

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.

Case No.: IPR2024-01133

Patent 9,263,509

PATENT OWNER'S RESPONSE

Table of Contents

I.	INTRODUCTION	1
II.	BACKGROUND OF THE '509 PATENT.....	2
III.	OVERVIEW OF ALLEGED PRIOR ART	3
	A. Weaver	3
	B. Lee053.....	4
	C. Song	5
	D. Lee149.....	6
	E. Bae	6
	F. Gupta.....	7
	G. Han	8
IV.	PERSON OF ORDINARY SKILL (“POSITA”)	10
	A. Dr. Baker is Not a POSITA	10
V.	HINDSIGHT.....	12
	A. Hindsight on the Record	13
	B. Petitioner’s Contradictory Positions Exposes Hindsight	14
	C. What a POSITA Would Have <i>Actually</i> Done:.....	19
	D. Petitioner Fails to Identify a Motivation To Modify Weaver as Proposed.....	20
VI.	Objective Indicia of Nonobviousness: Petitioner’s Expert Failed To Explain the Resulting Modification After Reviewing the Prior Art For 115 Hours	20
VII.	CLAIM CONSTRUCTION.....	21
	A. “auxiliary”	22
	B. “electrode”	25
VIII.	GROUND 1 (WEAVER § 102, CLAIMS 1-5, 9, 12-13).....	27
	A. All Claims: Weaver Does Not Disclose an “Auxiliary Electrode”	27
IX.	GROUND 2 (WEAVER, LEE053 § 103, CLAIMS 6-8).....	33
	A. Lee053 Does Not Cure The Deficiencies of Weaver.....	33
	B. Hindsight/No Motivation to Combine	33

X.	GROUND 3 (WEAVER, SONG § 103).....	35
A.	Song Does Not Cure the Deficiencies of Weaver.....	35
B.	Hindsight/No Motivation to Combine	36
XI.	GROUND 4 (WEAVER, LEE149 § 103)	39
A.	Lee149 Does Not Cure the Deficiencies of Weaver	39
B.	Hindsight/No Motivation to Combine	39
XII.	GROUND 5 (WEAVER, BAE § 103)	43
A.	Bae Does Not Cure the Deficiencies of Weaver.....	43
B.	Hindsight/No Motivation to Combine	43
XIII.	GROUND 6 (WEAVER, GUPTA OR HAN § 103).....	45
A.	Gupta or Han Do Not Cure the Deficiencies of Weaver.....	46
B.	Hindsight/No Motivation to Combine	46
1.	Han is Not Analogous Art.....	49
2.	A POSITA Would Have Used Han To Make a Different Modification	52
3.	Gupta’s Resistor is Not an Electrode	52
4.	The Proposed Combination Has No Relationship with Gupta	53
XIV.	GROUND 7 (WEAVER, LEE053, GUPTA OR HAN § 103).....	55
XV.	GROUND 8 (WEAVER, SONG, GUPTA OR HAN § 103)	55
XVI.	GROUND 9 (WEAVER, LEE149, GUPTA OR HAN § 103).....	55
XVII.	GROUND 10 (WEAVER, BAE, GUPTA OR HAN § 103)	55
XVIII.	CONCLUSION	55

Table of Authorities

Cases

<i>Apple Inc. v. Uniloc Luxembourg S.A.</i> , IPR2018-00420, Paper 7 (PTAB, Aug. 6, 2018)	22
<i>Kyocera Senco Indus. Tools Inc. v. ITC</i> , 22 F.4th 1369 (Fed. Cir. 2022).....	12
<i>Sensonics, Inc. v. Aerosonic Corp.</i> , 81 F.3d 1566 (Fed. Cir. 1999)	12, 41
<i>Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling U.S., Inc.</i> , 699 F.3d 1340 (Fed. Cir. 2012)	21
<i>Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.</i> , 200 F.3d 795 (Fed. Cir. 1999)	22
<i>Volvo Penta of the Americas, LLC v. Brunswick Corp.</i> , 81 F.4th 1202 (Fed. Cir. 2023)	21

Patent Owner's Exhibit List for IPR2024-01133

Pursuant to 37 C.F.R. § 42.63(e), Patent Owner Optronics Sciences LLC hereby submits its exhibit list associated with the above-captioned *inter partes* review of U.S. Patent No. 9,263,509.

Exhibit No.	Description
2001	Docket Control Order from <i>Optronics Sciences LLC v. BOE Tech. Group Co., Ltd.</i> , No. 2:23-cv-00549-JRG, Dkt. 33 (E.D. Tex. Aug. 5, 2024)
2002	Optronics Sciences LLC's Infringement Contentions from <i>Optronics Sciences LLC v. BOE Tech. Group Co., Ltd.</i> , No. 2:23-cv-00549-JRG (E.D. Tex. July 19, 2024).
2003	BOE Technology Group Co., LTD's Invalidity Contentions from <i>Optronics Sciences LLC v. BOE Tech. Group Co., Ltd.</i> , No. 2:23-cv-00549-JRG (E.D. Tex. Oct. 25, 2024).
2004	Declaration of Benjamin T. Wang in Support of Motion to Appear <i>Pro Hac Vice</i>
2005	Declaration of Andrew D. Weiss in Support of Motion to Appear <i>Pro Hac Vice</i>
2006	Declaration of Christian W. Conkle in Support of Motion to Appear <i>Pro Hac Vice</i>
2007	Time to Trial for Rodney Gilstrap Report from Docket Navigator, accessed December 12, 2024.
2008	Declaration of Paul A. Kroeger in support of Motion to Appear <i>Pro Hac Vice</i> .
2009	[Intentionally Omitted].
2010	<i>POS Solutions</i> , Cirque: Innovative Touch Solutions, available at https://web.archive.org/web/20131109010416/http://www.cirque.com/solutions/posSolutions.aspx (archived by the Wayback Machine on Nov. 9, 2013).
2011	COMPREHENSIVE DICTIONARY OF ELECTRICAL ENGINEERING (2d ed. 2005).
2012	WILEY ELECTRICAL AND ELECTRONICS ENGINEERING DICTIONARY (2004).
2013	MCGRAW-HILL DICTIONARY OF SCIENTIFIC AND TECHNICAL TERMS (6th ed. 2003)

2014	THE AMERICAN HERITAGE COLLEGE DICTIONARY (3rd ed. 1997)
2015	WEBSTER’S NEW WORLD DICTIONARY AT 94 (3rd College Ed. 1994)
2016	WEBSTER’S II NEW COLLEGE DICTIONARY (2001)
2017	Disclosure of Dr. Eric Bretschneider in Compliance with P.R. 4-3(B), <i>Optronic Sciences LLC v. BOE Tech. Group. Co., Ltd.</i> , No. 2:23-cv-005549-JRG (E.D. Tex.).
2018	Exhibit 9 from the Deposition of Dr. Baker, <i>IPR2024-01130, IPR2024-01133, IPR2024-01134</i> , Volume 1.
2019	Exhibit 10 from the Deposition of Dr. Baker, <i>IPR2024-01130, IPR2024-01133, IPR2024-01134</i> , Volume 1.
2020	Exhibit 11 from the Deposition of Dr. Baker, <i>IPR2024-01130, IPR2024-01133, IPR2024-01134</i> , Volume 1.
2021	<i>Solid-State Lighting Research and Development Multi-Year Program Plan</i> , U.S. DEPARTMENT OF ENERGY (Apr. 2013).
2022	Part 1 of Video Excerpt from April 2, 2025, Deposition Transcript of Dr. Jacob Baker, <i>IPR2024-01130, IPR2024-01133, IPR2024-01134</i> , Volume 1.
2023	Part 2 of Video Excerpt from April 2, 2025, Deposition Transcript of Dr. Jacob Baker, <i>IPR2024-01130, IPR2024-01133, IPR2024-01134</i> , Volume 1.
2024	Part 3 of Video Excerpt from April 2, 2025, Deposition Transcript of Dr. Jacob Baker, <i>IPR2024-01130, IPR2024-01133, IPR2024-01134</i> , Volume 1.
2025	Part 4 of Video Excerpt from April 2, 2025, Deposition Transcript of Dr. Jacob Baker, <i>IPR2024-01130, IPR2024-01133, IPR2024-01134</i> , Volume 1.
2026	Declaration of Dr. Eric Bretschneider in support of Patent Owner’s Response (“Bretschneider Decl.”).
2027	<i>Curriculum vitae</i> of Dr. Eric Bretschneider.
2028	April 2, 2025, Deposition Transcript of Dr. Jacob Baker, <i>IPR2024-01130, IPR2024-01133, IPR2024-01134</i> , Volume 1.
2029	April 3, 2025, Deposition Transcript of Dr. Jacob Baker, <i>IPR2024-01130, IPR2024-01133, IPR2024-01134</i> , Volume 2.

I. INTRODUCTION

The Petition asserts anticipation or obviousness against all challenged claims of U.S. Patent No. 9,263,509 (the “’509 Patent”). *See* Petition at 1. The Petition, however, is fundamentally flawed. Its grounds do not adequately state what a person of ordinary skill would have been motivated to do, and its reasoning relies on hindsight.

Petitioner’s expert is not qualified as a POSITA and his testimony should be given no weight. He argues for a broader, relaxed definition of a POSITA—a definition that fits his background. Petitioner’s expert is unfamiliar with the subject matter of the ’509 Patent, which “provides a pixel structure for solving the problem of poor overall luminous uniformity that occurs on the traditional electroluminescent device.” Ex. 1001, 1:48-50. Petitioner’s expert has no experience designing LEDs at the relevant time—he merely used LEDs in other circuits.

The reliance on hindsight is plain on the record. During deposition, Petitioner’s expert retroactively mapped the references to the language of the claims rather than relying on the teachings themselves. Further, Petitioner’s expert takes contradicting positions on what a POSITA would have been motivated and able to do and attempts to salvage the arguments with convoluted reasoning.

Additionally, the Petition relies on a construction of terms that are not within their plain and ordinary meaning.

For all these reasons, the Petition is fundamentally flawed and fails on all grounds.

II. BACKGROUND OF THE '509 PATENT

The '509 Patent “provides a pixel structure for solving the problem of poor overall luminous uniformity that occurs on the traditional electroluminescent device.” Ex. 1001, 1:48–50. This problem occurs in displays that contain traditional arrays of pixels. *Id.*, 1:52–55. Non-uniformity occurs because, in a traditional array, some pixels are farther from a power line, while other pixels are closer. The pixels thus connect to a power line using wires of different lengths and thus different resistances, with the farthest pixels experiencing the largest wiring resistance. This difference in wire resistance causes “IR drop,”¹ which contributes to non-uniform luminosity across the pixel array. *See id.*, 1:33–44, 5:55–62, 7:37–42; Ex. 2026 ¶¶ 31–32.

The '509 Patent provides a solution to this problem by providing the ability to *customize* the resistance *within each* individual pixel structure using an auxiliary electrode to compensate for increased wiring resistance. Within a pixel structure, an auxiliary electrode is electrically insulated from the light emitting device and acts to significantly reduce the total resistance of the pixel structure by up to 40%. *Id.*,

¹ This refers to a drop in voltage (V), proportional to current (I) times the resistance (R). Ex. 2026 ¶ 31.

2:10–23, 5:55–6:8. Thus, pixels at the farthest points of the array can be customized to have their resistances reduced to offset the resistance caused by the longer wires. Closer pixels that see less wiring resistance can be customized to have their resistances reduced by a smaller amount (or no amount), such that overall, the resistances (and corresponding IR drops) seen by pixels across the array is more uniform. *See* Ex. 2028, 89:24–95:3.² Some embodiments allow about a 40% reduction in pixel resistance. *See id.*, 5:63–6:13, 7:37–52.

The '509 Patent also describes a simplified fabrication process that enables additional desirable benefits related to further reductions in resistive losses in displays. Ex. 1001, 5:55–62.

III. OVERVIEW OF ALLEGED PRIOR ART

A. Weaver

Weaver is directed towards a configuration of an OLED display controlled by an n-type transistor. Ex. 1004, [0001]. Weaver teaches that designing an OLED with an anode disposed over the cathode enables the use of n-type transistors, which may reduce costs over using p-type transistors, allow for lower driving voltages. *Id.*

² Petitioner's expert, Dr. Baker initially did not seem to understand this. Dr. Baker initially believed the patent taught that "uniformity would improve if you were to lower the resistance to all of those pixels." Ex. 2028 at 91:3–21. Patent Owner's counsel had to provide a series of guiding questions for Dr. Baker to understand that the uniformity benefit resulted from reducing the resistance of the farthest pixels, not all of the pixels. *Id.* at 92:10–94:3.

