

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TIANMA MICROELECTRONICS CO. LTD.,
Petitioner,

v.

JAPAN DISPLAY INC.,
Patent Owner.

IPR2021-01059
Patent 8,830,409 B2

Before JO-ANNE M. KOKOSKI, KRISTINA M. KALAN, and
ELIZABETH M. ROESEL, *Administrative Patent Judges*.

KALAN, *Administrative Patent Judge*.

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

I. INTRODUCTION

Tianma Microelectronics Co. Ltd. (“Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting an *inter partes* review of claims 1–9 of U.S. Patent No. 8,830,409 B2 (Ex. 1001, “the ’409 patent”). Japan Display Inc. (“Patent Owner”) filed a Preliminary Response to the Petition (Paper 6, “Prelim. Resp.”). Pursuant to Board authorization, Petitioner filed a Reply (Paper 7, “Reply”) and Patent Owner filed a Sur-reply (Paper 9, “Sur-reply”).

To institute an *inter partes* review, we must determine that the information presented in the Petition shows “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). For the reasons discussed below, after considering the parties’ submissions and the evidence of record, we determine that Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to at least one claim of the ’409 patent. Thus, we do not institute an *inter partes* review.

A. *Related Proceedings*

The parties identify the following litigation involving the ’409 patent: *Japan Display Inc. v. Tianma Microelectronics Co.*, No. 2-20-cv-00284 (E.D. Tex.), *consolidated with* No. 2-20-cv-00283 (E.D. Tex.) (the “District Court litigation”). Pet. 108–109; Paper 5, 3.

B. *Real Parties-In-Interest*

Petitioner identifies itself as the real party-in-interest. Pet. 108. Patent Owner identifies itself as the real party-in-interest. Paper 5, 3.

C. The '409 Patent

The '409 patent is titled “Liquid Crystal Display Device Having Improved Electrostatic Discharge Resistance,” and is directed to a device including “a first substrate, a second substrate and liquid crystal,” in which the

first substrate includes pixel electrodes, a peripheral circuit and a dummy wiring. The peripheral circuit and the dummy wiring are provided outside a pixel area in which the pixel electrodes are arranged. The second substrate is opposed to the first substrate through the liquid crystal. The second substrate includes a translucent conductive film that is provided on an opposite side of the second substrate to a side where the liquid crystal is present. The dummy wiring is located on an outer peripheral side of the substrates than the peripheral circuit and is provided independently of the peripheral circuit in terms of circuit. The dummy wiring is grounded outside the first substrate.

Ex. 1001, codes (54), (57). Because “static electricity from the outside of the panels through a human body, or the like, may cause trouble with the panels,” this structure proposes a solution to improve the electrostatic discharge in an LCD device. *Id.* at 1:33–38, 1:8–10. More particularly, the device of the '409 patent is intended to flow “the static electricity through the dummy wiring 168 to the ground electric potential of the external circuit 18” to “suppress transmission of static electricity to the peripheral circuit 150,” and, thus, to improve the electrostatic discharge resistance. *Id.* at 7:4–12. Figure 3 of the '409 patent is reproduced below:

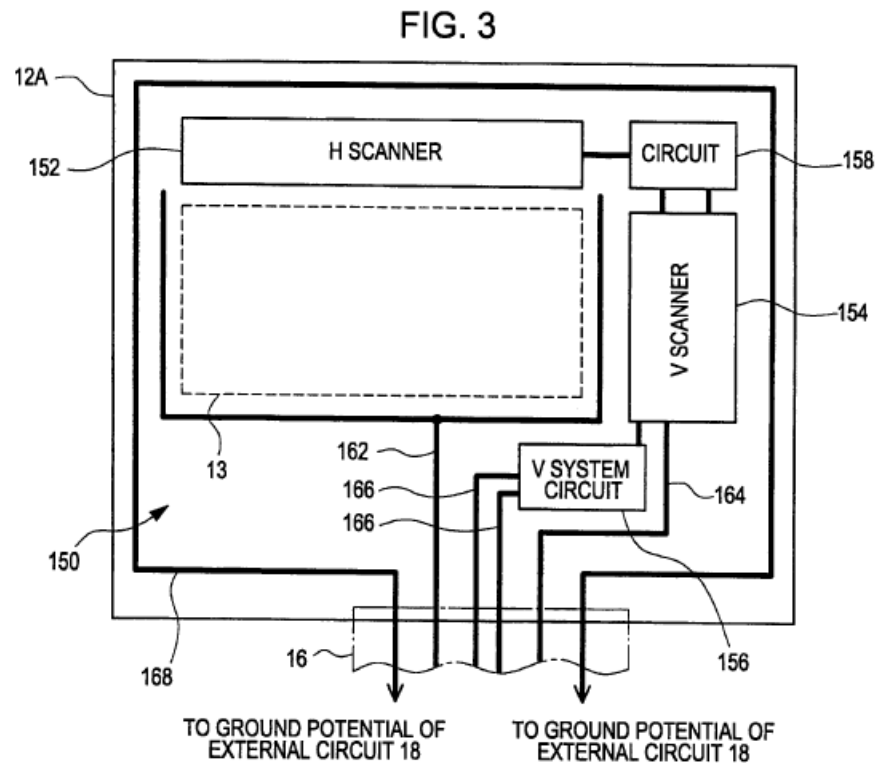


Figure 3 of the '409 patent is a plan view of an embodiment in which dummy wiring 168 surrounds peripheral circuit 150 without intersecting it, such that “static electricity entering the dummy wiring 168 is suppressed from being transmitted to the peripheral circuit 150 due to coupling” and “electrostatic discharge resistance is improved.” *Id.* at 2:55–57, 7:13–17.

D. Illustrative Claim

Claims 1 and 9 are independent claims; claims 2–8 depend from claim 1, which is reproduced below:

- 1(pre) A liquid crystal display device comprising:
- 1(a) a first substrate having a side and including pixel electrodes, a peripheral circuit, at least one common electrode, and a dummy wiring, the peripheral circuit and the dummy wiring being provided outside a pixel area in which the pixel electrodes are arranged, the peripheral circuit being arranged along the side of the first substrate;

- 1(b) a second substrate that includes a translucent conductive film provided at an opposite side of the second substrate to a side where the liquid crystal is present; and
- 1(c) liquid crystal through which the second substrate is opposed to the first substrate, wherein
- 1(d) the peripheral circuit includes a common wiring supplying a common electric potential to the at least one common electrode, the common wiring being separate from the dummy wiring,
- 1(e) the dummy wiring is located close to an outermost edge of the first substrate,
- 1(f) the dummy wiring is made of a continuous metal layer surrounding the pixel area and peripheral circuit to ground the static electricity,
- 1(g) the dummy wiring is located between the peripheral circuit and the outermost edge of the side at which the peripheral circuit is positioned and is not electrically connected to the peripheral circuit,
- 1(h) the dummy wiring is connected to a ground potential outside the first substrate and the dummy wiring surrounds the peripheral circuit on at least three sides of the first substrate, and
- 1(i) wherein the dummy wiring is provided to discharge electric potential rise on the first substrate that occurs due to coupling with electric potential rise of the translucent conductive film on the second substrate.

Ex. 1001, 9:18–50 (annotations added).

E. The Asserted Grounds of Unpatentability

Petitioner contends that claims 1–9 of the '409 patent are unpatentable on the following grounds. Pet. 21–108.

Ground	References	35 U.S.C. § ¹	Claim(s) Challenged
1	Maeda, ² Li ³	103	1–7, 9
2	Maeda, Li, Ozawa ⁴	103	8
3	Maeda, Ozawa	103	1–4, 6, 8–9

In support of its unpatentability arguments, Petitioner relies on the declaration of Richard A. Flasck. Ex. 1003. Patent Owner relies on the declaration of Thomas L. Credelle. Ex. 2005.

II. ANALYSIS

A. Claim Construction

We apply the claim construction standard articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b). Under *Phillips*, claim terms are afforded “their ordinary and customary meaning.” *Phillips*, 415 F.3d at 1312. The “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).

¹ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. § 103. Because the ’409 patent has an effective filing date prior to the effective date of the applicable AIA amendments, we refer to the pre-AIA version of § 103.

² US 6,346,932 B1, issued February 12, 2002 (Ex. 1005).

