the television image can be correctly displayed without any difficulties.

(RX-179 at 1:31-43.)

MStar asserts that Inoue discloses all of the claims limitations of the asserted claims except for the limitation requiring "the number of control lines of the matrix display being greater than the number of lines of the video signal to be displayed." Dr. Drabik acknowledges that Inoue discloses that the number of control lines is the same as the number of lines of the video signal to be displayed. (RX-160 at Q. 310.) MStar argues that Hara discloses this missing claim limitation, and that the combination of Inoue and Hara renders claims 1 and 4 obvious.

In opining that one of ordinary skill in the art would know how to combine the teachings of Inoue and Hara to practice the claimed invention of the '941 patent, Dr. Drabik testified:

> Both references suggest sending data to a matrix display during the blanking intervals of an input video signal. Hara suggests using the intervals to send additional data and thus create more active lines on the display. Inoue suggests using the intervals to send the data more slowly. A person of skill in the art aware of both references would recognize the advantages of doing both, although there would be a trade-off.

(RX-160 at Q. 315.) Dr. Drabik also offered an example that allegedly demonstrates the obviousness of the combination:

> As discussed earlier…a CGA signal has 200 lines and approximately 45% blanking. A designer of a 240-line display, who was aware of Hara, would use the blanking intervals to generate the 40 additional lines, but would not need the entirety of the blanking intervals to accomplish that. Since the designer would also have been aware of Inoue, she would have found it obvious to use the remainder of the blanking periods to lower the output frequency, to gain the advantages described in Inoue.

(*Id.*) The above-quoted testimony is the extent of the Dr. Drabik's opinion regarding the reasoning for combining Inoue and Hara.

Mr. Ferraro opined that the combination of Inoue and Hara does not render the claims obvious. He noted that Inoue is not directed to increasing the number of lines, as required by the asserted claims. (CX-4308C at Q. 267.) According to Mr. Ferraro:

> The disclosure of the timing within Inoue is directed to not increasing the number of lines and thus, in my opinion, any attempt to combine Inoue with Hara would be unpredictable and beyond the ability of one of ordinary skill in the art.

(*Id.*)[33] Mr. Ferraro also offered the following testimony at the hearing:

[33] To be clear, the quotation of this testimony is not an indication that I accept Mr. Ferraro's "teaching away" opinion, which is also offered in response to Question 267.

> Q. Would that combination result in the claimed inventions?
>
> A. No, not in my opinion.
>
> Q. Why not?
>
> A. Because the two are directed to different things. One is directed to maintaining a bus rate and one is directed towards outputting to stay signal to an LCD, keeping the data the same. And so you couldn't just pop something from one into the other without bringing into question what else would change in the original implementation as disclosed in the patent itself. You wouldn't know what the first rates were, what the second rates were, if they were going to conform to the rules in Hara or if they were going to conform to the rules in Inoue, and what was going to change, it would be beyond the scope of one of ordinary skill in the art.

(Tr. at 1804:9-1805:3.)

"If a person of ordinary skill, before the time of invention and without knowledge of that invention, would have found the invention merely an easily predictable and achievable variation or combination of the prior art, then the invention likely would have been obvious." *Rolls-Royce, PLC v. United Technologies Corp.*, 603 F.3d 1325, 1338 (Fed. Cir. 2010) (citing *KSR*, 550 U.S. at 417, 421). The Federal Circuit has cautioned that courts should avoid an evaluation of obviousness by using hindsight. *See Star Scientific, Inc. v. R.J. Reynolds Tobacco Co.*, 655 F.3d 1364, (Fed. Cir. 2011) ("[T]he great challenge of the obviousness judgment is proceeding without any hint of hindsight."); *In re Mettke*, 570 F.3d 1356, 1360 (Fed. Cir. 2009) ("[T]he selective hindsight combination of references that show various elements of the claim generally does not suffice to establish obviousness.") According to the Federal Circuit, "[t]o preclude hindsight in [the obviousness] analysis, this court flexibly seeks evidence from before the time of the invention in the form of some teaching, suggestion, or even mere motivation (conceivably found within the knowledge of an ordinarily skilled artisan) to make the variation or combination." *Rolls-Royce*, 603 F.3d at 1338.

I find that Dr. Drabik's testimony is insufficient to meet the high burden to clearly and convincingly prove obviousness. Drabik opines that one of ordinary skill in the art would know to incorporate Hara's upscaling feature within the apparatus disclosed in Inoue. Dr. Drabik does not offer sufficient testimony describing how the invention disclosed in Inoue would still work with the upscaling from Hara, and how all of the claim limitations, such as the rate requirements, would still be met. Mr. Ferraro pointed out this flaw in Dr. Drabik's testimony when he noted that "you couldn't just pop something from one into the other without bringing into question what else would change in the original implementation as disclosed in the patent itself." (Tr. at 1804:9-1805:3.)

Moreover, Dr. Drabik does not offer a sufficient reason for combining the references, as his opinion appears to be based on the hindsight view of trying to reconstruct the claimed invention from portions of each of the prior art references. (RX-160 at Q. 315.) Specifically, Dr. Drabik's example of the hypothetical designer of a 240-line display does not provide the necessary reason to combine the references, but instead presents an example of an improper hindsight analysis. (*Id.*)

Because I have found that MStar has failed to make a *prima facie* showing of obviousness, it is unnecessary to examine the alleged evidence of secondary considerations. Assuming *arguendo* that MStar had offered a *prima facie* showing of obviousness, I find that the alleged secondary considerations would not be sufficient to overcome such a showing.

Thomson argues that the '941 patent has been widely licensed to industry, and is one of Thomson's key patents in its LCD licensing program. (CIB at 179.) I find that the fact that the '941 patent has been widely licensed as part of a larger LCD patent portfolio, alone, does not demonstrate the non-obviousness of the '941 patent. "A nexus between the merits of the claimed invention and the evidence of secondary considerations is required in order for the evidence to be given substantial weight in an obviousness decision." *Simmons Fastener Corp. v. Illinois Tool Works, Inc.*, 739 F.2d 1573, 1575 (Fed. Cir. 1984). Thomson's only attempt to demonstrate the required nexus is an unsupported claims that the '941 patent is one of the key patents in the portfolio. (CIB at 179.) Such attorney argument is insufficient to demonstrate the required nexus between the licensing activity and the merits of the claimed invention.

Thomson also argues that the '941 patent solved a long-felt need in the industry, in that it provided a way to "upscale video signals to match the native resolution of [a] display while minimizing the amount of memory required to do so...by relying on the input video signal timing." (CIB at 179.) To support this position, Thomson cites to the testimony of Mr. Ferraro. (CX-4308C at Q. 295.) Thomson also cites to the testimony of a Realtek employee who agreed that scaling is an important feature for Realtek's LCD controller. (Tr. at 1276:17-25.) I do not find that either of these sources provides evidence for Thomson's claim that the '941 patent solved a long-felt need in the industry. Mr. Ferraro's testimony is conclusory and does not demonstrate that there was a long-felt need in the industry for the invention of the '941 patent. (CX-4308C at Q. 295.) The statement from the Realtek employee that scaling is an important feature in Realtek's LCD controllers also does not establish that the '941 patent solved a long-felt need in the industry. (Tr. at 1276:17-25.)

Based on the foregoing, I find that MStar failed to offer clear and convincing evidence that the asserted claims of the '941 patent are obvious in view of Inoue combined with Hara.

V. LICENSE DEFENSE

Qisda/BenQ's Position:[34] {

}

{

[34] AUO adopted the position of Qisda and BenQ regarding this license defense. (AIB at 72.) No other respondent advanced a license defense.

}

{

}

{

{ }

Discussion and Conclusions: {

}

The existence of a patent license is an affirmative defense to a claim of patent infringement. *Carborundum Co. v. Molten Metal Equip. Innov., Inc.*,,72 F.3d 872, 878 (Fed. Cir. 1995). The burden rests on the alleged infringer to prove the license defense. *Id.* The interpretation of a patent license is a matter of state law. *See Studiengesellschaft Kohle, m.b.H v. Hercules, Inc.*, 105 F.3d 629, 632 (Fed. Cir. 1997) (interpreting a patent license agreement under Delaware law).

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VI. INFRINGEMENT

A. Applicable Law

A complainant must prove either literal infringement or infringement under the doctrine of equivalents. Infringement must be proven by a preponderance of the evidence. *SmithKline Diagnostics, Inc. v. Helena Labs. Corp.*, 859 F.2d 878, 889 (Fed. Cir. 1988). A preponderance of the evidence standard "requires proving that infringement was more likely than not to have occurred." *Warner-Lambert Co. v. Teva Pharm. USA, Inc.*, 418 F.3d 1326, 1341 n. 15 (Fed. Cir. 2005).

Literal infringement is a question of fact. *Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1332 (Fed. Cir. 2008). Literal infringement requires the patentee to prove that the accused device contains each and every limitation of the asserted claim(s). *Frank's Casing Crew & Rental Tools, Inc. v. Weatherford Int'l, Inc.*, 389 F.3d 1370, 1378 (Fed. Cir. 2004).

As for the doctrine of equivalents:

> Infringement under the doctrine of equivalents may be found when the accused device contains an "insubstantial" change from the claimed invention. Whether equivalency exists may be determined based on the "insubstantial differences" test or based on the "triple identity" test, namely, whether the element of the accused device "performs substantially the same function in substantially the same way to obtain the same result." The essential inquiry is whether "the accused product or process contain elements identical or equivalent to each claimed element of the patented invention[.]"

TIP Sys., LLC v. Phillips & Brooks/Gladwin, Inc., 529 F.3d 1364, 1376-77 (Fed. Cir. 2008) (citations omitted).

Thus, if an element is missing or not satisfied, infringement cannot be found under the doctrine of equivalents as a matter of law. *London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1538-39 (Fed. Cir. 1991). Determining infringement under the doctrine of equivalents "requires an intensely factual inquiry." *Vehicular Techs. Corp. v. Titan Wheel Int'l, Inc.*, 212 F.3d 1377, 1381 (Fed. Cir. 2000).

B. The '063 Patent

1. Claim 1

Thomson's Position: Thomson argues that CMI, AUO, Qisda, and BenQ infringe claim 1 of the '063 patent.

Thomson alleges that it is undisputed that all accused monitors and their modules include display cells having a TFT and color filter substrate, and TN liquid crystal. {

}

Thomson asserts that the element "two substrates with at least one of said two substrates divided into an active aperture area and a non-active area" is found in the accused products under the construction of both sides. {

}

Regarding { ,} Thomson states that the color filter substrate in each {

} is {

} Thomson says the {

} Thomson concludes that

{

}.[36]

Thomson adds that Dr. West and Dr. Lowe each testified that color filter substrates of all { }

accused products are { }

{

}

---

[36] { }

{

}

{

}

Regarding { } Thomson alleges that { } as in the '063 patent, {

} Thomson alleges that AUO admits that its {

} and to the step-by-step process of { } starting with {

} Thomson alleges that the { } includes an affixing layer, because the {

} Thomson asserts that the portion of {

} is an affixing layer under Thomson's construction. {

}

[37] Thomson adds in a footnote that GDS files for accused CMI modules are identified in the direct witness statement of Dr. West. (Citing CX-4242C at Q. 249;and CX-3945 to CX-4085 ("CMI GDS files"))

Thomson says that Respondents' construction requires a "distinct" layer, not a separately applied "intermediate" layer. FOR ACTUAL CONSTRUCTION SEE ID AT 35 Thomson argues that Respondents should not be permitted to change constructions at this juncture. Thomson adds that the { } Thomson asserts that both the *Polymer Interface and Adhesion* book by Souheng Wu and Marcel Dekkar, and the article "An Overview of the Basic Aspects of Polymer Adhesion" by Georges Fourche, describe interface characteristics of polymers adhered to substances, including metal-polymer interfaces. { } Thomson says that when a polymer { } is applied to another material, an adhesion layer, or interfacial zone, forms in the polymer in the area where the { } polymer bonds to the surface. { } Thomson states that this adhesion layer is a region of finite thickness whose properties differs from the bulk properties { } Thomson alleges that Dr. Lowe admits it is "a fact of nature" that an interfacial region is formed { } and that this interfacial region has distinct composition and finite thickness. { } Thomson continues that Dr. Lowe argues that an interfacial region forms { }

{

}

{

} Thomson adds that AUO does not dispute {

} Dr. Lowe admits that {

} Thomson concludes that the {

}

{

}

{

}

{

}

Thomson contends that spacing elements are formed {

} Thomson alleges that AUO's

[38] {

.}

corporate representative admits that the {

} Thomson avers that {

}

Thomson says, for example, { } shows the {

} Thomson concludes that the

affixing layer remains { .}

{

}

{

}

{ }

Thomson alleges that AUO admitted that { } Thomson continues that Dr. Lowe admitted at trial that { } Thomson says its expert, Dr. West, also testified how { } Thomson asserts that the accused { } meet this element under Thomson's construction of "mechanically rubbed." {

}

{

}

{

.}

Thomson adds that, even if this element were not literally met under Respondents' construction, it would be met under their construction under the doctrine of equivalents. Thomson asserts that Respondents perform the same function { } in substantially the same way { } to achieve the same result { }

{ }

Regarding { } Thomson alleges that AUO and their expert Dr. Lowe admit that the { } maintain a substantially uniform cell gap under either side's construction. { } Thomson alleges that Dr. Lowe admits that { } Thomson continues that Dr. Lowe admits { }

Thomson asserts that { } plainly meet this element. { } Thomson adds that AUO's { } also meet this element, and AUO's arguments to the contrary are baseless. { } Thomson says that AUO argues that { .} Thomson counters that this is no defense, however, because it is undisputed that { } Thomson alleges that AUO's own expert admitted that { } Thomson concludes that { ,} meeting this element under Respondents' construction or Thomson's construction. { }[39]

{ }

[39] In a footnote, Thomson adds that { }

{

}

Thomson concludes that CMI's infringement expert Dr. Wagner, admittedly knows less about liquid crystal than Dr. West (Citing Tr. at 1403:16-18. {

}

AUO's Position:[40] AUO asserts that the accused products do not infringe claim 1, because they do not have an "affixing layer" under either side's construction. {

} {

}

[40] While Thomson also accuses respondents Qisda and BenQ of infringement of all asserted claims, {

} In their post-hearing briefs, Qisda and BenQ incorporate by reference the arguments of AUO and CMI and rely upon those arguments to defend the infringement allegations made against their finished products.

{"

}

AUO continues, that second, relying on literature concerning polymer interfaces and adhesion,[41] Thomson's expert, Dr. West, suggests that the properties { } at the interface { } are different from the bulk properties { } AUO says that based on this suggested premise, Thomson argues that the interfacial layer { } is the affixing layer. { }

AUO responds that Dr. West admitted that his hypothesized interfacial zone must have two characteristics – a finite thickness and a composition that is different from the bulk properties { } AUO alleges that Dr. West offered no evidence about either characteristic in the accused products. AUO says Dr. West neither measured, nor testified about any measurements concerning, the thickness of the alleged interfacial zone in the accused products, and he did not perform any tests of the accused products, or otherwise provide evidence, to demonstrate that the composition of the alleged interfacial zone differs from the bulk properties. { } AUO adds that Dr. West admitted that none of the literature he cites addresses { } -- the materials that allegedly form the interfacial zone in the accused products. { }

AUO argues that under either side's construction, the "affixing layer" is a separate claim element from the "spacing elements." { }

[41] AUO adds in a footnote that Thomson withdrew the Wu book { } which is the primary literature reference cited by Dr. West for his interface theory. AUO says that Thomson's demonstrative { } contains only a small excerpt from the Wu book, and Thomson's interface theory should be rejected, since it is impossible for the Court to evaluate Dr. West's opinion without reviewing the Wu book on which it is based.

AUO addresses the issue of the spacing elements having an { } saying that Dr. West addresses this element of claim 1 in paragraphs 321 to 325 of his testimony. { } { }

---

[42] { }

{

}

AUO argues that Thomson's theory of infringement under Respondents' proposed construction confuses rubbing direction with force vectors. AUO says that Dr. West agrees that the purpose of mechanical rubbing is to create alignment marks in a single direction by rubbing in that direction. { }

{ }

}

AUO alleges that Thomson introduced a new theory when submitting Dr. West's direct witness statement, which states {

}

AUO argues that the new theory is incorrect for two reasons. AUO says, first it is just a theory that is not backed up with any evidence. AUO states that Dr. West did not demonstrate, by tests or otherwise, that Respondents' rubbing process performs in the manner he theorizes.

AUO asserts that Thomson provided no test data or analysis to support infringement by the accused products under either their components of force theory or their new theory regarding { } AUO adds that Thomson has submitted no photomicrographs or other evidence showing { .}

{ }

{ }

AUO says, only with respect to Respondents' proposed construction, Thomson relies on the doctrine of equivalents ("DOE") with respect to the "mechanical rubbing" limitation of claim 1, but fails to properly apply the function, way, result test.

