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Paper 39
Date: February 17, 2026

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG DISPLAY CO., LTD.,
Petitioner,

v.

PICTIVA DISPLAYS INTERNATIONAL LTD.,
Patent Owner.

IPR2024-01187
Patent 9,257,492 B2

Before MIRIAM L. QUINN, GARTH D. BAER, and JASON M. REPKO, *Administrative Patent Judges*.

BAER, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining Some Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

A. SUMMARY

Samsung Display Co., Ltd. ("Petitioner") filed a Petition (Paper 1, "Pet.") for *inter partes* review of claims 1–3, 5, 6, 8–11, and 16 of U.S. Patent No. 9,257,492 B2 (Ex. 1001, "the '492 patent"). Pictiva Displays International Ltd. ("Patent Owner") filed a Preliminary Response. Paper 6. Pursuant to 35 U.S.C. § 314, we instituted *inter partes* review as to all of the challenged claims and all grounds raised in the Petition. Paper 10. Following institution, Patent Owner filed a Response. Paper 20 ("PO Resp."). Petitioner filed a Reply to Patent Owner's Response (Paper 28, "Pet. Reply"), and Patent Owner filed a Sur-reply (Paper 34, "PO Sur-reply"). On November 19, 2025, we held an oral hearing. A transcript of the hearing is included in the record. Paper 38.

We have jurisdiction under 35 U.S.C. § 6. This decision is a Final Written Decision issued pursuant to 35 U.S.C. § 318(a). For the reasons we discuss below, we determine that Petitioner has proven by a preponderance of the evidence that claims 1, 2, 8–11, and 16 are unpatentable, but has not proven by a preponderance of the evidence that claims 3, 5, and 6 are unpatentable.

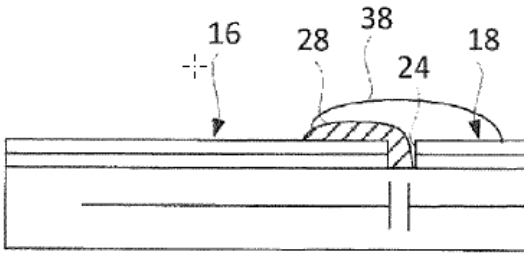
B. RELATED MATTERS

The parties indicate that the '492 patent is at issue in *Pictiva Displays International Ltd. v. Samsung Electronics Co., Ltd.*, Case No. 2:23-cv-00495 (E.D. Tex.) and *Pictiva Displays International Ltd. et al., v. Samsung Elecs. Co., Ltd. et al.*, No. 2:24-cv-00532 (E.D. Texas). Pet. 3; Paper 3, 1.

C. THE '492 PATENT

The '492 patent is titled "Method for Producing a Passive Electronic Component, Method for Producing an Optoelectronic Assembly and Passive Electronic Component." Ex. 1001, code (54). The specification of the '492 patent teaches that, in optoelectronic devices such as organic light emitting diodes (OLEDs), "insulators and/or dielectrics . . . separate and/or electrically insulate two electrode regions from one another." *Id.* at 1:23–26. The specification further teaches that certain insulators and dielectrics are expensive and complex to apply using processes such as lithography. *Id.* at 1:27–29. The specification teaches that passive electronic components may be produced in a cost-effective manner by applying certain features of the component in a "structured fashion." *Id.* at 1:47–65. "[A]pplied in a structured fashion" means "that the desired structure is already formed during the application of the corresponding layer." *Id.* at 1:67–2:3. This is shown in Figure 16, a portion of which is reproduced below.

Fig. 16



Ex. 1001, Fig. 16 (excerpt). Figure 16 depicts dielectric 28 (hatched) as well as electrode layer 38, each applied in structured fashion. *Id.* at 14:31–36.

D. CHALLENGED CLAIMS

Of challenged claims 1–3, 5, 6, 8–11, and 16, claims 1, 10, and 16 are independent. Claim 10 is representative and reproduced below.

> 10. [pre] A method for producing an optoelectronic assembly, comprising:
>
> [a] forming a passive electronic component, the passive electronic component, comprising:
>
> [b] a first electrically conductive layer on a substrate,
>
> [c] a second electrically conductive layer on the first electrically conductive layer,
>
> [d] a first trench formed in the first and second electrically conductive layers, wherein the first trench separates a first contact region from a second contact region,
>
> [e] a dielectric, which is applied in a structured fashion to the second electrically conductive layer in the first contact region and at least partly on the substrate in the first trench such that the dielectric electrically insulates the first contact region from the second contact region, and
>
> [f] an electrically conductive electrode layer, which is applied in a structured fashion to the dielectric above the first contact region and to the second contact region,
>
> [g] applying the dielectric in a structured fashion to the second layer such that the dielectric demarcates a component region for forming an optoelectronic component relative to the second contact region,
>
> [h] forming an optically functional layer in the component region, and
>
> [i] applying the electrode layer in a structured fashion such that a part of the electrode layer covers the optically functional layer.

Ex. 1001, 21:12–40 (Petitioner's element labeling added).

E. Asserted Grounds of Unpatentability

The Petition sets forth the following challenges to patentability.

Ground	Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1	1, 2, 8–11, 16	103	Ingle[1], Hasei[2]
2	1, 2, 8, 16	103	Hanamura[3]
3	3, 5, 6	103	Hanamura, Egitto[4]

II. DISCUSSION

A. Claim Construction

1. *"A First Trench in the First and Second Electrically Conductive Layers"*

Independent claims 1 and 16 require a first trench "in the first and second electrically conductive layers." Ex. 1001, 20:32–35, 22:31–33. Patent Owner asserts we should construe this term to mean "a trench defined by (and thus adjacent to) edges of the electrically conductive material of both the first and second electrically conductive layers." PO Resp. 21. We agree with Patent Owner's construction.

