

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BOE Technology Group Co., Ltd.,
Petitioner,

v.

Paneltouch Technologies LLC,
Patent Owner.

U.S. Patent No. 8,803,836
Original Issue Date: August 12, 2014
Title: DISPLAY DEVICE WITH TOUCH PANEL

Case No. IPR2025-01246

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 8,803,836
UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. § 42 *et seq.***

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LISTING OF EXHIBITS

Exhibit	Description
1001	U.S. Patent No. 8,803,836 (the “’836 patent”)
1002	Prosecution History of U.S. Patent No. 8,803,836
1003	Declaration of Dr. Vivek Subramanian
1004	U.S. Patent Publication No. 2008/0303798 A1 (“Nakamura”)
1005	U.S. Patent Publication No. 2008/0266273 A1 (“Slobodin”)
1006	Prosecution History of U.S. Patent No. 9,639,229 (excerpted)
1007	JP-A-2002-342014 to Takaya (“Takaya”)
1008	U.S. Patent Publication No. 2009/0096763 A1 (“Hinata”)
1009	U.S. Patent Publication No. 2010/0013785 A1 to Murai (“Murai”)

CHALLENGED CLAIM LISTING

Claim	Limitation No.	Limitation
1	[1-PRE]	A display device with a touch panel comprising:
	[1-A]	the touch panel which includes a first substrate, and a second substrate arranged to face the first substrate in an opposed manner, wherein:
	[1-B]	the first substrate and the second substrate each include a detection area configured to detect a coordinate and an outside area in which external terminals are formed,
	[1-C]	the first substrate includes a plurality of first lines each configured to detect a coordinate, the second substrate includes a plurality of second lines in the detection area which face the first substrate,
	[1-D]	each of the plurality of first lines and the plurality of second lines are configured of metal, each of the plurality of first lines is black in color,
	[1-E]	a polarizing plate is arranged on the first substrate at a side opposite to the second substrate,
	[1-F]	the first substrate includes a plurality of wiring groups, each of the plurality of wiring groups include at least two first lines of the plurality of first lines, and the at least two first lines of each of the plurality of wiring groups are combined with each other.
2	2	The display device with a touch panel according to claim 1, wherein the polarizing plate comprises a linear polarizing plate.
3	3	The display device with a touch panel according to claim 1, wherein the polarizing plate comprises a circular polarizing plate.

Claim	Limitation No.	Limitation
4	4	The display device with a touch panel according to claim 1, wherein the second lines comprise a second electrode each configured to detect a coordinate.
5	5	The display device with a touch panel according to claim 1, wherein a transparent electrode connects to the second lines.
6	6	A display device with a touch panel according to claim 1, wherein the at least two first lines of each of the plurality of wiring groups are combined with each other by a pad member.
7	7	A display device with a touch panel according to claim 1, wherein a transparent conductive film overlaps the plurality of the second lines in plan view, and wherein the transparent conductive film is electrically connected to the plurality of the second lines.
8	[8-PRE]	A display device with a touch panel comprising:
	[8-A]	the touch panel including a first substrate having a detection area to detect a coordinate and an outside area in which external terminals are formed, a plurality of first lines to detect the coordinate in the detection area, a plurality of second lines to detect the coordinate in the detection area, each of the plurality of first lines traversing each of the plurality of second lines;
	[8-B]	an organic luminescence electric device panel which is adhered to the touch panel; and
	[8-C]	a circular polarizing plate which is adhered to the touch panel at a side opposite to the organic luminescence electric device panel.
9	9	A display device with a touch panel according to claim 8, wherein each of the plurality of first lines and the plurality of second lines is made of metal, and wherein each of the plurality of first lines is black in color.

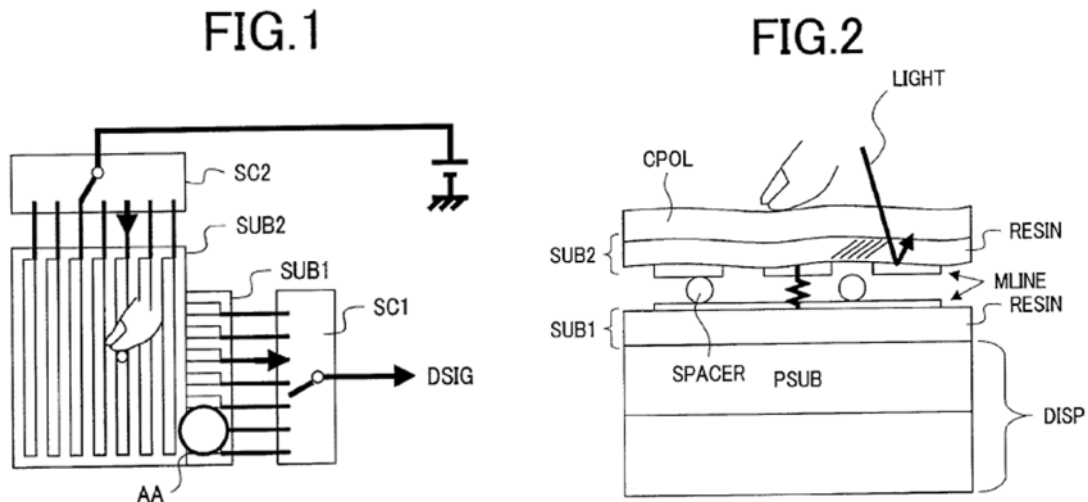
Claim	Limitation No.	Limitation
10	10	A display device with a touch panel according to claim 9, wherein the touch panel includes a plurality of wiring groups, wherein each of plurality of wiring groups includes at least first two lines of the plurality of first lines, and wherein the at least two first lines in each of plurality of wiring groups are combined with each other.
11	11	A display device with a touch panel according to claim 10, wherein the at least two first lines of each of the plurality of wiring groups are combined with each other by a pad member.
12	12	A display device with a touch panel according to claim 9, wherein a transparent conductive film overlays the plurality of the second lines, and wherein the transparent conductive film is electrically connected to the plurality of the second lines.
13	13	A display device with a touch panel according to claim 10, wherein a transparent conductive film overlays the plurality of the first lines, and wherein the transparent conductive film is electrically connected to the plurality of the first lines.
14	14	A display device with a touch panel according to claim 9, wherein a transparent conductive film underlays the plurality of the second lines, and wherein the transparent conductive film is electrically connected to the plurality of the second lines.
15	15	A display device with a touch panel according to claim 10, wherein a transparent conductive film underlays the plurality of the first lines, and wherein the transparent conductive film is electrically connected to the plurality of first lines.

I. INTRODUCTION

Pursuant to 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42, Petitioner respectfully requests *inter partes* review (“IPR”) of Claims 1-15 (“Challenged Claims”) of U.S. Patent No. 8,803,836 (the “’836 patent”).

The Challenged Claims are unpatentable because they claim touch panel structures that previously were previously described in Nakamura.

The ’836 patent describes display devices comprising resistive sensing touch panels that have a particular structure designed to address certain alleged drawbacks. The ’836 patent expressly admits that the “applicants of the present application” had already “proposed a touch panel which adopts [a] new detection structure” that addressed these alleged drawbacks in Nakamura. Ex. 1001, 2:57-59; *see also id.*, 4:53-60 (stating the “detail of the touch panel” is described in Nakamura), 6:39-48 (“adopt[ing]” Nakamura’s touch panel). Indeed, Figs. 1-2 of Nakamura are disclosed in Figs. 9-10 of the ’836 patent. Ex. 1004, Figs. 1-2:



To try and distinguish Nakamura, the '836 patent alleges that, when using it, “the user feels the surface unevenness,” preventing an “excellent touch feeling.” Ex. 1001, 2:57-3:3. To address this alleged issue, the '836 patent proposes the addition of “a resin film which is adhered to the first substrate on a side opposite to the second substrate,” as embodied by resin film 26 shown in Fig. 2. *Id.*, 3:14-19, 5:3-4, 5:25-29, Fig. 2.

The '836 patent claims do not claim this feature. Rather, they relate to other aspects of touch panels the '836 patent admits Nakamura teaches, like substrate detection areas, display panels, and polarizing plates.

Petitioner requests that the PTAB institute trial and find the Challenged Claims unpatentable for the reasons set forth herein.

II. 37 C.F.R. § 42.8(B): MANDATORY NOTICES

A. 37 C.F.R. § 42.8(b)(1): Notice of Real Parties-in-Interest

BOE Technology Group Co., Ltd. (“BOE” or “Petitioner”) is the real party-in-interest. No other parties exercised or could have exercised control over this Petition; no other parties funded or directed this Petition. See Office Patent Trial Practice Guide, 77 Fed. Reg. 48756, 48759-60 (Aug. 14, 2012).

B. 37 C.F.R. § 42.8(b)(2): Notice of Related Matters

To the best knowledge of Petitioner, the ’836 patent has been involved in the following matters:

Case Name	Filed
<i>Paneltouch Technologies LLC v. BOE Technology Group Co., Ltd.</i> , No. 2:25-cv-00245-JRG (E.D. Tex.)	February 28, 2025

C. 37 C.F.R. § 42.8(b)(3) and (4): Notice of Counsel and Service Information

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Petitioner submits a Power of Attorney with this Petition. Please address all correspondence to lead counsel. Petitioner consents to service by email at the

email addresses listed above.

D. Fee for Inter Partes Review

The USPTO is authorized to charge the filing fee and any other fees incurred by Petitioner to the deposit account of Orrick, Herrington, & Sutcliffe LLP: 15-0665.

III. REQUIREMENTS FOR IPR

This Petition complies with all requirements under 37 C.F.R. § 42.104 for IPR.

A. § 42.104(a): Grounds for Standing

The '836 patent is available for IPR. Petitioner is not barred or estopped from requesting IPR. This Petition is timely filed under 35 U.S.C. § 315(b).

B. § 42.104(b): Identification of Challenge

Under 37 C.F.R. §§ 42.104(b) and 42.22, Petitioner requests that the Board institute IPR on the Challenged Claims of the '836 patent and cancel those claims as unpatentable.

1. § 42.104(b)(1): Challenged Claims

Petitioner challenges Claims 1-15 of the '836 patent.

2. § 42.104(b)(2): The Prior Art and Statutory Grounds

The application for the '836 patent claims priority to U.S. application 12/649,414, filed on December 30, 2009, and foreign application JP 2009-004874,

Inter Partes Review

United States Patent No. 8,803,836

filed on January 13, 2009.

The references relied upon herein are prior art to the '836 patent as follows:

Patent/Publication	Prior Art Date	Prior Art	Ex.
U.S. Patent Publication No. 2008/0303798 A1 ("Nakamura")	December 11, 2008 (publication) June 6, 2008 (latest possible priority)	102(b), (a), (e)	1004
U.S. Patent Publication No. 2008/0266273 A1 ("Slobodin")	October 30, 2008 (publication) April 24, 2008 (latest possible priority)	102(b), (a), (e)	1005

The '836 patent is a pre-AIA patent. Nakamura and Slobodin are pre-AIA 102(b) art to the '836 patent because they were published more than one year before the earliest U.S. application the '836 patent claims priority to. The '836 patent's priority claim to foreign application JP 2009-004874 is not relevant to this inquiry and cannot be relied on to overcome 102(b) prior art. To be 102(b) prior art, a reference must have been published "more than one year prior to ***the date of the application for patent in the United States,***" which is the case here. Pre-AIA 35 U.S.C. § 102(b); Pre-AIA 35 U.S.C. § 119(a); *see also, e.g.*, Chisum on Patents § 14.05[4] (2004) (under pre-AIA § 119, foreign filings were "not equivalent to a domestic filing, which would preclude a statutory bar"); *Powdermagic, Ltd. v. Rossignol Ski Co.*, No. 1:04CV00133, 2005 WL 3981617, at *5 (D. Utah Aug. 4,

2005) (as there is no authority to support Patent Owner’s assertion “that the operative date in this case is September 1989—the filing date of Mr. Sutherland’s Canadian patent application,” prior art reference published after that date may serve as a statutory bar).

Notably, patent owner did not dispute Nakamura’s prior art status when the examiner applied it during the prosecution of a child patent of the ’836 patent, U.S. Patent No. 9,639,229 (“the ’229 patent”).¹ Ex. 1006 (’229 File History), 8/2/2016 Office Action, 11/1/2016 Response.

Below are the specific statutory grounds on which the claims are challenged:

Ground Number	Ground
1	Claims 1 and 3-15 are obvious under 35 U.S.C. § 103 (pre-AIA) (“obvious”) over Nakamura
2	Claim 2 is obvious over Nakamura, as well as Nakamura in combination with Slobodin

As discussed in detail below, the original Japanese application to which Nakamura claims priority (JP 2007-149884) is discussed in the ’836 patent specification, without incorporating it by reference. Despite this, the patent owner

¹ During the ’229 patent’s prosecution, the examiner referred to Nakamura as Matsudate. Because Mr. Matsudate is also a named inventor of the ’836 patent, while Mr. Nakamura is not, this Petition refers to Ex. 1004 as Nakamura to avoid the potential for confusion.

did not disclose Nakamura or its Japanese priority application to the examiner during prosecution in an IDS. *See* Ex. 1002.

Slobodin also was not before the Examiner during prosecution of the '836 patent. *Id.*

3. Level of Ordinary Skill in the Art

A POSITA in the technology described in the '836 patent in 2009 would have had at least a Bachelor's degree in electrical engineering or a similar discipline, along with 2-3 years of experience with display and touch panel technologies. Ex. 1003, ¶27. Relevant experience can substitute for education and vice versa. *Id.*

4. § 42.104(b)(5): Evidence Supporting Challenge

The Declaration of Dr. Vivek Subramanian (Ex. 1003) and other supporting evidence in the Exhibit List are filed herewith. Dr. Subramanian's background and qualifications, and the information provided to him, are discussed in Exhibit 1003.

IV. INSTITUTION SHOULD BE GRANTED

This Petition establishes a reasonable likelihood of success on the merits and all other requirements for an IPR.

