

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)

Inter Partes Review

No. IPR2024-01132 | **U.S. Patent No. 7,586,121**

Petitioner's Demonstratives

Undisputed Invalidity

It is undisputed between the parties that claims 1-2 and 5-6 are invalid

Only the validity of claims 3-4 and 7 are in dispute

*PET at 7-19, 27-42, 47-52
POR at 8-12, 18-21*

Ground	Claims	Stat. Basis	Prior Art
1	1-3 and 5	35 U.S.C. §102	Anzai
2	4	35 U.S.C. §103	Anzai in view of Yamazaki
3	1-7	35 U.S.C. §103	Yamazaki in view of Anzai

Patent Owner provided no argument of validity for:

Claims 1-2 and 5 under Ground 1

Claims 1-2 and 5-6 under Ground 3

POR at 8-12, 18-21

Claim Construction

PO's arguments of validity of claims 3-4 and 7 rest largely on its erroneous claim constructions for "passivation layer" and "capping layer"

**Construction of “passivation layer”
(Claims 3-4, 6-7)**

“passivation layer”

Patent Owner’s Proposed Construction	Petitioner’s Proposed Construction
Plain and ordinary meaning: “a layer of material that renders the surface layer below chemically passive or unreactive, especially by tying up dangling bonds” POR at 7	Plain and ordinary meaning: “a layer that serves as a physical barrier” (i.e., a layer of insulation material) Pet. at 19 Reply at 3

Construction of “passivation layer” (Claims 3-4, 6-7)

Petitioner’s Proposed Construction

Plain and ordinary meaning: “a layer that serves as a physical barrier” (i.e., a layer of insulation material)

- 121 Patent provides no meaning for “passivation layer”
 - Simply provides silicon nitride (SiN) as the sole example. *Pet. at 19, EX1001 at 5:34-36*

ILD 208 and gate oxide 204. A layer of passivation silicon nitride (SiN) 212 is formed over ILD 208 and second metal patterns 210A and 210B. A layer of indium tin oxide (ITO) is

EX1001 at 5:34-36

- No function or purpose is disclosed

Construction of “passivation layer” (Claims 3-4, 6-7)

Petitioner’s Proposed Construction

Plain and ordinary meaning: “a layer that serves as a physical barrier” (i.e., a layer of insulation material)

- Extrinsic evidence: “passivation layer” broadly refers to an insulation layer that provides protection by serving as a physical barrier

Reply at 2-5

Passivation (1) The application of an insulating layer of glass, SiO₂, or nitride over circuits and circuit elements for protection against moisture, contaminants, or other harmful conditions. (2) The growth of an oxide or nitride layer on the surface of a semiconductor to provide electrical stability by isolating the surface from electrical and chemical conditions in the environment. See also *Glass-ivation*.

Electronic Packaging, Microelectronics, and Interconnection Dictionary, EX1012 at 140

and chemical conditions in the environment. 5. The technique of providing a semiconductor device chip with an isolating layer or “skin” that protects it from contamination by unwanted impurity atoms or molecules. With silicon devices, the isolating layer is usually composed of silicon dioxide (quartz) or silicon nitride, grown on the chip at a high temperature. 6. Electrolytical treatment of a metal or semiconductor to create a chemically bonded oxide layer on the surface to protect it from corrosion. 7. The formation of an insulating layer directly over a circuit or circuit element to protect the surface from contaminants, moisture, or particles. 8. Surface oxidation that acts as a barrier to further oxidation and corrosion.

Modern Dictionary of Electronics, EX1013 at 542

Construction of “passivation layer” (Claims 3-4, 6-7)

Petitioner’s Proposed Construction

Plain and ordinary meaning: “a layer that serves as a physical barrier” (i.e., a layer of insulation material)

- “Passivation layer” in the 121 patent is not limited to any specific type of passivation
 - Not in the claims
 - Not in the specification
 - Not in the file history
 - Not in the extrinsic evidence

Construction of “passivation layer” No Support for Patent Owner’s Construction

Patent Owner’s Proposed Construction

Plain and ordinary meaning: “a layer of material that renders the surface layer below chemically passive or unreactive, especially by tying up dangling bonds”

✗ Zero support in 121 patent for Patent Owner’s construction

- Sole citation by Patent Owner:

ILD 208 and gate oxide 204. A layer of passivation silicon nitride (SiN) 212 is formed over ILD 208 and second metal patterns 210A and 210B. A layer of indium tin oxide (ITO) is

*POR at 7, citing
EX1001 at 5:34-36*

- 121 patent does not contemplate rendering surfaces of ILD 208/metal patterns 210A/210B chemically passive or unreactive or tying up dangling bonds
- Patent Owner is reading limitations into the claims not even found in the specification

Construction of “passivation layer”

Patent Owner's Expert is NOT Credible, Opinions Should Be Given NO Weight

Patent Owner's Proposed Construction

Plain and ordinary meaning: “a layer of material that renders the surface layer below chemically passive or unreactive, especially by tying up dangling bonds”

✗ Patent Owner's expert cherry picked narrow definition

- Patent Owner's expert admitted he only consulted one dictionary, no search for any other dictionaries
Reply at 4; EX1015, 30:16-20, 31:6-22

✗ Patent Owner's expert had “no opinion” on whether “passivation layer 212” of the 121 patent meets his construction of “passivation layer”

- Does passivation layer 212 passivate ILD 208 (i.e., by tying up dangling bonds)? Answer: “No opinion”
Reply at 4; EX1015, 34:19-35:8
- Does passivation layer 212 render metal patterns 210A/210B chemically passive or unreactive?
Answer: “No opinion” *Reply at 4; EX1015, 35:17-36:1*
- Does passivation layer 212 tie up dangling bonds? Answer: “No opinion”
Reply at 4; EX1015, 36:2-14

Construction of “capping layer” (Claims 3-4, 7)

“capping layer”

Patent Owner’s Proposed Construction	Petitioner’s Proposed Construction
Plain and ordinary meaning: “a layer of hard material to protect a layer underneath, like how a hard ‘cap’ can be worn to protect the head.” POR at 8	Plain and ordinary meaning: “an insulation layer covering an underlying layer or structure” Pet. at 19 Reply at 5

Construction of “capping layer” (Claims 3-4, 7)

Petitioner’s Proposed Construction

Plain and ordinary meaning: “an insulation layer covering an underlying layer or structure”

- 121 Patent provides no meaning for “capping layer”
 - Simply provides silicon nitride (SiN) as the sole example. *Pet. at 19, EX1001 at 5:40-42*

via hole (not numbered) in passivation SiN **212**. A layer of capping SiN **216** is deposited to cover passivation SiN **212** and ITO pattern **214C**. A layer of organics **218** is deposited

EX1001 at 5:40-42

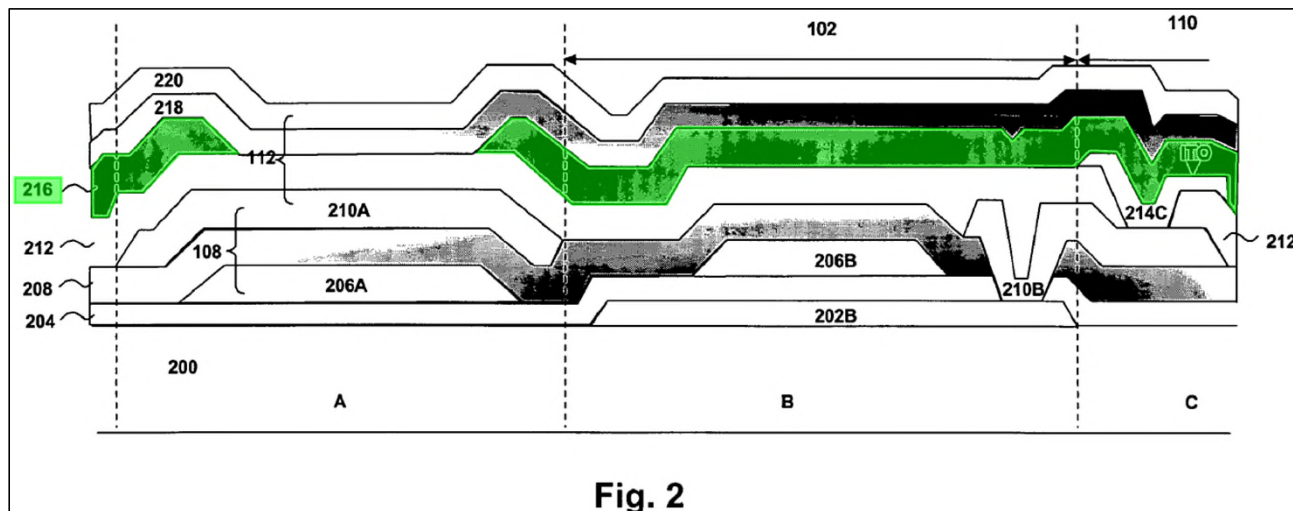
- No function or purpose is disclosed

Construction of “capping layer” (Claims 3-4, 7)

Petitioner’s Proposed Construction

Plain and ordinary meaning: “an insulation layer covering an underlying layer or structure”

- Capping layer 216 is not the uppermost layer in the layer stack



- Layers 218 and 220 formed over capping layer 216

Construction of “capping layer” No Support for Patent Owner’s Construction

Patent Owner’s Proposed Construction

Plain and ordinary meaning: “a layer of hard material to protect a layer underneath, like how a hard ‘cap’ can be worn to protect the head.”

❌ Zero support in 121 patent for Patent Owner’s construction

- Sole citation by Patent Owner:

via hole (not numbered) in passivation SiN 212. A layer of capping SiN 216 is deposited to cover passivation SiN 212 and ITO pattern 214C. A layer of organics 218 is deposited

*POR at 8, citing
EX1001 at 5:40-42*

- 121 patent does not contemplate how hard the material must be for the capping layer

❌ Same SiN material is disclosed for passivation layer as for capping layer

- Yet, “hard material” not included in PO’s construction for “passivation layer”

Construction of “capping layer” Patent Owner Construction Flawed and Indefinite

Patent Owner’s Proposed Construction

Plain and ordinary meaning: “a layer of hard material to protect a layer underneath, like how a hard ‘cap’ can be worn to protect the head.”