[0014]. Weaver describes a benefit that “the current through the OLED and driving transistor [are] independent of current-voltage characteristics of the OLED,” especially changes in current-voltage characteristics over time. *Id.*, [0014], [0019]. Thus, Weaver was not concerned with reducing the resistance within a pixel structure to improve luminous uniformity that resulted from IR drop (current-resistance) caused by wiring resistance. Weaver instead sought to make its OLED current *independent of* (e.g., not affected by) changes over time to the current and voltage characteristics of the OLED. *Id.*

B. Lee053

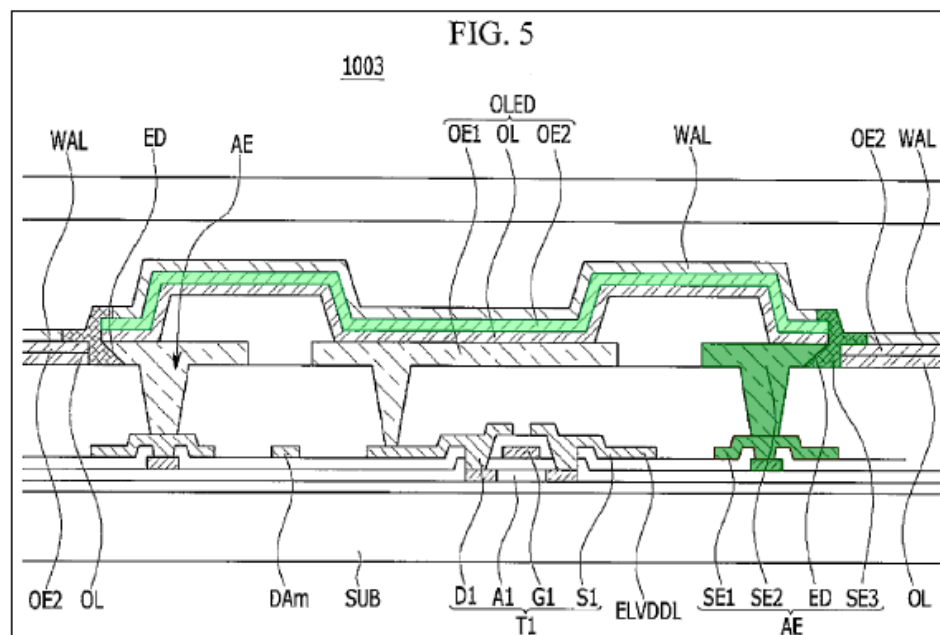
Lee053 relates to an OLED display device “capable of reducing a bezel width.” Ex. 1005, [0003]. Lee053 teaches that the “existing power wiring 151 is divided based on a common electrode marginal region as a boundary so as to be used as a wiring (not shown) as well as as [sic] the power wiring, and here, the reduced width of the wiring is compensated for by increasing the thickness of the wiring by using a metal used for an anode or a cathode, thus reducing the left and right bezel widths.” *Id.*, [0064]. To do this, Lee053 uses dummy wiring “formed at a lower side thereof and connected to the second power wiring 135, obtaining an effect that the thickness of the second power wiring 135 is substantially increased.” *Id.*, [0085].

Lee053 then teaches that the effect is that the width of power wirings 130 and 135 may be reduced, and a different signal or line may be additionally formed by the

reduced width. *Id.*, [0093]–[0094]. This contributes to the reduced bezel width that is the objective of Lee053. *Id.*, [0003].

C. Song

Song relates to the field of large area OLED displays—specifically, those in which individual OLED elements include large area electrodes. Ex. 1006, [0008]–[0009], [0011]. Song describes an “auxiliary electrode AE” that “may be formed using a so called metal self-patterning technology.” *Id.* [0077]. Auxiliary electrode AE has several portions, SE1, SE2, and SE3. *See id.*, [0090]. SE3 is “formed (or deposited) with a slope at the end” of the second electrode portion SE2. *Id.*, [0094].



Ex. 1003, ¶ 64 (annotated Ex. 1006, Fig. 5, showing auxiliary electrode AE).

D. Lee149

Lee149 relates to preventing infiltration of moisture or outgas in an OLED display. Ex. 1011, [0009], [0017]. Lee149 purports to improve reliability by integrating first and second passivation layers over the light emitting diode (LED) to isolate it from external moisture/gas. *See* Ex. 1011, [0018] (“infiltration of moisture or outgas into an organic electroluminescent layer is prevented by forming a plurality of passivation layers on a substrate on which the electroluminescent layer is formed.”).

E. Bae

Bae seeks to address problems inherent in prior art fabrication and assembly methods for OLED display devices. Ex. 1012, [0012]. Specifically, Bae is directed towards “an organic electro-luminescence display device and a method for fabricating the same, in which electrodes can be separated from one another in sub-pixels without using a conventional reverse-taper-shape separator.” *Id.*, [0016], [0058] (“Therefore, the space 534 can serve as a separator without providing a reverse-taper-shape separator that is used for a conventional organic electroluminescent display device. Because the conventional separator is not formed, the fabricating process can be simplified and the width of the sub-pixels can be increased, thereby improving the aperture ratio.”). Bae uses a blanket first electrode

132 and auxiliary electrode 139, to apply the common voltage to the sub-pixels. *Id.*, [0039].

F. Gupta

Gupta identifies problems with top emission OLED displays, which use common electrodes made from transparent conductive oxides. Ex. 1009, 1:39–56. (“*In a top emission OLED, light is extracted from a cathode side.* The cathode is optically transparent, while the anode is reflective. This top emission OLED normally enables a larger OLED aperture than a bottom emission OLED, since the top emission OLED is fabricated on top of TFT.”) (emphasis added). Specifically, Gupta stresses that designers face a performance trade off in which a balance must be struck between high optical transparency (which favors use of thin films) and low sheet resistance (which favors use of thicker layers). *Id.* Gupta teaches that a “bottom emission OLED may have a much smaller sheet resistance than the top emission OLED.” *Id.*, 1:57–58. Gupta teaches using “a conductive mesh or strip on top of the common electrode to reduce sheet resistance of the common electrode.” *Id.*, 1:67–2:2. A POSITA would have realized that Gupta’s teachings are applicable only to OLEDs with common ITO cathode. *Id.*, title, 1:8–12, 1:44–2:53, 4:50–5:32, 10:4–16; Ex. 2026 ¶ 48.

G. Han

Han generally relates OLED flat-panel light sources, specifically large area flat panel light sources. Ex. 1010, [0003]. Han seeks to improve the uniformity of light emission over large areas by using a plurality of branching electrodes. Ex. 1010, [0016]; Ex. 2026 ¶ 50. Han relates to light sources for general illumination, not displays of pixel arrays like in a TV or monitor. Ex. 2026, ¶ 51. The large area flat panel light sources of Han have different sizes and goals than the pixel array described in the '509 Patent. *Id.*



FIGURE 2.7 “V-LUX” OLED DESK LAMP AND “LIVINGSHAPES” INTERACTIVE OLED LIGHT AND MIRROR
Sources: Blackbody, Philips

Ex. 2021 at 15 (showing example OLED light sources for scale). The vastly larger size and different purpose of flat panel light sources led to different engineering problems. Ex. 2026, ¶ 51.

Han provides cross-sectional and plan views of a respective OLED in Figures 7A and 8, where 7A is taken along line m-m' of Figure 8. Ex. 1010, [0022], [0028]:

FIG. 7A

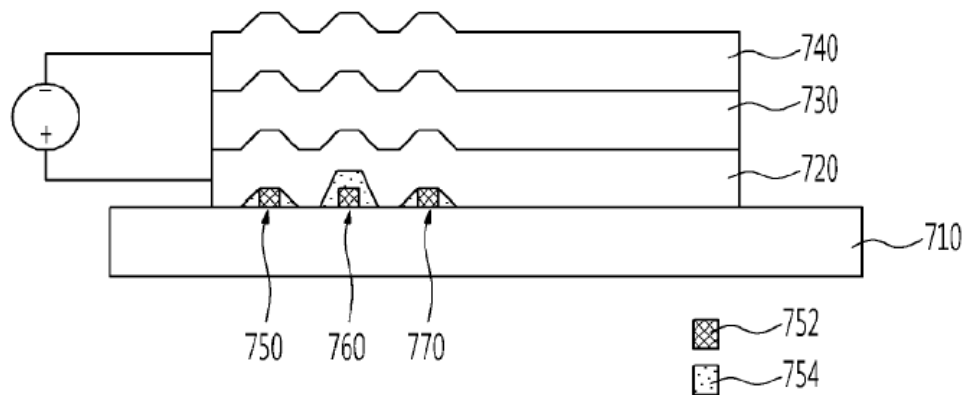
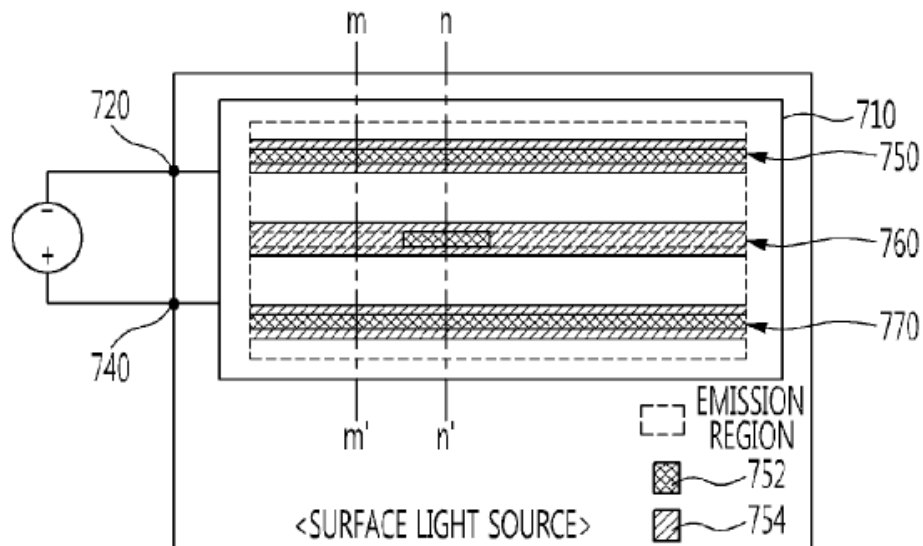


FIG. 8



Notably, a single anode 720, a single emissive light layer 730, and a single cathode 740 span the entire “Emission Region” shown by the dotted line in Figure 8. The

three branching electrodes are used to improve current distribution to the one anode 720 that is sized on the order of inches.

IV. PERSON OF ORDINARY SKILL (“POSITA”)

Contrary to Petitioner’s assertions, a POSITA for the ’509 Patent would have had experience with displays, specifically on the design and manufacture of LED or OLED pixel technology. Dr. Bretschneider considered the relevant factors and determined that a POSITA would have a person of ordinary skill in the art would have at least a Bachelors’ degree in a field of engineering or physics and at least two years of professional experience related to the design and manufacture of LED or OLED pixels for flat panel displays. Ex. 2026, §V. Additional graduate education, provided it included relevant semiconductor manufacturing or flat panel display technology, could reduce but not eliminate the time requirement for professional experience. *Id.*

A. Dr. Baker is Not a POSITA

Petitioner’s expert is not a POSITA for the ’509 Patent. Ex. 2026 ¶ 65. Petitioner’s expert does not have experience in the design and manufacture of LED and OLED displays. *Id.* The closest relevant experiences he conveyed were insufficient to gain adequate experience in LED and OLED pixel design. *Id.* For example, Petitioner’s expert pointed to his work at Cirque, Inc., but the experience he highlighted in his CV was about capacitive touch technology, not the design of

LEDs or OLEDs in pixels. *See* Ex. 2028, 37:19–38:3; Ex. 1003, p. 113 (“2013: Cirque, Inc. Consulting on the design of analog-to-digital interfaces for capacitive touch displays and pads.”). Dr. Bretschneider used the Wayback Machine to look at the products Cirque was offered in the relevant time frame Dr. Baker was working there, and posited that they would not have been the same technology as required for the manufacture of displays themselves. *See id.*; Ex. 2010 (“capacitance sensor panels are optically clear, touch sensitive panels that can be placed over LCD displays”).



Ex. 2010 at 1. Thus, Dr. Baker’s work at Cirque is not relevant because it involves different considerations and different technologies. Ex. 2026 ¶ 65. Otherwise, Dr. Baker’s work at Micron around 1994 did not involve designing LEDs and did not give him knowledge as of the invention 2013. *See* Ex. 2028, 21–25. Dr. Baker’s CRT experience is also not relevant because CRTs generate light by striking a phosphor with an electron, not with LEDs. Ex. 2026 ¶ 66.

Under the definition “a person of ordinary skill in the art would have at least a Bachelors’ degree in a field of engineering or physics and at least two years of

professional experience related to the design and manufacture of LED or OLED pixels for flat panel displays,” Petitioner’s expert is not a POSITA. Ex. 2026 ¶¶ 64–67. As such, the entire declaration of Petitioner’s expert has no evidentiary value. *See Kyocera Senco Indus. Tools Inc. v. ITC*, 22 F.4th 1369, 1377 (Fed. Cir. 2022) (excluding an expert’s testimony because “to be qualified to offer expert testimony on issues from the vantage point of an ordinarily skilled artisan in a patent case, an expert must at a minimum possess ordinary skill in the art” and the expert lacked ordinary experience in the art).

