

IN THE 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.

Case No. IPR2024-01222
Patent No. 6,949,389

**DECLARATION OF VIVEK SUBRAMANIAN, PH.D.
IN SUPPORT OF PETITIONER'S REPLY**

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1. I, Vivek Subramanian, have been retained by counsel for Petitioner Samsung Display Co, Ltd. to provide my expert opinions concerning the patentability of certain claims of U.S. Patent No. 6,949,389 (“’389 patent”).
2. In my original declaration (Ex. 1003) I provided my opinion that claims 34-37 and 40-46 of the ’389 patent would have been obvious to a person of ordinary skill in the art based on the disclosures of the prior art.

I. MATERIALS CONSIDERED

3. In forming the opinions expressed in this Declaration, I relied upon my education and experience in the relevant field of the art and have considered the viewpoint of a person having ordinary skill in the art (POSITA) at the time of the alleged invention.
4. In addition, I have considered the materials referenced herein.

II. RELEVANT LEGAL STANDARDS

5. I am not an attorney. For the purposes of this declaration, I have been informed about certain aspects of the law that are relevant to forming my opinions. I have applied the following understanding of the law:
6. Petitioner’s counsel has informed me that a patent claim is “anticipated” if each element of that claim is present either explicitly or inherently in a single prior art reference, with the elements arranged in the reference in the same manner as in the claim. Petitioner’s counsel has informed me that for a claimed limitation to

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be inherently present, the prior art need not expressly disclose the limitation, so long as the claimed limitation necessarily flows from a disclosure in the prior art.

7. Petitioner's counsel has informed me that a patent claim is "obvious" if the differences between the subject matter in the prior art and the subject matter in the claim would have been obvious to a person of ordinary skill in the art at the time the application was filed. I have been informed whether a claim would have been obvious involves consideration of (1) the level of ordinary skill in the art at the time the application was filed, (2) the scope and content of the prior art, (3) what differences, if any, existed between the claimed invention and the prior art, and (4) any secondary considerations of nonobviousness.
8. Petitioner's counsel has informed me that a single reference can render a patent claim obvious if any differences between that reference and the claim would have been obvious to a person of ordinary skill in the art. Alternatively, a claim can be rendered obvious where the teachings of two or more references may be combined in the same way as disclosed in the claim, if such a combination would have been obvious to one having ordinary skill in the art. In determining whether a combination based on either a single reference or multiple references would have been obvious, it is appropriate to consider, among other factors:

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- whether the teachings of the prior art references disclose known concepts combined in familiar ways, and when combined, would yield predictable results;
 - whether a person of ordinary skill in the art could implement a predictable variation, and would see the benefit of doing so;
 - whether the claimed elements represent one of a limited number of known design choices, and would have a reasonable expectation of success by those skilled in the art;
 - whether a person of ordinary skill would have recognized a reason to combine known elements in the manner described in the claim;
 - whether there is some teaching or suggestion in the prior art to make the modification or combination of elements claimed in the patent;
 - whether the innovation would have been obvious to try, i.e., involving a choice from a finite number of identified, predictable solutions, with a reasonable expectation of success; and
 - whether the innovation applies a known technique that had been used to improve a similar device or method in a similar way.
9. Petitioner's counsel has informed me that one of ordinary skill in the art has ordinary creativity and is not an automaton. Petitioner's counsel has informed me

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that in considering obviousness, it is important not to determine obviousness
using the benefit of hindsight derived from the patent being considered.

10. Petitioner's counsel has informed me that secondary considerations of nonobviousness can include a long-felt but unmet need for the claimed invention, failure of others, copying, unexpected results, commercial success, skepticism, or industry praise. I understand that it is generally the patent owner's burden to present evidence of secondary considerations if the patent owner contends that any apply. I am not aware of any evidence of secondary considerations of nonobviousness that would apply to the claims at issue.

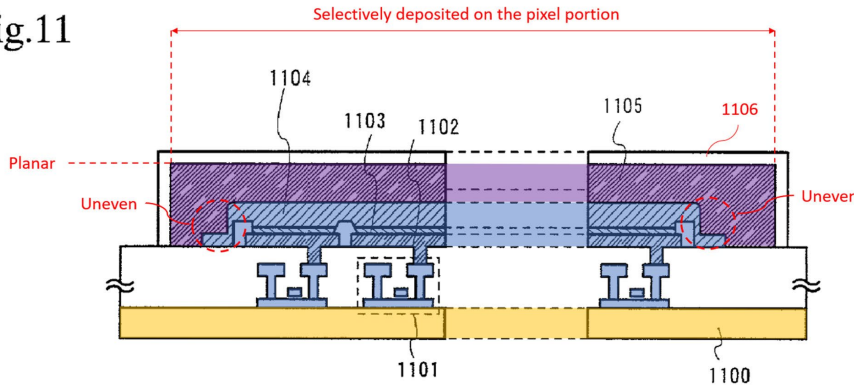
III. GROUND I: YAMAZAKI IN VIEW OF GHOSH