AUO contends that the DOE must be applied on an element-by-element basis. (Citing *Warner-Jenkinson Co., Inc. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 29 (1997) AUO argues in a DOE analysis, the Court must apply the same claim construction as for literal infringement, and cites *Novartis Pharm. Corp. v. Abbott Labs.*, 375 F.3d 1328, 1339 (Fed. Cir. 2004) and *Elekta Instrument S.A. v. O.U.R. Scientific Int'l, Inc.*, 214 F.3d 1302, 1304, 1309 n.2 (Fed. Cir. 2000) in support. AUO argues that under the DOE, the Court's claim construction should be given the same weight as the express language in the claim limitations. (Citing *Nautilus Grp., Inc. v. Icon Health & Fitness, Inc.*, 308 F. Supp. 2d 1217, 1219, 1222-23 (W.D. Wash. 2003))

AUO says that Thomson relies on the "so-called triple identity test" for proving equivalents. AUO argues under this test, Thomson was required to compare the function, way and result of the claimed mechanical rubbing limitation with the function, way and result of Respondents' rubbing steps, and then prove that the rubbing steps perform substantially the same function, in substantially the same way, to achieve substantially the same result as the claimed mechanical rubbing limitation. (Citing *Lear Siegler, Inc. v. Sealy Mattress Co. of Mich.*, 873 F.2d 1422, 1425 (Fed. Cir. 1989))

AUO contends that Thomson failed to do so through the only witness who testified on this subject, Dr. West. AUO avers that Dr. West never identified the "way" that the claimed "mechanical rubbing" limitation is performed. { }

AUO alleges that on cross-examination, Dr. West admitted that the only "way" that he describes in his testimony – {

} AUO argues that Dr. West never compared the claimed "way" to the accused "way" to determine whether they were substantially the same because he never identified what the claimed "way" was. AUO contends this failure of proof dooms Thomson's reliance on the DOE. (Citing *Tex. Instruments Inc. v. Cypress Semiconductor Corp.*, 90 F.3d 1558, 1568 (Fed. Cir. 1996) to hold there can be no DOE infringement where the expert testimony provides "no discussion of whether or how the way the [accused device] operates [was] similar to the patent claim" (quotation and citation omitted)).

AUO argues that proper application of the triple identity test demonstrates that there is no infringement under the DOE. {

.}

AUO adds that there is a separate and independent ground for finding no infringement under the DOE. AUO asserts that Thomson is precluded from relying on the DOE because during prosecution, the mechanical rubbing limitation was added to claims 1 and 11 by amendment in order to obtain allowance of the patent. { } (Citing *Honeywell*

Int'l Inc. v. Hamilton Sundstrand Corp., 370 F.3d 1131, 1141 (Fed. Cir. 2004) (en banc); and *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 736 (2002))

AUO argues that Thomson cannot rebut the presumption of surrender that arises from its addition of the mechanical rubbing limitation to the claims because it offered no evidence on this issue, and the three ways for overcoming the presumption identified in *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 344 F.3d 1359, 1368 (Fed. Cir. 2003), cannot be met here in any event.

AUO says, first, it is undisputed that the alleged equivalent --{ } -- was foreseeable at the time of the narrowing amendment. { }

AUO continues, second, the rationale for adding the mechanical rubbing limitation to the claims bears more than a tangential relationship to the equivalent in question. AUO says the prosecution history demonstrates that the amendment was made to avoid the prior art, including both Hasegawa and "prior art { } which are not able to withstand the rubbing process and are easily destroyed." { }

{ } AUO concludes that under Respondents' construction, Thomson is precluded from relying on the DOE to establish infringement of claim 1 and its asserted dependent claims.

{ }

{

}

43{ }

{

}

Discussion and Conclusions: I find that Thomson has not proven by a preponderance of the evidence that Respondents' accused products literally infringe claim 1 of the '063 patent.

A determination of whether or not the accused products practice the elements of asserted claim 1 turns on four issues: (1) whether or not the accused products include an "affixing layer" as construed herein; (2) whether or not the accused products contain "spacing elements" as construed herein[44]; (3) whether or not CMI's accused products[45] include spacing elements that are anisotropic in shape; (4) whether or not the accused products have spacing elements that are mechanically rubbed as construed herein.

Affixing Layer

First, I note that the term "affixing layer" as construed herein means "a stratum of material that attaches the spacing elements to a substrate, and which is separate and distinct from said spacing elements."

{

}

[44] {

}

[45] While AUO raises this issue, too, AUO does not deny that its products practice this element. Instead AUO asserts that Thomson has failed to "prove" the fact by admitted evidence. {

.}

{

}

On the subject of the CMI photospacers, Thomson argues that the testimony of Dr. Wagner regarding the presence or absence of affixing layers should be disregarded, because he was found not to be an expert in "interfacial regions." When Dr. Wagner's qualifications were discussed in some detail at the hearing, CMI's counsel made clear that he intended to use Dr. Wagner to testify, *inter alia*, about "the formation of affixing layers on ITO and the formation of photoresist layers." (Tr. at 1370:24-1371:3.) I specifically found that Dr. Wagner would not be accepted as an expert in interfacial exchanges between photoresist and ITO; but I accepted Dr. Wagner as an expert in the other areas highlighted above for which he was offered by CMI. (Tr. at 1373:24-1374:8.)

{

}

{

.}

<u>**Spacing Elements**</u>

AUO's accused products: Dr. Lowe admitted that{

} As a result of the inclusion of {

} in the AUO accused products. { } Based upon the foregoing, I find that the AUO accused products include "two or more structures, not physically connected to one another, which structures serve to substantially uniformly separate two substrates, said structures formed on one of said two substrates and contacting the second substrate" (i.e. "a plurality of spacing elements separate from one another").

CMI's accused products: Dr. West testified that he examined a representative sample of the CMI accused products. He testified regarding how, in his opinion, the accused CMI modules practice each of the elements of the asserted claims of the '063 patent. (CX-4242C at Q. 455, *et seq.*)

Claims 1 and 11 require a spacing layer including, *inter alia*, "a plurality of spacing elements separate from one another." I construed that term to mean "two or more structures, not physically connected to one another, which structures serve to substantially uniformly separate two substrates, said structures formed on one of said two substrates and contacting the second substrate."

{

}

{

}

Thomson's proof leaves a logical gap. Thomson has adduced contradictory evidence. On the one hand, Dr. West has testified that he examined representative samples of the CMI modules, and that the accused CMI products practice the characteristics of those representative samples. {

}

{

} Based upon the logical gap left by Thomson's evidence, I find that Thomson has failed to prove by a preponderance of evidence that the CMI accused products practice these required features of asserted claim 1.

Mechanically Rubbed

I turn to the issue of whether or not Respondents' { } are "mechanically rubbed" as construed herein, to wit: "having moving pressurized friction applied by a machine or apparatus substantially along the long axis of the { } {

}

[46] {

}

{

.}

An important object of requiring mechanical rubbing along the long axis of the anisotropic spacing elements in claim 1 is to provide greater strength and resistance to the forces of the aggressive mechanical rubbing process of the LCD assembly. In Section II.B.8 *supra*, in construing the term "mechanically rubbing," I described this object in some detail. {

}

Thomson also makes an argument that application of the doctrine of equivalents would result in a finding that the respondents' accused products infringe claim 1 of the '063 patent. "An element of an accused product is equivalent to a claim limitation if the differences between the two are insubstantial, a question that turns on whether the element of the accused product 'performs substantially the same function in substantially the same way to obtain the same result' as the claim limitation." *Absolute Software, Inc. v. Stealth Signal, Inc.*, 659 F.3d 1121, 1139-1140 (Fed. Cir. 2011) (quoting *AquaTex Indus., Inc. v. Techniche Solutions*, 419 F.3d 1374, 1382 (Fed. Cir. 2005)). A patentee must "provide particularized testimony and linking argument…with respect to the function, way, result test when such evidence is presented to support a finding of infringement under the doctrine of equivalents." *Texas Instruments Inc. v. Cypress Semiconductor Corp.*, 90 F.3d 1558, 1567 (Fed. Cir. 1996).

As AUO persuasively counters, Thomson's evidence does not support a finding that the "way" portion of the three-part "function, way, result test" is satisfied. {

}

Dr. West does not testify how the accused products would practice the "mechanical rubbing" step of the '063 patent as it is construed herein to include the requirement that the rubbing be "substantially along the long axis" of the spacing elements. Based upon the foregoing, I find that Thomson has failed to prove by a preponderance of evidence how the accused products practice the mechanical rubbing in substantially the same way as required by claim 1 of the '063 patent. Therefore, Thomson has failed to prove that the respondents' accused products infringe the mechanical rubbing step of asserted claim 1 under the doctrine of equivalents.

Based upon all of the foregoing, I find that Thomson has failed to prove by a preponderance of evidence that the accused products practice each and every element of asserted claim 1 of the '063 patent. Therefore, the accused products do not infringe claim 1 of the '063 patent.

2. Claims 2-4 & 8

Thomson's Position: Thomson alleges that Respondents do not dispute infringement of limitations added by dependent claims 2-4, and 8, instead disputing just independent claim 1. Thomson asserts that claim 2 depends from claim 1, adding "where the spacing elements are formed using a mask." Thomson states that AUO's {

} as are CMI's. (Citing CX-4242C at Q. 578-583; and JX-66C, 84:5-21.)

Thomson notes that claim 3 depends from claim 1, adding "wherein the spacing elements are prevented from being formed within the active aperture area." Thomson asserts that, in AUO { } modules, {

}

Thomson states that claim 4 depends from claim 1 and adds "wherein the spacing elements extend along a first axis and along a second axis shorter than the first axis." Thomson says, as described in the "anisotropic in shape" section above, accused AUO { } modules contain {

}

Thomson notes that claim 8 depends from claim 1, adding "wherein the display cell is a liquid crystal display cell and further comprises a liquid crystal layer interposed between said two substrates." Thomson alleges that it is undisputed that the accused products are liquid crystal display cells with a layer of liquid crystal interposed between color filter and TFT substrates.{ }

AUO's Position: AUO argues that claims 2-4 and 8 are not infringed for the same reasons stated above with respect to Claim 1. AUO adds, with respect to claim 4, due to the exclusion of AUO documents lacking translation and with the sole exception of the { } Dr. West has no evidentiary basis for his opinion that the spacing elements in the accused AUO products "extend along a first axis and along a second axis shorter than the first axis" (claim 4).

Discussion and Conclusions: Based on the evidence in the record, I find that Thomson has failed to prove by a preponderance of the evidence that Respondents infringe any of claims 2-4 or 8 of the '063 patent.

Claims 2-4 and 8 each directly depend from claim 1, and I have found that Thomson failed to prove infringement for claim 1. Thus it follows that Thomson failed to prove infringement of claims 2-4 and 8. *Wahpeton Canvas Co. v. Frontier, Inc.*, 870 F.2d 1546, 1552 n. 9 (Fed. Cir. 1989) ("One who does not infringe an independent claim cannot infringe a claim dependent on (and thus containing all the limitations of) that claim.")

If, however, the Commission determines that claim 1 is infringed by Respondents, then I find that Thomson has demonstrated infringement of claims 2-4 and 8. Respondents offer no argument against a finding of infringement for claims 2, 3 and 8, except to say that the accused products cannot infringe the dependent claims if they are not found to infringe the independent claim from which they depend.

Specifically, Thomson provided evidence that:

{ }{ }{ }

{ }{ }{ }

{

}

{

}

Regarding claim 4, AUO raises the issue of a lack of proof of {

} but I have already found that AUO did not deny that its spacing elements {

} and AUO's expert, Dr. Lowe, admitted that they are, in fact, { }

Therefore, based upon the evidence and my prior findings herein, if the Commission determines that the accused products infringe asserted claim 1, then I find that the accused products infringe asserted claim 4.

3. Claim 11

Thomson's position: Thomson argues that CMI, AUO and Qisda/BenQ infringe claim 11 of the '063 patent. Thomson alleges that there is no dispute that the accused products include display cells formed by a manufacturing method. {

}

Regarding the first element of claim 11, Thomson alleges that the parties construe this identically to "one of said two substrates divided into an active aperture area and a non-active area" of claim 1. Thomson says, as discussed above, { } { } methods meet this step, which is undisputed.{ }

Regarding the second element of claim 11, Thomson alleges that, as discussed above for claim 1's similar element, { } { } manufacturing methods include a step of forming a plurality of spacing elements separate from one another on the non-active areas of the substrate, where the spacing elements are anisotropic. {

}

{

}

Thomson turns to the third element of claim 11, and contends that the arguments are the same as for "mechanical rubbing" in claim 1. Thomson reiterates that { } { } manufacturing processes include { } Thomson alleges this element is met under both side's constructions as discussed for "mechanically rubbed" in claim 1. { }

Thomson next focuses on the fourth element of claim 11, alleging that it is undisputed that { } { } processes include attaching { } {

}

{

}

AUO's Position: AUO argues that the accused products do not infringe claim 11 because, under Respondents' construction, {

}

AUO argues that with respect to AUO, Dr. West addressed the requirement of element 2 of claim 11, that the spacing elements be anisotropic in shape, in paragraphs 406 to 409 of his testimony, portions of which have been excluded from evidence because they are based on AUO documents lacking translation. { } AUO contends, in view of the Court' evidentiary rulings and with the sole exception of { }

{

}

Regarding the third element of claim 11, AUO argues that under Respondents' construction, the mechanical rubbing limitation is not met, either literally or under the doctrine of equivalents, for the same reasons as set forth above with respect to claim 1, *supra*.

Finally, AUO argues that the { } in the accused products do not meet the "spacing element" or uniform gap claim limitations of claim 11 under either side's proposed constructions for the same reasons as set forth above with respect to claim 1, *supra*.

Discussion and Conclusions: Based on the evidence in the record, I find that Thomson failed to prove by a preponderance of the evidence that Respondents infringe claim 11 of the '063 patent.

There are four issues in dispute regarding whether or not Respondents' accused products infringe independent asserted claim 11. They are: (1) whether or not the spacing elements are formed on the front surface of either substrate; (2) whether or not the spacing elements are anisotropic in shape; (3) whether or not the mechanical rubbing limitation is met, either literally or under the doctrine of equivalents; and (4) whether or not the { } in the accused products meet the "spacing element" or uniform gap limitations of claim 11.

The elements of independent claim 11 do not differ materially from those of independent claim 1 as they both treat the second, third and fourth issues raised by AUO, except that claim 1 requires an affixing layer and claim 11 does not. I will not here repeat my findings and reasoning regarding those issues set forth in Section VI.B.1 *supra*; but I incorporate them in this section by reference.[47]

The sole issue remaining is whether or not the spacing elements of the accused products are formed on the front surface of either substrate. I find that they are.

AUO's argument on this point is based on the fallacious assumption that the terms "front surface" and "rear surface" must relate to their position in relation to a "viewer." It is not necessary to separately construe these terms, because the claim makes clear that the "front surface" of the first substrate is the surface upon which the spacing elements are formed, and the surface upon which the second substrate is mounted, thus locating the spacing elements between the two substrates. {

.}

Based upon all of the foregoing, I find that Thomson has failed to prove by a preponderance of evidence that the accused products practice each and every element of asserted claim 11 of the '063 patent. Therefore, the accused products do not infringe claim 11 of the '063 patent.

4. Claims 12, 14, 17, & 18

Thomson's position: Thomson argues that CMI, AUO, & Qisda/BenQ Infringe Dependent Claims 12, 14, 17 and 18.

[47] Inasmuch as, claim 11 does not require the inclusion of an "affixing layer," my findings regarding an affixing layer in Section VI.B.1 *supra*, are not included in this incorporating language.

Thomson alleges that Respondents do not dispute infringement of the additional elements of claims 12, 17, and 18. Thomson says that claim 12 depends from claim 11 and adds "wherein the spacing elements extend along a first axis and along a second axis shorter than the first axis." Thomson contends this is met for the same reasons as claim 4 above. { }

Thomson continues that claim 14 depends from claim 12 and adds "wherein the spacing elements are rubbed along the first axis." { } Thomson concludes that claim 14 is met under either side's construction.

Thomson notes that claim 17 depends from claim 11 and adds "wherein the forming step comprises photolithographically forming the spacing elements having the anisotropic shape using a mask." Thomson says, as discussed for claims 1 and 2, { }

Finally regarding claim 18, as discussed for claim 8, Thomson alleges there is no dispute that the accused products include display cells with a layer of liquid crystal. { }

AUO's position: AUO argues that claims 12, 14, 17 and 18 are not infringed for the same reasons stated above with respect to Claim 11.

AUO adds, with respect to claim 12, due to the exclusion of AUO documents lacking translation and with the sole exception of the { } Dr. West has no evidentiary basis for his opinion that the spacing elements in the accused AUO products "extend along a first axis and along a second axis shorter than the first axis," as recited in claim 12.

Regarding claim 14, AUO alleges that Thomson's expert agrees that, "here in claim 14 the requirement that the { } be rubbed along the long direction is finally appropriate." { } AUO contends that based on that testimony, and under Respondents' proposed construction, claim 14 is not literally met for the same reasons as set forth above with respect to mechanical rubbing limitation of claim 1. AUO concludes that Thomson has submitted no evidence that claim 14 is met under the doctrine of equivalents.

Discussion and Conclusions: Based on the evidence in the record, I find that Thomson has failed to prove by a preponderance of the evidence that Respondents infringe any of claims 12, 14, 17, or 18 of the '063 patent.

Claims 12, 17 and 18 each depend from claim 11, and claim 14 depends from claim 11 through claim 12, and I have found that Thomson failed to prove infringement for claim 11. Thus it follows that Thomson failed to prove infringement of claims 12, 14, 17 and 18. *Wahpeton Canvas Co. v. Frontier, Inc.*, 870 F.2d 1546, 1552 n. 9 (Fed. Cir. 1989) ("One who does not infringe an independent claim cannot infringe a claim dependent on (and thus containing all the limitations of) that claim.")

If, however, the Commission determines that claim 11 is infringed by Respondents, then I find that Thomson has demonstrated infringement of claims 12, 17 and 18. Respondents offer no argument against a finding of infringement for claims 12, 17 and 18, except to say that the accused products cannot infringe the dependent claims if they are not found to infringe the independent claim from which they depend.

Regarding claim 12, AUO raises the issue of a lack of proof of { }

{ }

Therefore, based upon the evidence and my prior findings herein, if the Commission determines that the accused products infringe asserted claim 11, then I find that the accused products infringe asserted claim 12.

Thomson demonstrated that { } { } { } as required by claim 17. { }

Regarding claim 18, as discussed for claim 8, *supra*, there is no dispute that the accused products include display cells with a layer of liquid crystal. { }

Inasmuch as, claim 14 requires that the spacing elements be "rubbed along the first axis," and that requirement is unequivocal (i.e. it does not include the word "substantially"), I find that the evidence clearly establishes that the accused products do not practice the element of claim 14.

Based upon all of the foregoing, I find that the accused products have not been shown by a preponderance of evidence to infringe any asserted claim of the '063 patent.