V. TECHNOLOGY BACKGROUND

By September 2009, display devices having touch panels were well established and built upon the decades-old understanding of basic detection

principles. Ex. 1003, ¶31. The concept of using wired detection areas in one or more substrates to detect the coordinates where a user touches a touch screen was already well in place, as were the display device and touch screen structures used to implement it. *Id.*

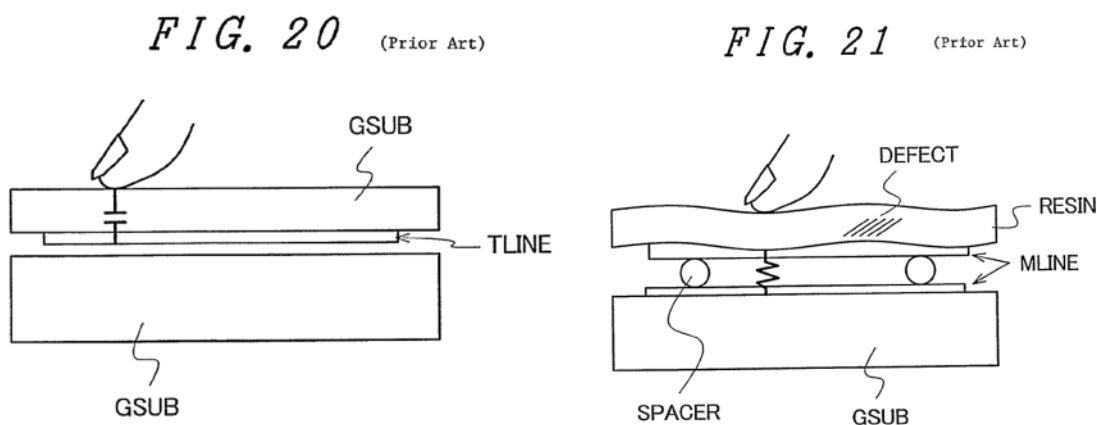
For example, as discussed in the following section, the '836 patent admits that detection methods ranging from light-based and electric characteristic-based, including both resistive and capacitive sensing methods, were all well known. Ex. 1003, ¶32; Ex. 1001, 1:20-50, Figs. 20-21. And the '836 patent repeatedly admits that the exact touch panel structure it claims had already been disclosed in Nakamura. Ex. 1003, ¶32; Ex. 1001, 2:57-59, 4:57-60, 6:40-52.

Thus, by 2009, the '836 patent was part of a crowded art where the concepts employed in the field were well understood, predictable, and routinely mixed and matched as needed to achieve a POSITA's design goals. Ex. 1003, ¶33. The '836 patent itself admits that the particularities of such detection techniques—such as the exact structure its claimed display device and its touch panel—were all known and available for designers to choose from, as discussed throughout this Petition. *Id.*

VI. THERE EXISTS A REASONABLE LIKELIHOOD THAT THE CHALLENGED CLAIMS ARE UNPATENTABLE

By 2009, display devices having touch panels were part of a crowded art that

routinely utilized and adapted well understood and predictable detection methods in various structures. Ex. 1003, ¶35. The '836 patent admits that a wide variety of detection methods had already been “adopted by a conventional display device with a touch panel,” including light-based and electric characteristic-based detection methods. Ex. 1001, 1:20-29; Ex. 1003, ¶35. Well-known prior art electric characteristic-based detection methods included both resistive detection, which works by detecting pressure applied to a touch panel, and capacitive sensing detection, which works by creating an electric field above the surface of the touch panel and detecting changes in the electric field caused by objects like a finger. *Id.*, 1:27-29; Ex. 1003, ¶35. The '836 patent depicts example prior art capacitive and resistive sensing touch panels in Figs. 20 and 21, respectively. Ex. 1003, ¶35; Ex. 1001, 1:30-50, Figs. 20-21:



The rest of the '836 patent focuses entirely on resistive sensing touch panels. Ex. 1003, ¶36.

The '836 patent acknowledges that touch panels, including resistive sensing touch panels, were already well-known. Ex. 1003, ¶37. However, it criticizes JP-A-2002-342014 to Takaya (“Takaya”), which teaches a resistive sensing touch panel “in which a transparent electrode is formed into stripe-shaped electrodes and these stripe-shaped transparent electrodes are made [to] intersect with each other thus arranging intersecting portions in a matrix array.” *Id.*; Ex. 1001, 1:51-57. The '836 patent does not provide pinpoint cites to Takaya that would clarify its criticism but appears to refer to the way electrodes 14 and electrodes 24 intersect with each other as shown in, *e.g.*, Fig. 1. *Id.*; Ex. 1007 (Takaya), Fig. 1:

The '836 patent criticizes this “stripe-shaped” approach because for its alleged inability to increase detection accuracy due to the tradeoff between the

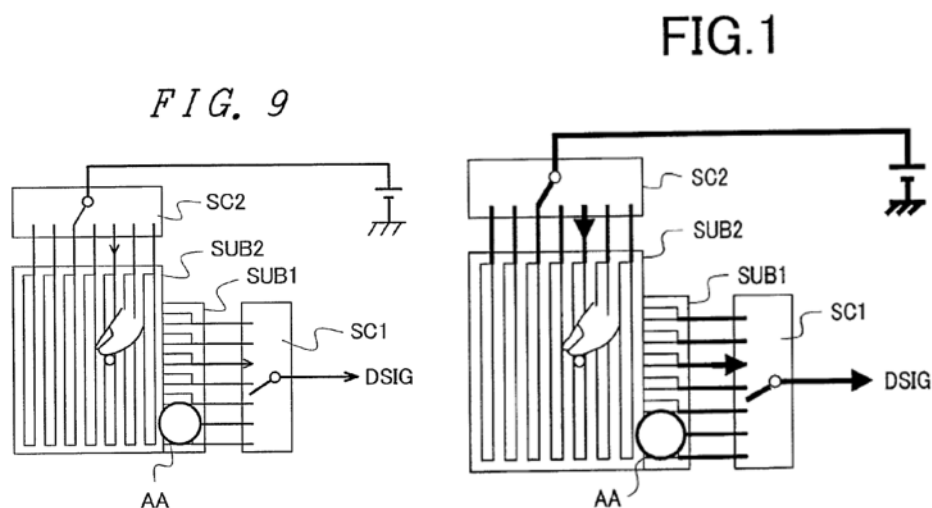
need to decrease electrode line width and the corresponding increase in resistance this causes. Ex. 1003, ¶38; Ex. 1001, 1:61-67. The '836 patent identifies other alleged drawbacks to Takaya's approach, including that "it is difficult to decrease a gap between the transparent electrodes," and that, because the contact positions "are detected one-dimensionally," detection is "performed twice along an X axis and a Y axis." *Id.*; Ex. 1001, 1:67-2:56.

Despite highlighting these issues, the '836 patent does not present a new solution to these problems. Ex. 1003, ¶39. Instead, it states that the "applicants of the present application" had already "proposed a touch panel which adopts [a] new detection structure (Japanese Patent Application 2007-149884)" that addresses the drawbacks in Takaya. *Id.*; Ex. 1001, 2:57-59. The '836 patent expressly adopts the same structure presented in this application. *Id.*

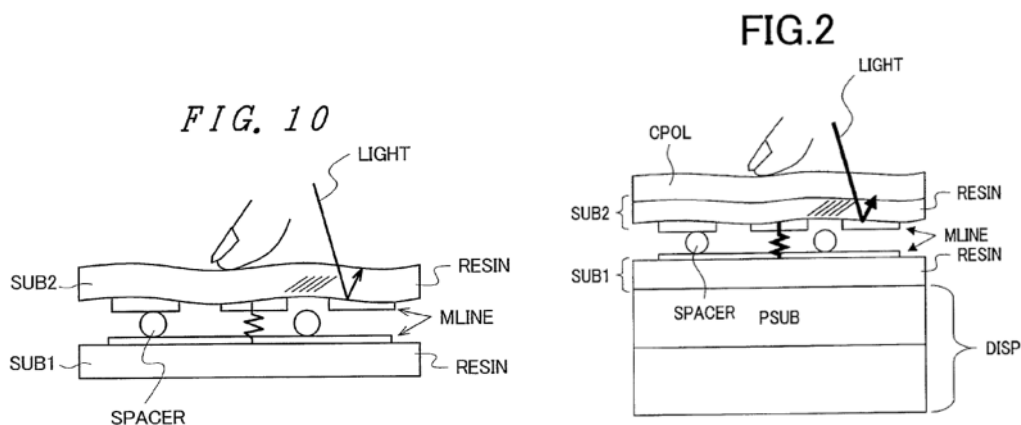
Notably, this Japanese application is the foreign priority application for the Nakamura prior art relied on in this Petition. *See* Ex. 1004, [0001] ("The present application claims priority from Japanese application JP2007-149884 filed on Jun. 6, 2007, the content of which is hereby incorporated by reference into this application"), (30) (priority claim to same application); Ex. 1003, ¶40.

The '836 patent reiterates several times that the detail of its disclosed touch panel 10 is the same as that described in Japanese Patent Application 2007-149884, *i.e.*, Nakamura. Ex. 1003, ¶41; Ex. 1001, 4:57-59. Indeed, the preferred

embodiment of the '836 patent's touch panel is shown in its Fig. 9, which is expressly stated to be copied from Nakamura: "FIG. 9 is a schematic plan view of the touch panel of this mode which adopts the touch panel described in" Nakamura. Ex. 1003, ¶41; Ex. 1001 ('836 patent), 6:45-52, Fig. 9 (below left); Ex. 1004 (Nakamura), Fig. 1 (same figure, below right):



As shown below, Nakamura had also already disclosed essentially the same cross-sectional view of the '836 patent Fig. 10 embodiment. Ex. 1003, ¶42; Ex. 1001 ('836 patent), Fig. 10 (below left); Ex. 1004 (Nakamura), Fig. 1 (same figure with additional detail, below right):

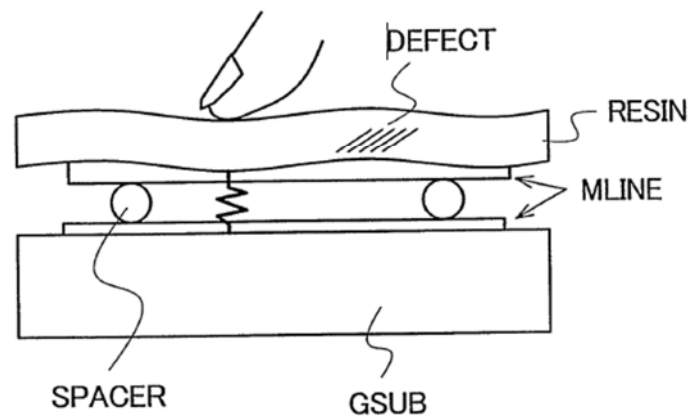


The '836 patent thus admits that Nakamura had already disclosed the same “new detection structure” the '836 patent presents to solve the alleged problems presented by Takaya. Ex. 1003, ¶43.

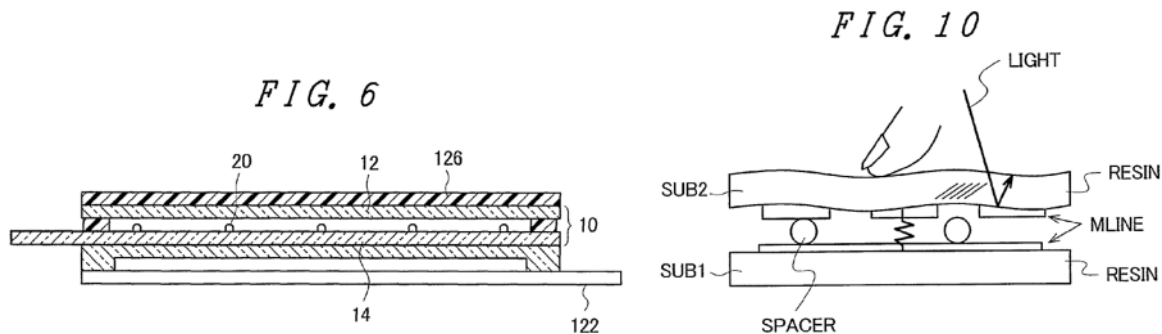
The '836 patent states, without reference to any particular prior art, that “according to such a related art, since a plurality of lines are formed on a touch panel and hence, when a user moves a pen on an operation surface in a sliding manner, the user feels the surface unevenness.” Ex. 1003, ¶44; Ex. 1001, 2:57-3:3. This is said to prevent the user from experiencing an “excellent touch feeling.” *Id.* The '836 patent states that this “excellent touch feeling” is achieved by adding “a resin film which is adhered to the first substrate on a side opposite to the second substrate.” Ex. 1003, ¶44; Ex. 1001, 3:14-16. Because “[a]ccording to the present invention, the resin film is adhered to the touch panel, the uneven[n]ess attributed to the first electrode is absorbed and hence, the touch panel can give a user excellent touch feeling.” Ex. 1003, ¶44; Ex. 1001, 3:16-19.

The '836 patent appears to be suggesting that in prior art systems, such as what is shown in Fig. 21, the user would touch only a resin film, and so could feel its defects. Ex. 1003, ¶45; Ex. 1001, Fig. 21:

FIG. 21 (Prior Art)



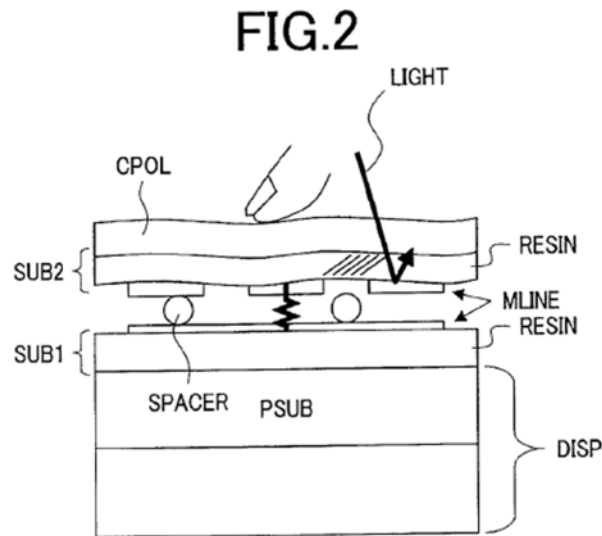
The '836 patent claims to have instead devised a touch panel that combines a resin film and a substrate, as shown in, for example, Figs. 6 and 10. Ex. 1003, ¶46; Ex. 1001, Figs. 6, 10:



But this too fails to distinguish the '836 patent from Nakamura, which had

already admittedly disclosed this same arrangement in its Fig. 2. Ex. 1003, ¶47;

Ex. 1004, Fig. 2:



While the '836 patent removed Nakamura's circular polarizing plate CPOL from its Fig. 10 embodiment for unexplained reasons, the same circular polarizing plate is shown as 126 in its Fig. 6, in exactly the same arrangement as Nakamura's Fig. 2. Ex. 1003, ¶48; Ex. 1001, 5:52-63. *Compare* Ex. 1004 (Nakamura), Fig. 2 (circular polarizing plate CPOL arranged over touch panel comprising substrates SUB1 and SUB2, itself arranged over display panel DISP), *with* Ex. 1001 ('836 patent), Fig. 6 (circular polarizing plate 126 arranged over touch panel 10 comprising substrates 12 and 14, itself arranged over display panel 122).

Thus, whatever advancement in "touch feeling" the '836 patent is referring to, it had already been taught by Nakamura. Ex. 1003, ¶49.

Indeed, while the '836 patent attributes its “excellent touch feeling” to “a resin film which is adhered to the first substrate on a side opposite to the second substrate,” Nakamura had already disclosed such a resin film in its Fig. 2. Ex. 1003, ¶50; Ex. 1001, 3:14-16. Not only this, the '836 patent admits that resin films were well-known in both “conventional resistance-film-type panel[s]” and Nakamura. Ex. 1003, ¶50; Ex. 1001, 1:38-50, 6:45-52, Figs. 9, 21.