✗ Patent Owner’s construction concedes its own flaw

- Including “hard” before “cap” admits that not all caps are hard (i.e., baseball cap, shower cap)
- Patent Owner’s expert admitted “there are caps that are not hard” *Reply at 7; EX1015 at 46:18-21*

✗ Construction is indefinite

- Patent Owner expert could not say how hard a material must be
 - “It would depend on the requirements.”
EX1015 at 42:20-43:5
 - ✗ No such requirements are disclosed in the 121 patent
 - As hard as SiN?
 - ✗ “No opinion.”
EX1015 at 43:14-19
 - Harder than material being protected?
 - ✗ Could not answer.
EX1015 at 43:20-44:19

Claim Construction Order

- Claim Construction Order (October 19, 2025)

“formed on” (’801 Patent, Claim 9) “directly formed on” (’121 Patent, Claim 1) “the gate oxide layer in the first area is formed directly on the substrate” (’117 Patent, Claim 1)	“formed in a manner directly touching the layer below”
“each pixel” / “each pixel area” (’121 Patent, Claims 1, 2)	Plain and ordinary meaning

EX1027 at 35

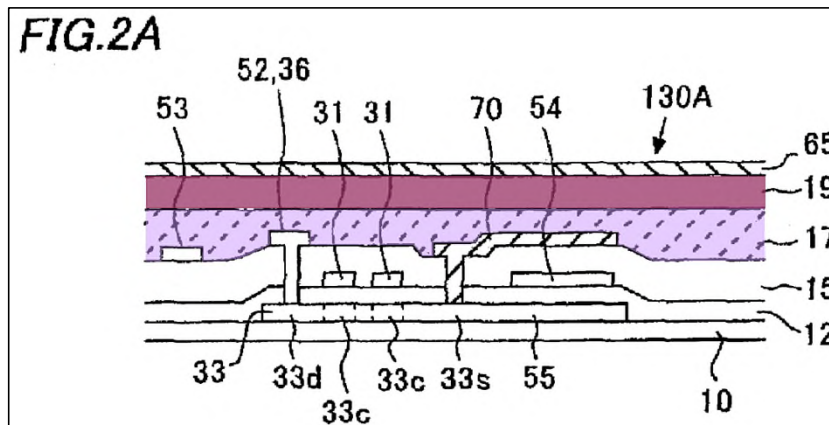
Ground 1

Claims 1-3, 5 anticipated by Anzai

- Invalidity of claims 1-2, 5 over Anzai undisputed.
- Patent Owner arguments for claim 3 rest entirely on its erroneous constructions for “passivation layer” and “capping layer”
 - No arguments of validity under the proper constructions of these terms
 - Should the Board reject PO’s constructions of “passivation layer” and “capping layer”, then it is undisputed that claim 3 is also anticipated by Anzai

Ground 1: Claims 1-3, 5 anticipated by Anzai

3. The device of claim 1, wherein the second dielectric layer (**first and second planarization layers 17, 19**) comprises a passivation layer (**first planarization layer 17**) and a capping layer (**second planarization layer 19**).



Anzai

- Planarization layers 17 and 19 are layers of insulation material
 - “Both the first planarization film 17 and the second planarization film 19 function as the capacitance **insulating film** in this configuration.” *EX1003, 5:65-67*
- Planarization layer 17 formed over entire surface for flattening, protecting the underlying structures from the surrounding environment during subsequent processing (i.e., a passivation layer).
- Planarization layer 19 formed on planarization layer 17 (i.e., capping the passivation layer 17).

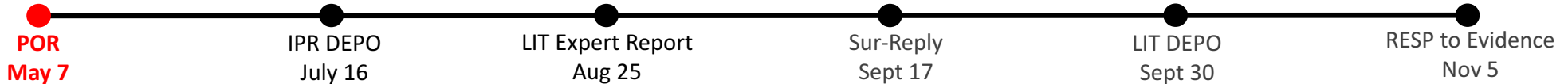
Pet., pp. 19-20

PO Contradictory Litigation Positions

- Patent Owner is taking contradictory positions regarding the construction of “passivation layer” in this IPR for validity, and the related litigation for infringement
 - The Board should give no weight to PO’s claim construction and validity arguments pertaining to “passivation layer,” and consider any other appropriate remedy for PO’s conduct.

PO Contradictory Litigation Positions

Patent Owner's "Passivation Layer" FIRST Position



1. PO First Position: Organic Molecule Theory

✗ Patent Owner and its IPR expert: Layer 17 of Anzai, an organic resin, is not a passivation layer because of the organic molecules in organic resins POR at 8-11

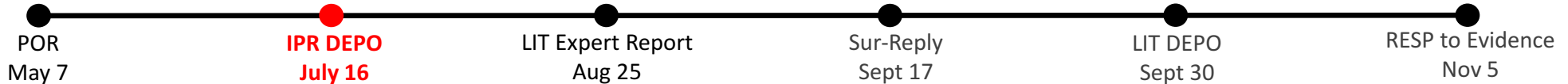
✗ "Organic resin does not passivate." POR at 11

✗ "Organic resin lacks the **chemical reactivity and appropriate atomic bonding characteristics** needed to neutralize the electrical active surface states and dangling bonds." POR at 11

✗ "The chemical compounds that form organic resins **are organic molecules** and do not have any free or unbonded electrons capable of reacting with and passivating the surface." EX2005, ¶71

PO Contradictory Litigation Positions

Patent Owner's “Passivation Layer” FIRST Position



✗ PO IPR expert admitted to “head in the sand” approach

- No search for how POSITAs use “passivation layer”

- “Outside the scope of my task.” Reply, 10; EX1015, 30:16-20; 31:6-22

- Consulted only one dictionary. EX1015, 30:16-20, 31:6-22

PO Contradictory Litigation Positions

Patent Owner's "Passivation Layer" FIRST Position

POR May 7 IPR DEPO July 16 LIT Expert Report Aug 25 Sur-Reply Sept 17 LIT DEPO Sept 30 RESP to Evidence Nov 5

• AU Optronics Corp. Patents, and PO expert admissions:

(12) United States Patent Chiang et al.		(10) Patent No.: US 7,226,801 B2	(45) Date of Patent: Jun. 5, 2007
(54) SEALANT REGION PATTERN FOR LIQUID CRYSTAL DISPLAY AND METHOD FOR FABRICATING THE SAME	6,998,221 B2 *	2/2006 Kimse	216/51
(75) Inventors: Yi-Chen Chiang, Yijhu Township, Chiayi County (TW); Kuo-Yu Huang, Hsinchu (TW)	2005/0178498 A1 *	8/2005 Chen et al.	156/268
(73) Assignee: AU Optronics Corp., Hsinchu (TW)	TW	464778	11/2001

vation layer. Alternatively, the passivation layer can comprise silicon oxynitride, silicon oxide, organic dielectric layer, or a combination thereof. The predetermined material

EX1016, 2:47-52; from IPR2024-01131

(19) United States (12) Patent Application Publication Chen		(10) Pub. No.: US 2007/0002212 A1	(43) Pub. Date: Jan. 4, 2007
(54) INTERCONNECT STRUCTURE FOR TFT-ARRAY SUBSTRATE AND METHOD FOR FABRICATING THE SAME	Related U.S. Application Data		
(75) Inventor: Kun-Hong Chen, Taipei County (TW)	(62) Division of application No. 10/780,932, filed on Feb. 17, 2004, now Pat. No. 7,119,411.		
	Publication Classification		

vation layer 350 is deposited on the insulating layer 340. A thick passivation layer 350 is formed to cover the surface of the insulating layer 340, preferably an organic layer with a thickness of 3-4 μm.

EX1018, [0022]

(19) United States (12) Patent Application Publication HUANG et al.		(10) Pub. No.: US 2009/0272977 A1	(43) Pub. Date: Nov. 5, 2009
(54) PIXEL STRUCTURE OF A THIN FILM TRANSISTOR LIQUID CRYSTAL DISPLAY AND FABRICATING METHOD THEREOF	Publication Classification		
(75) Inventors: MAO-TSUN HUANG, Taoyuan (TW); Tzongfong Huang, Taoyuan (TW)	(51) Int. Cl. H01L 29/04 (2006.01) H01L 21/00 (2006.01)	(52) U.S. Cl. 257/59; 438/38; 257/E21.002; 257/E29.003	

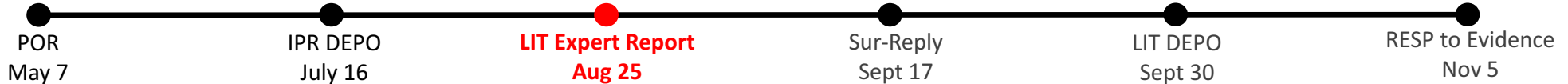
structures. In one preferred embodiment, the passivation layer 130 is fabricated from a material including silicon oxide, silicon nitride, silicon oxynitride or an organic compound, for example.

EX1019, [0030]

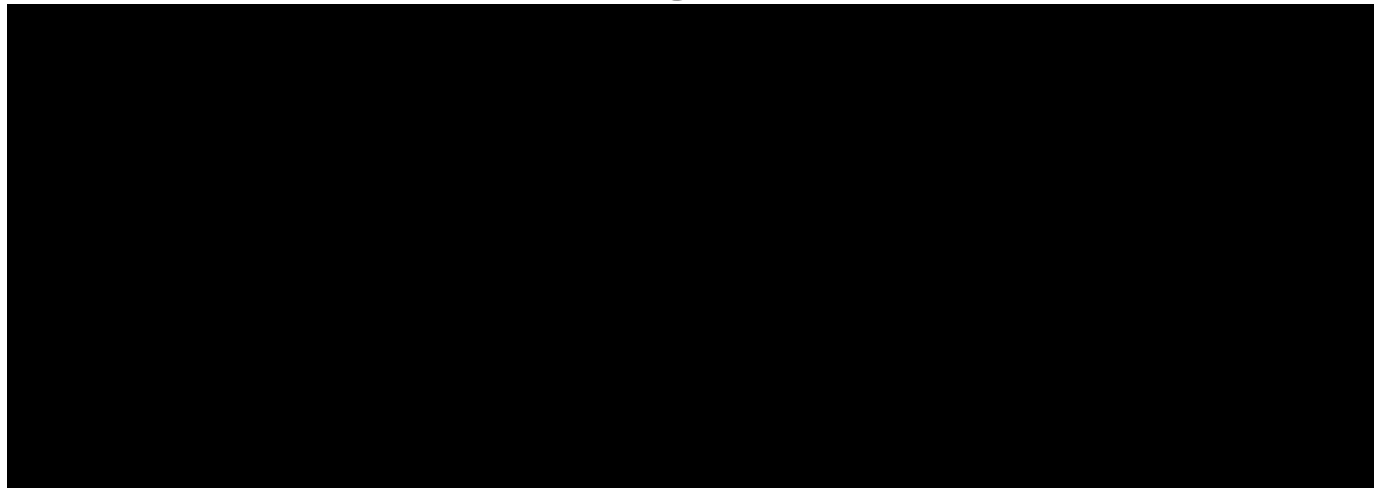
- Did not consider this passage, had no reason to
EX1015, 58:11-24
- Anzai's organic resin can be an organic dielectric layer
EX1015, 59:15-17
- Teachings wrong?: "no opinion"
EX1015, 64:15-24
- Anzai's organic resin is an organic layer
EX1015, 64:12-14
- Teachings wrong?: "no opinion"
EX1015, 66:7-14
- Anzai's organic resin could contain organic compounds
EX1015, 66:22-67:2

PO Contradictory Litigation Positions

Patent Owner's "Passivation Layer" FIRST Position



✗ PO First Position: Conflicts with Litigation



*Litigation Expert Report
EX1023, ¶¶ 221, 223*

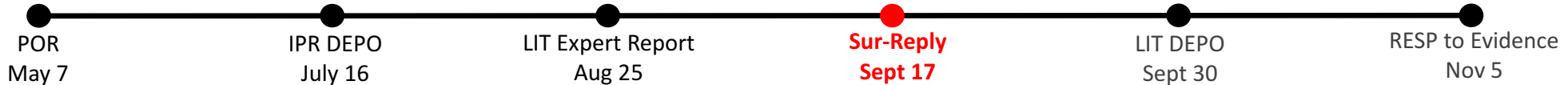
- Mere citation to all 67 pages of Liaw, with no explanation.