³ Chinese Patent No. CN 2789801Y, published June 21, 2006 (Ex. 1006).

⁴ US 6,392,622 B1, issued May 21, 2002 (Ex. 1007).

Petitioner states that “no terms need construction because the claims encompass the prior-art mappings provided below under any construction consistent with *Phillips*.” Pet. 21. Patent Owner does not appear to address claim construction directly. *See generally* Prelim. Resp. On this record, we determine that no claim terms require express construction.

B. Level of Ordinary Skill in the Art

Petitioner asserts that a person of ordinary skill in the art “would have had at least a four-year undergraduate degree in electrical engineering or physics or a closely related field and four years of experience in the design and implementation of flat panel display devices or components thereof,” and that additional education “could substitute for professional experience and vice versa.” Pet. 14 (citing Ex. 1003 ¶ 39). Patent Owner does not propose a definition of one of ordinary skill in the art. *See generally* Prelim. Resp. Although Mr. Credelle disagrees with Petitioner’s asserted level of ordinary skill and provides his own definition, he states that his opinions apply equally under either proposed level. Ex. 2005 ¶¶ 28–30.

In light of the record before us, we adopt Petitioner’s proposal regarding the level of one of ordinary skill in the art. The level of ordinary skill in the art is also reflected by the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

C. Asserted Obviousness over Maeda and Li (Ground 1)

Petitioner argues that claims 1–7 and 9 are obvious over Maeda and Li. Pet. 22–83.

1. Maeda

Maeda is a patent titled “Liquid Crystal Device and Electronic Equipment.” Ex. 1005, code (54). Maeda’s liquid crystal device has a

particular structure that “displays a high quality image without encountering an influence of electrostatic charges.” *Id.* at code (57). Maeda’s Figure 2a is reproduced below.

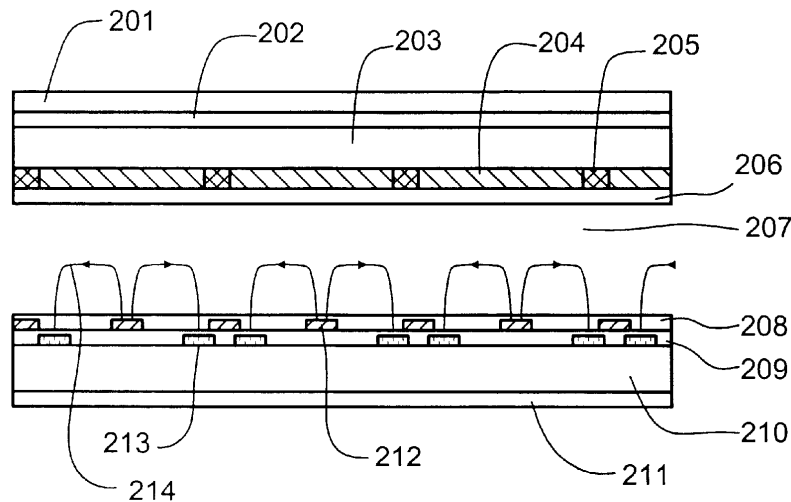


Fig. 2(a)

Maeda’s Figure 2 depicts “a cross-sectional view of the liquid crystal device according to the present invention.” *Id.* at 7:5–6. In Figure 2, transparent conducting ITO (indium tin oxide) film 202 is formed on the outer surface of upper glass substrate 203. *Id.* at 12:64–66; *see also* Ex. 1003 ¶ 95.

Figures 8(a) and 8(b) of Maeda are reproduced below.

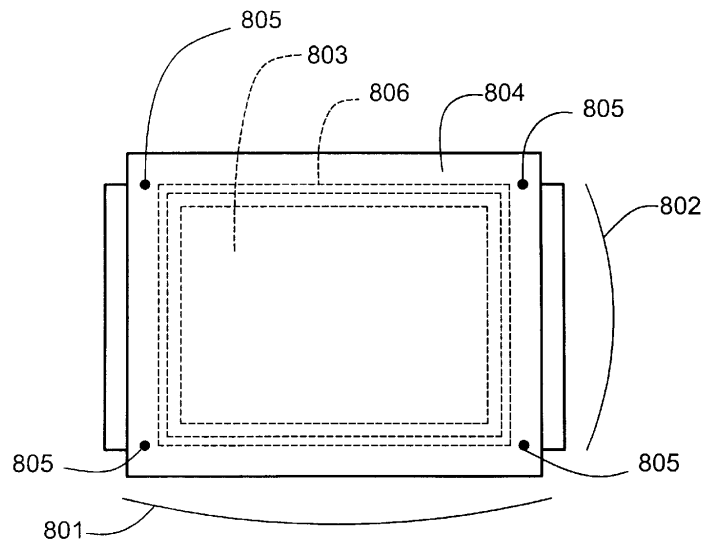


Fig. 8(a)

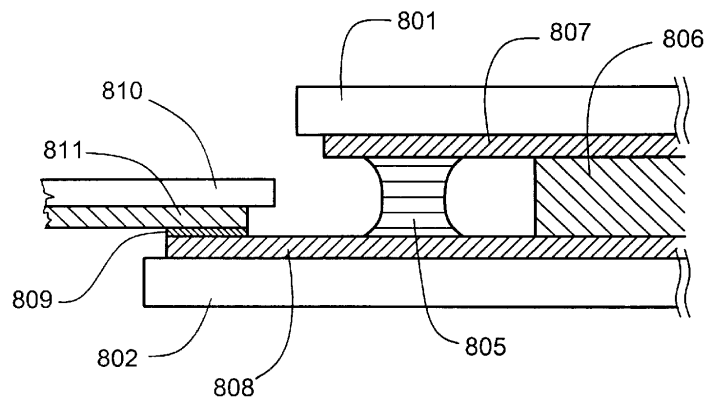


Fig. 8(b)

Maeda's Figure 8 depicts a liquid crystal cell "in which electrodes on the inner surfaces of the upper and lower substrates are electrically connected to each other via a silver paste, according to the present invention, wherein a plane view and an enlarged cross-sectional view thereof are shown."

Ex. 1008, 7:18–22. Silver paste 805 connects light-shielding chromium

film 807 to common electrode 808, and silver paste 806 is located “at four points outside the sealing area 806 of the liquid crystal.” *Id.* at 9:42–62.

Figure 9 of Maeda is reproduced below.

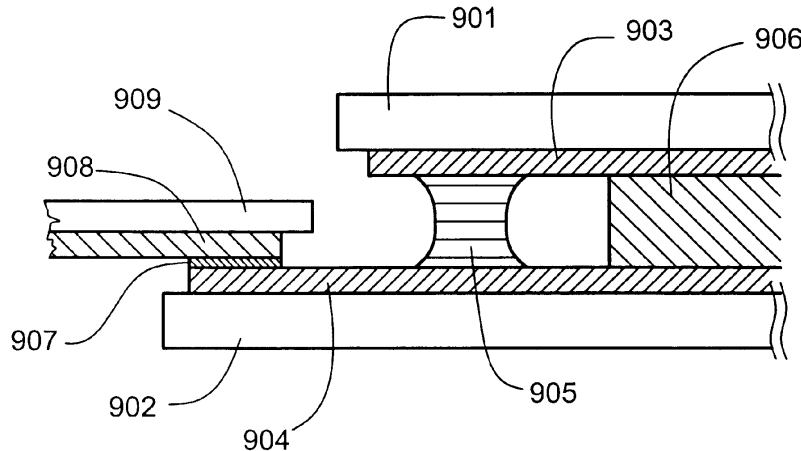


Fig. 9

Maeda’s Figure 9 depicts “a cross-sectional view illustrating a liquid crystal cell in which electrodes on the inner surfaces of the upper and lower substrates are electrically connected to each other via a silver paste, according to the present invention.” *Id.* at 7:23–26. In Figure 9, grounded light-shielding chromium film 903 formed on the inner surface of upper substrate 901 is connected to dummy electrode 904 formed on the inner surface of lower substrate 902 via silver paste 905 at a point outside seal area 906. *Id.* at 10:39–54. Also shown in Figure 9, “dummy electrode 904 is electrically connected via an anisotropic conducting film (ACF) 907 to interconnecting electrode 908 for supplying the ground voltage . . . thereby connecting the dummy electrode 904 to a ground voltage line provided on the liquid crystal driver circuit board.” *Id.* at 10:54–62.

