

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CHONGQING HKC OPTOELECTRONICS TECHNOLOGY CO., LTD.,
Petitioner,

v.

138 EAST LCD ADVANCEMENTS LIMITED,
Patent Owner.

IPR2023-00475
Patent 7,116,390 B2

Before DONNA M. PRAISS, CHRISTOPHER M. KAISER, and
WESLEY B. DERRICK, *Administrative Patent Judges*.

DERRICK, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Petitioner Chongqing HKC Optoelectronics Co., Ltd., filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 1–13 of U.S. Patent No. 7,116,390 B2 (Ex. 1001, “the ’390 patent”). Patent Owner 138 East LCD Advancements Limited (“Patent Owner”) filed a Preliminary Response (Paper 7, “Prelim. Resp.”).

We have authority to determine whether to institute an *inter partes* review. *See* 35 U.S.C. § 314(b); 37 C.F.R. § 42.4(a). To institute an *inter partes* review, we must determine that the information presented in the Petition shows that there is “a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). We deny *inter partes* review, for example, where a petition fails to identify “with particularity” the challenges or evidence supporting them. *Harmonic Inc. v. Avid Tech.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) as “requiring [*inter partes* review] petitions to identify ‘with particularity . . . the evidence that supports the grounds for the challenge to each claim’”); *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (“It is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify ‘with particularity’ the ‘evidence that supports the grounds for the challenge to each claim.’” (quoting 35 U.S.C. § 312(a)(3))).

For the reasons discussed below, we deny institution of *inter partes* review.

A. Real Parties in Interest

Petitioner identifies HKC Corp. Ltd., Chongqing HKC Optoelectronics Technology Co., Ltd., and HKC Overseas Ltd., as real

parties in interest. Pet. 86. Patent Owner identifies itself (Paper 3, 1), Crystal Leap Zrt (Paper 6, 1), and Longitude Licensing Limited (Paper 8, 1) as real parties in interest. Paper 3, 1; Paper 6, 1; Paper 8, 1.

B. Related Proceedings

The Parties identify *Crystal Leap Zrt v. HKC Corp. Ltd., Chongqing HKC Optoelectronics Technology Co., Ltd., and HKC Overseas Ltd.*, Case No. 2:22-cv-00382 (E.D. Tex.), as a related Proceeding. Pet. 86; Paper 3, 1; Paper 6, 1; Paper 8, 1.

C. The '390 Patent

The '390 patent is titled “Electro-Optical Device and Electronic Apparatus Comprising the Same” and is directed to “an electro-optical device that . . . include[s], in a peripheral region of the image display region on the element substrate, a plurality of external circuit connection terminals, a plurality of main wiring lines each having one end connected to each of the plurality of external circuit connection terminals, and peripheral driving circuits connected to the other ends of the main wiring lines.” Ex. 1001, codes (54), (57).

The '390 patent relates to a liquid crystal display (LCD) device that includes built-in peripheral driving circuits formed on a first substrate (“element substrate”) and counter electrodes formed on a second substrate (“counter substrate”), with liquid crystal (LC) molecules sandwiched between the element substrate and counter substrate. *Id.* at 1:8–12, 2:36–51, 8:66–9:3, 9:13–17. The device produces images by controlling and applying voltages to LC molecules between the substrates, as the LC molecules transmit light differently depending on the electric field applied to them. *Id.* at 2:36–57, 10:55–65. In particular, circuitry and wiring to control and apply voltages to thin film transistors (TFTs) that supply voltages to pixel

electrodes are provided on the element substrate with the counter substrate including counter electrodes. *Id.* at 1:10–11, 2:48–51. The '390 patent discloses a particular arrangement of main wiring lines in the peripheral region of an image display region to reduce mutual noise (interference) between components so that a smaller device can be made. *Id.* at 1:33–40, 2:15–20.

D. Challenged Claims

Petitioner challenges claims 1–13 of the '390 patent. Pet. 1. Independent claim 1 is illustrative of the subject matter at issue and is reproduced below:

1. An electro-optical device, comprising:
 - a plurality of pixel portions provided in an image display region on an element substrate;
 - in a peripheral region of the image display region on the element substrate, a plurality of external circuit connection terminals, a plurality of main wiring lines each having one end coupled to each of the plurality of external circuit connection terminals, and peripheral driving circuits coupled to the other ends of the main wiring lines, the peripheral driving circuits driving the pixel portions based on electric signals supplied from the external circuit connection terminals through the main wiring lines,
 - a counter electrode provided in the peripheral region on a counter substrate that is arranged to face the element substrate;
 - a counter electrode potential line that supplies counter electrode potential to the counter electrode, which is at least one of the plurality of main wiring lines,
 - upper and lower conduction terminals that are provided in the peripheral region on the element substrate, and that are connected to the counter electrode potential line,

the plurality of main wiring lines being made of a same conductive film and being planarly laid out so as not to intersect each other in the peripheral region; and

the counter electrode potential line being closest to edges of the element substrate, among the plurality of main wiring lines.

Ex. 1001, 21:52–22:12.

E. The Asserted Grounds of Unpatentability

Petitioner asserts that claims 1–13 are unpatentable on the following grounds:

Reference(s)/Basis ¹	35 U.S.C. § ²	Claim(s) Challenged
Muraide, ³ Sunao ⁴	103	1–11, 13
Muraide, Komeno ⁵	103	1–11, 13
Muraide, Sunao, Murade III ⁶	103	2, 3, 12
Muraide, Komeno, Murade III	103	2, 3, 12
Fujikawa ⁷	102	1–5, 7, 8, 11, 13
Murade II, ⁸ Sunao	103	1, 4–11, 13

¹ The Petition sets forth certain grounds relying on Sunao and Komeno in the alternative; each of these combinations are listed separately for clarity.