V. HINDSIGHT

Petitioner’s expert is not a POSITA, and he impermissibly relies on hindsight to reconstruct the language of the claims. “To draw on hindsight knowledge of the patented invention, when the prior art does not contain or suggest that knowledge, is to use the invention as a template for its own reconstruction—an illogical and inappropriate process by which to determine patentability.” *Sensonics, Inc. v. Aerosonic Corp.*, 81 F.3d 1566, 1570 (Fed. Cir. 1999).

Using the ’509 Patent as a template for its own reconstruction is exactly what Petitioner and its expert do here. For example, Petitioner and its expert (1) demonstrate reliance on hindsight on the record, (2) admit that the proposed modifications are outside the scope of what a POSITA’s knowledge, and (3) could not reconstruct the claims without reliance on hindsight, even after spending 115

hours reviewing the prior art, and (4) fail to identify any motivation to modify Weaver as they propose.

Thus, the petition is infested with hindsight, and the grounds cannot stand.

A. Hindsight on the Record

First, Petitioner's expert illustrated the hindsight process required to reach the claims of the '509 Patent during deposition.

Dr. Baker began his analysis by reviewing the '842 Patent before looking at the prior art to form an opinion about what was obvious. Ex. 2028 at 11:6–9.³ Thus, he looked at the solution before looking at the problem and became infected with hindsight. Dr. Baker was given the prior art to use for the Petition. Ex. 2028, 11:17–22.

During deposition, when asked how he would combine prior art references, Dr. Baker looked not only to the prior art that he was provided, but he also worked backward using the language of the patent claims to understand how prior art should be combined. Ex. 2022–2025; Ex. 2028, 197:2–14 (“Q[:] So to the extent that any other modifications you think are necessary and obvious, let me know now; otherwise, I will PDF this and get it committed as an exhibit. A[:] Well, just one sec.

³ Dr. Baker could not remember annotating his own figures; they were likely supplied to him to be used. Ex. 2028 at 95:10–12, 103:14–15, 106:7–20, 107:6–11, 116:14–22, 124:11–15, 150:2–5, 180:9–13, 183:2–11, 190:16–23.

I mean, Claim 11 teaches using the material 422. So you don't have an additional layer. So it'd probably be better to cover both Claims 10 and 11 with the modification, and you can easily do that by getting rid of the red box and just – or moving the red box to where it's on the same layer as 422 and then just extending it down to the -- yeah, kind of.”), 206:16 (“Hold on, let me look at the claim language”), 206:20–12 (“... let me read them, read the claim again.”).

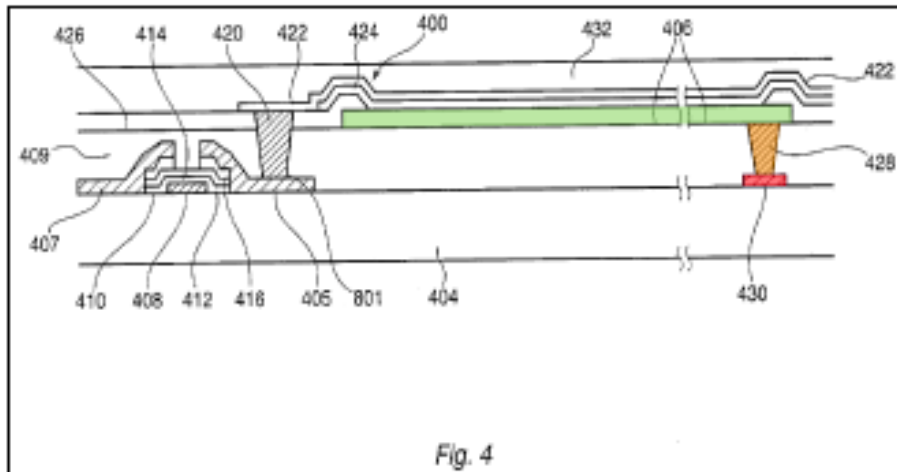
A video excerpt from the deposition shows Dr. Baker's effort to explain the result of his proposed modification and is filed in four parts as Exhibits 2022, 2023, 2024, and 2025. In this video, Dr. Baker is caught looking not only to the prior art, but also to the patent claims to determine how the prior art is to be combined. *See, e.g.,* Ex. 2022, 5:04–5:45 (regarding Ex. 2018, trying to combine Weaver and Lee149), 6:55–7:12 (regarding Ex. 2018, trying to combine Weaver and Lee149); Ex. 2023, 1:28–39 (regarding Ex. 2018, trying to combine Weaver and Lee149); Ex. 2024, 8:23–30 (regarding Ex. 2019, trying to combine Weaver and Bae).

B. Petitioner's Contradictory Positions Exposes Hindsight

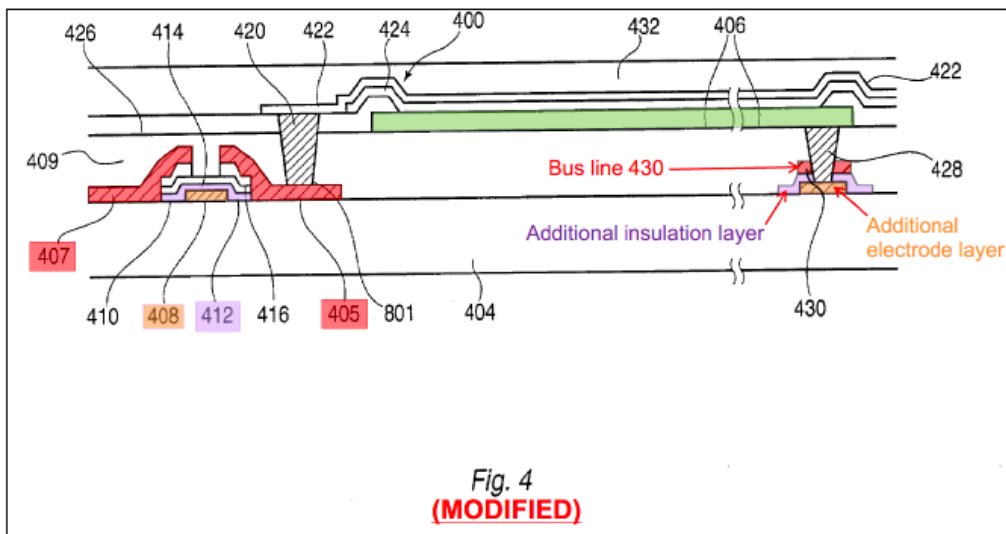
Dr. Baker takes numerous contradictory positions throughout his declaration (which are relied on in the Petition). The most fundamentally flawed position is Petitioner's expert's emphatic and repeated testimony that a “POSITA is not a person that is changing the process,” yet his proposed modifications involve changes to the fabrication process. Ex. 2028, 139:22–140:2 (“[A] POSITA is someone who

designs optoelectronic systems. They take components. They put them together . . . A POSITA is not a person that is changing the process . . .”), 137:15–22 (“[Q:] So could you please tell the board: Would a POSITA who had Weaver’s technology at the time of the invention, would this POSITA have or not have the freedom to modify the process? A[:] . . . [T]he question doesn’t make a lot of sense because it has the underlying . . . assumption that the POSITA would be able to modify the process), 137:23–138:15 (“I don’t know.”), 141:9–11 (“A POSITA is going to be somebody that makes an optoelectronic system using components that are already available.”); Petition at 33 (“The modification to Weaver could be implemented, for example, by adding an additional electrode layer electrically connected to the bus line 430 . . .”), 37 (“A POSITA would have been motivated to implement the solution of Lee053 in the Weaver device to manufacture the device more efficiently.”). Such modifications, which a POSITA would not have made, could only be rationalized by hindsight.

For example, Petitioner’s expert proposes modifications to Weaver that include extending via 428 through **bus line 430**, which the original structure of Weaver did not do:



Compare Ex. 1003, ¶ 98 (showing an annotated Ex. 1004, Fig. 4), with:



Ex. 1003, ¶ 130 (showing a proposed modification to Ex. 1004, Fig. 4).

Weaver's via 428 extends to bus line 430. That is, bus line 430 serves as an etch stop (meaning the method for etching the via 428 would not etch into bus line 430). See Ex. 2028 at 128:4–7 (“Etching in semiconductors is almost exclusively for removing entire areas. And there’s what’s called an ‘etch stop layer’ below the area that you’re trying to remove.”); Ex. 2026 ¶ 114. Thus, extending via 428 through

bus line 430 could only be done by changing the fabrication process by adding a step to etch through bus line 430 and the additional insulation layer.

To avoid the inconsistency of (1) asserting that a POSITA would not change the process while (2) simultaneously proposing the modification of extending a via through bus line 430, Petitioner's expert suggested during his deposition that bus line 430 would be deposited or patterned with a via hole so that the bus line 430 did not have to be etched. *See* Ex. 2028, 143:24–144:16, 187:17–188:1, 189:10–13. Depositing bus line 430 twice, leaving an opening in the middle for via 428, would effectively extend bus line 430 in a horizontal direction and widen it—something Dr. Baker said is impossible. Ex. 2028, 120:6–18 (impossible to increase cross-sectional area, which is thickness times width); *but see* Ex. 2028, 123:19–124:5 and 196:5–8 (flip-flopping and testifying that increasing width is possible).

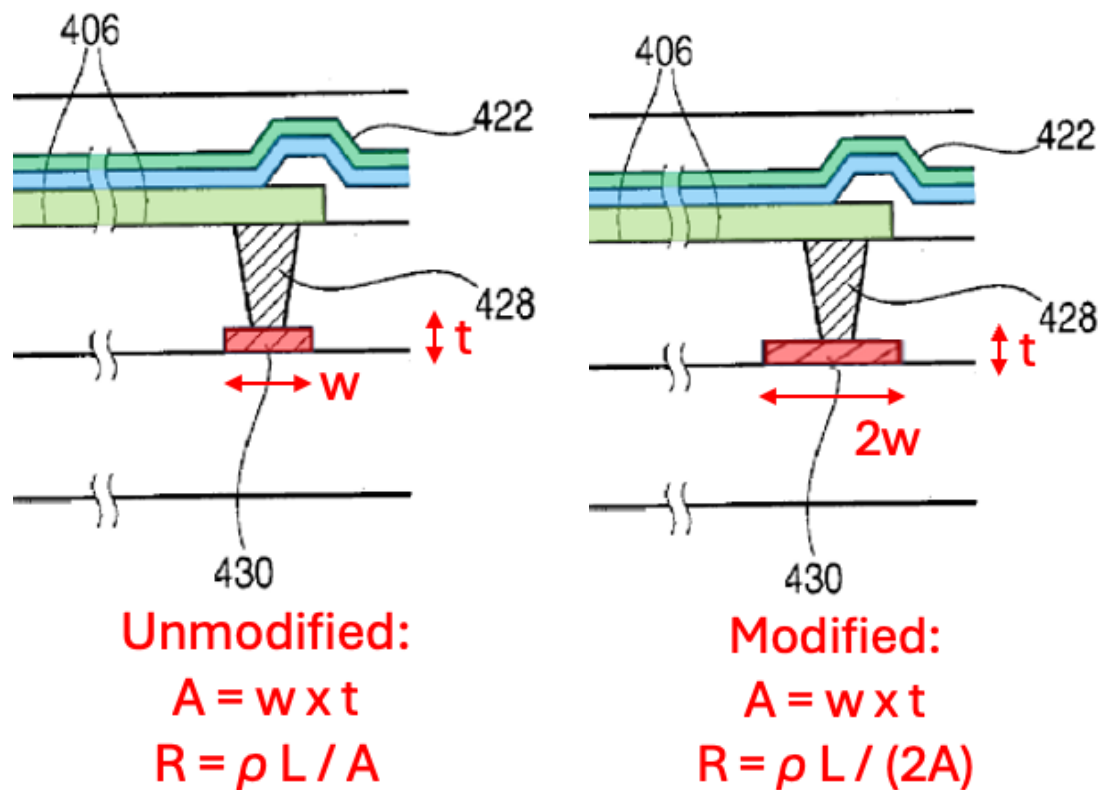
A POSITA would not have made the modification proposed by Dr. Baker. Ex. 2026 ¶ 115. Instead, a POSITA would simply have widened bus line 430 without the need for changing other layers and patterning, which would similarly lower resistance in a more reliable way. Ex. 2026 ¶¶ 165–66. Indeed, widening bus line 430 is exactly what Petitioner's expert proposes doing in several grounds, illustrating that it is a viable solution:



In summary, Dr. Baker said that a POSITA would not be able to modify the process to change the cross-sectional area (such as the thickness or width). Dr. Baker then proposes modifications that either require changing the process to 1) form vias through bus lines or 2) to increase the width of the bus line. If increasing the width of the bus line were possible and a POSITA wanted to lower the bus line resistance, then a POSTIA would make only the modification described by Dr. Bretschneider (increasing the width of the bus line). Ex. 2026 ¶¶ 165–66.

