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Paper 9
Date: August 28, 2023

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.

IPR2023-00476
Patent 7,335,913 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 2, "Pet.") requesting an *inter partes* review of claims 1–11 of U.S. Patent No. 7,335,913 B2 (Ex. 1001, "the '913 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. 99. 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. 99; Paper 3, 1; Paper 6, 1; Paper 8, 1.

C. The '913 Patent

The '913 patent is titled "Electro-Optical Device and Electronic Apparatus" and is directed to "an electro-optical device, such as a liquid crystal device or the like, and to an electronic apparatus, such as a liquid crystal projector or the like, having such an electro-optical device." Ex. 1001, code (54), 1:11–14.

The '913 patent relates to a liquid crystal device 100 that includes built-in driving circuits formed on a thin film transistor (TFT) array substrate 10 and counter electrode 21 formed on a counter substrate 20, with liquid crystal layer 50 sandwiched between the substrate and counter substrate. *Id.* at 1:11–14, 7:1–14, 7:25–26, 7:38–51. A portion of TFT array substrate 10 extends from the edge(s) of counter substrate 20 in plan view ("extending portion 201") and supports external connecting terminals 102a. *Id.* at 1:26–34, 5:38–40, 8:5–6, Fig. 1. 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 7:32–37. The '913 patent discloses a particular arrangement to reduce the width of the extending portion so that a smaller device can be made. *Id.* at 1:46–52. This arrangement includes the

placement of external connecting terminals 102a, lead wiring lines 103a, and wiring lines 105. *Id.* at 1:60–2:8, 7:38–46, 8:3–16.

D. Challenged Claims

Petitioner challenges claims 1–11 of the '913 patent. Pet. 1. Independent claims 1 and 5 are illustrative of the subject matter at issue and are reproduced below:

> 1. An electro-optical device comprising:
>
> a pair of substrates that are disposed to face each other with a predetermined gap therebetween, one substrate of the pair of substrates including an extending portion that extends from the other substrate on one side in plan view;
>
> display electrodes that are provided on the one substrate;
>
> a circuit unit that is provided on the one substrate so as to drive the display electrodes:
>
> wiring lines for driving the circuit unit and the display electrodes;
>
> a plurality of lead wiring lines provided on the extending portion and that are led from one of the sides of the wiring lines to the extending portion; and
>
> a plurality of external connecting terminals provided on the extending portion, each of the external connecting terminals overlapping with the plurality of lead wiring lines in plan view.

Ex. 1001, 16:31–49;

> 5. An electro-optical device comprising:
>
> a pair of substrates that are disposed to face each other with a predetermined gap therebetween, one substrate of the pair of substrates including an extending portion that extends from the other substrate on one side in plan view;
>
> display electrodes that are provided on the one substrate;
>
> a circuit unit that is provided on the one substrate so as to drive the display electrodes;

wiring lines for driving the circuit unit and the display electrodes;

a plurality of lead wiring lines provided on the extending portion and that are led from one of the sides of the wiring lines to the extending portion; and

a plurality of external connecting terminals provided on the extending portion, each of the external connecting terminals overlapping with the circuit unit in plan view.

Id. at 17:6–22.

E. The Asserted Grounds of Unpatentability

Petitioner asserts that claims 1–11 would have been unpatentable on the following grounds:

Reference(s)/Basis	35 U.S.C. §[1]	Claim(s) Challenged
Adachi[2]	102/103	1–4, 9
Adachi, Takezawa[3]	103	8
Adachi, Aruga[4]	103	10
Sekado[5]	102	1–6, 9
Sekado, Aruga	103	7
Sekado, Takezawa	103	8
Sekado, Kim[6]	103	10
Sekado, Aruga, Kim	103	11

[1] 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 '913 patent was filed before this date, the pre-AIA version of § 103 applies. Ex. 1001, code (22).
[2] Adachi, JPH10-282522A, published Oct. 23, 2002, with exhibit including certified English language translation. Ex. 1005.
[3] Takezawa, US 2002/0060780 A1, published May 23, 2002. Ex. 1006.
[4] Aruga, US 2002/0135293 A1, published Sept. 26, 2002. Ex. 1010.
[5] Sekado, JP2802156B2, issued Sept. 24, 1998, with exhibit including certified English language translation. Ex. 1007.
[6] Kim et al., US 6,396,558 B1, issued May 28, 2002. Ex. 1008.

Reference(s)/Basis	35 U.S.C. §[1]	Claim(s) Challenged
Takezawa, Kim	103	1–4, 8–10
Takezawa, Yoneda[7]	103	5, 6
Takezawa, Yoneda, Aruga	103	7
Takezawa, Yoneda, Aruga, Tanaka[8]	103	11
Hirosue[9]	102	5, 6
Hirosue, Aruga	103	7
Hirosue, Aruga, Tanaka	103	11

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.

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).

[7] Yoneda, JP2000267590A, published Mar. 19, 1999. Ex. 1011.
[8] Tanaka, JP2004094020A, published Mar. 25, 2004, with exhibit including certified English language translation. Ex. 1012.
[9] Hirosue, US 2003/0189686 A1, published Oct. 9, 2003. Ex. 1013.

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. 5 (citing Ex. 1002 ¶¶ 41–44). 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. 7.

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. 5–6. 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. 6.

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).