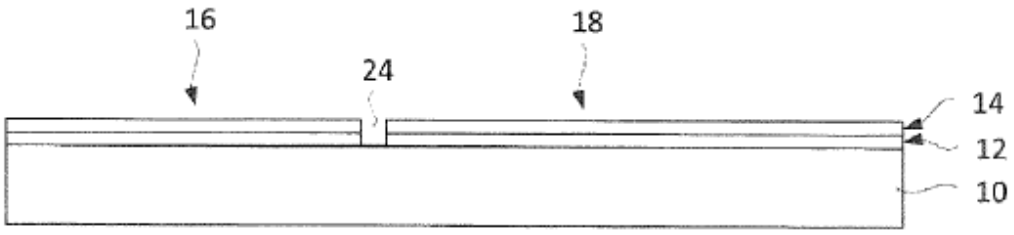
Petitioner characterizes Patent Owner's construction as "overly narrow" because "*a first trench* can be *in* the claimed layers without being 'defined by (and thus adjacent to)' those layers' edges." Pet. Reply 5. Petitioner asserts that *in* does not require *defined by* because a circle may be *in* a square "without being 'defined by (and thus adjacent to)' the square's walls" (*id.*). While true, Petitioner's analysis addresses the word *in* in

[1] WO 2011/036089 A1, pub. Mar. 31, 2011, certified translation (Ex. 1005, "Ingle").
[2] JP2003-317610, pub. Nov. 7, 2003, certified translation (Ex. 1007, "Hsaei").
[3] U.S. Pat. No. 5,691,877, iss. Nov. 25, 1997 (Ex. 1008, "Hanamura").
[4] U.S. Pat. App. 2009/0178271 A1, pub. July 16, 2009 (Ex. 1013, "Egitto").

isolation, rather than in the claims' context, and in light of the '492 patent's specification. In the trench/layers context of the '492 patent, the word *in* requires more than it does in the circle/square context.

As Patent Owner notes, its construction is consistent with the term's plain language, as well as the intrinsic evidence. PO Resp. 21–23. Figure 4 of the '492 patent is reproduced below.

Fig. 4



Ex. 1001 (Figure 4). Figure 4 (above) depicts trench 24 extending through and adjacent to electrically conductive materials 12 and 14. Patent Owner's construction is also consistent with multiple specification passages. *See, e.g.*, *id.* at 3:31 (describing forming the trench by laser ablation); 4:5–9 (same); 4:15–24 (describing encapsulating the "edges and/or side surfaces of the first and second electrically conductive layers in the first trench"); 11:27–46 (the trench's depth "corresponds to a common thickness of the two electrically conductive layers"). Further, dependent claim 9's dielectric-encapsulation-by-heating step is only possible if the layers' edges/side surfaces are adjacent to, and thus define, the sides of the trench. *See id.* at 21:5–11 ("[T]he dielectric is heated in such a way that it deforms and encapsulates edges and/or side surfaces of the first and second electrically conductive layers in the first trench."). Although, as Petitioner notes, claim 1 is broader than claim 9 (Pet. Reply 6), claim 9 narrows claim 1 by adding

the additional heating/deforming steps. That is, claim 9 does not add, but rather assumes, Patent Owner's trench-adjacent-to-edges interpretation. Conspicuously absent is any intrinsic evidence suggesting that the claimed trench may be in the two electrically conductive layers, yet not adjacent to their edges. For these reasons, we agree with Patent Owner that for a first trench to be in the first and second electrically conductive layers, it must be defined by (and thus adjacent to) edges of the electrically conductive material of layers.

2. Additional Disputed Claim Terms

The parties assert competing claim constructions for two additional terms—"First Electrically Conductive Layer on a Substrate and Second Electrically Conductive Layer on the First Electrically Conductive Layer" and "Forming a First Trench." PO Resp. 15–21, 24–28; Pet. Reply 1–5, 7–11. However, the parties' dispute regarding these terms impacts only Petitioner's Hanamura Grounds (Grounds 2 and 3), but not its Ingle Ground (Ground 1). Because our construction above is dispositive in Patent Owner's favor for Grounds 2 and 3, and because the parties' additional claim-construction disputes do not impact Ground 1, we need not resolve the additional constructions to determine unpatentability. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) ("[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.").

B. Description of Primary Prior Art References

1. Ingle (Ex. 1005)

Ingle "relates to a method for producing an electronic component and an electronic component." Ex. 1005, 1:8–9. Ingle's 1I is reproduced below.

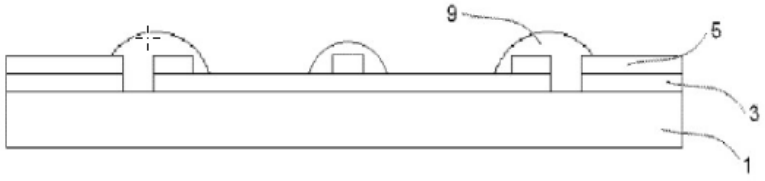


Figure 1I "illustrate[s] a method for producing an electronic component." Ex. 1005, 18:26–28. Figure 1I includes substrate layer 1, first electrically conductive layer 3, second electrically conductive layer 5, and insulator 9. 19:6–20:15. According to Ingle, "[a]n 'electronic component' which can be produced by the method according to the invention can be, but is not limited to, a transistor, a capacitor, a thermistor, an organic electronic component, such as an organic light-emitting diode, a solar cell, and the like." *Id.* at 6:1–7

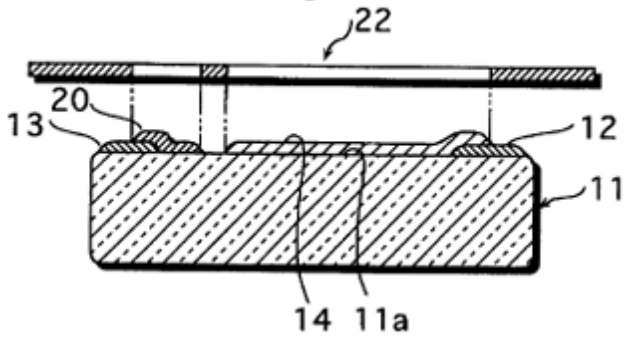
2. Hasei (Ex. 1007)

Hasei teaches a "method for manufacturing an electrode" in which "a liquid . . . is discharged from an inkjet head of a droplet discharging device . . . onto a desired location on a substrate. Ex. 1007 ¶ 15. "With this method," according to Hasei, "electrode material is discharged only onto the portion of the substrate where the conductive pattern is to be formed." *Id.* ¶ 5.