C. What a POSITA Would Have *Actually* Done:

Dr. Bretschneider explains, without hindsight, that if a POSITA wanted to modify Weaver's Figure 4 to reduce wiring resistance to the pixel structure, the POSITA would have easily done so by changing the width of the bus line 430, without adding the unnecessarily, complex, extraneous features proposed by Dr. Baker. Ex. 2026 ¶¶ 165–66. A POSITA would need only the freshman-level knowledge that resistance is inversely proportional to cross-sectional area (thickness times width) of the bus line, and the POSITA would have them made the bus line a little wider. *Id.* ¶ 165. The result is shown below:



Id. ¶¶ 165–66. Dr. Bretschneider further explains that a POSITA would have preferred this simpler modification over Dr. Baker’s proposals because Dr. Baker’s proposals “add unnecessary complexity that decrease yield and increase cost.” *Id.* ¶ 166.

D. Petitioner Fails to Identify a Motivation To Modify Weaver as Proposed

Petitioner fails to adequately identify a motivation to modify Weaver as proposed. Petitioner repeatedly states the motivation is to lower the Weaver device’s resistance. *See* Petition at 33, 47, 58, 67, 76.

If this were the case, a POSITA would have modified Weaver’s bus line 430 to be a bit wider, and that is it. Ex. 2026 ¶¶165–66. Otherwise, there is **no articulated motivation** for adding any of the other complex features from any other combination (such as other insulators, other vias, other metals, etc.), and there is **no evidence at all** that a POSITA would have done anything beyond increasing the width of the bus line 430. No POSITA would have engaged in the hindsight-fueled acrobatics suggested by Petitioner’s expert.

VI. Objective Indicia of Nonobviousness: Petitioner’s Expert Failed To Explain the Resulting Modification After Reviewing the Prior Art For 115 Hours

After 115 hours of reviewing the prior art and preparing his declaration, Dr. Baker could not describe how to draw the device that would result from his allegedly “obvious” combination. Objective evidence of nonobviousness includes: (1)

commercial success, (2) copying, (3) industry praise, (4) skepticism, (5) long-felt but unsolved need, and (6) failure of others. *See, e.g., Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling U.S., Inc.*, 699 F.3d 1340, 1349–56 (Fed. Cir. 2012). Here, Petitioner’s expert exemplified the “failure of others.”

Petitioner’s expert estimated spending between 115 hours preparing his declaration for the ’509 Patent and the related ’733 Patent, and eight hours reviewing his declaration in preparation for his deposition. Ex. 2028, 208:3–25, 212:3–15; Ex. 2029, 294:19–296:25. Even after studying the prior art for 115 hours, Petitioner’s expert was unable to show the result of his proposed modification/combination. Ex. 2028, 208:3–25, 212:3–15; Ex. 2029, 277:5–284:11 (testifying on redirect that he was still not sure he would draw the modifications as he described during deposition), 294:19–296:25; Ex. 2022; Ex. 2023; Ex. 2024; Ex. 2025. Instead, Dr. Baker’s inability to combine the references as he himself proposed despite 115 hours of preparation is affirmative evidence that it is not obvious how Weaver can be modified. *See, e.g., Volvo Penta of the Americas, LLC v. Brunswick Corp.*, 81 F.4th 1202 (Fed. Cir. 2023) (vacating and remanding to the Board for failing to properly consider evidence of objective indicia of nonobviousness).

VII. CLAIM CONSTRUCTION

The Federal Circuit has held that “only those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.” *Vivid*

Techs., Inc. v. Am. Sci. & Eng'g, Inc., 200 F.3d 795, 803 (Fed. Cir. 1999). This principle applies equally to IPR proceedings. *See, e.g., Apple Inc. v. Uniloc Luxembourg S.A.*, IPR2018-00420, Paper 7 at 8 (PTAB, Aug. 6, 2018).

Patent Owner respectfully maintains that the proper construction of “auxiliary electrode” under plain and ordinary meaning, precludes the prior art references.

A. “auxiliary”

Patent Owner submits that the term “auxiliary” should be afforded its plain and ordinary meaning. Something that is auxiliary is supplemental to something else that is primary and essential. Ex. 2026, ¶¶ 95–103; Ex. 2017 ¶¶ 55–65. An auxiliary electrode cannot itself provide a primary, essential connection.

The plain meaning of “auxiliary” is something that is subsidiary or supplemental to another thing that is primary. Ex. 2014 at 94 (“acting as a subsidiary; supplementary”); Ex. 2015 at 94 (“additional; supplementary; reserve”); Ex. 2016 at 77 (“acting as a subsidiary”). For example, “auxiliary” when used in the power context could refer to a back-up power source, like a battery or generator, that would be used to supplement a main power source, like a city power grid. The definition from a technical-focused dictionary cited by Petitioner similarly defines an “auxiliary anode” as “a supplementary anode utilized to obtain a better distribution of plating,” not as the primary anode that provides an essential connection. Ex. 1013 at 51.

BOE seeks to broadly interpret “auxiliary” to mean any electrode other than the first electrode. In other words, BOE seeks to construe “auxiliary electrode” as merely a “second electrode.” Ex. 2028, 69:6–8. This position is inconsistent with the language of claims 10 and 11. Claims 10 and 11 recite a “second auxiliary electrode.” Claims 10 and 11 are consistent with the plain and ordinary meaning of “auxiliary,” and these claims show that the inventors used the word “auxiliary” to have a distinct meaning from the word “second.” But this makes claims 10 and 11 nonsensical, as these claims would require a “second second electrode.”

The specification also confirms that “auxiliary” is meant to refer to something that is not primary and essential. The specification describes embodiments where the auxiliary electrode can be “coordinated” with the first electrode layer to “reduce the resistance of the first electrode layer 132” and that the design of the “auxiliary electrode” can be coordinated with “other suitable electrode layers or conductive layers.” Ex. 1001 at 5:63-6:13, 8:14-33. In an embodiment using a second “auxiliary” electrode, it is also described as providing additional functionality to the first electrode layer. *Id.* at 7:43-60. In other words, consistent with the plain meaning of “auxiliary,” the specification describes the “auxiliary electrodes” as providing supplemental functionality to the first electrode layer. It is not simply an additional electrode.

Further, Petitioner's expert opines that "the claims do not explicitly state what function or characteristic existed without the auxiliary electrode that has been supplemented with the auxiliary electrode." Ex. 1003, ¶ 56. In deposition, Petitioner's expert further explained that his opinion was that "auxiliary" electrode is anything other than claimed first electrode layer. Ex. 2028 at 69:1–70:4. Petitioner's expert seems to consider "auxiliary electrode" without the context of the remainder of the intrinsic evidence. The claims, when read in the context of the plain meaning of "auxiliary" and the specification, tell a POSITA that the "function or characteristic" being supplemented by the "auxiliary electrode" is the "function or characteristic" of the first electrode layer. One of the examples used in the specification is a parallel arrangement that would reduce resistance. In that embodiment, the electrode is "auxiliary" because it is not the primary and essential electrode but provides the supplemental functionality of allowing for the electrodes to reduce the resistance of the pixel structure. Conversely, without the auxiliary electrode in this preferred embodiment, the first electrode layer would still result in an operable pixel structure, but it would have higher resistance. Even Dr. Baker admitted this. Ex. 2028, 96:4–11.

This function of a preferred embodiment is explicitly stated in the specification of the '509 patent. "Therefore, the design of the invention that coordinates the first electrode layer of the light emitting device with the auxiliary

electrode decreases the resistance of the first electrode layer through parallel connection, so as to significantly reduce the total resistance of the pixel structure, thereby improving the overall luminous uniformity of the display panel.” Ex. 1001, 2:17-23. Thus, a POSITA reading the specification clearly understands at least one function of the auxiliary electrode in a preferred embodiment, namely to reduce the resistance of the first electrode layer and thereby reduce the total resistance of the pixel structure.

Accordingly, “auxiliary” should be afforded its plain and ordinary meaning, which does not include primary and essential.

B. “electrode”

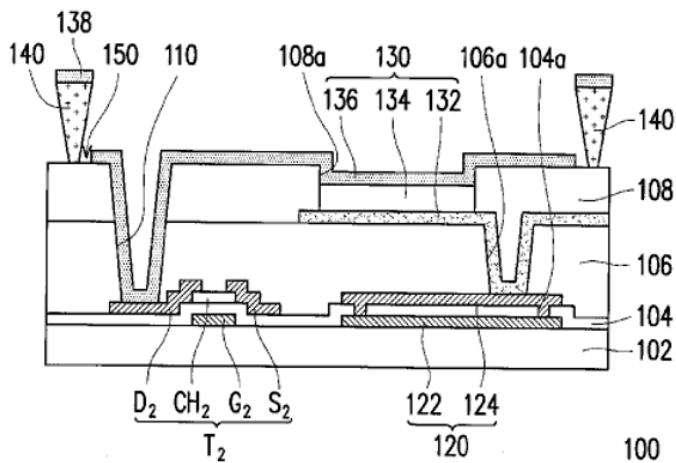
Consistent with the proposed construction in the co-pending district court litigation, Patent Owner submits that the term “electrode” should be afforded its plain and ordinary meaning, which means end structure of a conductor for making electrical contact. Ex. 2026, ¶ 104–08; Ex. 2017 ¶¶ 66–73.

According to the dictionary cited by Petitioner, an “electrode” is an electrical conductor that “provides the path for current entering or leaving a medium such as a dielectric [or] semiconductor.” Ex. 2012 at 237. Other dictionaries recite similar definitions. *See, e.g.*, Ex. 2013 at 694 (“an electric conductor through which an electric current enters or leaves a medium, whether it be an electrolytic solution, solid, molten mass, gas, or vacuum”). Both of the definitions are consistent with

Patent Owner’s proposed construction and the understanding of the term to a POSITA. Neither of these definitions apply to an entire intermediary structure, like a bus line.

Nothing in the claims or specifications expand the definition of electrode as to be any conductor. *Contra* Ex. 2028, 69:6–8 (“Q[:] And what do you mean by “supplemental [electrode]”? A[:] An additional electrode. An additional conductor.”). In the claims, the “electrode” layers and auxiliary “electrode” are electrically connected to each other, and the first “electrode” layer is electrically connected to the active device. Like its plain and ordinary meaning, “electrode” is used as an end point, not the road to get to an end point. The specification of the ’509 Patent contains a similar disclosure. *See, e.g.*, Ex. 1001 at 4:5-56, 5:25-6:21, 6:29-58, 7:1-60, 8:4-23. The file history does not alter the plain meaning of the term “electrode.”

Additionally, a construction of “electrode” to mean a power line would contradict the specification. In the ’509 Patent, the power line “PL” is shown in Figure 1, but the power line PL is not an electrode that is shown in Figure 2. Ex. 1001 at 3:32–42 (“the power line PL, and so on are omitted from FIG. 2”).



“the power line PL, and so on are omitted from FIG. 2”

Ex. 1001, cover (annotated). Because the '509 Patent's power line corresponds to Weaver's bus line 430, neither of these are the electrodes shown and described by the '509 Patent with respect to Figure 2.

Accordingly, “electrode” should be given its plain and ordinary meaning, which is an “end structure of a conductor for making electrical contact.”

VIII. GROUND 1 (WEAVER § 102, CLAIMS 1-5, 9, 12-13)

Weaver fails to anticipate the '509 Patent because it does not disclose every element of the claims, as discussed below.

A. All Claims: Weaver Does Not Disclose an “Auxiliary Electrode”

The term “auxiliary” is applied in this section using its plain and ordinary meaning, which does not include primary and essential. *See* §VII, *supra*. The term “electrode” is also applied using its plain and ordinary meaning, which is an end structure of a conductor for making electrical contact. *See* §VII, *supra*.

Petitioner relies on Weaver’s **bus line 430** for the claimed “first auxiliary electrode,” but this reading based on an overly broad interpretation of the terms that is incorrect and based on hindsight. *See, e.g.*, Petition at 16 (alleging that Weaver discloses “a first auxiliary electrode (**bus line 430**)” for claim [1c]), 19 (same for claim [1d]), 20 (same for claim [1e]); Ex. 2026, ¶122.

Weaver does not provide a definition for the term “bus line.” *See* Ex. 1004. Patent Owner submits that the term “bus line” be afforded its plain and ordinary meaning, which means a wire or conductor in a conducting system or supply point. Ex. 2026, ¶ 123; *see also*, Ex. 2011 at 86 (“bus[:] . . . a conducting system or supply point, usually of large capacity. May be composed of one or more conductors, which may be wires, cables or metal bars (busbars).”), 88 (“bus line[:] one of the wires or conductors that constitute a bus . . .”). Such a definition is consistent with the teachings of Weaver and what a POSITA would have understood Weaver’s **bus line 430** to be. Ex. 2026, ¶ 123.