2. *Li*

Li is a Chinese patent titled “Liquid Crystal Display with Anti-Static Structure.” Ex. 1006, code (54). *Li* relates to a liquid crystal display with an anti-static structure comprising, among other elements, an auxiliary ITO wire “disposed on the outer periphery of the sealant of the first transparent substrate and the second transparent substrate, the auxiliary ITO wire surrounds the entire ITO design pattern, and a discharge tip is disposed on one end of the auxiliary ITO wire.” *Id.* at code (57). Figure 4 of *Li* is reproduced below.

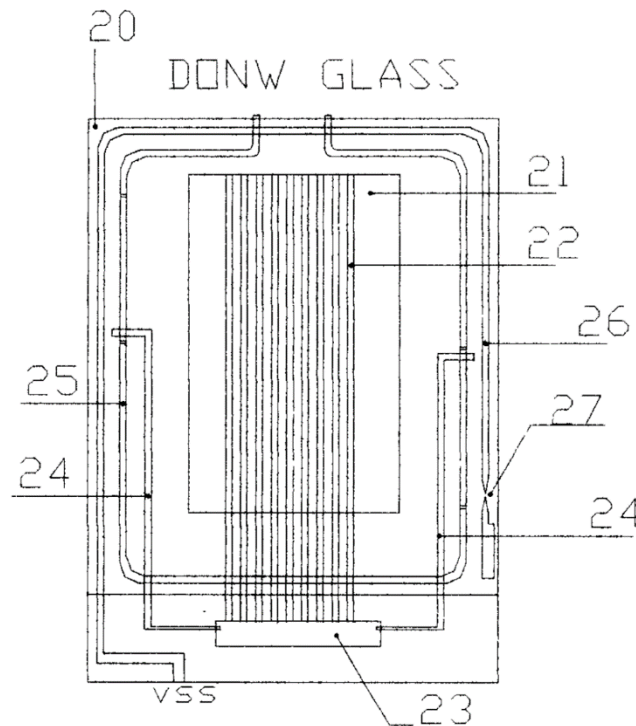


FIG. 4

Figure 4 of *Li* depicts “a structural diagram of a lower glass substrate” of *Li*’s Embodiment 2. *Id.* at 5. *Li* describes auxiliary ITO wire 26 as designed on the outer periphery of sealant 25, surrounding the entire ITO design pattern. *Id.* at 6. In *Li*’s Embodiment 2, auxiliary ITO wire 26 designed on

the outer periphery of sealant 25 on the lower glass may be directly connected to a VSS ground pin of a flexible printed circuit board. *Id.*

3. *Petitioner's Arguments*

Petitioner argues that the proposed combination of Maeda and Li discloses all the limitations of claim 1, as follows:

1(pre) A liquid crystal display device comprising: (Pet. 22 (relying on Ex. 1005, 2:45–49; Ex. 1003 ¶ 64));⁵

1(a) a first substrate having a side and including pixel electrodes, a peripheral circuit, at least one common electrode, and a dummy wiring, the peripheral circuit and the dummy wiring being provided outside a pixel area in which the pixel electrodes are arranged, the peripheral circuit being arranged along the side of the first substrate; (Pet. 22–38 (relying on Ex. 1005, Figs. 2(a), 8(a), 8(b), 9, 10, 13 (annotated); Ex. 1006, Fig. 4 (annotated); Ex. 1003 ¶¶ 66–83));

1(b) a second substrate that includes a translucent conductive film provided at an opposite side of the second substrate to a side where the liquid crystal is present; and (Pet. 38–39 (relying on Ex. 1005, Fig. 2(a) (annotated));

1(c) liquid crystal through which the second substrate is opposed to the first substrate, wherein (Pet. 39–40 (relying on Ex. 1005, Fig. 2(a) (annotated); Ex. 1003 ¶ 85));

1(d) the peripheral circuit includes a common wiring supplying a common electric potential to the at least one common electrode, the

⁵ We express no opinion on whether the preamble is limiting.

common wiring being separate from the dummy wiring, (Pet. 40–42 (relying on Ex. 1005, Figs. 8(b), 9 (annotated); Ex. 1003 ¶ 87));

1(e) the dummy wiring is located close to an outermost edge of the first substrate, (Pet. 42–44 (relying on Ex. 1005, Fig. 9 (annotated); Ex. 1006, Fig. 4 (annotated); Ex. 1003 ¶¶ 88–90));

1(f) the dummy wiring is made of a continuous metal layer surrounding the pixel area and peripheral circuit to ground the static electricity, (Pet. 45–50 (relying on Ex. 1005, Figs. 8(a), 9 (annotated), Ex. 1006, Fig. 4 (annotated); Ex. 1003 ¶¶ 93–98));

1(g) the dummy wiring is located between the peripheral circuit and the outermost edge of the side at which the peripheral circuit is positioned and is not electrically connected to the peripheral circuit, (Pet. 50–55 (relying on Ex. 1005, Figs. 8(a), 8(b), 9 (annotated), Ex. 1006, Fig. 4 (annotated); Ex. 1003 ¶¶ 101–104));

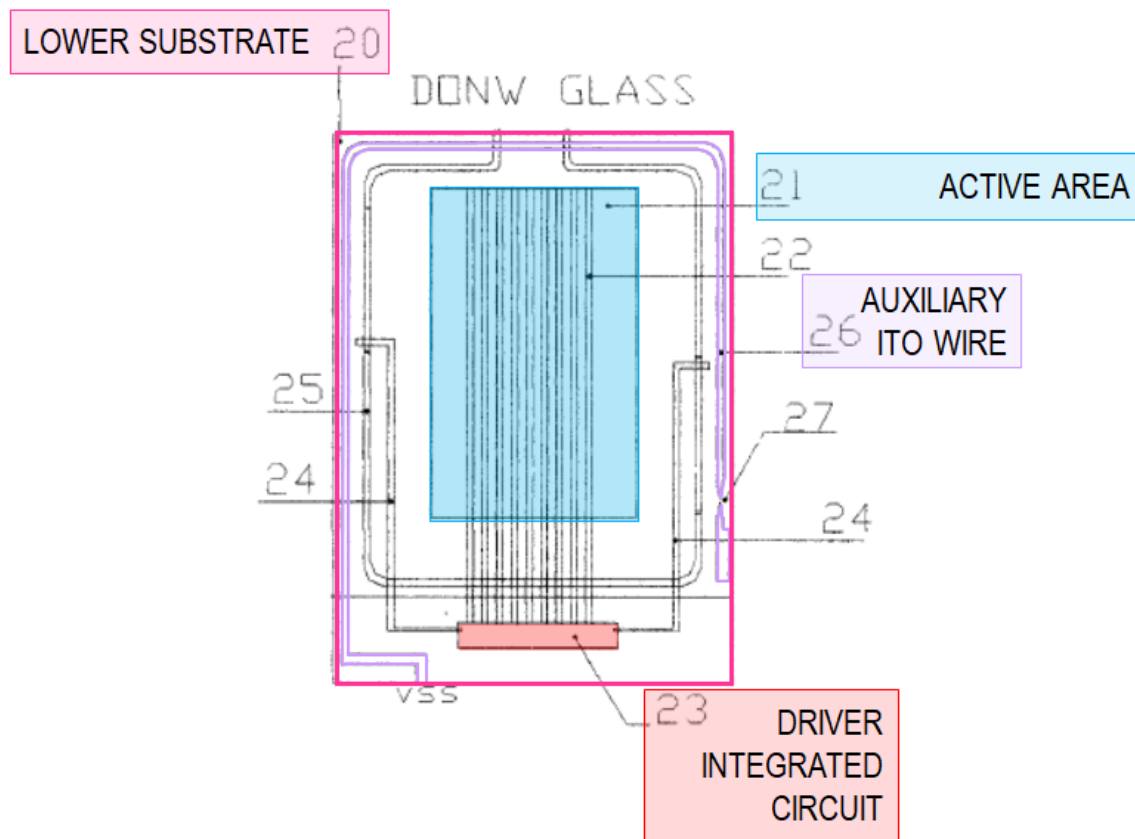
1(h) the dummy wiring is connected to a ground potential outside the first substrate and the dummy wiring surrounds the peripheral circuit on at least three sides of the first substrate, and (Pet. 55–58 (relying on Ex. 1005, Fig. 9 (annotated), Ex. 1006, Fig. 4 (annotated); Ex. 1003 ¶¶ 106–109));

1(i) wherein the dummy wiring is provided to discharge electric potential rise on the first substrate that occurs due to coupling with electric potential rise of the translucent conductive film on the second substrate. Pet. 58–59 (relying on Ex. 1005, 10:22–27; Ex. 1003 ¶¶ 110–111).