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 103, effective March 16, 2013. Because the ’390 patent was filed before this date, the pre-AIA version of § 103 applies. Ex. 1001, code (22).

³ Muraide, JP2002049052A, published Feb. 15, 2002, with exhibit including certified English language translation. Ex. 1005.

⁴ Sunao, JP2002196311A, published July 12, 2002, with exhibit including certified English language translation. Ex. 1006.

⁵ Komeno, US 2003/0063248 A1, published Apr. 3, 2003. Ex. 1009

⁶ Murade, US 6,433,767 B1, issued Aug. 13, 2002. Ex. 1010 (Murade III).

⁷ Fujikawa, US 2003/0174271 A1, published Sep. 18, 2003. Ex. 1007.

⁸ Murade, US 6,262,702 B1, issued July 17, 2001. Ex. 1008 (Murade II).

Reference(s)/Basis ¹	35 U.S.C. § ²	Claim(s) Challenged
Murade II, Komeno	103	1, 4–11, 13
Murade II, Sunao, Murade III	103	2, 3, 12
Murade II, Komeno, Murade III	103	2, 3, 12

Petitioner relies on the Declaration of Carl Sechen, Ph.D. (Ex. 1002) in support of its challenge.

II. ANALYSIS

We consider the merits of the challenges set forth by Petitioner and determine that Petitioner has failed to meet its burden for institution of an *inter partes* review. Accordingly, we do not consider whether it would be appropriate to decline institution in our discretion under § 314(a).

A. *Level of Ordinary Skill in the Art*

In determining the level of skill in the art, we consider the type of problems encountered in the art, the prior art solutions to those problems, the rapidity with which innovations are made, the sophistication of the technology, and the educational level of active workers in the field. *See Custom Accessories, Inc. v. Jeffrey-Allan Industries, Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986); *Orthopedic Equip. Co. v. United States*, 702 F.2d 1005, 1011 (Fed. Cir. 1983).

Petitioner contends that a person of ordinary skill in the art “would have either a bachelor’s degree in electrical or computer engineering with three years of experience in the field of display technology or a master’s degree with one year of experience in the field of display technology.” Pet. 8 (citing Ex. 1002 ¶¶ 38–41). Patent Owner, “[f]or purposes of th[e]

Preliminary Response . . . does not dispute the level of skill for a person of ordinary skill in the art.” Prelim. Resp. 18.

On this record, we find Petitioner’s definition of the level of ordinary skill reasonable and, therefore, adopt it for the purposes of this Decision.

B. Claim Construction

We apply the claim construction standard articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). See 37 C.F.R. § 42.100(b) (2020). Under *Phillips*, claim terms are afforded “their ordinary and customary meaning.” *Phillips*, 415 F.3d at 1312. “[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.” *Id.* at 1313. Only terms that are in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

Petitioner contends “that the Board need not provide a specific construction for any particular term as the prior art renders the claims unpatentable under any reasonable interpretation of the terms.” Pet. 9 (citing Ex. 1002 ¶¶ 42–43). Patent Owner contends that “[n]o claim terms require express construction” for purposes of this decision and “that the claims should be given their ordinary and customary meaning in light of the specification and prosecution history, as understood by a person of ordinary skill in the art.” Prelim. Resp. 18.

On this record, as detailed below, the construction of claim terms is determinative, although we decline to construe any claim terms beyond the limited extent we do so below in our analysis, because it is not necessary to do so in reaching our Decision on Institution.

C. Principles of Law

Petitioner challenges claims under 35 U.S.C. §§ 102 and 103.

A claim is anticipated under § 102 “only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. Inc., v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987). That “reference [must] ‘describe the claimed invention *with sufficient precision and detail* to establish that the subject matter existed in the prior art” and, “[f]or this reason, it has long been understood that ambiguous references do not, as a matter of law, anticipate a claim.” *Wasica Fin. GmbH v. Cont’l Auto Sys., Inc.*, 853 F.3d 1272, 1284 (Fed. Cir. 2017) (quoting *Verve, LLC v. Crane Cams, Inc.*, 311 F.3d 1116, 1120 (Fed. Cir. 2002); citing *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1554 (Fed. Cir. 1983)).

A claim is unpatentable under 35 U.S.C. § 103 if “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) if in evidence, objective evidence of nonobviousness, i.e., secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic*, 815 F.3d at 1363 (citing 35 U.S.C. § 312(a)(3) as

“requiring [*inter partes* review] petitions to identify ‘with particularity . . . the evidence that supports the grounds for the challenge to each claim’”). When challenging claims based on obviousness, the Petitioner must show that “a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1381 (Fed. Cir. 2016) (citations omitted). The burden of persuasion, whether for anticipation or for unpatentability for obviousness, never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (citing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)) (discussing the burden of proof in *inter partes* review).