✗ Contradicts IPR position that organic materials cannot be a passivation layer

-  EX1025, 207:16-19

PO Contradictory Litigation Positions

Patent Owner's "Passivation Layer" SECOND Position



2. PO Second Position: Organic Resin Theory

No.”). Thus, it is undisputed that while some organics may serve as passivation layers, organic resins do not passivate.

Sur-Reply, 12

✗ Pivot Failure: Organic resin is “an organic dielectric layer,” “an organic layer,” “an organic compound”, all of which are used as passivation layers

vation layer. Alternatively, the passivation layer can comprise silicon oxynitride, silicon oxide, organic dielectric layer, or a combination thereof. The predetermined material

EX1016, 2:47-52

vation layer 350 is deposited on the insulating layer 340. A thick passivation layer 350 is formed to cover the surface of the insulating layer 340, preferably an organic layer with a thickness of 3-4 μm .

EX1018, [0022]

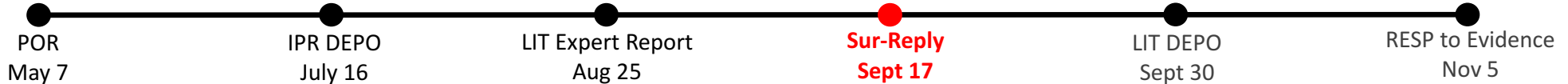
structures. In one preferred embodiment, the passivation layer 130 is fabricated from a material including silicon oxide, silicon nitride, silicon oxynitride or an organic compound, for example.

EX1019, [0030]

✗ No explanation or evidence why a resin “does not passivate”

PO Contradictory Litigation Positions

Patent Owner's "Passivation Layer" SECOND Position



✗ PO Pivot Position #2 Contradicts litigation



[Redacted text block]

[Redacted text block]

EX1025, 195:22-197:9, 194:17-23, 204:1-3

- PO's IPR expert provided the sole definition of "resin" in this IPR:

— "It's a liquid material that hardens" EX1015, 50:5-8



Undisputed:

[Redacted text block]

EX1025, 207:16-19

- Contradiction:

[Redacted text block]

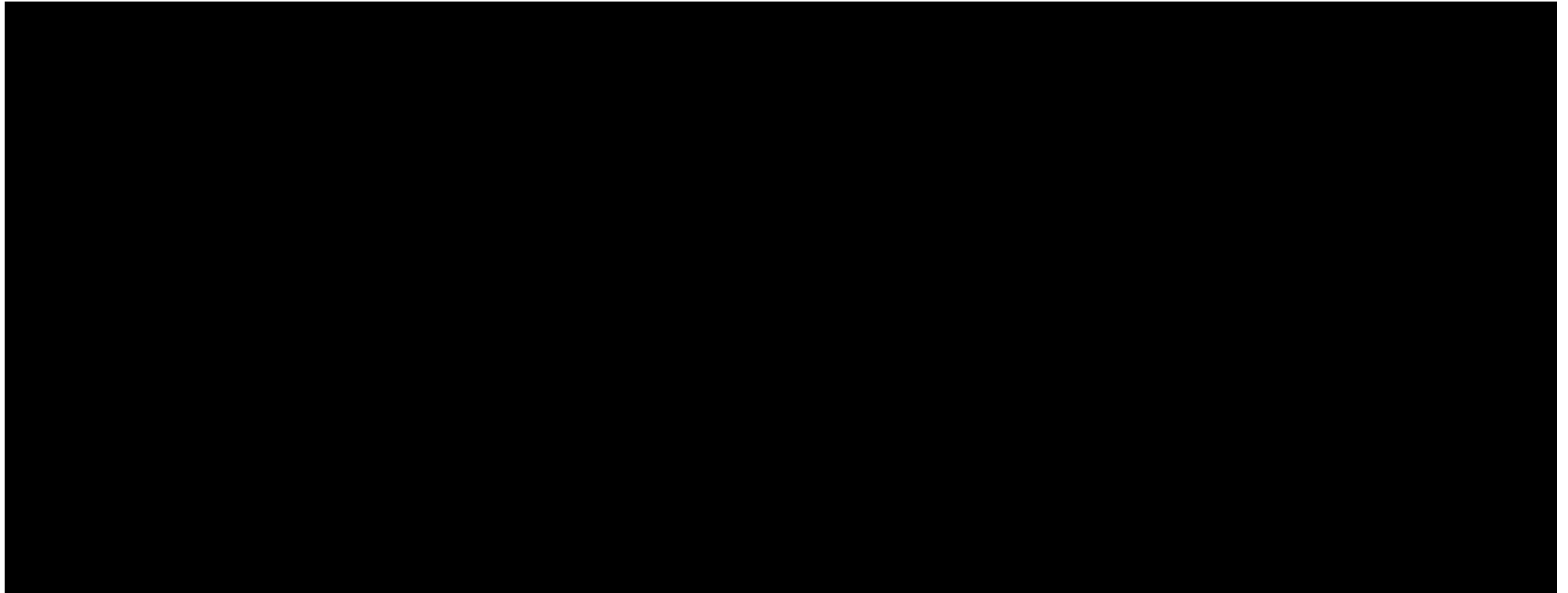
[Redacted text block]

PO Contradictory Litigation Positions

Patent Owner's "Passivation Layer" SECOND Position

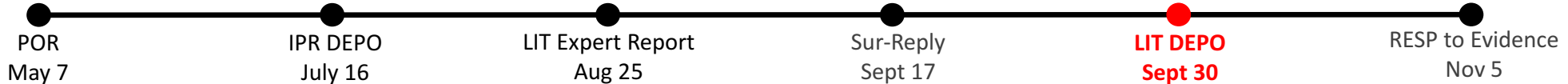


✗ PO Litigation Expert Confirms Scope of IPR/Litigation Contradictions



PO Contradictory Litigation Positions

Patent Owner's "Passivation Layer" SECOND Position



✗ PO shielded its litigation expert from all IPR briefing and positions

- IPR briefing not provided

13 Q Were you provided all of the briefings
14 in the IPR to review before you submitted your
15 infringement report?
16 A **I don't think so.**
17 Q Did you ask for them?
18 A **I don't think so.**

EX1025, 212:13-18

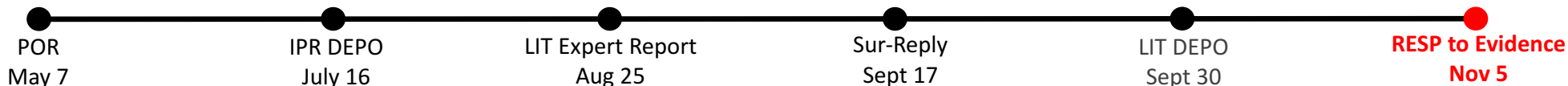
- IPR arguments not considered

3 Q Okay. But fair to say you did not
4 consider any of the arguments in the IPR in
5 forming your opinions in your infringement report.
6 Is that fair?
7 A **I think that's fair. Although there**
8 **might be overlap, of course. Because I'm working**
9 **with Optronix Sciences, right? So I don't know if**
10 **there's anything in the IPR or not that's**
11 **relevant. I can't say either way.**

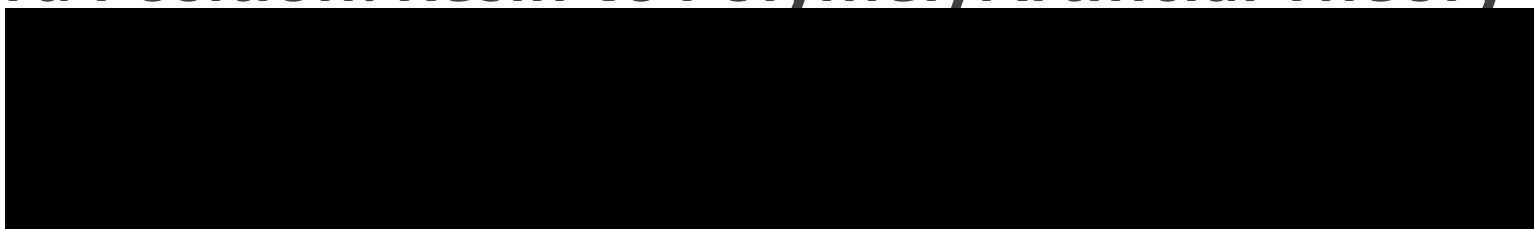
EX1025, 220:3-11

PO Contradictory Litigation Positions

Patent Owner's "Passivation Layer" THIRD Position

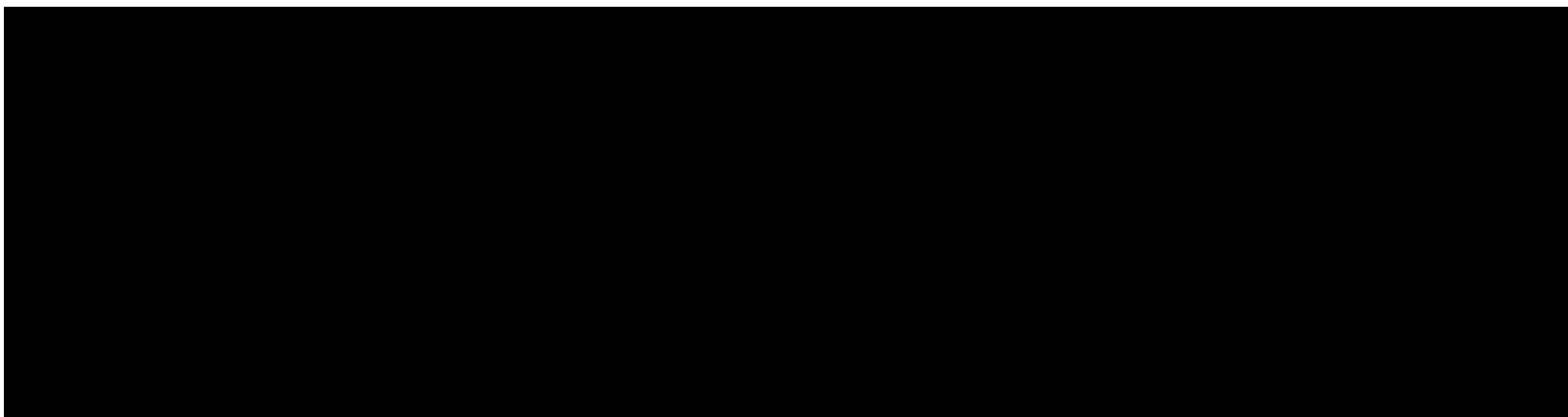


3. PO Third Position: *Resin* vs Polymer/Artificial Theory



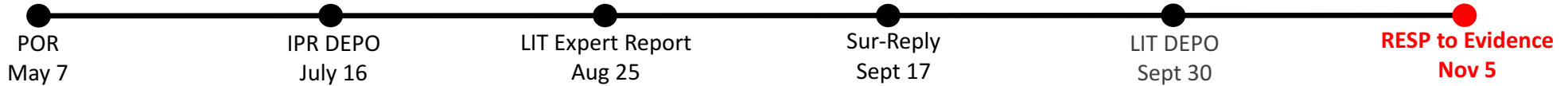
- PO ignores sole definition of “resin” in this proceeding (from its own IPR expert)

