

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BOE Technology Group Co., Ltd,
Petitioner,

v.

Optronic Sciences LLC
Patent Owner

IPR2024-01131
Patent No. 7,226,801

PATENT OWNERS' PRELIMINARY RESPONSE

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Table of Authorities

Cases

<i>Apple Inc. v. Fintiv, Inc.</i> , IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020).....	38, 39, 40
<i>Sotera Wireless, Inc. v. Masimo Corp.</i> , IPR2020-01019, Paper 12 at 18–1 (Dec. 1, 2020)	39, 40

Patent Owner's Exhibit List

Exhibit	Description
2001	Docket Control Order from <i>Optronic Sciences LLC v. BOE Tech. Group Co., Ltd.</i> , No. 2:23-cv-00549-JRG, Dkt. 33 (E.D. Tex. Aug. 5, 2024).
2002	Infringement Contentions from <i>Optronic Sciences LLC v. BOE Tech. Group Co., Ltd.</i> , No. 2:23-cv-00549-JRG, Dkt. 33 (E.D. Tex. Aug. 5, 2024).
2003	BOE Technology Group Co., LTD's Invalidity Contentions from <i>Optronic Sciences LLC v. BOE Tech. Group Co., Ltd.</i> , No. 2:23-cv-00549-JRG, (E.D. Tex. Oct. 25, 2024).

I. Introduction

The Board should decline to institute the Petition because the prior art fails to teach the claimed limitations.

Kwak (Ex. 1005) does not teach “**forming** a predetermined material layer **on** the first substrate” as recited in independent claim element [1b] in combination with “forming an organic material pattern layer having a saw tooth opening on the predetermined material layer to expose a surface of the predetermined material layer underneath” as recited in independent claim element [1c]. For similar reasons, Kwak does not teach “a predetermined material layer formed on the first substrate” as recited in independent claim element [9b] in combination with “an organic material pattern layer having a saw tooth opening formed on the predetermined material layer to expose the surface of the predetermined material layer underneath” as recited in independent claim [9c]. None of Kwak’s embodiments simultaneously meets both elements [1b] and [1c] or [9b] and [9c].

Zhang (Ex. 1006) does not teach “forming an organic material pattern layer having a saw tooth opening on the predetermined material layer to expose a surface of the predetermined material layer underneath” as recited in independent claim element [1c]. For similar reasons, Zhang does not teach “an organic material pattern layer having a saw tooth opening formed on the predetermined material layer to expose the surface of the predetermined material layer underneath” as recited in

independent claim [9c]. The layer identified by Petitioner is not an “organic” layer.

II. Partial Summary of Patent 7,226,801

Patent 7,226,801 relates to a sealant region pattern for a liquid crystal display (LCD) and the method of fabricating this LCD. Ex. 1001 at 1:5–9.

One aspect of the technology relates to an angled sawtooth opening in a sawtooth pattern in an organic layer to allow more sealant to make contact. *See, e.g.*, Ex. 1001 at Figs. 1A–1B (showing sawtooth pattern), Figs. 2B–2C (showing angled opening).

Another aspect of the technology relates to the method of fabricating this LCD. Ex. 1001 at 2:46–3:14. Patent 7,226,801 describes and shows the semiconductor layers that are fabricated on each other:

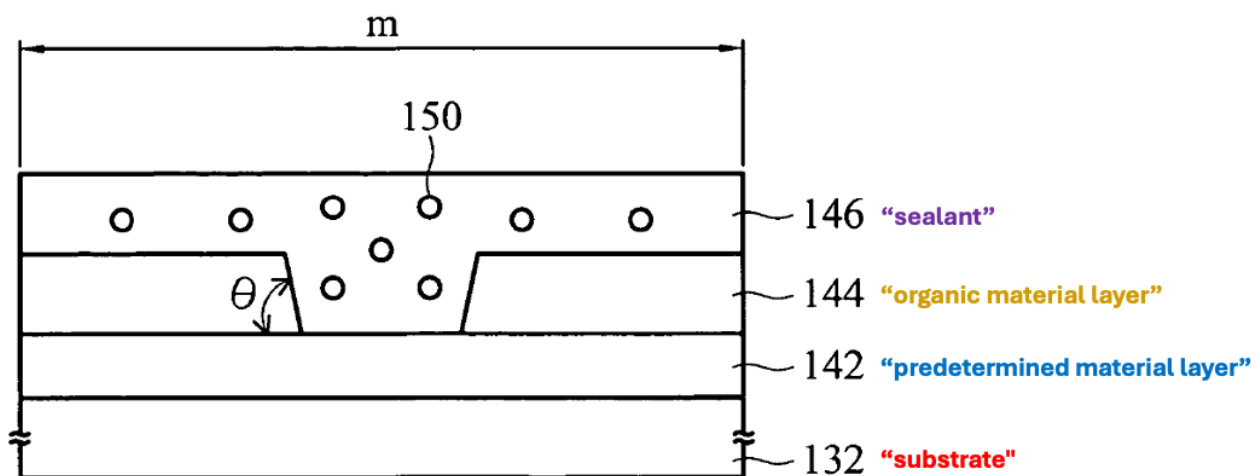


FIG. 1C

Id. at Fig. 1C (annotated according to 2:27–36.)

The method for fabricating the LCD is disclosed using Figures 2A–2C. Ex. 1001 at 2:1–3, 2:44–45.

First, “[a] predetermined material layer . . . 242 is formed on the TFT array substrate 232.” Ex. 1001 at 2:48–49 (color added).¹ Then, “[a]n organic material layer 244 is formed on the silicon nitride layer 242. The organic material layer 244 is patterned by lithography, exposed to UV light 250 through a half-tone mask 248 with a predetermined pattern thereon.” *Id.* at 2:56-59.

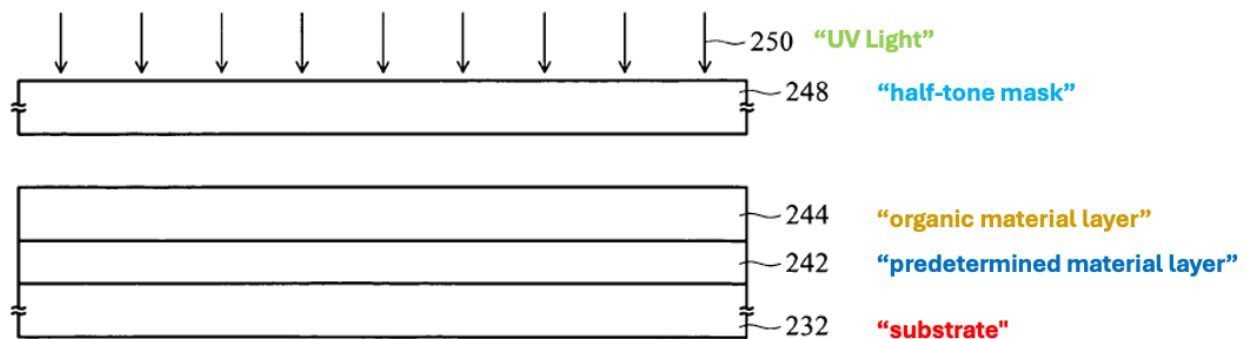


FIG. 2A

Id. at Fig. 2A. “Accordingly, the organic material layer 244 is tapered after subsequent development and etching.” *Id.* at 2:61-63. Figure 2B shows the resulting effect, where “saw tooth opening 234 are formed in the organic material layer 244 by etching.” *Id.* at 2:66-67.

¹ All color added unless otherwise noted.

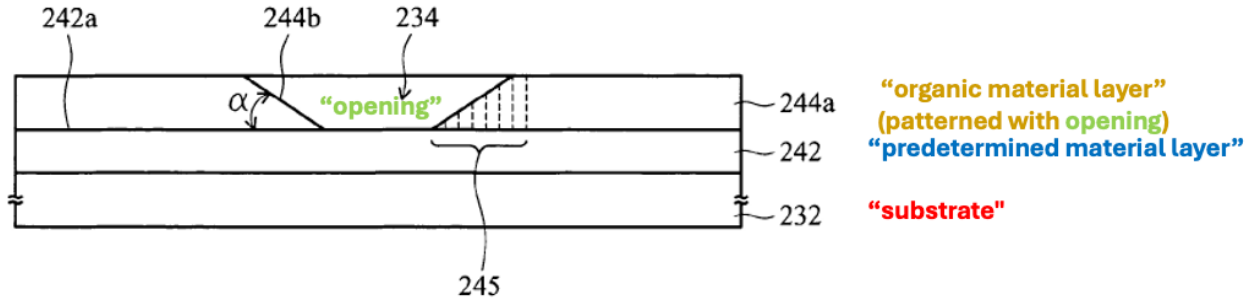


FIG. 2B

Id. at Fig. 2B, 2:66–67.

Finally, the sealant and color filter substrate are added on top. “In FIG. 2C, a predetermined sealant 246 is placed in the saw tooth opening 234 or in the corresponding position of the saw tooth opening 234 of the TFT-LCD substrate 232 for attaching the color filter substrate 260 with the TFT-LCD substrate 232.” Ex. 1001 at 3:22–26.