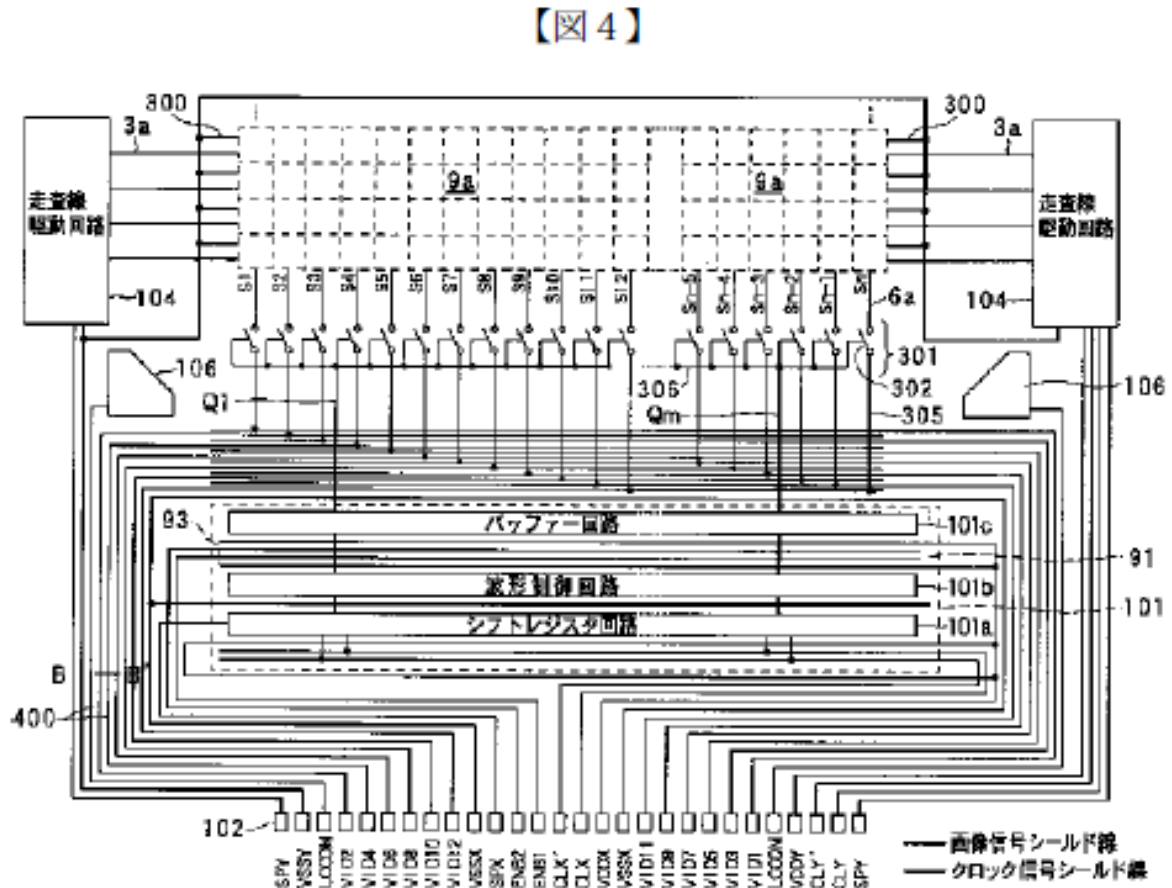
D. Asserted Obviousness over Muraide in Combination with Sunao or Komeno

Petitioner challenges claims 1–11 and 13 as unpatentable for obviousness over the combination of Muraide with either Sunao or Komeno. Pet. 20–57.

1. Overview of Muraide (Ex. 1005)

Muraide is titled “Electro-Optical Device” and relates to the same. Ex. 1005, Title. In particular, Muraide discloses a device with pixel electrodes 9a, with TFTs 30 connected to the pixel electrodes 9a, and a capacitive line 300 on a display region of the device. *Id.*, Abstr. This device further includes data line 6a and scanning line 3a, both connected to the TFT. *Id.* In a peripheral region of the device, the device includes signal lines 400 connected to the peripheral circuit. *Id.* The device further includes wiring 400 (LCCOM) that connects external input terminal 102 to vertical

conductive terminals 106 for electrically conducting counter potential to counter electrode 21 on the counter substrate 20. *Id.* ¶ 85. These elements are provided on TFT array substrate 10. *Id.*, Abstr., ¶ 85. Figure 4, reproduced below, depicts such an electro-optical device.



Ex. 1005, Fig. 4 (depicting a plan view of electro-optical device including elements formed on the array substrate (counter substrate not shown)), Abstr., ¶ 76. Counter substrate 20 (not shown in Figure 4) is provided with counter electrode 21 over its entire surface. *Id.* ¶ 65.

2. Overview of Sunao (Ex. 1006)

Sunao is titled “Liquid Crystal Display Device” and relates to “a liquid crystal display device . . . in which a liquid crystal layer is sandwiched between a matrix array substrate 2 and a counter substrate 3, the

counter electrode 7 formed on the whole surface of the counter substrate 3.”
Ex. 1006, Title, Abstract.

3. *Overview of Komeno (Ex. 1009)*

Komeno is titled “Display Device” and relates to “an active matrix type display device which forms a matrix array by making gate lines and data lines cross each other on one of two substrates.” Ex. 1009, code (54), ¶ 1. The display region is formed by sealing liquid crystal in a gap defined by laminating a first substrate and a second substrate with liquid crystal sealed between the two substrates. *Id.* ¶ 103. The first substrate extends further to an edge than the second substrate, defining a portion adjacent to the display region, with circuits necessary for the display function being directly built in the adjacent portion on the first substrate. *Id.* ¶¶ 103–104.

4. *Petitioner’s Challenge to Independent Claim 1*

Petitioner contends that Muraide discloses every element of independent claim 1 except “the counter electrode potential line being closest to edges of the element substrate, among the plurality of main wiring line,” and that this limitation is both “an obvious matter of design choice” and taught by both Sunao and Komeno. Pet. 13–24.