A. Claims 34 and 40

1. Yamazaki teaches and suggests a "planarization layer"

11. As I explained in my opening declaration, Yamazaki discloses a planarizing cover layer 1105/1407. Pet. at 25-26. Yamazaki teaches that "it is appropriate to use a material that ... has planarity" for this layer. Yamazaki, [0178]. Yamazaki also includes Figures showing that the cover layer 1105/1407 is planarizing, as shown for example, in annotated Figure 11:

Fig.11



12. The top of the cover layer 1105 (purple) is planar (or flat), as shown in Figure 11 above, while the underlying elements (e.g., cathode 1104) have uneven surfaces. Thus, Yamazaki teaches that the uneven surfaces are planarized (or flattened) by the cover layer. Cover layer 1407 (purple) is also planarizing:

Fig.14

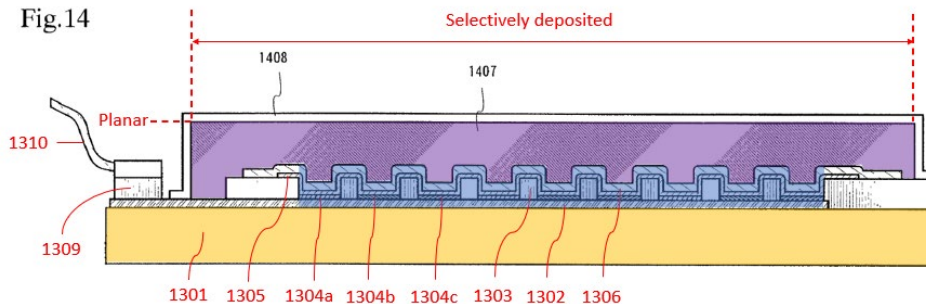


Fig. 14 (annotated). As shown above, the top surface of cover layer 1407 is planar despite the uneven structures below, and thus the addition of layer 1407 results in a planar surface topography. As with Figure 11, this cover layer 1407 of Figure 14 constitutes a *planarization layer*, because the top surface of cover layer 1407 is flat even though the underlying structure is uneven. A POSITA would understand that Yamazaki's cover layer 1105/1407 does not reproduce the underlying topography.

13. A POSITA would also understand that Yamazaki's cover layer 1105/1407 would interrupt the propagation of defects from one layer to another layer. As I explained previously, Yamazaki teaches that "[a]s a material for forming the cover layer 1105 made of an organic resin, it is appropriate to use a material that ... has planarity." Yamazaki, [0178]. Thus, Yamazaki teaches that the material used to form the cover layer would smooth out uneven surfaces below it. As a POSITA would recognize, smoothing out uneven surfaces in this way would prevent any defects from the underlying surfaces to be propagated to layers above.
14. As the prior art teaches, it was within the knowledge of a POSITA that that such an organic layer could be used to "make[] a smooth surface on the relatively irregular surface of the cathode" when forming OLED devices. Suzuki, 5:59-62. Indeed, as Suzuki explains, "it is inevitable that some pinholes or defects" will be formed when forming the cathode. Suzuki 5:41-45. Thus, Yamazaki teaches that a material with "planarity" is appropriate for the cover layer 1105/1407, such that defects will be filled in or smoothed over and thereby not propagated. Based on these teachings of Yamazaki, a POSITA would understand that Yamazaki's cover layer 1105/1407 interrupts the propagation of defects from one layer to another layer, and does not reproduce the topography of the underlying layer.

15. I understand that Pictiva and Mr. Humphrey have argued that Yamazaki's cover layer would be insufficient to prevent defect propagation, based on the thickness of Suzuki's barrier layer. POR at 26-30. I do not agree. The specific thickness of Suzuki's barrier layer relates to the specific needs of Suzuki and its device and application. That Suzuki used a thicker barrier layer does not mean that Yamazaki's cover layer is insufficient for its application. I also disagree with Mr. Humphrey's assertion that 500 nm is the minimum thickness required to interrupt defect propagation in all applications. This appears to be again based on Suzuki's stated preference for its barrier layer to be that thick. However, a POSITA would understand that different thicknesses may be appropriate depending on the materials and application at issue. Indeed, Yamazaki further teaches that its cover layer may be made thicker than the stated range. See, e.g., Yamazaki, [0090] ("it is possible to make the film thickness thereof thicker than the above stated range by repeating the application and drying processes."). It would have been well within the skill of a POSITA to repeat the application in this manner to form a thicker layer. Thus, at a minimum it would have been obvious to a POSITA to make the cover layer thick enough to prevent defect propagation, consistent with Yamazaki's teachings regarding the use of a material that "has planarity" for that reason. See, e.g., Yamazaki, [0178].