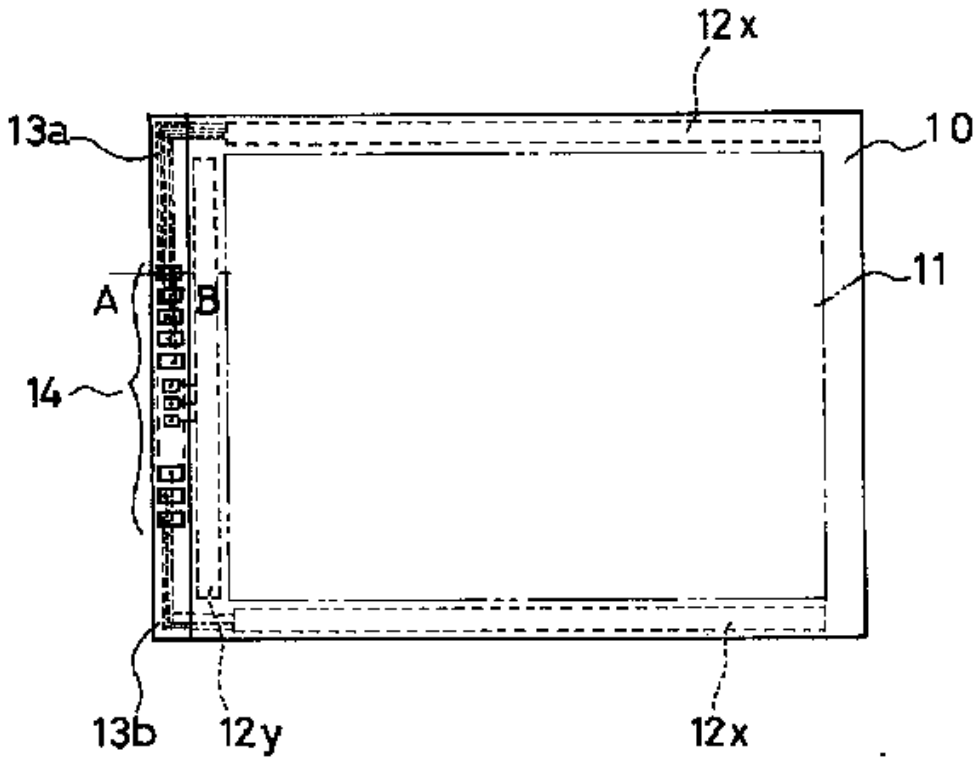
D. Asserted Anticipation by or Obviousness over Adachi

Petitioner challenges claims 1–4 and 9 as anticipated by or unpatentable for obviousness over Adachi. Pet. 6–23.

1. Overview of Adachi (Ex. 1005)

Adachi is titled "Display Device" and relates to "a configuration of a liquid crystal display element in which a drive circuit for driving a liquid crystal display element is integrated and built in on a glass substrate."

Ex. 1005, Title, ¶ 3. Figure 1, reproduced below, depicts such a display device.



Ex. 1005, Fig. 1 (depicting a display device). As depicted, "the liquid crystal display element 10 has a rectangular display region 11 and drive circuits 12x and 12y that drive the liquid crystal display element 10 are integrated and built in a periphery of the display region 11." *Id.* ¶ 15, Fig. 1. External connection terminal group 14 includes external connection terminals that are connected to the drive circuits via wiring groups 13a and 13b. *Id.* ¶¶ 17, 35.

2. Petitioner's Challenge to Independent Claim 1

Petitioner contends that Adachi discloses every element of independent claim 1 or renders it obvious in view of a person of ordinary skill's general knowledge. Pet. 6–17.

Petitioner relies on Adachi disclosing:

"[a]n electro-optical device," as recited in the preamble (*id.* at 6 (citing Ex. 1005 ¶ 14; Ex. 1002 ¶¶ 56–57));

"a pair of substrates that are disposed to face each other with a predetermined gap therebetween" (*id.* at 6–10 (citing Ex. 1005 ¶¶ 2, 14–15, 18–19, 35, Figs. 1–3, 4(e); Ex. 1001, 1:16–25; Ex. 1009, 1:21–26, 1:49–55, 2:46–54, Figs. 2, 5; Ex. 1002 ¶¶ 58–64))[10];

"one substrate of the pair of substrates including an extending portion that extends from the other substrate on one side in plan view" (*id.* at 10–11 (citing Ex. 1005, Figs. 1, 3; Ex. 1002 ¶¶ 65–68));

"display electrodes that are provided on the one substrate" (*id.* at 11 (citing Ex. 1005 ¶ 19, Fig. 4(e); Ex. 1002 ¶¶ 69–71));

"a circuit unit that is provided on the one substrate so as to drive the display electrodes" (*id.* at 11–13 (citing Ex. 1005 ¶ 15, Figs. 1–2, 4(e); Ex. 1002 ¶¶ 72–75));

"wiring lines for driving the circuit unit and the display electrodes" (*id.* at 13–14 (citing Ex. 1005 ¶¶ 7–8, 17, 35; Ex. 1002 ¶¶ 76–79));

"a plurality of lead wiring lines provided on the extending portion and that are led from one of the sides of the wiring lines to the extending portion" (*id.* at 14 (citing Ex. 1005, Fig. 1; Ex. 1002 ¶¶ 80–82));

[10] In addition to relying on Adachi, Petitioner relies on the '913 patent (Ex. 1001) and Ha (Exhibit 1009) as evidence of what was known to a person of ordinary skill in the art, specifically, "that conventional LCDs have two substrates with a predetermined gap between them in which the liquid crystals are located." Pet. 9.

"a plurality of external connecting terminals provided on the extending portion" (*id.* at 14–15 (citing Ex. 1005 ¶¶ 15, 20, Fig. 1; Ex. 1002 ¶¶ 83–85)); and

"each of the external connecting terminals overlapping with the plurality of lead wiring lines in plan view" (*id.* at 15–17 (citing Ex. 1005, ¶¶ 17, 35, Figs. 1, 3, 6; Ex. 1002 ¶¶ 86–92)).

More particularly, Petitioner relies on Adachi's wiring groups 13a and 13b for "wiring lines for driving the circuit unit and the display electrodes." *Id.* at 13–14. Petitioner then relies on "*Adachi* Figure 1 teach[ing] segments of the wirings in wiring group 13a/13b are led from one of the sides of the wirings to the extending portion and extend on the extending portion." *Id.* at 14 (citing Ex. 1005, Fig. 1; Ex. 1002 ¶¶ 80–82).

3. Patent Owner's Argument

Patent Owner argues that the Petition fails to show that Adachi discloses separate "wiring lines" and "lead wiring lines" as required by claim 1. Prelim. Resp. 9–11. Patent Owner relies on the plain language of claim 1 reciting two different lines—wiring lines and lead wiring lines. *Id.* Patent Owner contends that there is no evidence to show that wiring groups 13a and 13b comprise 'segments'" and that the claim cannot be met by the wiring lines identified by Petitioner because each is a single line and a single line cannot lead from one of its own sides. *Id.* at 10–11.