Petitioner presents additional arguments directed to claims 2–9. Pet. 60–83. Petitioner’s independent claim 9 arguments are similar to its claim 1 arguments. *Id.* at 72–83.

Petitioner argues that one of ordinary skill in the art would have been motivated to combine Maeda and Li for a number of reasons. Regarding limitation 1(a), Petitioner argues that one of ordinary skill in the art “would have been motivated by *Maeda*’s limited disclosure regarding the grounded **dummy electrode** to configure *Maeda*’s grounded **dummy electrode** in the manner described for the grounded **auxiliary ITO wire** in *Li*,” because *Li*’s configuration would “strengthen anti-static capabilities of” *Maeda*’s device by “channeling” and “eliminating” “static electricity . . . to effectively protect the LCD,” consistent with *Maeda*’s goal of removing electrostatic charge. Pet. 34. One of ordinary skill in the art, Petitioner argues, also would have been motivated and found it obvious to provide “*Maeda*’s **dummy electrode** ‘outside [the] **pixel area**,’ just as the **auxiliary ITO wire** is provided outside the **active area** of *Li*’s device” to further the shared goal of addressing static electricity in a liquid crystal device. *Id.* at 37–38 (citing Ex. 1003 ¶ 83); *see also id.* at 43 (limitation 1(e), citing Ex. 1003 ¶ 89).

Regarding limitation 1(f), Petitioner argues that one of ordinary skill in the art would have been motivated and found it obvious “to implement the **dummy electrode** as a ‘continuous metal layer’ because this is how the **auxiliary ITO wire** is implemented in *Li*,” and to “look to *Li* for additional description and illustration on how to configure the **dummy electrode** relative to the **driving circuit** on the **lower glass substrate**.” *Id.* at 47–48 (citing Ex. 1003 ¶ 96). Petitioner presents an annotated version of *Li*’s Figure 4, reproduced below, to illustrate the combination:



Annotated Li Figure 4 shows Petitioner’s proposed location of the dummy electrode outside active area 21, and the location of driver integrated circuit 23. *Id.* at 49.

Regarding limitation 1(g), Petitioner argues that one of ordinary skill in the art would have been motivated and found it obvious to “locate the dummy electrode ‘between’ Maeda’s driving circuit ‘and the outermost edge of the side at which’ Maeda’s driving circuit is positioned because this is how the auxiliary ITO wire is implemented relative to the driver integrated circuit in Li.” *Id.* at 52–54 (citing Ex. 1003 ¶ 104); *see also id.* at 56–58 (similar reasoning for limitation 1(h), citing Ex. 1003 ¶¶ 108–109). Petitioner presents an annotated version of Maeda’s Figure 8(a) to illustrate the proposed combination:

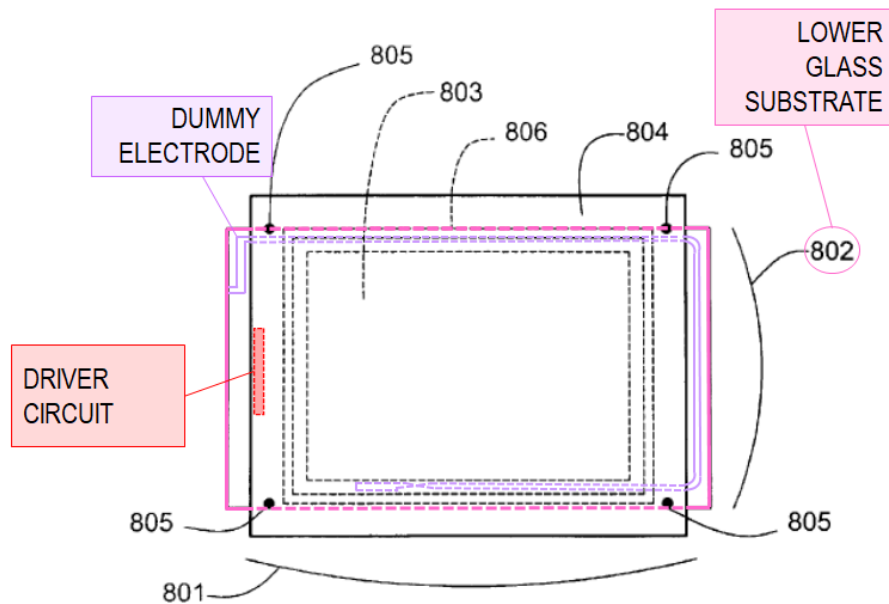


Fig. 8(a)

Annotated Maeda Figure 8(a) shows Petitioner’s proposed location of the dummy electrode relative to the proposed driver circuit. *Id.* at 55.

4. Patent Owner’s Arguments

Patent Owner argues that a person of ordinary skill in the art would not find it obvious to combine Maeda and Li. Prelim. Resp. 23. According to Patent Owner, “Maeda and Li are directed to very different technologies and problems,” i.e., “Li discloses a solution to the problem of static electricity buildup in a super twisted nematic (STN) display, which is very different from the LCD device of Maeda.” *Id.* at 23–24.

With respect to claim 1, Patent Owner argues, first, that the “‘dummy electrode’ of Maeda is quite different from the ‘dummy wiring’ of the ’409 Patent.” Prelim. Resp. 25. Patent Owner further argues that the proposed combination of Maeda and Li “fails to disclose the ‘dummy wiring’” because in addition to the “dummy electrode” being quite different from the

“dummy wiring” of the ’409 patent, “the structure of the device in Li is completely different from the structure of the device in Maeda,” with the device in Li being an STN device and the one in Maeda being an interdigitated IPS device. *Id.* at 25, 27.

Regarding limitation 1(f), Patent Owner argues that Maeda’s dummy electrode is not a “continuous metal layer,” Li’s “driver integrated circuit 23 does not surround the periphery of the device,” and Li’s ITO wire does not surround the peripheral circuit. *Id.* at 30–31. Regarding limitation 1(g), Patent Owner argues that the “auxiliary ITO wire is not ‘between the peripheral circuit and the outermost edge of the side at which the peripheral circuit is positioned,’ as required by the claim,” in the proposed combination of Maeda and Li. *Id.* at 32–33. Regarding limitation 1(h), Patent Owner argues that Li’s driver integrated circuit 23 cannot be equated with the peripheral circuit of the ’409 patent. *Id.* at 34. Driver integrated circuit 23, according to Patent Owner, “does not extend around the sides of the active pixel” and “auxiliary ITO wire 26 of Li does not protect the driver circuit because it does not surround it.” *Id.* at 34–35. Regarding limitation 1(i), Patent Owner states that “Petitioner is essentially arguing that the dummy electrode is connected to the transparent conducting ITO film,” but “nothing in Maeda indicates what feature connects to the transparent conducting film.” *Id.* at 35.