16. I also do not agree with Mr. Humphrey's suggestion that Yamazaki's organic resin cover layer may be "too thin to fully encapsulate particulates that could occur in manufacturing." This again appears to be based on Suzuki's disclosures relating to a thickness of 500 nm for its particular layer. POR at 28. As I have previously explained, there is a range of different resins with different physical and chemical properties that can be used to form planarizing layers. While Suzuki determines that a thicker layer is necessary for its application, this does not mean that the preferred thickness of Suzuki is the minimum thickness required for any and all planarizing layers.

17. I understand that Mr. Humphrey has also suggested that Yamazaki's inkjet printing and electric field application methods would not be sufficient to "decouple" defects in lower layers while still maintaining planarity. POR at 29-30. I do not agree, because these methods were known to form sufficiently thick layers. For example, in my own lab I have used inkjet printing to build layers that are many microns thick. It is also well known that screen printing can be used to print layers that are tens of micrometers thick. For example, another paper referencing the work described in Ex. 2023 specifies thicknesses of up to 2.5 μm for the inkjet printed gold layer. *See, e.g.,* Ex. 1028 at 3 ("Good step coverage is achieved for gold lines up to 2.5 μm thick," and "Three layers of dielectric are needed to ensure isolation, which results in an average film thickness of 3 μm .").

18. Mr. Humphrey's citation to Sturm's range of thickness for an inkjet pass is similarly inapposite. As an initial matter, Sturm's disclosures relate to forming OLED layers, rather than encapsulation layers. It was known that inkjet could be used to deposit thicker layers in a single pass, including, for example, by tuning the ink to increase viscosity.
19. Further, even at Sturm's stated thickness for depositing an EL layer, it would have been well within the skill of a POSITA to make "[e]ight or more passes" as Mr. Humphrey suggests, to generate an appropriately thick layer. Pictiva and Mr. Humphrey similarly overstate the "difficulty" of using inkjet techniques to form a layer on "a relatively large area." POR at 30. It is in fact a particular strength of printing techniques such as inkjet that they scale well to larger areas, because of the ability to use a large number of heads in parallel. See, e.g., Ex. 1029 at 2 (describing use of "ganged" print heads). Indeed, any alleged "precision" issues with inkjet would not increase with scale, as Pictiva and Mr. Humphrey appear to suggest, because the primary limit on precision of printing in inkjet is simply the precision limits imposed by droplet ejection from the nozzle itself, which is entirely unrelated to the size of the substrate on which material is being printed; in other words, the precision of inkjet printing will be the same on both small and large substrates.

2. A POSITA would have selectively deposited a barrier layer

20. As I explained in my opening declaration, Yamazaki discloses a “barrier layer” 1106/1408, that is selectively deposited over Yamazaki’s “cover layer” 1105/1407. Yamazaki further teaches that its “barrier layer 1106 is formed selectively using a shadow mask.” Yamazaki, [0183]. Figures 11 and 14 further show that Yamazaki’s “barrier layer” is selectively deposited, because layers 1106/1408 (yellow) are formed on only a certain portion of the underlying structure:

Fig.11

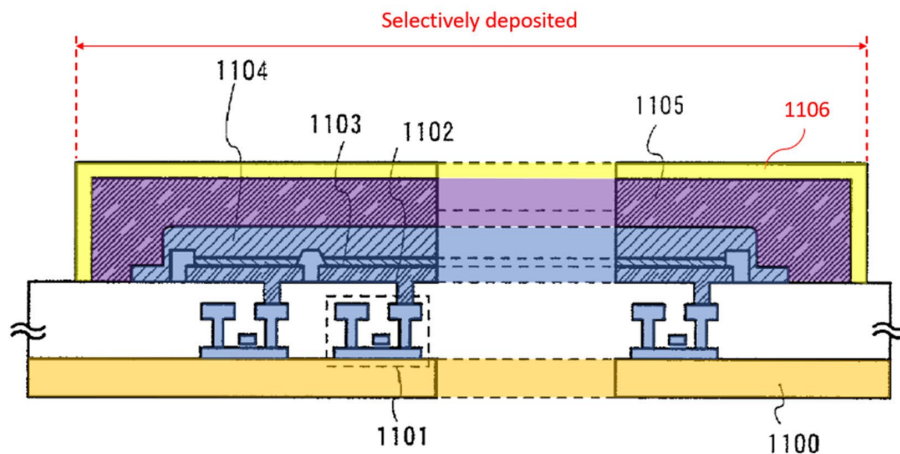


Fig. 11 (annotated).