C. The '006 Patent

1. AUO & CMI

Thomson's Position: Thomson claims that Respondents' TN LCDs that use polarizers with Fuji WV film infringe claims 4, 7, and 14 of the '006 patent. According to Thomson, the one dispute between the parties is whether or not the Fuji WV film is uniaxial.

Thomson asserts that the accused products meet all of the limitations of claim 1. Thomson states that the accused products are all TFT LCDs, and therefore electrically controlled display devices. { }

{ } Thomson asserts that this is true regardless of the adopted constructions of "layer" and "twisted nematic liquid crystal." { }

Thomson asserts that the accused products include "uniaxial compensating means with negative birefringence being associated with said layer within the optical cavity formed by said polarizers, wherein the optical axis of said uniaxial compensating means with negative birefringence have an inclination with respect to the normal (Z) to the main faces of said layer." Thomson claims that the { }

Thomson argues that the uniaxial compensating means of claim 1 is also present in the accused products when the Fuji WV film is viewed as a whole. { } Thomson offers evidence that it claims demonstrates that the Fuji WV film as a whole is uniaxial and negatively birefringent with an inclined optical axis. { }

Thomson asserts that to the extent that the element is not literally present, it is present under the doctrine of equivalents. { } Thomson offers expert testimony that the Fuji WV film satisfies the function, way, result test for doctrine of equivalents. { }

Thomson argues that the accused products meet the additional elements of claim 3. { } Thomson states that claim 3 is met regardless of the adopted construction of "plate." { } Thomson states that Respondents do not dispute that the accused products meet the additional element required by claim 4. { }

{ }

{ } Thomson argues that the Fuji WV film meets the "first birefringent layer" limitation, regardless of whether it is viewed across the entire thickness or when consideration is given to the layers that comprise the Fuji WV film. {

}

{

}

AUO's Position: AUO contends that the accused products do not infringe the asserted claims of the '006 patent.

AUO claims that the Fuji WV film does not have an optical axis under either proposed construction. Therefore, AUO asserts that the Fuji WV is not a uniaxial compensator, which is a required element of each asserted claim. {

}

AUO notes that Thomson argues that in the real world, there is nearly always a non-zero tolerance for retardation. {

} AUO asserts that the birefringence is a material property, and is not dependent on the thickness of the compensator. {

}

AUO claims that Thomson is incorrect to assert that the sublayers of the Fuji WV film have an optical axis and are uniaxial. {

}

AUO asserts that Fuji WV film is not an equivalent to a uniaxial compensator. {

} According to AUO, Fuji WV film has a fundamentally different structure from a uniaxial compensator. {

}

AUO also argues that the result asserted by Dr. Escuti in his function-way-result analysis is far too broad. {

}

{

}

AUO claims that the accused products do not meet the "compensating means" claim element if that element is construed to be a means-plus-function term. {

}

Moreover, AUO asserts that the Fuji WV film is not an equivalent of the "compensating means" element.

AUO states that under Thomson's "sublayer theory," the accused products do not meet the "associated with" limitation of claim 1. {

}

AUO claims that Thomson failed to identify competent evidence to show that the accused products meet the limitations added by claims 3 and 4. {

}

{

}

{

} AUO argues that Thomson's infringement argument with respect to claim 7 is therefore wholly inconsistent with its infringement argument with respect to claim 4.

According to AUO, the accused compensators do not have "orthogonal optical axes" as required by claim 7. {

}

With regard to claim 14, AUO asserts that under Thomson's sublayer theory of infringement, {

} AUO argues that claim 14 is not infringed for the reasons stated with respect to the other asserted claims.

CMI's Position: CMI's accused products also include Fuji WV films. For the same reasons articulated by AUO, CMI argues that the Fuji WV films are not the uniaxial compensators required by the asserted claims of the '006 patent. (*See* CMRB at 32-41.)

Discussion and Conclusions: Based on the evidence in the record, I find that Thomson failed to prove that any AUO or CMI accused product infringes the asserted claims of the '006 patent.

The primary dispute between the parties is whether or not the Fuji Wideview compensation film (hereinafter referred to as "Fuji WV film") in the accused products is a uniaxial negatively birefringent compensator. The parties rely heavily on their experts' opinions to support their respective positions on the issue.

Thomson defines the accused products {

}

} Dr. Escuti opined that the Fuji WV film is negatively birefringent, and this negative birefringence "cancels out, or nearly cancels out" the residual positive birefringence of the twisted nematic liquid crystal material. { } Dr. Escuti explained that the Fuji WV film is composed of two layers, one of which is the discotic liquid ("DLC") layer. {

} According to Dr. Escuti, the DLC layer "is made of layers of hybrid aligned discotic – or splayed – molecules in a solid form, and is what performs the majority of the compensation." { }

Literal Infringement

Each of the asserted claims requires a uniaxial compensator. Claims 4 and 7 require "uniaxial compensating means with negative birefringence." Claim 14 requires a "first birefringent layer" that "has the property that it provides uniaxial negative birefringence…" Dr. Escuti offers two different theories regarding how the Fuji WV film constitutes a uniaxial negatively birefringent compensator. { } Under one theory, the Fuji WV film as a whole constitutes the uniaxial negatively birefringent compensator. {

} As Dr. Escuti opines, "the Fuji WV film is uniaxial across its entirety, and it has an optical axis that is inclined with respect to the normal to the main faces of the liquid crystal material."

{ }

---

[48] Because Thomson's infringement analysis centers on the Fuji WV film, it is identical for AUO and CMI.

To support his opinion, Dr. Escuti relies on two articles by Yamahara, where the Fuji WV film was analyzed. { } In one of the articles, Yamahara calculates n2 and n3 to be 1.5999 and 1.6, respectively, and states that the Fuji WV film "has the optical characteristics of an inclined optical indicatrix which has uniaxial negative birefringence and acts as the entire compensator." { }

I find that these Yamahara articles are insufficient to demonstrate that the Fuji WV film meets the "compensating means" limitation. Dr. Drzaic testified in depth about these articles, explaining why they do not show that the Fuji WV film is a uniaxial compensator. { } Specifically, Dr. Drzaic explained that the Fuji WV film is not homogeneous, and has a random structure. { } Therefore, the Yamahara articles must rely on modeling the Fuji WV film to be able to make measurements. { } Dr. Drzaic opined that the modeling used in the Yamahara articles was simplified and was inadequate to fully describe the complex nature of the Fuji WV film. { }

Moreover, Dr. Drzaic notes that the Yamahara articles are from 2002 and 2003, and an assumption made by Yamahara that hybrid alignment is likely not present in the Fuji WV film has been shown to be incorrect. { } Dr. Drzaic notes that to date, there is still no consensus in the industry as to how to model Fuji WV film. { } According to Dr. Drzaic, none of the proposed models "truly predict the optical behavior of Fuji WV film under the range of conditions important for usage of the film." { }

{ }

I find that the evidence supports a conclusion that the Fuji WV film is not uniaxial. I construed "uniaxial" to mean "having a single optical axis." I construed "optical axis" to mean "a direction in a doubly refracting (birefringent) material along which the two refracted rays travel at the same speed – i.e., without double refraction." Therefore, an optical axis is a direction where light experiences no birefringence. Dr. Drzaic testified that because the Fuji WV film is hybridly aligned, it does not have a single optical axis. { } Dr. Drzaic cited to literature in the art that confirms that Fuji WV film does not have a single optical axis. One paper includes the following conclusion:

> The difference between the WV film and a uniaxial negative-birefringence film is quantitatively discussed and clearly described...From the optical measurement and numerical analysis, we have proved that the WV film has no optic axis due to its hybrid-alignment structure.

{ } Dr. Drzaic details how the paper differentiates between the Fuji WV film and uniaxial negative birefringence film. { }

Dr. Drzaic also cites to the retardation testing performed by Dr. Shin-Tson Wu for this investigation. The testing showed that the Fuji WV film has no point of zero retardation, which demonstrates that there is no direction in the Fuji WV film where there is no birefringence. { } Furthermore, the lowest point of retardation measured by Dr. Wu, 12.7 nm, was well above the 5 nm range of experimental error. { } Dr. Wu also performed the same retardation testing on calcite crystal, a known uniaxial material. The testing confirmed that the calcite is uniaxial, as there was a single direction where the calcite experienced no birefringence. { } The retardation testing performed by Dr. Wu is consistent with a technical article where the retardation of the Fuji WV film and a uniaxial negative birefringent film were both measured. { } In addition, Dr. Wu performed conoscopic testing on the Fuji WV film and the calcite that further confirmed that the Fuji WV film is not uniaxial. { }

Dr. Escuti does nothing to criticize the above-described { } Based on my adopted constructions of "uniaxial" and "optical axis," I find that the extensive { }

Dr. Escuti also relies on conoscopic testing performed by Thomson. { } He opines that the conoscopic testing supports the conclusion that the Fuji WV film is a uniaxial negative birefringent material. { } and found that the methodology of the testing was flawed, and that the results of the testing do not support the conclusions reached by Dr. Escuti. { } I find that the conoscopic testing relied on by Dr. Escuti does not constitute reliable evidence that the Fuji WV film is a uniaxial negatively birefringent material.

Dr. Escuti's second theory of literal infringement centers on the assertion that the DLC layer in the Fuji WV film is comprised of a number of sublayers. { . } Dr. Escuti claims that each of these sublayers constitutes a "uniaxial compensating means with negative birefringence." { }

Dr. Escuti claims that each sublayer in the DLC layer of the Fuji WV film meets the "compensating means" or "first birefringent layer" limitations of the asserted claims. { } Dr. Escuti has offered no evidence that the DLC layer in the Fuji WV film can even be divided into sublayers. As Dr. Drzaic explained, "[i]t is not the case that there are individual layers of molecules. The molecules that comprise the film form a continuous material with a high degree of local variability." { } Dr. Drzaic adds that "[a]ny choice of boundary between supposed 'layers' is completely arbitrary, with no physical or optical basis for making such a boundary selection." { } This high degree of variability is supported by the Takahashi paper discussing Fuji WV film. { .} Dr. Escuti offers no indication of how many sublayers are found in the DLC layer, how thick each sublayer is, or how one would determine where one sublayer ends and another begins. { } Moreover, Dr. Escuti has not offered sufficient evidence to support his claim that these alleged sublayers are uniaxial. { }

To support his sublayer theory, Dr. Escuti relies on the fact that { }

{

}

In responding to the criticism of {

}

{

}

Based on the foregoing, I find that Thomson failed to demonstrate that accused products literally meet the "uniaxial compensating means with negative birefringence" limitation of claims 4 and 7 and the "wherein the first birefringent layer has the property that it provides uniaxial negative birefringence" limitation of claim 14 because Thomson failed to show that the Fuji WV films are uniaxial under either of Dr. Escuti's two theories.

Doctrine of Equivalents

Thomson claims that if the "uniaxial compensating means with negative birefringence" and "wherein the first birefringent layer has the property that it provides uniaxial negative birefringence" limitations are not met literally, then they are satisfied under the doctrine of equivalents.

"An element of an accused product is equivalent to a claim limitation if the differences between the two are insubstantial, a question that turns on whether the element of the accused product 'performs substantially the same function in substantially the same way to obtain the same result' as the claim limitation." *Absolute Software, Inc. v. Stealth Signal, Inc.*, 659 F.3d 1121, 1139-1140 (Fed. Cir. 2011) (quoting *AquaTex Indus., Inc. v. Techniche Solutions*, 419 F.3d 1374, 1382 (Fed. Cir. 2005)). A patentee must "provide particularized testimony and linking argument...with respect to the function, way, result test when such evidence is presented to support a finding of infringement under the doctrine of equivalents." *Texas Instruments Inc. v. Cypress Semiconductor Corp.*, 90 F.3d 1558, 1567 (Fed. Cir. 1996).

Dr. Escuti testified that the function is "compensating for the residual positive birefringence of the liquid crystal layer through negative birefringence." { }

I find that using Dr. Escuti's sublayer theory, the Fuji WV film does not perform a function substantially the same as the one recited by Dr. Escuti. As Dr. Drzaic notes, an arbitrarily thin sublayer of the Fuji WV film will not perform the compensation function because "it would be far too thin to provide sufficient retardation to effectively serve as a compensator in a liquid crystal display." { }

The way that the Fuji WV film compensates is through the use of its hybrid structure that has no optical axis. { } I find that this is substantially different than the way that the claimed invention compensates, as the claimed invention provides compensation through a single optical axis. { } Dr. Escuti testified that the Fuji WV film performs the function is a substantially similar way because the Fuji WV film is "a compensation material that exhibits uniaxial negative birefringence along an inclined axis." { } This is just a repeat assertion from the literal infringement analysis, and I have already concluded that Fuji WV film is not a uniaxial negatively birefringent material. { }

Dr. Escuti further testified that if the Fuji WV film is determined not be uniaxial, it could still be considered uniaxial under the doctrine of equivalents if n2 and n3 are approximately equal. { } To support this assertion, Dr. Escuti again cites to the Yamahara article that found an n2-n3 difference of 0.0001. { } I do not concur with this analysis. First, Dr. Escuti relies on the Yamahara article, which I have already found is not a reliable piece of evidence because Yamahara's calculations are based on simplified modeling of the Fuji WV film. { }

Second, I find that Thomson's position would entirely vitiate the "uniaxial" limitation from the claims. "[A]n element of an accused product or process is not, as a matter of law, equivalent to a limitation of the claimed invention if such a finding would entirely vitiate the limitation." *Freedman Seating Co. v. Am. Seating Co.*, 420 F.3d 1350, 1358 (Fed. Cir. 2005). Accepting Thomson's position that a material where n2 is approximately equal to n3 can meet the "uniaxial" limitation would render the claim construction of "uniaxial" meaningless, as the adopted construction requires n2 and n3 to be equal.

Finally, Dr. Escuti testified that the Fuji WV film provides the same result as the claimed invention because they both improve the viewing angle and off-axis contrast ratio. { } by opining that the Fuji WV film does not provide the same result because the Fuji WV film produces substantially better compensation that the invention claimed in the'006 patent. { } I do not find Respondents' position persuasive. The '006 patent does not provide a specific measure or degree of improvement that is provided by the claimed invention. The '006 patent merely states that the invention "can be used to obtain a far more homogeneous contrast ratio in a wider angle of observation." { } The fact that the Fuji WV film may provide compensation superior to the invention of the '006 patent does not change the conclusion that both the Fuji WV film and the claimed invention provide an improved viewing angle and off-axis contrast ratio. { }

Based on the foregoing, I find that Thomson has failed to demonstrate that the Fuji WV film meets the "uniaxial" claim limitation under the doctrine of equivalents.

2. Qisda/BenQ

Thomson's Position: Thomson offers a single infringement argument that applies to AUO, CMI, and Qisda/BenQ. Therefore, Thomson's position described in Section VI.C.1 *supra*, is hereby incorporated by reference.

Qisda/BenQ's Position: Qisda/BenQ does not offer its own non-infringement arguments, and instead relies on the arguments offered by the other respondents.

Discussion and Conclusions: Based on the evidence in the record, I find that Thomson failed to prove that any BenQ/Qisda accused product infringes the asserted claims of the '006 patent.

Thomson's infringement argument against Qisda/BenQ is based on the assertion that Qisda and BenQ LCD displays include the accused AUO or CMI modules. (CX-4241C at Q. 278, 281.) For the reasons stated in Section VI.C.1 *supra*, I find that accused Qisda/BenQ products do not infringe any of claims 4, 7, or 14 of the '006 patent.

D. The '556 Patent

1. CMI

Thomson's Position: Thomson contends that products manufactured using CMI's 5 PEP process infringe claim 3 of the '556 patent.

{ }

{

}

Thomson contends that the CMI process meets all of the limitations of claim 2. (Citing CX4095C; CX-4244C at Q. 424, 450; CDX-812C; CDX-817C.) Thomson contends that the CMI process meets the limitation added by claim 3. (Citing CX-4095; CX-4244C at Q. 450; CDX-823C.)

CMI's Position: CMI contends that its accused products do not infringe claim 3 of the '556 patent.

{

}

{

}

{

}

Discussion and Conclusions: Based on the evidence in the record, I find that Thomson has failed to prove that CMI infringes claim 3 of the '556 patent.

The parties dispute whether or not CMI's accused products include an "etch stopper," as is required by claim 3. I construed "etch stopper" to mean "a structure that protects an underlying layer from being etched."

{

}

{

}

Based on the foregoing, I find that Thomson has failed to demonstrate that the accused CMI products include an "etch stopper." {

}

In addition, the parties dispute the limitation of claim 1 related to the formation of the source and drain electrodes. { } limitations are met in CMI's { } process: "a portion of each of the drain electrodes being formed over a first portion of a corresponding one of the etch stoppers" and "a portion of each of the source electrodes being formed over a second portion of the corresponding one of the etch stoppers." I construed "a portion of" to mean "a part less than the whole." I construed "source electrode" and "drain electrode" to each mean "an electrode of a transistor through which current can flow when a voltage greater than the threshold voltage of the transistor is applied to the gate electrode."

{ }

{

}

Because I have concluded that the accused CMI products lack an all of the limitations required by claim 3, I find that Thomson has failed to demonstrate that CMI infringes claim 3 of the '556 patent.

2. AUO

Thomson's Position: Thomson contends that products manufactured using {

} infringe claim 3 of the '556 patent. {

}

Thomson claims that the {

}

{

}

Thomson contends that the AUO processes meet all of the limitations of claim 2. { } Thomson contends that the AUO processes meet the limitation added by claim 3. { }

AUO's Position: AUO contends that products made using the { } do not infringe claim 3 of the '556 patent.

{

}

{

}

{ }

AUO asserts that Dr. Parsons created a new theory on the witness stand, claiming that the { } AUO states that this theory was never articulated in Dr. Parsons' witness statement or Thomson's pre-hearing brief. { } AUO argues that Dr. Parsons' new theory is flawed because { }

{

}

Discussion and Conclusions: Based on the evidence in the record, I find that Thomson has failed to prove that AUO infringes claim 3 of the '556 patent. Thomson has accused two separate AUO processes of infringement. I address each separately.