Moreover, despite the '836 patent specification's statement that this resin film is the only alleged advancement over an unidentified “related art,” none of the '836 patent claims recite it. Indeed, no claim recites the word “resin” at all. Ex. 1003, ¶51. While dependent claims 7 and 12-15 recite “a transparent conductive film” that overlays or underlays certain detection lines, they do not relate to the allegedly novel resin film, but rather the “transparent electrode TLINE” that was admittedly well disclosed by both “conventional” touch panels and Nakamura. Ex. 1003, ¶50; Ex. 1001, 1:30-57, 8:51-9:15, 9:47-10:17, Figs. 12-13, 16-19, 20-21; *see also* Ex. 1004, [0007]-[0008], [0081]-[0089], [0098]-[0110], Figs. 4-5, 8-11, 13-14 (same disclosures in Nakamura).

As the '836 patent expressly admits, and as shown throughout this Petition, the concepts it claims, such as substrate detection areas, display panels, and polarizing plates, were already disclosed by the touch panel structure of Nakamura. Ex. 1003, ¶52.

In sum, the '836 patent itself admits that Nakamura had already taught the claimed touch panel structure. The claims are thus admittedly disclosed by Nakamura. Ex. 1003, ¶53.

B. Prosecution History

The '836 patent stems from foreign application JP 2009-004874 and U.S. application 12/649,414 and was prosecuted in the United States as Application No. 13/966,857.

As discussed above, despite the fact that Nakamura admittedly discloses the touch panel structure claimed in the '836 patent, the patent owner did not disclose Nakamura to the examiner in an IDS during prosecution. *See generally* Ex. 1002.

The examiner first rejected the pending claims over prior art including U.S. Patent Publication No. 2009/0096763 A1 (“Hinata”). *Id.*, 12/12/2013 Office Action, pp. 3-8.

In response, patent owner amended pending Claim 1 to add limitations relating to detection lines on the first and second substrates and argued Hinata did not disclose them. *Id.*, 3/11/2014 Amendment, pp. 2, 7-8.

Patent owner also newly added independent Claim 8, arguing that Hinata did not disclose “an organic luminescence electric device panel, wherein the organic luminescence electric device panel is adhered to the touch panel, and a circular polarizing plate is adhered to the touch panel at a side opposite to the organic

luminescence organic electric device panel.” *Id.*, pp. 3-4, 8-9.

Following these amendments, the examiner allowed the claims over Hinata. *Id.*, 4/16/2015 Notice of Allowance.

C. Claim Construction

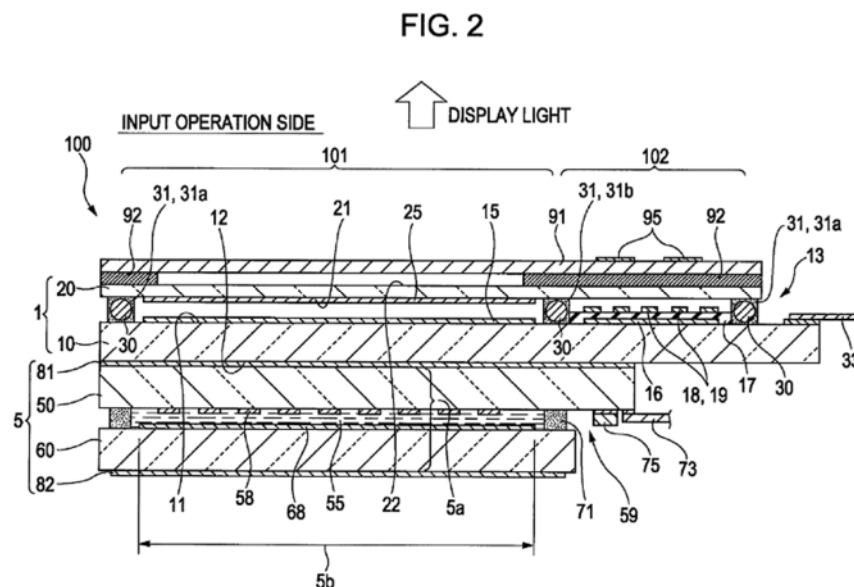
The Board construes claims under *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (*en banc*) and its progeny. Under *Phillips*, claims are given their plain and ordinary meaning in light of the specification. 415 F.3d at 1315-17. The Board only construes claim terms when necessary to resolve the controversy. *See, e.g., Toyota Motor Corp. v. Cellport Sys., Inc.*, IPR2015-00633, Paper 11 at 16 (PTAB Aug. 14, 2015).

While Petitioner does not believe any claim construction is necessary here, to avoid any confusion, it should be understood that Claim 8 does **not** require a touch panel with first and second detection lines on “one and only one substrate.” Ex. 1003, ¶61. Claim 8 does not state that both sets of detection lines are adhered to the first substrate. *Id.* Thus, as a comprising claim, Claim 8 covers touch panels with additional substrates beyond the claimed first substrate. *Id.*

This understanding was repeatedly confirmed throughout the ’836 patent family’s prosecution history. Ex. 1003, ¶62. For example, as discussed above, during prosecution of the ’836 patent itself, the pending claims were rejected over Hinata, after which patent owner added Claim 8 and argued against Hinata for

other reasons. Ex. 1002 ('836 Patent File History), 12/12/2013 Office Action, pp. 3-8; 3/11/2014 Amendment, pp. 2-4, 7-9.

Importantly, after Claim 8 took on its issued form, the examiner maintained that Hinata disclosed Element [8-A], which recites only a single “first substrate,” but two separate sets of detection lines (“first lines” and “second lines”). *Id.*, 4/16/2015 Notice of Allowance, pp. 3-4; Ex. 1003, ¶63. This was the case despite the fact that, like the '836 patent's specification embodiments, Hinata's touch panel discloses two separate substrates, each with its own set of detection lines. Ex. 1003, ¶63; Ex. 1008 (Hinata), Fig. 2 (depicting first electrode 15 formed on first substrate 10 opposite second electrode 25 formed on second substrate 20):



See also, e.g., Ex. 1001, 6:45-7:14, Figs. 9-10 (two-substrate structure in '836 patent).

The '836 patent file history thus demonstrates that the patent owner and examiner both understood that the plain and ordinary meaning of Claim 8 covers embodiments that contain two substrates, with the claimed “plurality of first lines” on a first substrate and the claimed “plurality of second lines” on a second substrate. Ex. 1003, ¶64.

This understanding was further confirmed during the prosecution the '836 patent's child '229 patent, where the examiner applied Hinata against a version of pending Claim 1 that recited two substrates. Ex. 1006 ('229 Patent File History), 3/14/2016 Office Action, pp. 4-8; Ex. 1003, ¶65. After the patent owner amended Claim 1 to, like '836 patent Claim 8, recite only a single substrate (*id.*, 6/14/2016 Amendment, pp. 2), the examiner again applied Hinata's two-substrate embodiment. *Id.*, 8/2/2016 Office Action, pp. 3-7.

This understanding that '836 patent Claim 8 is satisfied by two-substrate embodiments, as reflected across the '836 patent family's prosecution history, is an important one. Ex. 1003, ¶66. Every embodiment in the '836 patent specification is, like Hinata, a two-substrate embodiment. *Id.*; Ex. 1001, 6:45-7:14, Figs. 9-10 (two-substrate structure in '836 patent).

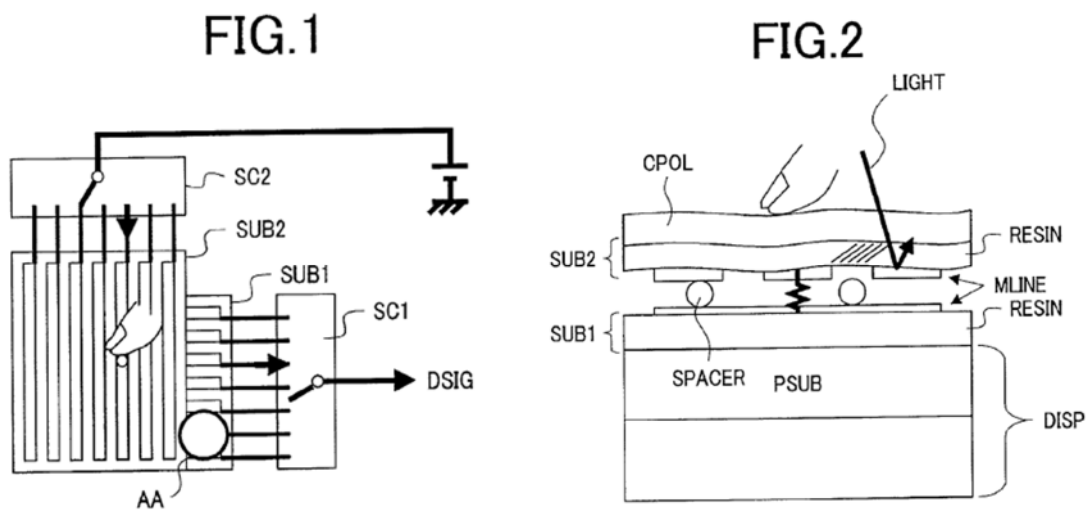
VII. THE PRIOR ART

A. Nakamura

Nakamura is directed to display devices with touch panels having particular

structures. Ex. 1003, ¶68; Ex. 1004, Abstract. As discussed above, the '836 patent repeatedly admits that the exact touch panel structure it claims had already been disclosed in Nakamura. Ex. 1003, ¶68; Ex. 1001, 2:57-59, 4:57-60, 6:45-52.

The preferred embodiment of Nakamura's touch panel is shown in schematic diagram and cross-sectional diagram views in Figs. 1 and 2, respectively. Ex. 1003, ¶69; Ex. 1004, Figs. 1-2:



See also Ex. 1001, Figs. 9-10 (substantially similar disclosure in '836 patent, with less detail in Fig. 10).

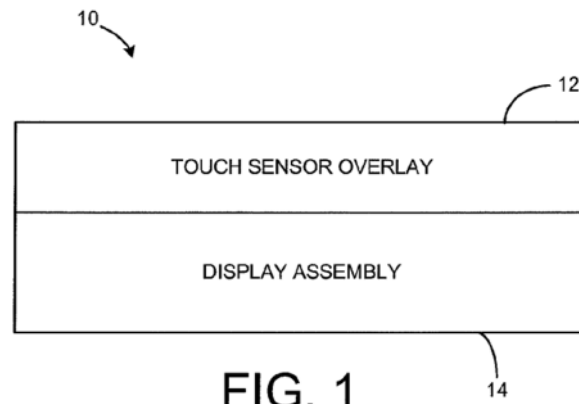
As shown, Nakamura's touch panels comprise two oppositely facing substrates, each arranged "so that their respective metal wirings face each other and that directions along which the respective metal wirings extend are made to intersect," a display panel, and a circularly polarizing plate CPOL. Ex. 1003, ¶70; Ex. 1004, [0050]-[0055], Figs. 1-2; see also Ex. 1001, 6:45-7:14, Figs. 9-10

(substantially similar disclosure in '836 patent).

Additional details regarding Nakamura's touch panels, each again substantially similar to those of the '836 patent, are discussed in the claim analysis below. Ex. 1003, ¶71.

B. Slobodin

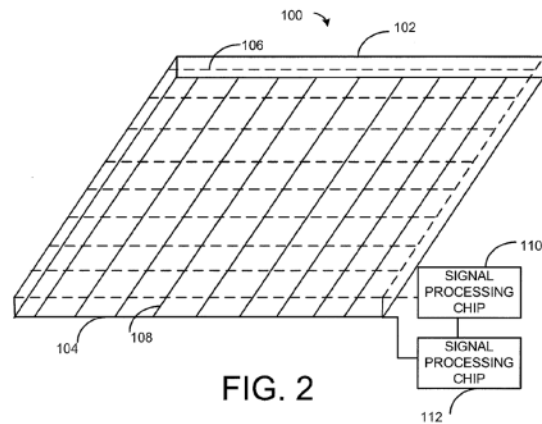
Slobodin is directed to “[a]n interactive display system including a touch sensor overlay,” “a display assembly and an optical layer interposed the touch sensor overlay and the display assembly.” Ex. 1005 (Slobodin), Abstract, Fig. 1:



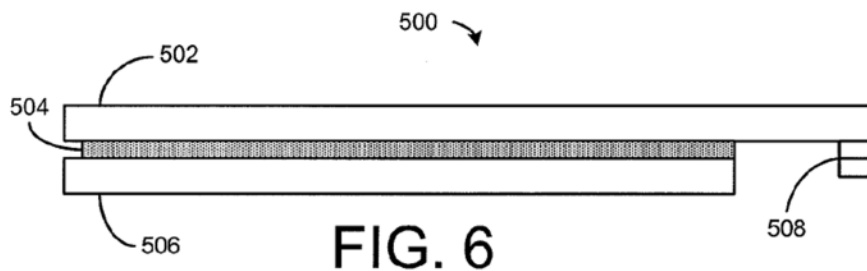
Slobodin's system can be integrated into a variety of different devices, including cellular phones and televisions, and its display assembly can comprise many different display types, including LCDs and OLEDs. Ex. 1003, ¶74; Ex. 1005, [0024]-[0025].

A touch sensor overlay embodiment is shown in Fig. 2, which depicts opposing surfaces 102 and 104, each having detection electrodes arranged along an

x-y coordinate axis. Ex. 1003, ¶75; Ex. 1005, [0026]-[0031], Fig. 2:



Slobodin's touch panels may be adhered to an OLED display assembly to form an interactive display system. Ex. 1003, ¶76; Ex. 1005, [0041], [0043], Fig. 6:



One focus in Slobodin is its discussion of the pros and cons of using a linear polarizer versus a circular polarizer on the outer surface of the touch sensor (opposite the display panel) to reduce surface reflections, which are discussed in detail in Section VIII.B.1 below. Ex. 1003, ¶¶77-78; Ex. 1005, [0005], [0009]-[0010], [0050]-[0052], Figs. 7-8:

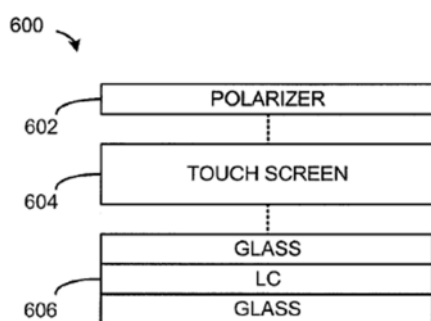


FIG. 7

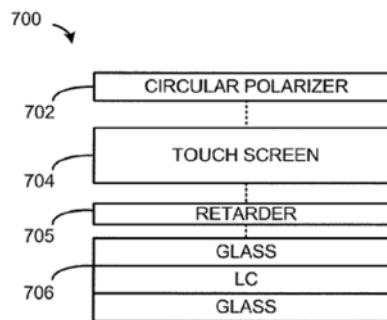


FIG. 8

C. Motivation to Combine Nakamura and Slobodin

A POSITA would have found it obvious to combine Nakamura and Slobodin for many reasons. Ex. 1003, ¶¶79-82.