As Dr. Bretschneider posits, a POSITA immediately understood Weaver’s **bus line 430** was the sole mechanism for transporting electricity to the pixel structure. Ex. 2026, ¶124. In other words, Weaver’s **bus line 430** is connected *in series* with **anode 406**—the electricity flows from **bus line 430** to **anode 406** through point contacts (vias 428):

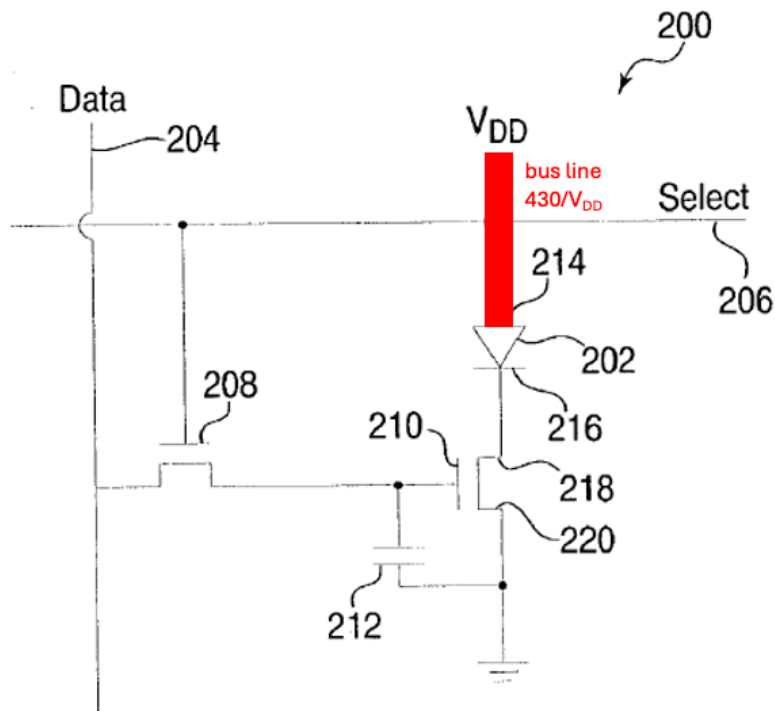
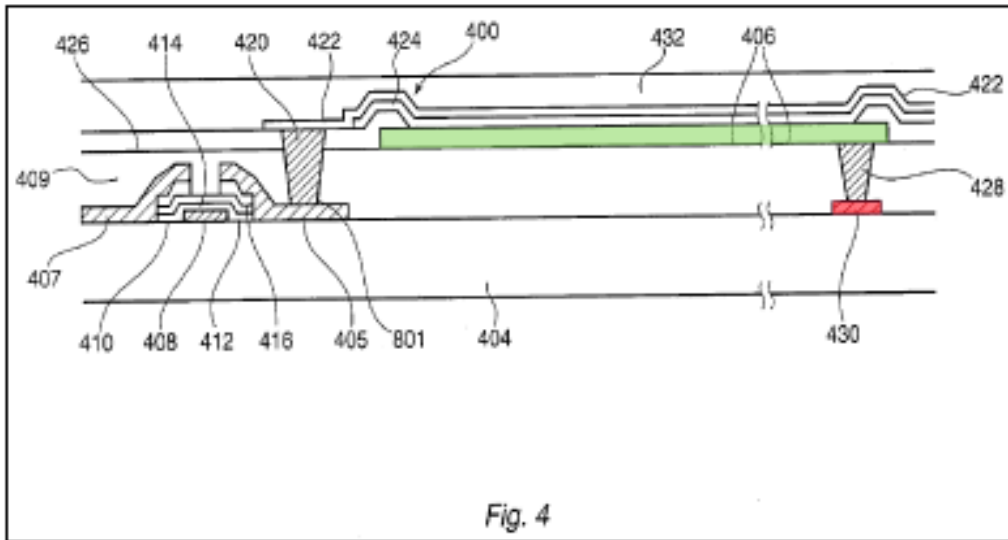


Fig. 2

Ex. 1004, Figs. 2 and 4 (annotated). If **bus line 430** were removed, Weaver would cease to function because the diode would be deprived of its primary power source.

Thus, **bus line 430** is not “auxiliary” because it is primary and essential to the operation of the pixel structure. Ex. 2026 ¶ 125. In other words, **bus line 430** is not secondary, supplemental, or parallel with a primary connection to the power supply.

For comparison, the **bus line 430** of Weaver corresponds to the “power line PL” of the ’509 Patent which is **not shown** in Figure 2. Ex. 1001, 3:32–43 (“the power line PL, and so on are omitted from FIG. 2”), Figs. 1–2.

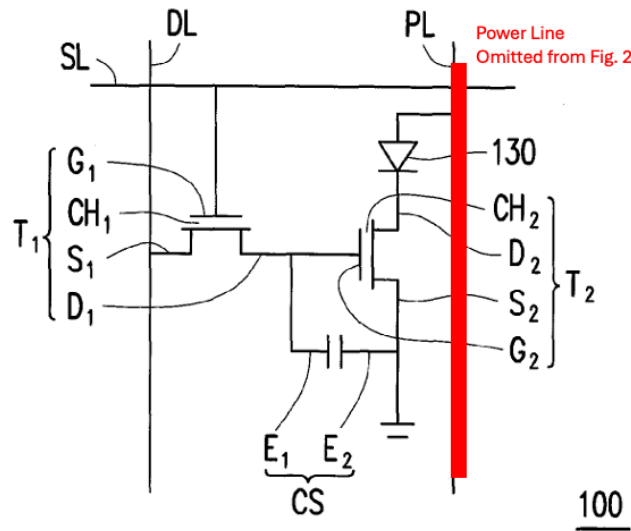


FIG. 1

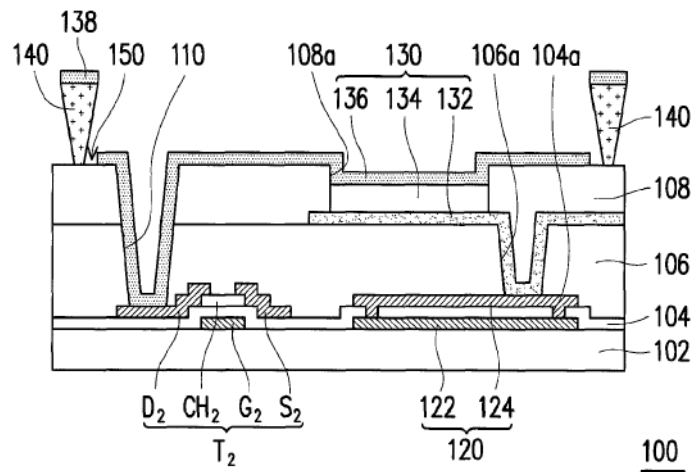
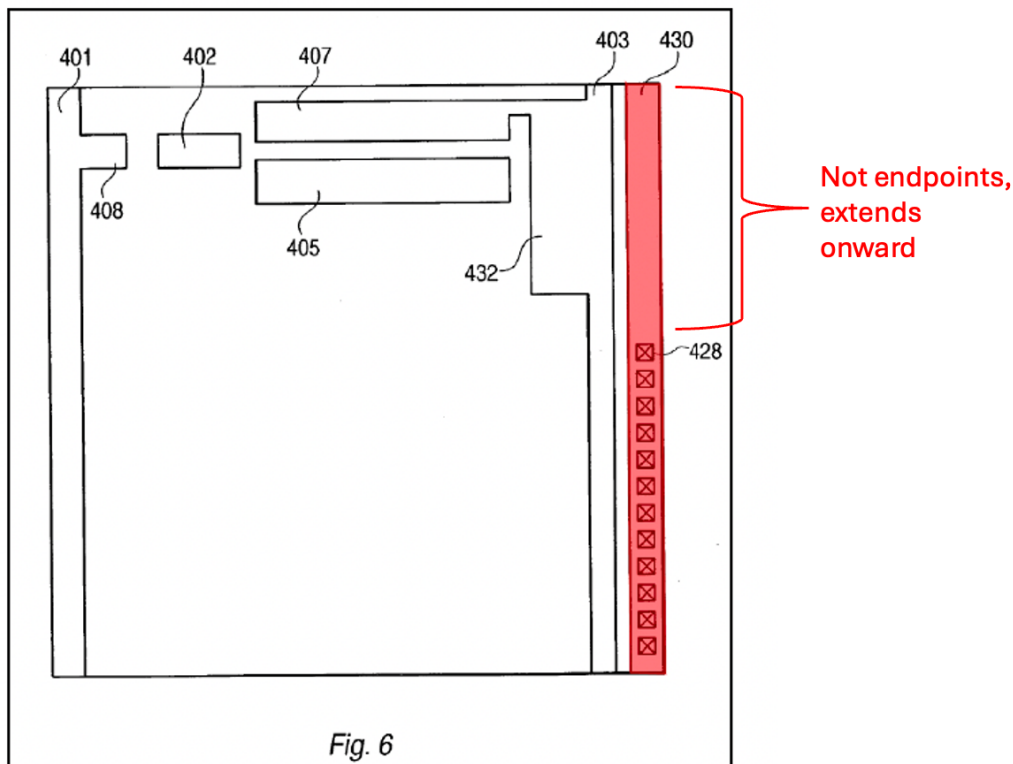


FIG. 2

Id. at Figs. 1–2. Both the **bus line 430** of Weaver and the power line PL of the '509 Patent provide connections from the LED to a power source. Thus, because the **bus line 430** of Weaver corresponds to a component omitted from Figure 2, the **bus line**

430 of Weaver cannot correspond to the auxiliary electrode that is shown in Figure 2 of the 509 Patent.

Further, **bus line 430** is not an “electrode” under the plain and ordinary meaning of the term, which is “an end structure of a conductor for making electrical contact.” **Bus line 430** is not an electrode because it includes far more than just the end structure of a conductor for making electrical contact—that is, it encompasses the entirety of the bus line, not just the end structure.



Ex. 2026 ¶ 127. Petitioner simply identifies a wire in a conducting system or supply point by pointing at **bus line 430**. See Ex. 2026, ¶127; Ex. 2011 at 86, 88. This is

wholly inconsistent with what a POSITA would understand the term electrode to encompass under its plain and ordinary meaning.

Accordingly, Weaver fails to disclose an “auxiliary electrode,” which is recited in independent claim 1. Claims 2–5, 9, and 12–13 depend from claim 1 and are not anticipated for at least the same reasons.

IX. GROUND 2 (WEAVER, LEE053 § 103, CLAIMS 6-8)

A. Lee053 Does Not Cure The Deficiencies of Weaver

Lee053 does not cure the fact that Weaver’s bus line 430 is not an auxiliary electrode under the plain and ordinary meaning of the terms. *See* §VIII.A, *supra*. Specifically, the term “auxiliary” is applied in this section using its plain and ordinary meaning, which does not include primary and essential. *See* §VII, *supra*. The term “electrode” is also applied using its plain and ordinary meaning, which is an end structure of a conductor for making electrical contact. *See* §VII, *supra*.

Because Lee053 is not used to cure the deficiency of Weaver with independent claim 1, dependent claims 6–8 are not anticipated for at least the same reasons discussed above for independent claim 1. *See* §VIII.A, *supra*.

B. Hindsight/No Motivation to Combine

A POSITA would not combine Weaver and Lee053.

As is apparent in the ground itself and stated explicitly by Dr. Bretschneider, “[t]here is no clear way to get around that the proposed modifications to Weaver

would involve changing the process” under Dr. Baker’s own theory. Ex. 2026, ¶131 (emphasis in original). Specifically, and as discussed in §V.B, Weavers **bus line 430** is an etch stop, meaning it cannot be etched without changing the process. Further, Petitioner’s attempt to get around this by suggesting that **bus line 430** is patterned around via 428 is plain hindsight because it would increase the total width of **bus line 430**, which increases the cross-sectional area, and this was something that Dr. Baker said could not be done. Ex. 2028, 120:6–9; *see* §§V.D, V.B, *supra*. If the width could in fact be changed, then there is no reason for the unnecessarily complex structure; changing the width of the bus line alone would accomplish the same thing. Ex. 2026 ¶¶ 165–66; Ex. 2028 at 123:22–124:5, 196:3–8.

Lee053’s design uses “dummy wiring.” There is no structure in Weaver that corresponds to the “dummy wiring” of Lee053 that can be used. Petitioner proposes modifying the structure of Weaver by adding an “additional electrode layer” and “additional insulation layer” and extending via 428 through **bus line 430**:



Petition at 34.

Accordingly, a POSITA would not make the proposed combination, and the only way this modification could be reached is with the use of hindsight. *See* Ex. 2026, ¶ 133, ¶¶ 165–66. Therefore, the Petition’s obviousness theory is based on an improper combination of Weaver and Lee053 and must fail.