4. Analysis

Claim 1 recites "wiring lines for driving the circuit unit and the display electrodes" and "a plurality of lead wiring lines provided on the extending portion and that are led from one of the sides of the wiring lines to the extending portion." Ex. 1001, 16:40–44. Separately listing "wiring lines" and "a plurality of lead wiring lines" clearly implies that wiring lines

and lead wiring lines are separate elements. *Becton Dickinson & Co. v. Tyco Healthcare Group, LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010) (internal quotation omitted) ("Where a claim lists elements separately, the clear implication of the claim language is that those elements are distinct component[s] of the patented invention."); *Engel Indus., Inc. v. Lockformer Co.*, 96 F.3d 1398, 1404–05 (Fed. Cir. 1996) (concluding that two separately recited elements could not be the same element because it would contradict the plain language of the patent and "they logically cannot be one and the same"). Here, the claim language identifies wiring lines and lead wiring lines as separate elements in that the "lead wiring lines . . . are led from one of the sides of the wiring lines to the extending portion." Ex. 1001, 16:42–44. Here also, the '913 patent's specification separately identifies and describes both lead wiring lines 103a and wiring lines 105 in a single embodiment. *See, e.g.*, *id.* at Fig. 1, 7:42–46 ("In FIG. 1, . . . [t]he wiring lines 105 are relayed on the upper side of the frame light-shielding film 53 so as to connect the two scanning line driving circuits 104."), 8:26–29 ("the data line driving circuit 101a is connected to the plurality of external connecting terminals 102a through the lead wiring lines 103a at both ends of the extending portion 201" (referring to the embodiment depicted in Figure 1)).

Petitioner's position that Adachi discloses both the "wiring lines" and "plurality of lead wiring lines" ostensibly relies on the presence of multiple "segments" of wirings in the wiring group 13a/13b, that is, that a portion of each respective line in wiring group 13a/13b are "wiring lines" and another portion are "lead wiring lines." Pet. 13–14. The support for this is limited to Dr. Sechen's testimony that: (1) "[a] [person of ordinary skill in the art] would understand *Adachi* to teach a plurality of lead wiring lines on the

extending portion that lead from one side of the wiring lines to the extending portion" (Ex. 1002 ¶ 80); and (2) "[a] [person of ordinary skill in the art] would understand *Adachi* Figure 1 . . . teaches segments of the wirings in the wiring group 13a/13b are led from one of the sides of the wirings to the extending portion and extend on the extending portion" (*id.* ¶ 81).

On this record, including Dr. Sechen's testimony, Petitioner fails to sufficiently establish the recited plurality of lead wiring lines where wiring lines and lead wiring lines are, at the very least presumptively, separate elements. First, there is no argument of record that the wiring lines and lead wiring lines are not set forth as distinct elements in the claim. Pet. Second, there is no explanation why Adachi's wiring group 13a/13b would be understood to include distinct "segments" and, if it was, there is no explanation why different "segments" would be understood to be separate, distinct elements. *Id.*; Ex. 1002 ¶¶ 80–82. Accordingly, Petitioner has not shown a reasonable likelihood of showing that claim 1 is unpatentable based on Adachi.

5. Dependent Claims

Petitioner's challenge to dependent claims 2–4 and 9 address additional limitations to independent claim 1. Pet. 18–23. On this record, Petitioner fails to remedy the deficiency as to the challenge to claim 1, as discussed above.

6. Conclusion

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

E. Asserted Obviousness over Adachi in combination with Takezawa or Aruga

Petitioner challenges claim 8 as unpatentable for obviousness over the combination of Adachi and Takezawa (Pet. 23–26) and claim 10 over the combination of Adachi and Aruga (*id.* at 26–29). Aruga and Takezawa are relied on for further limitations of these dependent claims, and not for the elements of independent claim 1. *Id.* at 23–29.

On this record, Petitioner fails to remedy the deficiency as to the corresponding challenge to claim 1 grounded on Adachi, discussed above. Accordingly, Petitioner fails to meet its burden for instituting *inter partes* review on these grounds.

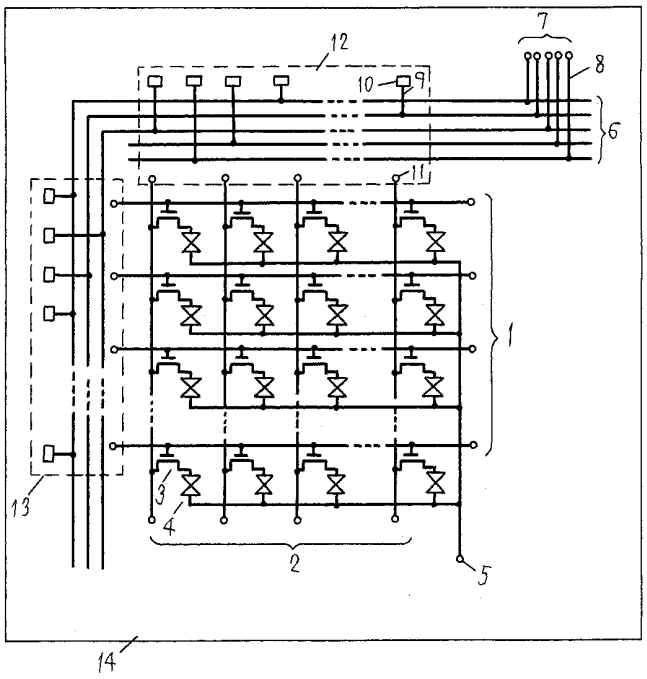
F. Asserted Anticipation by Sekado

Petitioner challenges claims 1–6 and 9 as anticipated by Sekado. Pet. 29–45.