3. Hanamura (Ex. 1008)

Hanamura is titled "Chip Type Thick Film Capacitor and Method of Making the Same." Ex. 1008, code (54). Hanamura's Figure 4 is reproduced below.

Fig. 4



In Figure 4, "a first capacitor electrode 14 and an auxiliary electrode 20 are formed simultaneously on the head surface 11a of the chip 11 by printing an electrically conductive paste with the use of a second screen 22." Ex. 1008, 5:29–32. Hanamura further teaches that "[t]hen . . . a dielectric layer 15 is formed on the first capacitor electrode 14 by printing a pasty insulating or dielectric material with the use of a third screen 23." *Id.* at 5:33–36.

C. Level of Ordinary Skill in the Art

Petitioner proposes that a person of ordinary skill in the art ("POSITA") for the '492 patent would have the following qualifications:

> a bachelor's degree in Electrical Engineering, Physics, or a comparable field of study, and at least three years of research or industrial experience with semiconductor (organic or inorganic) optoelectronic devices and/or lighting or displays. An individual with additional education could have less research or industrial experience and vice-versa.

Pet. 9. Patent Owner does not dispute Petitioner's proposed definition. We adopt Petitioner's uncontested proposed definition because it is consistent with the disclosures of the asserted prior art.

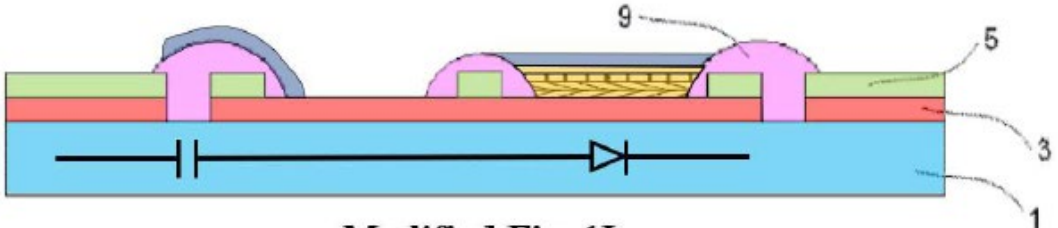
III. OBVIOUSNESS ANALYSIS

A. PETITIONER'S CHALLENGE BASED ON INGLE AND HASEI (GROUND 1)

Petitioner contends that claims 1, 2, 8–11, and 16 are unpatentable as obvious over Ingle and Hasei. For the reasons explained below, we find that Petitioner has shown by a preponderance of evidence that these claims are unpatentable over the asserted prior art.

1. Petitioner's Proposed Combination of Ingle and Hasei

In challenging independent claim 10, Petitioner relies primarily on Ingle. Petitioner explains that Ingle teaches a method for producing an optoelectronic assembly because Ingle describes building both optoelectronic and passive components on a substrate. Pet. 26; *see id.* at 18. Petitioner explains, with relevant support from the prior art and Dr. Kattamis, that skilled artisans would recognize Ingle's capacitor and OLED "as conventional components of an optoelectronic assembly" and that "placing capacitors in close proximity (or directly connected) to optically functional layers are a conventional way to form such devices." *Id.* at 21–22 (citing Ex. 1003 ¶¶ 101–107, 120–122; Exs. 1014, 1010). Thus, Petitioner asserts, "it would have been obvious . . . to build an optoelectronic assembly including both a capacitor and an OLED," as shown in Petitioner's annotated version of Ingle's Figure 1I, reproduced below.



Modified Fig. 1I

Pet. 27 (citing Ex. 1005, Fig. 1I).

Petitioner relies on Hasei for teaching the structured application of layers because Hasei teaches a forming an OLED's layers using an inkjet device that deposits material to only the desired locations on a substrate. *Id.* at 12–13 (citing Ex. 1007 ¶ 13); *see id.* at 38.

2. Disputed Issues

Claim elements 10[f] and 10[i] recite "an electrically conductive electrode layer, which is applied in a structured fashion to the dielectric above the first contact region and to the second contact region" and "applying the electrode layer in a structured fashion such that a part of the electrode layer covers the optically functional layer." Petitioner asserts that its proposed combination includes these features because Ingle's capacitor could be constructed by applying a cathode above the first contact region using Hasei's structured-application method for cathodes. Pet. 36–38; *see id*. at 21–25. Further, according to Petitioner, a person of ordinary skill in the art would have applied an electrode layer to Ingle's OLED embodiment using Hasei's suggested structured application for cathodes, such that a part of the electrode layer covers the optically functional layer. *See id.* at 25–26, 38–39. Patent Owner challenges several aspects of Petitioner's showing for these elements. We address those issues below.

a. Applying an Electrically Conductive Electrode Layer "in a Structured Fashion"

Petitioner asserts it would have been obvious to produce Ingle's capacitor by applying an electrically conductive electrode layer in a structured fashion given Ingle's statements that its method "is usually free of photolithographic steps" and that "each layer of the component can be applied individually and, if necessary, structured according to desire or purpose." Pet. 24 (quoting Ex. 1005, 18:7–10, 7:20–24). In addition,

Petitioner explains that structured application of Ingle's capacitor would have been obvious because Hasei "advocates for a structured application process, *e.g.*, using a droplet discharge device like an inkjet printer, rather than photolithography." *Id.* at 24–25 (citing Ex. 1007 ¶¶ 14–15, 37). Hasei also notes several benefits of structured component application, including reduced electrode-material waste and shortens manufacturing time because there is no need to create a photomask. *Id.* at 25 (citing Ex. 1007 ¶¶ 5, 7).