Fig.14

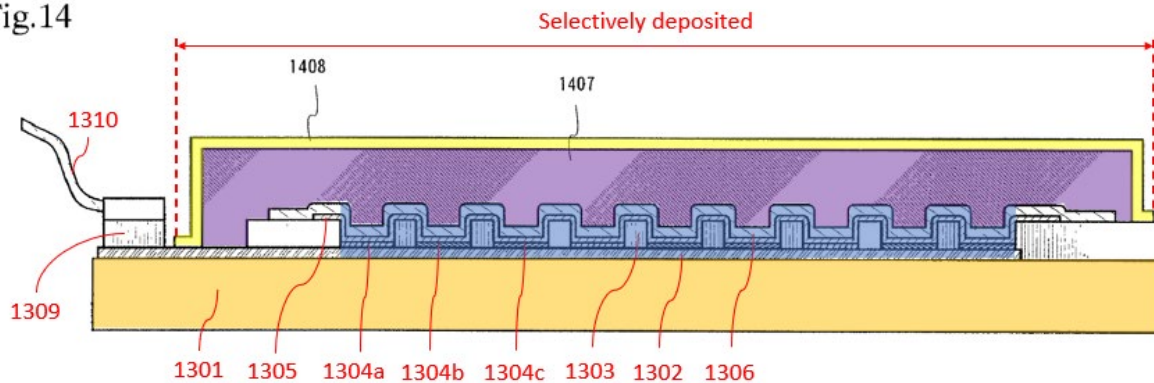
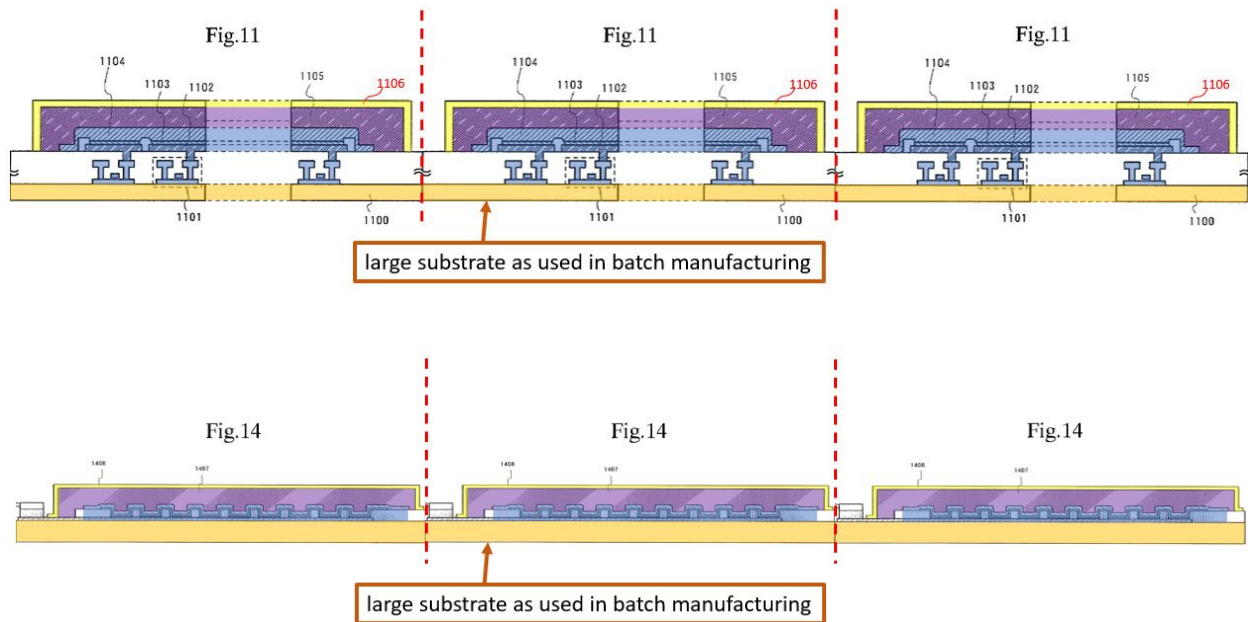


Fig. 14 (annotated).

21. As I explained in my opening declaration, a POSITA would have been motivated to use Yamazaki's methods to encapsulate a plurality of devices. The result of applying Yamazaki's encapsulation methods to encapsulate a plurality of devices is shown below with replicated and annotated versions of Yamazaki's Figures 11 and 14:



22. As I explained in my opening declaration, a POSITA would have known that flat panel displays, such as the OLED panels in Yamazaki, were conventionally manufactured in bulk on a large sheet of substrate, which would be cut into smaller display sizes at the end of the manufacturing process. Compared to producing each display panel individually, producing multiple display panels

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from a large substrate was well-known to reduce costs, increase throughput, and increase yield. A POSITA would have recognized that batch manufacture, by increasing the number of panels processed at one time, improves throughput, improves productivity, and reduces manufacturing costs.

23. Further, in my opinion, a POSITA would have had a reasonable expectation of success in applying Yamazaki's encapsulation methods in batch manufacturing. As the '389 patent admits, in the prior art it was conventional to use batch fabrication to manufacture OLED display devices with thin-film encapsulation. *See* '389 patent, 1:63-2:12. Furthermore, Ghosh, like Yamazaki, is directed to encapsulation of an OLED display device with multiple thin-film layers, where at least the first encapsulation layer 21 is selectively deposited—in other words, “patterned to leave exposed a portion of the substrate surface in between the individual OLED devices.” Ghosh, [0032]. This amounts to the combination of familiar elements according to known methods, in order to yield predictable results.