- Instead:



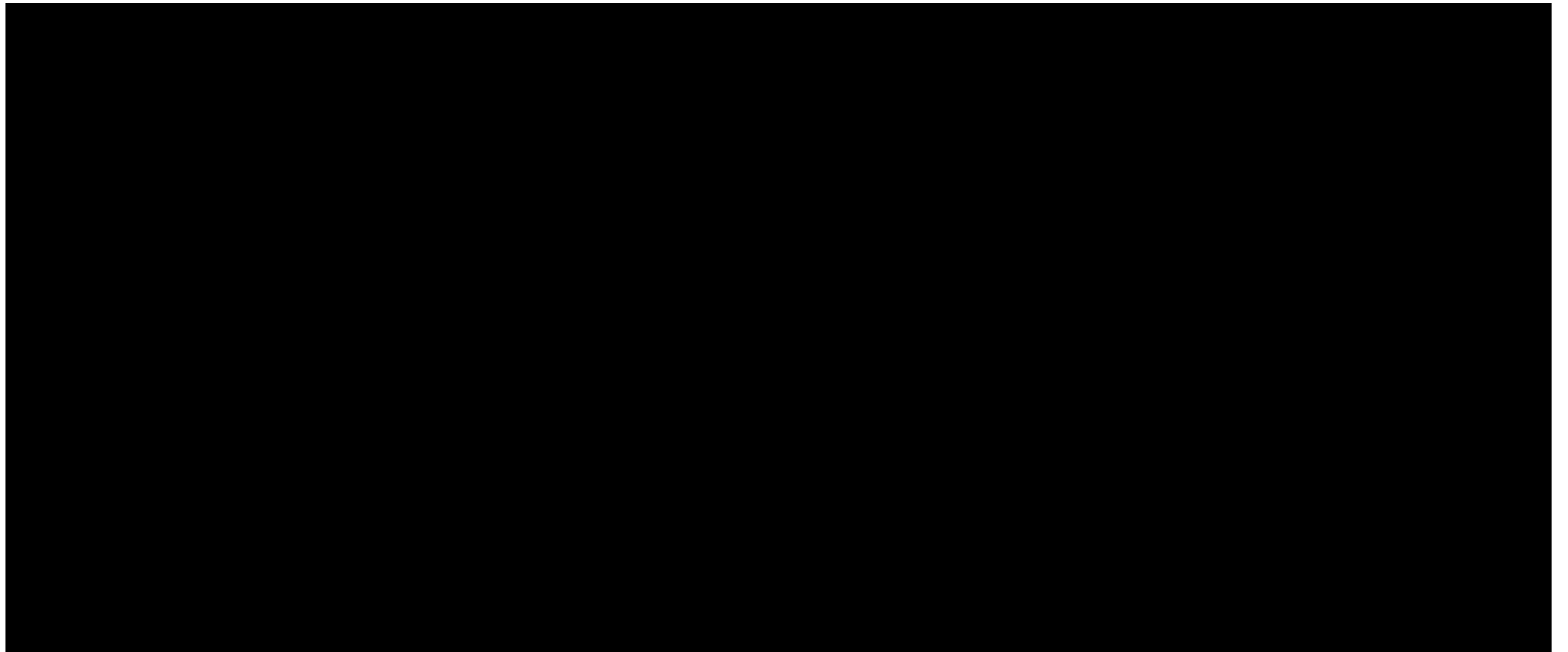
PO Contradictory Litigation Positions

Patent Owner's "Passivation Layer" THIRD Position



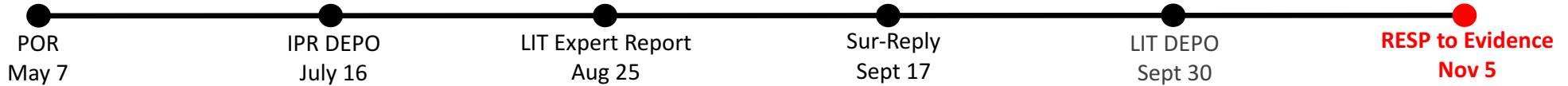
PO Contradictory Litigation Positions

Patent Owner's "Passivation Layer" THIRD Position



PO Contradictory Litigation Positions

Patent Owner's "Passivation Layer" THIRD Position



PO Contradictory Litigation Positions

CONCLUSION

All 3 IPR positions on “passivation layer” directly contradict
PO’s litigation position

IPR

- Position 1: Passivation layer cannot be organic *material*
- Position 2: Passivation layer cannot be organic *resin*
- Position 3: Passivation layer: organic polymers are artificial and not *resins*

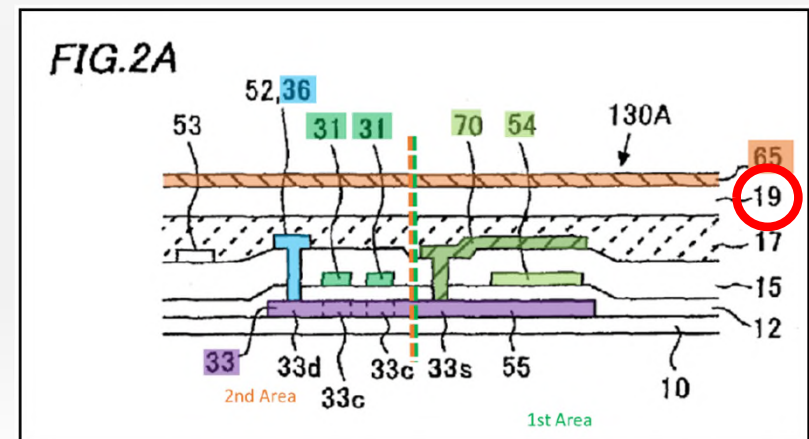
Litigation

- [REDACTED]

Ground 2

Claim 4 rendered obvious by Anzai and Yamazaki

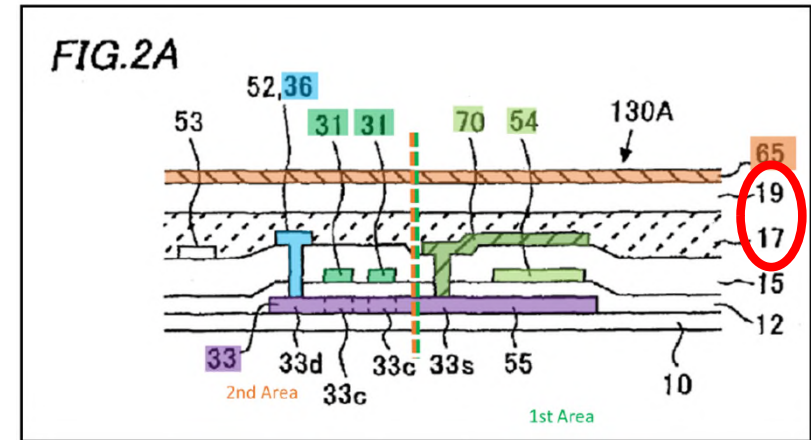
- Sole Issue: what materials would have been obvious to use for Anzai's planarization layer 19



Ground 2: Claim 4 obvious over Anzai and Yamazaki

4. The device of claim 3, wherein at least one of the passivation layer and the capping layer comprises **silicon nitride**.

- Anzai's organic EL device:
 - Planarization layers 17, 19: function as the capacitance insulating film under the cathode 65. *EX1003, 5:62-6:9*
 - Planarization layer 17: organic resin *EX1003, 4:23*
 - Planarization layer 19: no material identified
- Yamazaki's organic light emitting device:
 - Insulating material 30: insulator under 2nd electrode 32 *EX1004, Fig. 2*
 - Top surface flattened (i.e., planarized) by CMP *EX1004, 20:17-24*
 - Silicon nitride is suitable material *EX1004, 11:45-50*



Anzai

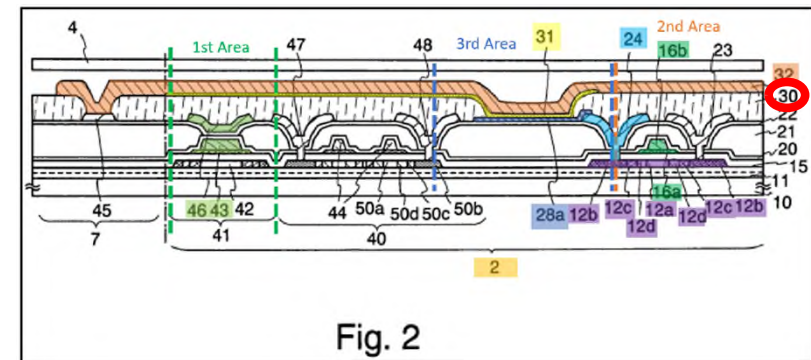


Fig. 2

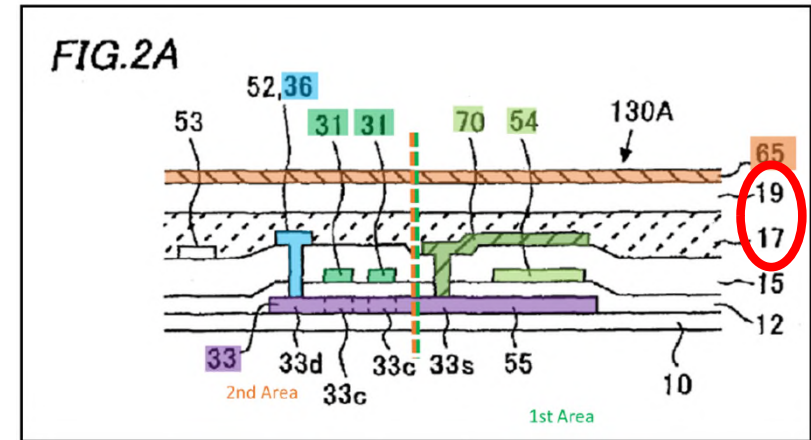
Yamazaki

Ground 2: Claim 4 obvious over Anzai and Yamazaki

4. The device of claim 3, wherein at least one of the passivation layer and the capping layer comprises silicon nitride.

✓ Would have been obvious to use silicon nitride for Anzai's planarization layer 19 *Petition, 22-27*