Petitioner additionally asserts that Ingle's "OLED's cathode would likewise be applied in a structured fashion" because Hasei teaches applying its OLED's cathode "by the droplet discharging method." *Id.* at 25. Petitioner explains that skilled artisans would have been motivated to use Hasei's structured application for the OLED's cathode because "this approach could allow both cathodes to be formed during the same manufacturing step." *Id.* (citing Ex. 1003 ¶ 170). Moreover, Petitioner asserts that "using Hasei's inkjet printing method would have been nothing more than applying a known method of structured application, e.g., droplet discharge, to improve a similar device, e.g., the OLED and capacitor of Ingle, to obtain predictable results, e.g., a manufacturing process free from photolithography." *Id.* at 26 (citing Ex. 1003 ¶¶ 168–170).

Patent Owner asserts that Petitioner's theory on Ingle's capacitor fails because Ingle expressly teaches structured application for only certain layers, but not the capacitor's cathode, and that Ingle's general statements regarding layers "applied individually and . . . structured according to desire" do not address whether the structuring occurs as part of the application or later as part of subsequent techniques. PO Resp. 32. We disagree with Patent Owner's argument because it attacks Ingle individually,

rather than the combination of Ingle's capacitor and Hasei's droplet discharge application that Petitioner asserts. *See In re Keller*, 642 F.2d 413, 426 (CCPA 1981). Even if Ingle falls short of teaching structured application for its capacitor's cathode, as Patent Owner argues, that does not undermine Petitioner's challenge because Petitioner proposes using Hasei's structured application (i.e., a droplet discharge device) to form the cathode of Ingle's capacitor. *See* Pet. 24–25. Patent Owner's additional argument that "Hasei contains no discussion of forming capacitors" (PO Resp. 36; *see* PO Sur-reply 17–18) is similarly flawed—it attacks Hasei individually, while ignoring Ingle's capacitor teaching. We agree with Petitioner—the combination of Ingle and Hasei teaches structured application of the capacitor's cathode.

In addition, we disagree with Patent Owner that "Petitioner provides no reason why a POSITA would have extended Hasei's method for producing its OLED to a capacitor." PO Resp. 36; *see* PO Sur-reply 17 (asserting "pure conjecture"). To the contrary, as noted above, Petitioner explains, with relevant support from Hasei, that its structured application method reduced electrode-material waste and shortened manufacturing times as compared to photolithography. Pet. 25 (citing Ex. 1007 ¶¶ 5, 7). Given those benefits, Petitioner has articulated sufficient reasoning with rational underpinning to support that its proffered combination would have been obvious. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007).

Patent Owner raises several additional challenges to Petitioner's OLED embodiment. First, Patent Owner argues that Petitioner's OLED embodiment fails because Ingle describes using a "**conventional process**" to produce OLED tiles, which, Patent Owner argues, would form the top

electrode layer using photolithography rather than a structured-application process. PO Resp. 33–35 (quoting Ex. 1005, 21:34–36); *see* PO Sur-reply 12–14. We disagree with this argument because it again attacks Ingle individually, rather than Petitioner's combination, which proposes using Hasei's structured application for the OLED's cathode. *See* Pet. 25, 37.

Next, Patent Owner criticizes Petitioner's reliance on Hasei's Figure 3. PO Resp. 36–38; *see* PO Sur-reply 14–15. Specifically, Patent Owner argues that "a POSITA would not have been motivated to use Hasei's droplet discharging method to form [negative electrode 50]" in Hasei's Figure 3 because that figure depicts a common (continuous) electrode that "extends continuously across the entire device," rather than a structured one that is coated only in "discrete regions." PO Resp. 37, 38; *see id.* at 34–35; PO Sur-reply 15–16. We disagree.

First, even if Patent Owner were correct in its characterization of Hasei's Figure 3, Patent Owner's argument incorrectly assumes that a skilled artisan could do no more than bodily incorporate a continuous-electrode OLED onto Ingle's substrate. That, however, is neither what Petitioner proposes, nor is it the test for obviousness. *See Allied Erecting & Dismantling Co., Inc. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016) (explaining that physical combinability and bodily incorporation are not the proper tests for obviousness); *KSR*, 550 U.S. 398, 418 (noting that "a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ"); *see also* Pet. 24–26, 37–39. Rather, as Petitioner explains, a skilled artisan would know not to employ an electrode with a common electrode across all pixels because "[s]uch planar application would . . . require subsequent etching,

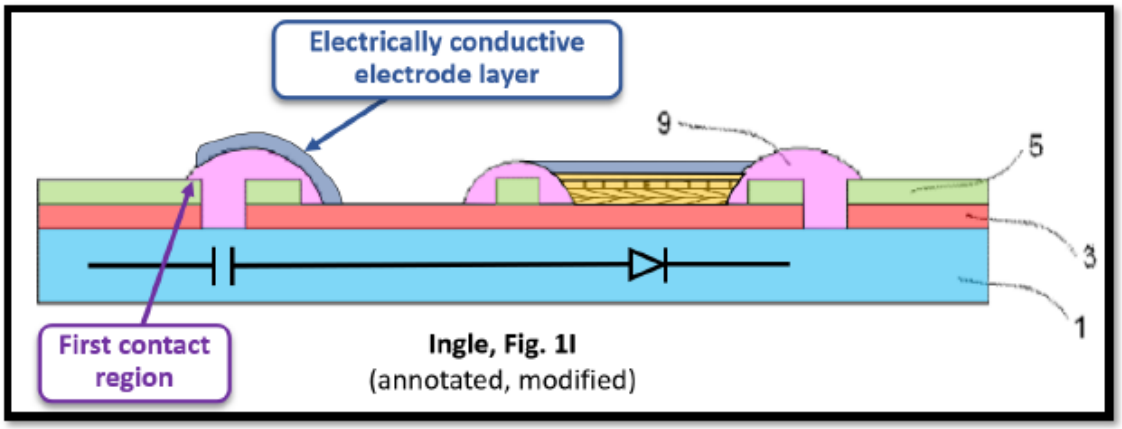
which risks damaging the OLED . . . and which both Hasei and Ingle teach against." Pet. Reply 15–16.