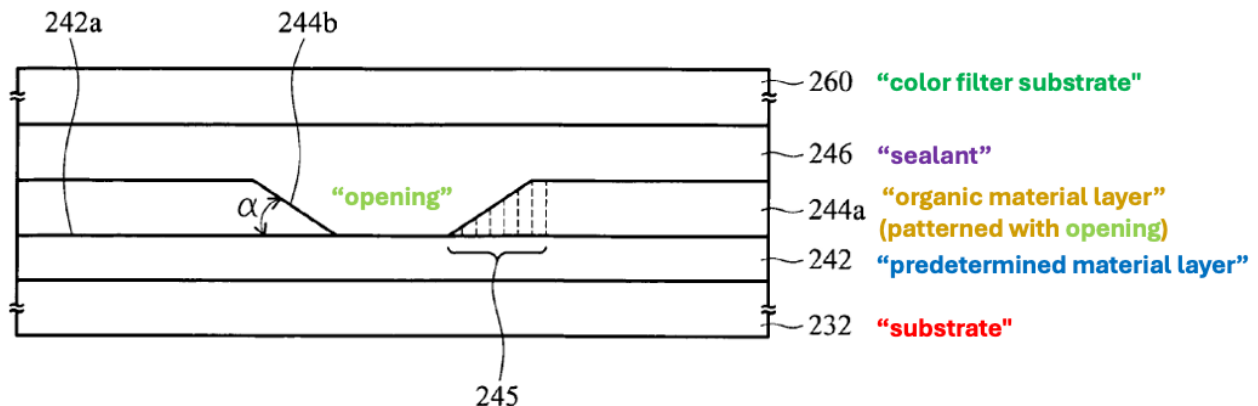


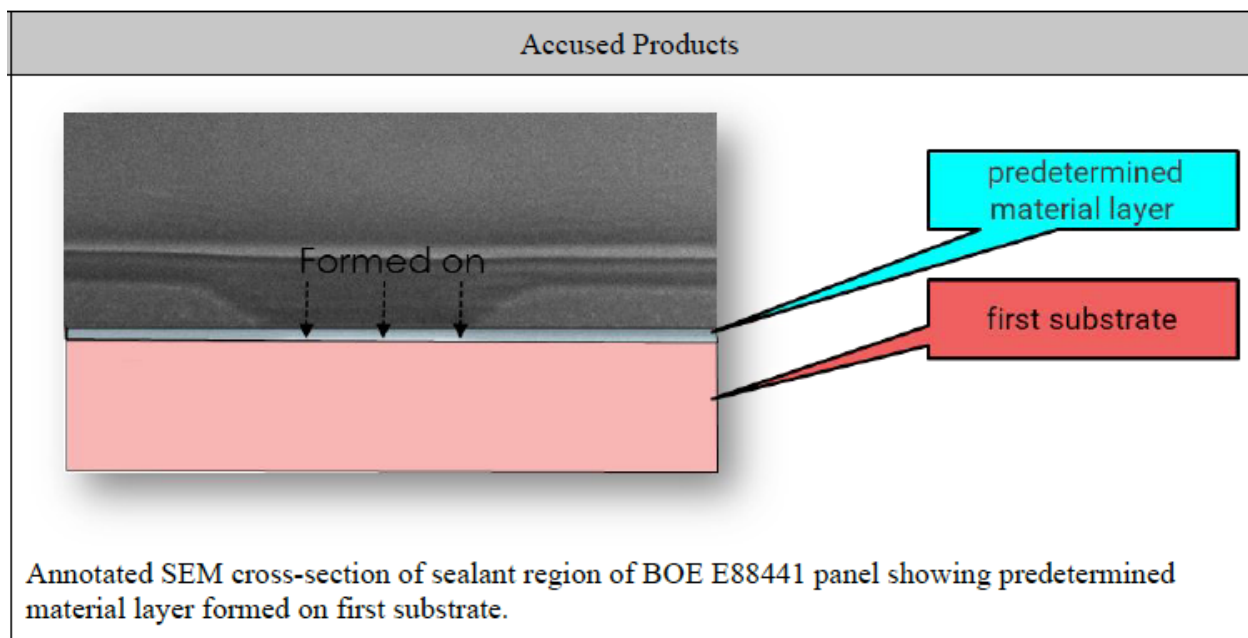
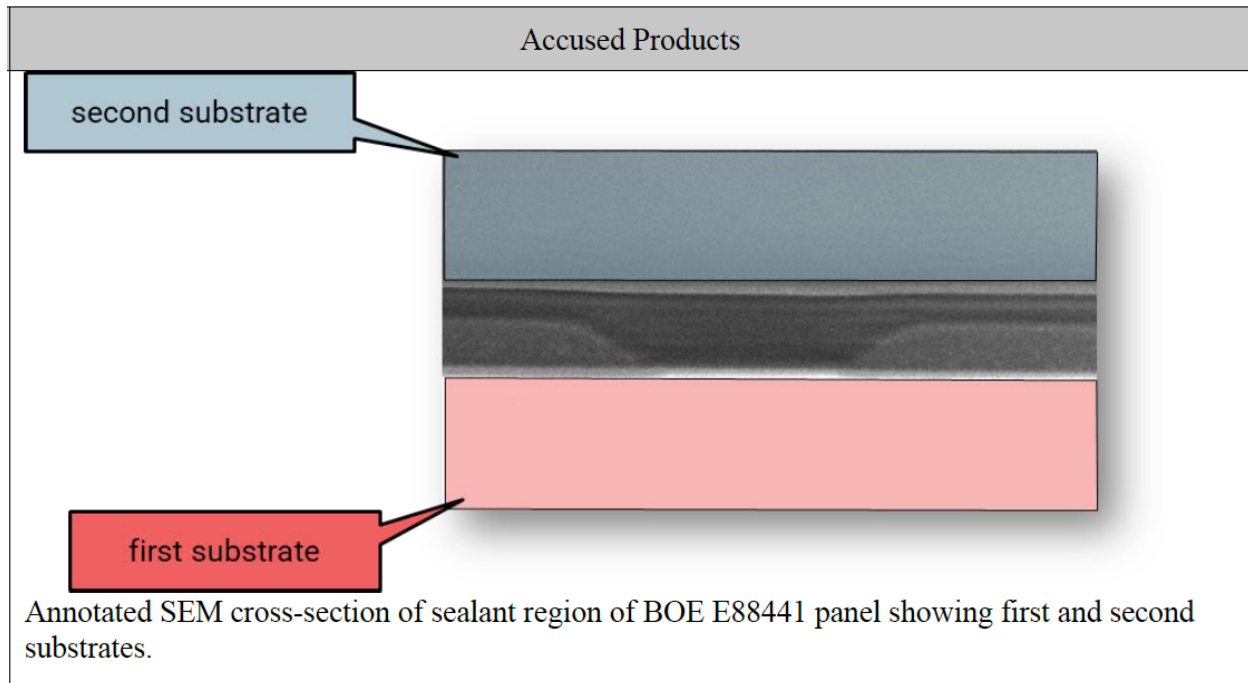
FIG. 2C

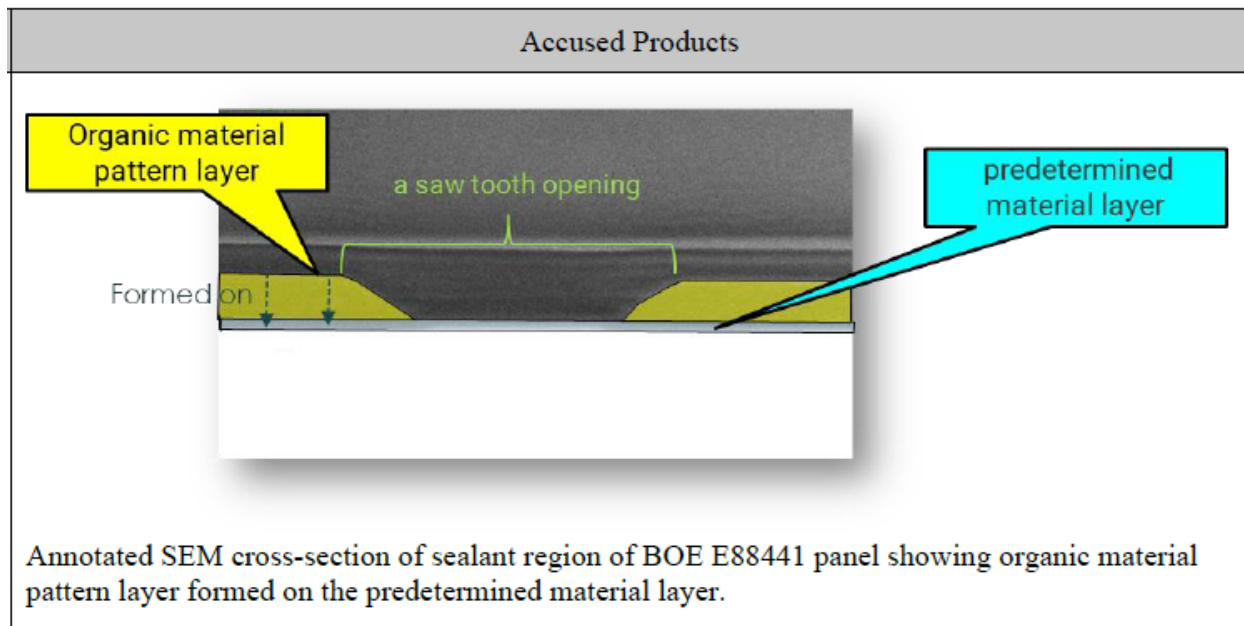
Id. at Fig. 2C.

III. Summary of Related Litigation

Optronic Sciences LLC filed case 2:23-cv-00549 in the Eastern District of

Texas against BOE Technology Group Co., Ltd. (“BOE” or “Petitioner”). The complaint alleges that BOE infringes Patent 7,226,801. One of the accused products in this case is the BOE E88441 panel. Cross-sections of the LCD panel are shown below:





Ex. 2002 at 5–7.

Consistent with Patent 7,226,801, the infringement contentions show how the accused device has a “predetermined material layer” that is “formed on” the substrate without additional intervening layers. *Id.* Also, the infringement contentions show an organic material “formed on” the “predetermined material layer.” *Id.*

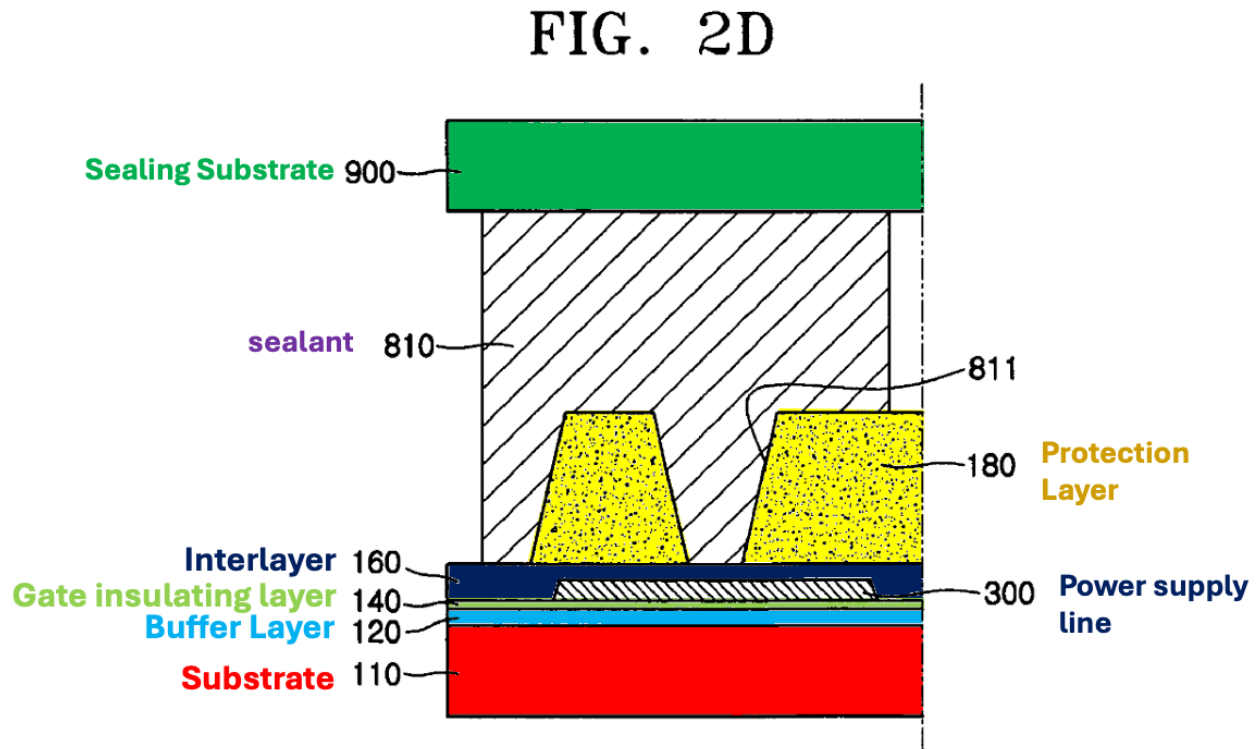
IV. Summary of the Primary References

A. Patent 7,538,488 (“Kwak,” Ex. 1005)

1. The Embodiments of Figures 2A–2D

The primary embodiment relied upon in the Petition is Kwak Figure 2D. The Petition annotates Figure 2D across pages 23–26. The Petitioner’s annotations to Figure 2D use the blue color for three different layers: buffer layer 120, gate

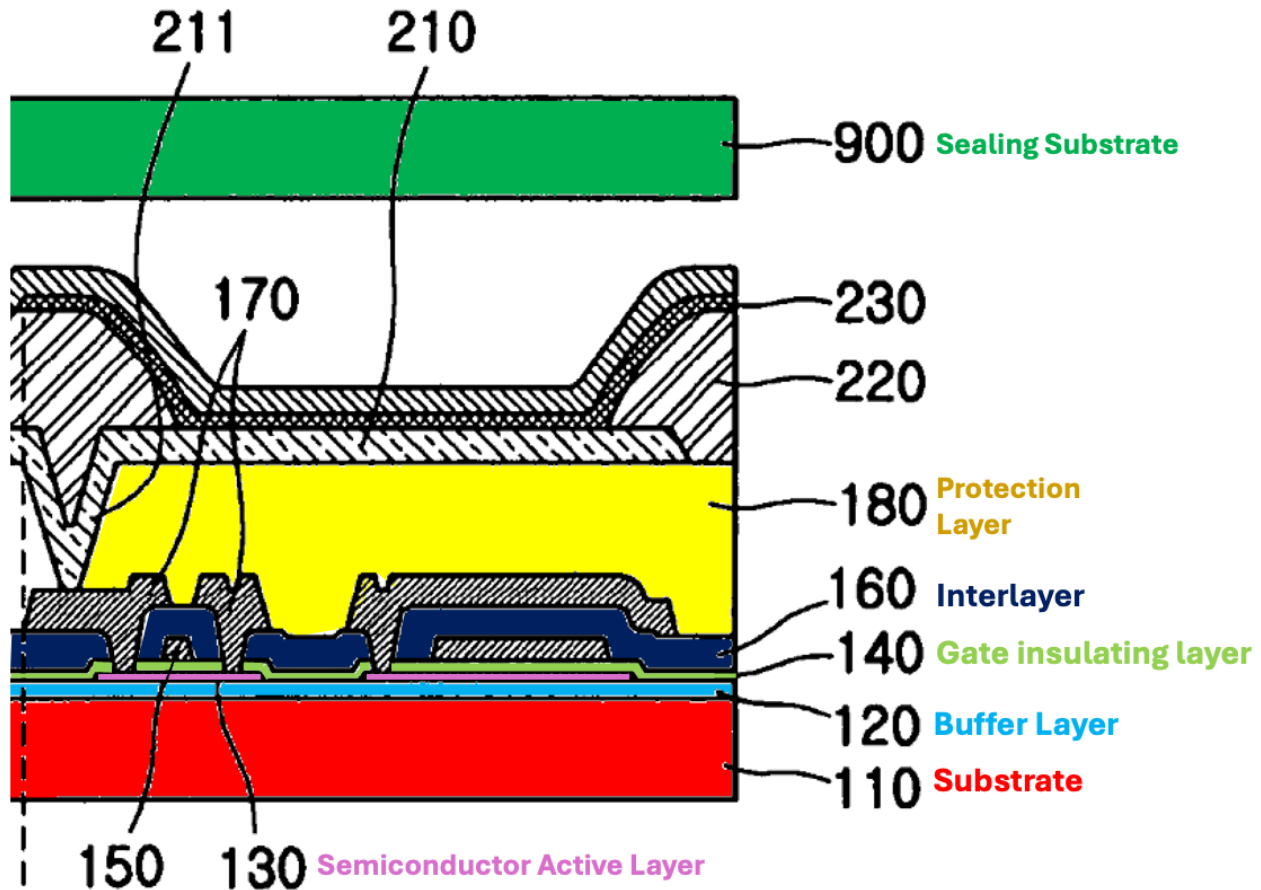
insulating layer 140, and interlayer 160. Patent Owner respectfully submits that the following recolored figure better represents the distinct layers shown in Figure 2D:



Ex. 1005, Fig. 2D (annotated by Patent Owner).