Petitioner relies on Muraide disclosing:

“[a]n electro-optical device,” as recited in the preamble (*id.* at 13 (citing Ex. 1005 ¶ 1; Ex. 1002 ¶¶ 51–52));

“a plurality of pixel portions provided in an image display region on an element substrate” (*id.* at 14 (citing Ex. 1005 ¶ 51, Figs. 1, 4; Ex. 1002 ¶¶ 53–55));

“in a peripheral region of the image display region on the element substrate, a plurality of external circuit connection terminals, a plurality of main wiring lines each having one end coupled to each of the plurality of

external circuit connection terminals, and peripheral driving circuits coupled to the other ends of the main wiring lines, the peripheral driving circuits driving the pixel portions based on electric signals supplied from the external circuit connection terminals through the main wiring lines” (*id.* at 15–16 (citing Ex. 1005 ¶¶ 1, 78–80, Fig. 4; Ex. 1002 ¶¶ 56–59));

“a counter electrode provided in the peripheral region on a counter substrate that is arranged to face the element substrate” (*id.* at 16 (citing Ex. 1005 ¶ 41; Ex. 1002 ¶¶ 60–62));

“a counter electrode potential line that supplies counter electrode potential to the counter electrode, which is at least one of the plurality of main wiring lines” (*id.* at 17 (citing Ex. 1005 ¶¶ 61, 85, Figs. 3–4; Ex. 1002 ¶¶ 63–65));

“upper and lower conduction terminals that are provided in the peripheral region on the element substrate, and that are connected to the counter electrode potential line” (*id.* at 17–18 (citing Ex. 1005 ¶ 85, Fig. 4; Ex. 1002 ¶¶ 66–67)); and

“the plurality of main wiring lines being made of a same conductive film and being planarly laid out so as not to intersect each other in the peripheral region” (*id.* at 18–19 (citing Ex. 1005 ¶ 87, Figs. 4, 7, 8; Ex. 1002 ¶¶ 68–69)).

Petitioner concedes that Muraide does not disclose the limitation, “the counter electrode potential line being closest to edges of the element substrate, among the plurality of main wiring lines.” *Id.* at 19 (“In *Muraide*, the counter electrode potential line, wiring 400 (LCCOM), . . . is located nearer the center of the substrate.”). Petitioner contends “locat[ing] the counter electrode potential line nearer to the edge of the substrate . . . is a simple choice without changing any property or characteristics of the wiring

layout,” and thus obvious and unpatentable as a mere design choice. *Id.* (citing Ex. 1002 ¶ 70). Petitioner also contends that “*Sunao* discloses its device has a counter electrode potential line being closest to edges of the element substrate,” thus rendering the limitation obvious. *Id.* at 20–22 (citing Ex. 1006 ¶¶ 13, 14, 16, Fig. 3; Ex. 1002 ¶¶ 71–73, 77). Petitioner also contends that Komeno similarly discloses this limitation in its “wiring lines B1, B2 [that] are located closest to the edges of the element substrate SUB1,” thus rendering the limitation obvious. *Id.* at 22–23 (citing Ex. 1009 ¶¶ 4, 108, Fig. 1; Ex. 1002 ¶¶ 75, 77).

5. Analysis

Claim 1 recites “in a peripheral region of the image display region on the element substrate, a plurality of external circuit connection terminals, a plurality of main wiring lines . . . and peripheral driving circuits.” Ex. 1001, 21:55–60. The plain and ordinary meaning of this phrase includes that the plurality of main wiring lines and peripheral driving circuits are formed on the element substrate. Claim 1 further recites, for the main wiring lines, “each having one end coupled to each of the plurality of external circuit connection terminals, and peripheral driving circuits coupled to the other ends of the main wiring lines.” *Id.* at 21:57–59. The plain and ordinary meaning of this phrase is that each main wiring line is connected at one end to an external circuit connection terminal and, at the other end, to the peripheral driving circuits; this is how Petitioner addresses “a plurality of main wiring lines” as to this portion of claim 1 in accordance with the plain and ordinary meaning. Pet. 15 (“Figure 4 shows wiring lines coupled to the external connection terminals 102 at one end and coupled to peripheral circuits, including data line driving circuit 101, and scanning line driving circuit 104, at the other.”); *see also* Ex. 1002 ¶ 59. Petitioner and its

declarant Dr. Sechen rely on data line driving circuit 101 and scanning line driving circuit 104 as peripheral circuits. Pet. 15–16 (citing Ex. 1005 ¶¶ 1, 78–80, Fig. 4; reproducing Fig. 4 without annotation); Ex. 1002 ¶¶ 56–59.

Claim 1 also recites “a counter electrode potential line that supplies counter electrode potential to the counter electrode, which is at least one of the plurality of main wiring lines.” Ex. 1001, 22:1–3. Petitioner relies on Muraide’s “wiring 400 (LCCOM), that supplies potential from the external input terminal 102 to the vertical conduction terminal 106 and then to the counter electrode 21 on the counter substrate 20” as the “counter electrode potential line.” Pet. 17 (citing Ex. 1005 ¶ 85, Fig. 4; Ex. 1002 ¶¶ 63–65).

Petitioner fails, however, to address the clause, “which is at least one of the plurality of main wiring lines,” and the implication that follows from the plain language of the claim. *Id.* Specifically, as set forth above, the “plurality of main wiring lines” are coupled at one end to peripheral circuits, and Petitioner provides no basis for the wiring 400 (LCCOM) to be coupled to any element identified by Petitioner as a peripheral circuit. *Id.* at 15–17 (identifying data line driving circuit 101 and scanning line driving circuit 104 as peripheral circuits). Rather, Petitioner sets forth that wiring 400 (LCCOM) “supplies potential from the external input terminal 102 to the vertical conduction terminal 106 and then to the counter electrode 21 on the counter substrate 20.” *Id.* at 17 (citing Ex. 1005 ¶ 85, Figs. 3, 4; Ex. 1002 ¶¶ 63–65). Further, to the extent Petitioner states that Muraide “discloses a counter electrode provided in the peripheral region on a counter substrate that is arranged to face the element substrate” (*id.* at 16 (citing Ex. 1005 ¶ 41; Ex. 1002 ¶¶ 60–62)), Petitioner does not clearly identify the counter electrode as a peripheral circuit (*id.*) and, further, the counter electrode on the counter substrate is not a peripheral driving circuit on the element

substrate, as required by the plain language of the claim (Ex. 1001, 21:55–61 (“*in a peripheral region of the image display region on the element substrate, . . . peripheral driving circuits*” (emphasis added)))).