Nakamura and Slobodin are in the same field, display device touch panels, and both use polarizers on the outer surface of the touch panels to achieve the same thing, reducing surface reflections. Ex. 1003, ¶80; Ex. 1004 (Nakamura), Abstract, [0002]-[0009], [0029], [0055], [0061], Fig. 2; Ex. 1005 (Slobodin), Abstract, [0003]-[0010], Figs. 7-8.

The references are implemented in standard display panels using standard electrical and optical principles. Ex. 1003, ¶81; Ex. 1004 (Nakamura), Abstract, [0002]-[0009], Figs. 13-14; Ex. 1005 (Slobodin), Abstract, [0003]-[0010]. Both can be integrated into a variety of different devices, including cellular phones and televisions, and can comprise many different display types, including LCDs and OLEDs. Ex. 1003, ¶81; Ex. 1004 (Nakamura), [0055], [0078], Fig. 12; Ex. 1005

(Slobodin), [0024]-[0025]. And both disclose panels that touch detect using opposing surfaces, each having detection electrodes arranged along an x-y coordinate axis. Ex. 1003, ¶81; Ex. 1004 (Nakamura), [0003], [0051]-[0054], [0079], [0093], Figs. 1-2, 6; Ex. 1005 (Slobodin), [0026]-[0031], Fig. 2. Thus, a POSITA could have predictably and successfully combined them without undue experimentation. Ex. 1003, ¶81.

Additional details regarding why a POSITA would have been motivated to combine Nakamura and Slobodin to arrive at the relevant claim are discussed in Section VIII.B.1 below. Ex. 1003, ¶82. For example, a POSITA would have been inspired to replace Nakamura's circular polarizer with Slobodin's linear polarizer in touch sensor applications involving birefringent materials, a situation where the optical performance improvements provided by circular polarizers are limited, in order to take advantage of linear polarizers' simpler and less expensive nature. *Id.*

VIII. THE CHALLENGED '836 PATENT CLAIMS ARE UNPATENTABLE OVER THE PRIOR ART

A. GROUND 1: Claims 1 and 3-15 Are Obvious Over Nakamura

1. Independent Claim 1

Nakamura renders Claim 1 obvious. Ex. 1003, ¶¶85-130.

a) [1-PRE]

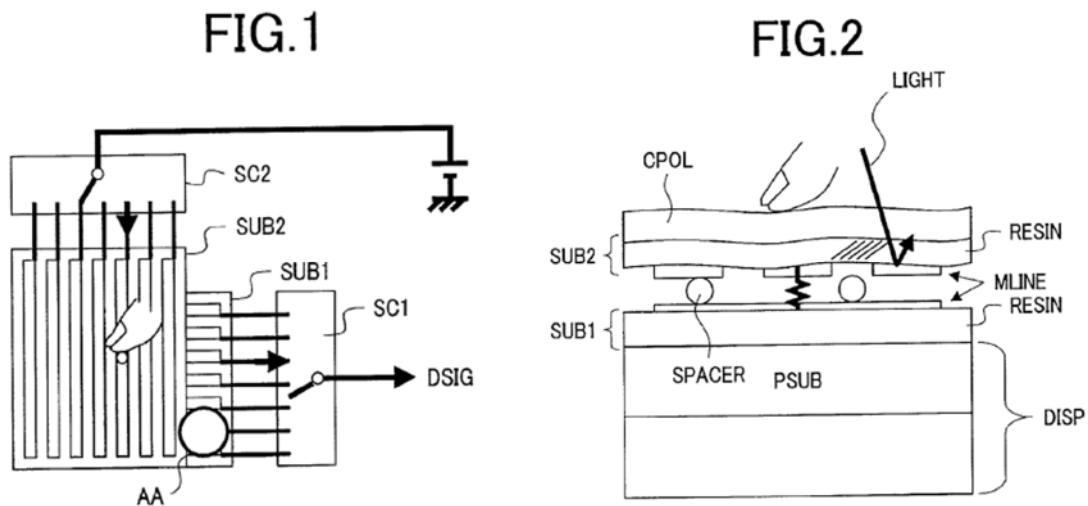
To the extent the preamble is found to be limiting, Nakamura discloses and renders obvious "[a] display device with a touch panel." Ex. 1003, ¶¶86-87.

Nakamura repeatedly expressly discloses a “display device with [a] touch panel.” See, e.g., Ex. 1004, (54) (Title: “DISPLAY DEVICE WITH TOUCH PANEL”), Abstract, [0003], [0026], [0036], [0055]; Ex. 1003, ¶87.

b) Element [1-A]

Nakamura discloses and renders obvious “the touch panel which includes a first substrate, and a second substrate arranged to face the first substrate in an opposed manner.” Ex. 1003, ¶¶88-93.

As shown in Figs. 1-2, Nakamura’s touch panel includes “[t]he first substrate SUB1 and the second substrate SUB2,” which “are arranged so that their respective metal wirings face each other and that directions along which the respective metal wirings extend are made to intersect.” Ex. 1003, ¶89; Ex. 1004, [0052], Figs. 1-2:



For clarity, for the remainder of the Claim 1 group, the substrate this

Nakamura embodiment labels as the SUB2 will be referred to as the “top” substrate, as it is located above the substrate labeled SUB1, and SUB1 will be referred to as the “bottom” substrate. Ex. 1003, ¶90.

This arrangement is one in which the each substrate “face[s]” the other substrate “in an opposed manner.” Ex. 1003, ¶91; Ex. 1004, Abstract (“a touch panel including a pair of substrates provided with electrodes on opposing surfaces thereof”), [0026] (same); *see also* [0030], [0058], [0082], [0086].

The disclosure of this concept in the ’836 patent is substantially similar to that of Nakamura, which the ’836 patent expressly “adopts” in discussing it. Ex. 1003, ¶92; Ex. 1001, 6:45-67, Figs. 9-10.

Nakamura thus discloses and renders obvious a touch panel that includes a first substrate, and a second substrate arranged to face the first substrate in an opposed manner. Ex. 1003, ¶93.

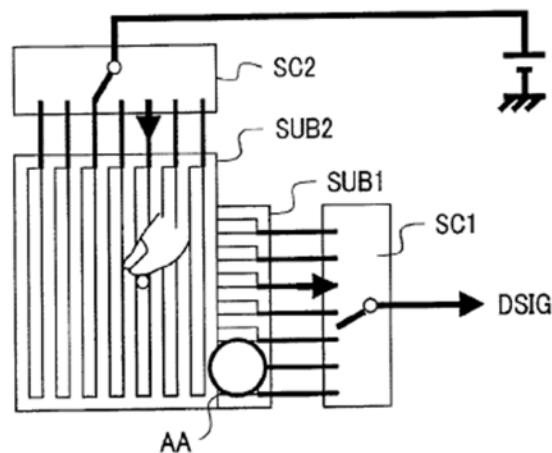
c) Element [1-B]

Nakamura discloses and renders obvious that “the first substrate and the second substrate each include a detection area configured to detect a coordinate and an outside area in which external terminals are formed.” Ex. 1003, ¶¶94-98.

As shown in Fig. 1, the top substrate SUB2 and the bottom substrate SUB1 in Nakamura’s touch panel both include a detection area configured to detect a coordinate and an outside area in which external terminals are formed. Ex. 1003,

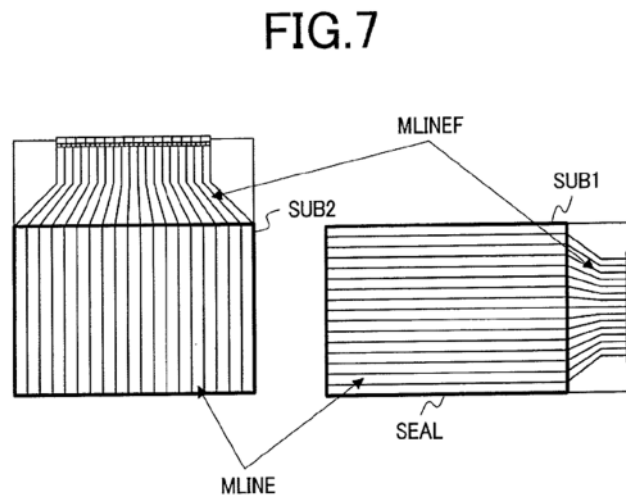
¶95; Ex. 1004, [0051] (touch panel includes “a first peripheral circuit SC1, a second peripheral circuit SC2, a power supply, and a detection signal output terminal”), [0053] (“second peripheral circuit SC2 is connected to the second substrate SUB2, and selects the metal wiring line by line to input a voltage thereto from the power supply”), [0054] (“first peripheral circuit SC1 is connected to the first substrate SUB1, and selects the metal wiring line by line to detect a voltage therefrom”), Fig. 1:

FIG. 1



Nakamura additionally discusses the detection areas and outside areas of its substrates many more times. Ex. 1003, ¶96; Ex. 1004, [0079], [0083] (discussing the “detection area”), [0102] (same), [0105] (same), [0108] (same) [0095]-[0097] (discussing the “external terminals” and area “outside the detection area”), [0111],

Fig. 7 (showing MLINE wiring in detection areas and MLINEF wiring in outside areas):



The disclosure of this concept in the '836 patent is substantially similar to that of Nakamura, which the '836 patent expressly “adopts” in discussing it. Ex. 1003, ¶97; Ex. 1001, 6:45-52, 7:1-7, 9:28-46, Figs. 9, 15.

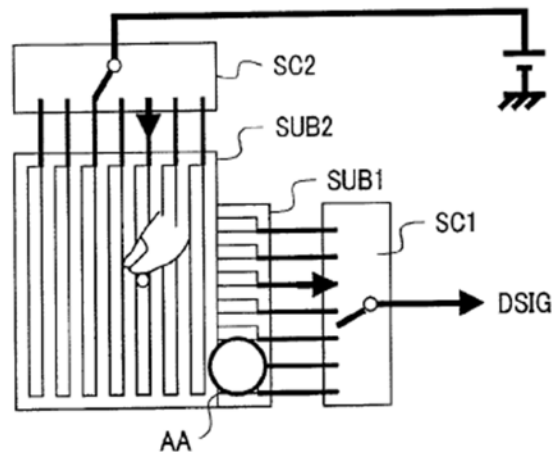
Nakamura thus discloses and renders obvious first substrates and second substrates that include both a detection area configured to detect a coordinate and an outside area in which external terminals are formed. Ex. 1003, ¶98.

d) Element [1-C]

Nakamura discloses and renders obvious that “the first substrate includes a plurality of first lines each configured to detect a coordinate,” and “the second substrate includes a plurality of second lines in the detection area which face the first substrate.” Ex. 1003, ¶¶99-103.

As shown in Fig. 1, the top substrate SUB2 and the bottom substrate SUB1 in Nakamura's touch panel both include a plurality of lines that are configured to detect a coordinate, and also both include a plurality of lines that "face" the other substrate. Ex. 1003, ¶100; Ex. 1004, Fig. 1:

FIG. 1



Because Nakamura's Fig. 1 apparatus is a touch sensor, a POSITA would have understood that its lines are configured to detect a coordinate. Ex. 1003, ¶101. And Nakamura expressly states that "[t]he first substrate SUB1 and the second substrate SUB2 are flexible wiring substrates" that "are arranged so that their respective metal wirings face each other and that directions along which the respective metal wirings extend are made to intersect." Ex. 1004, [0052]; *see also* [0051], [0053]-[0054], [0058], Figs. 2, 6-7.

The disclosure of this concept in the '836 patent is substantially similar to that of Nakamura, which the '836 patent expressly “adopts” in discussing it. Ex. 1003, ¶102; Ex. 1001, 6:45-7:7, Fig. 9.

Nakamura thus discloses and renders obvious a first substrate that includes a plurality of first lines each configured to detect a coordinate and a second substrate that includes a plurality of second lines in the detection area which face the first substrate. Ex. 1003, ¶103

e) Element [1-D]

Nakamura discloses and renders obvious that “each of the plurality of first lines and the plurality of second lines are configured of metal,” and “each of the plurality of first lines is black in color.” Ex. 1003, ¶¶104-109.

Nakamura expressly states that the first lines and second lines are “configured of metal.” Ex. 1003, ¶105; Ex. 1004, [0052] (“The first substrate SUB1 and the second substrate SUB2 are arranged so that their respective metal wirings face each other and that directions along which the respective metal wirings extend are made to intersect”), [0053] (“The second peripheral circuit SC2 is connected to the second substrate SUB2, and selects the metal wiring line by line to input a voltage thereto from the power supply”), [0054] (“The first peripheral circuit SC1 is connected to the first substrate SUB1, and selects the metal wiring line by line to detect a voltage therefrom”), [0066] (“Possible materials of the

metal wiring include an opaque metal film made of aluminum (Al), carbon (C), nonferrous metal such as copper (Cu), stainless steel (SUS), or iron (Fe)”; *see also* [0028], [0032], [0050]-[0053], [0055]-[0065], [0067]-[0069], [0071]-[0111].

Nakamura also discloses that any of its lines, including the first lines, may be “black in color.” Ex. 1003, ¶106; Ex. 1004, [0078] (“By changing the color of the above-mentioned metal wiring into black, it is possible to raise a contrast of a display such as a liquid crystal equipped with a touch panel”).

The disclosure of these concepts in the ’836 patent are substantially similar to that of Nakamura, which the ’836 patent expressly “adopts” in discussing them. Ex. 1003, ¶107; Ex. 1001, 6:45-67, 7:45-48, 8:34-37.

Indeed, during the prosecution of the ’836 patent’s child ’229 patent, the examiner expressly applied Nakamura against similar claim language. Ex. 1003, ¶108; Ex. 1006 (’229 File History), 8/2/2016 Office Action, p. 9. Patent owner did not dispute that Nakamura disclosed this concept, and instead amended the claims. Ex. 1003, ¶108; Ex. 1006, 11/1/2016 Response.

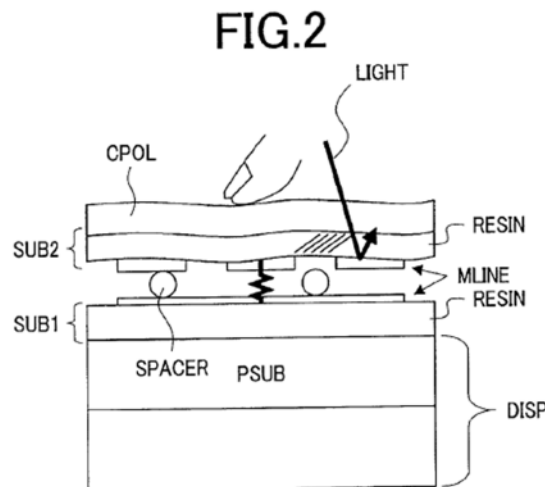
Nakamura thus discloses and renders obvious that each of the plurality of first lines and the plurality of second lines are configured of metal and that each of the plurality of first lines is black in color. Ex. 1003, ¶109.

f) Element [1-E]

Nakamura discloses and renders obvious that “a polarizing plate is arranged on the first substrate at a side opposite to the second substrate.” Ex. 1003, ¶¶110-116.