3. A POSITA would have applied Yamazaki's encapsulation to a plurality of devices

24. I understand that Pictiva and Mr. Humphrey have argued that a POSITA would not have applied to encapsulate a plurality of devices. POR at 33-34. This appears to be based on Mr. Humphrey's suggestion that “Yamazaki's methods are far from ready for manufacturing.” Ex. 2046 at ¶¶56-58. Mr. Humphrey appears to

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criticize Yamazaki for being “silent on fundamental manufacturability concerns.”

Ex. 2046, ¶59. It is unclear to me why this would indicate Yamazaki’s method would somehow not be used for batch fabrication. As I explained in my previous declaration, it was conventional to use batch fabrication to manufacture OLED display devices with thin-film encapsulation, as the ’389 patent itself acknowledges. *See* ’389 patent, 1:63-2:12. That Yamazaki does not specifically discuss manufacturing details does not render it “far from ready for manufacturing.” As I explained in my opening declaration, in my opinion a POSITA would have recognized that Yamazaki’s encapsulation could readily be applied in batch manufacturing, and would have had a reasonable expectation of success in using Yamazaki’s encapsulation in batch fabrication.

25. I note that Pictiva and Mr. Humphrey also appear to suggest that using Yamazaki’s inkjet approach for both the EL layer and cover layer would lead to issues. POR at 34-35. I note first that the ’389 patent itself does not describe any particular challenges associated with using inkjet for depositing encapsulation layers on an OLED device. *See generally*, ’389 patent at 1:56-67 (describing use of invention to encapsulate “ink-jet printed OLEDs”); 1:48-55 (describing that screen-printing or ink-jet printing may be employed for depositing the organic layer on the OLED device”). In my opinion there would be no particular

Declaration of Vivek Subramanian, Ph.D. in Support of Reply challenges associated with using the inkjet method to deposit both the EL layer and the cover layer, as Yamazaki itself teaches.

26. Pictiva and Mr. Humphrey also appear to allege that challenges with precision in depositing OLED layers would lead to issues depositing encapsulation layers. POR at 35-36. I do not agree. While there may be different challenges associated with depositing these different layers, they would be particular to the layer being deposited, and it would have been fully within the skill of a POSITA to deposit an encapsulation layer using inkjet. If anything, depositing the encapsulation layers would require less precision than depositing the EL layers.
27. Pictiva and Mr. Humphrey also suggest that the size of the area to be printed would cause issues with inkjet printing the encapsulation layer. POR at 36-37. I do not agree. As I explain above, scalability is a relative strength of inkjet printing, due to the ability to gang together large numbers of inkjet heads. Mr. Humphrey suggests that a larger printed area increases the likelihood of defects, but again this is incorrect. Any “precision” issues with inkjet do not increase at scale. In fact, it was well-known at the time of the ’389 patent that inkjet could be used to print multiple devices on a glass substrate.
28. Pictiva and Mr. Humphrey also point to a paper from 2003 I co-authored involving the use of inkjet printing for multilevel interconnects for RFID circuits and related inductive components. POR at 22-23. The paper discusses how to

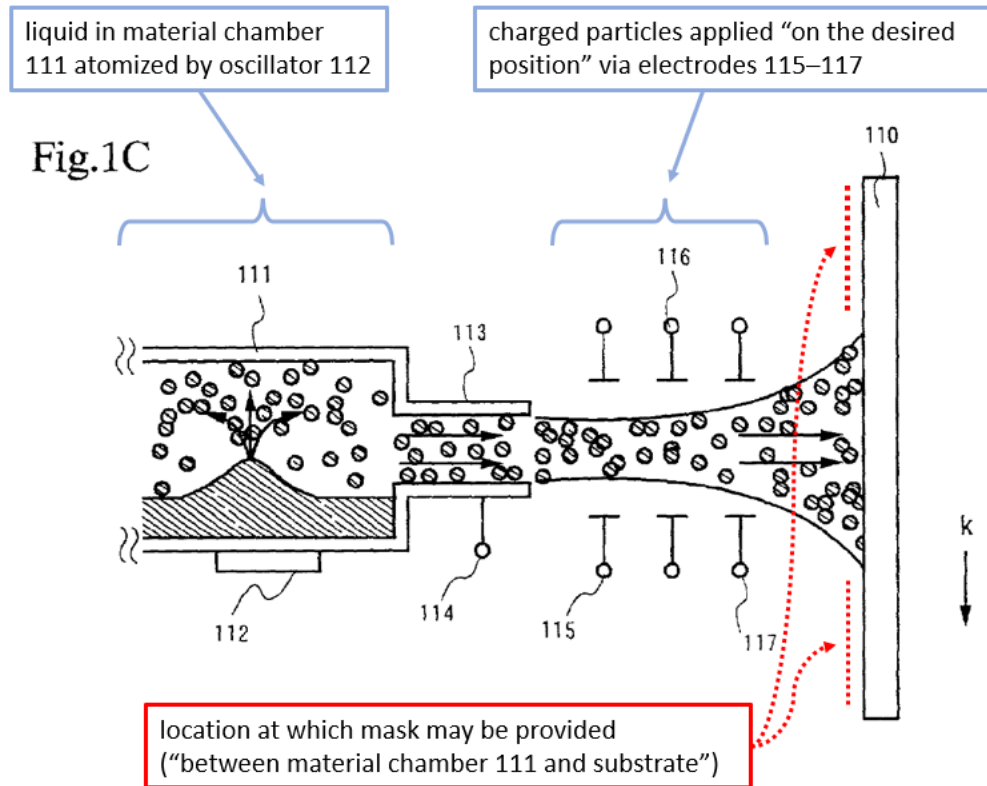
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prevent a “splash” effect resulting in a formation of a coffee-ring or donut structure using inkjet printing. Ex. 2023 at 2. But as the paper describes in detail, by controlling the temperature of the substrate and the solvent used, any coffee-ring effect from inkjet printing can be eliminated. Ex. 2023 at 3-4.