Accordingly, on this record, we determine that Petitioner fails to sufficiently establish “a counter electrode potential line that supplies counter electrode potential to the counter electrode, which is at least one of the plurality of main wiring lines.” Although Patent Owner did not clearly raise this particular issue, “[i]n an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic*, 815 F.3d at 1363 (citing 35 U.S.C. § 312(a)(3)). The burden of persuasion, whether for anticipation or for unpatentability for obviousness, never shifts to Patent Owner. *See Dynamic Drinkware*, 800 F.3d at 1378. Further, our role is not to remedy the deficiencies in Petitions that fall short. *Sirona Dental Sys. GMBH v. Institut Straumann AG*, 892 F.3d 1349, 1356 (Fed. Cir. 2018) (quoting *SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1356–57 (2018)) (explaining that because “‘the petitioner’s contentions, not the Director’s discretion, define the scope . . . [,]’ [i]t would thus not be proper for the Board to deviate from the grounds in the petition and raise its own obviousness theory” “institut[ing] a *different inter partes* review”); *cf. Magnum Oil Tools*, 829 F.3d at 1380–81 (rejecting an argument that the Board properly “ma[de] an obviousness argument on behalf of [petitioner]” that “could have been included in a properly-drafted petition,” because “petitioner . . . bears the burden of proof”).

6. *Dependent Claims*

Petitioner’s challenge to dependent claims 2–11 and 13 address additional limitations to independent claim 1, or to claims depending from

independent claim 1. Pet. 24–39. On this record, Petitioner fails to remedy the deficiency as to the challenge to claim 1, as discussed above.

7. Conclusion

On this record, Petitioner fails to meet its burden for instituting *inter partes* review based on Muraide with Sunao or Komeno.

E. Asserted Obviousness over Muraide with Sunao or Komeno in Further Combination with Murade III

Petitioner challenges claims 2–3 and 12 as unpatentable for obviousness over the combination of Muraide, Sunao, and Murade III or the combination of Muraide, Komeno, and Murade III. Pet. 40–44. Petitioner relies on Murade III for disclosing “sub-wiring lines” (claims 2–3) and “partially redundant wiring lines” among the “plurality of main wiring lines” (claim 12). *Id.* (citing Ex. 1010, 5:14–25, 18:38–19:2, 19:4–13, 19:51–56, 26:66–27:3 Figs. 5, 6; Ex. 1002 ¶¶ 116–129).

On this record, Petitioner fails to remedy the deficiency as to the corresponding challenge to claim 1 grounded on Muraide with Sunao or Komeno, discussed above. Accordingly, Petitioner fails to meet its burden for instituting *inter partes* review on this ground.

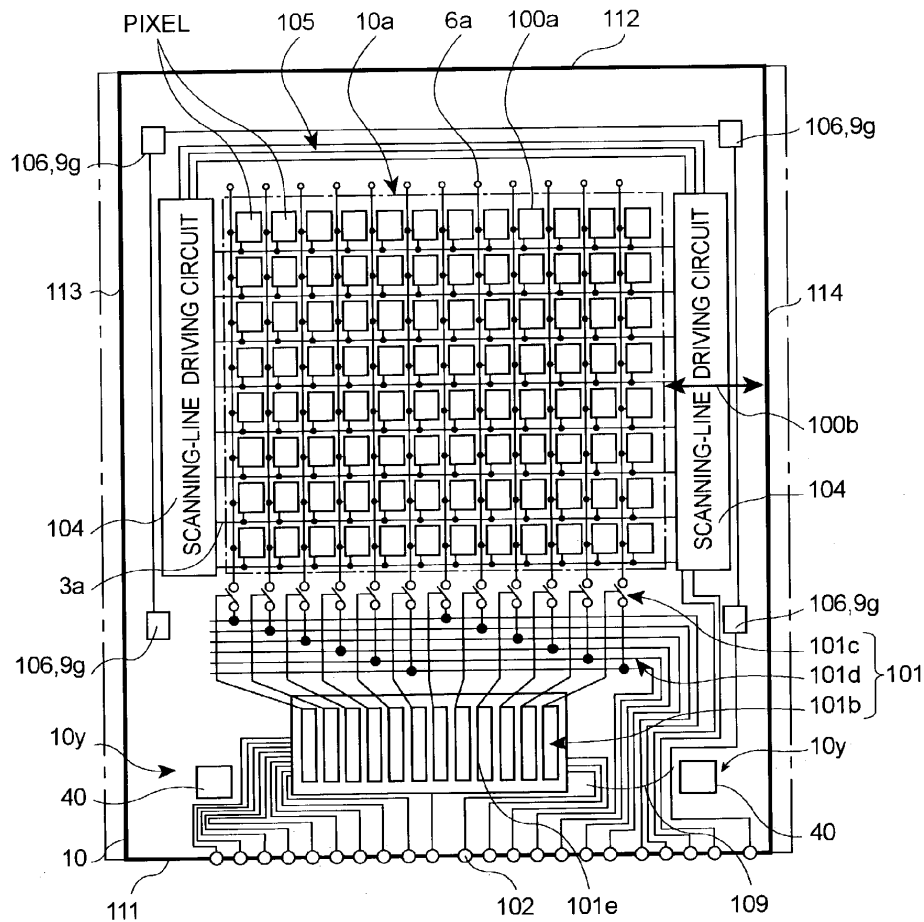
F. Asserted Anticipation by Fujikawa

Petitioner challenges claims 1–5, 7, 8, 11, and 13 as anticipated by Fujikawa. Pet. 44–63.

1. Overview of Fujikawa (Ex. 1007)

Fujikawa is titled “Electrooptic Device and Electronic Device” and relates to “an electrooptic device and an electronic device in which a region that does not directly contribute to the display can be narrowed by improving the layout of peripheral circuits,” including “unit circuits” formed on “a TFT array substrate of a liquid crystal device.” Ex. 1007, codes (54),

(57). Figure 12, reproduced below, depicts the configuration of a TFT array substrate used in a liquid crystal device.