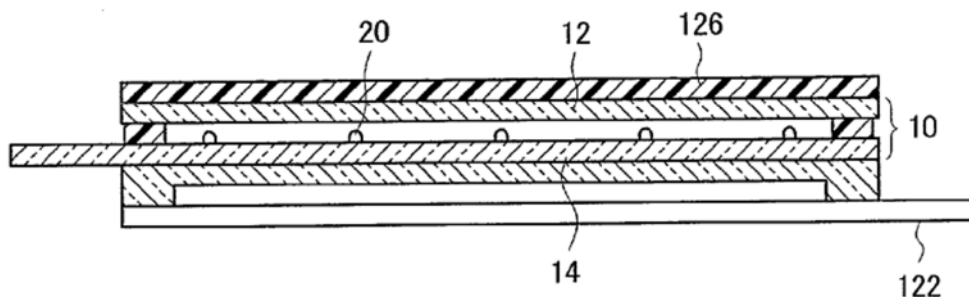
Nakamura explains that “one of substrates may be provided with a polarizing plate on an outside thereof,” which “can suppress ambient light reflection.” Ex. 1003, ¶111; Ex. 1004, [0029]; *see also* [0061]. Thus, Nakamura discloses that a polarizing plate can be arranged on either substrate, including on the first substrate at a side opposite the second substrate. Ex. 1003, ¶111.

Fig. 2 shows one embodiment of such a polarizing plate, in which the polarizing plate is a circular polarizing plate. Ex. 1003, ¶112. As shown, Nakamura’s display device includes a “circularly polarizing plate CPOL” that “is fixed onto” the top substrate SUB2. *Id.*; Ex. 1004, [0055], Fig. 2:



Indeed, the disclosure of this concept in the '836 patent is substantially similar to that of Nakamura, which the '836 patent expressly “adopts” in discussing it. Ex. 1003, ¶113; Ex. 1001, 4:37-60, 5:52-63, Fig. 6 (depicting circular polarizing plate 126 fixed onto substrate 12, at a side opposite substrate 14).

FIG. 6



Nakamura’s circularly polarizing plate is fixed onto the top substrate SUB2, which is labeled the “second substrate” in its Fig. 2 embodiment. Ex. 1003, ¶114. Despite this labeling, Nakamura’s top substrate SUB2 can be, and is, the “first substrate” of '836 patent Claim 1. *Id.* The “first” language in Claim 1 is simply a numerical identifier, and nothing about Claim 1 requires that the substrate the polarizing plate is “arranged on” be a “first” substrate *in haec verba*. *Id.*

Indeed, this understanding was confirmed during the prosecution of the '836 patent’s child '229 patent, during which the examiner repeatedly stated that the “first and second labels” that carried over into its pending claims “are very

arbitrary.” Ex. 1003, ¶115; Ex. 1006 (’229 File History), 3/14/2016 Office Action, pp. 7-8; 8/2/2016 Office Action, pp. 8-9. Patent owner did not dispute these statements. Ex. 1003, ¶115.

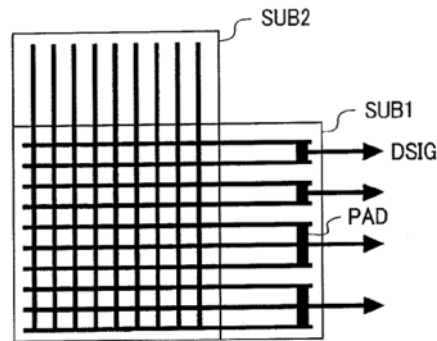
Nakamura thus discloses and renders obvious a polarizing plate that is arranged on the first substrate at a side opposite to the second substrate, both generally as well as in the form of a circular polarizing plate. Ex. 1003, ¶116.

g) Element [1-F]

Nakamura discloses and renders obvious that “the first substrate includes a plurality of wiring groups,” “each of the plurality of wiring groups include at least two first lines of the plurality of first lines,” and “the at least two first lines of each of the plurality of wiring groups are combined with each other.” Ex. 1003, ¶¶117-130.

As shown in Fig. 6, the metal wiring MLINEs on Nakamura’s substrates can be combined with each other to form wiring groups. Ex. 1003, ¶118; Ex. 1004, [0091] (“a terminal PAD for combining a plurality of metal wirings MLINE is provided in order to detect voltages of the plurality of metal wirings MLINE simultaneously, and a detection signal is output from each terminal PAD”), [0092] (“If the coordinate detection high in definition is unnecessary, the plurality of metal wirings MLINE are combined, to thereby enhance a recognition rate”), Fig. 6:

FIG.6



Nakamura expressly states that “[t]his [Fig. 6 wiring] mode can be applied to the stripe-shaped metal wirings according to Wiring Layout Modes 1 and 2.” Ex. 1003, ¶119; Ex. 1004, [0093]. Wiring Layout Mode 1 is the preferred embodiment shown in Figs. 1-3. Ex. 1003, ¶119; Ex. 1004, [0050]-[0080].

While Fig. 6 only depicts the metal wiring on the bottom substrate SUB1 combined into a group, a POSITA would have considered it obvious to apply Nakamura’s wiring grouping teachings to the “top” substrate SUB2 (*i.e.*, the “first substrate” of Claim 1) for at least two independent reasons. Ex. 1003, ¶¶120-129.

First, Nakamura explains that, in the Fig. 2 embodiment, the top substrate SUB2 connects to a circuit that “selects the metal wiring line by line to input a voltage thereto from the power supply,” while the bottom substrate SUB1 connects to a circuit that “selects the metal wiring line by line to detect a voltage therefrom.” Ex. 1003, ¶121; Ex. 1004, [0053]-[0054]. However, Nakamura (like the ’836

patent) does not say there is any special reason why the bottom substrate needs to be the detection substrate. Ex. 1003, ¶121. There is no reason why the positions of Nakamura's two Fig. 2 substrates could not simply be reversed, and no reason why it would not have been obvious to do so. *Id.* Indeed, both of Nakamura's substrates use the same metal wirings, and the wirings in both substrates are used in detecting the coordinates of a touch. *Id.*; Ex. 1004, [0051], [0056]-[0057], [0079], Fig. 7. While Nakamura's Fig. 6 embodiment applies the detection voltage to the wiring of the top substrate SUB2 and reads the detection signal on the wiring of the bottom substrate SUB1, it would have been obvious to a POSITA that this could have been reversed. *Id.* With the substrates reversed, the detection substrate would be the top substrate, and all of Nakamura's wiring grouping teachings for Fig. 6 directly apply to it, disclosing this limitation. *Id.*

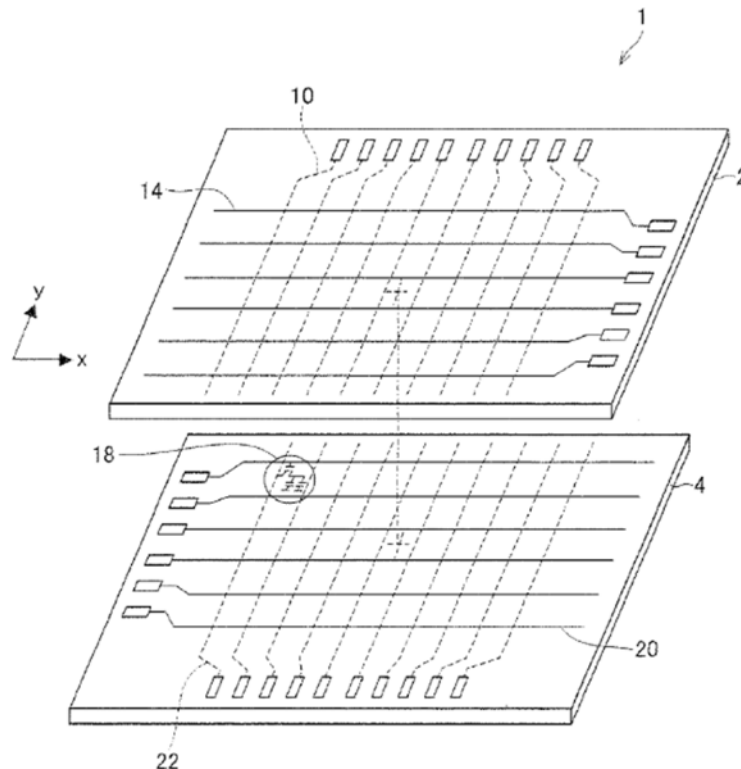
Second, even if the top substrate in Nakamura's Fig. 2 embodiment remained the input substrate rather than the detection substrate, a POSITA still would have considered it obvious to apply Nakamura's wiring grouping teachings for Fig. 6 to it. Ex. 1003, ¶122. Grouping the wiring on any substrate reduces the resolution of the touch detection that substrate is responsible for. *Id.* For example, Nakamura's Fig. 6 embodiment groups the wiring on the "bottom" substrate, which reduces the touch resolution in the y-axis direction, just as the '836 patent's sole embodiment in Fig. 14, which is identical to Nakamura Fig. 6, does. *Id.* This

means that the locations of touches in that direction are detected at are less precise than they would have been if the wires were not grouped, a loss the '836 patent is willing to accept, without any explanation. *Id.*

Because Nakamura (and the '836 patent) do not explain that any particular touch resolution is required, and expressly limit touch resolution for the “bottom” substrate in the Fig. 6 embodiment without qualification or discussion of its downsides, there is no reason why the wiring of the top substrate cannot be similarly grouped. Ex. 1003, ¶123. A POSITA would have recognized that grouping in this manner reduces the complexity of wiring provided to the display, with less external wiring needed. *Id.* Additionally, with less externally-addressed lines, the overall scanning speed can be increased, as schematically illustrated by the rotary switches SC1 and SC2 in Fig. 1. *Id.* In other words, resolution can be traded off for reduced wiring complexity and faster scanning. *Id.* Indeed, Nakamura expressly discusses making adjustments in view of that same tradeoff. *Id.*; Ex., 1004, [0092] (“If the coordinate detection high in definition is unnecessary, the plurality of metal wirings MLINE are combined, to thereby enhance a recognition rate”). Thus, a POSITA would have considered it obvious to apply Nakamura’s wiring grouping teachings for Fig. 6 to the top substrate in applications where high resolution is not required. *Id.*

This understanding is confirmed by prior art references that discuss this very

concept. Ex. 1003, ¶124. For example, U.S. Patent Publication No. 2010/0013785 A1 to Murai (“Murai”) (Ex. 1009) is directed to a touch panel for a display that includes two sets of intersecting metal wires formed on a substrate for use in X-Y coordinate touch detection, with metal wires 14 arranged in the X direction and metal wires 10 arranged in the Y direction. Ex. 1003, ¶124; Ex. 1009, [0146]-[0150], Fig. 2:



As shown, Murai Fig. 2 depicts each wire connected to a different terminal as one possible arrangement. Ex. 1003, ¶125; Ex. 1009, Fig. 2. However, Murai explains that one metal wire “does not necessarily correspond to one terminal,” and that “[a]lternatively, several metal wires. . . can be connected to one terminal.” Ex.

1003, ¶125; Ex. 1009, [0150]. Murai teaches that the decision of whether to group these wires depends on the very consideration discussed above, the desired resolution: the fewer wires connected to a given terminal, “the higher the detected resolution of a contact position” becomes. Ex. 1009, [0150]. “Therefore, a relation of connection of the metal wires 10 and the metal wires 14 to terminals can be freely set within an acceptable range of desired resolution of coordinate detection.” *Id.*

This discussion in Murai confirms a POSITA’s understanding that the decision of whether or not to group detection wiring on a particular touch panel substrate is an obvious one that depends on the resolution needed for a particular application. Ex. 1003, ¶126. This also confirms that a POSITA would have readily applied this concept to either of Nakamura’s two substrates. *Id.*

The flexibility of Nakamura’s wiring grouping teachings was confirmed during the prosecution of the ’836 patent’s child ’229 patent, during which the examiner repeatedly stated that the “first and second labels” that carried over into its pending claims “are very arbitrary.” Ex. 1003, ¶127; Ex. 1006 (’229 File History), 3/14/2016 Office Action, pp. 7-8; 8/2/2016 Office Action, pp. 8-9. *Id.* These statements were expressly applied to claim language involving the “pluralit[ies] of wiring groups.” *Id.* Patent owner did not dispute these statements. *Id.*

The disclosure of this concept in the '836 patent is substantially similar to that of Nakamura. Ex. 1003, ¶128; Ex. 1001, 9:17-26, Fig. 14.

Indeed, during the prosecution of the '836 patent's child '229 patent, the examiner expressly applied Nakamura against similar claim language. Ex. 1003, ¶129; Ex. 1006 ('229 File History), 8/2/2016 Office Action, p. 8. The examiner also stated that “figures 16-21 suggest[] different wiring patterns are in groups and banded by being printed on the different films.” *Id.* Patent owner did not dispute that Nakamura disclosed this concept, and instead amended the claims. Ex. 1003, ¶129; Ex. 1006 ('229 File History), 11/1/2016 Response.

Nakamura thus discloses and renders obvious a first substrate that includes a plurality of wiring groups, each of which includes at least two first lines of the plurality of first lines, and that the at least two first lines of each of the plurality of wiring groups are combined with each other. Ex. 1003, ¶130.

2. Claim 3

Claim 3 depends from Claim 1 and further requires that “the polarizing plate comprises a circular polarizing plate.”

Nakamura discloses and renders obvious this additional limitation. Ex. 1003, ¶¶131-133.

As discussed above for Claim 1 in Section VIII.A.1.f, Nakamura expressly states that the polarizing plate CPOL in its Fig. 2 embodiment is a “circularly

polarizing plate.” Ex. 1003, ¶133; Ex. 1004, [0055].

3. Claims 4 and 5

Claim 4 depends from Claim 1 and further requires that “the second lines comprise a second electrode each configured to detect a coordinate.”

Claim 5 depends from Claim 1 and further requires that “a transparent electrode connects to the second lines.”

Nakamura discloses and renders obvious these additional limitations in several embodiments. Ex. 1003, ¶¶134-146. Indeed, the disclosure of this concept in the '836 patent is the same as in Nakamura. Ex. 1003, ¶138; Ex. 1001, 9:47-10:3, Figs. 16-18.