<u>AUO's { }</u>

The parties dispute whether or not the { } includes the step of "forming a plurality of etch stoppers over the plurality of gate electrodes using a second mask." I construed "etch stopper" to mean "a structure that protects an underlying layer from being etched." I find that Thomson has failed to demonstrate that { } forms a plurality of etch stoppers.

{

}

Thomson argues that because {

}

In addition, the parties dispute the limitation of claim 1 related to the formation of the source and drain electrodes. I find that Thomson has failed to demonstrate that the following limitations are met in AUO's {

}

{

}

{ }

Based on the foregoing, I find that Thomson failed to prove that the accused products made using the AUO { } infringe claim 3 of the '556 patent.

AUO's { }

The parties dispute whether or not accused products made using { } the limitation added by claim 3, which requires that "an etching rate of the passivation layer is at least an etching rate of the gate insulating layer." To support its assertion that AUO's { } meets this claim limitation, Thomson relies on a { } that does not disclose any information regarding etching rates. { } Thomson relies on the testimony of Dr. Parsons, who testifies that { }

{ } The first portion of testimony cited by Thomson, { }, was excluded at the hearing. { }[49]

I find that the next portion of testimony, { }, should be given no weight because the testimony is based on an exhibit that was excluded at the hearing, { }[50] To allow Thomson to rely on testimony that is derived from an exhibit that I have excluded from the hearing would circumvent my ruling excluding { }

---

[49] After the conclusion of the hearing, the parties amended { } to include a list of the excluded deposition designations. The testimony at page 195, lines 12 through 17 is on the list of excluded testimony. { }

[50] The cited testimony concerns { } Exhibit 52, which, according to AUO, is Exhibit { }

Even if I was to consider the testimony, I find that it does not demonstrate that all products made using the AUO { } meet the etching rate limitation. { } Such equivocal testimony is not sufficient to demonstrate by a preponderance of the evidence that the limitation of claim 3 is satisfied for all accused products made using the AUO { }

{ }[51]

It is unclear how this testimony relates specifically to the AUO { }, as the above-quoted passage is not specifically referencing { }

[51] I have omitted quoting the portion of the transcript where the interpreter notes that { } asked to have a question translated again. { }

{

} (emphasis added). Beyond this rather ambiguous testimony, Thomson cites to no documents or expert testimony to support its claim that the etching rate limitation is met.

Based on the foregoing, I find that Thomson failed to prove that the accused products made using the AUO { } infringe claim 3 of the '556 patent.

3. Qisda/BenQ

Thomson contends that Qisda and BenQ infringe claim 3 of the '556 patent, but it offers no distinct argument regarding Qisda and BenQ. Instead, Thomson's argument is directed solely to AUO and CMI processes. (CIB at 111-122.) Qisda and BenQ offer the following assertion:

> The Qisda and BenQ Respondents incorporate by reference the non-infringement arguments presented by the other Respondents (their component suppliers), who manufacture the allegedly infringing components of the finished LCD monitors sold by the Qisda and BenQ Respondents.

(QIB at 14.)

Because I have concluded that Thomson failed to prove that either AUO or CMI infringes claim 3 of the '556 patent, it follows that BenQ and Qisda do not infringe claim 3 of the '556 patent.

E. The '674 Patent

1. CMI

Thomson's Position: Thomson contends that the accused CMI modules infringe claims 1, 7,8, 9, 11, 13, 14, 16, 17, and 18 of the '674 patent.

Because of the similarity between independent claims 1 and 16, Thomson addressed those claims together. Thomson asserts that the CMI products use a glass substrate, which is a surface on which circuitry can be formed. (Citing JX-68C at 23:16-24:7; CX-4244C at Q. 483-490, 495-501, 504, 652-657, 660-666, 669; CX-2268 at Fig. 1.)

{

}

{

}

{

}

CMI's Position: CMI contends that the accused products do not infringe any of the asserted claims of the '674 patent.

{

}

{

}

{

}

Discussion and Conclusions: Based on the evidence in the record, I find that Thomson has proven by a preponderance of the evidence that the CMI Type 2 accused products using indium tin oxide infringe claims 1, 7, 8, 9, 11, 13, 14, 16, 17, and 18 of the '674 patent. Below, I address each category of CMI products.

{

}

CMI contends that Thomson's doctrine of equivalents argument is barred by prosecution history estoppel. Under the doctrine of equivalents, "a product or process that does not literally infringe upon the express terms of a patent claim may nonetheless be found to infringe if there is 'equivalence' between the elements of the accused product or process and the claimed elements of the patented invention." *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 21 (1997). However, infringement under the doctrine of equivalents is limited by prosecution history estoppel, which "prevents a patent owner from recapturing through the doctrine of equivalents subject matter surrendered to acquire the patent." *Duramd Pharm., Inc. v. Paddock Labs., Inc.*, 644 F.3d 1376, 1380 (Fed. Cir. 2011). Specifically, "[p]rosecution history estoppel serves to limit the doctrine of equivalents by denying equivalents to a claim limitation whose scope was narrowed during prosecution for reasons related to patentability." *Pioneer Magnetics, Inc. v. Micro Linear Corp.*, 330 F.3d 1352, 1356 (Fed. Cir. 2003).

"A patentee's decision to narrow his claims through amendment may be presumed to be a general disclaimer of the territory between the original claim and the amended claim." *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 740 (2002). "If the narrowing amendment was the addition of a new claim limitation…equivalents are presumptively not available with respect to that limitation." *Biagro Western Sales, Inc. v. Grow More, Inc.*, 423 F.3d 1296, 1305 (Fed. Cir. 2005).

The Supreme Court has provided that there are certain instances where "the patentee can overcome the presumption that prosecution history estoppel bars a finding of equivalence." *Festo*, 535 U.S. at 741. A patentee may overcome the presumption by showing that (1) "[t]he equivalent may have been unforeseeable at the time of the application;" (2) "the rationale underlying the amendment may bear no more than a tangential relation to the equivalent in question;" or (3) "there may be some other reason suggesting that the patentee could not reasonably be expected to have described the insubstantial substitute in question." *Id.* at 740-741.

The claims as originally filed required a third patterned conductive layer, but did not specify the material used to form the third patterned conductive layer. (*See, e.g.*, JX-7 at THOM00003617.) The original claims also required "a second patterned conductive layer that comprises highly conductive metal," but did not further specify the type of metal to be used. (*Id.* at THOM0003616.)

In response to an Office Action that rejected the pending claims under both 35 U.S.C. §§ 102 and 103, the applicants amended the claims. The applicants added the requirement that "the third patterned conductive layer being a layer of indium tin oxide," and that the second patterned conductive layer comprise "highly conductive metal other than indium tin oxide." (JX-7 at THOM00003723.) In making the amendments, the applicants explained the following:

> This combination of features therefore requires that a conductive element in an ITO layer contacts an exposed part of an electrode in a highly conductive non-ITO metal layer so that the ITO conductive element is electrically connected to a contact lead through the non-ITO electrode. This combination of features has the advantages that an ITO conductive element provides, including blocking injection of charge carriers into a selenium coating as described at page 31 last paragraph-page 32 first paragraph. This combination of features also has the simplicity and high switching speeds attainable by forming the lines, contact leads, and capacitor electrode in a single layer, as described at page 2 second paragraph and page 4 first paragraph.

(*Id.* at THOM00003715-16.) The applicants went on to argue that the asserted prior art "does not teach or suggest an ITO conductive element contacting an exposed part of a highly conductive non-ITO electrode as claimed." (*Id.* at THOM0003716.) The applicants claimed that the prior art references instead disclosed a conductive element contacting an electrode, where both the conductive element and the electrode were formed from the same material instead of different materials. (*Id.*)

Because the claims were narrowed through amendment in response to a prior art rejection, there is a presumption that prosecution history estoppel bars Thomson's doctrine of equivalents argument. *Festo*, 535 U.S. at 740. Thomson argues that it has overcome the presumption because the narrowing amendment does not bear anything more than a tangential relation to the equivalent in question. (CRB at 64 (citing *Festo*, 535 U.S. at 740-741).) Specifically, Thomson claims that "[t]he amendment was made to differentiate the two materials, not to exclude equivalents to ITO, { }" (CRB at 64.)

"The primary consideration in determining when an amendment bears only a tangential relation to the equivalent in question is 'whether the reason for the amendment is peripheral, or not directly relevant, to the alleged equivalent.'" *Terlep v. Brinkmann Corp.*, 418 F.3d 1379, 1385 (Fed. Cir. 2005) (quoting *Insituform Techs., Inc. v. CAT Constr., Inc.*, 385 F.3d 1360, 1370 (Fed. Cir. 2004)). "The tangential relation criterion for overcoming the *Festo* presumption is very narrow." *Honeywell Int'l, Inc. v. Hamilton Sundstrand Corp.*, 523 F.3d 1304, 1315 (Fed. Cir. 2008).

Here, the proposed equivalent is a third patterned conductive layer made from { } instead of indium tin oxide. (*See* CX-4244C at Q. 612, 784.) I do not find that the reason for the amendment is peripheral to the alleged equivalent. It is true, as Thomson argues, that the amendment was made to require that the second and third patterned conductive layers be made of different materials. (JX-7 at THOM0003716.) Yet, it is also true that instead of merely amending the claims to require that the second and third patterned conductive layers be formed from different highly conductive metals, the applicants amended the claims to require that the third patterned conductive layer be made from indium tin oxide. (JX-7 at THOM00003723.) In explaining the amendment, the applicants described the benefits provided by using indium tin oxide. (JX-7 at THOM0003715.) It is clear that the reason for the amendment certainly involved the inclusion of indium tin oxide as a claim limitation, and that the amendment was not offered solely to distinguish the metals used in the second and third patterned conductive layer. Because Thomson has not overcome the presumption that prosecution history estoppel applies, I find that Thomson's doctrine of equivalents argument is barred.[52]

Based on the foregoing, I find that Thomson has failed to prove that any accused CMI product that uses { } as the top conductive element does not infringe the asserted claims of the '674 patent, either literally or under the doctrine of equivalent.

---

[52] While Thomson did not argue that the use of { } as an equivalent was unforeseeable at the time of the application, I note that CMI offered credible evidence that one of ordinary skill in the art during the relevant time period would have known about { } as an alternative to indium tin oxide. (RX-635C at Q. 245-248.)

{

}

The asserted claims require both a "second contact lead" and a "second electrode." The asserted claims further require that "the second electrode [is] electrically connected to the second contact lead," and that "the second contact lead and the second electrode [are] joined in the second patterned conductive layer."

The specification provides insight into these claim elements. The term "lead" is expressly defined in the specification as "a part of a component at which the component is electrically connected to other components." (JX-2 at 5:32-33.) In describing Figure 1, the specification states: "[s]econd contact lead 24 joins and is therefore electrically connected to capacitor electrode 30, also in the patterned conductive layer." (*Id.* at 7:23-25.) Figure 1 depicts the following:

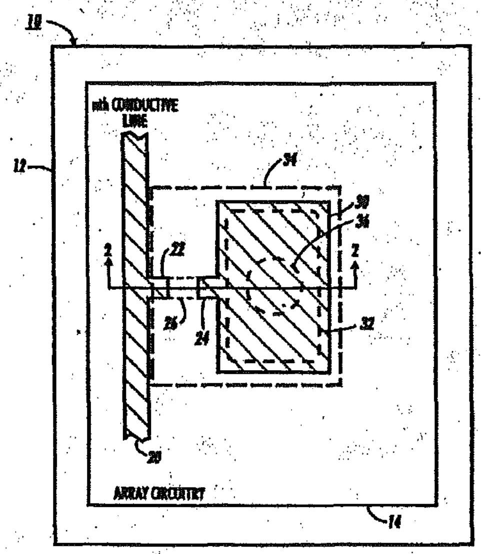

FIG. 1

(*Id.* at Fig. 1.)

Figure 2 shows the second contact lead (item 24) as a portion of the same structure identified as the capacitor electrode (item 30):

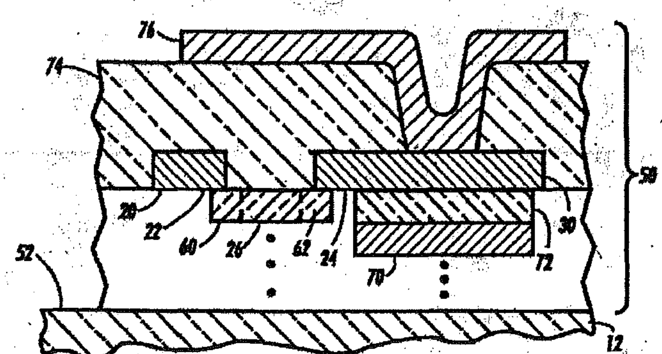

FIG. 2

(*Id.* at Fig. 2.) The specification explains that "conductive element 76 contacts capacitor electrode 30 and is electrically connected to second contact lead 24." (*Id.* at 7:60-63.) Likewise, Figure 4 shows the conductive element 230 in contact with the upper electrode 156. The second contact lead 152 is not separate or distinct from the upper electrode 156; the contact lead and the upper electrode are shown as two portions of the same structure:

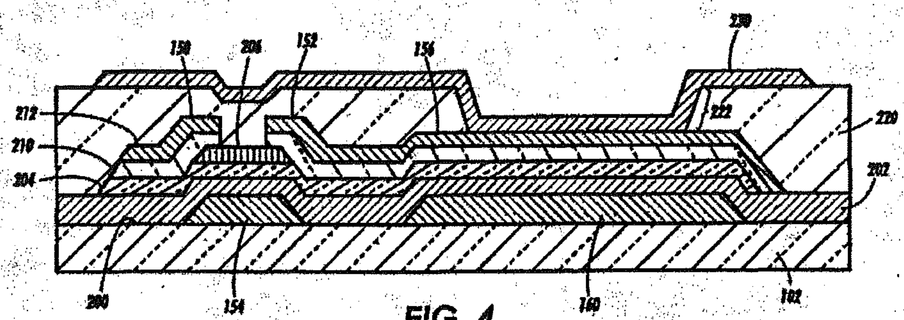

FIG. 4

(*Id.* at Fig. 4; *see also* Tr. at 525:7-526:23, 1208:13-1213:2.) Dr. Hatalis analogized the second electrode and second contact lead shown in Figure 4 to the upper and lower parts of a thigh bone. (Tr. at 1217:25-1218:23.) As Dr. Hatalis stated, "[s]o it is the same bone, but the two ends of it refer to different functions and different connections." (*Id.* at 1218:21-23.) Both Figure 2 and Figure 4 are consistent with the claim language requiring "the conductive element contacting the exposed part of the second electrode so that the conductive element is electrically connected to the second contact lead through the second electrode."

Based on the foregoing evidence, it becomes clear that the second contact lead and second electrode are two elements of the same structure. The patent defines a "lead" as "a part of a component," meaning that the lead is not intended to be a stand-alone structure. (JX-2 at 5:32-33.) The claims establish that the second contact lead and second electrode are "joined," meaning that they are not separate structures. Finally, Figures 1, 2, and 4 in the specification show that the second contact lead and second electrode are two parts of a singular structure.

CMI relies heavily on the Federal Circuit's decision in *Unique Concepts, Inc. v. Brown*, 939 F.2d 1558, 1561-1562 (Fed. Cir. 1991). I find that this case is factually distinguishable. There, the claim at issue made reference to two distinct elements: linear border pieces and right angle corner border pieces. The court rejected the patentee's claim that the same structure in the accused products met both claim limitations, reasoning that the claim language and specification made clear that linear border pieces and right angle border pieces must be distinct, different structures. As the court stated: "[l]inear border pieces are not right angle corner border pieces. Both types of pieces are required by the claim." *Id.* at 1562. In the current case, the intrinsic evidence shows that the second electrode and second contact lead may be two regions of the same structure, thus supporting the conclusion that CMI is incorrect in arguing that the two claim elements must refer to separate, distinct structures.

I find that Thomson has demonstrated that the CMI Type 2 accused products meet the following limitations concerning the "second contact lead" and "second electrode:" "the second electrode being electrically connected to the second contact lead;" "the second patterned conductive layer including the N conductive lines and the first and second contact leads and the second electrode of each unit of cell circuitry;" and "the second contact lead and the second electrode being joined in the second patterned conductive layer." {

}

---

[53] {

}

The second non-infringement argument offered by CMI is related to the argument discussed *supra*. CMI claims that the Type 2 accused products fail to meet the following limitation "the conductive element contacting the exposed part of the second electrode so that ***the conductive element is electrically connected to the second contact lead through the second electrode***." (emphasis added). According to CMI, this claim language requires an electrical connection from a starting point (the conductive element) to an end point (the second contact lead), through an intermediary element (the second electrode). {

}

CMI is correct in stating that the plain language of the asserted claims require that the electrical connection between conductive element and the second contact lead go through the second electrode. (JX-2 at 15:4-8, 18:23-26.) The claim language further requires that the conductive element contacts the exposed part of the second electrode. (*Id.*) This is also made clear in the specification, which states that "[t]he second contact lead connects electrically to the second electrode of the capacitive element, which in turn connects electrically to the conductive element." (*Id.* at 1:52-54; *see also* 2:1-5.) This configuration is apparent in Figures 2 and 4, shown above. (*Id.* at 7:60-63, Figs. 2, 4; Tr. at 525:7-526:23, 1208:13-1213:2.)

I find that Thomson has offered sufficient evidence to demonstrate that the Type 2 accused products meet the requirement that "the conductive element contact[s] the exposed part of the second electrode so that the conductive element is electrically connected to the second contact lead through the second electrode." CMI's argument hinges on its belief that the second contact lead and second electrode must be distinct structures. For the reasons described *supra*, the accused products may satisfy this claim limitation even though the second contact lead and second electrode are different parts of the same structure. Dr. Parsons' testimony and the images cited by Thomson show that the conductive element contacts the second electrode, thus forming an electrical connection between the conductive element and second contact lead through the second electrode. (CX-4244C at Q. 538, 554, 583-592, 604-607; CX-2268.)