Moreover, we disagree with Patent Owner's characterization of Hasei's electrode in Figure 3 as "extend[ing] continuously across the entire device." PO Resp. 37. At most, Figure 3 displays electrode 50 as common for all subpixels, but not across the entire device, as Patent Owner contends. *See* Pet. Reply 15–16. We agree with Petitioner that because "Figure 3 is a two-dimensional cross-section lacking a planar view . . . it cannot be determined based on Figure 3 alone whether negative electrode 50 is structured." *Id.* at 15. Critically, Petitioner does not rely on Figure 3 alone. *See* Pet. 12–14, 24–26, 37–39. Beyond what is depicted in Figure 3, Hasei also teaches that "the negative electrode 50 may be formed by the droplet discharging method." Ex. 1007 ¶ 37. Hasei teaches its droplet discharging method uses an "inkjet device" such that "electrode material is discharged only onto the portion of the substrate where the conductive pattern is to be formed." *Id.* ¶¶ 5, 15. Hasei contrasts its droplet-discharging method with "photolithography, etching, or the like," in which "a transparent electrode material must first be provided over the entire surface of the substrate." *Id.* ¶ 5. The '492 patent confirms that Hasei's droplet-discharging method applies materials in a structured fashion as claimed, because it defines structured application in substantively the same way ("'applied in a structured fashion' means . . . that the desired structure is already formed during the application of the corresponding layer") and lists the same method ("inkjet printing") as an example method for doing so. Ex. 1001, 1:67–2:3, 2:15–17.

In sum, we agree with Petitioner that together, Ingle and Hasei teach applying an OLED's cathode in a structured fashion because Ingle expressly identifies an "OLED" as an example electronic component that "can . . . be produced on the substrate layer" (Ex. 1005, 21:34–35) and Hasei teaches applying an OLED's cathode in a structured fashion. *See* Pet. 18–19, 36–37. We also agree with Petitioner that skilled artisans would have been motivated to use Hasei's structured-application method because it was a known way to produce an OLED's cathode with predictable benefits that Hasei identifies, including reduced waste and shorter manufacturing times, and because it would allow both cathodes to be formed during the same manufacturing step. *Id.* at 19–20, 25–26; *see* Ex. 1007 ¶¶ 5, 7.

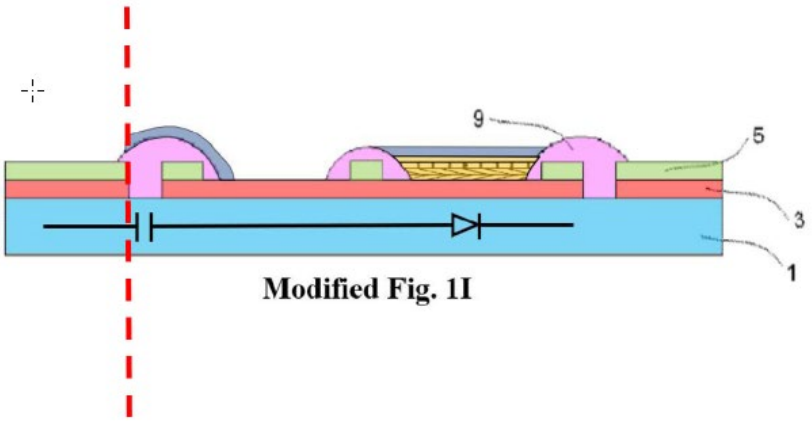
b. Applying an Electrically Conductive Electrode Layer "Above the First Contact Region"

Petitioner asserts that the capacitor in its combination would have an electrically conductive electrode "above the first contact region" as the challenged claims require because Ingle's capacitor would be "completed on Ingle's base structure by applying an electrode above the dielectric in the first contact region." Pet. 36; *see id.* at 22–23 (citing Ex. 1005, 6:3–7, 20:1–7). Petitioner provides the following illustration:



Pet. Reply 19; *see also* Pet. 37. Petitioner's figure above shows Ingle's Fig. 1I (annotated). In its combination, Petitioner explains, "the electrically conductive layer (grey) is applied to the dielectric (pink) above the first contact region and to the second contact region." Pet. 37.

Patent Owner argues Petitioner's challenge fails because in the asserted combination, "the electrode (gray) ends at the right edge of the first contact region and it is therefore not 'above' the first contact region." PO Resp. 43. This is shown in Patent Owner's reproduction of Petitioner's figure, below:



PO Resp. 43. The figure above shows Petitioner's modified version of Ingle's Figure 1I, further modified by Patent Owner with a broken red line. According to Patent Owner, "Ingle Figure 1I itself belies the notion that a capacitor could be formed in the manner suggested in the Petition." *Id.* Patent Owner also argues that "it is difficult to envision any such overlap, given the applied dielectric's minimal overlap of the first contact region" in Ingle's figures. *Id.* at 44.