First, as shown in Fig. 8, Nakamura discloses “that a stripe-shaped transparent wiring TLINE having the same pattern as that of the metal wiring MLINE is located under the metal wiring MLINE.” Ex. 1003, ¶139; Ex. 1004, [0099], Fig. 8:

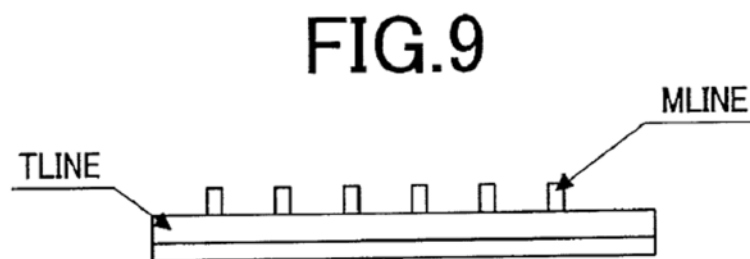


As explained throughout Nakamura, the transparent wiring TLINE is a transparent electrode that is configured to detect coordinates, and the metal wiring

MLINEs, which are also electrodes used to detect coordinates, comprise the first and second lines on both the first and second substrates. Ex. 1003, ¶140; Ex. 1004, [0007]-[0008], [0056]-[0057], [0079], [0091]-[0092], [0095], [0099], [0102], [0105], [0108], [0111]. And as applied to and shown in Fig. 8, a collection of TLINEs connects to the plurality of MLINEs. *Id.*

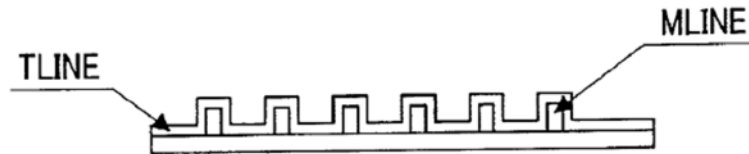
Thus, Nakamura discloses both second lines comprising electrodes configured to detect a coordinate (*i.e.*, the MLINEs) and also transparent electrodes that connect to the second lines (*i.e.*, the TLINE). Ex. 1003, ¶141.

Second, as shown in Fig. 9, Nakamura discloses “that a transparent wiring (electrode) TLINE that covers the entirety of the detection area is located under the metal wiring MLINE.” Ex. 1003, ¶142; Ex. 1004, [0102], Fig. 9:



Third, as shown in Fig. 10, Nakamura discloses “that a transparent wiring (electrode) TLINE that covers the entirety of the detection area is located above the metal wiring MLINE.” Ex. 1003, ¶143; Ex. 1004, [0105], Fig. 10:

FIG. 10



Nakamura expressly states that the wirings shown in all of Figs. 8-10 “can be applied to the stripe-shaped metal wirings according to Wiring Layout Modes 1 to 5.” Ex. 1003, ¶144; Ex. 1004, [0100], [0103], [0106]. Wiring Layout Mode 1 is the preferred embodiment shown in Figs. 1-3. Ex. 1003, ¶144; Ex. 1004, [0050]-[0080].

To the extent Patent Owner argues that these teachings relating to Figs. 8-10 apply only to the lines on the “top” substrate (*i.e.*, the “first substrate” of ’836 patent Claim 1) and not the lines on the “bottom” substrate (*i.e.*, the “second substrate” of ’836 patent Claim 1), that argument fails for many reasons: 1) the discussion of Figs. 8-10 do not limit which substrate or lines its teachings apply to; and 2) as discussed, the disclosure of this concept in the ’836 patent is the same as in Nakamura. Ex. 1003, ¶145. At a minimum, a POSITA would have found it obvious to apply this concept to the lines on the “bottom” substrate. *Id.* This is at least the case because the metal lines MLINE on both substrates are used for coordinate detection, such that both could benefit from transparent conductive film overlays and/or underlays. *Id.*; *see also* Ex. 1004, [0079]. As discussed in Section

VIII.A.1.g, it would have been obvious to a POSITA that either of Nakamura's substrates could be the "top" or "bottom" substrate. Ex. 1003, ¶145. Thus, the transparent conductive film could be applied to either substrate. *Id.*

Nakamura thus discloses and renders obvious that the second lines comprise a second electrode each configured to detect a coordinate, and that a transparent electrode connects to the second lines. Ex. 1003, ¶146.

4. Claim 6

Claim 6 depends from Claim 1 and further requires that "the at least two first lines of each of the plurality of wiring groups are combined with each other by a pad member."

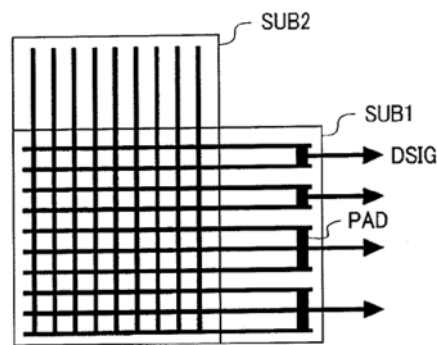
Nakamura discloses and renders obvious this additional limitation. Ex. 1003, ¶¶147-153. Indeed, the disclosure of this concept in the '836 patent is the same as in Nakamura. Ex. 1003, ¶149; Ex. 1001, 9:17-26, Fig. 14.

As discussed above for Claim 1, in view of Nakamura's teaching that the metal wirings on its bottom substrate can be combined with each other to form wiring groups, which is identical to the '836 patent's disclosure, a POSITA would have considered it obvious to apply that teaching to the top substrate for multiple reasons. Ex. 1003, ¶150; *see also* Section VIII.A.1.g; Ex. 1004, [0050]-[0080], [0091]-[0093], Figs. 1-2, 6-7.

Further, as shown in Nakamura's Fig. 6, lines of these wiring groups can be

combined with each other by a pad member. Ex. 1003, ¶151; Ex. 1004, [0091] (“a terminal PAD for combining a plurality of metal wirings MLINE is provided in order to detect voltages of the plurality of metal wirings MLINE simultaneously, and a detection signal is output from each terminal PAD”), Fig. 6:

FIG.6



Because the pad member is applied to the wiring groups, a POSITA would have considered it obvious to apply it to grouped wiring on the top substrate for the same reasons discussed above for Claim 1. Ex. 1003, ¶152; *see also* Section VIII.A.1.g.

Nakamura thus discloses and renders obvious that the at least two first lines of each of the plurality of wiring groups are combined with each other by a pad member. Ex. 1003, ¶153.

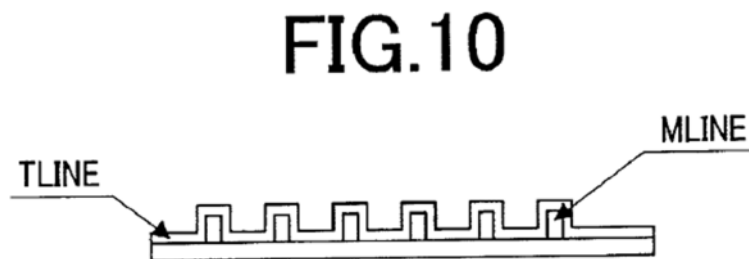
5. Claim 7

Claim 7 depends from Claim 1 and further requires that “a transparent

conductive film overlaps the plurality of the second lines in plan view” and “the transparent conductive film is electrically connected to the plurality of the second lines.”

Nakamura discloses and renders obvious this additional limitation. Ex. 1003, ¶¶154-162. Indeed, the disclosure of this concept in the '836 patent is the same as in Nakamura. Ex. 1003, ¶156; Ex. 1001, 9:63:10-3, Fig. 18.

As shown in Fig. 10, Nakamura discloses “that a transparent wiring (electrode) TLINE that covers the entirety of the detection area is located above the metal wiring MLINE.” Ex. 1003, ¶157; Ex. 1004, [0105], Fig. 10:



As explained throughout Nakamura, the transparent wiring TLINE is a transparent conductive film that is electrically connected to the metal lines. Ex. 1003, ¶158; Ex. 1004, [0007]-[0008], [0102], [0105]. And as shown in Fig. 10, TLINE overlaps the MLINEs. Ex. 1003, ¶158.

Nakamura expressly states that “[t]his [Fig. 10 wiring] mode can be applied to the stripe-shaped metal wirings according to Wiring Layout Modes 1 to 5.” Ex. 1003, ¶159; Ex. 1004, [0106]. Wiring Layout Mode 1 is the preferred embodiment

shown in Figs. 1-3. Ex. 1003, ¶159; Ex. 1004, [0050]-[0080].

Indeed, during the prosecution of the '836 patent's child '229 patent, the examiner expressly applied Nakamura against similar claim language. Ex. 1003, ¶160; Ex. 1006 ('229 File History), 8/2/2016 Office Action, p. 10. Patent owner did not dispute that Nakamura disclosed this concept, and instead amended the claims. Ex. 1003, ¶160; Ex. 1006, 11/1/2016 Response.

To the extent Patent Owner argues that these teachings relating to Fig. 10 apply only to the lines on the “top” substrate (*i.e.*, the “first substrate” of '836 patent Claim 1) and not the lines on the “bottom” substrate (*i.e.*, the “second substrate” of '836 patent Claim 1), that argument fails for many reasons: 1) the discussion of Fig. 10 does not limit which substrate or lines its teachings apply to; 2) as discussed, the disclosure of this concept in the '836 patent is the same as in Nakamura; and 3) as also discussed, Nakamura was applied against identical claim language during related prosecution. Ex. 1003, ¶161. At a minimum, a POSITA would have found it obvious to apply this concept to the lines on the “bottom” substrate. *Id.* This is at least the case because the metal lines MLINE on both substrates are used for coordinate detection, such that both could benefit from transparent conductive film overlays and/or underlays. *Id.*; *see also* Ex. 1004, [0079]. As discussed in Section VIII.A.1.g, it would have been obvious to a POSITA that either of Nakamura's substrates could be the “top” or “bottom”

substrate. Ex. 1003, ¶161. Thus, the transparent conductive film could be applied to either substrate. *Id.*

Nakamura thus discloses and renders obvious that a transparent conductive film overlaps the plurality of the second lines in plan view and the transparent conductive film is electrically connected to the plurality of the second lines. Ex. 1003, ¶162.

6. Independent Claim 8

Nakamura renders Claim 8 obvious. Ex. 1003, ¶¶163-187.

a) [8-PRE]

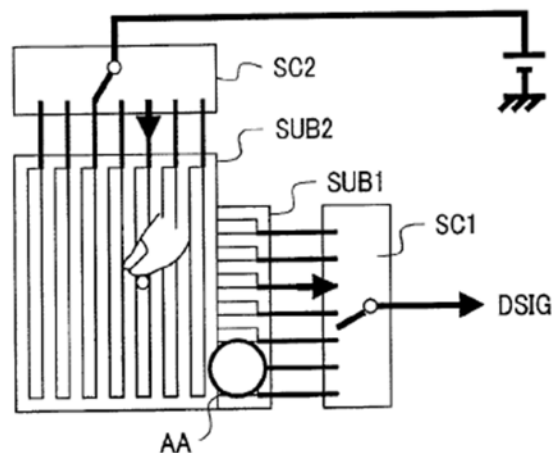
[8-PRE] is the same as [1-PRE]. Thus, to the extent it is found to be limiting, Nakamura discloses and renders obvious [8-PRE] for the same reasons discussed above for [1-PRE]. Ex. 1003, ¶164; *see also* Section VIII.A.1.a.

b) Element [8-A]

Nakamura discloses and renders obvious “the touch panel including a first substrate having a detection area to detect a coordinate and an outside area in which external terminals are formed, a plurality of first lines to detect the coordinate in the detection area, a plurality of second lines to detect the coordinate in the detection area, each of the plurality of first lines traversing each of the plurality of second lines.” Ex. 1003, ¶¶165-172.

As shown in Fig. 1, Nakamura's touch panel includes first substrate SUB1 and second substrate SUB2, both of which include a detection area configured to detect a coordinate and an outside area in which external terminals are formed. Ex. 1003, ¶166; Ex. 1004, [0051] (touch panel includes “a first peripheral circuit SC1, a second peripheral circuit SC2, a power supply, and a detection signal output terminal”), [0052], [0053] (“second peripheral circuit SC2 is connected to the second substrate SUB2, and selects the metal wiring line by line to input a voltage thereto from the power supply”), [0054] (“first peripheral circuit SC1 is connected to the first substrate SUB1, and selects the metal wiring line by line to detect a voltage therefrom”), Fig. 1:

FIG. 1

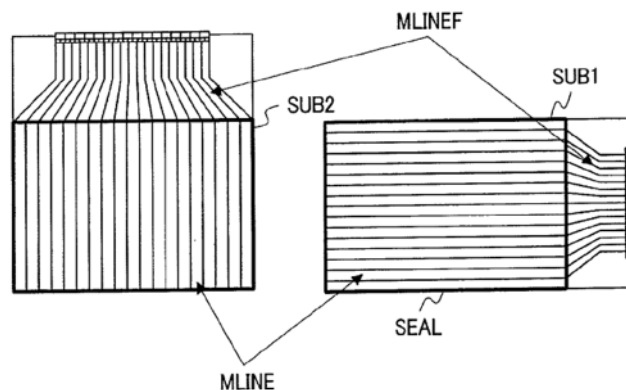


Either of Nakamura's substrates SUB1 and SUB2 can be the “first substrate” claimed in Claim 8, the only substrate expressly recited in the claim. Ex. 1003,

¶167. For simplicity, Petitioner will treat the bottom substrate SUB1 as the exemplary claimed “first substrate” for the remainder of this claim. *Id.* However, in the alternative, the top substrate SUB1 can also be the claimed “first substrate.” *Id.*

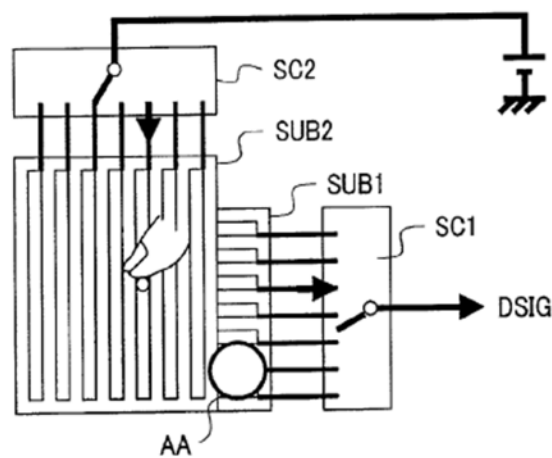
Nakamura additionally discusses the detection areas and outside areas of its substrates in which external terminals are formed many more times. Ex. 1003, ¶168; Ex. 1004, [0079], [0083] (discussing the “detection area”), [0102] (same), [0105] (same), [0108] (same) [0095]-[0097] (discussing the “external terminals” and area “outside the detection area,” including “the external terminals and wirings MLINEF extending up to the external terminals”), [0111], Fig. 7 (showing MLINE wiring in detection areas and MLINEF wiring connecting to external terminals in outside areas):