Id. at Fig. 12 (depicting configuration of TFT array substrate used in a liquid crystal device), ¶ 36. The TFT array substrate 10 includes terminals 102 that are connected by a plurality of lines 109 to data-line driving circuit 101 and scanning-line driving circuit 104.⁹ *Id.* ¶¶ 45–46, Fig. 12. Conductive electrodes 9g and conductive materials 106 are formed in areas corresponding to four corners of counter substrate 20 (not shown), and are similarly connected to terminals by wiring lines. *Id.* ¶ 47, Fig. 12. Counter

⁹ The elements in Figure 12 are identified and described in reference to other figures throughout Fujikawa. *Id.* ¶ 87 (“Common components are denoted by the same reference numerals, and descriptions thereof are omitted.”).

electrodes 21 are formed on counter substrate 20, and are supplied a constant voltage (DCCOM) that is supplied to terminals 102 of TFT array substrate 10 and conducted by wiring lines to counter electrodes 20. *Id.* ¶ 79.

2. *Petitioner's Challenge to Independent Claim 1*

Petitioner contends that Fujikawa discloses every element of independent claim 1. Pet. 44–53.

Petitioner relies on Fujikawa disclosing:

“[a]n electro-optical device,” as recited in the preamble (*id.* at 44 (citing Ex. 1007, Abstr.; Ex. 1002 ¶¶ 130–131));

“a plurality of pixel portions provided in an image display region on an element substrate” (*id.* at 44–45 (citing Ex. 1007 ¶¶ 49, 50, 53, Fig. 4; Ex. 1002 ¶¶ 132–133));

“in a peripheral region of the image display region on the element substrate, a plurality of external circuit connection terminals, a plurality of main wiring lines each having one end coupled to each of the plurality of external circuit connection terminals, and peripheral driving circuits coupled to the other ends of the main wiring lines, the peripheral driving circuits driving the pixel portions based on electric signals supplied from the external circuit connection terminals through the main wiring lines” (*id.* at 45–46 (citing Ex. 1007 ¶¶ 46, 50, 53, 55–58, Figs. 1, 2; Ex. 1002 ¶¶ 134–137));

“a counter electrode provided in the peripheral region on a counter substrate that is arranged to face the element substrate” (*id.* at 46–47 (citing Ex. 1007 ¶¶ 46, 49, 78, 79, Fig. 9; Ex. 1002 ¶¶ 138–139));

“a counter electrode potential line that supplies counter electrode potential to the counter electrode, which is at least one of the plurality of

main wiring lines” (*id.* at 47–49 (citing Ex. 1007 ¶¶ 8, 46, 47, 50, 55, 72, 79, Figs. 12, 19; Ex. 1002 ¶¶ 140–143));

“upper and lower conduction terminals that are provided in the peripheral region on the element substrate, and that are connected to the counter electrode potential line” (*id.* at 49–51 (citing Ex. 1007 ¶¶ 47, 78–79, Figs. 9, 12, 19; Ex. 1002 ¶¶ 144–146));

“the plurality of main wiring lines being made of a same conductive film and being planarly laid out so as not to intersect each other in the peripheral region” (*id.* at 51–52 (citing Ex. 1007 ¶ 55, Figs. 12, 19; Ex. 1002 ¶¶ 147–149)); and

“the counter electrode potential line being closest to edges of the element substrate, among the plurality of main wiring lines” (*id.* at 52–53 (citing Ex. 1007 ¶ 79, Figs. 12, 19; Ex. 1002 ¶¶ 149–151)).

3. *Analysis*

Our analysis again focuses on the recited “plurality of main wiring lines” and the “counter electrode potential line.” Petitioner relies on Fujikawa disclosing an element substrate (“TFT array substrate 10”) having a peripheral region (“10c”) having multiple external connection terminals (“terminals 102”) that are connected to a plurality of main wiring lines (“lines 109”) that “transfer voltage and signals from the terminals 102 to a data-line driving circuit 101 and a scanning-line driving circuits 104,” which Petitioner relies on as “peripheral driving circuits.” Pet. 45 (citing Ex. 1007 ¶¶ 46, 50, 53, 55–58, Fig. 1; Ex. 1002 ¶¶ 134–137).

As to the recited “counter electrode potential line,” Petitioner relies on Fujikawa disclosing a main wiring line 109 that supplies power from one of terminals 102 to conductive electrodes 9g and conductive materials 106 where “[c]onductive elements 9g and 106 electrically connect the TFT array

substrate 10 and the counter substrate 20” (*id.* at 47–48 (citing Ex. 1007 ¶¶ 8, 46, 47, 50, 55, 72, 79, Fig. 12; Ex. 1002 ¶¶ 140–143)), where counter electrode(s) 21 are positioned on the counter substrate 20 (*id.*; *id.* at 46–47 (citing Ex. 1007 ¶¶ 46, 49, 78–79; Ex. ¶¶ 138–139)).

Petitioner fails again, however, to address the implications of the clause, “which is at least one of the plurality of main wiring lines.” *Id.* Specifically, as set forth above, the “plurality of main wiring lines” are coupled at one end to peripheral circuits, and Petitioner provides no basis for the main wiring line 109 relied on for the “counter electrode potential line” to be coupled to any element identified by Petitioner as a peripheral circuit, as the wiring line relied on goes to conductive electrodes 9g and conductive materials 106 that then connect to counter electrode 21 of counter substrate 20 (*id.* at 45–49), and, further, the counter electrode on the counter substrate is not a peripheral driving circuit on the element substrate, as required by the plain language of the claim (Ex. 1001, 21:55–61 (“*in a peripheral region of the image display region on the element substrate, . . . peripheral driving circuits*” (emphasis added)))).