1. Overview of Sekado (Ex. 1007)

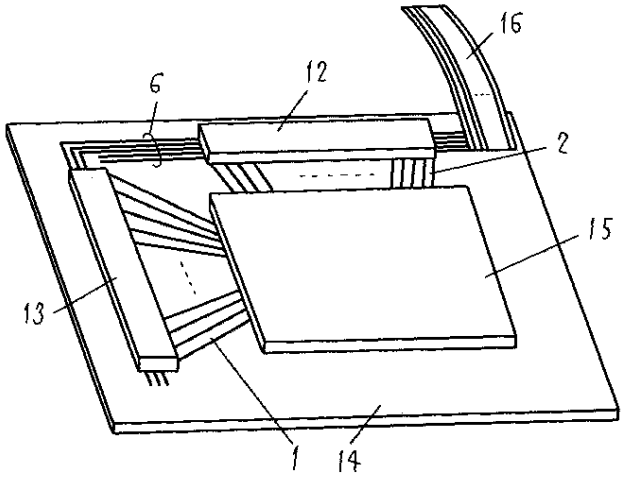
Sekado is titled "Liquid crystal display device" and relates to "an active matrix liquid crystal panel using a thin film transistor as a switching element." Ex. 1007, 1:8, 2:21–22.

Sekado Figure 4, reproduced below, schematically illustrates an active liquid crystal display circuit.



Id. at Fig. 4 (schematic illustrating an active liquid display circuit). Figure 4 depicts elements forming the liquid crystal display, formed on insulating substrate 14, including scanning lines 1 and signal lines 2 with, at the intersection of these lines, field-effect transistor switching elements 3 and liquid crystal cells 4. *Id.* at 2:40–44. Counter electrode 5 is formed of a transparent electrode layer common to all of the liquid crystal cells 4. *Id.* at 2:42–44. Scanning line driving driver 13 and signal line driving driver 12 are supplied signals by driver driving wirings 6. *Id.* at 2:44–45. Extraction wirings 9 connect the driver driving wirings to input connection terminals 10 of the driving driver 12, 13 and extraction wirings 8 connect driver driving wires 6 to an external signal supply mounting terminal group 7. *Id.* at 2:46–3:3.

Sekado Figure 5, reproduced below, illustrates an external perspective view of the liquid crystal circuit illustrated in Figure 4.



Id. at Fig. 5 (illustrating external perspective view of liquid crystal display circuit), 3:7. Liquid crystals are sealed into a gap between color filter 15 and insulating substrate 14 to form a screen. *Id.* at 3:7–9. Signal line driving driver 12 and scanning line driving driver 13 are connected to signal lines 2 and scanning lines 1, respectively. *Id.* at 3:9–10. External signal supplying conductive film 16 is connected to the external signal supplying terminal 7 (not shown). *Id.* at 3:11–12.

2. Petitioner's Challenge to Independent Claim 1

Petitioner contends that Sekado discloses every element of independent claim 1. Pet. 29–35.

Petitioner relies on Sekado disclosing:

"[a]n electro-optical device," as recited in the preamble (*id.* at 29 (citing Ex. 1007, Title; Ex. 1002 ¶¶ 130–132));

"a pair of substrates that are disposed to face each other with a predetermined gap therebetween" (*id.* at 29–30 (citing Ex. 1007, 3:7–9, Fig. 5; Ex. 1002 ¶¶ 130–132));

"one substrate of the pair of substrates including an extending portion that extends from the other substrate on one side in plan view" (*id.* at 30 (citing Ex. 1007, Fig. 5; Ex. 1002 ¶¶ 133–135));

"display electrodes that are provided on the one substrate" (*id.* at 30–31 (citing Ex. 1007, 2:40–42, Fig. 4; Ex. 1002 ¶¶ 136–138));

"a circuit unit that is provided on the one substrate so as to drive the display electrodes" (*id.* at 31–32 (citing Ex. 1007, 2:7–15 (claim 1), 2:40–42, 2:45, 3:9–10, Figs. 4–5; Ex. 1002 ¶¶ 139–142));

"wiring lines for driving the circuit unit and the display electrodes" (*id.* at 32–33 (citing Ex. 1007, 2:44–45, Fig. 4; Ex. 1002 ¶¶ 143–145));

"a plurality of lead wiring lines provided on the extending portion and that are led from one of the sides of the wiring lines to the extending portion" (*id.* at 33 (citing Ex. 1007, Figs. 4–5; Ex. 1002 ¶¶ 146–148));

"a plurality of external connecting terminals provided on the extending portion" (*id.* at 34 (citing Ex. 1007, Fig. 4; Ex. 1002 ¶¶ 149–152)); and

"each of the external connecting terminals overlapping with the plurality of lead wiring lines in plan view" (*id.* at 35 (citing Ex. 1007, 4:30–31, Figs. 4, 9; Ex. 1002 ¶¶ 153–155)).

More particularly, Petitioner relies on Sekado's driver driving wires 6 for "wiring lines for driving the circuit unit and the display electrodes." *Id.* at 32–33. Petitioner then relies on "segments of the wirings 6 [that] are provided on the extending portion and are led from one of the sides of the wirings to the extending portion" for "lead wiring lines." *Id.* at 33 (citing Ex. 1005, Figs. 4–5; Ex. 1002 ¶¶ 146–148).

3. Petitioner's Challenge to Independent Claim 5

Petitioner contends that Sekado discloses every element of independent claim 5. Pet. 40–42. Petitioner relies on its contentions for portions of claim 1 that are identical to those in claim 5. *Id.* at 40–41. For the last clause of claim 5, Petitioner separately relies on Sekado disclosing "each of the external connecting terminals overlapping with the circuit unit in plan view." *Id.* at 41–42 (citing Ex. 1007, Figs. 4, 7; Ex. 1002 ¶¶ 180–182). Again, as with claim 1, Petitioner relies on Sekado's driving driver wires 6 for "wiring lines" and on "segments" of wirings 6 for "lead wiring lines." *Id.* at 33, 41.

4. Patent Owner's Argument

In the same manner as for Adachi, discussed above, Patent Owner argues that the Petition fails to show that Sekado discloses separate "wiring lines" and "lead wiring lines" as required by claim 1 and claim 5. Prelim. Resp. 19–20, 25.