X. GROUND 3 (WEAVER, SONG § 103)

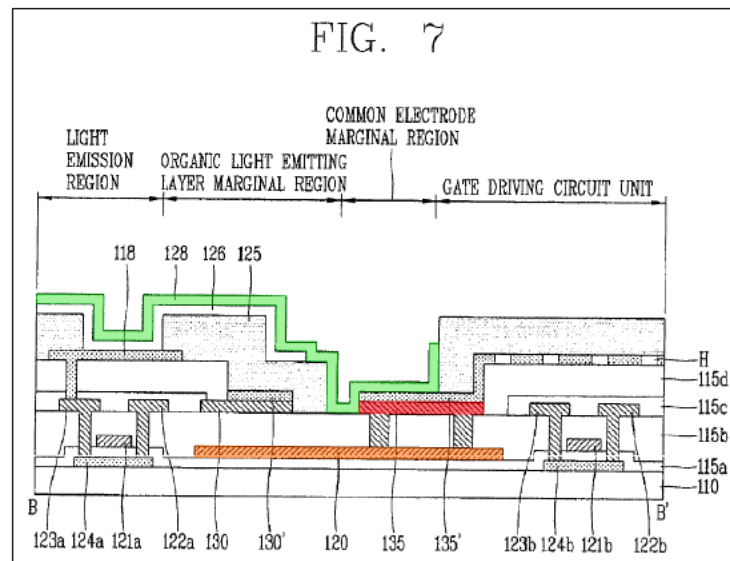
A. Song Does Not Cure the Deficiencies of Weaver

Song does not cure the fact that Weaver’s bus line 430 is not an auxiliary electrode under the plain and ordinary meaning of the terms. *See* §VIII.A, *supra*. Specifically, the term “auxiliary” is applied in this section using its plain and ordinary meaning, which does not include primary and essential. *See* §VII, *supra*. The term “electrode” is also applied using its plain and ordinary meaning, which is an end structure of a conductor for making electrical contact. *See* §VII, *supra*.

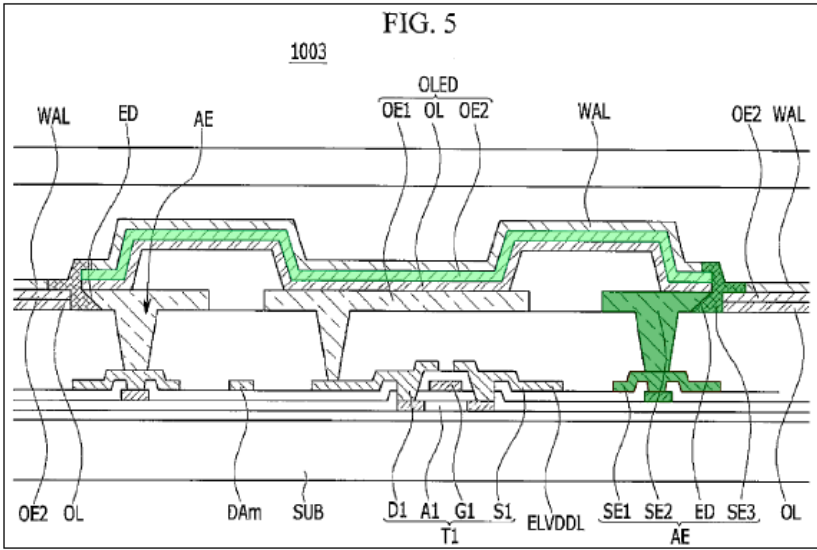
Because Song is not used to cure the deficiency of Weaver with independent claim 1, dependent claims 6–8 are not anticipated for at least the same reasons discussed above for independent claim 1. *See* §VIII.A, *supra*.

B. Hindsight/No Motivation to Combine

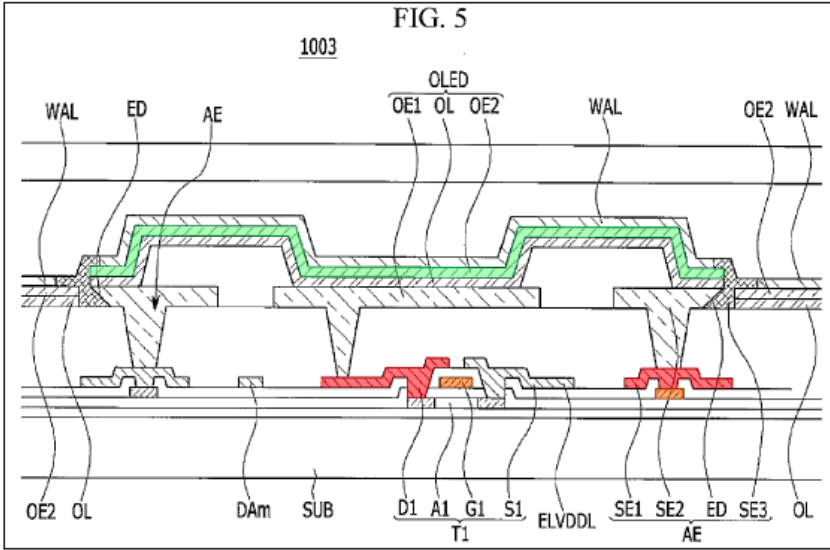
As an initial matter, Petitioner, relying on its expert, submits that the combination of Weaver and Song would result in an identical structure to that of Weaver and Lee053, despite Lee053 and Song having entirely different structures:



Ex. 1003, ¶124 (annotated Ex. 1005, Fig. 7, showing dummy wiring 120).



Ex. 1003, ¶64 (annotated Ex. 1006, Fig. 5, showing auxiliary electrode AE).



Ex. 1003, ¶ 151 (annotated Ex. 1006, Fig. 5, breaking down SE1 into process steps saying “the first auxiliary electrode portion SE1 is formed of two sublayers (a **top electrode layer** and a **bottom electrode layer**)”). Petitioner’s pointing to selective portions of Song’s **auxiliary electrode AE** while divorcing the overall structure is nothing more than a hindsight-based attempt to map Song to the language of the

claims. Song’s **auxiliary electrode AE** plainly involves a multifaceted structure that extends over a portion of the anode, which is a complex and completely different design from that of Lee, which teaches using “dummy wiring” that is not part of a larger, complex structure. Asserting that the vastly different structures taught by Lee053 and Song would result in the exact same modification to Weaver is further indicative of hindsight required to meet the language of the claims.

Further, as discussed above in §IX.A, a POSITA would not make the proposed modification to Weaver and Song because it involves changing the process. Ex. 2026, ¶138; *see* Ex. 2028, 139:22–140:2 (“[A] POSITA is someone who designs optoelectronic systems. They take components. They put them together . . . A POSITA is not a person that is changing the process . . .”), *see also id.*, 137:15–22 (“[Q:] So could you please tell the board: Would a POSITA who had Weaver’s technology at the time of the invention, would this POSITA have or not have the freedom to modify the process? A[:] . . . [T]he question doesn’t make a lot of sense because it has the underlying . . . assumption that the POSITA would be able to modify the process), 141:9–11 (“A POSITA is going to be somebody that makes an optoelectronic system using components that are already available.”).

Accordingly, a POSITA would not make the proposed combination of Weaver and Song, and the only way this modification could be reached is with the use of

hindsight. Ex. 2026, ¶ 140. Therefore, the Petition’s obviousness theory is based on hindsight and must fail.

XI. GROUND 4 (WEAVER, LEE149 § 103)

A. Lee149 Does Not Cure the Deficiencies of Weaver

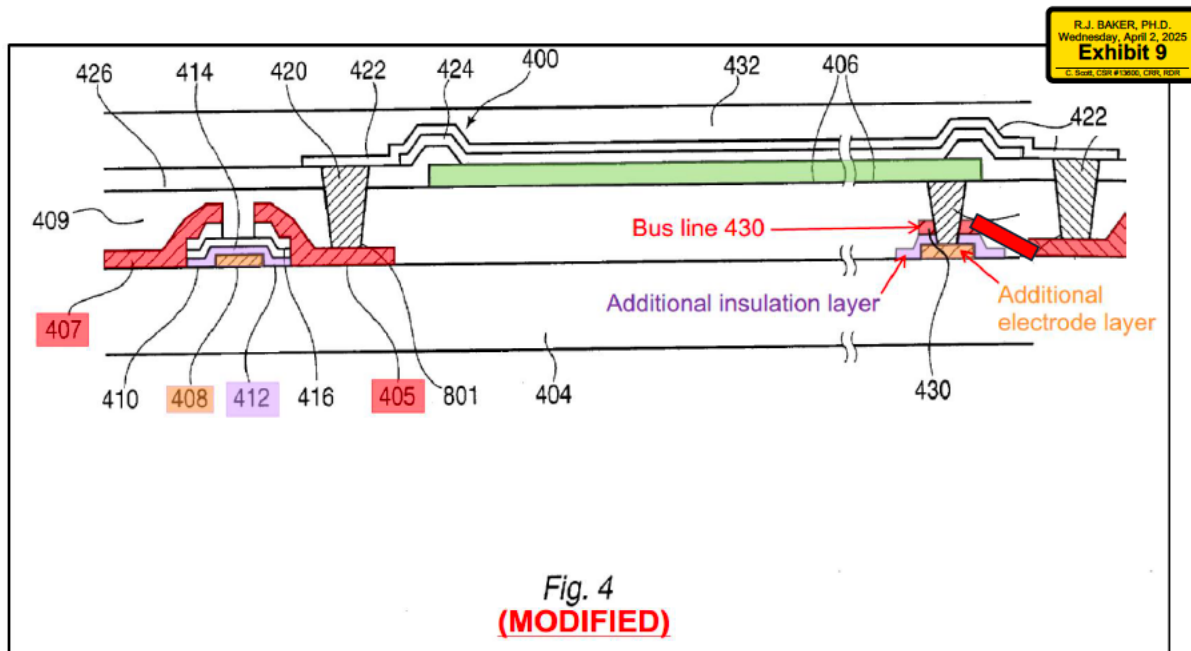
Lee149 does not cure the fact that Weaver’s bus line 430 is not an auxiliary electrode under the plain and ordinary meaning of the terms. *See* §VIII.A, *supra*. Specifically, the term “auxiliary” is applied in this section using its plain and ordinary meaning, which does not include primary and essential. *See* §VII, *supra*. The term “electrode” is also applied using its plain and ordinary meaning, which is an end structure of a conductor for making electrical contact. *See* §VII, *supra*.

Because Lee149 is not used to cure the deficiency of Weaver with independent claim 1, dependent claims 10–11 are not anticipated for at least the same reasons discussed above for independent claim 1. *See* §VIII.A, *supra*.

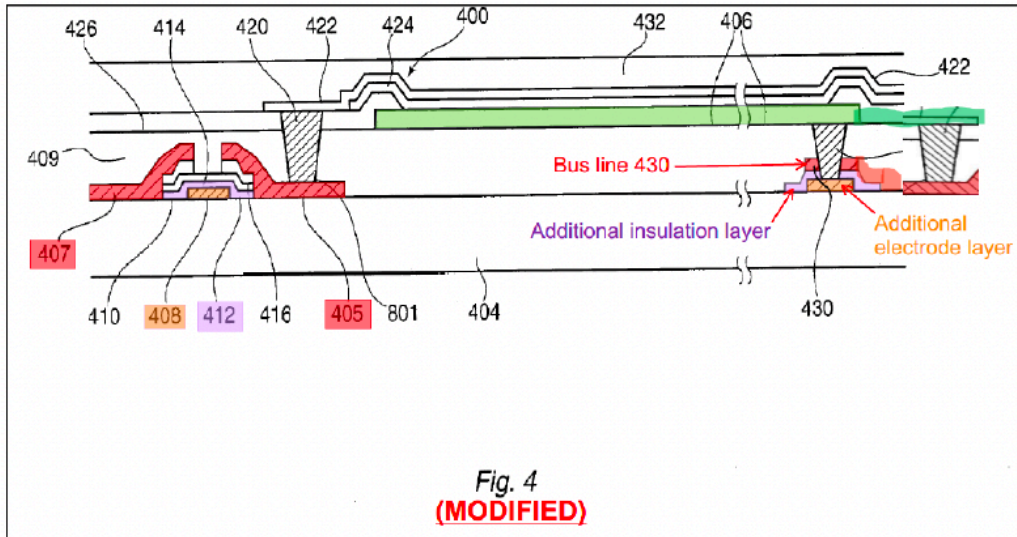
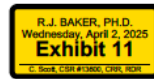
B. Hindsight/No Motivation to Combine

Petitioner’s combination of Weaver and Lee149 is impermissible and based on hindsight. For instance, Petitioner and its expert do not even illustrate how the resulting combination would be implemented—they merely provide a paragraph with a conclusory, high-level description of how to modify the process of Weaver. *See* Petition at 62. When asked during his deposition how to depict the proposed

exhibit 11 is a later correction to deposition exhibit 9):



Weaver and Lee149).



Ex. 2020 (Deposition Exhibit 11); Ex. 2028, 206:14–212:25; Ex. 2025, 5:47–8:14.

First, these structures suffer the same shortcomings described in in §§V.B and V.D. Additionally, these structures openly demonstrate increasing the width of **bus line 430**, and Petitioner fails to explain why a POSITA who could increase the width of **bus line 430** (and thus, already lowered the bus line resistance) would further need to include an “additional electrode layer.” *See* Ex. 1003, ¶ 182; Ex. 2026, ¶¶ 144, 165–66. The structure depicted by Petitioner is plainly based on impermissible hindsight in an attempt to reconstruct the language of the claims. *See Sensonics, Inc* 81 F.3d 1566, 1570 (“To draw on hindsight knowledge of the patented invention, when the prior art does not contain or suggest that knowledge, is to use the invention as a template for its own reconstruction—an illogical and inappropriate process by which to determine patentability.”).