- Anzai and Yamazaki are analogous prior art
- POSITA would investigate insulation material appropriate for planarization layer 19
- Yamazaki uses silicon nitride as an insulator between electrodes and for planarization
- POSITA knows that SiN has high dielectric constant and would result in enhancing capacitance for the capacitor formed by electrodes 65 and 70



Anzai

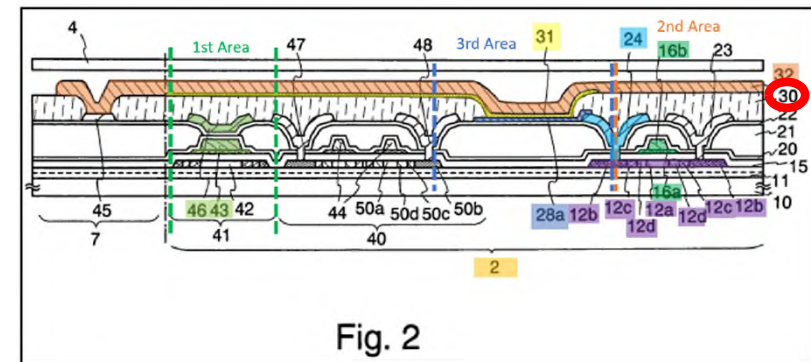


Fig. 2

Yamazaki

Ground 2: Claim 4 obvious over Anzai and Yamazaki

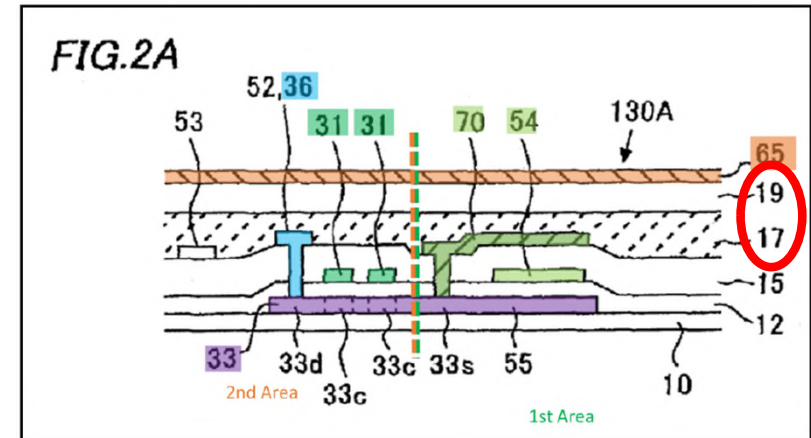
4. The device of claim 3, wherein at least one of the passivation layer and the capping layer comprises silicon nitride.

✗ PO's Argument for planarization 19: No justification for picking out silicon nitride from "huge range of choices" offered by Yamazaki. *POR at 15-16.*

The insulating material 30 may be a photosensitive or non-photosensitive organic material (such as polyimide, acrylate, polyamide, polyimide amide, resist, or benzocyclobutene), an inorganic material (such as silicon oxide, silicon nitride, or silicon oxynitride) with a CVD method, a sputtering method, or coating method, or a laminate thereof.

EX1004, 11:45-50

- Only 9 total material examples (3 inorganic materials)
- SiN known to have high dielectric constant
- Defies logic to argue unobvious to pick from a list of 9 materials total or from 3 inorganic materials



Anzai

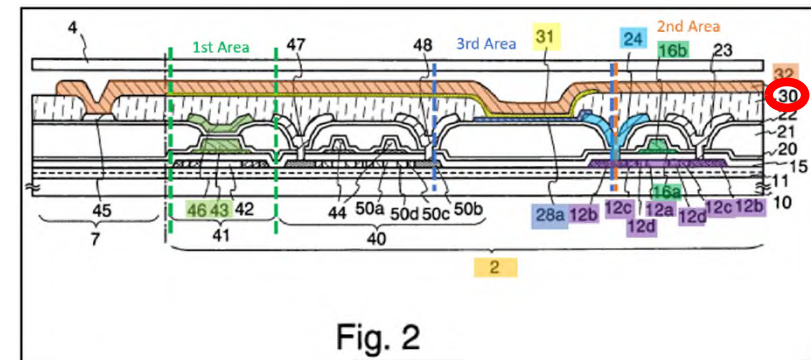


Fig. 2

Yamazaki

Ground 3

Claims 1-7 rendered obvious by Yamazaki and Anzai

- Invalidity of claims 1-2, 5-6 over Yamazaki and Anzai undisputed.
- Patent Owner arguments for claims 4 and 7 rest entirely on its erroneous construction for “capping layer”
 - Should the Board reject PO’s construction of “capping layer”, then it is undisputed that claims 1-2 and 4-7 are invalid as obvious

Ground 3: Claims 1-7 rendered obvious over Yamazaki and Anzai

3. The device of claim 1, wherein the second dielectric layer comprises a passivation layer (**insulating material 30**) and a capping layer (**Anzai's planarization layer 19**).

Pet., pp. 42-46

- It would have been obvious to add **planarization layer 19** from Anzai or insulation layer 1430 from Yamazaki on top of Yamazaki's **insulating material 30**.
- Yamazaki teaches using two insulation layers 1430/1431 in separate embodiment
- Adding another insulating layer would improve planarization (flattening) of pixel area of Yamazaki
- Insulating material 30** can be made thinner to preserve capacitance

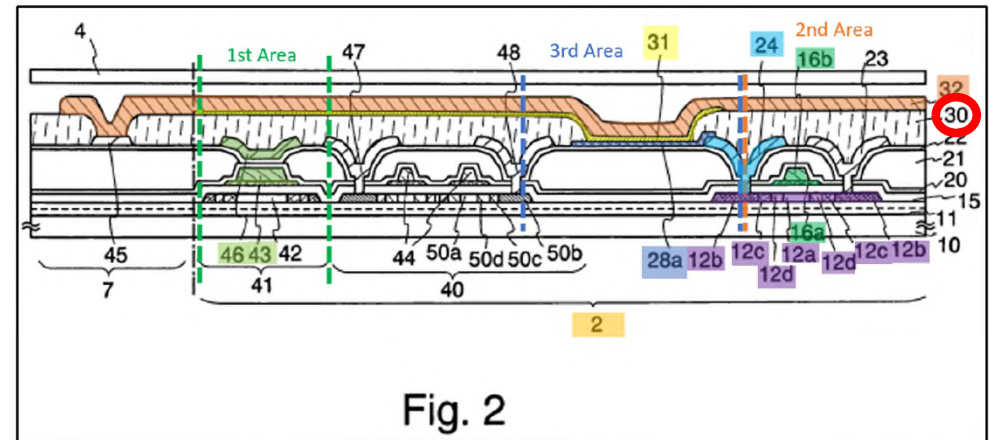


Fig. 2

Yamazaki

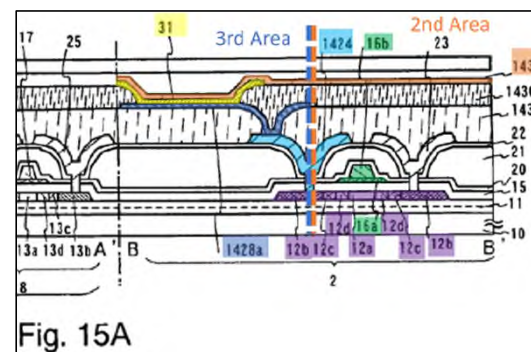
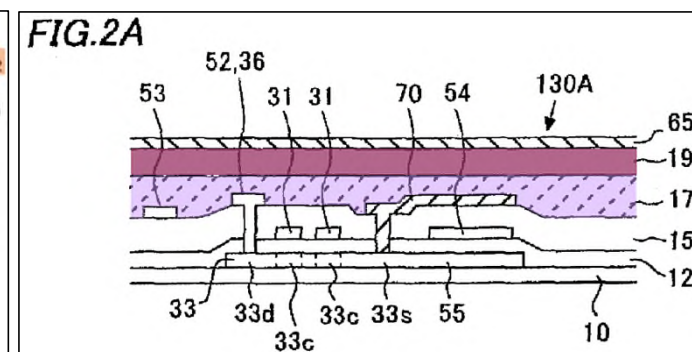


Fig. 15A

Yamazaki separate embodiment



Anzai

Ground 3: Claims 1-7 rendered obvious over Yamazaki and Anzai

3. The device of claim 1, wherein the second dielectric layer comprises a passivation layer (**insulating material 30**) and a capping layer (**Anzai's planarization layer 19**).

PO's Arguments Fail

- ❌ PO: Anzai's planarization layer 19 does not meet PO's construction of "capping layer" POR, at 19
 - PO's construction should be rejected
- ❌ PO: No reason to add a planarization layer on a planarization layer POR, at 19
 - Profound misunderstanding of semiconductors Reply, at 18-20
 - No planarization layer is perfectly planar
 - Planarity is a function of material and underlying topography, so its upper surface is more planar
 - Adding a second planarization layer can increase planarity and integrity of components above
- ❌ PO's expert:
 - Are all planarization layers perfectly flat? Answer: "No opinion" EX1015, 79:19-23
 - "No reason" to meet a flatness requirement as a two-layer step EX1015, 80:22-25
 - When pressed, changed answer to "I haven't considered that" EX1015, 82:19-23

Ground 3: Claims 1-7 rendered obvious over Yamazaki and Anzai

3. The device of claim 1, wherein the second dielectric layer (**insulating material 30**) comprises a passivation layer (**insulating material 30**) and a capping layer (**Anzai's planarization layer 19**).

Petitioner has NOT taken inconsistent positions

- Petitioner in litigation: accused [REDACTED] serves no purpose in the active area and could be omitted.
- ✗ PO: This contradicts stated motivation in Ground 3 to add an insulating layer for improved planarity *Paper 40, at 1-2*
 - Purpose or value of [REDACTED] in Petitioner's design is irrelevant to obviousness combination at issue
 - The Yamazaki/Anzai combination is motivated by adding a second planarization layer for planarity
 - PO does not, nor cannot, allege that the [REDACTED] has anything to do with planarity
 - Value/purpose of any layer depends on its attributes and its relationship with the surrounding design *Paper 43, at 3*
- ✗ PO: This contradicts stated motivation in Ground 2 to use SiN for Anzai's planarization layer 19 *Paper 40, at 2-3*
 - The Anzai/Yamazaki combination is motivated by enhancing capacitance of Anzai's capacitor by selecting SiN
 - The fact that [REDACTED] serves no purpose in Petitioner's active area is not relevant to what materials would have been obvious to use to implement layer 19 in Anzai's design *Paper 43, at 2*

Ground 3: Claims 1-7 rendered obvious over Yamazaki and Anzai

4. The device of claim 3, wherein at least one of the passivation layer and the capping layer comprises **silicon nitride**.