5. Analysis

Claims 1 and 5 both recite "wiring lines for driving the circuit unit and the display electrodes" and "a plurality of lead wiring lines provided on the extending portion and that are led from one of the sides of the wiring lines to the extending portion." Ex. 1001, 16:40–44, 17:15–19. As discussed above, "wiring lines" and "a plurality of lead wiring lines" are separate elements.

Petitioner again relies on a wiring—specifically, Sekado's driver driving wires 6—for "wiring lines" and on "segments" of that same wiring for "a plurality of lead wiring lines." Pet. 32–33, 41. The support for "segments" meeting the required "lead wiring lines" is again limited to Dr. Sechen's testimony: (1) "[a] [person of ordinary skill in the art] would

understand *Sekado* discloses a plurality of lead wiring lines that are on an extending portion of the one substrate and that led from one side of the wiring lines to the extending portion" (Ex. 1002 ¶ 146); and (2) "*Sekado* Figures 4 and 5 . . . disclose that segments of wirings 6 that are used to provide driving signals to the drivers are provided on the extending portion and are led from one of the sides of the wirings to the extending portion" (*id.* ¶ 147).

On this record, including Dr. Sechen's testimony, Petitioner fails to sufficiently establish the recited plurality of lead wiring lines where wiring lines and lead wiring lines are, at the very least presumptively, separate elements. First, there is no argument of record that the wiring lines and lead wiring lines are not set forth as distinct elements in the claim. Pet. Second, there is no explanation why Sekado's driver driving wires 6 include distinct "segments" and, if they did, there is no explanation why different "segments" are separate, distinct elements. *Id.*; Ex. 1002 ¶¶ 146–148, 178. Accordingly, Petitioner has not shown a reasonable likelihood of showing that claims 1 and 5 are unpatentable based on Sekado.

6. Dependent Claims

Petitioner's challenge to dependent claims 2–4, 6, and 9 address additional limitations to the base independent claim from which they depend, and not for the elements of the corresponding independent claim. Pet. 35–40, 43–44.

On this record, Petitioner fails to remedy the deficiency as to the challenge to claims 1 and 5, as discussed above.

7. Conclusion

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

G. Asserted Obviousness over Sekado in Combination with Aruga, Takezawa, Kim, or Aruga and Kim

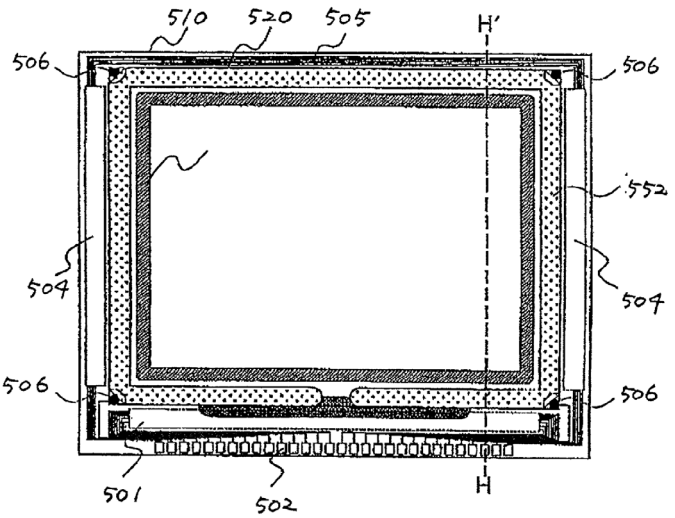
Petitioner challenges claim 7 as unpatentable for obviousness over the combination of Sekado and Aruga (Pet. 45–47), claim 8 over the combination of Sekado and Takezawa (*id.* at 48–51), claim 10 over the combination of Sekado and Kim (*id.* at 51–54), and claim 11 over the combination of Sekado, Aruga, and Kim (*id.* at 54–55). In each challenge, Petitioner relies on the additional reference(s) for disclosing further elements to meet additional limitations. *Id.* at 45–55. On this record, Petitioner fails to remedy the deficiency as to the challenges to claims 1 and 5, as discussed above. Accordingly, Petitioner fails to meet its burden for instituting *inter partes* review on these grounds.

H. Asserted Obviousness over Takezawa and Kim

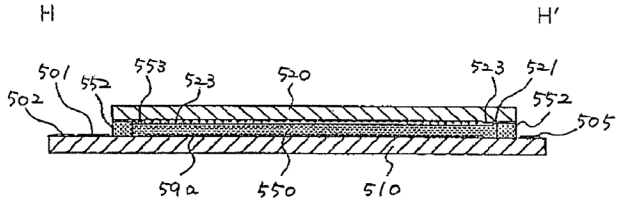
Petitioner challenges claims 1–4 and 8–10 as unpatentable for obviousness over the combination of Takezawa and Kim. Pet. 55–73.

1. Overview of Takezawa (Ex. 1006)

Takezawa is titled "Projector" and relates to a projector that includes an active liquid crystal device. Ex. 1006, code (54), ¶ 4. Takezawa discloses the structure of liquid crystal panels, including in Figures 6 and 7, reproduced below. Figure 6 is a plan view and Figure 7 is a section view taken along the line H-H' of Figure 6. *Id.* ¶ 71.



Id. at Fig. 6 (illustrating a plan view of a liquid crystal display panel device).



Id. at Fig. 7 (illustrating a section view of the liquid crystal display panel device depicted in Figure 6). Each of Figures 6 and 7 depict "base substrate 510, which is a light-exiting-side substrate, and the counter substrate 520, which is a light-incident-substrate, . . . [the substrates] bonded together by a sealant 552." *Id.* ¶¶ 71–72. Liquid crystals 550 are sealed in the space bounded by base substrate 510, counter substrate 520, and sealant 552. *Id.* ¶ 72. At the outer side of sealant 552, the depicted structure includes data line drive circuit 501, which drives data lines 56a (not shown), and scanning line drive circuit 504, which drives scanning lines 53a (not shown). *Id.* ¶¶ 73–74, Figs. 6–7. External circuit connection terminal 502 is provided along one side of base substrate 510, along with wirings 505 for connecting the scanning line drive circuits 504 on both sides of the image display area and upper and lower conductive materials 506 for achieving

electrical conduction between base substrate 510 and counter substrate 520. *Id.* ¶ 74.