Of the interlayer 160, gate insulating layer 140, and buffer layer 120, only the “buffer layer 120 is formed on a substrate 110.” Ex. 1005 at 6:62–63. Neither the gate insulating layer 140 nor the interlayer 160 are described in Kwak as being “formed on” the substrate 110. The next surface above the buffer layer 120 is described as being “formed on” buffer layer 120, not as being “formed on” the substrate 110. For example, the excerpted part of Kwak’s Figure 2B (which shows a different part of the device than Figure 2D) below shows how part of the device has a “semiconductor active layer 130.” Ex. 1005 at 6:61–64. Kwak states that this

“semiconductor active layer 130 . . . is formed on one surface of the buffer layer 120,” not that the semiconductor active layer 130 is formed on the substrate 110. *Id.* at 6:64–66.



Id. at Fig. 2B (excerpt of bottom right section).

Kwak states that the “gate insulating layer 140 of SiO₂ is formed between the semiconductor active layer 130 and the gate electrode 150,” not that gate insulating layer 140 is formed on the substrate 110. Ex. 1005 at 7:12–14. The excerpted part of Figure 2B above shows the gate insulating layer 140 formed on semiconductor active layer 130. In Figures 2B and 2D, when the semiconductor is not present, the gate

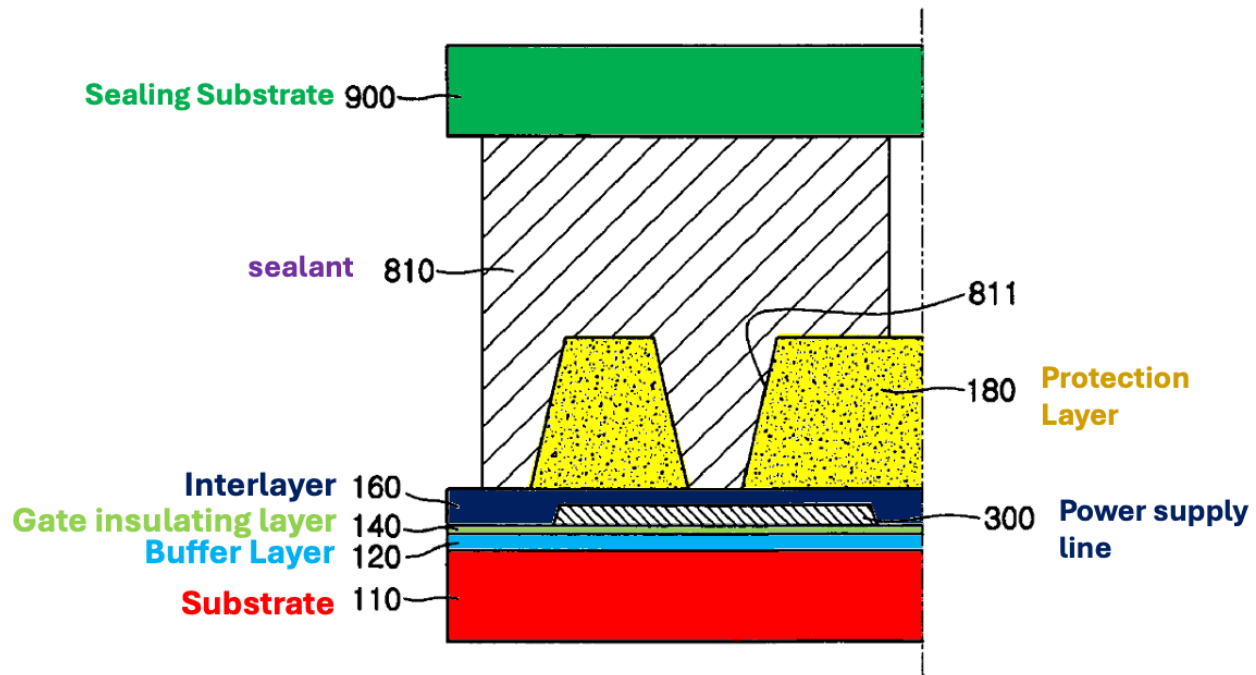
insulating layer 140 is instead “formed on” the buffer layer 120, not formed on the substrate 110.

Kwak describes “interlayer 160” as “arranged on an upper portion of the gate electrode 150,” not as being formed on the substrate 110. Ex. 1005 at 7:16–18. The excerpted part of Figure 2B above shows the interlayer 160 is formed on gate electrode 150. In Figures 2B and 2D, when the gate electrode 150 is not present, the interlayer 160 is instead “formed on” the gate insulating layer 140.

Thus, Figure 2D of Kwak shows that interlayer 160 is formed on the gate insulating layer 140, but gate insulating layer 140 is not formed on the substrate 110.

Similarly, Figure 2D of Kwak shows that the protection layer 180 is formed on interlayer 160, but the protection layer 180 is not formed on buffer layer 120. An opening in the protection layer 180 exposes the surface of interlayer 160, but the opening does not further extend to expose the surface of the buffer layer 120 that is formed on the substrate 110.

FIG. 2D

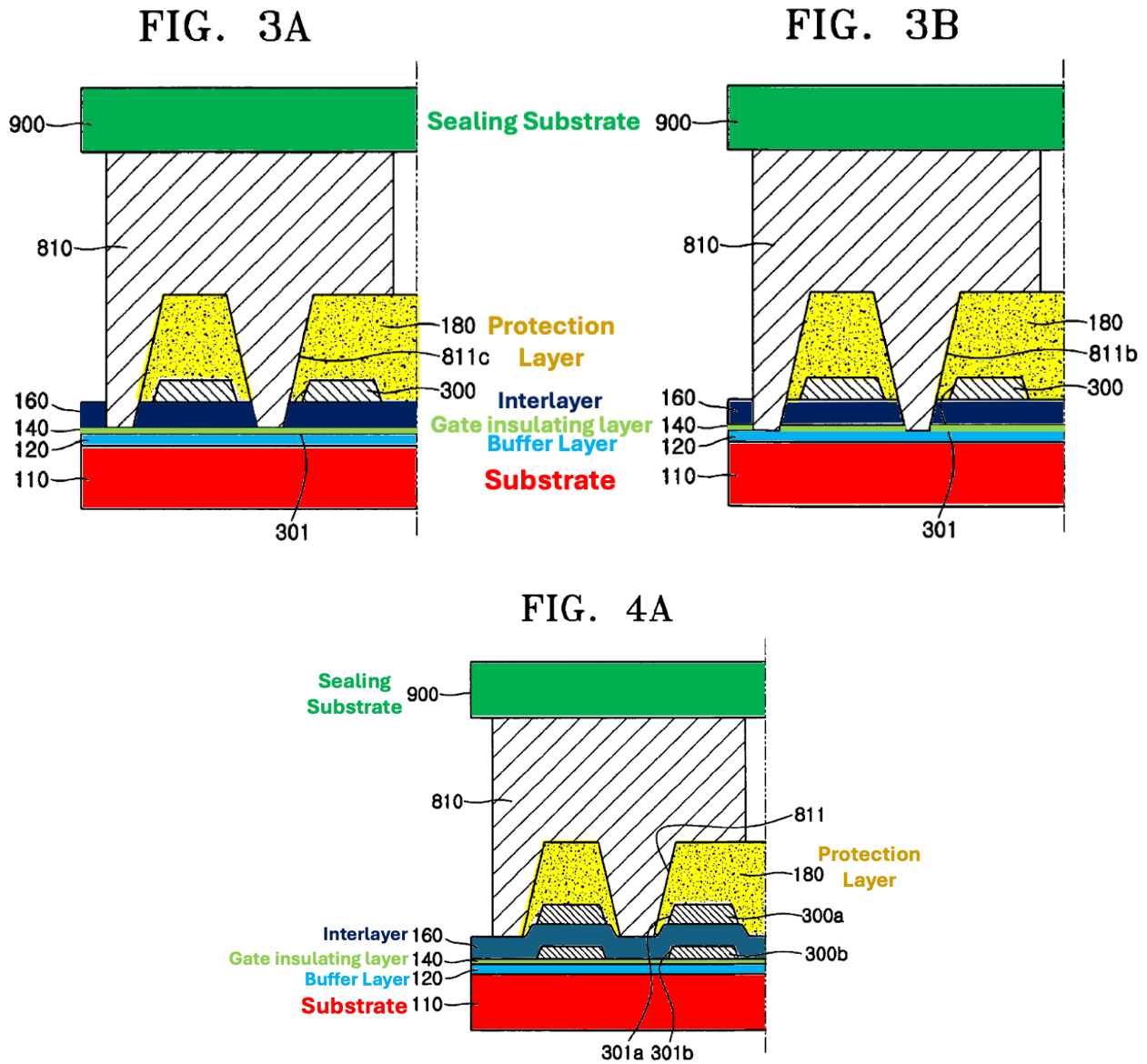


Ex. 1005 at Fig. 2D (annotated by Patent Owner).

2. The Embodiments of Figures 3 and 4

According to Kwak, Figures 2, 3, and 4 all show distinct, modified embodiments. Ex. 1005 at 6:21–37 (describing Figures 2A–2D as showing different views according to an embodiment, Figures 3A–3C as views of “another embodiment,” and Figures 4A–4C as “still another embodiment”), 10:37–62 (describing differences between these embodiments, especially regarding the via hole). The Petition relies on embodiments shown in Figures 2D, 3A, 3B, and 4A. Petition at 24. In these embodiments, a via hole 811 extends to different depths. *Id.* However, in all these embodiments, the protection layer 180 is still formed on only the interlayer 160 (and also on the power supply line 300). None of these

embodiments show a **protection layer 180** formed on the **buffer layer 120**.



Ex. 1005 at Figs. 3A, 3B, 4A (annotated by Patent Owner).

B. Summary of Patent CN1538212A (“Zhang,” Ex. 1006)

1. Conventional Embodiments of Figures 1 and 2

The specification of Zhang begins on pages 5–7² by discussing conventional LCD panels. Ex. 1006 at 5–7, 8 (describing Figures 1A–2B as views of a “conventional” LCD panel). Notably, Zhang Figures 1A, 1B, 2A, and 2B are annotated with numbers in the range of 100’s and 200’s.

Of these, Figure 2B shows the following:

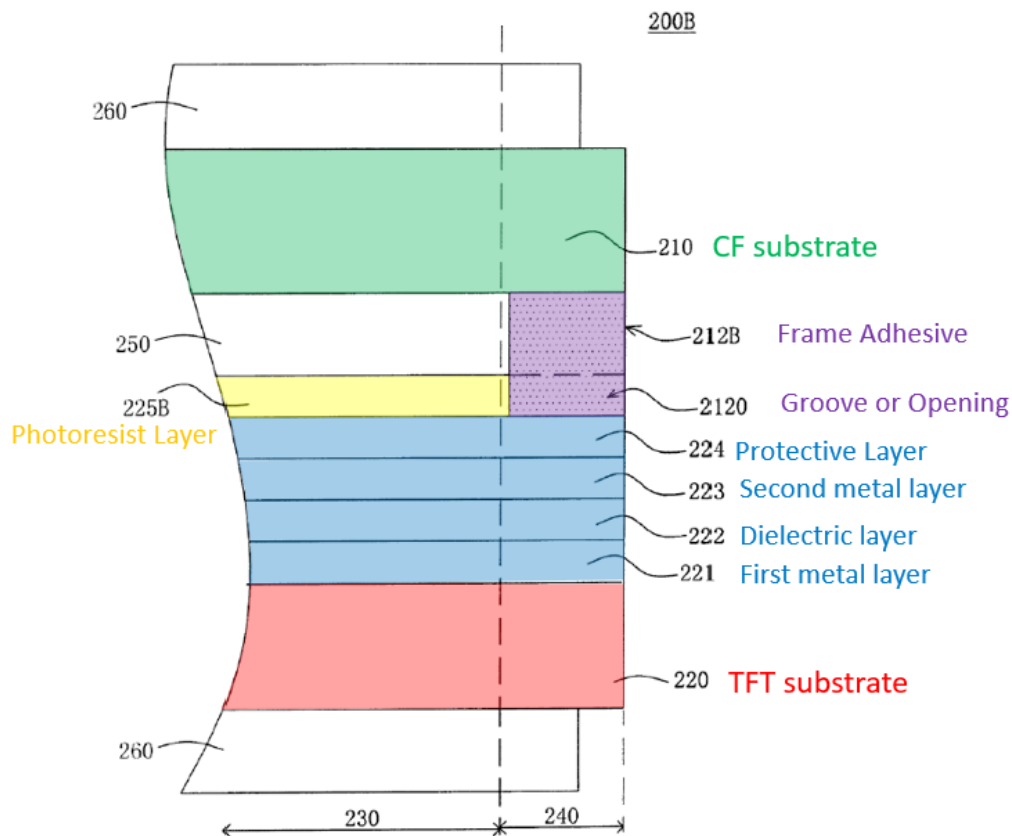


Fig. 2B

² All Zhang citations to page numbers by Petitioner at the bottom right. The original numberings at the top right and bottom middle have inaccuracies.