We disagree with Patent Owner's argument because it focusses exclusively on Ingle's figures (and Petitioner's reproduction of those

figures), while ignoring Ingle's express disclosure that its electronic component "can be . . . a capacitor." Ex. 1005, 6:2–3. Furthermore, the structure of a capacitor (with two conductors separated by an insulator) is well-known (Ex. 1003 ¶ 162), and its placement in series with an OLED has been shown to be a common placement (Pet. 21–22; Ex. 1010, Fig. 1; Ex. 1003 ¶ 162). Petitioner has shown that the second electrode may be applied above the insulative layer to form that capacitor, with a person of ordinary skill in the art knowing how to do so in a structured fashion given the teachings of Ingle to apply the layer of electronic components individually and free of photolithographic steps. Ex. 1003 ¶ 162. We are persuaded by these showings and Petitioner's further argument that skilled artisans would know that "the degree to which both the dielectric (pink) and electrically conductive layer (grey) extend over the first contact region may be adjusted to fine tune the capacitance of the capacitor." Pet. at 38; Ex. 1003 ¶ 167; *see also* Pet. Reply 21–23. Thus, Petitioner has shown persuasively that a capacitor, useful for driving an OLED, (i.e., a working capacitor) would have been formed as suggested by Ingle and Hasei's teachings, even if the annotations of the figures lack the finesse of the second electrode that Patent Owner argues would be necessary.

Patent Owner's argument that Petitioner's proposed combination "would not Produce a working capacitor" because "the minimal overlap and non-uniform distance between the cathode and anode would not result in a functional capacitor" is similarly flawed. PO Resp. 47; *see id.* at 47–51. It is premised on an incorrect assumption that Ingle's capacitor is limited to the scale and shape drawn in its figures. Rather, by teaching a presumably working capacitor, Ingles teaches an overlap and dielectric shape necessary

for such a capacitor, whether or not that shape/overlap is also depicted in Ingle's figures. *See* Pet. Reply 22 (describing "adjust[ing] the overlap—and the electrode's and dielectric's size and shape—to . . . design a functional capacitor").

Last, we also disagree with Patent Owner that Petitioner asserted a scale different from Ingle's figures for the first time in Petitioner's Reply. PO Sur-Reply 24. The Petition repeatedly asserted that its proposed combination included Ingle's disclosure of a capacitor (*see, e.g.*, Pet. 21, 22, 27 (all citing Ex. 1005, 6:3–7)) and relied on that disclosure for teaching the claimed layer above the first contact region (*id.* at 36). Petitioner's reply arguments addressing the scale/shape depicted in Ingle's figures (Pet. Reply 21–23) reasonably responded to Patent Owner's arguments, but did not "make a meaningfully distinct contention" for the first time, as Patent Owner asserts. *See* PO Sur-reply 24.

For the reasons above, we agree with Petitioner that its proposed combination teaches elements 10[f] and 10[i].

3. Undisputed Issues

a. Claim 10

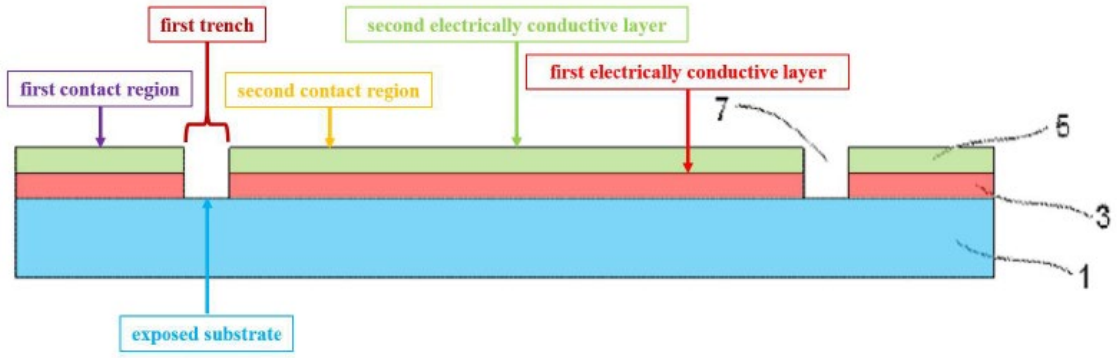
We also agree with Petitioner that its proposed combination teaches the additional undisputed elements in claim 10, as outlined below.

Claim 10's preamble recites "[a] method for producing an optoelectronic assembly." Ex. 1001, 21:12–13. Petitioner explains that Ingle this feature because Ingle describes building both optoelectronic and passive components on a substrate. Pet. 26; *see id.* at 18. Petitioner explains, with relevant support from the prior art and Dr. Kattamis, that skilled artisans would recognize Ingle's capacitor and OLED "as

conventional components of an optoelectronic assembly" and that "placing capacitors in close proximity (or directly connected) to optically functional layers are a conventional way to form such devices." *Id.* at 21–22 (citing Ex. 1003 ¶¶ 101–107, 120–122, Exs. 1014, 1010). Thus, Petitioner asserts, "it would have been obvious . . . to build an optoelectronic assembly including both a capacitor and an OLED." *Id.* at 27.