Pet., p. 47

- **Undisputed:** Yamazaki teaches insulating material 30 may be silicon nitride. *EX1004, 11:45-50*

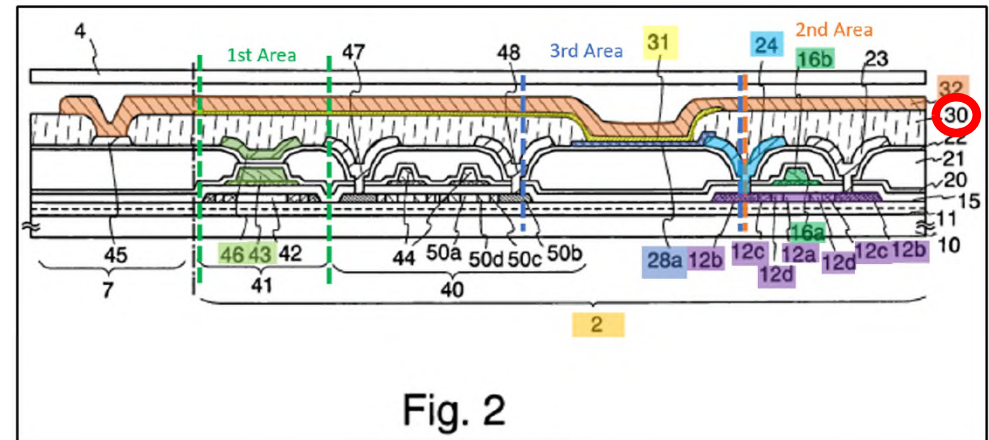


Fig. 2

Yamazaki

- See claims 3, 4 and 6.

7. The device of claim 1, wherein the second dielectric layer comprises a passivation layer, a capping layer on the passivation layer and a second organic layer formed on the capping layer, at least one of the passivation layer and the capping layer comprising silicon nitride, and the second organic layer comprising the same material as the first organic layer.

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)

Thank You!

Ground 1 – Uncontested Claims 1-2, 5

Ground 1

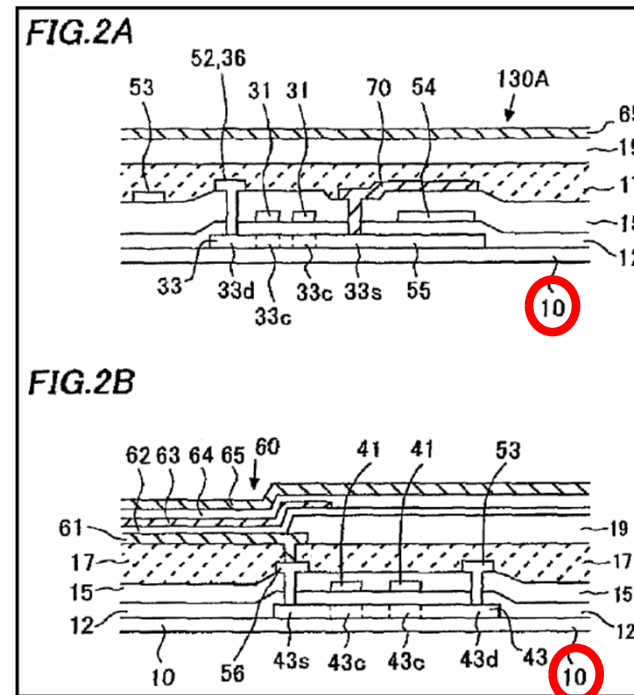
Uncontested that Claims 1-2, 5 anticipated by Anzai

1. An electroluminescence (EL) device,
comprising:
a substrate (10); and
....

“An electroluminescent (referred to as
EL hereinafter) display device”

EX1003, 1:11-12

UNDISPUTED



Anzai

Pet., pp. 7-8

Ground 1

Uncontested that Claims 1-2, 5 anticipated by Anzai

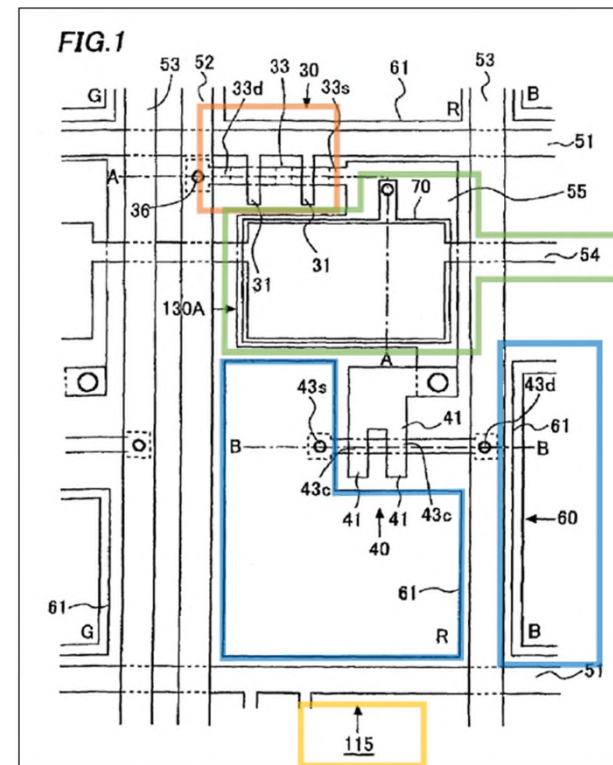
1. An electroluminescence (EL) device, comprising:

....

a plurality of pixels (**RGB OLED pixels**) formed on the substrate, each pixel being in a respective pixel area (**115**), each pixel area including at least a first area (**Capacitor Area**), a second area (**Transistor Area**), and a third area (**OLED Area**), wherein each pixel includes:

....

UNDISPUTED



Anzai

Pet., pp. 8-9

Ground 1

Uncontested that Claims 1-2, 5 anticipated by Anzai

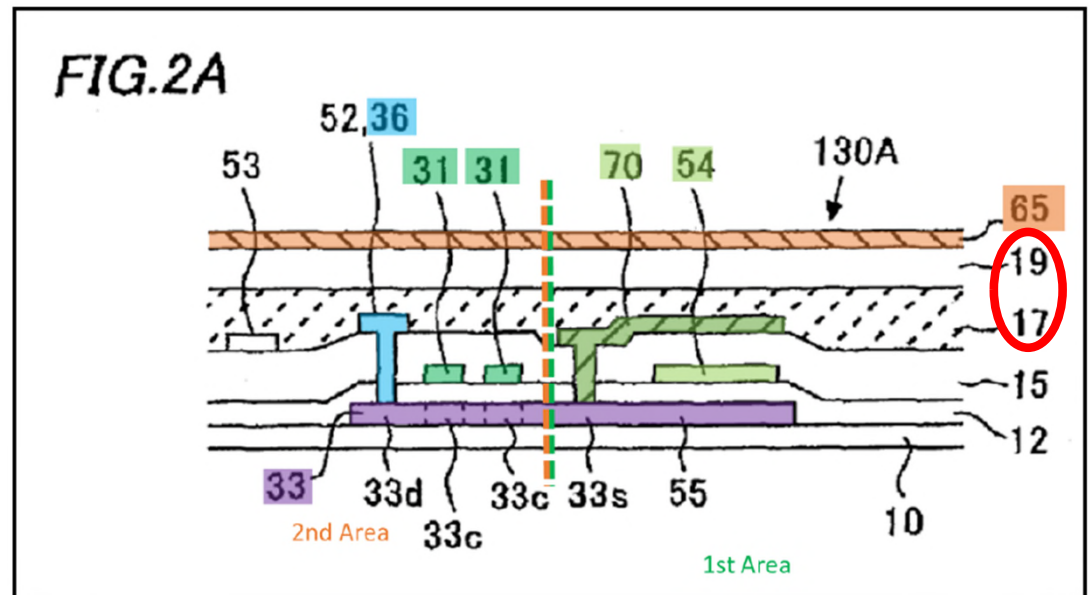
1. An electroluminescence (EL) device,
comprising:

....

at least a first capacitor (**layers 54, 15, 70**) and a second capacitor (**layers 70, 17, 19, 65**) in the first area, the first capacitor including a first conductive layer (**electrode layer 54**) formed over a first gate oxide layer (**gate insulating film 12**), a first dielectric layer (**interlayer insulating film 15**) over the first conductive layer, and a second conductive layer (**electrode layer 70**) over the first dielectric layer, and the second capacitor including the second conductive layer, a second dielectric layer (**first and second planarization films 17, 19**) over the second conductive layer, and a third conductive layer (**cathode layer 65**) over the second dielectric layer;

....

UNDISPUTED



Anzai

Pet., pp. 9-13

Ground 1

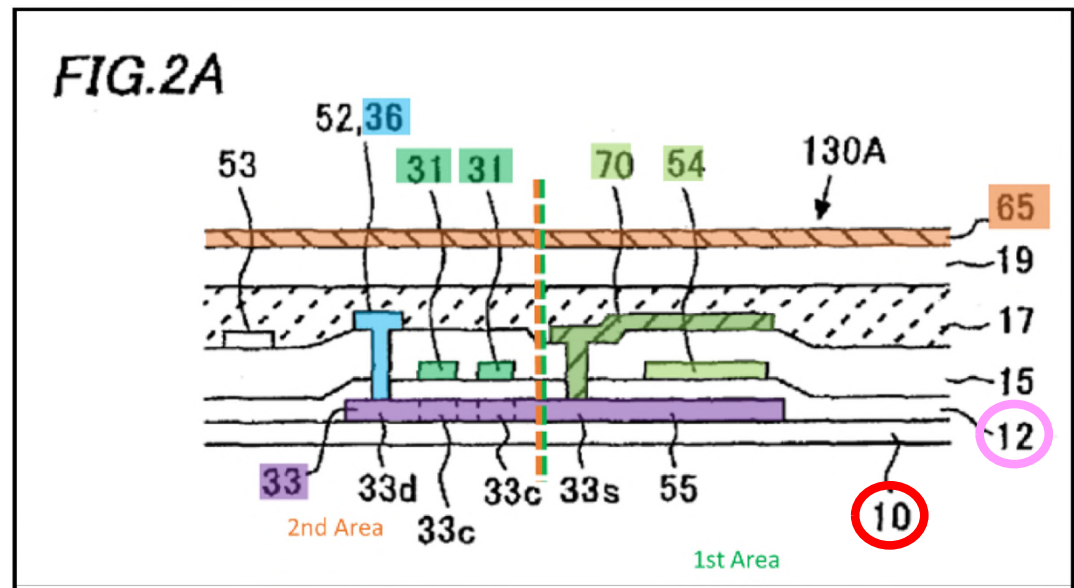
Uncontested that Claims 1-2, 5 anticipated by Anzai

1. An electroluminescence (EL) device,
comprising:

....
a transistor in the second area (**Transistor Area**), the transistor including a first semiconductor layer (**active layer 33**) formed on the substrate (**substrate 10**), the first gate oxide layer (**gate insulating film 12**) over the first semiconductor layer, and a fourth conductive layer (**gate electrode 31**) over the first gate oxide layer, wherein the fourth conductive layer (**gate electrode 31**) is formed of the same conductive film as the first conductive layer (**first electrode layer 54**), and wherein both the first conductive layer and the fourth conductive layer are directly formed on the gate oxide layer (**gate insulating film 12**); and

....