Petition at 7 (Petitioner annotating Zhang Figure 2B). Of these layers, Zhang states, “the **protective layer 224** can be composed of silicon nitride (Si_3N_4) or silicon dioxide (SiO_2), and the **photoresist layer 225** can be composed of an organic material.” Ex. 1006 at 7. Thus, the **photoresist layer 225** is organic, but the **protective layer 224** is not.

Zhang goes on to describe the problem with this conventional LCD: “the frame adhesive 212B in the frame adhesive area 240 contacts the liquid crystal injection area 250 and the photoresist layer 225B in the display area 230.” *Id.* at 7. “However, the bonding strength of the assembled liquid crystal display panels 100, 200A, and 200B is insufficient. During reliability tests or drop tests, the panels are prone to developing cracks at the contact interface between the TFT substrate and the CF substrate due to impact or vibrational forces. This results in damage to the display panel, significantly affecting the quality of the display panel.” *Id.* Zhang then proceeds to discuss the different, improved design in Figure 3 after disparaging the conventional art.

2. Zhang’s embodiment in Figure 3B contains an inorganic second covering layer 380a

Figure 3 shows “the first embodiment” of Zhang’s invention. Ex. 1006 at 8. These embodiments of Zhang’s invention “provide a display panel frame adhesive structure with greater bonding strength,” which “allows the structure to withstand greater external impact or vibration forces.” *Id.*

Zhang describes Figure 3 on pages 9–11. Figure 3 as annotated by Petitioner uses misleading colors because Petitioner uses yellow for the “second covering layer 380a,” despite this not being an organic photoresist layer that yellow was previously used for. *See* Petition at 7 (using both photoresist layer 225B in Figure 2B and yellow for inorganic second covering layer 380a). A better colored version of Figure 3B is shown below:

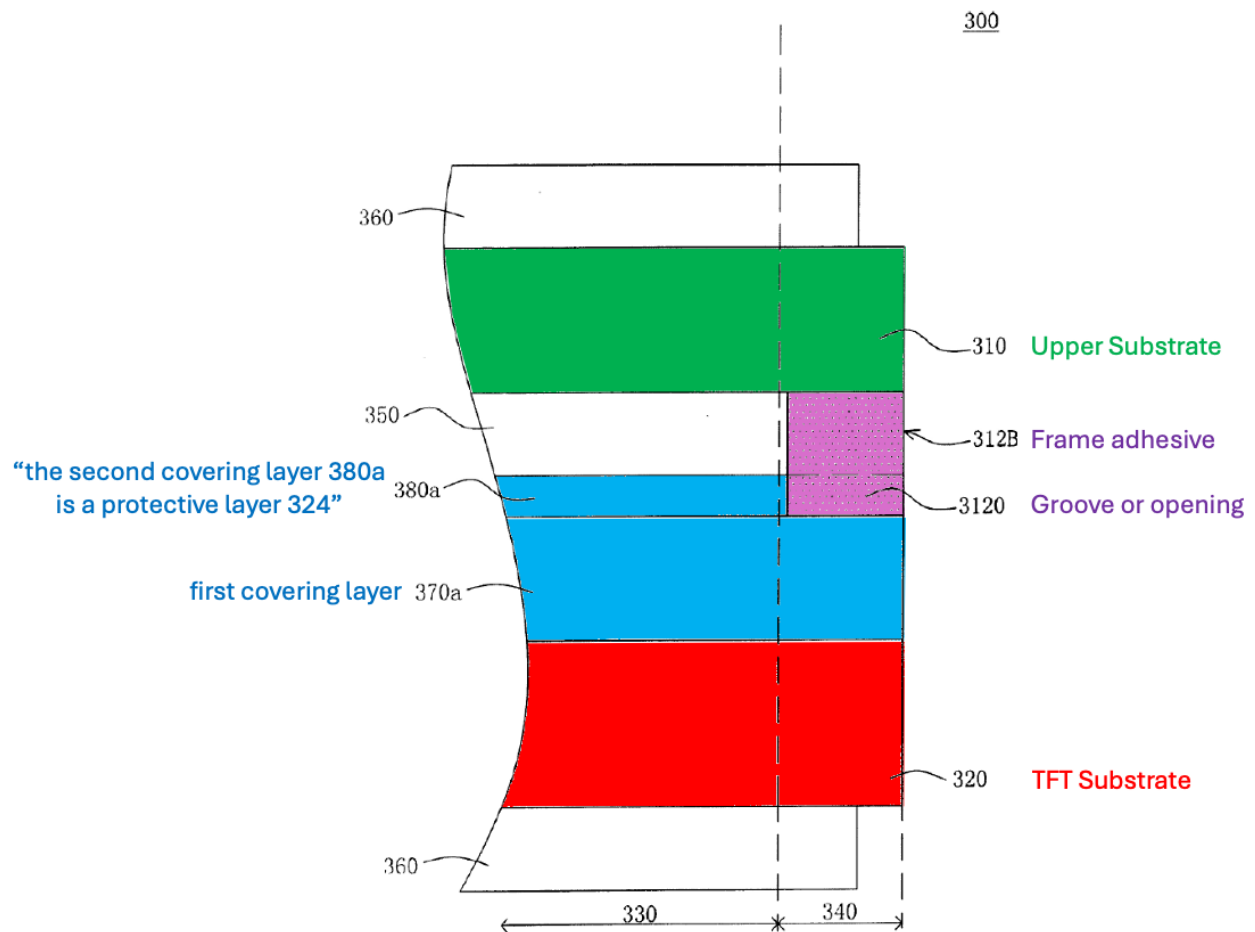


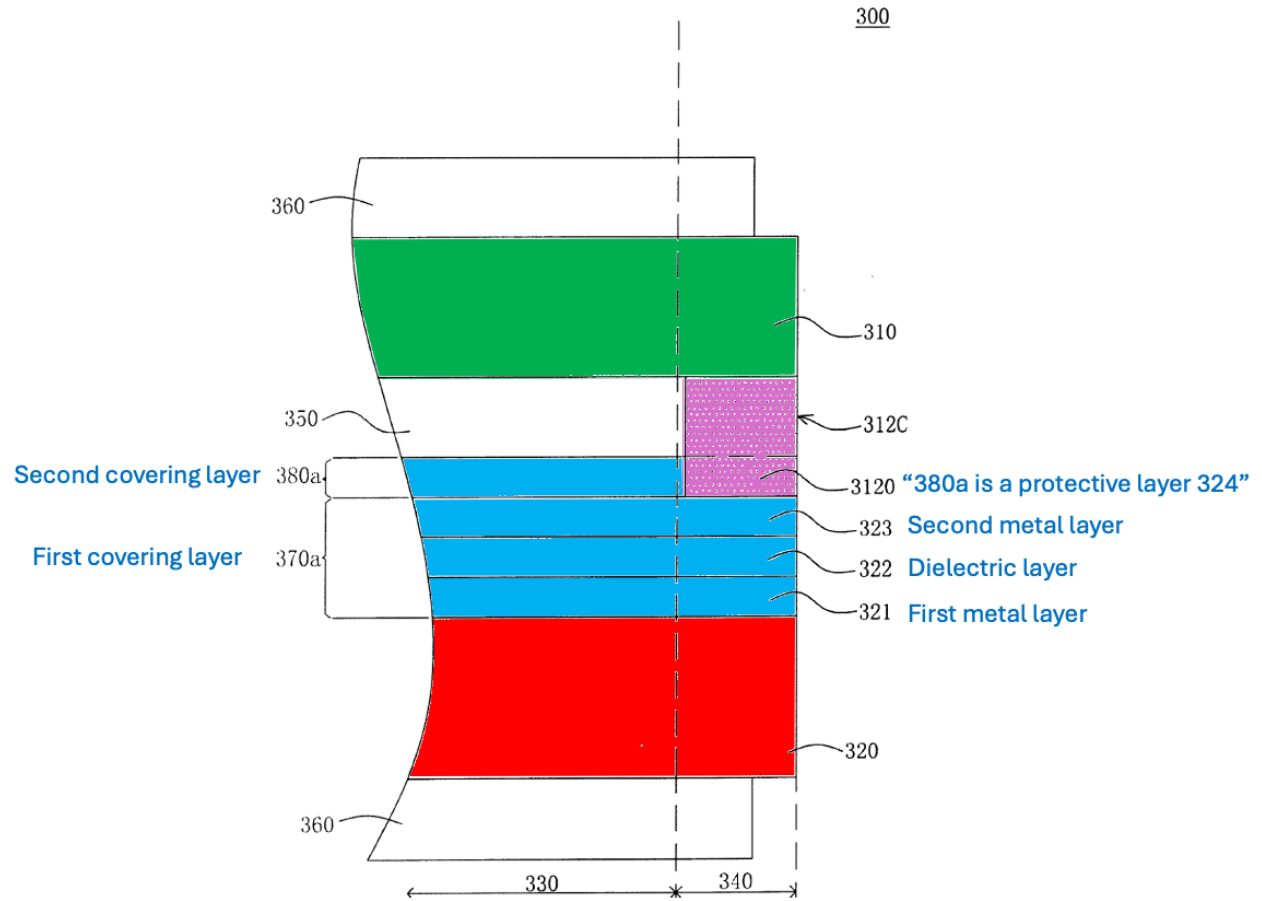
Fig. 3B

Notably, Figure 3B shows a “first covering layer 370a and the second covering layer 380a, with the second covering layer 380a positioned above the first covering layer

370a.” Ex. 1006 at 9. “Here, the second covering layer 380a has a groove or opening 3120 exposing a portion of the first covering layer 370a, and the groove or opening 3120 is elongated.” *Id.*

Zhang states, “the second covering layer 380a is a protective layer 324.” Ex. 1006 at 10; *see also id.* at Fig. 3C (explicitly labeling protective layer 324). Zhang also states, “the protective layer 324 is composed of silicon dioxide (SiO_2) or silicon nitride (Si_3N_4).” *Id.* at 10. Thus, Zhang’s second covering layer 380a is an inorganic material.

Using Figures 3C, 3D, and 3D, Zhang shows examples of what is included in the first covering layer 370 and the second covering layer 380. None of these examples include an organic photoresist. Despite this, the Petition misleadingly uses yellow for the second covering layer 380 to suggest that the second covering layer 380 is somehow similar to the photoresist layer 225B from the conventional design in Figure 2B. *See* Petition at 8. It is not. Better versions of Zhang Figures 3C–3E are provided below:



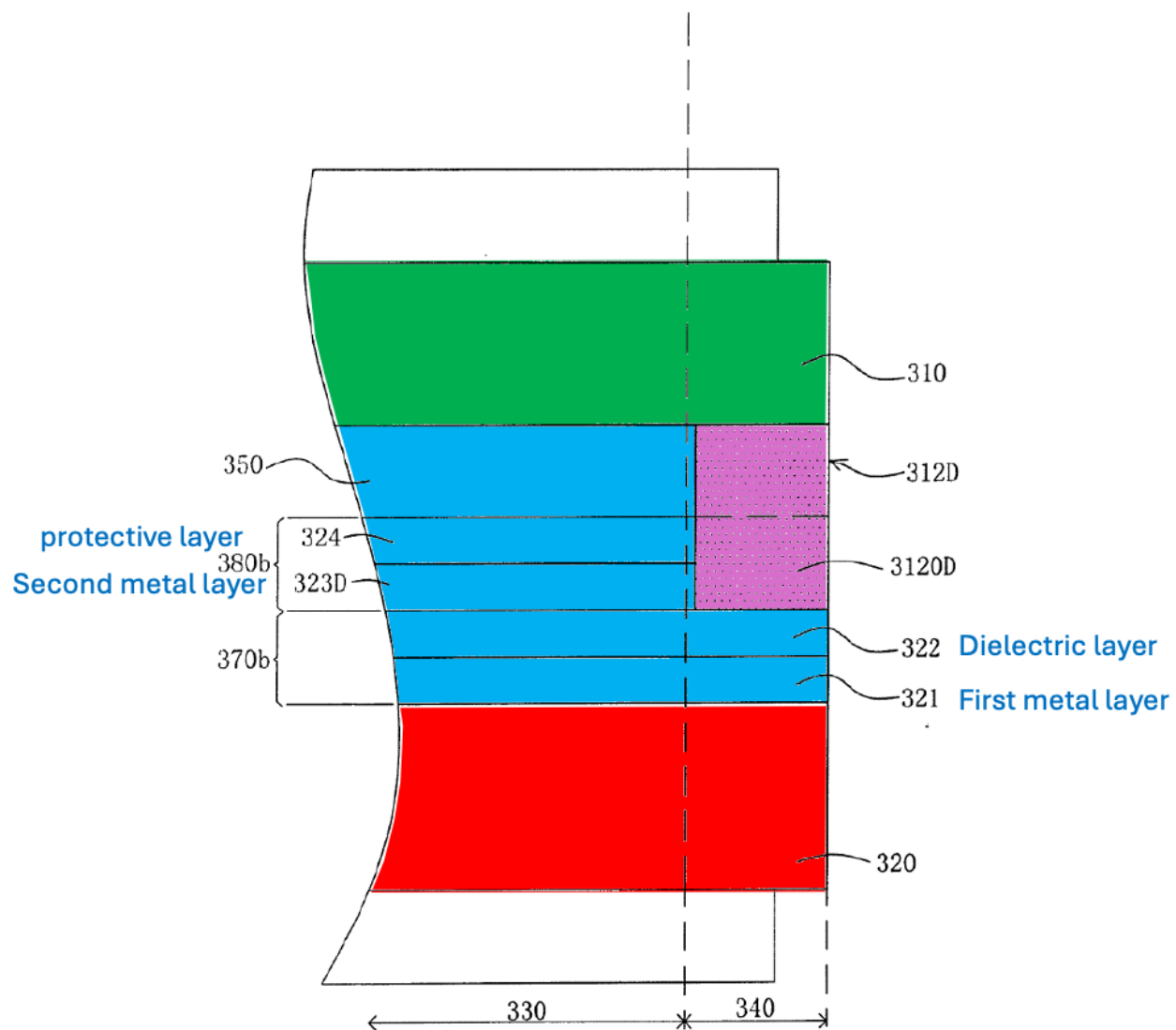


Fig. 3D

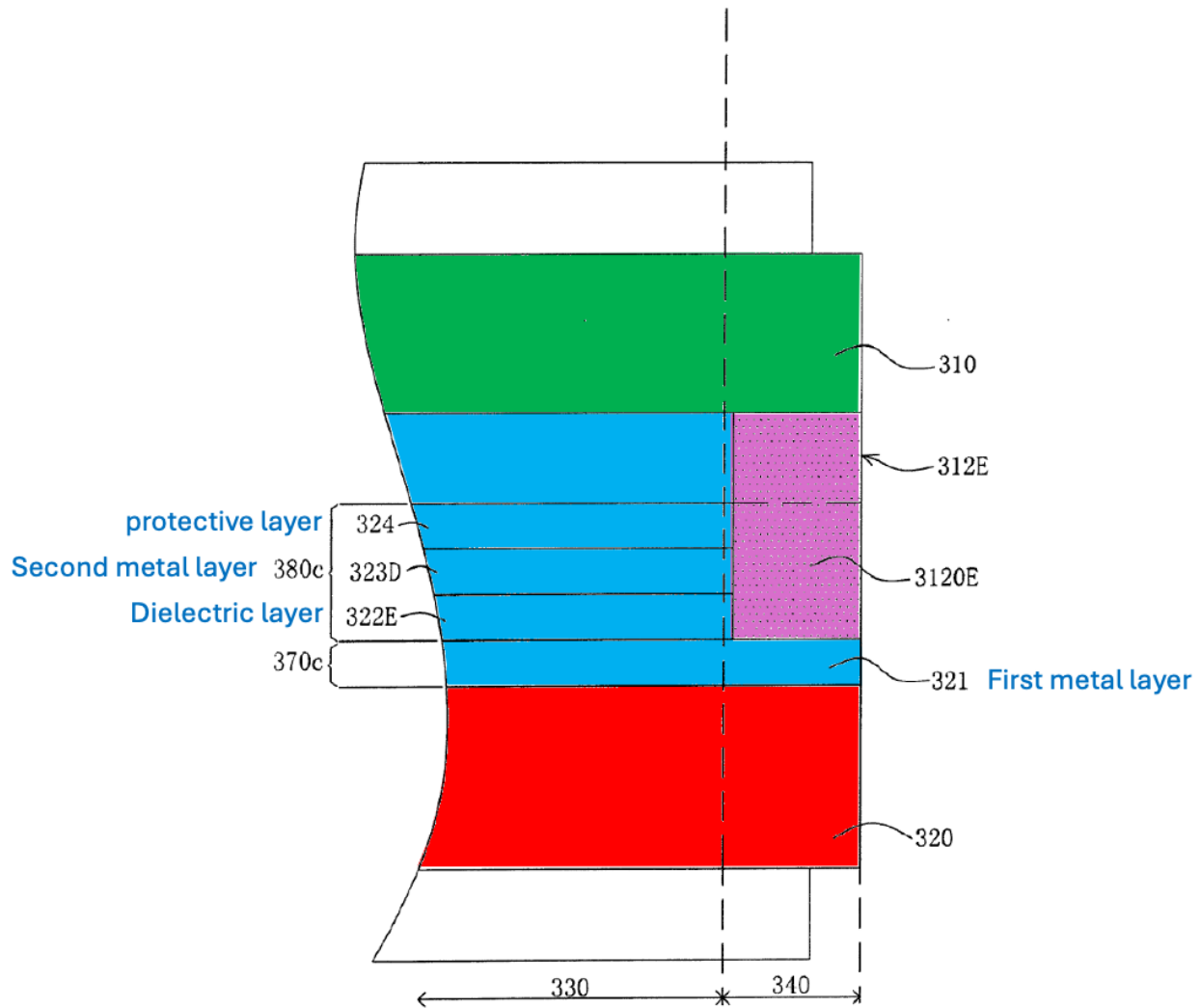


Fig. 3E

Ex. 1006 at Figs. 3C–3E (annotated per Ex. 1006 at 10–11).

These better colored figures 3B–3E make it clear that across all these embodiments of Zhang’s invention that improve the bonding strength to withstand greater impact and vibration, there is no **organic photoresist layer** (no yellow from Figure 2B). The Petition (and the expert opinion that is nearly identical) is wrong to assert that “Zhang discloses a second covering 380a that, when implemented in a conventional reflective LCD, would comprise at least organic layer 225B, and would

optionally include additional underlying layers such as protective layer 224.”

Petition at 57; Ex. 1003 ¶ 189.

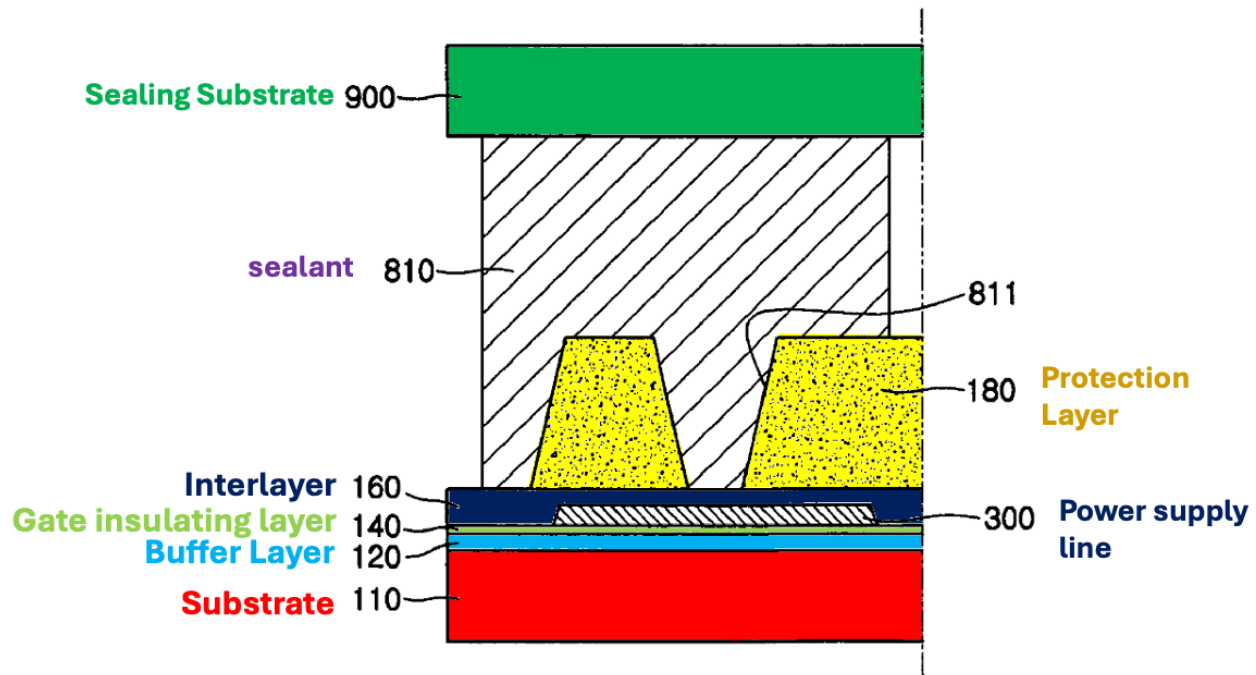
V. Institution Should Be Denied Because the References Lack Claimed Elements

The Board should deny institution because the Petition fails to identify critical claim elements in each ground and thus has not established a reasonable likelihood of prevailing on the merits.

A. Ground 1 (Kwak § 102, Claim 9): Kwak’s Layers Are Not Formed in the Claimed Arrangement

None of Kwak’s embodiments meet both the limitations of claims [9b–c] or claims [1b–c]. Claim [9b] requires “a predetermined material layer formed on the first substrate.” In Kwak, only **buffer layer 120** is formed on **substrate 110**. Claim [9c] then requires “an organic material pattern layer . . . formed on the predetermined material layer to expose the surface of the predetermined material layer.” In Kwak’s embodiments, the **protection layer 180** is formed on **interlayer 160**, but the **protection layer 180** is not formed on **buffer layer 120**. Thus, the **protection layer 180** does not meet the requirements of claim [9c]. Petitioner’s arguments for claim 1 are deficient for similar reasons.

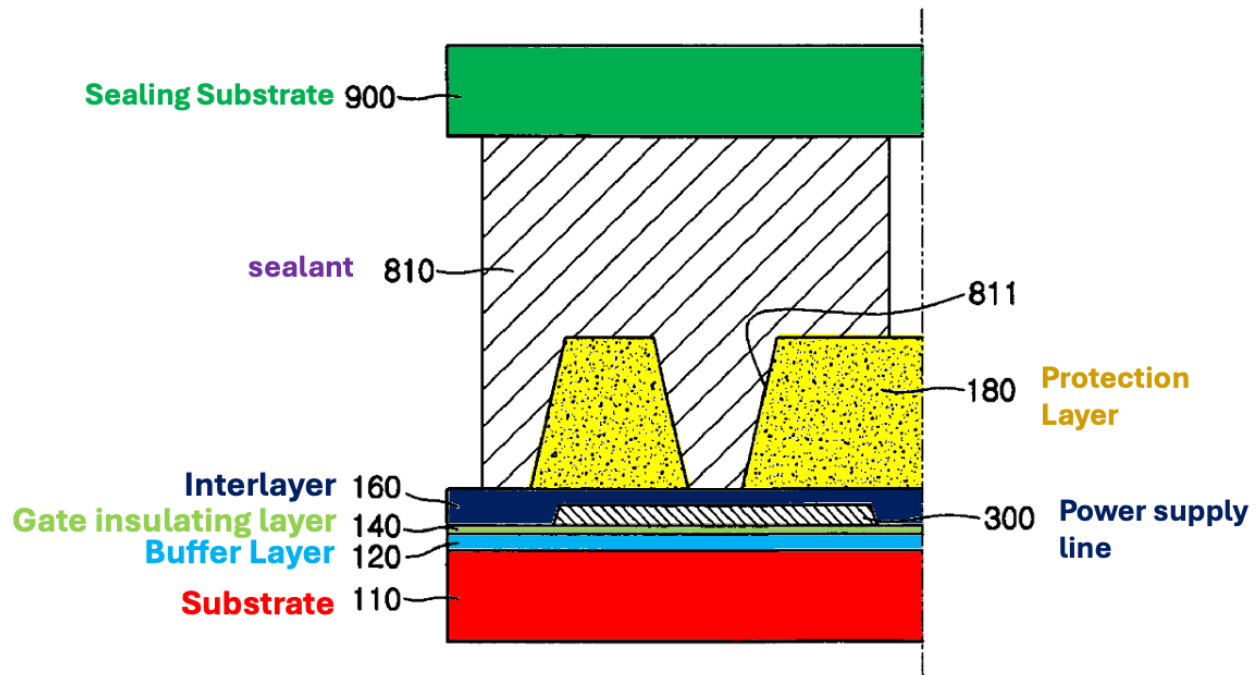
FIG. 2D



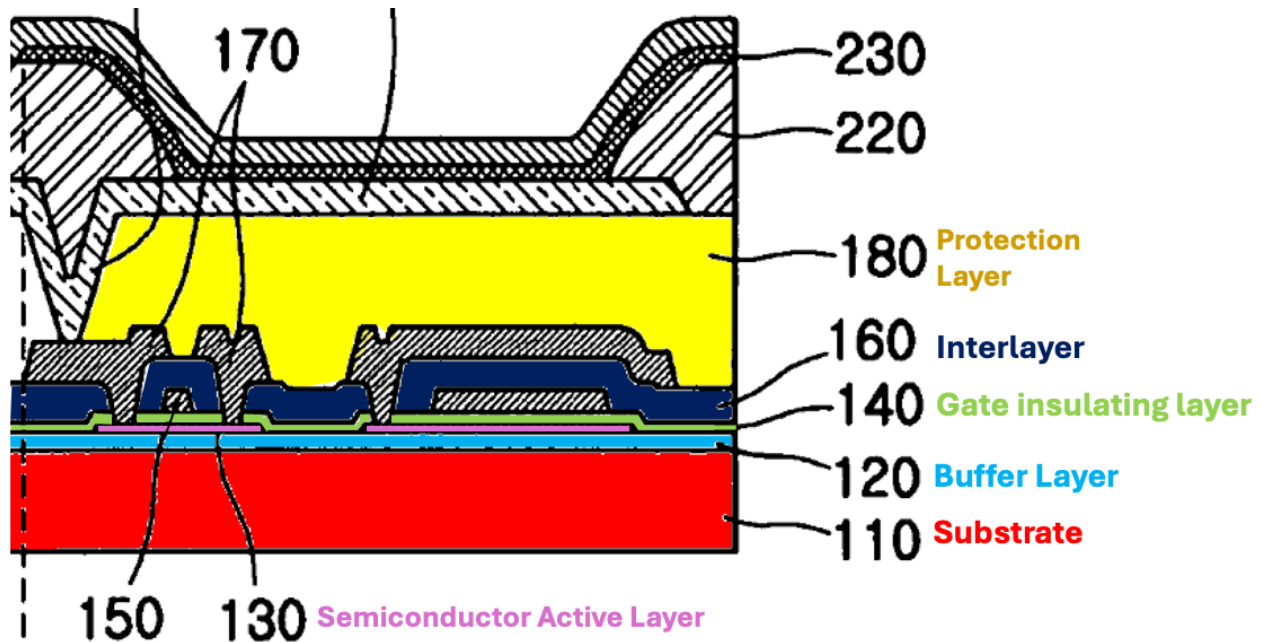
1. Independent Claim [9b]: Only Kwak’s buffer layer 120 is “a predetermined material layer formed on the first substrate”