The above arguments are the only two arguments offered by CMI to dispute the assertion that the CMI Type 2 accused products using indium tin oxide infringe independent claims 1 and 16. (CMIB at 79-85.) I have rejected both arguments. Thomson offers undisputed evidence that the remaining limitations of claims 1 and 16 are satisfied by the CMI Type 2 accused products using { } (*See* CX-4244C at Q. 477-490, 495-501, 504-536, 538-554, 560-567, 569-572, 575-601, 604-607, 651-657, 660-666, 669-706, 708-727, 733-773, 776-779; CX-2268.) Therefore, I conclude that Thomson has proven by a preponderance of the evidence that the CMI Type 2 accused products using { } infringe independent claims 1 and 16.

Thomson asserts that the accused CMI products also infringe a number of dependent claims. CMI offers no argument regarding why the accused products do not infringe the dependent claims. Therefore, based on the unrebutted evidence offered by Thomson, I find that Thomson has proven by a preponderance of the evidence that the CMI Type 2 accused products using { } infringe dependent claims 7, 8, 9, 11, 13, 14, 17, and 18.

Specifically, claim 7 depends from claim 1 and adds the requirement that the substrate is an insulator. Claim 8 depends from claim 7 and requires that the substrate is glass. Dr. Parsons testified that glass is used as the substrate, and that glass is a well-known insulator to those of ordinary skill in the art. (CX-4244C at Q. 613-619.)

Claim 9 depends from claim 1 and requires that the highly conductive metal identified in claim 1 is aluminum. {

}

Claim 11 depends from claim 1 and states that the "second patterned conductive layer includes first and second sublayers; the first sublayer including highly conductive metal; the second sublayer including a refractory metal different than the highly conductive metal." {

}

Claim 13 depends from claim 1 and requires that the "second insulating layer has an edge around the opening defined therein; the edge having a tapered profile." {

}

Claim 14 depends from claim 1 and requires that "the first and second conductive channel leads and the channel comprise amorphous silicon." {

}

Claim 17 depends from claim 16 and requires that "the first and second directions are perpendicular." Looking back at claim 16, the first and second directions refer to the directions of the scan lines and data lines, respectively. {

}

Claim 18 depends from claim 16 and requires that "the array circuitry defines a two-dimensional array." { }

Based on the foregoing, I find that Thomson has proven by a preponderance of the evidence that the CMI Type 2 accused products using indium tin oxide[54] infringe claims 1, 7, 8, 9, 11, 13, 14, 16, 17, and 18 of the '674 patent.

{ }

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[54] { .}

Based on the foregoing, I find that Thomson has failed to prove by a preponderance of the evidence that the CMI Type 1 products infringe any of the asserted claims of the '674 patent.

{

}

{

}

2. Qisda & BenQ

Qisda and BenQ do not offer their own independent non-infringement argument, instead stating that they "incorporate by reference the non-infringement arguments presented by the other Respondents {

} (QIB at 15.) For the same reasons as described in Section VI.E.1 *supra*, I find that any Qisda or BenQ product that incorporates a CMI Type 2 accused product { } infringes claims 1, 7, 8, 9, 11, 13, 14, 16, 17, and 18 of the '674 patent.

F. The '941 Patent

1. Realtek

Thomson's Position: Thomson contends that the accused Realtek products infringe claims 1 and 4 of the '941 patent.

Thomson asserts that the accused products meet the preamble of claim 1 because the accused products implement a method for controlling an LCD monitor, are capable of displaying input signals that include blanking intervals, and control picture elements in a line-by-line manner. (Citing CX-4243C at Q. 407-411; CX-1913C; CX-1956C; CX-1703C.) Thomson asserts that the accused products meet the "scanning" element of claim 1 because each accused product can read in picture information contained in input video signals. (Citing CX-4243C at Q. 418-440.)

{

} According to Thomson, {

}

Thomson states that the Realtek products meet the requirement that the number of control lines of the matrix display are greater than the number of lines of the video signal to be displayed. {

} Thomson claims that the Realtek products meet the ft/za ratio limitation. {

}

Thomson notes that claim 4 is an apparatus claim that is analogous to the method of claim 1. Thus, Thomson asserts that the Realtek accused products infringe claim 4 for the same reasons as offered with respect to claim 1.

Thomson notes that Realtek makes the argument that claim 4 is not infringed because the accused Realtek products do not come with an input video signal. Thomson asserts that Realtek's argument is contrary to Federal Circuit law that courts must take care to avoid reading process limitations into an apparatus claim. According to Thomson, claim 4 requires an apparatus capable of processing an input video signal, and does not require that the apparatus include the input video signal.

Realtek's Position: Realtek contends that the accused Realtek products do not infringe claims 1 or 4 of the '941 patent.

Realtek asserts that Thomson's infringement allegations are limited to Realtek-based products containing one of thirteen identified Realtek scaler chips. Realtek argues that the accused products do not infringe claims 1 or 4 because those claims require the presence of an input video signal. Realtek states that neither the Realtek scaler chips nor the Realtek-based products generate an input video signal, a fact that is not in dispute. (Citing RX-617C at Q. 38-69; RX-395C at Q. 248-249.) Realtek states that the input video signal can only be provided by an end user when the Realtek-based products are connected to a third-party video source. (Citing RX-617C at Q. 38-69; RX-395C at Q. 248-249; RX-618C at Q. 41-43.)

Realtek argues that a judgment of non-infringement should be entered if Respondents' proposed construction of "determined by" is adopted. (Citing Tr. at 691:17-692:1.) {

}

Realtek further argues that if Respondents' construction of the "time available" component of the second rate limitation is adopted, there is no infringement as a matter of law. (Citing Tr. at 691:8-16.)

{

}

Realtek asserts that the second rate limitation is not satisfied because Thomson failed to identify a pixel data rate in any of the Realtek chips. {

}

Realtek argues that under Respondents' claim construction positions, the claims require that upscaling occurs prior to the input video signal being stored in memory. {

}

Discussion and Conclusions: Based on the evidence in the record, I find that Thomson failed to prove by a preponderance of the evidence that the accused Realtek products directly infringe any of the asserted claims of the '941 patent.

The two asserted claims, claims 1 and 4, are similar in substance, but claim 1 is a method claim while claim 4 is an apparatus claim. Realtek argues that it cannot directly infringe either claim 1 or claim 4 because the Realtek products do not include the input video signal discussed in the claims.

I find that Thomson has failed to offer evidence of direct infringement of claim 1, the method claim. "A method claim is *directly* infringed only by one practicing the patented method." *Joy Techs., Inc. v. Glakt, Inc.*, 6 F.3d 770, 775 (Fed. Cir. 1993) (emphasis in original). In *Joy Techs.*, the court made clear that "the sale of equipment to perform a process is not a direct infringement of the process[.]" *Id.* at 774. Here, the infringement allegation is directed to Realtek's importation, sale for importation, or sale after importation of an apparatus that allegedly performs the claimed process. Because such actions do not constitute direct infringement of a method claim, I find that Thomson has failed to prove direct infringement of claim 1 by Realtek.

Moreover, the method of claim 1 requires manipulation of an input video signal. For example, claim 1 requires "scanning and storing in memory active portions of an input video signal at a first rate..." This step of the claimed method therefore can only be performed when the matrix display including the accused scaler chip is connected to an input video signal. The evidence demonstrates that the accused products do not include an input video signal, and that the input video signal is only present when the matrix display is connected to a video source such as a computer. (RX-617C at Q. 39-40.) Thomson does not offer any evidence of Realtek actually performing this method step by providing an input video signal. (*See* CIB at 161; CX-4243C at Q. 418-440.) Therefore, I find that there is no evidence that Realtek directly infringes the method of claim 1.

Realtek also argues that claim 4 cannot be infringed due to the lack of an input video signal. I do not concur. Claim 4 is directed to an "[a]pparatus for controlling a matrix display." (JX-5 at 8:6.) The apparatus itself does not include an input video signal, but performs certain actions when presented with an input video signal. (*Id.* at 8:6-32.) Therefore, for the infringement analysis, the inquiry is whether or not the accused Realtek products include all of the elements of the claimed apparatus; the fact that Realtek does not provide the input video signal is not relevant. *See Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1468 (Fed. Cir. 1990) ("[A]pparatus claims cover what a device *is,* not what a device *does.*")

I find that Thomson failed to prove that the accused Realtek products meet the "second rate" limitation of claims 1 and 4. Claim 1 requires "a second rate determined by the density of picture information to be displayed and the time available for display comprising active and inactive parts." Likewise, claim 4 requires "a second rate which is determined by the density of picture information to be displayed and from the time available for its display which includes time available for the active and inactive parts." I construed "a second rate determined by..." and "a second rate which is determined by..." to mean "a frequency equal to the density of picture information to be displayed divided by the time available for display comprising active and inactive parts."

{

}

{

} Moreover, Mr. Ferraro has conceded that if the adopted construction of "a second rate determined by…" is applied, he has no opinion regarding infringement. (Tr. at 691:17-692:1.) Therefore, I find that Thomson has failed to demonstrate that the accused Realtek products meet the "second rate" limitations of claims 1 and 4.

Based on the foregoing, I conclude that Thomson failed to prove by a preponderance of the evidence that Realtek directly infringes either claim 1 or claim 4 of the '941 patent.

2. MStar

Thomson's Position: Thomson contends that the accused MStar products infringe claims 1 and 4 of the '941 patent.

Thomson asserts that the accused products meet the preamble of claim 1 because the accused products implement a method for controlling an LCD monitor, are capable of displaying input signals that include blanking intervals, and control picture elements in a line-by-line manner. (Citing CX-4243C at Q. 260-269, 271-280; CX-1703.) Thomson asserts that the accused products meet the "scanning" element of claim 1 because {

} (Citing CX-4243C at Q. 282-310.)

Thomson claims that the accused products meet the first rate limitation because {

} (Citing CX-4243C at Q. 311-319.) According to Thomson, this rate corresponds to the density of picture information contained in the active portion of the input video signal because {

} (Citing CX-4243C at Q. 310.)

Thomson argues that the accused products meet the second rate limitation because the second rate is determined by the density of picture information to be displayed and the time available for display comprising active and inactive parts. (Citing CX-4243C at Q. 345-347.) Thomson offers { } to calculate the second rate. (Citing CX-4243C at Q. 330-349; CX-1801C.)

Thomson states that the MStar products meet the requirement that the number of control lines of the matrix display are greater than the number of lines of the video signal to be displayed. Thomson states that this element is met because { } (Citing CX-4243C at Q. 350-351; CX-1908C.) Thomson claims that the MStar products meet the ft/za ratio limitation. Thomson asserts that Mr. Ferraro provided a table showing { .} (Citing CX-4243C at Q. 359.)

Thomson notes that claim 4 is an apparatus claim that is analogous to the method of claim 1. Thus, Thomson asserts that the MStar accused products infringe claim 4 for the same reasons as offered with respect to claim 1.

MStar's Position: MStar contends that the accused products do not infringe claims 1 and 4 of the '941 patent. MStar asserts that there is no dispute that if Respondents' claim construction positions are adopted, there can be no direct infringement. (Citing Tr. at 631:1-8, 691:17-692:1.)

MStar states that the accused products are MStar display controller chips that are incorporated into LCD monitors. MStar asserts that the accused products do not meet the second rate limitation of claims 1 and 4 because { .} (Citing Tr. at 610:17-611:6, 611:24-612:4, 612:12-25, 614:3-7.) MStar argues that Thomson has conceded infringement if Respondents' construction of "time available for display" is adopted. (Citing Tr. at 631:1-8.) MStar argues that even if Thomson's proposed construction is adopted, there is still no infringement. MStar asserts that Mr. Ferraro's testimony fails to explain { } (Citing CX-4243C at Q. 347.) MStar states that Dr. Drabik's testing demonstrates { .} (Citing RX-559C at Q. 104-124; Tr. at 1510:17-1513:2.)

MStar argues that in its pre-hearing brief, Thomson raised a new infringement argument based on Respondents' construction of "the time available for display." MStar argues that this new argument is untimely and should be deemed waived. Even if the argument is considered, MStar asserts that Thomson's new argument is confusing, circular, and meritless.

MStar argues that the second rate limitation is not satisfied because { } the "density of picture information to be displayed," which the parties agree is the number of pixels on the matrix. (Citing Tr. at 632:1-6; CX-4243C at Q. 114.) MStar asserts that Mr. Ferraro's testimony at trial demonstrates that the { } (Citing Tr. at 633:15-634:9, 636:1-639:21.)

MStar argues that the second rate limitation is not satisfied under Respondents' construction because { } MStar notes that Thomson's expert concedes infringement if Respondents' proposed construction of "determined by" is adopted. (Citing Tr. at 691:17-692:1.) Even under Thomson's proposed construction of "determined by," MStar claims that Mr. Ferraro has conceded non-infringement. (Citing Tr. at 719:24-720:8.)

MStar argues that if the terms "stored information" and "video information stored in memory" are construed to require the memory to contain upscaled picture data, the accused products do not infringe because {

} (Citing RX-559C at Q. 168-169.)

Finally, MStar argues that there can be no direct infringement because the accused chips and LCD monitors containing those chips do not generate an input video signal. MStar asserts that because the claims require the presence of an input video signal, there is no infringement. (Citing RX-559C at Q. 136-149.)

Discussion and Conclusions: Based on the evidence in the record, I find that Thomson failed to prove by a preponderance of the evidence that the accused MStar products directly infringe any of the asserted claims of the '941 patent.

For the reasons described in Section VI.F.1 *supra*, I find that Thomson has failed to prove that MStar directly infringes the method of claim 1. Thomson offers no evidence of MStar performing the method of claim 1. I find that it is insufficient for Thomson to allege direct infringement of claim 1 based on MStar's importation, sale for importation, or sale after importation of an apparatus that can perform the method of claim 1. *Joy Techs.*, 6 F.3d at 774.

Claim 1 requires "a second rate determined by the density of picture information to be displayed and the time available for display comprising active and inactive parts." Likewise, claim 4 requires "a second rate which is determined by the density of picture information to be displayed and from the time available for its display which includes time available for the active and inactive parts." I construed "a second rate determined by..." and "a second rate which is determined by…" to mean "a frequency equal to the density of picture information to be displayed divided by the time available for display comprising active and inactive parts." I find that Thomson has failed to demonstrate that the accused MStar products meet the "determined by" limitations under the adopted construction.

Thomson points to the testimony of its expert, Mr. Ferraro, in claiming that the MStar products meet this claim limitation. Mr. Ferraro's testimony details {

} from the adopted construction, which requires "a frequency equal to the density of picture information to be displayed divided by the time available for display comprising active and inactive parts." (*Id.*) Specifically, it is clear that the second rate in the MStar products {

.} (*Id.*; RX-559C at Q. 130-135.) Mr. Ferraro has conceded that if the adopted construction of "a second rate determined by…" is applied, he has no opinion regarding infringement. (Tr. at 691:17-692:1.)

Based on the foregoing, I find that Thomson has failed to prove by a preponderance of the evidence that MStar directly infringes either claim 1 or claim 4 of the '941 patent.

3. CMI, Qisda, & BenQ

Thomson's direct infringement allegations against CMI, Qisda, and BenQ are based on the assertion that Qisda- and CMI-manufactured LCDs include the accused Realtek or MStar scaler chips. (CX-4243C at Q. 211.) Because I have concluded in Sections VI.F.1-2 *supra* that the accused MStar and Realtek chips do not directly infringe either claim 1 or claim 4 of the '941 patent, it follows that the identified Qisda- and CMI-manufactured LCDs including the accused Realtek or MStar chips do not directly infringe either claim 1 or claim 4 of the '941 patent.

4. Indirect Infringement

Thomson claims that CMI, BenQ, Qisda, MStar, and Realtek are liable for indirect infringement. As described in Sections VI.F.1-2 *supra*, I have found that Thomson failed to demonstrate any direct infringement of the asserted claims of the '941 patent. Without a showing of direct infringement, there can be no indirect infringement. *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1374 (Fed. Cir. 2003) (explaining that direct infringement "is a prerequisite to indirect infringement.") Therefore, I find that Thomson has failed to prove by a preponderance of the evidence that that CMI, BenQ, Qisda, MStar, or Realtek is liable for either contributory infringement or inducement.

VII. DOMESTIC INDUSTRY

A. Applicable Law

In patent-based proceedings under section 337, a complainant must establish that an industry "relating to the articles protected by the patent...exists or is in the process of being established" in the United States. 19 U.S.C. § 1337(a)(2) (2008). Under Commission precedent, the domestic industry requirement of Section 337 consists of an "economic prong" and a "technical prong." *Certain Data Storage Systems and Components Thereof*, Inv. No. 337-TA-471, Initial Determination Granting EMC's Motion No. 471-8 Relating to the Domestic Industry Requirement's Economic Prong (unreviewed) at 3 (Public Version, October 25, 2002).

The "economic prong" of the domestic industry requirement is satisfied when it is determined that the economic activities set forth in subsections (A), (B), and/or (C) of subsection 337(a)(3) have taken place or are taking place. *Certain Variable Speed Wind Turbines and Components Thereof*, Inv. No. 337-TA-376, USITC Pub. No. 3003, 1996 ITC LEXIS 556, Comm'n Op. at 21 (Nov. 1996). With respect to the "economic prong," 19 U.S.C. § 1337(a)(2) and (3) provide, in full:

> (2) Subparagraphs (B), (C), (D), and (E) of paragraph (1) apply only if an industry in the United States, relating to the articles protected by the patent, copyright, trademark, mask work, or design concerned, exists or is in the process of being established.
>
> (3) For purposes of paragraph (2), an industry in the United States shall be considered to exist if there is in the United States, with respect to the articles protected by the patent, copyright, trademark, mask work, or design concerned-
>
> (A) significant investment in plant and equipment;
>
> (B) significant employment of labor or capital; or
>
> (C) substantial investment in its exploitation, including engineering, research and development, or licensing.