B. Claim 35

29. Pictiva and Mr. Humphrey’s arguments as to claim 35 appear to repeat the same arguments regarding the planarization layer I discuss above. As I explain above, Yamazaki discloses the use of inkjet printing to selectively deposit its cover layer, and it was known to use inkjet printing to deposit such layers. Ex. 2020, 153:4-14. I thus disagree with Mr. Humphrey’s opinions for the same reasons I explain above.

C. Claim 37

30. As I explain in my initial declaration, Yamazaki teaches depositing an organic cover layer through a shadow mask. Pet. at 33. Yamazaki notes that the cover layer is “formed by the same method for forming the EL layer,” id., [0202], namely “the electric field application method,” id., [0188], in which “a mask may be provided ... to thereby control the positions on the substrate” where the material is applied, id., [0086]. I annotated Figure 1C to show the location (in red) to which the mask may be applied according to Yamazaki:



31. To the extent there is any doubt, it would have been obvious to deposit Yamazaki's organic cover layer through a shadow mask, as taught by Ghosh. The use of a shadow mask to deposit the organic cover layer would have been one of the alternative selective deposition techniques Yamazaki teaches can be used to deposit its organic cover layer. Yamazaki, [0011], [0007]. I also explained in my initial declaration the advantages a POSITA would have recognized from the use of a shadow mask, as well as why a POSITA would have had a reasonable expectation of success in using a shadow mask in this way.
32. Pictiva and Mr. Humphrey have suggested that the disclosures relating to forming the cover layer using the same process as the EL layer are provided with

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respect to a different embodiment, and so should not be considered to apply to
cover layer 1105/1407. POR at 40. But Yamazaki teaches that Figure 14 (and its
cover layer 1407) is part of this same embodiment, and in Figure 14 “barrier layer
1408 is formed after forming a cover layer 1407.” Yamazaki, [0203]. Thus, a
POSITA would recognize that this layer would be formed using the same process
as the EL layer, as Yamazaki teaches.

33. Pictiva and Mr. Humphrey also suggest that even if the cover layer is formed
using the same process as the EL layer, it would not be formed with a mask, citing
in support to paragraph [0086] of Yamazaki. However, that paragraph teaches
that “a mask may be provided between the material chamber 111 and the
substrate to thereby control the positions on the substrate at which the application
liquid is via the mask.” A POSITA would thus understand that, even though this
mask is not illustrated in Figure 1C, Yamazaki’s express teachings make clear
that a mask may be used to form this layer.

34. Pictiva and Mr. Humphrey also suggest that even if a mask were used, it would
not be a shadow mask, because the mask “does nothing to further define that
position.” POR at 41. I do not agree. Yamazaki specifically teaches that a mask
may be used “to thereby control the positions on the substrate at which the
application liquid is via the mask.” Yamazaki, [0186]. A POSITA would thus
understand that a shadow mask may be used to deposit this layer. As I explained

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in my initial declaration, this was a known use of shadow masks, and would have
been well within the skill of a POSITA.

35. Pictiva and Mr. Humphrey also argue that a POSITA would not have used Ghosh's shadow masking technique because Ghosh teaches an evaporative process, whereas Yamazaki describes a solution-based process. However, this overlooks that Yamazaki teaches the use of a mask with a film deposition method (electric field application method) to control positions. A POSITA would have recognized that this would have included methods like Ghosh's use of a shadow mask. This is what was proposed in the petition for the combination of Yamazaki and Ghosh. This argument also overlooks the known advantages of using a shadow mask taught by Ghosh, which a POSITA would have similarly appreciated. Ex.1003, ¶117; see also Burrows-631 (Ex.1022), 4:18-19 (explaining that a shadow masks allow using a "known technology for achieving uniform deposition over a wide area to fabricate a large array of devices simultaneously").