The Petition argues that Kwak meets this claim requirement because “interlayer 160, gate insulating layer 140, buffer layer 120, or a combination of the same” are “formed on the first substrate [substrate 110].” Petition at 23. Of these, **only** buffer layer 120 is a “predetermined material layer” of claim [9b] that is formed on the substrate 110. Ex. 1005 at 6:62–63 (“buffer layer 120 is formed on a substrate 110”); *see* Section V(B), above.

FIG. 2D



Kwak does not describe the gate insulating layer 140 as being “formed on” the substrate 110. Ex. 1005 at 7:3–15. Rather, the gate insulating layer 140 is formed on the semiconductive active layer 130 (shown in Figure 2B, excerpted below) or, when the semiconductor is not present, the gate insulating layer 140 is formed on the buffer layer 120. *Id.* at 7:12–14 (as seen in Figure 2D, shown above).



Kwak also does not describe the interlayer 160 as being “formed on” the substrate 110. Ex. 1005 at 7:16–23. Rather, the interlayer 160 is formed on the gate electrode 150 (as shown in Figure 2B, excerpted above), or, when the gate electrode 150 is not present, the interlayer 160 is formed on the gate insulating layer 140.

Petitioner offers no reason to collectively treat the interlayer 160, gate insulating layer 140, buffer layer 120 as a single layer. These layers are formed at different stages, in different places, at different heights, can have different compositions, and are marked with different numbers. The buffer layer 120 is formed on a glass substrate. *Id.* at 6:62–64. The gate insulating layer 140 is made of SiO₂ and formed on semiconductor active layer 130 using plasma-enhanced chemical vapor deposition. *Id.* at 7:12–15. The interlayer 160 is formed of SiO₂ or SiN_x and arranged on an upper portion of the gate electrode 150. *Id.* at 7:16–18. As

shown in the Figure 2B excerpt above, the semiconductor layer 130 and gate electrode 150 layer are also present. Figures 2D, 3A, and 4A further show a power supply line 300 layer between the interlayer 160 and the gate insulating layer 140. Thus, the interlayer 160, gate insulating layer 140, and buffer layer 120 are three distinct layers that further includes additional layers therebetween. There is no reason to treat the interlayer 160, gate insulating layer 140, and buffer layer 120 as a single layer as argued by Petitioner.

In conclusion, only the buffer layer 120 of Kwak can be the claimed “predetermined material layer” that is “formed on” the substrate consistent with claim [9b]. The gate insulating layer 140, interlayer 160, and combinations thereof are perhaps formed “above” the substrate, but not “formed on” the substrate 110 according to claim [9b].

2. Independent Claim [9c]: “an organic material pattern layer . . . formed on the predetermined material layer to expose the surface of the predetermined material layer underneath”

None of the embodiments of Kwak meet the limitations of claim [9c] because Kwak’s protection layer 180 is not formed on the buffer layer 120. The Petitioner relies on the protection layer 180 for being the claimed “organic material pattern layer,” but Kwak’s protection layer 180 is not formed on the buffer layer 120 that is the “predetermined material layer” of claim [9b].

The Petitioner relies on the protection layer 180 for being the claimed “organic

material pattern layer.” Petition at 24. However, all of the relied-upon figures of Kwak (Figures 2D, 3A, 3B, and 4A in Petition at 26) show that the protection layer 180 is formed on the surface of the interlayer 160 and/or formed on power supply line 300. None of these figures show a protection layer formed on the buffer layer 120. Thus, Kwak fails to disclose or render obvious “an organic material pattern layer [Kwak protection layer 180] . . . formed on the predetermined material layer [Kwak buffer layer 120].”

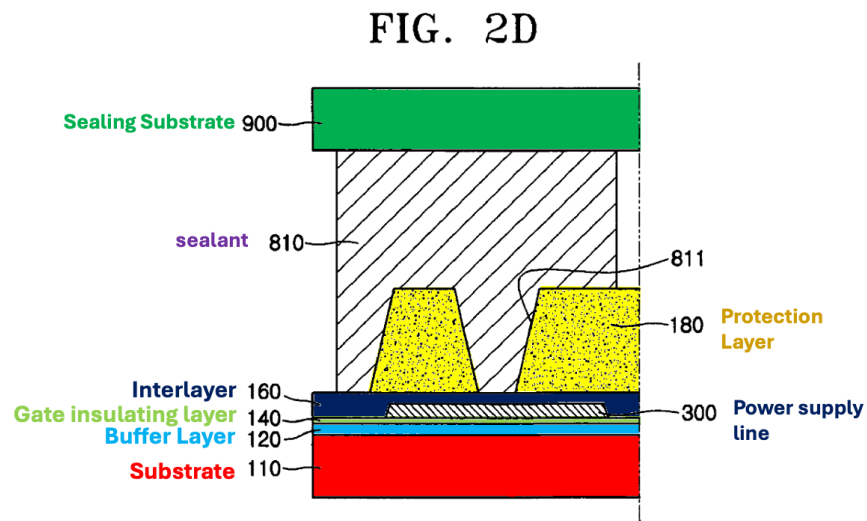


FIG. 3A

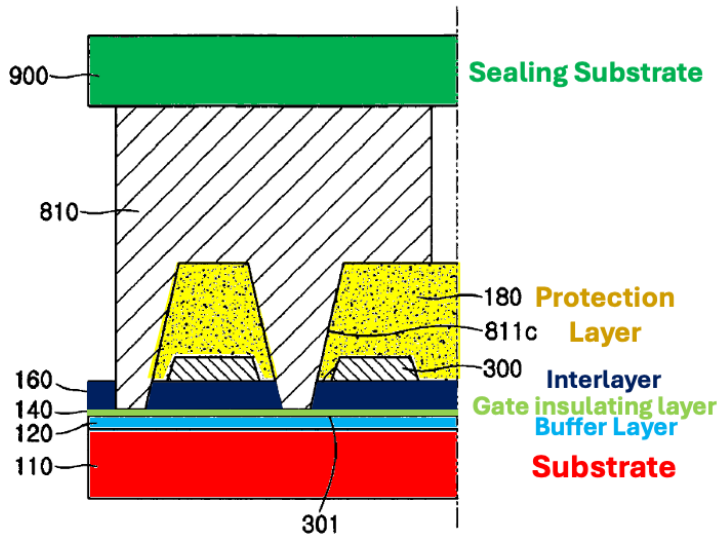


FIG. 3B

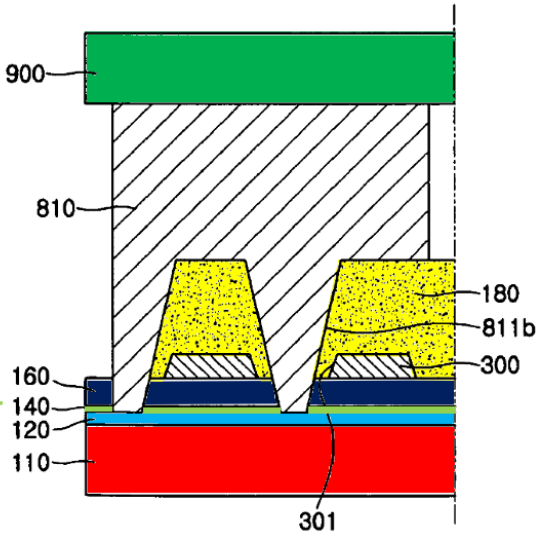
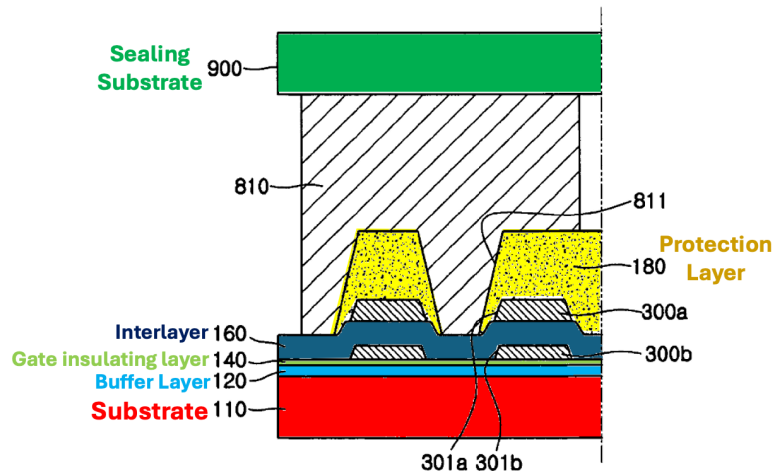


FIG. 4A



The figures show that Kwak's protection layer is formed, in part, on the surface of interlayer 160, but interlayer 160 cannot be the claimed "predetermined material layer" of claim [9b] because interlayer 160 is not "formed on" the substrate 110. For this to meet the claim element [9c], the Petition would need to apply an interpretation where the interlayer 160, gate insulating layer 140, buffer layer 120 (as well as the layers between them, including semiconductor layer 130, gate

electrode 150, and power supply line layer 300) are collectively considered to be a single layer that meets the “predetermined layer” requirement from claim [9b]. Such an interpretation is unreasonable because these 6 layers have different purposes (ranging from insulation to semiconducting to conducting power), are located in different vertical and horizontal positions, use different materials, and have different geometries. Petitioner’s argument is unlikely to succeed on the merits, so institution should be denied.

**B. Ground 2 (Kwak § 103, Claims 1–6, 8–14): Kwak’s Layers Are
Not Formed in the Claimed Arrangement Even Under § 103**

**1. Independent Claim 9 Not Obvious For the Same
Reasons Discussed in Ground 1**

In Ground 2, the Petition cites back to its argument in claim 1, except for further adding obviousness arguments about the angle of the opening. Petition at 29–33. Ground 2 of the Petition does not cure the deficiencies previously identified for Ground 1 above. Thus, Petitioner’s argument for claim 9 in Ground 2 is similarly unlikely to succeed on the merits.

**1. Independent Claim 1 Not Obvious For the Same
Reasons Discussed for Claim 9**

For independent claim 1, the Petition merely cites back to its argument for claim 9. Petition at 38–39. Thus, Petitioner’s argument for claim 1 is similarly unlikely to succeed on the merits.