Given that these criteria are listed in the disjunctive, satisfaction of any one of them will be sufficient to meet the domestic industry requirement. *Certain Integrated Circuit Chipsets and Products Containing Same*, Inv. No. 337-TA-428, Order No 10, Initial Determination (Unreviewed) (May 4, 2000), citing *Certain Variable Speed Wind Turbines and Components Thereof*, Inv. No. 337-TA-376, Commission Op. at 15, USITC Pub. 3003 (Nov. 1996).

To meet the technical prong, the complainant must establish that it practices at least one claim of the asserted patent. *Certain Point of Sale Terminals and Components Thereof*, Inv. No. 337-TA-524, Order No. 40 (April 11, 2005). "The test for satisfying the 'technical prong' of the industry requirement is essentially same as that for infringement, i.e., a comparison of domestic products to the asserted claims." *Alloc v. Int'l Trade Comm'n*, 342 F.3d 1361, 1375 (Fed. Cir. 2003). The technical prong of the domestic industry can be satisfied either literally or under the doctrine of equivalents. *Certain Excimer Laser Systems for Vision Correction Surgery and Components Thereof and Methods for Performing Such Surgery*, Inv. No. 337-TA-419, Order No. 43 (July 30, 1999).

A complainant who seeks to satisfy the domestic industry requirement by its investments in patent licensing must first establish that its asserted investment activities satisfy three requirements of section 337(a)(3)(C): that there is a nexus between relied upon investment activities and the asserted patents, that the investment relates to licensing, and that the investment occurred in the United States. *Certain Multimedia Display and Navigation Devices and Systems, Components Thereof, and Products Containing Same*, Inv. No. 337-TA-694, Commission. Op. at 7-8 (August 8, 2011) ("*Navigation Devices*"). Section 337(a)(3)(C) then requires the complainant to show that the qualifying investments are substantial. *Id.* at 8. Thus, where a complainant is relying on licensing activities, the domestic industry determination does not require a separate technical prong analysis and the complainant need not show that it or one of its licensees practices the patents-in-suit. *See Certain Semiconductor Chips with Minimized Chip Package Size and Products Containing Same*, Inv. No. 337-TA-605, Initial Determination at 112 (February 9, 2009) (unreviewed in relevant part).

B. Analysis

Thomson's Position: Thomson contends that it has made a substantial investment in its domestic licensing activities and those investments have a strong nexus to each of the asserted patents, to licensing, and to the U.S.

Thomson argues that it has identified over { } in US investments in its LCD licensing program, including { } on tasks specifically including one or more the asserted patents. (Citing CX-4245C at Q43-44, 140, 141, 181; CX-4246C at Q30-34, 41, 87-98, 110-113, 171-174.) Thomson further argues that these licensing investments have resulted in { } licenses { }. Thomson claims that each of those { } licenses includes the '006 and '941 patents and that { } of those licenses include the '063, '556, and '674 patents. (Citing CX-4245C at Q66-74, 183; CX-4246C at Q99-100.) Thomson also claims that its "investments are substantial based upon magnitude and successful exploitation of each of the Asserted Patents through licensing as shown by the number of licenses, the percent of the relevant markets licensed, and the over { } in royalties." (CIB at 182.)

Regarding Thomson's alleged { } investment in its LCD licensing program, Thomson identified the following expenditures: { } in employee costs; { } in facilities; { } for travel; { } in products for analysis; { } to acquire a portfolio of { } patents from Xerox including the '063, '556, and '674 patents; and { } in legal fees. (Citing CX-4247C at Q20-68; CX-270C-CX-287C; CX-293C-CX-307C; CX-351C-CX-353C; CX-4246C at Q143-167.) Thomson claims it may rely upon investments related to its LCD licensing program as a whole because the asserted patents have a nexus to the program and are important to the LCD patent portfolio. Alternatively, Thomson argues that its { } investments related specifically to the asserted patents are substantial on their own and include the following expenditures: { } in employee and facility costs; { } for travel; { } in products for analysis; { } for acquisition of the '063, '556, and '674 patents from Xerox; and { } for legal fees. (Citing CX-4245C at Q140-170; CX-4246C at Q174-175; CX-4247C at Q66, 69-98; CX-286C; CX-287C; CX-293C-CX-307C; CX-352C-CX-354C; CX-1047C-CX-1084C.)

{ } However, Thomson argues that a nexus exists between the licenses, the asserted patents and a significant portion of the royalties. (Citing CX-4246C at Q110, 132; CX-4245C at Q190-192.) {

}

Thomson further argues there is a strong nexus between each of the asserted patents and Thomson Licensing LLC's licensing activities. Thomson claims its LCD patent portfolio contains { } patents {

} Regarding the importance of the asserted patents, Thomson argues that the patents are important because they are discussed during negotiations, are base or pioneering patents, are infringed or practiced in the U.S., and the market recognizes their value. (Citing CX-4245C at Q33, 43, 44, 126-131, 154-169, 192, 203; CX-4246C at Q55-56, 61, 86, 113, 143-167; CX-289C; CX-290C; CX-4190C at 6-8; CX-4194C at 6-8; CX-267C.) {

}

Thomson also argues that its identified investments have a strong nexus to licensing. Regarding employee costs, Thomson claims that the employee groups for which expenditures were identified fill essential roles in Thomson's LCD licensing program. (Citing CX-4245C at Q91-93, 193-195; CX-4246C at Q197.) Regarding facility costs, Thomson claims the included expenditures cover U.S. office space where Thomson Licensing LLC's employees perform licensing work. (Citing CX-4245C at Q104-106, 193-195; CX-4246C at Q197.) Regarding included travel expenditures, Thomson claims such expenses are essential for meeting and negotiating with licensees and that the included travel costs used allocations for trips that included other business purposes beyond licensing. (Citing CX-4245C at Q113-114, 193-195;

CX-4246C at Q83, 199; CX-286C at 12, 14, 58-59, 122-123, 131-132, 136-137, 154.) Regarding the included product acquisition costs, Thomson claims that sample analysis is an essential aspect of its licensing practice. (Citing CX-4245C at Q120-121, 193-195; CX-4246C at Q80-83, 200.) Regarding Thomson's expenditure related to the acquisition of Xerox patents, Thomson argues this acquisition expenditure is a clear investment in licensing {

} Finally, Thomson argues that the included legal fees are a continuation of its licensing activities {

}

Thomson also argues that its relied upon licensing activities have a strong nexus to the United States. Thomson claims its licensing efforts involve personnel who live and work in the U.S.; Thomson Licensing LLC's offices are in New Jersey; all travel costs included are for U.S. employees; all products acquired for analysis were purchased in the U.S.; the Xerox patent acquisition occurred in the U.S.; and the included legal fees involve U.S. patents, attorneys, and experts. (Citing CX-4245C at Q62, 83-88, 91-93, 111-114, 120-121, 126-139, 154-169, 196-198; CX-4246C at Q12-14, 79, 88, 90, 143-167, 184-185, 187; CX-4247C at Q40-45, 48-55, 65-68; CX-295C; CX-296C; CX-303C; CX-304C; CX-305C; CX-306C; CX-351C.)

Thomson next argues that its expenditures are a substantial investment in the exploitation of the asserted patents through licensing. Thomson argues that the appropriate context for determining whether its expenditures represent a substantial investment "is the success of Thomson's licensing efforts as shown by the percent of the market licensed and royalties received." (CIB 195-196.) {

}Thomson also claims to have received { } in U.S. royalties. Thus, Thomson argues that its investment must be substantial because it has licensed { } and earned a significant return on its investment. (Citing CX-4245C at Q203, 205; CX-308C-337C.)

Respondents' Position: Respondents contend that Thomson has not met its burden of establishing that a domestic industry exists based on licensing.

Respondents first argue that Thomson's alleged expenditures related to the asserted patents do not qualify as a substantial investment. Respondents claim that from January 1, 2008 through June 30, 2010, Thomson's worldwide licensing expenditures totaled over { } and its US licensing expenditures totaled { } (Citing JX-60C at 235:18-236:4, 242:5-243:13; RX-626C at Q120, 121). Respondents claim that Thomson's alleged { } expenditure related to the asserted patents is negligible compared to Thomson's total worldwide or U.S. licensing expenditures. (Citing RX-626C at Q120-124.)

Regarding the amount of Thomson's expenditures applicable to the domestic industry determination, Respondents argue that the majority of expenditures relied upon by Thomson are not legally cognizable or adequately supported by the evidence of record. Respondents argue that the { } dollar amount cited by Thomson cannot be applied to establish domestic industry because it includes expenditures for all of Thomson's LCD licensing program. (Citing CX-4247C at Q24, 25; RX-626C at Q33; JX-60C at 44:8-56:5; RDX-1003.) Regarding Thomson's alleged { } expenditures related to the asserted patents, Respondents argue that this amount includes an arbitrary allocation of the { } Xerox patent purchase price and related due diligence costs. (Citing CX-4245C at Q155; CX-342C) Respondents also argue that the { } includes legal expenses for the present investigation that should not be considered a qualifying investment. Regarding employee costs, Respondents claim that Thomson employs the equivalent of { } people per year working full-time on activities related to licensing the asserted patents, which is { } of Thomson's U.S. employee base. (Citing RX-626C at Q133, 134.) Respondents claim that the appropriate amount of qualifying expenditures for the domestic industry analysis is at most { }, and Respondents claim this amount represents { } of Thomson's worldwide licensing expenses or { } of Thomson's U.S. licensing expenses. (Citing RX-626C at Q120, 122, 123.) {

}

Respondents also argue that Thomson has failed to prove that there is a strong nexus between its alleged investments and licensing of the asserted patents. {

} Respondents conclude that "[c]onsidering the large number of patents in the portfolio, the relatively minor value contributed by the asserted patents to the portfolio, the mere inclusion as opposed to particular prominence of the asserted patents in licensing discussions, negotiations, and resulting license agreements, and the scope of the portfolio compared to the scope of the asserted patents,... [Thomson] has not shown the requisite strength of the nexus between the asserted patents and the portfolio licensing activities and alleged investment." (QIB at 70.)

{

}

Discussion and Conclusions: Based on the evidence in the record, I find that Thomson has shown that its investments in employee costs, facility costs, travel costs, and product acquisition costs have a strong nexus to the asserted patents, are related to licensing, and occurred in the United States. I also find that these investments total approximately { } and represent a substantial investment in the exploitation of the asserted patents such that Thomson has met its burden to prove by a preponderance of the evidence that it has established a domestic industry pursuant to section 337(a)(3)(C) for the asserted patents based on its licensing activities.

Nexus to the Asserted Patents

The first issue to be considered is the strength of the nexus, if any, between Thomson's relied upon activities and the asserted patents.

The Commission has recently addressed the issue of the extent to which a complainant may rely on licensing activities directed to an entire patent portfolio to prove the existence of a domestic industry. *Navigation Devices*, Commission. Op. at 8. Where a complainant's activities are associated with asserted patents and unasserted patents, the strength of the nexus between the activities and the asserted patents is a key issue. *Id.* Regarding this issue, the Commission held that "[w]here the complainant's licensing and investments involve a group of patents or a patent portfolio, the complainant must present evidence that demonstrates the extent of the nexus between the asserted patent and the complainant's licensing activities and investments." *Id.* at 9. The Commission also provided guidance regarding the nature of evidence that may be considered in assessing this nexus including the number of patents in the portfolio, the relative value contributed by the asserted patent to the portfolio, the prominence of the asserted patent in licensing discussions, negotiations, and license agreements, and the scope of the technology covered by the portfolio compared to the scope of the asserted patent. *Id.* at 10. The Commission declined to adopt a policy whereby any investment in a patent portfolio would automatically be allocated in its entirety to every individual patent in the portfolio. *Id.* at 13. However, the Commission requires a case-by-case, fact-focused inquiry regarding whether such a nexus exists and the extent to which investment in a patent portfolio may be allocated to individual asserted patents, and thus, the Commission indicates that where a sufficiently strong nexus between investment in an entire portfolio and the asserted patents is shown, the entirety of that investment may be attributed to the asserted patents. *See Id.* at 13, 20-21.

Thomson Licensing LLC is a U.S. company with offices in Princeton, New Jersey whose primary business is to license the patents owned or controlled by Thomson Licensing SAS. (CX-4246C at Q. 12-17.) Thomson Licensing LLC and Thomson Licensing SAS are both subsidiaries of the French company Technicolor. (CX-4246C at Q. 18.) Thomson owned approximately 42,000 patents and patent applications worldwide as of December 31, 2009. (CX-420 Ex. 13 at 35.) Of these, approximately { } patents are part of its LCD licensing program. (RX-626C at Q. 30-31.) From January 1, 2008 through June 30, 2010, Thomson's worldwide expenditures on its licensing programs totaled over { } and its United States expenditures on its licensing programs totaled approximately { } (JX-60C at 235:18-236:4, 242:5-13.)

Stephen Samuels, Thomson Licensing LLC's President, identified the following steps in the licensing process related to Thomson's LCD licensing program: {

}

{

}

As part of its efforts to license its LCD patent portfolio, Thomson has repeatedly identified and discussed the asserted patents to potential licensees. In its communications with potential licensees, Thomson identified the following instances where the asserted patents were addressed: {

}

{

}

As a result of its licensing program, Thomson executes licenses {

} With respect to the LCD licensing program, Thomson has executed { } licenses { } that cover the '006 and '941 patents. (CX-4246C at Q. 100; CX-289C; CX-290C.) Further, { } of those licenses { } cover the '063, '556, and '674 patents. (*Id.*) Thomson has also executed { } release agreements { } that cover the '006 and '941 patents. (*Id.*) Since 2003, Thomson has received over { } in revenue from its licenses covering the patents-in-suit, including over { } collected from January 1 2008 to June 30, 2010 and over { } collected between 2003 and 2007. (CX-4246C at Q. 129; CX-4245C at Q. 184.) {

}

Based on the evidence of record, I find that there is a strong nexus between Thomson's licensing activities and the asserted patents such that Thomson may attribute the entirety of its LCD licensing program expenditures to the asserted patents. *See Navigation Devices*, Commission Op. at 13 (indicating that investments in a patent portfolio may be attributed to asserted patents where complainant has established a significantly strong nexus between the investments and the asserted patents). Thomson has sufficiently shown that the asserted patents are important to Thomson's LCD patent portfolio. Despite the portfolio including over { } patents and covering a broad scope of technology, each of the asserted patents has been repeatedly discussed and asserted in negotiations with potential licensees {

}

Cf. Navigation Devices, Commission Op. at 19 (finding an attenuated nexus between licensing activities and the asserted patents where the asserted patents were only occasionally referenced in negotiations and there was no showing regarding the relative importance or value of the asserted patents). I find that the value of the asserted patents is further demonstrated in the fact that through these negotiations, Thomson has executed over { } licenses covering the asserted patents generating revenue of more than {

.}

Respondents argue that the communications relied upon by Thomson also include many unasserted patents and that Thomson has not provided all of its licensing communications including those that do not reference one or more of the asserted patents. (*See* QIB at 68-69.) However, Thomson has shown that the asserted patents are important patents through their repeated assertion, regardless of the number of other patents from the portfolio that may also be mentioned in a specific communication. Further, Respondents appear to speculate that if the whole universe of Thomson's licensing negotiations were in the record, I would give little weight to those communications including the asserted patents. I decline to speculate regarding evidence that is not part of the record, and to the extent Respondents had concerns about

Complainant's "self-selected sample" (QIB at 68) of licensing communications, Respondents should have raised those concerns in a motion to compel discovery.

<u>Relates to Licensing</u>

Thomson has allocated its relied upon investments into categories including employee costs, facility costs, travel, acquisition of products to analyze, acquisition of Xerox portfolio, and legal expenditures. (CIB at 190-191.) Regarding employee costs, facility costs, and travel, I find that Respondents do not dispute that these expenditures relate to licensing. Rather, Respondents argue that Thomson's calculations regarding the amounts of these expenditures are inaccurate. (*See* QIB at 66.) The amount of each of these expenditures that is appropriate for consideration in this investigation is discussed below with respect to whether Thomson's expenditures are substantial. Regarding Thomson's product acquisition costs, legal expenses and Xerox portfolio acquisition, Respondents argue that they are not related to licensing.

Regarding product acquisition costs, Respondents argue in a footnote that Thomson has not shown that this expenditure is related to licensing. (QIB at 64, n. 22.) Debra Coto, the Controller of Thomson Licensing LLC, testified that Thomson spent approximately { } to acquire products to analyze with respect to patents within the LCD licensing program, based on a collection of Thomson's receipts, invoices, and bills in exhibit CX-307C from January 1, 2008 through June 30, 2010. (CX-4247C at Q. 56-58.) Respondents cite to no evidence in the record to support their argument that these product acquisition costs are not related to licensing. Thus, I find that Thomson has shown that its approximately { } product acquisition expenditure is related to licensing and specifically to Thomson's LCD licensing program.

Regarding the acquisition of the Xerox patent portfolio, Thomson seeks to include its expenditure of { } as a licensing-related expenditure. The Commission has recently provided insight regarding what type of pre-acquisition expenditures may be included in determining whether the domestic industry requirement has been satisfied. *See Certain Video Game Systems and Controllers*, Inv. No. 337-TA-743, Commission Op. at 6-9 (Apr. 13, 2011) ("*Video Game Systems*"). In *Video Game Systems*, the Commission found that section 337(a)(3)(C) is broad enough to cover investments made before the asserted patent was issued. *Id.* at 6. The Commission stated that "[n]either the language of the statute nor the legislative history preclude from consideration engineering and research and development investments that precede the issuance of the patent in determining whether a domestic industry exists or is in the process of being established." *Id.* at 7. Thus, the Commission states that "it may be appropriate to credit engineering and research and development investments that predate the issuance of a patent." *Id.* However, the Commission also states:

> Certain pre-issuance activities related to the patent may not be germane to the domestic industry requirement under the facts and circumstances established by the complainant in a particular investigation. For example, depending on the facts and evidence, a complainant may not be able to show that patent prosecution activities are related to its engineering, research and development, or licensing "exploitation" activities for the asserted patents within the meaning of section 337(a)(3)(C). *See Coaxial Cable Connectors,* at 46 (noting that "patent litigation activities alone do not constitute 'exploitation' under section 337(a)(3)(C)"). Because all United States patents must be prosecuted in the United States Patent and Trademark Office before they can issue as a patent, patent prosecution activities alone would be insufficient to establish the domestic industry requirement under section 337(a)(3)(C). *See Id.* at 45 ("Congress clearly stated that it did not intend mere [patent] ownership to constitute domestic industry."); S. REPT. No. 100-71 at 129-30; H. REPT. 100-41 at 157 ("mere ownership of a patent" is not sufficient).