FIG.7



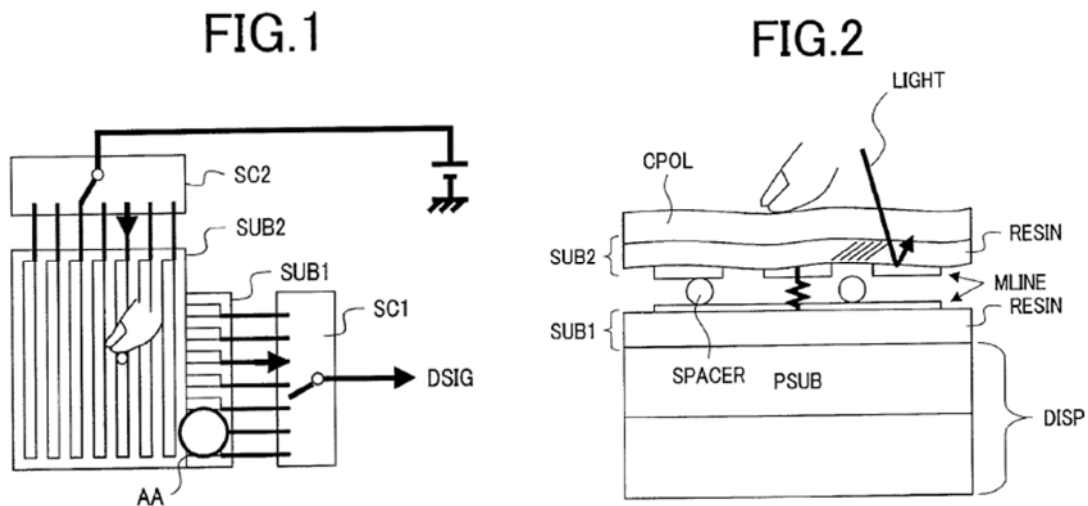
Nakamura's first substrate (*i.e.*, bottom substrate SUB1, or, in the alternative, top substrate SUB2) includes a plurality of first lines to detect a coordinate in the detection area, and its second substrate includes a plurality of second lines to detect the coordinate in the detection area. Ex. 1003, ¶169; Ex. 1004, [0003], [0079] ("The coordinate detection is performed on the metal wiring"), [0053] ("second peripheral circuit SC2 is connected to the second substrate SUB2, and selects the metal wiring line by line to input a voltage thereto from the power supply"), [0054] ("first peripheral circuit SC1 is connected to the first substrate SUB1, and selects the metal wiring line by line to detect a voltage therefrom"), [0111] ("In a case where the metal wiring is used as a wiring for the coordinate detection as in Wiring Layout Modes 1 to 9..."), Fig. 1:

FIG. 1

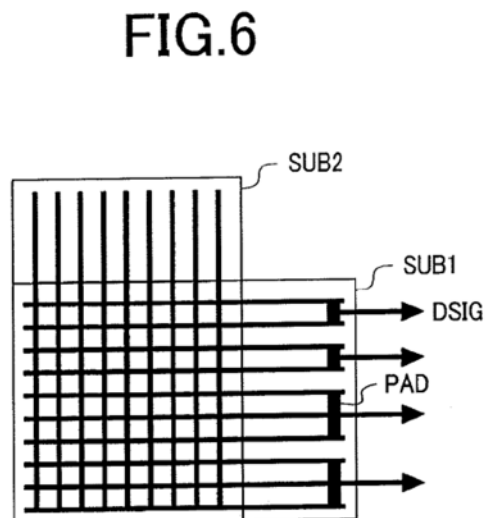


Further, as shown in Figs. 1-2, Nakamura's first and second substrates "are

arranged so that their respective metal wirings face each other and that directions along which the respective metal wirings extend are made to intersect,” *i.e.*, its substrates are arranged so that each of the plurality of first lines traverse each of the plurality of second lines. Ex. 1003, ¶170; Ex. 1004, [0052], Figs. 1-2:



See also Ex. 1004, [0093], Fig. 6:



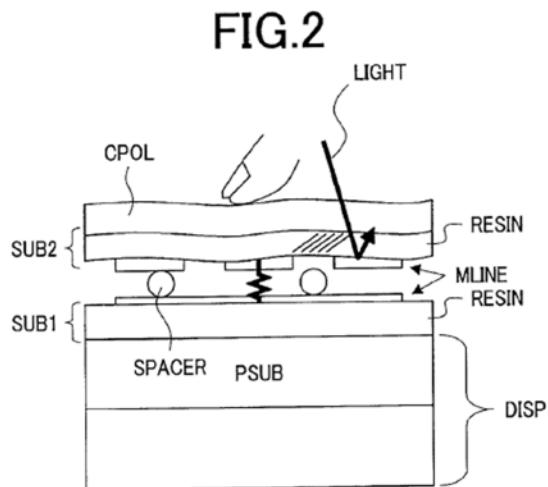
Indeed, the disclosure of this concept in the '836 patent is substantially similar to that of Nakamura, which the '836 patent expressly “adopts” in discussing it. Ex. 1003, ¶171; Ex. 1001, 6:45-7:14, Figs. 9-10 (two-substrate structure in '836 patent).

Nakamura thus discloses and renders obvious a touch panel that includes a first substrate having a detection area to detect a coordinate and an outside area in which external terminals are formed, a plurality of first lines to detect the coordinate in the detection area, a plurality of second lines to detect the coordinate in the detection area, each of the plurality of first lines traversing each of the plurality of second lines. Ex. 1003, ¶172.

c) Element [8-B]

Nakamura discloses and renders obvious “an organic luminescence electric device panel which is adhered to the touch panel.” Ex. 1003, ¶¶173-180.

As shown in Fig. 2, Nakamura discloses that “the touch panel of FIG. 1 is bonded to a surface of a display panel,” and the “display device with the touch panel includes a display panel substrate PSUB composing a display device DISP, the first substrate SUB1, the second substrate SUB2, a spacer SPACER, and a circularly polarizing plate CPOL.” Ex. 1003, ¶174; Ex. 1004, [0055], Fig. 2:



“The display panel substrate PSUB” constitutes “a display-surface-side substrate similar to a counter substrate of a liquid crystal display device and a sealing substrate of a top emission organic EL display device.” Ex. 1003, ¶175; Ex. 1004, [0055]. The “top emission organic EL display device” panel is “an organic luminescence electric device panel.” Ex. 1003, ¶175. Specifically, a POSITA would know that EL is an acronym for electroluminescent, and indeed, therefore, an organic emitting display panel is an organic electroluminescent display device. *Id.* The use of the phrase “top emission” in Nakamura further confirms this understanding, since it makes clear that the display is an emissive element, again exactly as is an organic “emitting” display panel. *Id.*

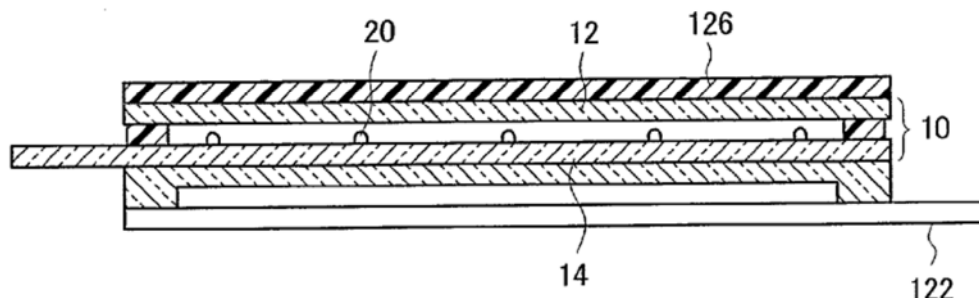
OLEDs like Nakamura’s organic EL display were well-known display devices in 2009. Ex. 1003, ¶176. POSITAs at the time understood that the selection of one type of well-known display device, such as a liquid crystal display

or OLED display, was an obvious and routine one that they could implement as they chose based on the design needs of their system. *Id.*

Further, Nakamura explains that “[t]he first substrate SUB1 is adhered onto the display panel substrate PSUB.” Ex. 1003, ¶177; Ex. 1004, [0055].

The disclosure of this concept in the ’836 patent is substantially similar to that of Nakamura. Ex. 1003, ¶178; Ex. 1001, 5:52-63, Fig. 6 (showing same arrangement of “circular polarizing plate” 126, “touch panel” 10 comprising substrates 12 and 14, and “organic EL display panel” 122):

FIG. 6



Indeed, during the prosecution of the ’836 patent’s child ’229 patent, the examiner expressly applied Nakamura against similar claim language. Ex. 1003, ¶179; Ex. 1006 (’229 File History), 8/2/2016 Office Action, pp. 7-8. The examiner also stated that Nakamura discloses an “organic EL display, predetermined layer of resin, touch panel, and circular polarizing plate and polarizing circular plates [that] adheres to touch panel,” and a “touch panel with circular polarized plates bonded

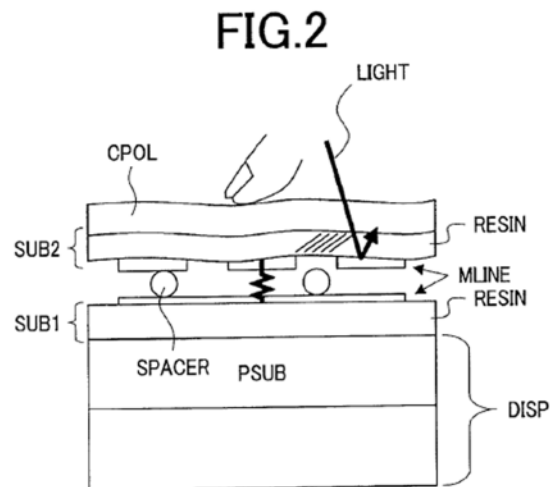
to resin with organic EL display.” *Id.* Patent owner did not dispute that Nakamura disclosed these concepts, and instead amended the claims. Ex. 1003, ¶179; Ex. 1006, 11/1/2016 Response.

Nakamura thus discloses and renders obvious an organic luminescence electric device panel which is adhered to the touch panel. Ex. 1003, ¶180.

d) Element [8-C]

Nakamura discloses and renders obvious “a circular polarizing plate which is adhered to the touch panel at a side opposite to the organic luminescence electric device panel.” Ex. 1003, ¶¶181-187.

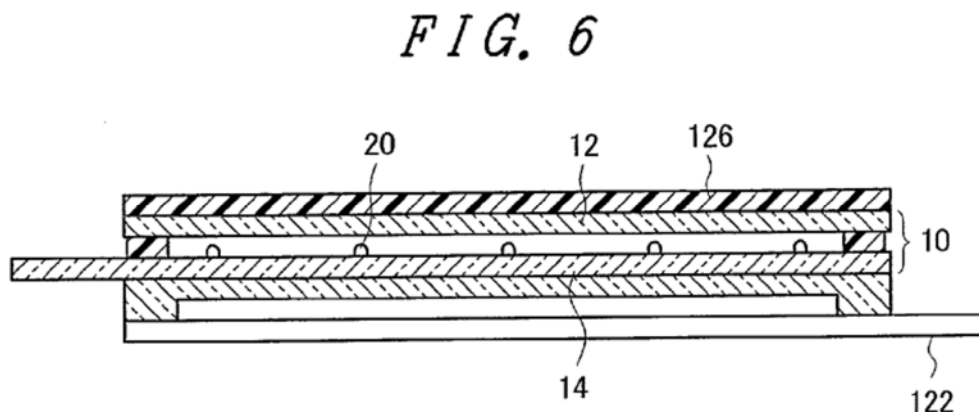
As discussed for the previous limitation, Nakamura’s Fig. 2 shows that “the touch panel of FIG. 1 is bonded to a surface of a display panel,” and the “display device with the touch panel includes a display panel substrate PSUB composing a display device DISP, the first substrate SUB1, the second substrate SUB2, a spacer SPACER, and a circularly polarizing plate CPOL.” Ex. 1003, ¶182; Ex. 1004, [0055], Fig. 2:



“The circularly polarizing plate CPOL is fixed onto the second substrate SUB2.” Ex. 1004, [0055]. A POSITA would have understood that this statement that the CPOL is fixed onto the substrate means it is adhered to the touch panel, or at a minimum that it would have been obvious to fix the CPOL to the touch panel by adhering. Ex. 1003, ¶183. They would have understood that in 2009 adhering was one of a few obvious ways to fix display device components together, the selection of any of which would have been an obvious design choice. *Id.* This is particularly the case because Nakamura mentions adhering the substrate in this same paragraph. *Id.*; Ex. 1004, [0055].

Further, as shown in Fig. 2, the circularly polarizing plate CPOL is adhered to the touch panel at a side opposite to the organic luminescence electric device panel, the “top emission organic EL display device” located in the display panel substrate PSUB. Ex. 1003, ¶184; Ex. 1004, [0055], Fig. 2.

The disclosure of this concept in the '836 patent is substantially similar to that of Nakamura. Ex. 1003, ¶185; Ex. 1001, 5:52-63, Fig. 6 (showing same arrangement of “circular polarizing plate” 126, “touch panel” 10 comprising substrates 12 and 14, and “organic EL display panel” 122):



Indeed, during the prosecution of the '836 patent's child '229 patent, the examiner expressly applied Nakamura against similar claim language. Ex. 1003, ¶186; Ex. 1006 ('229 File History), 8/2/2016 Office Action, pp. 7-8. The examiner also stated that Nakamura discloses a “circular polarizer [that] adheres to touch panel,” which the examiner stated was well known to a POSITA, an “organic EL display, predetermined layer of resin, touch panel, and circular polarizing plate and polarizing circular plates [that] adheres to touch panel please see figure 2,” and a “touch panel with circular polarized plates bonded to resin with organic EL display.” *Id.* Patent owner did not dispute that Nakamura disclosed these concepts, and instead amended the claims. Ex. 1003, ¶186; Ex. 1006, 11/1/2016

Response.

Nakamura thus discloses and renders obvious a circular polarizing plate which is adhered to the touch panel at a side opposite to the organic luminescence electric device panel. Ex. 1003, ¶187.

7. Claim 9

Claim 9 depends from Claim 8. The additional limitation of Claim 9 is the same as Element [1-D]. Thus, Nakamura discloses and renders obvious Claim 9 for the same reasons discussed above for Element [1-D]. Ex. 1003, ¶¶188-189; *see also* Section VIII.A.1.e.

8. Claim 10

Claim 10 depends from Claim 8.

The additional limitation of Claim 10 is a broader version of Element [1-F]. Ex. 1003, ¶191. While Element [1-F] requires the plurality of wiring groups to be on the first substrate, Claim 10 allows the wiring groups to be anywhere on the touch panel, including on either of substrates SUB1 or SUB2. *Id.*

Thus, regardless of which substrate is labeled the “first substrate” in Nakamura, Nakamura discloses and renders obvious Claim 10 for at least the same reasons discussed above for Element [1-F]. Ex. 1003, ¶192; *see also* Section VIII.A.1.g.

9. Claim 11

Claim 11 depends from Claim 10.