UNDISPUTED



Pet., pp. 13-15

Anzai

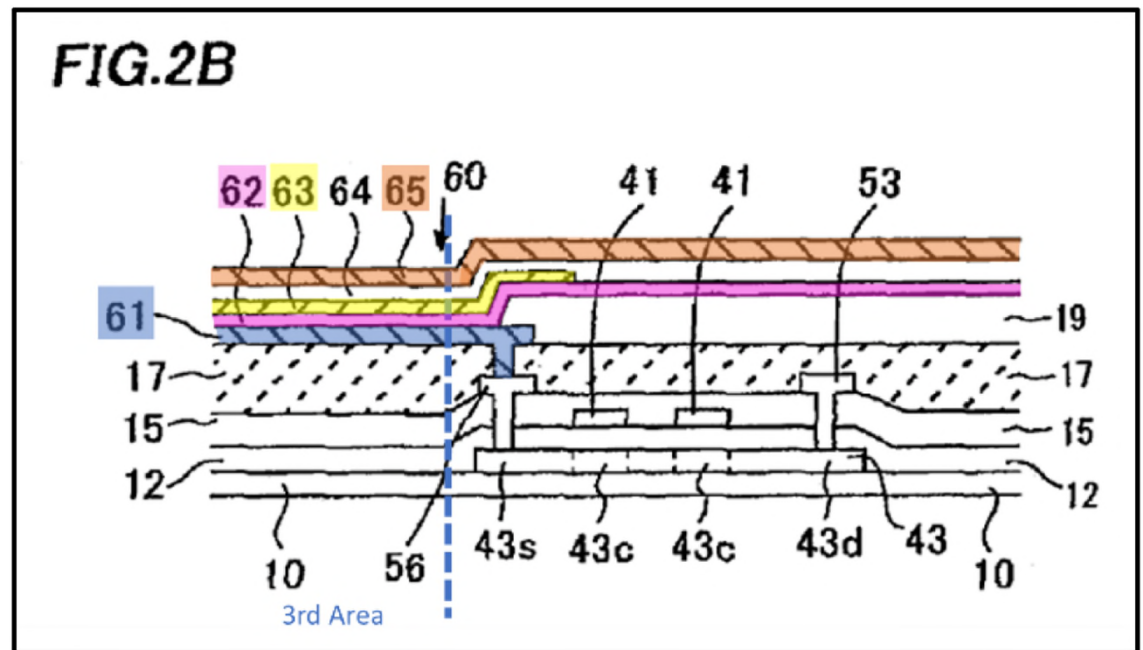
- First electrode layer 54 and gate electrode 31 are formed “directly on” (i.e., formed in manner directly touching) gate insulating film, meeting the district court’s construction of “directly on.”

Ground 1

Uncontested that Claims 1-2, 5 anticipated by Anzai

1. An electroluminescence (EL) device, comprising:
-
- a light emitting device (**organic EL element 60**) in the third area (**OLED area**), the light emitting device including a fifth conductive layer (**anode layer 61**), a first organic layer (**emissive layer 63**) over the fifth conductive layer, and a sixth conductive layer (**cathode layer 65**) over the first organic layer, wherein the sixth conductive layer (**cathode layer 65**) is formed of the same conductive film as the third conductive layer (**cathode layer 65**).

UNDISPUTED



Anzai

Pet., pp. 15-17

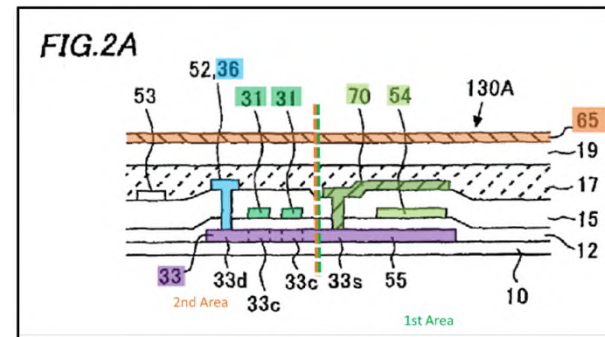
Ground 1

Uncontested that Claims 1-2, 5 anticipated by Anzai

2. The device of claim 1, each pixel further comprising a seventh conductive layer (**drain electrode 36**) in the second area for providing contact to the first semiconductor layer (**active layer 33**).

Pet., pp. 17-19

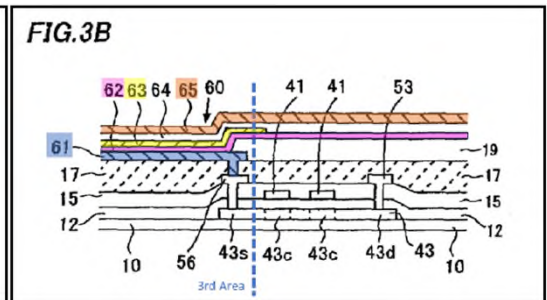
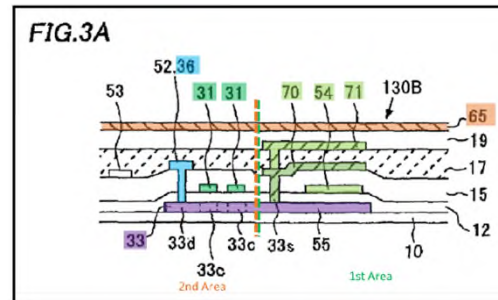
UNDISPUTED



Anzai

5. The device of claim 1, wherein the second conductive layer (**electrode layer 70/71**) and the fifth conductive layer (**anode layer 61**) both comprise indium tin oxide (ITO).

Pet., p. 21



Anzai

• Anzai second embodiment

- Anode layer 61 is made of ITO *EX1003, 5:14-25; Figs. 3A-3B*
- Electrode layer 71 made of same layer and process as anode layer 61. *EX1003, 5:55-57*

Ground 3 – Uncontested Claims 1-2, 5-6

Ground 3

Uncontested that Claims 1-2, 5-6 obvious over Yamazaki & Anzai

1. An electroluminescence (EL) device,
comprising:
a substrate (10); and
....

UNDISPUTED

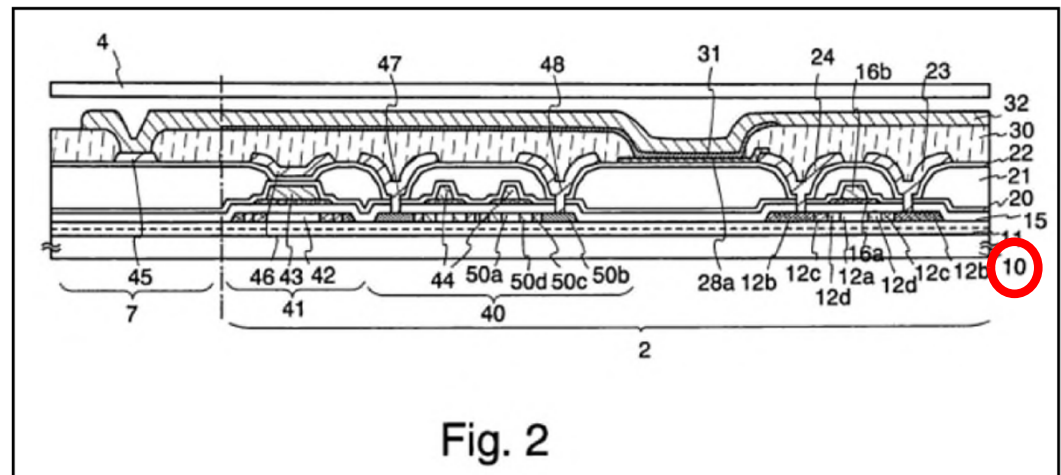


Fig. 2

Yamazaki

“Light emitting device”

EX1004, Abstract

Pet., pp. 27-28

Ground 3

Uncontested that Claims 1-2, 5-6 obvious over Yamazaki & Anzai

1. An electroluminescence (EL) device, comprising:

....

a plurality of pixels formed on the substrate, each pixel being in a respective pixel area (**pixel part 2**), each pixel area including at least a first area (**Capacitor Area**), a second area (**TFT Area**), and a third area (**EL Area**), wherein each pixel includes:

....

UNDISPUTED

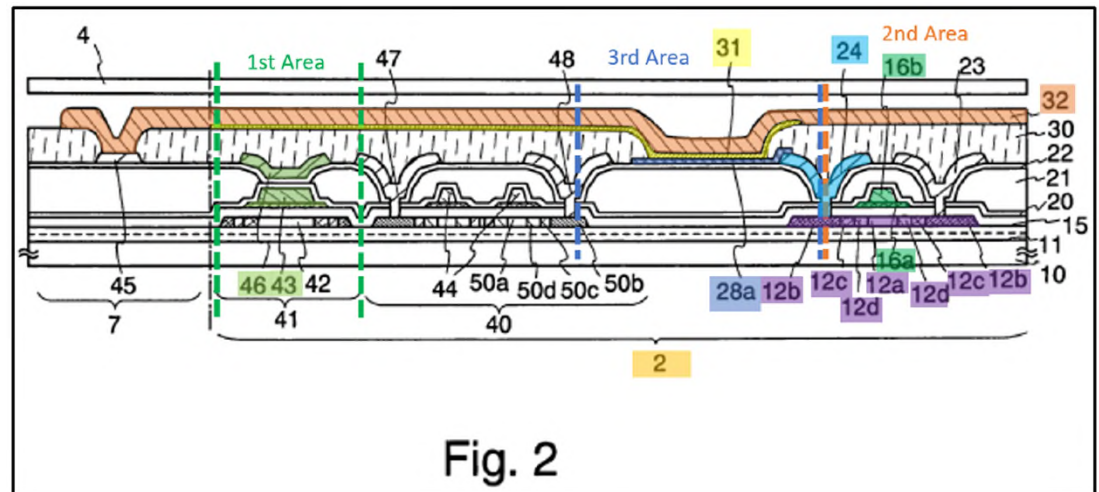


Fig. 2

Yamazaki

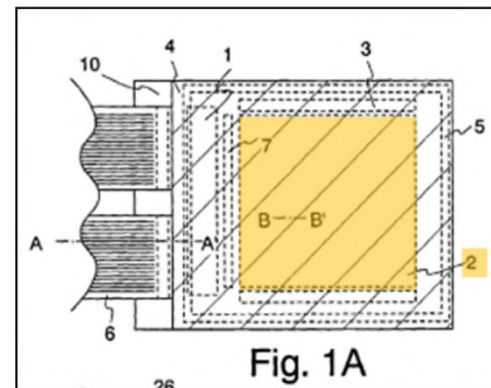


Fig. 1A

Pet., pp. 29-30

Ground 3

Uncontested that Claims 1-2, 5-6 obvious over Yamazaki & Anzai

1. An electroluminescence (EL) device, comprising:
....

at least a first capacitor (**capacity 41**) and a second capacitor (**capacity 41**) in the first area, the first capacitor including a first conductive layer (**electrode 43**) formed over a first gate oxide layer (**gate insulating film 15**), a first dielectric layer (**interlayer insulation films 22, 20**) over the first conductive layer, and a second conductive layer (**electrode 46**) over the first dielectric layer, and the second capacitor including the second conductive layer (**electrode 46**), a second dielectric layer (**Yamazaki's insulating material 30 as modified by Anzai**) over the second conductive layer, and a third conductive layer (**2nd electrode (cathode) 32**) over the second dielectric layer;

....