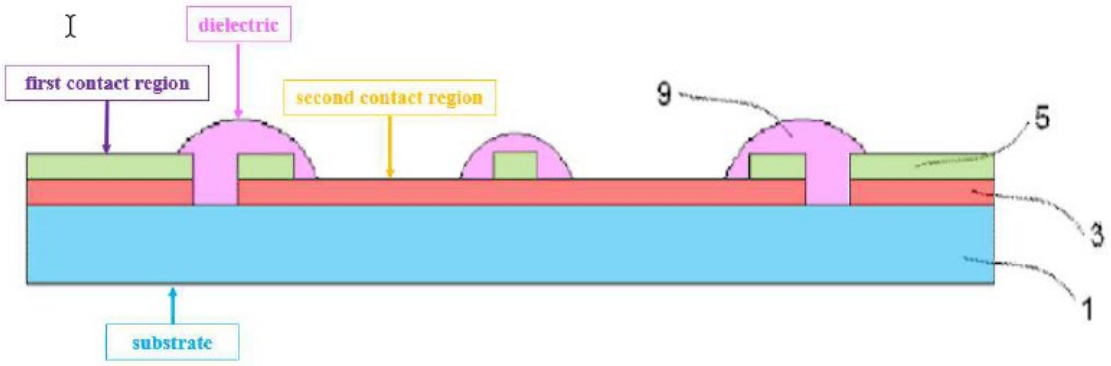
Elements 10[a]–10[c] recite "forming a passive electronic component, the passive electronic component, comprising: a first electrically conductive layer on a substrate, a second electrically conductive layer on the first electrically conductive layer." Ex. 1001, 21:14–18. Petitioner explains that Ingle teaches these features because its "method can be used to form 'a capacitor,' which is a passive electronic component." Pet. 27 (quoting Ex. 1005, 1:7–8, 6:3–7). Relying on Ingle's Figure 1I, Petitioner asserts Ingle's substrate layer 1, electrically conductive layer 3, and electrically conductive layer 5 teach the substrate, first electrically conductive layer, and second electrically conductive layer, respectively. *Id.* at 28–29.

Element 10[d] recites "a first trench formed in the first and second electrically conductive layers, wherein the first trench separates a first contact region from a second contact region." Ex. 1001, 21:19–22. For this element, Petitioner notes Ingle describes a "trench" or "gap" in its conductive layers that may be formed by laser ablation. Pet. 30 (quoting Ex. 1005, 8:30–31). This trench exposes the substrate and creates a separation between the claimed first contact region and second contact region (i.e., Ingle's first electrode region and second electrode region) as shown in Petitioner's annotated version of Ingle's Figure 1D, reproduced below. Pet. 30 (citing Ex. 1005, Fig. 1D).



The figure above shows Petitioner's modified version of Ingle's Figure 1D.

Element 10[e] recites "a dielectric, which is applied in a structured fashion to the second electrically conductive layer in the first contact region and at least partly on the substrate in the first trench such that the dielectric electrically insulates the first contact region from the second contact region." Ex. 1001, 21:23–28. Petitioner asserts that Ingle's insulator 9, which Ingle describes as "applied . . . in a structured manner" (Ex. 1005, 20:9–11) teaches the claimed dielectric. *Id.* at 31–32 (citing Ex. 1005, 20:9–11, 20–22, 21:27–30). This is depicted in Ingle's Fig. 1I, reproduced below with Petitioner's annotations. *Id.* at 32.



The figure above shows Petitioner's modified version of Ingle's Figure 1I.

Element 10[g] recites "applying the dielectric in a structured fashion to the second layer such that the dielectric demarcates a component region for forming an optoelectronic component relative to the second contact

region." Ex. 1001, 21:32–37. Ingle teaches this feature, Petitioner explains, because "Ingle discloses applying the dielectric in a structured fashion" and "the dielectric (pink) demarcates a component region for forming an optoelectronic component relative to the second contact region." Pet. 34.

Element 10[h] recites "forming an optically functional layer in the component region." Ex. 1001, 21:36–37. According to Petitioner, its combination of Ingle and Hasei teaches this feature because Ingle teaches "form[ing] a conventional OLED on Ingle's base structure" and Hasei discloses a conventional OLED including "light emitting layers [that] are an optically functional layer." Pet. 35 (citing Ex. 1005, 21:34–22:5, Ex. 1007 ¶¶ 32, 37). Petitioner explains that it would have been obvious to form Hasei's OLED on Ingle's base structure given "Ingle's direction to incorporate an OLED on Ingle's base structure" (*id.* at 20), and because "[d]oing so would have been nothing more than combining prior art elements according to known methods and applying a known technique to improve a similar device in the same way to obtain predictable results." *Id.* at 19 (citing *KSR*, 550 U.S. 398, 401); *see id.* at 35–36.

Other than the arguments above, Patent Owner does not additionally challenge Petitioner's showing for independent claim 10. Based on Petitioner's analysis outlined above, we agree with Petitioner that claim 10 would have been obvious over Ingle and Hasei.

b. Independent Claims 1 and 16

As Petitioner explains, independent claims 1 and 16 are "subset[s] of the method of Claim 10." Pet. 42, 48. Thus, Petitioner's challenge to claims 1 and 16 references its arguments for claim 10. *See id.* at 42–44, 48–50. Other than the arguments above, Patent Owner does not additionally

challenge Petitioner's showing for independent claims 1, 10 and 16. Based on Petitioner's analysis and for the same reasons outlined above, we agree with Petitioner that claims 1 and 16 would have been obvious over Ingle and Hasei.

c. Dependent Claims 2, 8, 9, and 11

Petitioner also asserts that its combination teaches the additional elements in dependent claims 2, 8, 9, and 11. Specifically, Petitioner asserts that its proposed combination of "an electrode above the left-side dielectric in Ingle's base structure using Hasei's droplet discharge method, or that Ingle's vapor-deposition method, in order to form a capacitor in series with the OLED" also teaches the additional limitation in dependent claim 2, which requires "a first electrode of a capacitor is formed by the first contact region between the dielectric and the substrate and a second electrode of a capacitor is formed by the electrode layer on a side of the dielectric facing away from the first contact region." Pet. 45; Ex. 1001, 20:44–48. Petitioner asserts that Ingle also teaches applying the dielectric "by a printing method," as required in dependent claim 8, because "Ingle discloses that its insulator 9 'may be applied . . . by means of a printing process, such as screen printing, inkjet printing, or flexographic printing.'" *Id.* at 46 (quoting Ex. 1005, 20:17–20) (alteration in original). Petitioner asserts that Ingle teaches applying the dielectric "in a structured fashion to the second electrically conductive layer in such a way that it adjoins the first trench, and wherein then the dielectric is heated in such a way that it deforms and encapsulates edges and/or side surfaces of the first and second electrically conductive layers in the first trench," as required in dependent claim 9 given the progression shown in Ingle's Figures 1E to 1I and its teaching that "insulator

9 is then heated directly such that the insulator 9 softens (reflow) and flows over the open edges of the second electrically conductive layer 5 and the first electrically conductive layer 3." *Id.* at 47–48 (quoting Ex. 1005, 21:27–30); *see* Ex. 1001, 21:5–10. Petitioner asserts Ingle also teaches the additional element in claim 11 ("before the optically functional layer is applied, the second electrically conductive layer is removed in the component region and the optically functional layer is applied to the first electrically conductive layer in the component region" (Ex. 1001, 21:41–45)) because Ingle's Figures 1F–1I show a progression in which the second electrically conductive layer is removed in the component region before the optically functional layer is applied. Pet. 39–42.