5. *Analysis*

Limitation 1(g) requires that “the dummy wiring is located between the peripheral circuit and the outermost edge of the side at which the peripheral circuit is positioned and is not electrically connected to the peripheral circuit.” Having considered the parties’ arguments, we are not

persuaded, on this record, that Petitioner sufficiently shows that the auxiliary ITO wire in Petitioner's proposed Maeda-Li combination is "between the peripheral circuit and the outermost edge of the side at which the peripheral circuit is positioned," as recited in the claim. Petitioner relies on annotated Figure 4 from Li and annotated Figure 8(a) from Maeda, as shown in Section II.C.3 above (Pet. 53, 55), but Patent Owner presents its own annotated Figure 8(a) of Maeda, reproduced below:

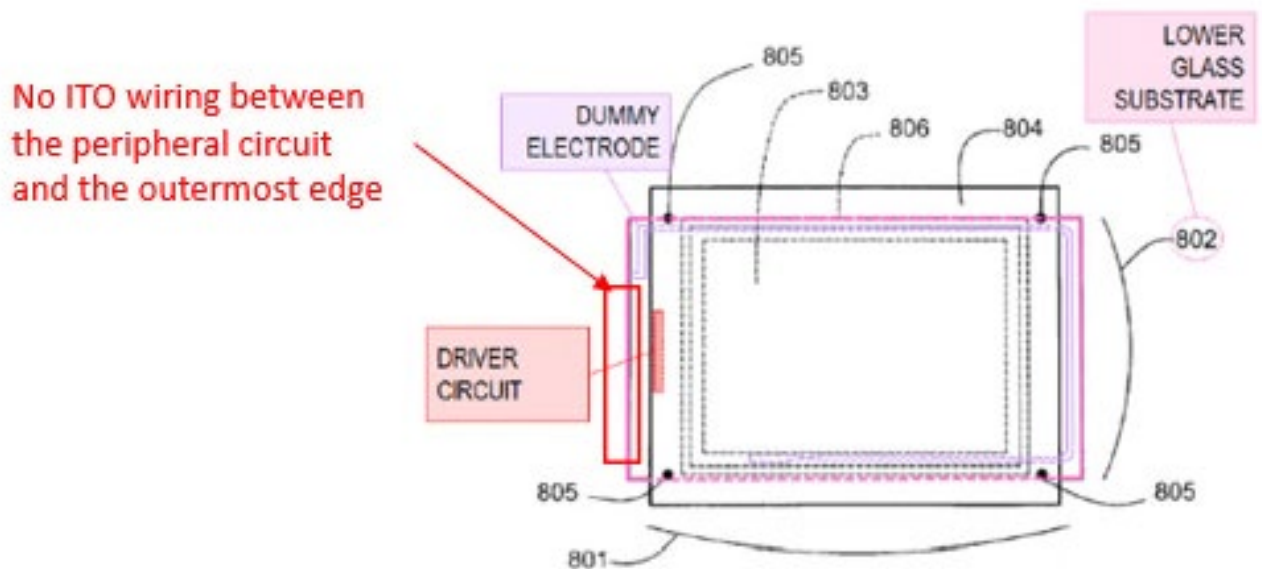


Fig. 8(a)

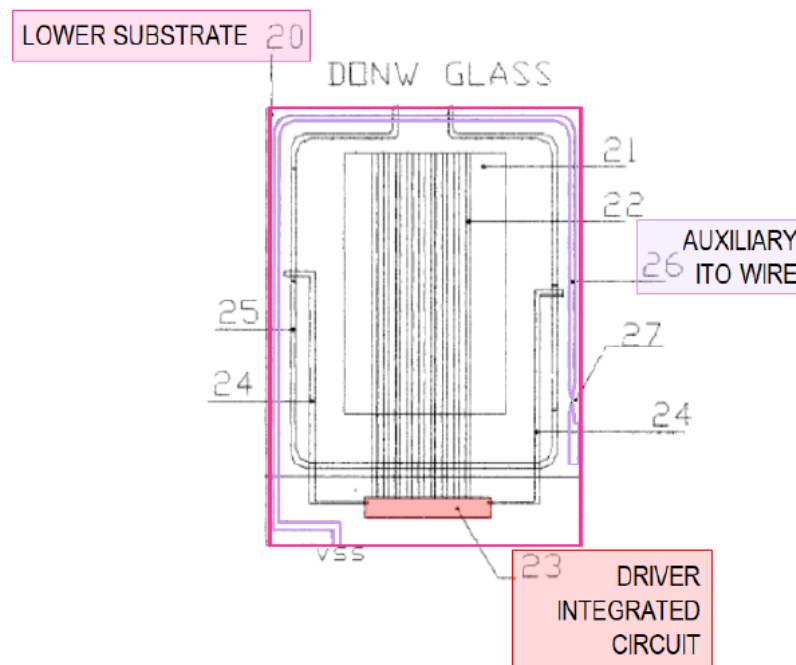
Patent Owner's version of Petitioner's annotated Maeda Figure 8(a) overlaid with elements from Li's Figure 4 shows peripheral circuit or driver circuit 23 at the left side of Patent Owner's annotated figure, and adds a box identifying an area labeled "No ITO wiring between the peripheral circuit and the outermost edge." Prelim. Resp. 33. Patent Owner's further annotation illustrates Patent Owner's argument that the dummy electrode in Petitioner's proposed combination would not extend "between the peripheral

circuit and the outermost edge of the side at which the peripheral circuit is positioned.” *Id.* at 32–33.

We agree with Patent Owner that Petitioner’s analysis falls short. In order to meet the requirement of limitation 1(g), the dummy electrode of the proposed combination would need to be located between the driver circuit (shaded red by Petitioner) and the leftmost edge of the lower glass substrate in Patent Owner’s annotated Figure 8(a). Petitioner does not appear to have shown that any portion of the dummy electrode extends between the driver circuit and the outermost edge of the left side of the lower glass substrate (as indicated by the unshaded red box added in Patent Owner’s annotated Figure 8(a) above). Although Petitioner identifies a lower glass substrate, a dummy electrode, and a driver circuit (corresponding to the claimed “peripheral circuit”) in Maeda Figure 8(a), Petitioner does not adequately explain, on this record, how the dummy electrode is “between” the peripheral circuit and the outermost edge of the lower glass substrate, when there is no dummy electrode along the outermost edge portion identified by Patent Owner. Accordingly, Petitioner does not show sufficiently that the auxiliary ITO wire in Petitioner’s proposed combination is between the peripheral circuit and the outermost edge of the side at which the peripheral circuit is positioned, as in limitation 1(g).

Claim limitation 1(h) requires that the “dummy wiring surrounds the peripheral circuit on at least three sides of the first substrate.” The language of limitation 1(h) would appear to permit “surrounds” to mean that the dummy wiring surrounds the peripheral circuit on at least three sides, or to mean that the dummy wiring surrounds at least three sides of the first substrate. On this record, Petitioner has not shown sufficiently that its

proposed combination satisfies either interpretation of “surrounds.” In Petitioner’s proposed combination, shown in Petitioner’s annotated Figure 4 of Li (which is rotated 90° from the proposed combination depicted in Maeda Figure 8(a)), the purple auxiliary ITO wire extends entirely along the left side, entirely along the top side, along part of the right side, and along a small part of the bottom side, as shown below:



Li, Figure 4 (annotated).

Li’s annotated Figure 4 shows the auxiliary ITO wire in purple around a portion of the first substrate, as well as driver integrated circuit 23 located near the bottom side on the same substrate. Pet. 57. On this record, Petitioner has not shown sufficiently that its combination would have resulted in the dummy wiring surrounding the driver integrated circuit on at least three sides. A generous interpretation would have the dummy wiring 26 “surrounding” rectangular driver integrated circuit 23 on a maximum of two sides (left side and top side). However, the lack of

proximity of dummy wiring 26 to the left side and top side of driver integrated circuit 23 strains the meaning of the term “surrounds” in a way that renders it inapplicable to Petitioner’s proposed combination. Petitioner also has not shown sufficiently that its combination would have resulted in dummy wiring that “surrounds” the first substrate on at least three sides. At most, the dummy wiring runs along two sides (top and left) of the first substrate, but only runs along a portion of a third side (right), and a very small portion of a fourth side (bottom), as seen in Li’s annotated Figure 4 above.

Regarding limitation 1(h), Petitioner relies on its annotated Figure 4 of Li and argues: “As Figure 4 shows, *Li*’s auxiliary ITO wire ‘surrounds’ the driver integrated circuit ‘on at least three sides of’ *Li*’s lower substrate.” Pet. 57. However, as discussed above, Petitioner has not shown sufficiently that Li’s auxiliary ITO wire surrounds the driver integrated circuit, or surrounds at least three sides of the lower substrate. Petitioner does not elaborate on this explanation or provide additional persuasive support for its assertion that the dummy wiring of its proposed combination surrounds either the peripheral circuit or the first substrate on at least three sides. Accordingly, under either or both of these interpretations, Petitioner’s proposed Maeda-Li combination fails to meet limitation 1(h).