2. Overview of Kim (Ex. 1008)

Kim is titled "Connecting Part of Outer Circuit in Liquid Crystal Display Panel and a Fabricating Method Thereof" and relates to "[a] connecting part of an outer circuit in a liquid crystal display panel [that] includes a substrate and a plurality of pads on the substrate, where the pads are to be connected to the outer circuit." Ex. 1008, codes (54), (57).

3. Petitioner's Challenge to Independent Claim 1

Petitioner contends that Takezawa discloses every element of independent claim 1 except "each of the external connecting terminals overlapping with the plurality of lead wiring lines in plan view," and that this limitation is taught by Kim. Pet. 55–62.

Petitioner relies on Takezawa disclosing:

"[a]n electro-optical device," as recited in the preamble (*id.* at 55 (citing Ex. 1006 ¶ 71, Figs. 6–7; Ex. 1002 ¶¶ 222–223));

"a pair of substrates that are disposed to face each other with a predetermined gap therebetween" (*id.* at 55 (citing Ex. 1006 ¶ 72, Fig. 7; Ex. 1002 ¶¶ 224–226));

"one substrate of the pair of substrates including an extending portion that extends from the other substrate on one side in plan view" (*id.* at 56–57 (citing Ex. 1006, Figs. 6–7; Ex. 1002 ¶¶ 227–229));

"display electrodes that are provided on the one substrate" (*id.* at 57 (citing Ex. 1006 ¶ 76, Figs. 7, 10; Ex. 1002 ¶¶ 230–232));

"a circuit unit that is provided on the one substrate so as to drive the display electrodes" (*id.* at 57–58 (citing Ex. 1006 ¶ 74, Figs. 6, 8; Ex. 1002 ¶¶ 233–235));

"wiring lines for driving the circuit unit and the display electrodes" (*id.* at 58–59 (citing Ex. 1006 ¶ 74, Figs. 6–8; Ex. 1002 ¶¶ 236–238));

"a plurality of lead wiring lines provided on the extending portion and that are led from one of the sides of the wiring lines to the extending portion" (*id.* at 59 (citing Ex. 1006, Fig. 6; Ex. 1002 ¶¶ 239–241)); and

"a plurality of external connecting terminals provided on the extending portion" (*id.* at 59–60 (citing Ex. 1006 ¶ 74, Fig. 6; Ex. 1002 ¶¶ 242–244)).

Petitioner relies on Kim for the limitation, "each of the external connecting terminals overlapping with the plurality of lead wiring lines in plan view." *Id.* at 60–62 (citing Ex. 1008, code (54) (Title), 1:27–29, 1:38–48, 3:46–67, 4:14–18, 4:23–26, 4:67–5:1, Figs. 2, 4–5; Ex. 1002 ¶¶ 245–250).

More particularly, Petitioner relies on Takezawa disclosing "a plurality of data lines 56a for transmitting image signals to pixel electrodes 59a" and "Figure 6 show[ing] a plurality of wiring lines coupled to the data line drive circuit 501" for "wiring lines." *Id.* at 58–59 (citing Ex. 1006 ¶ 74, Figs. 6, 8; Ex. 1002 ¶¶ 236–238). Petitioner then relies on "segments of the wiring lines [that] are led from one of the sides of the wirings to the extending portion and extend on the extending portion" for "lead wiring lines." *Id.* at 59 (citing Ex. 1006, Fig. 6; Ex. 1002 ¶¶ 239–241).

4. Patent Owner's Argument

In the same manner as for Adachi and Sekado, discussed above, Patent Owner argues that the Petition fails to show that Takezawa discloses separate "wiring lines" and "lead wiring lines" as required by claim 1, instead relying on "segments" of the "wiring lines" as "lead wiring lines." Prelim. Resp. 30–32. Patent Owner also addresses Petitioner's passing

comment that Kim's segments of wires 42 constitute lead wiring lines; Patent Owner argues that Kim's disclosure also falls short for the same reasons. *Id.* at 32 n.1 (citing Pet. 61; Ex. 2001 ¶ 105).

5. Analysis

As discussed above, as set forth in claim 1, "wiring lines" and "a plurality of lead wiring lines" are separate elements.

Petitioner again relies on a wiring—specifically, the plurality of wiring lines coupled to the data line drive circuit 501, as depicted in Takezawa's Figure 6—for "wiring lines" and on "segments" of that same wiring for "a plurality of lead wiring lines." Pet. 58–59. The support for "segments" meeting the required "lead wiring lines" is again limited to Dr. Sechen's testimony: (1) "[a] [person of ordinary skill in the art] would understand that *Takezawa* teaches a plurality of lead wiring lines provided on the extending portion and that are led from one of the sides of the wiring lines to the extending portion" (Ex. 1002 ¶ 239); and (2) "*Takezawa* Figure 6 . . . shows segments of the wiring lines are led from one of the sides of the wirings to the extending portion and extend on the extending portion" (*id.* ¶ 240).

On this record, including Dr. Sechen's testimony, Petitioner fails to sufficiently establish the recited plurality of lead wiring lines where wiring lines and lead wiring lines are, at the very least presumptively, separate elements. First, there is no argument of record that the wiring lines and lead wiring lines are not set forth as distinct elements in the claim. Pet. Second, there is no explanation why Takezawa's wiring lines coupled to the data line drive circuit 501 include distinct "segments" and, if they did, there is no explanation why different "segments" are separate, distinct elements. *Id.*; Ex. 1002 ¶¶ 239–241.