Other than the arguments above, Patent Owner does not additionally challenge Petitioner's showing for dependent claims 2, 8, 9, and 11. Based on Petitioner's analysis outlined above, we agree with Petitioner that dependent claims 2, 8, 9, and 11 would have been obvious over Ingle and Hasei.

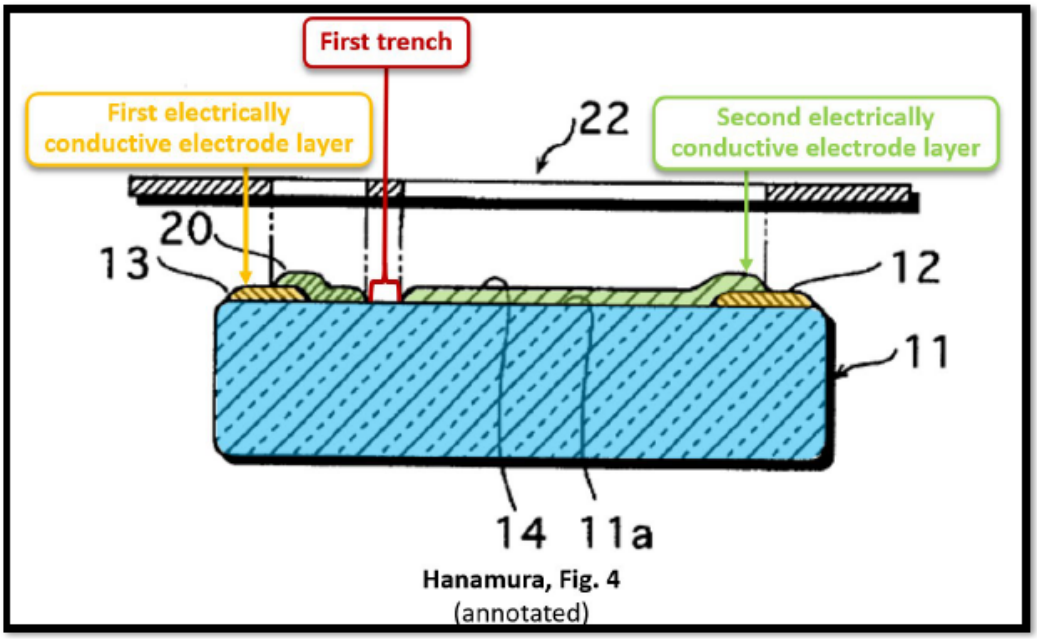
B. Petitioner's Challenge Based on Hanamura and Egitto (Grounds 2 and 3)

In two additional grounds, Petitioner asserts claims 1–3, 5, 6, 8, and 16 would have been obvious over Hanamura alone (Ground 2), or in combination with Egitto (Ground 3). For the reasons below, we find Petitioner has not met its burden to shown unpatentability for these challenges.

1. "A First Trench in the First and Second Electrically Conductive Layers"

Independent claims 1 and 16 require a first trench "in the first and second electrically conductive layers." Ex. 1001, 20:32–35, 22:31–33.

Petitioner asserts that Hanamura teaches this feature because Hanamura's Figure 4 embodiment shows "a first trench (dark red brackets) is formed in the first and second electrically conductive layers (yellow and green, respectively)." Pet. 53. Petitioner's annotated version of Hanamura's Figure 4 is reproduced below.



Pet. Reply 27; *see* Pet. 53–54.

In light of our claim construction above (*see supra*, section II.A.1), we agree with Patent Owner that Hanamura fails to disclose the claimed trench in the electrically conductive layers because the alleged trench is not defined by and adjacent to edges of the electrically conductive material layers. PO Resp. 57–59. As Patent Owner explains, "[b]ecause no part of the alleged 'first trench' is adjacent to the alleged 'first electrically conductive layer' of electrodes 13 and 12, there is no possibility of the edges of that alleged layer defining the alleged first trench." *Id.* at 58. Given this deficiency, Petitioner has not demonstrated obviousness for its Hanamura-based challenges (Grounds 2 and 3).

IV. CONCLUSION

Based on the fully developed trial record, Petitioner demonstrates by a preponderance of the evidence that claims 1, 2, 8–11, and 16 are unpatentable. Petitioner has not, however, demonstrated that claims 3, 5, and 6 are unpatentable. A summary of our conclusions is set forth in the table below.

Claims	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 2, 8–11, 16	103	Ingle, Hasei	1, 2, 8–11, 16	
1, 2, 8, 16	103	Hanamura		1, 2, 8, 16
3, 5, 6	103	Hanamura, Egitto		3, 5, 6
Overall Outcome			1, 2, 8–11, 16	3, 5, 6

V. ORDER

Accordingly, it is

ORDERED that claims 1, 2, 8–11, and 16 of the '492 patent have been shown to be unpatentable; and

ORDERED that claims 3, 5, and 6 of the '492 patent have not been shown to be unpatentable

FURTHER ORDERED that, because this is a Final Written Decision, parties to this proceeding seeking judicial review of our decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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