Petitioner “has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016); *see also SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1355 (2018) (“in an inter partes review the petitioner is master of its complaint”). Based on our review of the record, we find that there is insufficient explanation supported by record evidence that the

proposed combination would have resulted in a device that meets limitations 1(g) and 1(h) of the '409 patent.

For these reasons, we determine that Petitioner has not sufficiently established that the combined teachings of Maeda and Li disclose or suggest all of the limitations of independent claims 1 or 9 (which contains similar limitations to those discussed above in relation to claim 1), and we determine that Petitioner does not show a reasonable likelihood of prevailing on its assertion that the subject matter of claims 1–7 and 9 would have been obvious over the combined teachings of Maeda and Li.

D. Asserted Obviousness Based on Maeda and Ozawa (Ground 3)

Petitioner argues that claims 1–4, 6, and 8–9 would have been obvious over Maeda and Ozawa. Pet. 86–108.

1. Ozawa

Ozawa is a patent titled “Active-Matrix Substrate, Electro-Optical Device, Method for Manufacturing Active-Matrix Substrate, and Electronic Equipment.” Ex. 1007, code (54). In Ozawa, “an antistatic common wiring is made from a conductive layer, when the active-matrix substrate is manufactured” and the “common wiring is formed so as to cross over the boundary of adjacent panel areas and collects static electricity generated when the rubbing process is applied to the large substrate, and the charges are dispersed.” *Id.* at code (57).

Figure 6 of Ozawa is reproduced below.

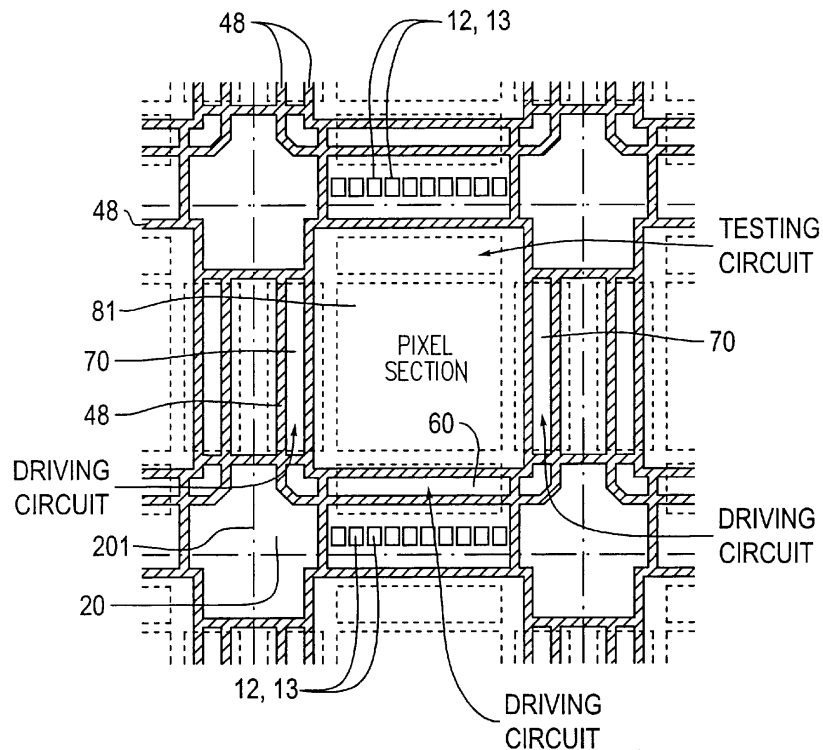


Fig. 6

Figure 6 “is a plan view showing an enlarged part of the antistatic common wiring (conductive layer)” of Ozawa. *Id.* at 4:55–57. Ozawa focuses on common wiring 48 formed in each panel area 20 on the surface of large substrate 200 “so as to enclose the pixel section 81 disposed almost at the center of each panel area 20.” *Id.* at 9:20–25.

2. Petitioner’s Arguments

Petitioner refers back to its arguments concerning Ground 1 for a number of limitations of claim 1 that Petitioner argues are disclosed by Maeda alone, namely: 1(pre) (Section VIII.A.1.a); 1(b) (Section VIII.A.1.c); 1(c) (Section VIII.A.1.d); 1(d) (Section VIII.A.1.e); and 1(i) (Section VIII.A.1.j). Petitioner argues that the combination of Maeda and Ozawa discloses the remaining limitations as follows:

1(a) a first substrate having a side and including pixel electrodes, a peripheral circuit, at least one common electrode, and a dummy wiring, the peripheral circuit and the dummy wiring being provided outside a pixel area in which the pixel electrodes are arranged, the peripheral circuit being arranged along the side of the first substrate; (Pet. 86–93 (relying on Ex. 1005 (as discussed in Pet. 23–29); Ex. 1007, Fig. 6 (annotated); Ex. 1003 ¶¶ 156–160));

1(e) the dummy wiring is located close to an outermost edge of the first substrate, (Pet. 93–94 (relying on Ex. 1005 (as discussed in Pet. 42–44); Ex. 1007, Fig. 6 (annotated); Ex. 1003 ¶¶ 162–163));

1(f) the dummy wiring is made of a continuous metal layer surrounding the pixel area and peripheral circuit to ground the static electricity, (Pet. 95–97 (relying on Ex. 1005 (as discussed in Pet. 45–50); Ex. 1007, Fig. 6 (annotated); Ex. 1003 ¶¶ 165–168));

1(g) the dummy wiring is located between the peripheral circuit and the outermost edge of the side at which the peripheral circuit is positioned and is not electrically connected to the peripheral circuit, (Pet. 98–100 (relying on Ex. 1005 (as discussed in Pet. 50–55); Ex. 1007, Fig. 6 (annotated); Ex. 1003 ¶ 172));

1(h) the dummy wiring is connected to a ground potential outside the first substrate and the dummy wiring surrounds the peripheral circuit on at least three sides of the first substrate, and (Pet. 100–102 (relying on Ex. 1005 (as discussed in Pet. 55–58); Ex. 1007, Fig. 6 (annotated); Ex. 1003 ¶ 175)).

Petitioner presents additional arguments directed to claims 2, 4, 6, 8, and 9. Pet. 102–108. Petitioner’s independent claim 9 arguments are similar to its claim 1 arguments. *Id.* at 104–108.