UNDISPUTED

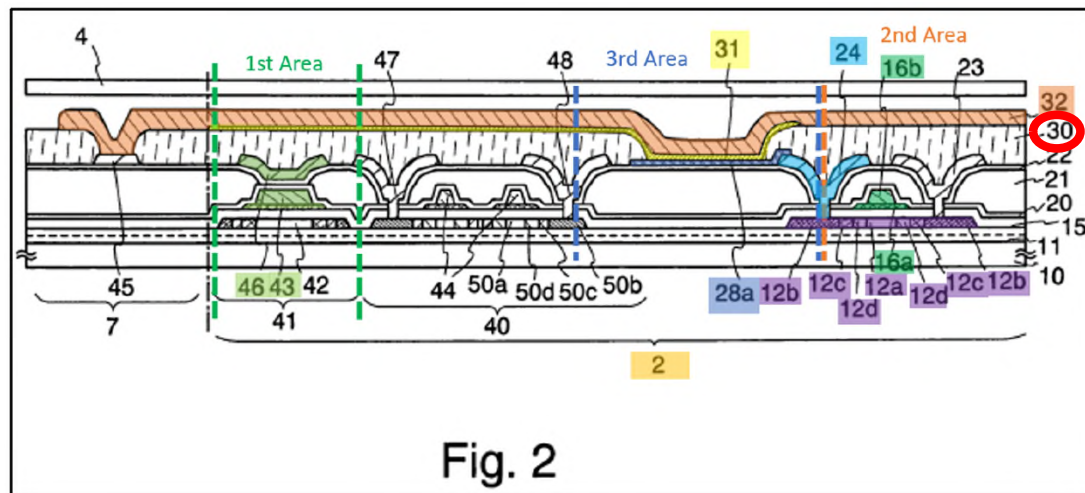


Fig. 2

Yamazaki

- **Undisputed:** it would have been obvious to modify the thickness of insulating material 30 of Yamazaki to form the second capacitor between electrode 46 and cathode 32 as taught by Anzai.

Pet., pp. 30-34

Ground 3

Uncontested that Claims 1-2, 5-6 obvious over Yamazaki & Anzai

1. An electroluminescence (EL) device,
comprising:

....
a transistor in the second area (**TFT Area**), the transistor including a first semiconductor layer (**regions 12a-12d**) formed on the substrate (**substrate 10**), the first gate oxide layer (**gate insulating film 15**) over the first semiconductor layer, and a fourth conductive layer (**gate electrode 16a/16b**) over the first gate oxide layer, wherein the fourth conductive layer (**gate electrode 16a/16b**) is formed of the same conductive film as the first conductive layer (**electrode 43**), and wherein both the first conductive layer and the fourth conductive layer are directly formed on the gate oxide layer (**gate insulating film 15**); and

....

UNDISPUTED

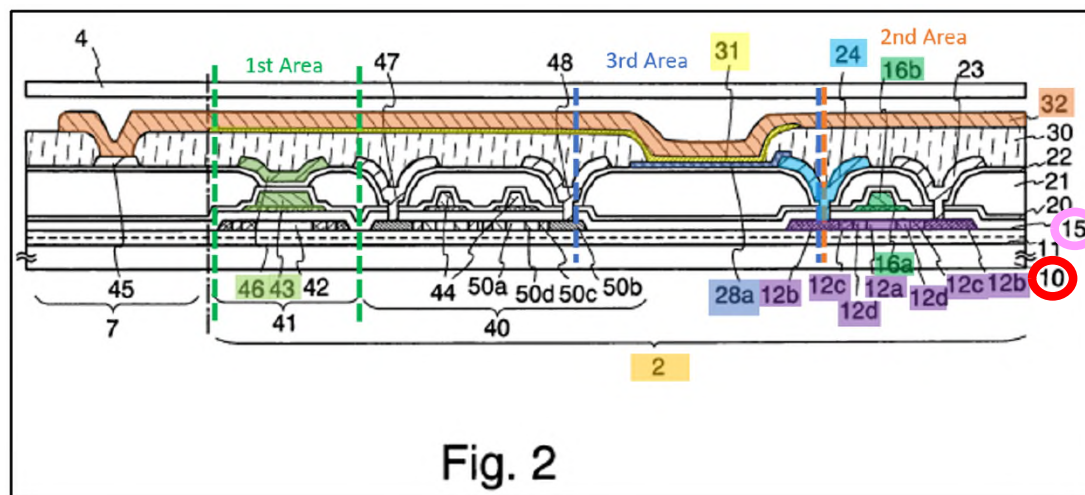


Fig. 2

Yamazaki

- **Undisputed:** it would have been obvious to form **electrode 16** and **electrode 43** of the same conductive film
- First **electrode 43** and **gate electrode 16** are formed “directly on” (in manner directly touching) **gate insulating film 15**, meeting the district court’s construction of “directly on.”

Pet., pp. 35-39

Ground 3

Uncontested that Claims 1-2, 5-6 obvious over Yamazaki & Anzai

1. An electroluminescence (EL) device,
comprising:

....

a light emitting device (**EL element**) in the third area (**EL area**), the light emitting device including a fifth conductive layer (**1st electrode (anode) 28a**), a first organic layer (**EL layer 31**) over the fifth conductive layer (**anode 28a**), and a sixth conductive layer (**cathode 32**) over the first organic layer, wherein the sixth conductive layer (**cathode 32**) is formed of the same conductive film as the third conductive layer (**cathode 32**).

UNDISPUTED

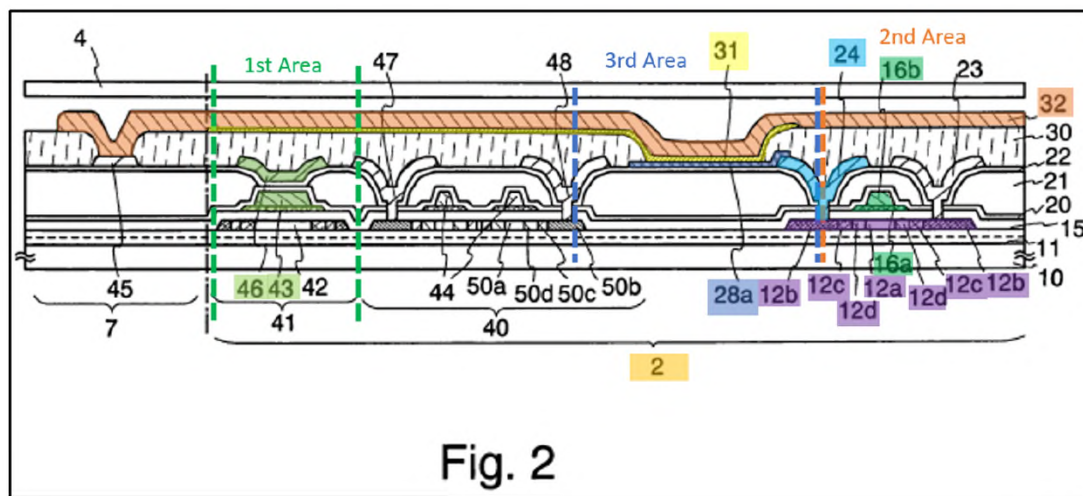


Fig. 2

Yamazaki

Pet., pp. 39-41

Ground 3

Uncontested that Claims 1-2, 5-6 obvious over Yamazaki & Anzai

UNDISPUTED

2. The device of claim 1, each pixel further comprising a seventh conductive layer (**connecting electrode 24**) in the second area for providing contact to the first semiconductor layer (**regions 12a-12d**).

Pet., pp. 41-42

5. The device of claim 1, wherein the second conductive layer (**electrode 46**) and the fifth conductive layer (**anode 28a**) both comprise indium tin oxide (ITO).

Pet., p. 47-50

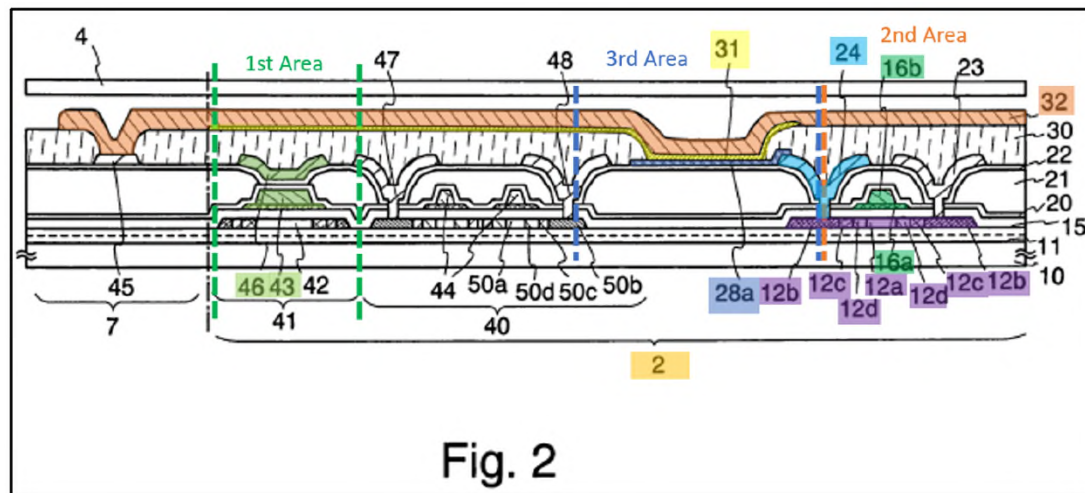


Fig. 2

Yamazaki

- **Undisputed:** Yamazaki teaches **anode 28a** can be formed of ITO.
- **Undisputed:** It would have been obvious to make **electrode 46** of ITO in view of the teachings of Yamazaki and Anzai.