Id. at 8 (citing *Certain Coaxial Cable Connectors and Components Thereof and Products Containing Same*, Inv. No. 337-TA-650, Commission Op. (Apr. 14, 2010) ("*Coaxial Cable Connectors*")) (footnote omitted). Thus, while the Commission suggests in *Video Game Systems* that patent prosecution activities could, depending on the evidence, count as investments in the exploitation of a patent, investments related merely to patent ownership do not constitute an investment in a domestic industry.

I find that Thomson has not shown that its expenditures related to acquiring the Xerox patent portfolio relate to licensing. Thomson has not shown that these expenditures are more than acquisition costs for obtaining the Xerox patent portfolio. {

. } Thomson's motivation is similar to most patent owners, who acquire patents, either through prosecution or purchase, for the purpose of exploiting them for financial gain. However, the Commission requires that these activities are actually related to licensing exploitation activities in order to be included in the domestic industry analysis. *See Video Game Systems*, Commission Op. at 8. I find that Thomson's Xerox patent acquisition expenditures are separate and distinct from its licensing expenditures because Thomson has not shown that these patent acquisition expenditures are related to the process of exploiting those patents through licensing.

Regarding Thomson's legal expenses, Thomson seeks to include over { } in legal fees as part of its investment in licensing the asserted patents. (CIB at 183.) Ms. Coto testified that these legal fees include over { } in costs related to this investigation, over { } in fees related to reexaminations of the '006, '674, and '556 patents, and more than { } in fees related to a stayed Delaware case. (CX-4247C at Q. 66.) Regarding litigation expenses, the Federal Circuit has held that patent litigation expenses do not automatically qualify as investments in the exploitation of a patent through licensing. *John Mezzalingua Associates, Inc. v. International Trade Comm'n*, 660 F.3d 1322, 1328 (Fed. Cir. 2011). A complainant must demonstrate a nexus between its litigation expenses and licensing, which can be established by showing that the complainant was in licensing negotiations before the suit was filed, the complainant made a concerted effort to license the patent, or the complainant has an established licensing program that includes litigation as a step toward executing a license agreement. *See Coaxial Cable Connectors* at 53-54. However, the Commission has also stated that with respect to this inquiry, "only activities that occurred before the filing of a complaint with the Commission are relevant to whether a domestic industry exists or is in the process of being established under sections 337(a)(2)-(3)." *Id.* at 51, n. 17 (citation omitted). Thus, I find it is inappropriate to consider expenses related to the current investigation that occurred after the filing of the complaint in the domestic industry analysis. I also find that Thomson has not established the extent to which the { } in legal fees was incurred before the filing of its complaint, and thus, I find that the entirety of this { } should be excluded from the domestic industry analysis.

Thomson cites *Certain Electronic Imaging Devices*, Inv. No. 337-TA-726, Order 18, at 14-15 (Feb. 7, 2011) (unreviewed) ("*Imaging Devices*")) to support its argument that it "is of no consequence" that these legal expenditures were incurred after it filed its complaint in this investigation. (CIB at 192.) That case is inapposite. In *Imaging Devices*, the complainant amended the complaint to include a new licensee and the administrative law judge found it appropriate to consider the domestic industry of the licensee at the time the amended complaint was filed. *Imaging Devices* at 14. After reviewing Commission precedent, the administrative law judge found the complainant was not precluded as a matter of law from "showing a domestic industry at times other than at the filing of the initial complaint." *Id.* at 15. Thus, the administrative law judge found it appropriate to consider activities after the original complaint was filed because the Commission allowed complainant to file an amended complaint and the complaint was amended to specifically include domestic industry related activities. *Id.* No such amendment to the complaint is at issue here.

In The United States

Regarding whether Thomson's licensing activities occurred in the United States, its licensing activities involved the efforts of Thomson Licensing LLC personnel who live and work in the U.S. (CX-4247C at Q. 40-45; CX-4246C at Q. 12-14; CX-4245C at Q. 62, 91-93.) Thomson's included facility expenses are for Thomson Licensing LLC's offices in Princeton, N.J. (CX-4247C at Q. 48-51, CX-303C-CX-306C; CX-295C.) Further, Thomson's travel costs included are for U.S.-based employees. (CX-4245C at Q. 111-114; CX-4247C at Q. 52-55; CX-286C.) Also, all products acquired for analysis were purchased in the U.S. (CX-4245C at Q. 120-121; CX-4246C at Q. 79.) Thus, I find that Thomson has established that each of these expenditures occurred in the United States.

Substantial Investment

Based on the foregoing, I find that the expenditures applicable to a determination of whether Thomson has made a substantial investment in licensing the asserted patents are expenditures related to employee costs, facility costs, travel, and acquisition of products for analysis that are related to the Thomson's LCD licensing program. Thomson argues that these expenditures include { } in employee costs, { } in facility costs, { } in travel, and { } in products for analysis. (CIB at 183.) Respondents do not dispute the { } amount of Thomson's product acquisition costs, but Respondents do dispute the accuracy of Thomson's expenditures related to employee costs, facility costs, and travel. (*See* QIB at 66.)

Ms. Coto testified that she used { } methods to calculate the percentage of time relevant employees devoted to the LCD licensing program:

{

} Based on these percentages, Ms. Coto calculated the portion of "the general costs associated with each employee" that related to the LCD licensing program. (*Id.* at Q. 32.) Based on this methodology, Ms. Coto determined that Thomson spent more than {

} on employee costs related to the LCD licensing program from January 1, 2008 to June 30, 2010. (*Id.* at Q. 29.) Ms. Coto further testified regarding how she determined Thomson's facility costs related to the LCD licensing program:

{

} By this method, Ms. Coto calculated more than { } in facility expenditures related to the LCD licensing program. (*Id.* at Q. 48.)

Regarding Thomson's alleged { } expenditure for travel, Ms. Coto testified that exhibit CX-286C is a spreadsheet compiled from travel expense records showing Thomson's total travel expenditure. (CX-4247C at Q. 53.) Ms. Coto testified that she compiled exhibit CX-286C from travel expense records {

}

Regarding Thomson's alleged employee and facility costs as calculated by Ms. Coto, Respondents argue that Ms. Coto's methodology is flawed {

} Respondents argue, without explanation, that this assumption is unreasonable. (*Id.*) Respondents also argue that

Thomson's travel expenses are overstated because it includes expenditures unrelated to the LCD licensing program. (QRB at 27.) In support of their argument, Respondents point to testimony of Mr. Samuels and Mr. Hausman regarding this calculation. (*Id.*) Significantly, Respondents chose not to cross-examine Ms. Coto regarding the methodology used or the bases for her calculations related to employee costs, facility costs, and travel expenses. I find that the methodology outlined in Ms. Coto's testimony indicates the expenditure totals calculated are reasonable and related to Thomson's LCD licensing program.

Based on the foregoing, I find that Thomson's expenditures that should be included in the analysis regarding whether Thomson's investments are substantial include { } in employee costs, { } in facility costs, { } in travel, and { } in products for analysis. Thus, I find that Thomson has invested a total of approximately { } in expenditures related to licensing the asserted patents.

Having determined the appropriate amount of Thomson's investment, the final issue to be considered is whether that amount represents a substantial investment in the exploitation of the asserted patents through licensing.

In *Navigation Devices*, the Commission adopted "a flexible approach" to determining whether an investment in licensing is substantial, "whereby a complainant whose showing in one or more of the three section 337(a)(3)(C) requirements is relatively weak may nevertheless establish that its investment is 'substantial' by demonstrating that its activities and/or expenses are of a large magnitude." Commission Op. at 15. The Commission listed the following factors that may be relevant in making this determination: the nature of the industry; the size and resources of the complainant; exploitation of the asserted patents by other means including research, development, or engineering; investment in license-related ancillary activities;

continued licensing activities of the complainant; whether the licensing activities were favorably referenced in the legislative history; and return on licensing investment. *Id.* at 15-16.

Based on the evidence of record, I find that Thomson's { } investment in expenditures related to licensing the asserted patents represents a substantial investment in the exploitation of those patents. First, Thomson's { } investment represents { } of its total U.S. licensing expenditures of { } of its worldwide licensing expenditures of over { }. (*See* JX-60C at 235:18-236:4, 242:5-13.) I find that this represents a substantial portion of Thomson's licensing expenditures in light of the fact that the LCD licensing program, which includes approximately { } patents, represents only approximately { } of Thomson's approximately 42,000 patents and patent applications.

I find that Thomson has also demonstrated the substantial nature of its investment in licensing the asserted patents through its continued licensing activities, its investment in ancillary license-related activities, and its return on investment. *See Navigation Devices*, Commission Op. at 15-16. {

} Finally, Thomson's licensing investment has resulted in the collection of over { } in revenue from its licenses covering the patents-in-suit, including over { } collected from January 1 2008 to June 30, 2010 and over { } collected between 2003 and 2007. (CX-4246C at Q. 129; CX-4245C at Q. 184.) I find that this return on investment is strong evidence that Thomson's investment is substantial.

VIII. REMEDY & BONDING

A. Limited Exclusion Order

Thomson's Position: Thomson contends that the Commission should issue a limited exclusion order against Respondents found to violate Section 337.

Thomson asserts that the limited exclusion order should not be restricted to specific models of accused products. According to Thomson, the Commission's long-standing practice is not to include specific model numbers in exclusion orders. Thomson further requests that the limited exclusion order include a certification requirement, so that Respondents will be required to certify that any LCD device or component imported into the United States does not infringe a patent-in-suit.

AUO's Position: AUO contends that Thomson is not entitled to a limited exclusion order against AUO because Thomson did not request this relief in its Complaint. AUO asserts that the Complaint only sought a limited exclusion order against BenQ and Qisda. AUO states that if Thomson is entitled to a limited exclusion order, the limited exclusion order should contain a certification provision.

CMI's Position: CMI contends that if there is a violation of Section 337, the appropriate remedy is the issuance of a limited exclusion order with a certification provision. CMI asserts that there is no dispute that a visual inspection will not permit Customs to determine whether or not a particular product is the subject of an exclusion order.

MStar's Position: MStar contends that Thomson is not entitled to a limited exclusion order against MStar because Thomson failed to request such a remedy in its Complaint. MStar asserts that any limited exclusion order should be limited to MStar chips that do not cooperate with an external DRAM, because these were the only products subject to Thomson's infringement allegations.

Realtek's Position: Realtek contends that if Thomson is entitled to a limited exclusion order, any such order should not cover the Realtek products for which Thomson failed to provide evidence of infringement. Specifically, Realtek claims that there are 61 scaler chips for which Thomson did not produce evidence of infringement. (Citing Tr. at 710:14-711:2.) Realtek asserts that any exclusion order should contain a certification provision.

Qisda/BenQ's Position: Qisda/BenQ contends that if Thomson is entitled to a limited exclusion order, any such order should be limited to products that have been found to infringe and are not licensed. Qisda/BenQ asserts that any exclusion order should include a certification provision.

Discussion and Conclusions: If the Commission finds a violation of Section 337, I recommend that the Commission issue a limited exclusion order that applies to the respondents found to infringe any of the asserted patents, as well as all of their affiliated companies, parents, subsidiaries, or other related business entities, or its successors or assigns, and covers the liquid crystal display devices, including monitors, televisions, and modules, and components thereof found to infringe the asserted patents.

I recommend that any exclusion order include a certification provision to allow Respondents to certify products that they may import notwithstanding a limited exclusion order. The Commission has explained that "[c]ertification provisions are generally included in exclusion orders where Customs is unable to easily determine by inspection whether an imported product violates a particular exclusion order." *Certain Semiconductor Chips With Minimized Chip Package Size & Products Containing Same*, Inv. No. 337-TA-605, Commission Opinion (July 29, 2009) (including a certification provision in an exclusion order because of the difficulty of determining whether imported products contain the infringing chipsets); *see also Certain Ground Fault Circuit Interrupters & Products Containing Same*, Inv. No. 337-TA-615, Commission Opinion (Mar. 26, 2009) (noting that a certification provision "gives U.S. Customs & Border Protection the authority to accept a certification from the parties that goods being imported are not covered by the exclusion order.") Here, because Customs would not be able to easily determine by inspection whether or not an imported product violates an exclusion order, I find that a certification provision is appropriate.

Certain Respondents argue that because Thomson did not expressly seek an exclusion order against them in Thomson's Complaint, I should not recommend the issuance of an exclusion order. I do not concur. Section 337 provides that, *inter alia*, "[i]f the Commission determines, as a result of an investigation under this section, that there is a violation of this section, it ***shall*** direct that the articles concerned, imported by any person violating the provision of this section, be excluded from entry into the United States..." 19 U.S.C. § 1337(d)(1) (emphasis added).[55] Thus, the statute mandates that the Commission issue an exclusion order upon the determination that there has been a violation of Section 337, regardless of whether or not Thomson included a request for such relief in its Complaint. *Gilda Indus., Inc. v. United States*, 446 F.3d 1271, 1282 (Fed. Cir. 2006) ("Statutory instructions using the term 'shall' are ordinarily treated as mandatory.")

B. Cease & Desist Order

Thomson's Position: Thomson contends that the Commission should issue a cease and desist order against Respondents because they are maintaining commercially significant levels of inventory within the United States.

{

} Thomson states that Qisda (Suzhou) Co. Ltd. has an inventory of { } with an estimated value of { } that it maintains for importation into, and are possibility warehoused within, the U.S. (Citing CX-379C at No. 9.) Thomson states that Qisda America has a U.S. inventory of { } with a value of { } (Citing CX-367C at No. 5.) Thomson states that BenQ Latin America has a U.S. inventory of { } with a value of { } (*Id.*)

AUO's Position: AUO contends that Thomson has failed to offer evidence to show that AUO maintains a commercially significant inventory of accused products in the United States.

CMI's Position: CMI contends that Thomson has failed to offer sufficient evidence to demonstrate that CMI maintains a commercially significant domestic inventory.

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[55] The statute does provide an exception to this rule, but the exception only relates to instances where the Commission finds that an exclusion order would be contrary to the public interest. 19 U.S.C. § 1337(d)(1).

CMI claims that Thomson failed to argue in its pre-hearing brief that a cease and desist order was necessary. CMI asserts that even if Thomson is allowed to raise the issue now, it has failed to offer sufficient evidence because Thomson only sought inventory numbers for all LCD devices, and not just those accused of infringement. CMI argues that there are CMI LCD devices that clearly do not infringe the asserted patents, and were not accused of infringement by Thomson.

CMI asserts that even if the entire inventory cited by Thomson comprised accused products, the inventory would still not be commercially significant. {

}

MStar's Position: MStar contends that Thomson has never requested a cease and desist order against MStar. Accordingly, MStar claims that Thomson is not entitled to a cease and desist order.

Realtek's Position: Realtek contends that Thomson has failed to offer evidence to show that Realtek maintains a commercially significant inventory of accused products in the United States.

Qisda/BenQ's Position: Qisda/BenQ contends that Thomson has failed to prove that each of the Qisda and BenQ respondents maintains a commercially significant inventory of accused products in the United States. Qisda/BenQ states that Thomson improperly relies on aggregated inventory figures, thereby including inventory maintained overseas. (Citing CPHB at 918-919.) In addition, Qisda/BenQ asserts that there is insufficient evidence regarding domestic inventory in the record because Dr. Hausman's testimony on the subject was stricken. (Citing Tr. at 76:22-78:10, 854:18-858:2.)

Discussion and Conclusions: If the Commission finds a violation of Section 337, I recommend the entry of a cease and desist order against Qisda America. I do not recommend the entry of a cease and desist order against any of the other Respondents.

Section 337 provides that the Commission may issue a cease and desist order as a remedy for violation of Section 337. *See* 19 U.S.C. § 1337(f)(1). The Commission generally issues a cease and desist order directed to a domestic respondent when there is a "commercially significant" amount of infringing, imported product in the United States that could be sold so as to undercut the remedy provided by an exclusion order. *See Certain Crystalline Cefadroxil Monohydrate*, Inv. No. 337-TA-293, USITC Pub. 2391, Comm'n Op. on Remedy, the Public Interest and Bonding at 37-42 (June 1991); *Certain Condensers, Parts Thereof and Products Containing Same, Including Air Conditioners for Automobiles*, Inv. No. 337-TA-334, Comm'n Op. at 26-28 (Aug. 27, 1997). The complainant bears the burden of proving that a respondent has a commercially significant inventory in the United States. *Certain Integrated Repeaters, Switches, Transceivers & Products Containing Same*, Inv. No. 337-TA-435, Comm'n Op., 2002 WL 31359028 (Aug. 16, 2002).

Thomson only offers inventory evidence with respect to CMI and Qisda/BenQ. I will address these respondents individually.

CMI

If the Commission finds a violation of Section 337, I do not recommend the entry of a cease and desist order against CMI. {

}

To support its position, Thomson cites to CMI's response to Thomson's Interrogatory No. 9. Thomson's Interrogatory No. 9 sought information regarding CMI's domestic inventory of "each LCD Device identified in [CMI's] response to Interrogatory No. 1, and any other LCD Device you are planning to import into the United States or that you plan will be imported into the United States by others for sale in the United States." (CX-461C.) Thomson's Interrogatory No. 1 sought identification of "each and every LCD Device that is manufactured, assembled, sold, offered for sale, sold for importation, imported into the United States or sold after importation into the United States." (CX-459C.)