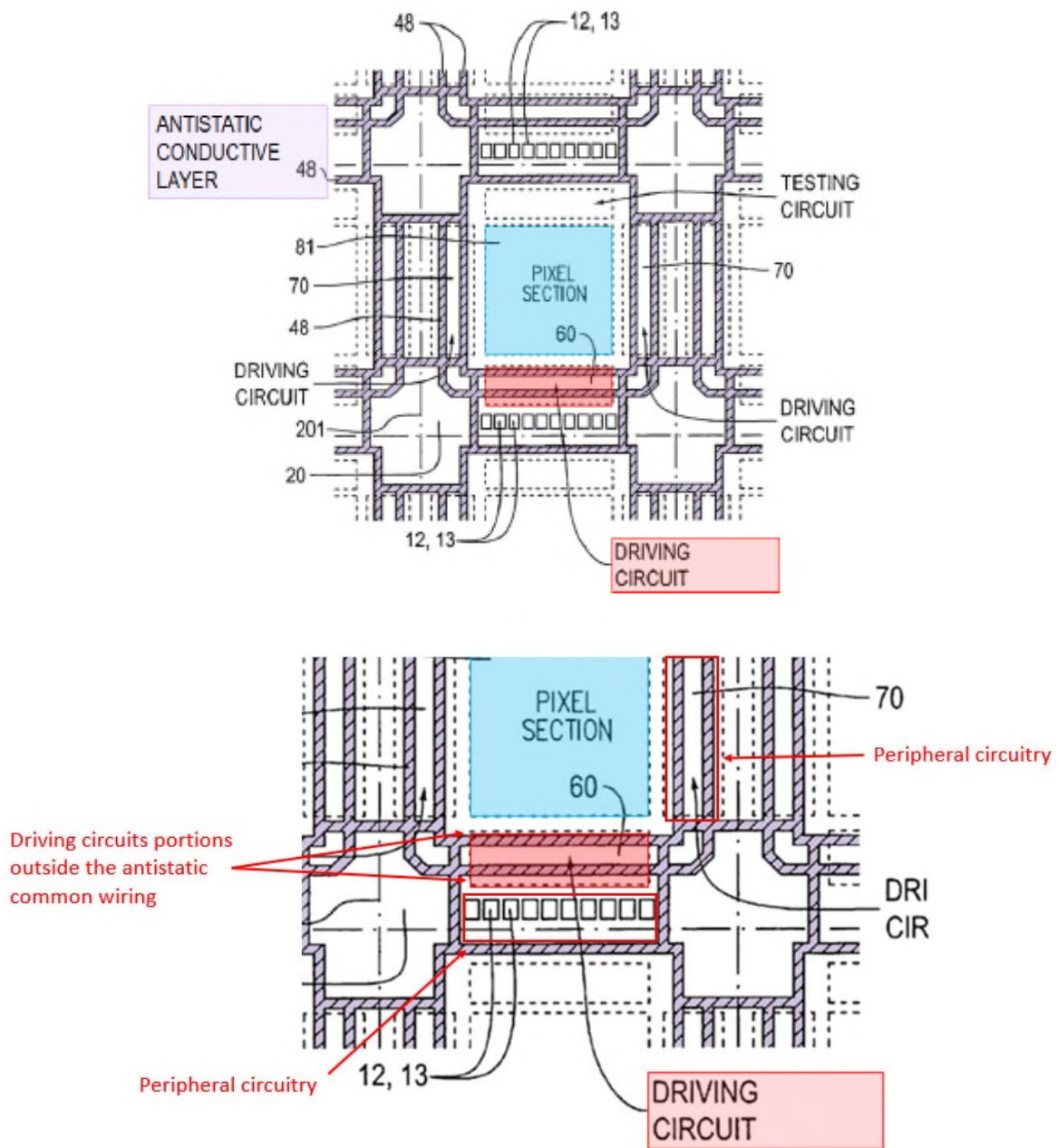
Petitioner argues that one of ordinary skill in the art would have been motivated to combine Maeda and Ozawa for a number of reasons. Regarding 1(a), Petitioner argues that one of ordinary skill in the art “would have been motivated by *Maeda*’s limited disclosure regarding the grounded dummy electrode to configure *Maeda*’s grounded dummy electrode in the manner described for the grounded antistatic conductive layer in *Ozawa*,” because *Ozawa*’s configuration would collect static electricity in *Maeda*’s device so that the charges are dispersed and the substrate itself is prevented from being charged, which is consistent with *Maeda*’s goal of removing electrostatic charge. Pet. 89–90. One of ordinary skill in the art, Petitioner argues, also would have been motivated and found it obvious to provide “*Maeda*’s dummy electrode ‘outside [the] pixel area,’” just as “the antistatic conductive layer is provided in *Ozawa*” to further the shared goal of addressing static electricity in a liquid crystal device. *Id.* at 90–93 (citing Ex. 1003 ¶ 160); *see also id.* at 93 (limitation 1(e), citing Ex. 1003 ¶ 162).

Regarding limitation 1(f), Petitioner argues that one of ordinary skill in the art would have been motivated and found it obvious “to implement the dummy electrode as a ‘continuous metal layer’ because this is how the antistatic conductive layer is implemented in *Ozawa*,” and to look to *Ozawa* for “additional description and illustration on how to configure a dummy electrode relative to a driving circuit on a substrate.” *Id.* at 96 (citing Ex. 1003 ¶ 166). Regarding limitation 1(g), Petitioner argues that one of ordinary skill in the art would have been motivated and found it obvious to

“locate the dummy electrode ‘between’ Maeda’s driving circuit ‘and the outermost edge of the side at which’ Maeda’s driving circuit is positioned because this is how the antistatic conductive layer is implemented relative to the driving circuit in Ogawa.” *Id.* at 98 (citing Ex. 1003 ¶ 172); *see also id.* at 100–102 (similar reasoning for limitation 1(h), citing Ex. 1003 ¶ 175).

3. Patent Owner’s Arguments

Patent Owner argues that one of ordinary skill in the art would not be motivated to combine Maeda and Ozawa, because Maeda discloses managing electrostatic charge during device operation while Ozawa discloses reduction of static electricity during the manufacturing process. Prelim. Resp. 37. Patent Owner also argues that Maeda and Ozawa do not disclose the claimed “dummy wiring” because Maeda discloses only a “dummy electrode,” and because Ozawa’s “antistatic common wiring 48 is not the claimed dummy wiring.” *Id.* at 38. Regarding claim 1(f), Patent Owner argues that Ozawa does not disclose a dummy wiring surrounding the peripheral circuit. Patent Owner presents an annotated Figure 6 and an enlarged annotated Figure 6 of Ozawa, reproduced below:

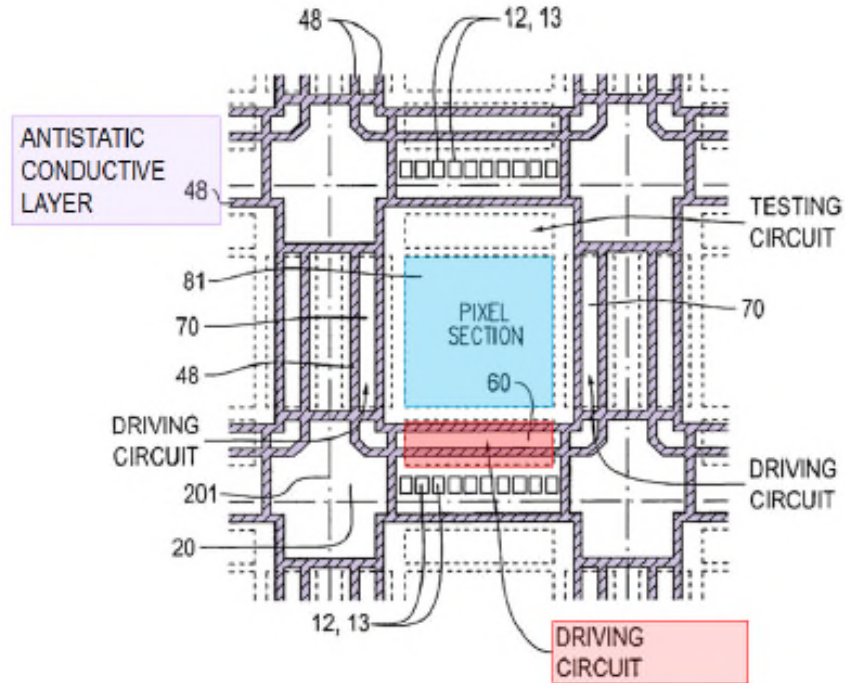


Annotated Figure 6 of Ozawa depicts a driving circuit in red, pixel section 81 in blue, and antistatic conductive layer 48 in purple. *Id.* at 39–40. Patent Owner argues that “the antistatic common wiring 48 does not surround the data-line driving circuit 60” and “[s]everal portions of the data-line driving circuit 60 are outside of the antistatic conductive wiring 48.” *Id.*

at 38–39. Patent Owner also argues that “there are peripheral circuits outside of the antistatic common wiring 48 – for example, the scanning-line driving circuit 70.” *Id.* at 39. Regarding claim 1(g), Patent Owner argues that Ozawa’s antistatic common wiring 48 is not located in the same place as the dummy wiring in the claim, because “data-line driving circuit 60, scanning-line driving circuit 70 and external connection terminal 13 extend beyond the antistatic common wiring 48.” *Id.* at 40. Regarding claim 1(h), Patent Owner argues that Ozawa’s “antistatic common wiring 48 does not surround the scanning-line driving circuit 70 ‘on at least three sides of the substrate’” because “portions of the scanning-line driving circuits 70 (which appear on the left and right sides of the substrate) extend outside of the antistatic common wiring 48.” *Id.* at 41 (citing Ex. 2005 ¶ 52).