IV. GROUND II: YAMAZAKI IN VIEW OF GHOSH AND FUJIMORI

36. As I explained in my initial declaration, a POSITA would have applied Fujimori's mask approach with Yamazaki's methods to encapsulate a plurality of OLED display panels. Indeed, Yamazaki teaches that its cover layer may be applied using alternative selective deposition methods, and explains, for

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example, that this layer may be formed “by the ink jet method or the electric field
application method.” Yamazaki, [0011].

37. As I also explained in my initial declaration, a POSITA would have recognized there would be benefits to using Fujimori’s masking technique to deposit Yamazaki’s cover layer, including improved accuracy countering the effects of warping.
38. Pictiva and Mr. Humphrey suggest that even if a POSITA were to use a mask as Yamazaki teaches, it would be placed “between” the material chamber and the substrate, not in contact with the substrate. I do not agree that Yamazaki’s description would indicate to a POSITA that the mask would not be in contact with the substrate. A POSITA would recognize that placing the mask in contact with the substrate would still place the mask “between” the material chamber and the substrate. Indeed, it was well known to apply masks in such a way. I also explained in my initial declaration the benefits with using a shadow mask in this manner.
39. Pictiva and Mr. Humphrey also argue that a shadow mask could not be combined with an electric field application method. POR at 45-46. I do not agree. Pictiva and Mr. Humphrey create concerns that do not materially exist. As I have previously explained, any deviation caused by the magnet would be miniscule, and would not impact the ability to deposit the layer as intended. In fact, any such

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deviations would be much smaller than the natural deviation that occurs using an electric field method. Thus, using Fujimori's mask to deposit only at the desired position (i.e., the mask opening) would likely reduce any uncertainty of the electric field method.

40. Additionally, because Fujimori's mask is in contact with the substrate, the layer formed on the substrate is deposited only through the mask opening. This means that any lateral particle deviation would not impact the deposited layer. It further would have been well within the skill of a POSITA to adjust the magnetic force and magnetic position to perform the deposition process in this manner.

V. GROUND III: WEAVER

A. Weaver discloses a “planarization layer.”

41. As I explained in my opening declaration, Weaver teaches a “planarizing layer” 151a made from a “layer of planarizing material.” *See, e.g.,* Weaver, [0035], [0052]. Weaver explains that this “[m]eans a material that forms a smooth planar surface, rather than forming a surface that reflects irregular contours of the underlying surface.” Weaver, [0035], [0052].

42. A POSITA would understand based on Weaver's teachings that Weaver's “planarizing layer” would not reproduce the underlying topology and would prevent defect propagation. A POSITA would understand from Weaver's teaching that the planarizing layer does not form “a surface that reflects irregular

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contours of the underlying surface” that this layer would not follow the underlying topology. Additionally, by smoothing out the underlying contours and forming a “planar surface,” Weaver’s planarizing layers fill in or smooth out any defects in the underlying surface. This includes, for example, known defects that arise from forming other layers, such as from cathode formation as Suzuki described.

B. Weaver discloses “selectively depositing.”

43. Pictiva argues that Weaver does not disclose selective deposition of its layer 151a because the structure of Weaver could be performed by non-selective deposition followed by patterned etching. POR at 58-59. This argument is inconsistent with the teachings of Weaver, as well as the understanding of a POSITA. First, as explained in the Petition, Weaver discloses the use of “deposition sources” with “apertures” that are used to selectively deposit its planarization and barrier layers, as shown in Figure 8:

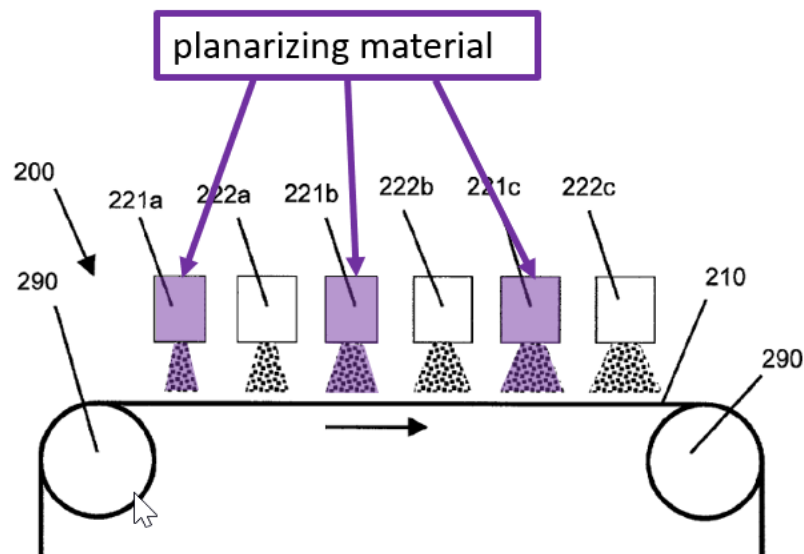


Fig. 8

Weaver, Fig. 8; see also Fig. 9; Pet. at 72-73.