2. Dependent Claims 2–6, 8, and 10–14

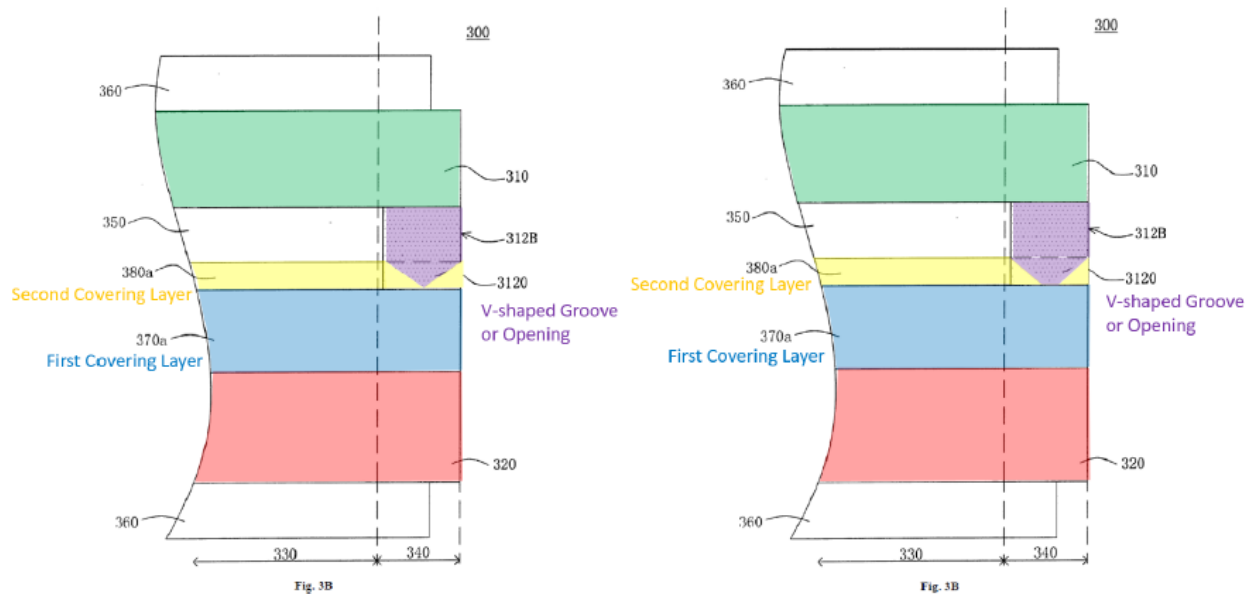
Dependent claims 2–6, 8, and 10 depend from claim 1. Dependent claims 10–14 depend from claim 9. None of Petitioner’s arguments regarding these dependent claims cures the deficiencies regarding independent claims 1 and 9. Because the Petition fails to demonstrate a reasonable likelihood that the underlying independent claims are obvious for at least for the reasons discussed above, the Petition similarly fails to demonstrate a reasonable likelihood of success regarding these dependent claims.

C. Ground 3–5 (Kwak § 103 with Vaganov/Kim/Yamazaki, Claims 2, 3, 6, 8, 10, 11, 14): Dependent Claims Nonobvious For Same Reasons

Dependent claims 2, 3, 6, 8, and 10 depend from claim 1. Dependent claims 11 and 14 depend from claim 9. None of Petitioner’s arguments regarding these dependent claims cures the deficiencies regarding independent claims 1 and 9. Because the Petition fails to demonstrate a reasonable likelihood that the underlying independent claims are obvious for at least for the reasons discussed above, the Petition similarly fails to demonstrate a reasonable likelihood of success regarding these dependent claims.

**D. Ground 6 (Zhang § 103, Claims 1–6, 9–13): Zhang Lacks the
“Organic” Layer**

The Zhang embodiment of Figure 3B does not include the “organic material pattern layer” of claims 1 and 9. The Petition relies on a version of Figure 3B of Zhang, arguing that Zhang’s embodiment can be modified to reshape the originally blocky “groove or opening 3120” into a V-shape. *See, e.g.*, Petition at 52–66 (relying on the embodiment of Figure 3B for all claim elements).



Zhang, Fig. 3B (modified)

Id. (Petitioner annotating Zhang, relying on the yellow, **second covering layer 380**).

However, the Petition errs in asserting that the **second covering layer 380** is an organic layer. The **second covering layer 380** is not organic. Zhang states, “the **second covering layer 380a** is a protective layer 324 . . . the protective layer 324 is

composed of silicon dioxide (SiO_2) or silicon nitride (Si_3N_4).” Ex. 1006 at 10.³ Thus, Zhang teaches that the **second covering layer 380a** is an inorganic material.

Alternatively, the Petition also relies on a modification to Zhang’s Figure 2, the conventional system that Zhang purports to improve upon. Petition at 59–60. This embodiment does not meet claim elements [9b]–[9c] because, as with Kwak, the embodiment of Zhang Figures 2A/2B have too many layers.

1. Independent Claim 9[c]: Zhang Figure 3B Lacks “an organic material pattern layer”

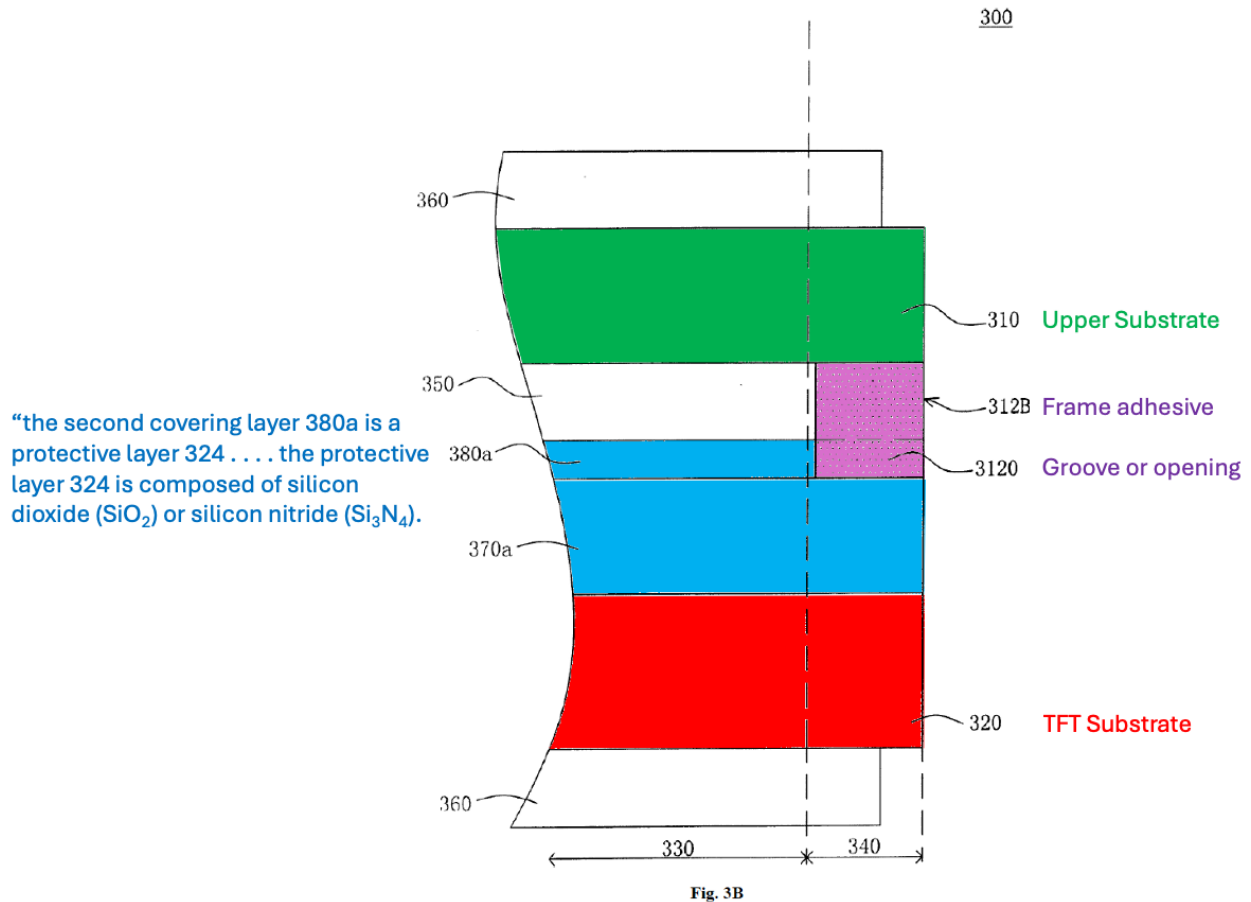
The Petition asserts in error that the second covering layer 380 of Zhang in Figure 3B is an “organic” layer. Petition at 55–58. Petitioner is wrong for two reasons. First, Zhang explicitly teaches that the second covering layer 380 is an inorganic compound. Second, the Petition and its expert misinterpret Zhang.

a. Zhang Explicitly Describes the Second Covering Layer 380a Is The Inorganic Compound Silicon Dioxide (SiO_2) or Silicon Nitride (Si_3N_4)

An “organic” material in the context of semiconductor fabrication is a material that comprises carbon. Zhang states, “the **second covering layer 380a** is a protective layer 324 the protective layer 324 is composed of silicon dioxide (SiO_2) or silicon nitride (Si_3N_4).” Ex. 1006 at 10. Neither silicon dioxide nor silicon nitride include carbon. Thus, Zhang explicitly teaches that the second covering layer is not

³ All Zhang citations to stamped page numbers at the bottom right.

organic. See Section V(B)(2), above.



b. No Evidence That Zhang’s Figure 3B Second Covering Layer 380a Includes Photoresist Layer 225B

The Petition erroneously asserts that Zhang’s “second covering layer 380a . . . would have comprised photoresist layer 225B.” Petition at 55, 57 (“Zhang discloses a second covering 380a that, when implemented in a conventional reflective LCD, would comprise at least organic layer 225B”). There is no evidence of this.

Pages 55–58 of the Petition erroneously assumes that Zhang’s description of the photoresist layer 225B in the conventional LCD panel shown in Figure 2B

somehow applies to the second covering layer 380a that includes the inorganic protective layer 324. These are not reasonable interpretations that a POSITA would have made. As explained in Section V(B)(1) and V(B)(2) above, Zhang's description of the conventional LCD with respect to Figure 2 is distinct from Zhang's embodiment in Figure 3B–E. Most notably, all of Zhang's embodiments in Figures 3B–E **omit** the photoresist layer 225B found in conventional LCD's.

The Petition's coloring of layer second covering layer 380 in Figures 3B-3E using yellow is misleading because the second covering layer 380 is not the same as the photoresist layer 225B of a conventional LCD previously marked with yellow in Figure 2B.

Rather, Zhang teaches variations where the second covering layer 380 may include 1) the protective layer 324 in Figures 3B and 3C; 2) the protective layer 324 and metal layer 323D in Figure 3D; or 3) the protective layer 324, the second metal layer 323D, and dielectric layer 322E in Figure 3E. None of these variations include a "photoresist" layer in the second covering layer 380. *See also* Ex. 1006 at 8 (summarizing, "the covering layer from top to bottom includes a protective layer, a second metal layer, a dielectric layer, and a first metal layer. The dielectric layer covers the first metal layer, the second metal layer covers the dielectric layer, and the protective layer covers the second metal layer.")

Both Petitioner and its expert make the mistake of believing that Zhang's layer

380 is organic. Petition at 57 (“A POSITA would have understood Zhang to teach that the second covering layer 380a would, when implemented in conventional reflective LCDs, consist of or comprise organic photoresist layer 225B.”); Ex. 1003 ¶ 190 (identical language).⁴ This error pervades the argument in the Petition, as well as the declaration of its expert.

For this reason, neither the Petition nor the expert declaration use reliable evidence. There is no evidence for the position that Zhang teaches or renders obvious that the second covering layer 380 is organic. This is especially true when the organic “photoresist” layer is mentioned only in the context of conventional LCD’s that are “prone to developing cracks” (Ex. 1006 at 7) and then omitted from all of Zhang’s invention embodiments in Figures 3–6 that “provide a display panel frame adhesive structure with greater bonding strength,” which “allows the structure to withstand greater external impact or vibration forces.” Ex. 1006 at 8–12. If anything, Zhang teaches away from the use of the conventional photoresist layer.

2. Independent Claim [9]: Zhang Figure 2 Fails to Meet All Claim Elements

Petitioner appears to recognize that the Zhang’s Figure 3 embodiments lack the organic photoresist layer that is present in Zhang Figure 2, so Petitioner cites to

⁴ Much of the Petition and Declaration are identical.

Zhang Figure 2. Petition at 59.⁵ However, Zhang Figure has the same problem as Kwak: there are too many layers, such that the limitation of claims [9b] and [9c] cannot be simultaneously satisfied. Specifically, the conventional embodiments described in Zhang Figure 2 do not include both “a predetermined material layer formed on the first substrate” and “an organic material pattern layer . . . formed on the predetermined material layer” as recited in claims [9b] and [9c].

a. No Evidence or Explanation of How Zhang Figure 2 Meets [9pre], [9a], or [9b]

In its analysis of claim elements [9pre], [9a], and [9b], the Petition mentions Zhang Figures 2A and 2B as part of a “*see also*” string cite, without further explanation or analysis. Petition at 53–54. The Petition fails to identify which parts of Zhang Figures 2A and 2B allegedly meet the claim elements of [9a] or [9b]. *Id.* Petitioner only identifies allegedly obvious elements in the 300-range (e.g., elements 320, 310, 330, 370a, 380a) that can only be found in Zhang Figure 3, not Zhang Figures 2A and 2B. Due to a lack of evidence and argument, Petitioner is unlikely to succeed on any theory relying on Zhang Figure 2A and 2B.