4. *Analysis*

Regarding limitation 1(f), Patent Owner argues that Ozawa “does not disclose a dummy wiring surrounding the peripheral circuit.” Prelim. Resp. 38. Although we agree with Petitioner that the dummy wiring appears to “surround” pixel section 81 of Ozawa, it is less clear whether the dummy wiring “surrounds” the peripheral circuit. Patent Owner’s annotated Figure 6 of Ozawa is reproduced again below:



Prelim. Resp. 39. Patent Owner’s annotated Figure 6 demonstrates that the driving circuit is oriented in a number of different ways relative to the dummy wiring – it could be seen as partially outside, partially inside, overlapping, or some combination of the foregoing. In none of these situations could the dummy wiring fairly be said to “surround” driving circuit 60. Petitioner’s argument with respect to annotated Figure 6 simply states that “Ozawa’s antistatic conductive layer ‘surround[s]’ the pixel section of Ozawa’s device as well as the driving circuit on Ozawa’s active-matrix substrate.” Pet. 96. Petitioner fails to clarify how Ozawa’s web-like antistatic conductive layer 48 “surrounds” the driving circuit as required by claim 1, and fails to identify which portions of antistatic conductive layer 48 Petitioner contends “surround[.]” the driving circuit. Patent Owner raises the point that there are additional peripheral circuits in Ozawa’s Figure 6 in addition to the red-highlighted driving circuit 60 (*see, e.g.,* driving

circuits 70 on left and right sides of pixel section 81), which appear to be outside antistatic conductive layer 48. Prelim. Resp. 39. Petitioner has not addressed these additional driving circuits or relied upon them as teaching or suggesting the claim limitations. In sum, we are unpersuaded that Petitioner has demonstrated sufficiently that the Maeda-Ozawa combination meets limitation 1(f).

Without a clear articulation by Petitioner of how Ozawa's antistatic conductive layer "surrounds" the driving circuit, we are similarly unpersuaded that Petitioner has demonstrated sufficiently that the Maeda-Ozawa combination meets limitations 1(g) and 1(h). Regarding limitation 1(g), Petitioner does not show sufficiently that the branched and web-like antistatic common wiring in Ozawa's Figure 6 is located "between the peripheral circuit and the outermost edge," as recited in the claim. Petitioner does not specify which portions or pathway of Ozawa's antistatic conductive layer 48 it relies on to meet this limitation. If Petitioner relies on all of it, Petitioner does not explain how it accounts for the portions of the driver circuit that are not between the peripheral circuit and the outermost edge. If Petitioner relies on only portions of it, Petitioner does not provide a rationale for relying on only those unidentified portions. Petitioner relies on similar arguments regarding limitation 1(h), and fails to show sufficiently how the "dummy wiring surrounds the peripheral circuit on at least three sides of the first substrate" in Petitioner's proposed Maeda-Ozawa combination.

Having reviewed Petitioner's arguments with respect to claims 1, 2, 4, 6, 8, and 9 based on obviousness over Maeda and Ozawa, and Patent Owner's counterarguments, we are not persuaded that Petitioner has

demonstrated a reasonable likelihood of prevailing on its obviousness contentions as to these claims.

E. Asserted Obviousness Based on Maeda, Li, and Ozawa (Ground 2)

Petitioner argues that claim 8 would have been obvious over Maeda, Li, and Ozawa. Pet. 83–86.

Claim 8 depends from claim 1, and further recites “wherein the dummy wiring surrounds all of the at least three sides of the first substrate and surrounds at least part of a fourth side.” Ex. 1001, 10:18–21. Petitioner argues that Ozawa’s antistatic conductive layer surrounds all four sides of an active-matrix substrate, allowing it to “accumulate high-voltage static electricity . . . to disperse charges.” Pet. 83–85. Petitioner presents an annotated version of Ozawa’s Figure 6 (*id.* at 85), reproduced below, to illustrate the placement of Ozawa’s antistatic conductive layer surrounding all four sides of an active-matrix substrate:

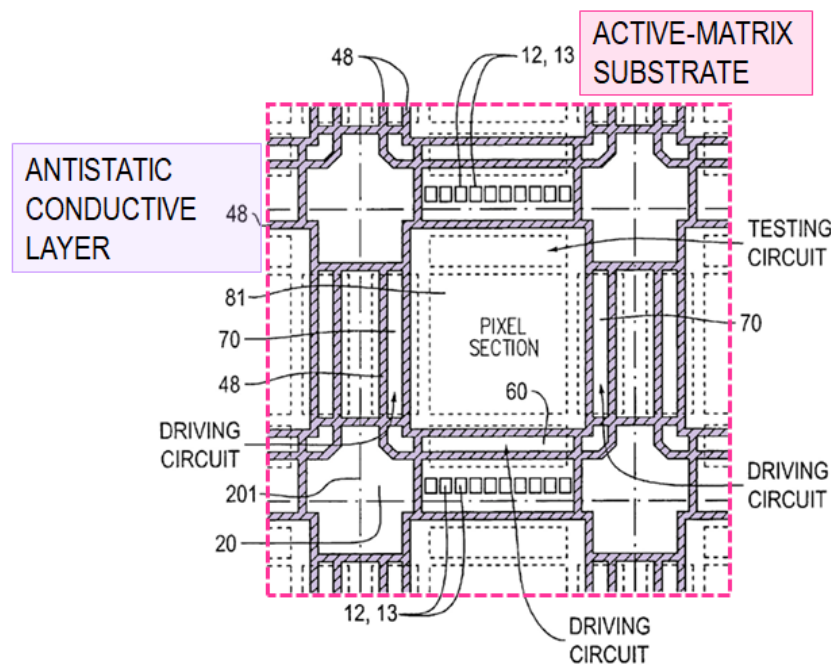


Fig. 6

Annotated Figure 6 of Ozawa is a plan view showing an enlarged part of the antistatic common wiring (conductive layer), with the active-matrix substrate outlined with a dashed pink line and the antistatic conductive layer filled in with purple. Petitioner argues that one of ordinary skill in the art

would have recognized from *Ozawa* that configuring *Maeda*'s dummy electrode to “surround[] all of the at least three sides of” *Maeda*'s lower substrate, as in *Ozawa*, rather than surrounding only part or all of each side of *Maeda*'s lower substrate, as in *Li*, would give *Maeda*'s dummy electrode “a much larger capacitance,” allowing the dummy electrode to “accumulate high-voltage static electricity ... to disperse charges, as *Ozawa* explains for the antistatic conductive layer.

Pet. 86 (citing Ex. 1003 ¶ 152).

Patent Owner argues that a person of ordinary skill in the art would not be motivated to combine *Maeda*, *Li*, and *Ozawa*, because “*Ozawa* discloses reduction of static electricity during the manufacturing process,” using “an antistatic conductive layer to collect static electricity” during that process. Prelim. Resp. 36–37.

For generally the same reasons given above for the combination of *Maeda* and *Ozawa* proposed in Petitioner's Ground 3, we are unpersuaded by Petitioner's Ground 2 arguments with respect to claim 8. Petitioner has not shown sufficiently that *Ozawa*'s web of antistatic wiring meets the limitation of claim 8 that requires the dummy wiring to surround “all of the at least three sides of the first substrate and at least a part of a fourth side.” Nor has Petitioner explained sufficiently how a person of ordinary skill in the art one would have combined *Ozawa*'s wiring web with *Li* and *Maeda* to attain the limitations of claim 8, or how one of ordinary skill in the art would have done so with a reasonable expectation of success. Pet. 85–86

(relying on Ex. 1003 ¶ 152). Having reviewed Petitioner’s arguments based on obviousness over Maeda, Li, and Ozawa, and Patent Owner’s counterarguments, we are not persuaded that Petitioner has demonstrated a reasonable likelihood of prevailing on its obviousness contentions as to claim 8.

F. Discretion Under 35 U.S.C. § 314(a)

Patent Owner argues that the Board should exercise its discretion to deny institution under 35 U.S.C. § 314(a) in view of the District Court litigation, and Petitioner disagrees. Prelim. Resp. 1–15 (citing *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential)); Pet. 14–19. Petitioner’s Reply and Patent Owner’s Sur-reply also present arguments directed to whether we should exercise our discretion to deny institution under 35 U.S.C. § 314(a). *See generally* Reply; Sur-reply. For the reasons stated above, we decline to institute an *inter partes* review. Because we base our denial of institution on the merits of this case, it is unnecessary for us to analyze whether we should also discretionarily deny institution under 35 U.S.C. § 314(a).

III. CONCLUSION

For the reasons set forth above, we determine that Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to at least one challenged claim of the ’409 patent. Thus, we decline to institute *inter partes* review.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is *denied* and no trial is instituted.

IPR2021-01059
Patent 8,830,409 B2

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