Petitioner relies wholly on Takezawa's wiring lines coupled to the data line drive circuit 501, but we note that: (1) Takezawa's data lines 56a for transmitting image signals to pixel electrodes 59a, relied on for wiring lines, cannot provide the recited "lead wiring lines" because they do not reach the "extending portion" and do not overlap with "external circuit connection terminal[s] 502" relied on for "external connecting terminals" (Ex. 1006 ¶¶ 74, 76, Figs. 6–7); and (2) Kim would likewise fall short because Petitioner, although noting that "[t]he segments of the wires 42 . . . constitute lead wiring lines" (Pet. 61 (citing Ex. 1002 ¶ 248)), again provides no explanation, including for why different "segments" are separate, distinct elements (Pet.). Moreover, 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").

Accordingly, Petitioner has not shown a reasonable likelihood of showing that claims 1 and 5 are unpatentable based on Takezawa and Kim.

6. Dependent Claims

Petitioner's challenge to dependent claims 2–4 and 8–10 address additional limitations to independent claim 1 from which they depend, directly or indirectly, and not for the elements of the corresponding independent claim. Pet. 62–73.

On this record, Petitioner fails to remedy the deficiency as to the challenge to claim 1, as discussed above.

7. Conclusion

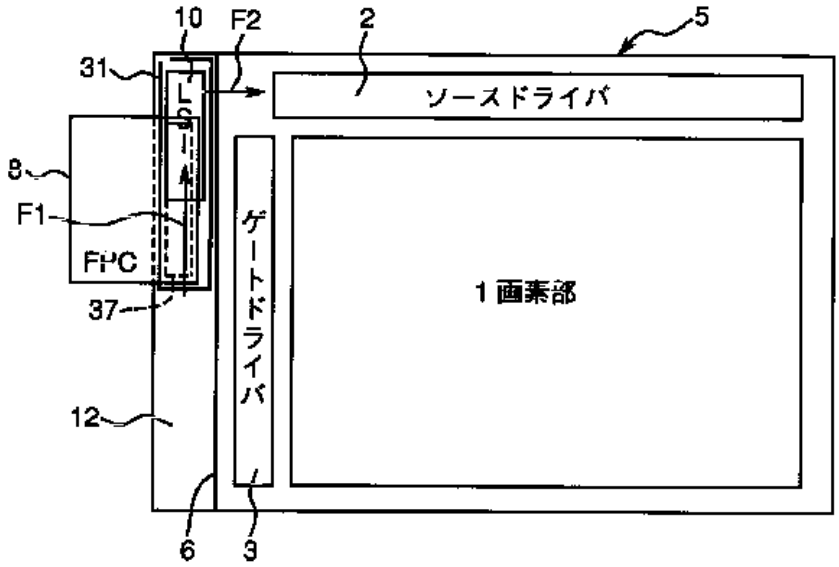
On this record, Petitioner fails to meet its burden for instituting *inter partes* review based on the combination of Takezawa and Kim.

I. Asserted Obviousness over Takezawa and Yoneda

1. Overview of Yoneda (Ex. 1011)

Yoneda is titled "Image Display Device" and relates to "[a]n image display device in which peripheral circuits for a polysilicon TFT liquid crystal display can be configured without increasing frame area." Ex. 1011, Title, ¶ 10.

Figure 3, reproduced below, depicts a polysilicon TFT liquid crystal display device.



Id. at Fig. 3 (depicting a polysilicon TFT liquid crystal display device). The pixel portion/section 1 receives input from circuitry; arrows F1 and F2 indicate the flow of a video signal, which is received from the outside through flexible wiring board 8, then proceeding through external terminals 37, integrated circuit (LSI) 10, and source driver 2. *Id.* ¶¶ 22–24, 32, 50, Fig. 3. The display device further includes gate driver 3. *Id.* ¶ 22.

Source driver 2, gate driver 3, and pixel section 1 are formed on substrate 5, which also has side 6, and adjacent region 12 inside TFT substrate 5 and protruding outside the counter substrate (not shown).[11] *Id.* As depicted, integrated circuit (LSI) 10 is formed on (or over) relay substrate 31. *Id.* ¶ 32, Fig. 3. So configured, "the flexible wiring board 8, the integrated circuit 10, and the relay substrate 31 are arranged in approximately half the area of adjacent area 12, so that the video signal transmission path can be shortened." *Id.* ¶ 32.

2. Petitioner's Challenge

Petitioner challenges claims 5 and 6 as unpatentable for obviousness over the combination of Takezawa and Yoneda. Pet. 73–77. Petitioner relies on its contentions for portions of claim 1 that are identical to those in claim 5. *Id.* at 73–74. For the last clause of claim 5, Petitioner separately relies on Yoneda disclosing "each of the external connecting terminals overlapping with the circuit unit in plan view." *Id.* at 74–77 (citing Ex. 1011, Title, Abstr., ¶¶ 22, 24, 32, Fig. 3; Ex. 1002 ¶¶ 299–305).

3. Patent Owner's Argument

In the same manner as for Takezawa in combination with Kim, discussed above, Patent Owner argues that the Petition fails to show that Takezawa discloses separate "wiring lines" and "lead wiring lines" as required by claim 1. Prelim. Resp. 38 (citing *id.* at 30–32 (§ VI.I.3.a.i)).

4. Analysis

On this record, Petitioner fails to remedy the same deficiency as to the corresponding challenge to claim 1 grounded on Takezawa and Kim, that is,

[11] Although not explicitly stated, by implication, side 6 appears to define the edge of structure that is overlapped by the counter substrate.

the failure of Takezawa to disclose or teach separate lead wiring lines. Accordingly, Petitioner fails to meet its burden for instituting *inter partes* review on this ground.

J. Asserted Anticipation by Hirosue

Petitioner challenges claims 5 and 6 as anticipated by Hirosue. Pet. 84–94.

1. Overview of Hirosue (Ex. 1013)

Hirosue is titled "Display Device" and relates to a "display device compris[ing] scan lines on a[n] insulating substrate, signal lines intersecting with the scan lines . . . a display area comprising pixel electrodes connected to the signal lines, a scan line driver circuit connected to the scan lines, a signal line driver circuit connected to the signal lines" where "[t]he scan line driver circuit and the signal line driver circuit are mounted directly on the insulating substrate outside of the display area . . . close to one side of the display area." Ex. 1013, codes (54), (57).