Indeed, while creating these structures, Petitioner's expert demonstrates his use of hindsight on the record by using the '905 Patent claims 10 and 11 as guidance. *See, e.g.*, Ex. 2022, 5:04–5:45 (regarding Ex. 2018, trying to combine Weaver and Lee149), 6:55–7:12 (regarding Ex. 2018, trying to combine Weaver and Lee149); Ex. 2023, 1:28–39 (regarding Ex. 2018, trying to combine Weaver and Lee149); Ex. 2028, 197:2–14 (“Q[:] So to the extent that any other modifications you think are necessary and obvious, let me know now; otherwise, I will PDF this and get it committed as an exhibit. A[:] Well, just one sec. I mean, Claim 11 teaches using the material 422. So you don't have an additional layer. So it'd probably be better to cover both Claims 10 and 11 with the modification, and you can easily do that by getting rid of the red box and just – or moving the red box to where it's on the same layer as 422 and then just extending it down to the -- yeah, kind of.”). Petitioner's expert exemplifies hindsight that Petitioner and its expert rely on throughout the petition in order to retroactively map the combinations of references to the language of the claims. This is improper and is not indicative of what a POSITA would have been motivated to do.

Finally, at the end of the deposition, Dr. Baker admitted that he still did not know how he would have drawn the resulting combination. Ex. 2029, 278:5–17. As of April 3, 2025, after his 115 hours of preparation and two days of deposition, Dr.

Baker still did not know how to draw out the result of the allegedly “obvious” modification.⁴

XII. GROUND 5 (WEAVER, BAE § 103)

A. Bae Does Not Cure the Deficiencies of Weaver

Bae does not cure the fact that Weaver’s bus line 430 is not an auxiliary electrode under the plain and ordinary meaning of the terms. *See* §VIII.A, *supra*. Specifically, the term “auxiliary” is applied in this section using its plain and ordinary meaning, which does not include primary and essential. *See* §VII, *supra*. The term “electrode” is also applied using its plain and ordinary meaning, which is an end structure of a conductor for making electrical contact. *See* §VII, *supra*.

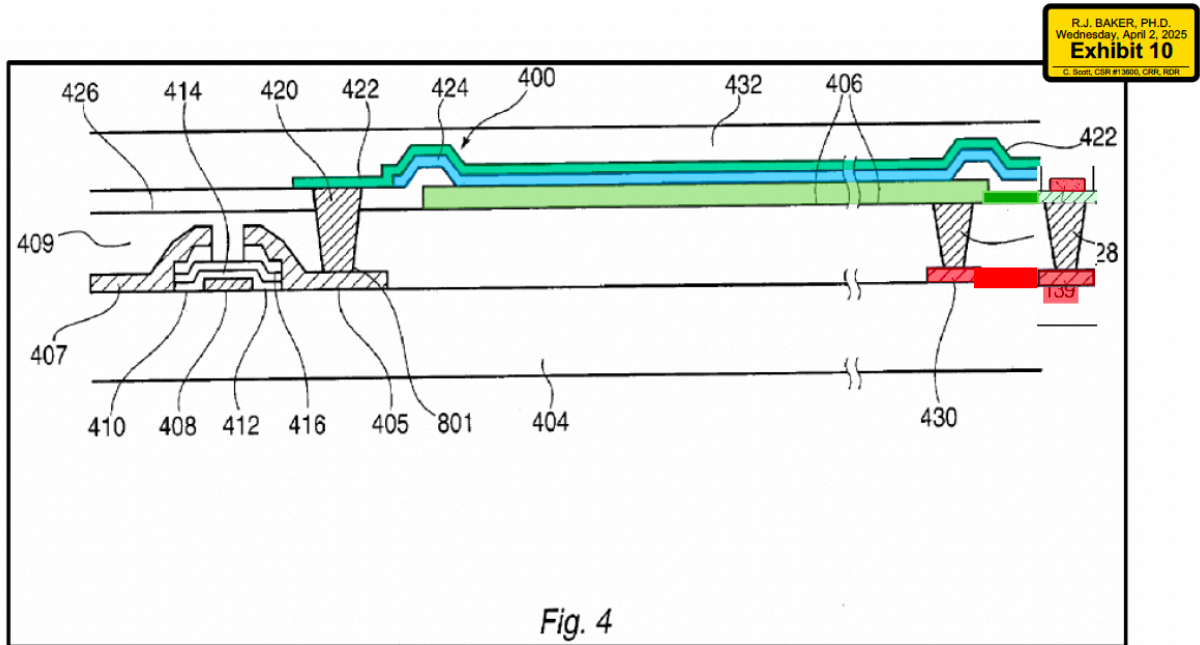
Because Bae is not used to cure the deficiency of Weaver with independent claim 1, dependent claims 10–11 are not anticipated for at least the same reasons discussed above for independent claim 1. *See* §VIII.A, *supra*.

B. Hindsight/No Motivation to Combine

Petitioner’s combination of Weaver and Bae is impermissible and based on hindsight. For instance, Petitioner and its expert do not even illustrate how the resulting combination would be implemented—they merely provide a paragraph with a conclusory, high-level description of how to modify the process of Weaver.

⁴ Besides serving as objective indicia of non-obviousness, it is fundamentally unfair to Patent Owner, who is not put on notice of what the resulting device actually is.

See Petition at 66. When asked during his deposition how to depict the proposed modification of Weaver, Petitioner's expert directed the resulting figure:



Ex. 2019; Ex. 2028, 202:18–209:15; Ex. 2024, 8:23–30.

The above structure showcases the shortcomings described in §V.B, as it openly demonstrates increasing the width of **bus line 430**. See Ex. 2026, ¶149. Indeed, while creating these structures, Petitioner's expert openly demonstrates his use of hindsight on the record. Ex. 2028, 205:18–22 (“For Claim 11, I think it requires that the -- let me read Claim 11.”); *see also id.*, 197:2–14 (“Q[:] So to the extent that any other modifications you think are necessary and obvious, let me know now; otherwise, I will PDF this and get it committed as an exhibit. A[:] Well, just one sec. I mean, Claim 11 teaches using the material 422. So you don't have an

additional layer. So it'd probably be better to cover both Claims 10 and 11 with the modification, and you can easily do that by getting rid of the red box and just – or moving the red box to where it's on the same layer as 422 and then just extending it down to the -- yeah, kind of.”), 206:16 (“Hold on, let me look at the claim language”), 206:20–12 (“... let me read them, read the claim again.”). Petitioner's expert exemplifies hindsight that Petitioner and its expert rely on throughout the petition in order to retroactively map the combinations of references to the language of the claims. This is improper and is not indicative of what a POSITA would have been motivated to do.

Finally, at the end of the deposition, Dr. Baker again admitted that his demonstrative drawings were inaccurate. Ex. 2029, 286:11–288:13. As of April 3, 2025, after his 115 hours of preparation and two days of deposition, Dr. Baker remained unable to draw out the result of the allegedly “obvious” modification.

XIII. GROUND 6 (WEAVER, GUPTA OR HAN § 103)

If the Petitioner failed to carry its burden under Gound 1 under Petitioner's broadest claim constructions, there is no need for the PTAB to consider the redundant grounds 6–10, which use narrower constructions. Ex. 2028, 99:16–102:14; Ex. 2029, 291:7–292:24.

A. Gupta or Han Do Not Cure the Deficiencies of Weaver

Neither Gupta nor Han cure the fact that Weaver’s bus line 430 is not an auxiliary electrode under the plain and ordinary meaning of the terms. *See* §VIII.A, *supra*. Specifically, the term “auxiliary” is applied in this section using its plain and ordinary meaning, which does not include primary and essential. *See* §VII, *supra*. The term “electrode” is also applied using its plain and ordinary meaning, which is an end structure of a conductor for making electrical contact. *See* §VII, *supra*.

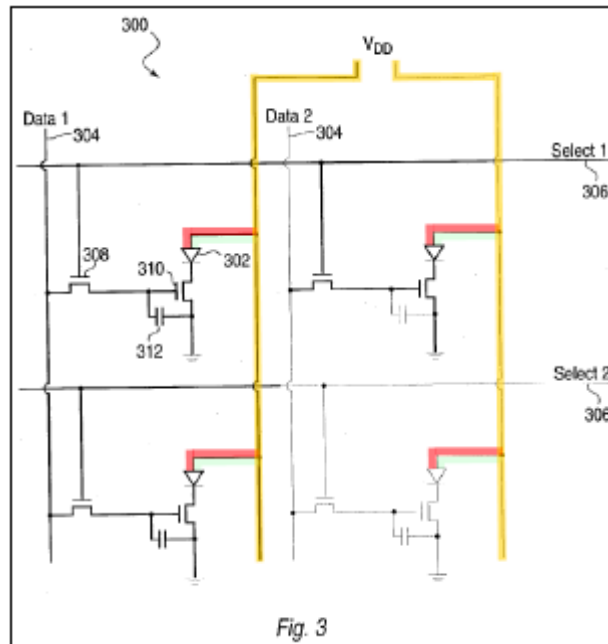
Because Gupta and Han are not used to cure the deficiency of Weaver with independent claim 1, dependent claims 10–11 are not anticipated for at least the same reasons discussed above for independent claim 1. *See* §VIII.A, *supra*.

B. Hindsight/No Motivation to Combine

As an initial matter, any modification with Gupta or Han is based on hindsight. Patent Owner has demonstrated numerous instances of Petitioner’s expert relies on hindsight, and it is once again on display in this ground.

Specifically, Petitioner posits that a “POSITA would have been motivated to implement the solution of Gupta or Han in the Weaver device to lower the resistance and voltage drop between anode 406 and the VDD line of Weaver,” and that “[t]his is consistent with the teachings of Weaver, which discloses concerns about non-uniformities caused by voltage drops across the OLED, and using highly conductive material (indium tin oxide – ITO) for the **anode 406** and the **bus line 430**.” Petition

at 75 (citing Ex. 1004, [0017], [0030], [0034], [0036]). The Petition concludes that it would have been obvious to connect bus line 430 and anode 406 in parallel to the VDD line of Weaver:



Id. (showing a modified Fig. 3 of Weaver, reducing resistance to all pixels). Dr. Baker initially believed that lowering the resistance to all of these pixels would improve uniformity. Ex. 1006, 91:5–21. However, after guiding questioning and reasoning, Dr. Baker admitted that improved uniformity does not result from lowering the resistive pathway to all pixels. *Id.* at 92:10–95:3 (eventually realizing that the solution to improving uniformity is only to reduce the resistance of the longest wires, not all of them). Dr. Baker thus proposed this combination based on an initial misunderstanding of how the technology works—not based on the knowledge of a POSITA.

The Petition uses an annotated circuit schematic of Weaver and the corresponding annotated structure, with no modifications depicted for the corresponding structure. *See* Petition at 76–77. Petitioner’s expert repeatedly emphasized that the schematic does not actually correspond to any physical change. He testified that there is “no physical correlation between a schematic and a layout or cross-sectional view” and that it “doesn’t make sense” that a specific structure has a physical relation to a schematic. Ex. 2028 at 66:12–13. Thus, Petitioner’s annotated schematic does not correspond any actual physical change, if the change is not as simple connecting the anode to the VDD line. Ex. 2026, ¶ 155. As best understood, Petitioner’s proposed modification would either involve a significant redesign of the structure of Weaver (as a POSITA understood that **bus line 430** was connected in series with **anode 406**), or is based on an interpretation that the teachings of Weaver that **bus line 430** and **anode 406** were both connected to VDD (which is not taught in Weaver and could only arise with the use of hindsight).

Second, even if a POSITA were seeking to lower the resistance of Weaver, they would have done so by either increasing the width of **bus line 430** (which would not require a modification to the structure or fabrication process) or would change the material of the bus line (which was a known, routine solution in the art and did not require a redesign of the structure of Weaver). *See* Ex. 2028, 140:1–2 (“A POSITA is not a person that is changing the process . . .”).

Petitioner’s proposed combination of Gupta or Han to lower the resistance of Weaver’s structure is based purely on impermissible hindsight, a misunderstanding of the technology, and a desire to invalidate the claims of the ’509 Patent.

1. Han is Not Analogous Art

Han is directed towards the use of OLEDs in light sources, which are much larger than pixels in a display, so Han is not analogous art. *See* Ex. 1010, [0003] (“The present invention relates to an organic-light emitting-diode (OLED) flat-panel light-source apparatus and, more particularly, to an OLED flat-panel light-source apparatus and a method of manufacturing the same, which may improve the uniformity of electrical and optical properties of a *large-area* OLED flat-panel light-source apparatus required for an illumination system and a display device.”) (emphasis added). These “large-area OLED flat panel light sources” are significantly larger than pixels in a display and have different design constraints and different challenges. Ex. 2026, ¶¶ 51, 159; Ex. 2028, 221:6–20 (“Q[:]: As an end-user, what flat panel light source did you use? A[:]: I have several. . . . Q[:]: About how big are they? A[:]: The small . . . flat panel light source is about 4 inches by 15 inches.”).