Accordingly, on this record, we determine that Petitioner again fails to sufficiently establish “a counter electrode potential line that supplies counter electrode potential to the counter electrode, which is at least one of the plurality of main wiring lines.”

4. *Dependent Claims*

Petitioner’s challenge to dependent claims 2–5, 7, 8, 11, and 13 address additional limitations to independent claim 1, or to claims depending from independent claim 1. Pet. 53–63. On this record, Petitioner fails to remedy the deficiency as to the challenge to claim 1, as discussed above.

5. Conclusion

On this record, Petitioner fails to meet its burden for instituting *inter partes* review based on Fujikawa.

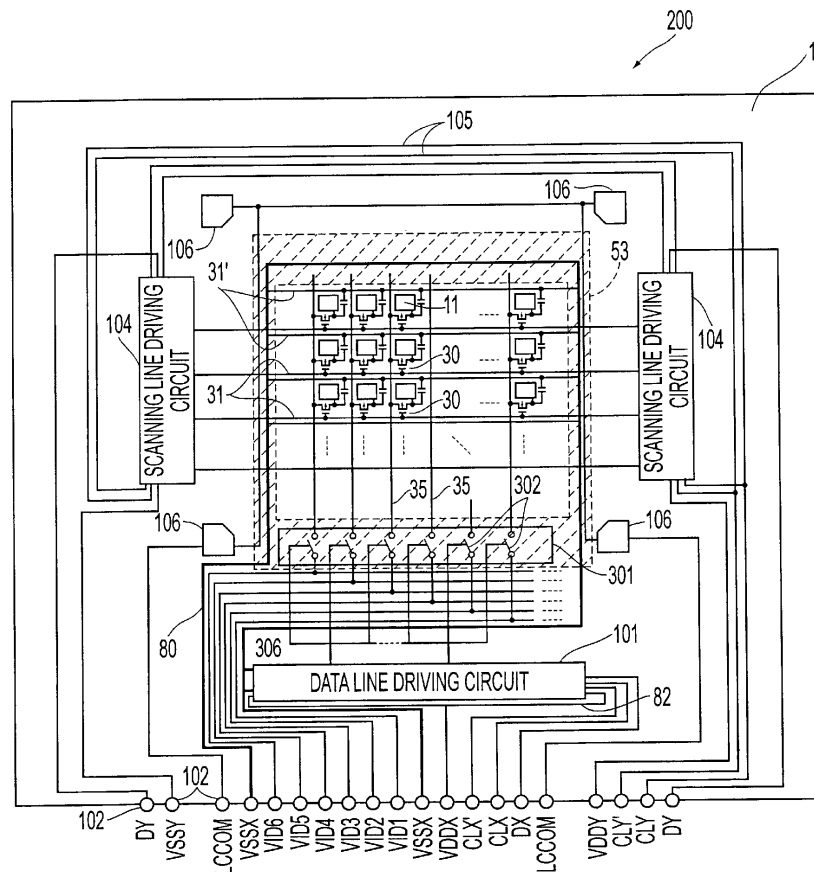
G. Asserted Obviousness over Murade II in Combination with Sunao or Komeno

Petitioner challenges claims 1–11 and 13 as unpatentable for obviousness over the combination of Murade II with either Sunao or Komeno. Pet. 63–81.

1. Overview of Murade II (Ex. 1008)

Murade II is titled “Electro-Optical Device and Electronic Apparatus” and relates to the same. Ex. 1008, Title.

Figure 1, reproduced below, depicts the configuration of elements on a TFT array substrate used in a liquid crystal device.



Id. at Fig. 1 (depicting a schematic plan view of a liquid crystal apparatus), 13:61–64, 15:10–11. Liquid crystal apparatus 200 includes a TFT array substrate 1 on which there are provided a plurality of external input terminals 102, variously named wirings (the names corresponding to respective signals), a data line driving circuit 101, scanning line driving circuit 104, and upper-to-lower conducting elements 106. *Id.* at 15:10–11, 15:28–31, 15:35–52. Liquid crystal apparatus 200 also includes an opposite substrate 2 that has common electrode 21; wiring LCCOM and upper-to-lower conducting elements 106 connect the corresponding external input terminals 102 to common electrode 21. *Id.* at 19:45–50, 27:24–27. Liquid crystal layer 50 is disposed between TFT array substrate 1 and opposite substrate 2. *Id.* at 27:28–30.

2. *Petitioner’s Challenge to Independent Claim 1*

Petitioner contends that Murade II discloses every element of independent claim 1 except “the counter electrode potential line being closest to edges of the element substrate, among the plurality of main wiring line,” and that this limitation is both “an obvious matter of design choice” and taught by both Sunao and Komeno. Pet. 63–70.

Petitioner relies on Murade II disclosing:

“[a]n electro-optical device,” as recited in the preamble (*id.* at 63 (citing Ex. 1008, cover; Ex. 1002 ¶¶ 174–175));

“a plurality of pixel portions provided in an image display region on an element substrate” (*id.* (citing Ex. 1008, 13:61–64, 15:31–35, Fig. 1; Ex. 1002 ¶¶ 176–177));

“in a peripheral region of the image display region on the element substrate, a plurality of external circuit connection terminals, a plurality of

main wiring lines each having one end coupled to each of the plurality of external circuit connection terminals, and peripheral driving circuits coupled to the other ends of the main wiring lines, the peripheral driving circuits driving the pixel portions based on electric signals supplied from the external circuit connection terminals through the main wiring lines” (*id.* at 64–65 (citing Ex. 1008, 13:61–64, 15:42–57, Fig. 1; Ex. 1002 ¶¶ 178–179));

“a counter electrode provided in the peripheral region on a counter substrate that is arranged to face the element substrate” (*id.* at 65–66 (citing Ex. 1008, 28:13–29, Fig. 13; Ex. 1002 ¶¶ 180–182));