2. Petitioner's Challenge to Independent Claim 5

Petitioner contends that Hirose discloses every element of independent claim 5. Pet. 84–91.

Petitioner relies on Hirose disclosing:

"[a]n electro-optical device," as recited in the preamble (*id.* at 84 (citing Ex. 1013, code (57); Ex. 1002 ¶¶ 326–327));

"a pair of substrates that are disposed to face each other with a predetermined gap therebetween" (*id.* at 84–85 (citing Ex. 1013 ¶ 35, Figs. 1–2; Ex. 1002 ¶¶ 328–330));

"one substrate of the pair of substrates including an extending portion that extends from the other substrate on one side in plan view" (*id.* at 85–86 (citing Ex. 1013, Figs. 1–2; Ex. 1002 ¶¶ 331–333));

"display electrodes that are provided on the one substrate" (*id.* at 86–87 (citing Ex. 1013 ¶ 35, Figs. 1–2; Ex. 1002 ¶¶ 334–336));

"a circuit unit that is provided on the one substrate so as to drive the display electrodes" (*id.* at 87 (citing Ex. 1013 ¶ 35, Figs. 1–2; Ex. 1002 ¶¶ 337–340));

"wiring lines for driving the circuit unit and the display electrodes" (*id.* at 88 (citing Ex. 1013 ¶ 35, Figs. 1–2; Ex. 1002 ¶¶ 341–343));

"a plurality of lead wiring lines provided on the extending portion and that are led from one of the sides of the wiring lines to the extending portion" (*id.* at 89 (citing Ex. 1013, Fig. 1; Ex. 1002 ¶¶ 344–346));

"a plurality of external connecting terminals provided on the extending portion" (*id.* at 89–90 (citing Ex. 1013 ¶ 35, Figs. 1–2; Ex. 1002 ¶¶ 347–349)); and

"each of the external connecting terminals overlapping with the circuit unit in plan view" (*id.* at 90–91 (citing Ex. 1013 ¶ 21, Figs. 1–2; Ex. 1002 ¶¶ 350–353)).

More particularly, Petitioner relies on Hirosue teaching that, in Figures 1 and 2,

> element "6 denotes a group of lines that connects scan lines on one side of the display region and a scan line driver circuit, 7 denotes a group of lines that connects scan lines on a side that lies opposite to one side of the display region and the scan line driver circuit, 8 denotes a group of lines that connects the signal lines of the display region and the signal line driver circuit; 9 denotes connecting lines that connects the scan line driver circuit and the signal line driver circuit"

for "wiring lines." Pet. 88 (citing Ex. 1013 ¶ 35, Figs. 1–2; Ex. 1002 ¶¶ 341–343). Petitioner then relies on "segments of at least the lines 9, that extend in the up-down direction in Figure 1, are provided on the extending

portion, and are led from one of the sides of the lines to the extending portion and extend on the extending portion." *Id.* at 89 (citing Ex. 1013, Fig. 1; Ex. 1002 ¶¶344–346).

3. Patent Owner's Argument

In the same manner as for Adachi, Sekado, and Takezawa, discussed above, Patent Owner argues that the Petition fails to show that Hirosue discloses separate "wiring lines" and "lead wiring lines" as required by claim 1, instead relying on "segments" of the "wiring lines" as "lead wiring lines." Prelim. Resp. 43–45.

4. Analysis

As discussed above, as set forth in claim 5, "wiring lines" and "a plurality of lead wiring lines" are separate elements.

Petitioner again relies on wirings (lines)—specifically, elements 6, 7, 8, and 9—the plurality of lines coupling various other elements, including lines 9 that connect the scan line driver circuit and the signal line driver circuit, as "wiring lines." Pet. 88. Petitioner also again relies on "segments" of that same wiring, particularly, of the lines 9, for "a plurality of lead wiring lines." *Id.* at 89. The support for "segments" meeting the required "lead wiring lines" is again limited to Dr. Sechen's testimony: (1) "[a] [person of ordinary skill in the art] would understand that *Hirosue* discloses a plurality of lead wiring lines provided on the extending portion and that are led from one of the sides of the wiring lines to the extending portion." (Ex. 1002 ¶ 344); and (2) "[a]s shown in Figure 1 of *Hirosue*, segments of at least the lines 9, that extend in the up-down direction in FIG. 1, are provided on the extending portion, and are led from one of the sides of the lines to the extending portion and extend on the extending portion" (*id.* ¶ 345).

On this record, including Dr. Sechen's testimony, Petitioner fails to sufficiently establish the recited plurality of lead wiring lines where wiring lines and lead wiring lines are, at the very least presumptively, separate elements. First, there is no argument of record that the wiring lines and lead wiring lines are not set forth as distinct elements in the claim. Pet. Second, there is no explanation why Hirosue's wiring lines 9, or any other of the lines cited as "wiring lines," include distinct "segments" and, if they did, there is no explanation why different "segments" are separate, distinct elements. Pet.; Ex. 1002 ¶¶ 344–346. Accordingly, Petitioner has not shown a reasonable likelihood of showing that claim 5 is unpatentable based on Hirosue.

5. Dependent Claim 6

Petitioner's challenge to dependent claim 6 addresses additional limitations to independent claim 5 from which it depends, and not for the elements of the corresponding independent claim. Pet. 92–94.

On this record, Petitioner fails to remedy the deficiency as to the challenge to claim 5, as discussed above.

6. Conclusion

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

K. Asserted Obviousness over Hirosue in Combination with Aruga or Aruga and Tanaka

Petitioner challenges claim 7 as unpatentable for obviousness over the combination of Hirosue and Aruga (Pet. 94–97) and claim 11 over the combination of Hirosue, Aruga, and Tanaka (*id.* at 97–99). In both challenges, Petitioner relies on the additional reference(s) for disclosing further elements to meet additional limitations. *Id.* at 94–99. On this record,

Petitioner fails to remedy the deficiency as to the challenge to claim 5, as discussed above. Accordingly, Petitioner fails to meet its burden for instituting *inter partes* review on these grounds.

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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