{

}

Qisda/BenQ

Thomson seeks a cease and desist order against the following Qisda/BenQ entities: Qisda (Suzhou) Co. Ltd.; Qisda America; BenQ America; and BenQ Latin America. (CIB at 199.) If the Commission finds a violation of Section 337, I recommend the entry of a cease and desist order against Qisda America. I do not recommend the entry of a cease and desist order against Qisda (Suzhou) Co. Ltd.; BenQ America; and BenQ Latin America

{ }

With regard to Qisda America, Thomson cites to evidence that shows that Qisda America's domestic inventory as of May 3, 2011 was { } (CX-379C.)[56] Qisda/BenQ argues that Thomson has failed to establish that this snapshot of Qisda America's inventory on one day in May 2011 demonstrates that Qisda America maintains a commercially significant domestic inventory.

I find that Qisda America maintains a commercially significant domestic inventory. While Qisda/BenQ is correct in asserting that the inventory figure is from one point in time in May 2011, I find that such evidence is a reasonable proxy for the typical inventory maintained by Qisda America in the United States. Moreover, I find that Qisda America's inventory of over { } is commercially significant, regardless of the fact that Thomson did not

---

[56] To the extent that Qisda/BenQ argues that this inventory includes both accused and non-accused products, such an argument is undercut by Qisda/BenQ's interrogatory response, which clearly states that the listed inventory consists of LCD products "that Complainants have accused of infringement." (CX-379C at 99.)

suggest a standard as to what a "commercially significant" inventory amounts to in the LCD inventory.

With regard to BenQ America and BenQ Latin America, Thomson cites to evidence showing that as of March 31, 2011, BenQ America had a domestic inventory of { } products and BenQ Latin America had a domestic inventory of { }[57] (CX-367C.) For both BenQ entities, I find that such a small amount of domestic product does not amount to a "commercially significant" inventory. Moreover, this conclusion is further supported by the evidence that {

} (RX-315C at Q. 57-58.)

C. Bonding

Thomson's Position: Thomson contends that a bond is appropriate for Qisda, BenQ, and CMI because they directly import infringing products into the U.S.

Thomson claims that a bond is necessary to protect Thomson because Qisda, BenQ, and CMI sell infringing products in direct competition with products sold by Thomson licensees. (Citing CX-4245C at Q. 315-316.) Thomson asserts that CMI refused to participate in discovery regarding the bond amount, meaning that CMI's bond should be set at 100%. (Citing CX-398C at Nos. 83-85; CX-4245C at Q. 319.) Thomson asserts that for Qisda/BenQ, the following bond amounts should apply: { } per LCD monitor; { } per digital TV for screens smaller than 20.0"; { } per digital TV for screens of at least 20.0" but smaller than 32.0"; { } per digital TV for screens of at least 32.0" but smaller than 42.0"; and { } per digital TV for screens larger than 42.0". Thomson claims that these bond amounts are comparable to {

57 {

}

} (Citing CX-4245C at Q. 320-333; CX-349C; CX-400C through CX-403C; CX-131C through CX-213C; JX-20C through JX-23C.) Thomson argues that Qisda/BenQ's suggested bond of $1000 is insufficient because it would be substantially less than the { } Thomson would receive in revenue during that time period. (Citing CX-4245C at Q. 335-337.)

CMI's Position: CMI contends that Thomson failed to meet its burden with respect to bond.

CMI claims that Thomson had the necessary information to calculate a reasonable royalty rate and simply chose not to do so. According to CMI, Thomson never informed CMI that it lacked the necessary information to calculate a bond. CMI states that Thomson possessed information concerning CMI's market share and licenses with third parties. (Citing CX-4245C at Q. 288; CX-134C.) CMI asserts that Thomson could have readily obtained CMI's profit margin through publicly available sources.

Qisda/BenQ's Position: Qisda/BenQ contends that Thomson failed to carry the burden of proof in its request for a bond. Qisda/BenQ states that should a bond be recommended, it should be set at the amount of $1,000.

Qisda/BenQ argues that a bond is not necessary to protect Thomson because Thomson does not { } (Citing CX-4245C at Q. 316; CX-4246C at Q. 17-18; CX-4247C at Q. 10.) Qisda/BenQ further argues that Thomson failed to establish that { } (Citing CX-4245C at Q. 316.) According to Qisda/BenQ, this lack of competitive injury means that Thomson is not entitled to a bond.

Qisda/BenQ claims that even if Thomson could show that Qisda/BenQ would enjoy a competitive advantage during the bond period, a nominal bond of $1,000 is appropriate. Qisda/BenQ asserts that the analysis offered by Thomson to support its bond rates is unsupported by the fact and unreliable. {

}

Discussion and Conclusions: If the Commission finds a violation of Section 337, I recommend that no bond be required.

The administrative law judge and the Commission must determine the amount of bond to be required of a respondent, pursuant to section 337(j)(3), during the 60-day Presidential review period following the issuance of permanent relief, in the event that the Commission determines to order a remedy. The purpose of the bond is to protect the complainant from any injury. 19 CFR §§ 210.42(a)(1)(ii), 210.50(a)(3). The complainant has the burden of supporting any bond amount it proposes. *Certain Rubber Antidegradants, Components Thereof, and Products Containing Same*, Inv. No. 337-TA-533, Comm'n Op., 2006 ITC LEXIS 591 (Jul. 21, 2006).

When reliable price information is available, the Commission has often set the bond by eliminating the differential between the domestic product and the imported, infringing product. *See Certain Microsphere Adhesives, Processes for Making Same, and Products Containing Same, Including Self-Stick Repositionable Notes*, Inv. No. 337-TA-366, Comm'n Op. a 24 (1995). In other cases, the Commission has turned to alternative approaches, especially when the level of a reasonable royalty rate could be ascertained. *See, e.g., Certain Integrated Circuit Telecommunication Chips and Products Containing Same, Including Dialing Apparatus*, Inv. No. 337-TA-337, Comm'n Op. at 41 (1995).

The Commission has set a bond of 100% when the evidence supported a finding that it would be difficult or impossible to calculate a bond based on price differentials. *Certain Variable Speed Wind Turbines and Components Thereof*, Inv. No. 337-TA-376, Comm'n Op., 1996 WL 1056209 (Sept. 23, 1996) (finding that a bond of 100% was appropriate "because of the difficulty in quantifying the cost advantages of respondents' imported Enercon E-40 wind turbines and because of price fluctuations due to exchange rates and market conditions."); *Certain Systems For Detecting and Removing Viruses or Worms, Components Thereof, and Products Containing Same*, Inv. No. 337-TA-510, Comm'n Op., 2007 WL 4473083 (Aug. 2007) (imposing a bond of 100% based on a finding that the parties had numerous models and products lines, and that a price comparison would be difficult because respondent's products were a combination of hardware and software while the complainant's products were software only); *Certain Flash Memory Circuits and Products Containing Same*, Inv. No. 337-TA-382, USITC Pub. No. 3046, Comm'n Op. at 26-27 (July 1997) (a 100% bond imposed when price comparison was not practical because the parties sold products at different levels of commerce, and the proposed royalty rate appeared to be *de minimis* and without adequate support in the record).

Thomson only seeks a bond from CMI and Qisda/BenQ. I will address these respondents individually.

Qisda/BenQ

Thomson seeks a bond for Qisda/BenQ that is related to an alleged reasonable royalty for LCD monitors and LCD televisions. Thomson bases it bond amount on existing licenses in the industry. (*See* CX-4245C at Q. 320-333.)

I find that Thomson has failed to establish that a bond is appropriate. "The purpose of a bond during the Presidential review period is to offset any competitive advantage resulting from the alleged unfair acts enjoyed by persons benefitting from the importation of the articles in question." *Certain Silica-Coated Lead Chromate Pigments*, Inv. No. 337-TA-120, Views of the Comm'n (Apr. 21, 1983). {

}

While Thomson's argument makes sense in the abstract, Thomson offers no supporting details to back up its claim. Specifically, Thomson failed to identify the licensees in question, the terms of those specific licenses, and the products sold by the licensees. In addition, Thomson offered no evidence that these supposed products from the unnamed licensees actually compete with any of Respondents' products. In my view, Dr. Hausman's single unsupported opinion does not sufficiently demonstrate that a bond is necessary to prevent injury to Thomson. Therefore, I recommend no bond be required for Qisda/BenQ.

<u>**CMI**</u>

Thomson seeks a bond of 100% for CMI, asserting that CMI failed to participate in discovery regarding the appropriate bond amount. (*See* CIB at 199; CX-4245C at Q. 319.) I do not concur that a bond of 100% is appropriate.

For the reasons described supra, I find that Thomson has failed to show that a bond is necessary to protect Thomson from injury. Even if Thomson could make such a showing, Thomson has failed to show that a 100% bond is appropriate with respect to CMI. To support its claim that CMI failed to participate in discovery with regard to bonding, Thomson cites to CMI's responses to three interrogatories. The first interrogatory, Interrogatory No. 83, sought CMI's contention regarding the appropriate amount of the bond that should be imposed. (CX-398C.) CMI responded that it had no contention regarding the appropriate bond amount. (*Id.*) This response does not demonstrate that CMI refused to participate in discovery regarding bond, as CMI does not bear the burden on the issue of bond and is not required to offer any contention regarding the appropriate bond amount.

The second interrogatory, Interrogatory No. 84, sought an identification of "all license agreements to which you are a party that related to any CMI Product, or to any CMI LCD Component." (CX-398C.) The third interrogatory, Interrogatory No. 85, sought financial information such as gross and net sales figures, profit margins, and profits for "each CMI Product." (*Id.*) CMI refused to provide an answer to these interrogatories, and instead offered only objections, including an objection that each interrogatory was overly broad and unduly burdensome. (*Id.*) Neither party cites to any exhibit that offers the definitions for "CMI Product" or "CMI LCD Component."

I find that the fact that CMI responded to these interrogatories by objecting does not demonstrate that CMI refused to participate in discovery regarding the bond. While I do not have the definitions of "CMI Product" or "CMI LCD Component," it appears that both Interrogatory No. 84 and Interrogatory No. 85 were broad, and there is no evidence that CMI was not justified in raising such an objection. Thomson offers no evidence that it attempted to narrow the scope of the interrogatories in response to CMI's objections. Thomson also offers no evidence that it moved to compel CMI to provide substantive responses. Thomson cannot rely on CMI's objections to these interrogatories to prove that CMI outright refused to provide discovery regarding bonding. Because Thomson has the burden to prove the appropriate bond amount, I do not recommend the entry of a bond for CMI.

IX. MATTERS NOT DISCUSSED

This Initial Determination's failure to discuss any matter raised by the parties, or any portion of the record, does not indicate that it has not been considered. Rather, any such matter(s) or portion(s) of the record has/have been determined to be irrelevant, immaterial or meritless. Arguments made on brief which were otherwise unsupported by record evidence or legal precedent have been accorded no weight.

X. CONCLUSIONS OF LAW

1. The Commission has subject matter jurisdiction, *in rem* jurisdiction, and *in personam* jurisdiction.

2. There has been an importation into the United States, sale for importation, or sale within the United States after importation of the accused liquid crystal display devices, including monitors, televisions, and modules, and components thereof which are the subject of the alleged unfair trade allegations.

3. Thomson has satisfied the domestic industry requirement pursuant to 19 U.S.C. § 1337(a)(3)(C) for U.S. Patent Nos. 5,978,063; 5,375,006; 5,621,556; 5,648,674; and 6,121,941.

U.S. Patent No. 5,978,063

4. Claims 1, 2, 3, 4, 8, 11, 12, 14 and 18 of U.S. Patent No. 5,978,063 are invalid pursuant to 35 U.S.C. § 103.

5. Claim 17 of U.S. Patent No. 5,978,063 is not invalid.

6. Claims 1, 2, 3, 4, 8, 11, 12, 14, 17, and 18 of U.S. Patent No. 5,978,063 are not infringed by AUO, CMI, Qisda, or BenQ.

7. There is no violation of 19 U.S.C. § 1337(a)(1) with respect to U.S. Patent No. 5,978,063.

U.S. Patent No. 5,375,006

8. Claims 4 and 14 of U.S. Patent No. 5,375,006 are invalid pursuant to 35 U.S.C. § 102.

9. Claim 7 of U.S. Patent No. 5,375,006 is not invalid.

10. Claims 4, 7, and 14 of U.S. Patent No. 5,375,006 are not infringed by AUO, CMI, Qisda, or BenQ.

11. There is no violation of 19 U.S.C. § 1337(a)(1) with respect to U.S. Patent No. 5,375,006.

U.S. Patent No. 5,621,556

12. Claim 3 of U.S. Patent No. 5,621,556 is not invalid.

13. Claim 3 of U.S. Patent No. 5,621,556 is not infringed by AUO, CMI, Qisda, or BenQ.

14. There is no violation of 19 U.S.C. § 1337(a)(1) with respect to U.S. Patent No.

5,621,556.

U.S. Patent No. 5,648,674

15. Claims 1, 7, 8, 9, 11, 13, 14, 16, 17, and 18 of U.S. Patent No. 5,648,674 are not invalid.

16. Claims 1, 7, 8, 9, 11, 13, 14, 16, 17, and 18 of U.S. Patent No. 5,648,674 are not infringed by the CMI accused products including the Type 1 Array Circuitry, Type 3 Array Circuitry, Type IZO Array Circuitry, or any Qisda or BenQ accused products incorporating these CMI accused products.

17. Claims 1, 7, 8, 9, 11, 13, 14, 16, 17, and 18 of U.S. Patent No. 5,648,674 are infringed by the CMI accused products including the Type 2 Array Circuitry and any Qisda or BenQ accused product incorporating these CMI accused products.

18. The finding of infringement does not apply to the Qisda-manufactured G2200W LCD monitor, because Qisda & BenQ have established that it is a covered by a valid license.

19. There is a violation of 19 U.S.C. § 1337(a)(1) with respect to U.S. Patent No. 5,648,674.

U.S. Patent No. 6,121,941

20. Claims 1 and 4 of U.S. Patent No. 6,121,941 are not invalid.

21. Claims 1 and 4 of U.S. Patent No. 6,121,941 are not infringed by Realtek, MStar, CMI, Qisda, or BenQ.

22. There is no violation of 19 U.S.C. § 1337(a)(1) with respect to U.S. Patent No. 6,121,941.

XI. ORDER

Based on the foregoing, and the record as a whole, it is my Final Initial Determination that there is a violation of 19 U.S.C. § 1337(a)(1) in the importation into the United States, sale for importation, and the sale within the United States after importation of certain liquid crystal display devices, including monitors, televisions, and modules, and components thereof.

I hereby **CERTIFY** to the Commission my Final Initial and Recommended Determinations together with the record consisting of the exhibits admitted into evidence. The pleadings of the parties filed with the Secretary, and the transcript of the pre-hearing conference and the hearing, as well as other exhibits, are not certified, since they are already in the Commission's possession in accordance with Commission rules.

It is further **ORDERED** that:

In accordance with Commission Rule 210.39, all material heretofore marked *in camera* because of business, financial and marketing data found by the administrative law judge to be cognizable as confidential business information under Commission Rule 201.6(a), is to be given *in camera* treatment continuing after the date this investigation is terminated.

The initial determination portion of the Final Initial and Recommended Determination, issued pursuant to Commission Rule 210.42(a)(1)(i), shall become the determination of the Commission sixty (60) days after the service thereof, unless the Commission, within that period, shall have ordered its review of certain issues therein, or by order, has changed the effective date of the initial determination portion. If the Commission determines that there is a violation of 19 U.S.C. § 1337(a)(1), the recommended determination portion, issued pursuant to Commission Rule 210.42(a)(1)(ii), will be considered by the Commission in reaching a determination on remedy and bonding pursuant to Commission Rule 210.50(a).

Within ten days of the date of this document, each party shall submit to the Office of the Administrative Law Judge a statement as to whether or not it seeks to have any portion of this document deleted from the public version. The parties' submissions must be made by hard copy by the aforementioned date and must include a copy of this document with red brackets indicating any portion asserted to contain confidential business information to be deleted from the public version. The parties' submission concerning the public version of this document need not be filed with the Commission Secretary.

SO ORDERED.

Issued: 1/12/2012
DATE

Robert K. Rogers, Jr.
Administrative Law Judge

CERTAIN LIQUID CRYSTAL DISPLAY DEVICES, INCLUDING MONITORS, TELEVISIONS, AND MODULES, AND COMPONENTS THEREOF

Inv. Nos. 337-TA-749
337-TA-741

PUBLIC CERTIFICATE OF SERVICE

I, James R. Holbein, hereby certify that the attached **ORDER** was served upon the following parties via first class mail delivery on February 28, 2012

James R. Holbein, Secretary
U.S. International Trade Commission
500 E Street SW, Room 112A
Washington, D.C. 20436

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FOR RESPONDENTS BENQ AMERICA CORPORATION, BENQ CORPORATION, BENQ LATIN AMERICA CORPORATION, QISDA AMERICA CORPORATION, QISDA CORPORATION, AND QISDA (SUZHOU) CO., LTD.:

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CERTAIN LIQUID CRYSTAL DISPLAY DEVICES, INCLUDING MONITORS, TELEVISIONS, AND MODULES, AND COMPONENTS THEREOF

Inv. Nos. 337-TA-749
337-TA-741

PUBLIC CERTIFICATE OF SERVICE PAGE 2

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CERTAIN LIQUID CRYSTAL DISPLAY DEVICES, INCLUDING MONITORS, TELEVISIONS, AND MODULES, AND COMPONENTS THEREOF

Inv. Nos. 337-TA-749
337-TA-741

PUBLIC CERTIFICATE OF SERVICE PAGE 3

PUBLIC MAILING LIST

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