“a counter electrode potential line that supplies counter electrode potential to the counter electrode, which is at least one of the plurality of main wiring lines” (*id.* at 66 (citing Ex. 1008, 19:45–50, Fig. 1; Ex. 1002 ¶¶ 183–184));

“upper and lower conduction terminals that are provided in the peripheral region on the element substrate, and that are connected to the counter electrode potential line” (*id.* at 66–67 (citing Ex. 1008, 15:38–42, Fig. 1; Ex. 1002 ¶¶ 185–186)); and

“the plurality of main wiring lines being made of a same conductive film and being planarly laid out so as not to intersect each other in the peripheral region” (*id.* at 67–68 (citing Ex. 1008, 19:20–24, 19:34–44, Figs. 1–3, 7(b); Ex. 1002 ¶¶ 187–189)).

Petitioner concedes that *Murade II* does not disclose the limitation, “the counter electrode potential line being closest to edges of the element substrate, among the plurality of main wiring lines.” *Id.* at 68 (“*Murade II* teaches a counter electrode potential line located nearer to the center of the substrate.”). As with the challenges grounded on *Muraide* in combination

with Sunao or Komeno, Petitioner contends the location of the counter electrode potential line is obvious as a mere design choice, as taught by Sunao in the combination of Murade II and Sunao, and as taught by Komeno in the combination of Murade II and Komeno. *Id.* at 68–70 (citing *id.* at 13–24 (Section VI.B.1); Ex. 1002 ¶¶ 190–195).

3. Analysis

Our analysis again focuses on the recited “plurality of main wiring lines” and the “counter electrode potential line.” Petitioner relies on Murade II disclosing a TFT substrate having disposed on it “[e]xternal input terminals 102 . . . correspond[ing] to the claimed external circuit connection terminals. . . . a plurality of wiring lines connected to the external input terminals 102. . . . [and the] peripheral driving circuits [that] drive the pixel portions [of the liquid crystal display apparatus 200] via the wiring lines.” Pet. 64–65 (citing Ex. 1008, 13:61–64, 15:42–57, Fig. 1). Petitioner identifies the “scanning line driving circuits 104” as peripheral driving circuits. *Id.* (citing Ex. 1008, 15:53–57).

As to the recited “counter electrode potential line,” Petitioner relies on Murade II disclosing wiring “designated LCCOM,” how “the LCCOM wiring supplies power via elements 106 on the TFT to a ‘common electrode provided on an opposite substrate,’” and that “LCCOM is one of the main wiring lines” (*id.* at 66 (citing Ex. 1008, 19:45–50, Fig. 1; Ex. 1002 ¶¶ 183–184)), where the “common electrode provided on an opposite substrate” refers to Murade II’s “counter electrode”—common electrode 21 formed on substrate 2 opposite the TFT substrate (*id.* at 65–66 (citing Ex. 1008, 28:13–29, Fig. 13; Ex. 1002 ¶¶ 180–182)).

Petitioner fails again, however, to address the implication that follows the LCCOM relied on for the “counter electrode potential line” being one of

the main wiring lines. *Id.* at 64–66. Specifically, as set forth above, the “plurality of main wiring lines” are coupled at one end to peripheral circuits—scanning line driving circuits 104 (*id.* at 64–65 (citing Ex. 1008, 15:53–57, Fig. 1; Ex. 1002 ¶¶ 178–179)), and Petitioner provides no basis for the main wiring line LCCOM relied on for the “counter electrode potential line” to be coupled to any element identified by Petitioner as a peripheral circuit, as the cited LCCOM wiring supplies power via upper-to-lower conducting elements 106 on the TFT substrate to the counter electrode (common electrode 21) formed on counter substrate 2 (*id.* at 65–66), and, further, the counter electrode on the counter substrate is not a peripheral driving circuit on the element substrate, as required by the plain language of the claim (Ex. 1001, 21:55–61 (“*in a peripheral region of the image display region on the element substrate, . . . peripheral driving circuits*” (emphasis added)))).

Accordingly, on this record, we determine that Petitioner again fails to sufficiently establish “a counter electrode potential line that supplies counter electrode potential to the counter electrode, which is at least one of the plurality of main wiring lines.”

4. *Dependent Claims*

Petitioner’s challenge to dependent claims 4–11, and 13 address additional limitations to independent claim 1, or to claims depending from independent claim 1. Pet. 70–81. On this record, Petitioner fails to remedy the deficiency as to the challenge to claim 1, as discussed above.

5. *Conclusion*

On this record, Petitioner fails to meet its burden for instituting *inter partes* review based on Murade II with Sunao or Komeno.

H. Asserted Obviousness over Murade II with Sunao or Komeno in Further Combination with Murade III

Petitioner challenges claims 2, 3 and 12 as unpatentable for obviousness over the combination of Murade II, Sunao, and Murade III or the combination of Murade II, Komeno, and Murade III. Pet. 81–85. Petitioner relies on Murade III for disclosing “sub-wiring lines” (claims 2–3) and “partially redundant wiring lines” among the “plurality of main wiring lines” (claim 12). *Id.* (citing Ex. 1010, 5:14–25, 18:66–19:2, 19:4–13, 19:51–56, 26:66–27:3 Figs. 5, 6; Ex. 1002 ¶¶ 224–237).

On this record, Petitioner fails to remedy the deficiency as to the corresponding challenge to claim 1 grounded on Murade II with Sunao or Komeno, discussed above. Accordingly, Petitioner fails to meet its burden for instituting *inter partes* review on this ground.

III. CONCLUSION

After considering the arguments and evidence of record, we determine that Petitioner has failed to meet its burden for instituting *inter partes* review.

IV. ORDER

It is:

ORDERED that the petition is denied and no *inter partes* review is instituted.

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