FIGURE 2.7 “V-LUX” OLED DESK LAMP AND “LIVINGSHAPES” INTERACTIVE OLED LIGHT AND MIRROR
Sources: Blackbody, Philips

Ex. 2021 at 15. The vastly larger size and different purpose of flat panel light sources led to different engineering problems. Ex. 2026, ¶¶ 51, 159. Han’s Figures 7A and 8 show how one anode 720 spans the entire “Emission region,” so the anode would be several inches in size. Ex. 1010, [0022], [0028]:

FIG. 7A

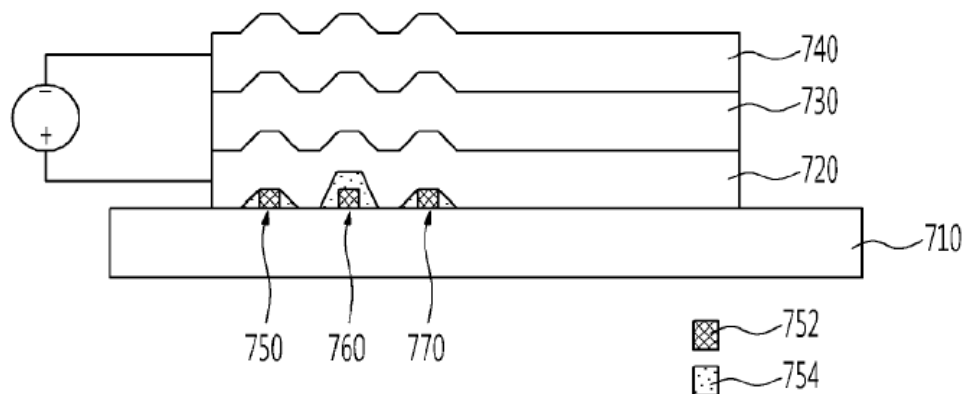
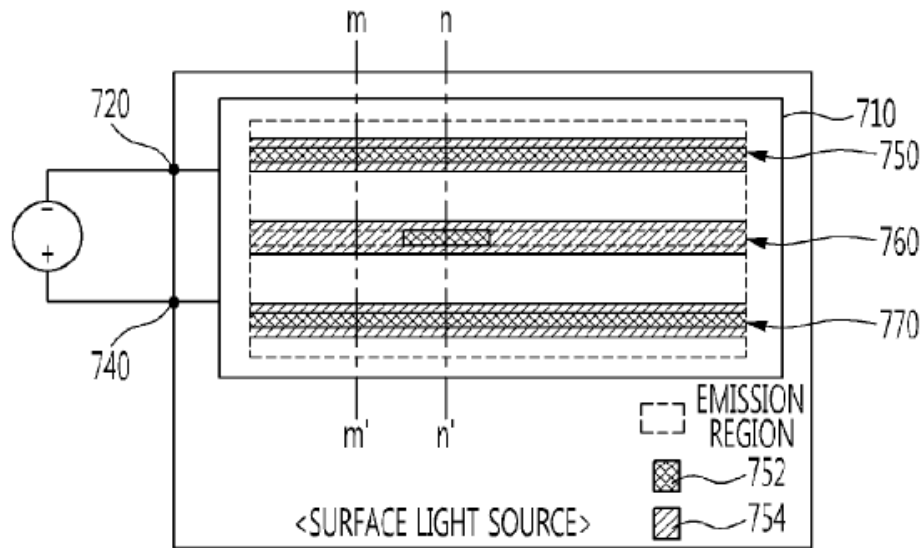


FIG. 8



Thus, Han merely represents the state of knowledge that, when OLEDs that have anodes or cathodes that are several inches in size, they may benefit when current is distributed using multiple branched electrodes (730, 760, and 770). Han's technique applies to better distribute current to one, multi-inch anode (or cathode); it does not apply. So, because the flat panel light sources are so large, branched electrodes were used to increase the contacts in the light source to help with uniformity and current distribution across several inches of an anode—a concept that POSITAs knew did not apply to LED pixels for displays, which were millimeter size or smaller. Ex. 2026, ¶¶ 50, 159.

There are no branched electrodes in Weaver that can be used like in Han, and the size scale is too different. *Id.* Accordingly, a POSITA would not have looked to

Han as analogous art for the '509 Patent, and a POSITA would not have made any modifications to Weaver based on Han.

2. A POSITA Would Have Used Han To Make a Different Modification

If a POSITA were instructed to modify Weaver based on a teaching from Han, the POSITA, without hindsight, would have instead made a very different modification from what Dr. Baker proposed. Ex. 2026 ¶ 159.

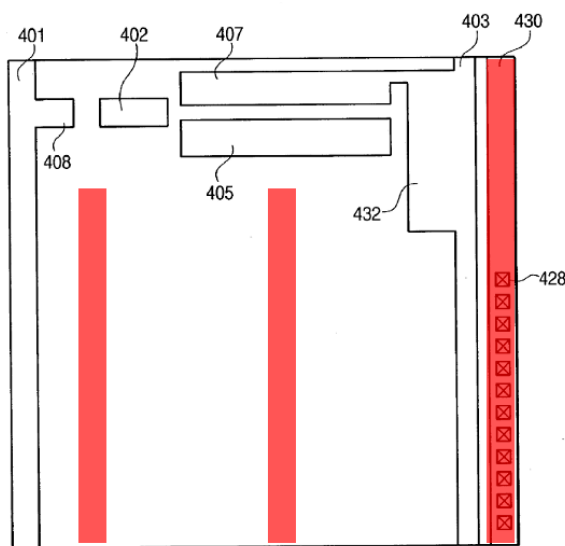
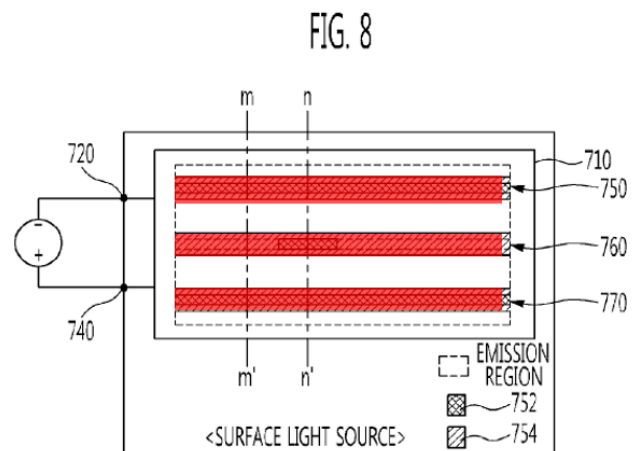


Fig. 6



Id. (showing modified Weaver on the left based on Han's Fig. 8 on the right). This would be a POSITA's best attempt to use Han's branched electrode technique in LED pixel for a display (despite it being unnecessary).

3. Gupta's Resistor is Not an Electrode

The Petition relies on Gupta for teaching a [resistor 238](#). Petition at 73. Gupta's resistor is not an electrode under the plain and ordinary meanings of an electrode

and a resistor. *See* § VII(B), above. Even Gupta considers its resistor to be as *separate* from its anode 230, not that the resistor is a part of the anode. Ex. 1009, 8:3–14.

Even if a POSITA somehow modified Weaver’s non-electrode bus line 430 to be in parallel with Gupta’s non-electrode resistor merely results in two non-electrode components in parallel. Two non-electrode elements in parallel still does not meet the “electrode” of independent claim 1. Ex. 2026 ¶ 160.

4. The Proposed Combination Has No Relationship with Gupta

Ground 6 begins by talking about Gupta’s resistor 238 (which Gupta implements as a mesh and not as a discrete resistor) and how resistor 238 is in parallel with anode sheet resistance. Petition at 72–74. Then, the Petition proposes: “It would have been obvious to a POSITA to combine the teachings of Weaver and either Gupta or Han so that bus line 430 of Weaver is connected in parallel with anode 406 to voltage supply line VDD in order to reduce the overall resistance of the pixel structure that includes OLED 400.” *Id.* at 75.

This proposed modification is completely untethered from teachings related to Gupta’s resistor 238. Gupta’s resistor 238 mesh is shown below:

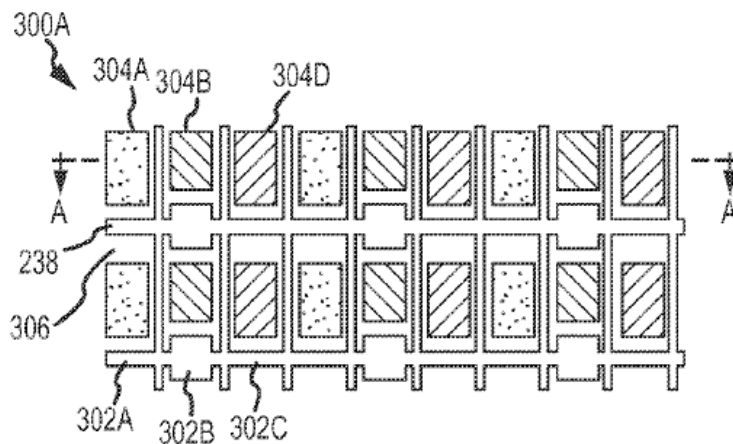


FIG.3A

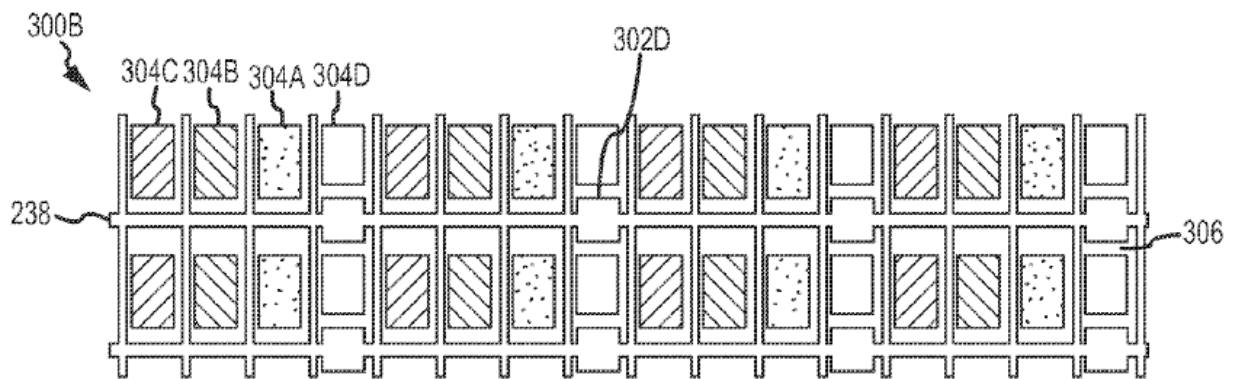


FIG.3B

Ex. 1009 at Figs. 3A, 3B. This design does not, in any way, suggest that Weaver's bus line should be put in parallel with Weaver's anodes. The above-pictured mesh looks nothing like Weaver's design and looks nothing like Petitioner's proposed result. Petitioner does not cite to any teachings related to bus lines in Gupta. There is no explanation of why teachings related to Gupta's resistor 238 would motivate a

POSITA to do anything with Weaver's bus line 430. The proposal was made in complete hindsight.⁵

XIV. GROUND 7 (WEAVER, LEE053, GUPTA OR HAN § 103)

Petitioner sets forth no additional reasoning for this ground, and the combination must fail for at least the same reasons discussed in §IX and §XIII.

XV. GROUND 8 (WEAVER, SONG, GUPTA OR HAN § 103)

Petitioner sets forth no additional reasoning for this ground, and the combination must fail for at least the same reasons discussed in §X and §XIII.

XVI. GROUND 9 (WEAVER, LEE149, GUPTA OR HAN § 103)

Petitioner sets forth no additional reasoning for this ground, and the combination must fail for at least the same reasons discussed in §XI and §XIII.

XVII. GROUND 10 (WEAVER, BAE, GUPTA OR HAN § 103)

Petitioner sets forth no additional reasoning for this ground, and the combination must fail for at least the same reasons discussed in §XII and §XIII.

XVIII. CONCLUSION

For the reasons set forth above, Patent Owner respectfully requests that the Board deny the Petition entirely.

⁵ Without hindsight, one might have expected a POSITA to propose somehow adding Gupta's resistor 238 mesh to Weaver's design, but the Petition did not propose to do this, and it is not obvious how it could be done, if at all. Ex. 2026 ¶ 160.

Date: April 23, 2025

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CERTIFICATION REGARDING WORD COUNT

Pursuant to 37 C.F.R. §42.24(d), Patent Owner hereby certifies, in accordance with and reliance on the word count provided by the word-processing system used to prepare this **PATENT OWNER'S RESPONSE**, that the amount of words in this paper is 10,079. Pursuant to 37 C.F.R. § 42.24, this word count is in compliance with the word limit set forth in 37 C.F.R. § 42.24(b)(2) excluding the portions exempted under 37 C.F.R. § 42.24(a)(1).

Date: April 23, 2025

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

The undersigned hereby certifies that the above document was served on April 23, 2025, by filing this document through the Patent Trial and Appeal Board End to End system as well as delivering a copy via electronic mail upon the following attorneys of record for the Petitioner:

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