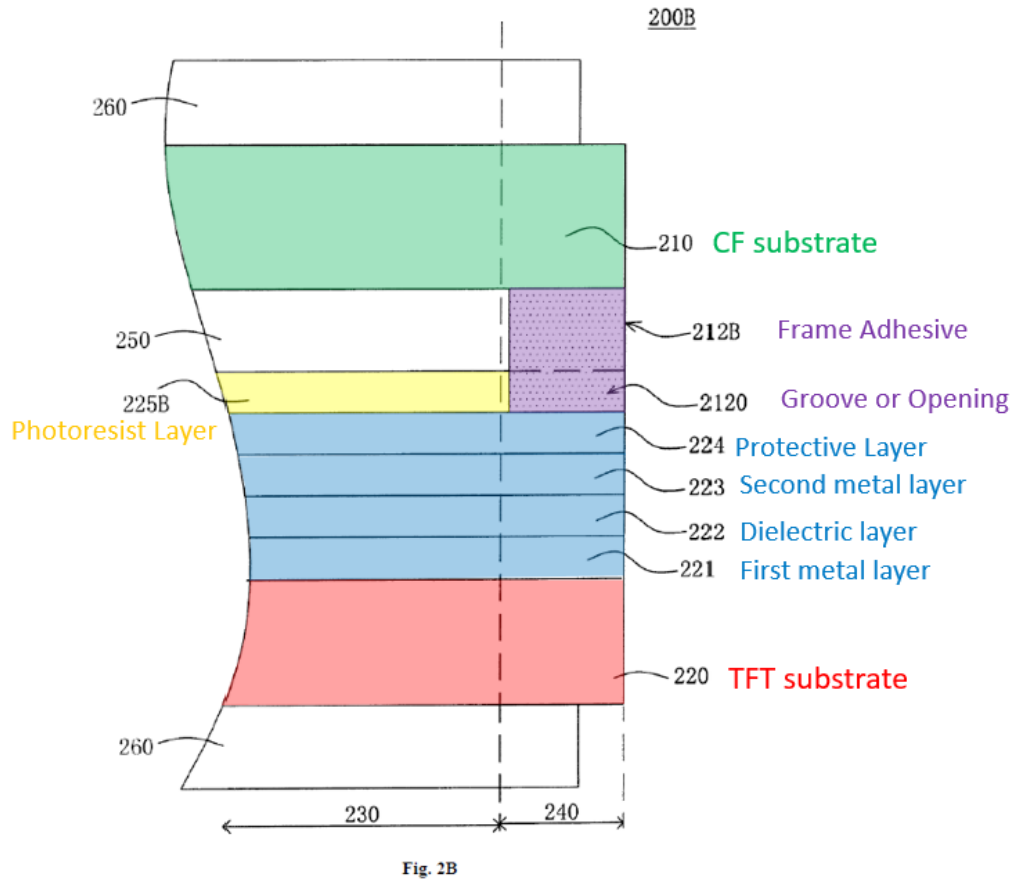
⁵ Petitioner cites but does not explicitly argue that it relies on a combination using Figure 2.

b. Modified Zhang Figure 2 Does Not Meet Claim [9b] and [9c]

Page 59 of the Petition vaguely hints⁶ at a modification of Zhang Figure 2A-2B, that “a POSITA would have understood Zhang to teach both an opening through an organic photoresist layer (e.g., Figs. 2A–B) as well as an opening through an organic photoresist and additional layers (e.g., Figs. 3B-E), such as a protective layer, to expose the underlying layers.”⁷ To the extent Petitioner is suggesting to modify Zhang Figure 2A and 2B by modifying the shape and/or depth of the opening, it would still fail to meet the claim elements [9b] and [9c] because, like Kwak’s design, Zhang Figures 2A and 2B have too many layers.

⁶ Again, Patent Owner addresses this to be thorough, but Patent Owner is not understood as advancing a combination based on Zhang Figures 2A-2B.

⁷ Petitioner starts with Figure 2A–B, but then suggests an opening through layers of Figure 3B–E. Petitioner does not seem to have a coherent theory.



Ex. 1006 at Fig. 2B.

Claim [9b] requires “a predetermined material layer formed on the first substrate.” Claim [9c] requires, in part, “an organic material pattern layer . . . formed on the predetermined material layer.” As seen in annotated Zhang Figure 2B above, there is no layer that meets both criteria.

In Zhang Figure 2B (even if modified to adjust the shape/depth of the groove or opening as proposed by Petitioner), the organic photoresist layer 225B is formed on the protective layer 224 per claim [9c]. However, the protective layer 224 is not formed on the TFT substrate 220 in accordance with claim [9b]. Thus, the protective

layer 224 cannot be the “predetermined material layer.”

In Zhang Figure 2B (even if modified to adjust the shape/depth of the groove or opening as proposed by Petitioner), only the first metal layer 221 is formed on the TFT substrate per claim [9b]. However, the photoresist layer 225B is not formed on the first metal layer 221 in accordance with claim [9c]. Thus, the first metal layer 221 cannot be the “predetermined material layer.”

The same analysis applies to any proposed modification of Zhang Figure 2A.

In summary, to the extent Petitioner is relying on a modification of Zhang Figure 2A and 2B, there is no argument or evidence that any layer can meet both the requirements of claims [9b] and [9c].

3. Independent Claim 1: Not Obvious For the Same Reasons as Claim 9

The Petition’s argument for independent claim 1 cites back to its argument regarding independent claim 9. For the same reasons discussed above in Section VI(D)(1), Zhang does not teach or render obvious “forming an organic pattern layer . . . on the predetermined material layer” as recited in claim 1[c] because Zhang’s layer 380 is not organic.

4. Dependent Claims 2–6 and 10–13

Dependent claims 2–6 depend from claim 1. Dependent claims 10–13 depend from claim 9. None of Petitioner’s arguments regarding these dependent claims cures the deficiencies regarding their underlying independent claims. Because the

Petition fails to demonstrate a reasonable likelihood that claims 1 and 9 are obvious at least for the reasons discussed above, the Petition similarly fails to demonstrate a reasonable likelihood of success regarding these dependent claims.

E. Grounds 7–8 (Zhang § 103 with Vaganov/Yamazaki, claims 2, 3, 6, 10, 11): Dependent Claims Nonobvious For Same Reasons

Dependent claims 2, 3, and 6 depend from claim 1. Dependent claims 10 and 11 depend from claim 9. None of Petitioner’s arguments regarding these dependent claims cures the deficiencies regarding their underlying independent claims. Because the Petition fails to demonstrate a reasonable likelihood that claims 1 and 9 are obvious at least for the reasons discussed above, the Petition similarly fails to demonstrate a reasonable likelihood of success regarding these dependent claims.

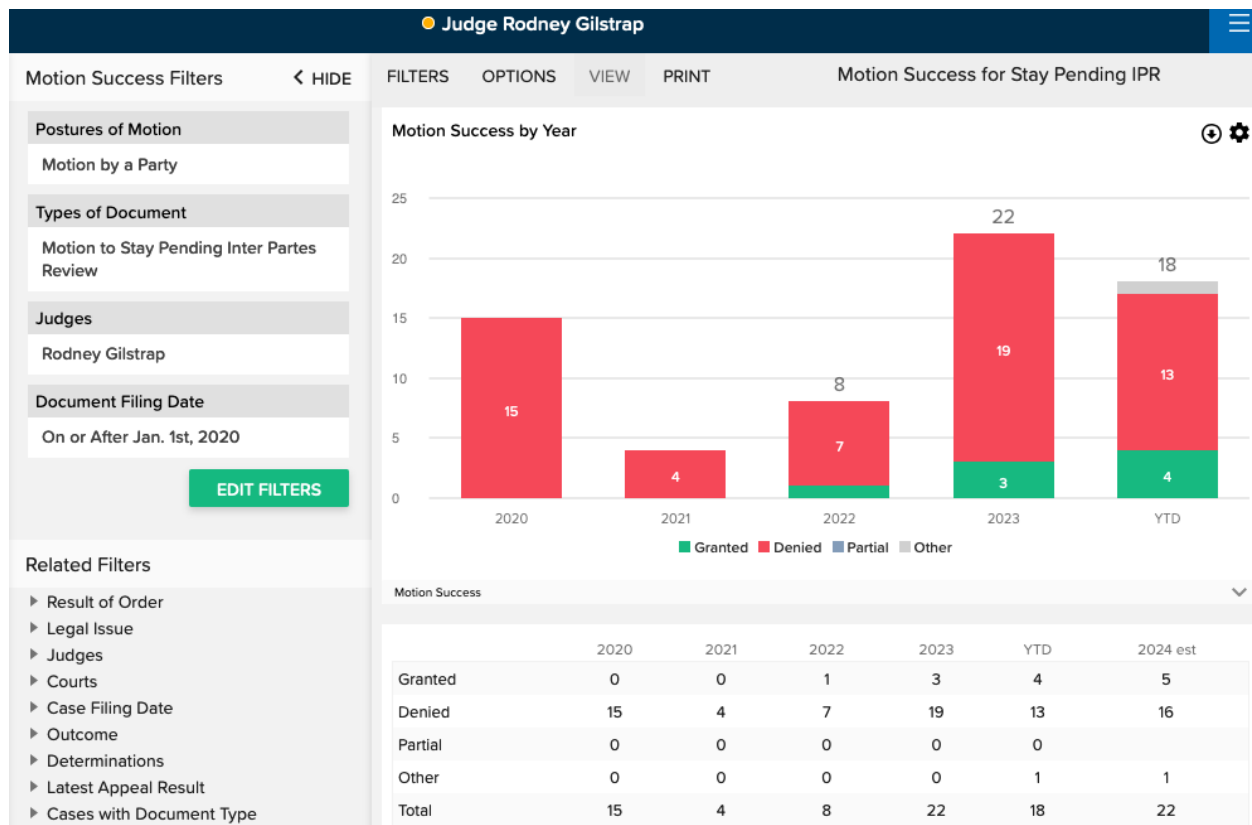
VI. The Board Should Deny Institution Under *Fintiv*

The Board should not waste its limited resources on reconsidering the low-quality prior art when, under the *Fintiv* factors, the Board’s decision will likely have no effect whatsoever on trial. The final written decision is not expected until February 16, 2026, over a month after the trial scheduled for January 6, 2026.

The *Fintiv* factors are: 1) whether the court granted a stay, or evidence exists that one may be granted if a proceeding is instituted; 2) a comparison of the district court trial date to the Board’s statutory deadline; 3) an investment in the district court proceedings; 4) overlap between issues raised in the petition and in the parallel

proceeding; 5) overlapping parties; and 6) other considerations. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 5-6 (PTAB Mar. 20, 2020) (precedential).

Factor 1 (a stay) weighs against institution. Judge Gilstrap has rarely stayed a patent case pending *inter partes* review, only granting 8 of 67 motions to stay pending an IPR (12%) since 2020 according to a report from Docket Navigator:



Docket Navigator Motion Outcomes Report (October 17, 2024)

Because of the 88% chance that a stay will be denied, this factor weighs against institution.

Factor 2 (the trial and written decision deadlines) also weighs against institution. Trial is set for January 5, 2026. Ex. 2001 at 1. The final written decision

is not expected until February 16, 2026, more than a month after trial. These facts in favor of denying institution. *Fintiv* at 9.

Factor 3 (investment in court proceedings) is neutral. The deadline for an institution decision is February 16, 2025. By then, the parties will have spent *over a year* litigating in district court and be close to the start of the claim construction process set for March 11, 2025. Even though the case will be near its pre-*Markman* stage, the year-long investment in this case by the parties should make this factor be neutral. *Fintiv* at 9–10.

Factor 4 (overlap of the issues) weighs against institution because Petitioner asserts the same prior art in district court, without a *Sotera*-type stipulation, such that the duplicative arguments in these two forums are inefficient. *See Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 18–19 (Dec. 1, 2020) (precedential). Petitioner asserts 14 different patent publications as prior art. Ex. 2003 at 15. Moreover, Petitioner is asserting **85** systems as prior art. *Id.* at 16–18. Due to the sheer volume of systems identified as prior art in litigation, even a *Sotera* stipulation will have little effect. Regardless of what the Board does, Petitioner is likely to wastefully proceed with parallel invalidity arguments in litigation asserting at least one of its 85 systems as prior art in litigation. The Board should deny institution in the interest of efficiency, so that Petitioner will pick its best prior art references—including from among any system art—and present Petitioner’s best

arguments in a single proceeding.

Factor 5 (same parties) favors denial. It is undisputed that the parties in the IPR are the same as those in litigation, so “this factor supports denying institution.” *Sotera*, Paper 12 at 19.

The final *Fintiv* factor considers the merits and other circumstances. For the reasons in Section V above, the Petition is not likely to succeed on the merits, much less reach any level of compelling merit. This factor heavily weighs against institution.

VII. Conclusion: The Board Should Deny the Petition

The Board should deny the Petition on the merits because both primary references fail to disclose or render obvious various claim elements. Alternatively, the Board should deny institution under *Fintiv* to avoid wasting its limited resources writing a decision that will not issue until more than a month after trial.

Respectfully submitted,

Dated: November 15, 2024

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CERTIFICATION REGARDING WORD COUNT

Pursuant to 37 C.F.R. §42.24(d), Patent Owner certifies that there are 5,784 words in the paper excluding the portions exempted under 37 C.F.R. §42.24(a)(1).

Dated: November 15, 2024

/ Qi Tong /
Qi Tong

CERTIFICATE OF SERVICE (37 C.F.R. § 42.6(e)(1))

The undersigned hereby certifies that the above document was served on November 15, 2024, by filing this document through P-TACTS as well as delivering a copy via electronic mail upon the following attorneys of record for Petitioners:

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