44. Weaver explains that “each deposition source is provided with an aperture that is larger than that of the adjacent upstream source ... such that the material being deposited from each source progressively covers a wider area ...” Weaver, [0057]-[0059]. Accordingly, Weaver teaches that its deposition method is selective, i.e., it “deposit[s] a material only in desired areas, such that no additional processing must be performed for removing unwanted material.”

45. Indeed, Weaver does not describe a subsequent etching step. And elsewhere in its POR Pictiva acknowledges that Weaver’s web-based processing “achieved ‘selective deposition.’” POR at 73. In addition, to obtain the structures shown in Weaver’s Figures without selective deposition, an etch step would have to be

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used after depositing each layer, thereby effectively doubling the number of
necessary process steps. A POSITA would readily understand, particularly in
light of Weaver's disclosures particularly in light of Weaver's disclosures
relating to adjusting apertures or the distance of sources to the substrate for
depositing in desired areas only, that Weaver's structures would be obtained
using selective deposition rather than deposition followed by etching. See, e.g.,
Weaver [0057]-[0059];

46. Pictiva also appears to argue that the deposition process described with reference
to Weaver's Figure 8 would apply only to Weaver's barrier region 120, and not
to barrier region 150. POR at 60-62. This is not correct. As Weaver explains,
"[d]eposition of progressively larger cooperative barrier layers can be achieved
in a number of ways," with reference to Figure 8. Weaver, [0057]. Weaver further
explains that barrier region 150 comprises cooperative barrier layers, Weaver,
[0052], and that barrier region 150 "can be arranged in essentially the same
fashion as the first barrier region 120, id., [0010]. Accordingly, a POSITA would
recognize that Weaver's deposition method, as shown in Figure 8 would be used
to deposit its barrier region 150.

VI. GROUND IV: WEAVER IN VIEW OF PALANISAMY**A. Claim 35**

47. I understand that Pictiva and Mr. Humphrey have suggested that a POSITA would not have deposited Weaver's organic layer using inkjet printing. POR at 63-71. These arguments appear to largely repeat the arguments I have already addressed above for Grounds I and II. As I have explained, it was well within the skill of a POSITA to form thicker layers using inkjet printing. Indeed, Weaver teaches that its planarizing layers can be "provided using techniques known in the art," Weaver, [0035], and "in a number of ways," Weaver, [0057]. Deposition by ink jet was a known technique for depositing such planarization layers, and was further known to provide specific benefits as I explained in my initial declaration.

48. Additionally, I note for example that Palanisamy teaches the use of an "ink jet printer" for "selectively applying an organic passivation material." Palanisamy, [0021], Abstract. A POSITA would have recognized that the use of inkjet would have been one of a finite number of known options that provided particular benefits.

B. Claim 36

49. I understand that Pictiva and Mr. Humphrey similarly suggest that a POSITA would not have deposited Weaver's organic layer using inkjet printing. POR at

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81-84. As I previously mentioned, Weaver teaches that these layers can be “provided using techniques known in the art,” Weaver, [0035], and “in a number of ways,” Weaver, [0057]. Deposition by screen printing was a known technique for depositing such planarization layers, and was further known to provide specific benefits, as I explained in my initial declaration.

50. Pictiva and Mr. Humphrey additionally argue that there is no evidence that screen printing could operate at low temperature, or with the desired viscosity for Weaver’s process. POR at 72-73. However, this overlooks that Palanisamy specifically teaches a low temperature process, Palanisamy, [0025]. Additionally, it would have been obvious to a POSITA to use a material with a viscosity conducive to screen printing, as is taught by Palanisamy. This would have further been well within the skill of a POSITA.

VII. GROUND V: WEAVER IN VIEW OF BURROWS

51. As I explained in my initial declaration, a POSITA would have been familiar with the use of shadow masks, and aware of the benefits of using such masks, including the more precise control they can provide. Additionally, as I noted above, Weaver explains that its method of depositing its layers “can be achieved in a number of ways.” Weaver, [0057]. A POSITA would have recognized that the use of Burrows’ shadow masks would have been a natural application of a

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known technique ready for improvement, and one of the ways contemplated by
Weaver for depositing its layers.

VIII. JURAT

52.I declare that all statements made herein of my own knowledge are true and that
all statements made on information and belief are believed to be true; and further
that these statements were made with the knowledge that willful false statements
and the like so made are punishable by fine or imprisonment, or both, under
Section 1001 of Title 18 of the United States Code.

Date: October 9, 2025

Vivek Subramanian
Vivek Subramanian, Ph.D.