The additional limitation of Claim 11 is a broader version of Claim 6. Ex. 1003, ¶194. While Claim 6 requires the plurality of wiring groups to be on the first substrate, via Claim 1, Claim 11 allows the wiring groups to be anywhere on the touch panel, including on either of substrates SUB1 or SUB2. *Id.*

Thus, regardless of which substrate is labeled the “first substrate” in Nakamura, Nakamura discloses and renders obvious Claim 11 for at least the same reasons discussed above for Claim 6. Ex. 1003, ¶195; *see also* Section VIII.A.4.

10. Claim 12

Claim 12 depends from Claim 9.

The additional limitation of Claim 12 is a broader version of Claim 7. Ex. 1003, ¶197.

Claim 7’s application of the transparent conductive film to the plurality of the second lines requires the second lines to be on the second substrate, via Claim 1. Ex. 1003, ¶198. Claim 12 allows the transparent conductive film to be anywhere on the touch panel, including on either of substrates SUB1 or SUB2. *Id.*

Another difference is that Claim 12 says the “transparent conductive film **overlays** the plurality of the second lines,” while Claim 7 says the film “**overlaps**” the second lines. Ex. 1003, ¶199. However, this is a non-substantive difference.

Id.

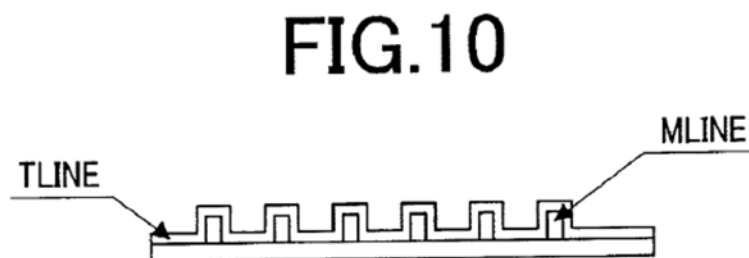
Thus, Nakamura discloses and renders obvious Claim 12 for at least the same reasons discussed above for Claim 7. Ex. 1003, ¶200; *see also* Section VIII.A.5.

11. Claim 13

Claim 13 depends from Claim 10 and further requires that “a transparent conductive film overlays the plurality of the first lines” and “the transparent conductive film is electrically connected to the plurality of the first lines.”

Nakamura discloses and renders obvious this additional limitation. Ex. 1003, ¶¶201-209. Indeed, the disclosure of this concept in the '836 patent is the same as in Nakamura. Ex. 1003, ¶203; Ex. 1001, 9:63:10-3, Fig. 18.

As shown in Fig. 10, Nakamura discloses “that a transparent wiring (electrode) TLINE that covers the entirety of the detection area is located above the metal wiring MLINE.” Ex. 1003, ¶204; Ex. 1004, [0105], Fig. 10:



As explained throughout Nakamura, the transparent wiring TLINE is a transparent conductive film that is electrically connected to the metal lines

MLINE. Ex. 1003, ¶205; Ex. 1004, [0007]-[0008], [0102], [0105]. And as shown in Fig. 10, TLINE overlays the MLINEs. *Id.*

Nakamura expressly states that “[t]his [Fig. 10 wiring] mode can be applied to the stripe-shaped metal wirings according to Wiring Layout Modes 1 to 5.” Ex. 1003, ¶206; Ex. 1004, [0106]. Wiring Layout Mode 1 is the preferred embodiment shown in Figs. 1-3. Ex. 1003, ¶206; Ex. 1004, [0050]-[0080].

Indeed, during the prosecution of the ’836 patent’s child ’229 patent, the examiner expressly applied Nakamura against identical claim language. Ex. 1003, ¶207; Ex. 1006 (’229 File History), 8/2/2016 Office Action, pp. 10-11. Patent owner did not dispute that Nakamura disclosed this concept, and instead amended the claims. Ex. 1003, ¶207; Ex. 1006, 11/1/2016 Response.

To the extent Patent Owner argues that these teachings relating to Fig. 10 apply only to the second lines and not the first lines, that argument fails for many reasons: 1) the discussion of Fig. 10 does not limit which lines its teachings apply to; 2) as discussed, the disclosure of this concept in the ’836 patent is the same as in Nakamura; and 3) as also discussed, Nakamura was applied against identical claim language during related prosecution. Ex. 1003, ¶208. At a minimum, a POSITA would have found it obvious to apply this concept to the first lines. *Id.* This is at least the case because the metal lines MLINE on both substrates are used for coordinate detection, such that both could benefit from transparent conductive

film overlays. *Id.*; see also Ex. 1004, [0079]. As discussed in Section VIII.A.1.g, it would have been obvious to a POSITA that either of Nakamura's substrates could be the "top" or "bottom" substrate. Ex. 1003, ¶208. Thus, the lines used for application of voltage and those used for detection could be placed on either substrate without concern. *Id.*

Nakamura thus discloses and renders obvious that a transparent conductive film overlays the plurality of the first lines and the transparent conductive film is electrically connected to the plurality of the first lines. Ex. 1003, ¶209.

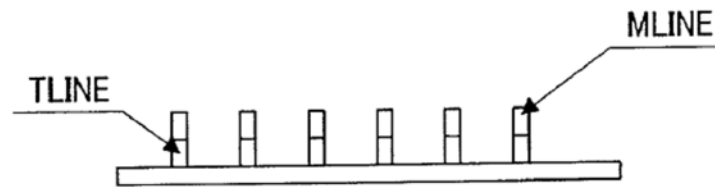
12. Claim 14

Claim 14 depends from Claim 9 and further requires that "a transparent conductive film underlays the plurality of the second lines" and "the transparent conductive film is electrically connected to the plurality of the second lines."

Nakamura discloses and renders obvious these additional limitations in several embodiments. Ex. 1003, ¶¶210-219. Indeed, the disclosure of this concept in the '836 patent is the same as in Nakamura. Ex. 1003, ¶212; Ex. 1001, 9:47-62, Figs. 16-17.

First, as shown in Fig. 8, Nakamura discloses "that a stripe-shaped transparent wiring TLINE having the same pattern as that of the metal wiring MLINE is located under the metal wiring MLINE." Ex. 1003, ¶213; Ex. 1004, [0099], Fig. 8:

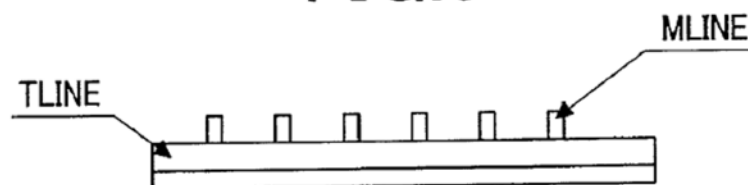
FIG.8



As explained throughout Nakamura, the transparent wiring TLINE is a transparent conductive film that is electrically connected to the metal lines. Ex. 1003, ¶214; Ex. 1004, [0007]-[0008], [0102], [0105]. And as applied to and shown in Fig. 8, a collection of TLINEs underlays and connects to the plurality of MLINEs. Ex. 1003, ¶214.

Second, as shown in Fig. 9, Nakamura discloses “that a transparent wiring (electrode) TLINE that covers the entirety of the detection area is located under the metal wiring MLINE.” Ex. 1003, ¶215; Ex. 1004, [0102], Fig. 9:

FIG.9



Here again, TLINE underlays the MLINEs. Ex. 1003, ¶216.

Nakamura expressly states that the wirings shown in all of Figs. 8-9 “can be applied to the stripe-shaped metal wirings according to Wiring Layout Modes 1 to

5.” Ex. 1003, ¶217; Ex. 1004, [0100], [0103]. Wiring Layout Mode 1 is the preferred embodiment shown in Figs. 1-3. Ex. 1003, ¶217; Ex. 1004, [0050]-[0080].

Indeed, during the prosecution of the ’836 patent’s child ’229 patent, the examiner expressly applied Nakamura against identical claim language. Ex. 1003, ¶218; Ex. 1006 (’229 File History), 8/2/2016 Office Action, p. 11. Patent owner did not dispute that Nakamura disclosed this concept, and instead amended the claims. Ex. 1003, ¶218; Ex. 1006, 11/1/2016 Response.

Nakamura thus discloses and renders obvious that a transparent conductive film underlays the plurality of the second lines and the transparent conductive film is electrically connected to the plurality of the second lines. Ex. 1003, ¶219.

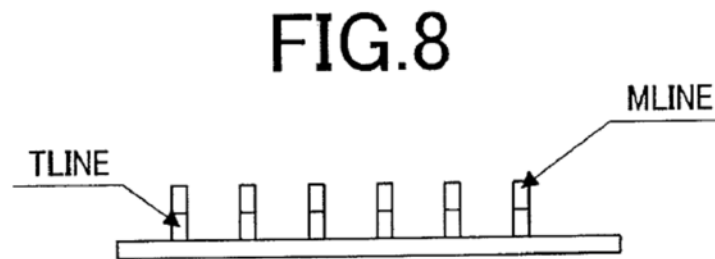
13. Claim 15

Claim 15 depends from Claim 10 and further requires that “a transparent conductive [sic] film underlays the plurality of the first lines” and “the transparent conductive film is electrically connected to the plurality of first lines.”

Nakamura discloses and renders obvious these additional limitations in several embodiments. Ex. 1003, ¶¶220-230. Indeed, the disclosure of this concept in the ’836 patent is the same as in Nakamura. Ex. 1003, ¶222; Ex. 1001, 9:47-62, Figs. 16-17.

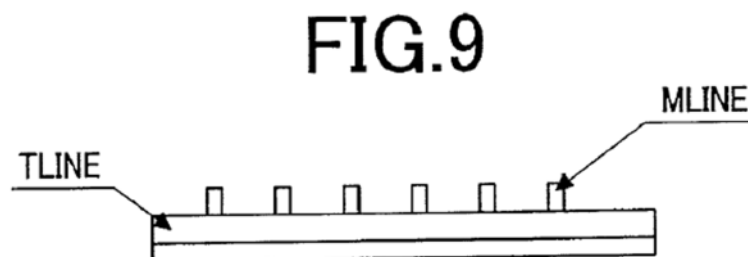
First, as shown in Fig. 8, Nakamura discloses “that a stripe-shaped

transparent wiring TLINE having the same pattern as that of the metal wiring MLINE.” Ex. 1003, ¶223; Ex. 1004, [0099], Fig. 8:



As explained throughout Nakamura, the transparent wiring TLINE is a transparent conductive film that is electrically connected to the metal lines. Ex. 1003, ¶224; Ex. 1004, [0007]-[0008], [0099], [0102], [0105]. And as applied to and shown in Fig. 8, a collection of TLINEs underlays and connects to the plurality of MLINEs. Ex. 1003, ¶224.

Second, as shown in Fig. 9, Nakamura discloses “that a transparent wiring (electrode) TLINE that covers the entirety of the detection area is located under the metal wiring MLINE.” Ex. 1003, ¶225; Ex. 1004, [0102], Fig. 9:



Here again, TLINE underlays the MLINEs. Ex. 1003, ¶226.

Nakamura expressly states that the wirings shown in all of Figs. 8-9 “can be applied to the stripe-shaped metal wirings according to Wiring Layout Modes 1 to 5.” Ex. 1003, ¶227; Ex. 1004, [0100], [0103]. Wiring Layout Mode 1 is the preferred embodiment shown in Figs. 1-3. Ex. 1003, ¶227; Ex. 1004, [0050]-[0080].

Indeed, during the prosecution of the ’836 patent’s child ’229 patent, the examiner expressly applied Nakamura against identical claim language. Ex. 1003, ¶228; Ex. 1006 (’229 File History), 8/2/2016 Office Action, p. 11. Patent owner did not dispute that Nakamura disclosed this concept, and instead amended the claims. Ex. 1003, ¶228; Ex. 1006, 11/1/2016 Response.

To the extent Patent Owner argues that these teachings relating to Figs. 8-9 apply only to the second lines and not the first lines, that argument fails for many reasons: 1) the discussion of Figs. 8-9 does not limit which lines its teachings apply to; 2) as discussed, the disclosure of this concept in the ’836 patent is the same as in Nakamura; and 3) as also discussed, Nakamura was applied against identical claim language during related prosecution. Ex. 1003, ¶229. At a minimum, a POSITA would have found it obvious to apply this concept to the first lines. *Id.* This is at least the case because the metal lines MLINE on both substrates are used for coordinate detection, such that both could benefit from

transparent conductive film overlays. *Id.*; *see also* Ex. 1004, [0079]. As discussed in Section VIII.A.1.g, it would have been obvious to a POSITA that either of Nakamura's substrates could be the "top" or "bottom" substrate. Ex. 1003, ¶229. Thus, the lines used for application of voltage and those used for detection could be placed on either substrate without concern. *Id.*

Nakamura thus discloses and renders obvious that a transparent conductive film underlays the plurality of the first lines and the transparent conductive film is electrically connected to the plurality of the first lines. Ex. 1003, ¶230.

B. GROUND 2: Claim 2 Is Obvious Over Nakamura Alone, As Well as Nakamura in Combination with Slobodin

1. Claim 2

Claim 2 depends from Claim 1 and further requires that "the polarizing plate comprises a linear polarizing plate."

Nakamura discloses and renders obvious this additional limitation, both alone and in combination with Slobodin. Ex. 1003, ¶¶231-250.

The '836 patent does not allege that the concept of a polarizing plate of any type was novel or nonobvious. Ex. 1003, ¶234. Nor does it describe the structure or operation of a any sort of polarizing plate, much less linear or circular polarizing plates specifically. *Id.* Indeed, the fact that the "polarizing plate" recited in '836 patent Claim 1 is able to comprise both a "linear polarizing plate" in dependent

Claim 2 and a “circular polarizing plate” in dependent Claim 3, without any explanation in the specification, demonstrates the obviousness of both types. *Id.*

Further, as discussed above for Claim 1 in Section VIII.A.1.f, Nakamura discloses both the use of a polarizing plate generally, as well as the use of a circular polarizing plate in its Fig. 2 embodiment. Ex. 1003, ¶235.

At a minimum, a POSITA would have thus considered it obvious to select a linear polarizing plate, consistent with its general disclosure, as well as to substitute the circular polarizing plate of Nakamura’s Fig. 2 embodiment with a linear polarizing plate. Ex. 1003, ¶236. They also would have considered this obvious because linear and circular polarizers are the two most common polarizers, such that a POSITA would have found it obvious to use either of them in Nakamura, depending on the needs of the application and design choices. *Id.*

For example, a POSITA would have been motivated to select a linear polarizer or replace the circular polarizer in Nakamura’s Fig. 2 embodiment with a linear polarizer in applications where linear polarizers adequately suppress ambient light. Ex. 1003, ¶237. By doing so, they would have been able to save on both costs and valuable space in their touch panel. *Id.*

Indeed, Nakamura simply states that the “polarizing plate” it utilizes is included to “suppress ambient light reflection.” Ex. 1003, ¶238; Ex. 1004, [0029], [0061]. But it does not state how much reflection necessarily needs to be

suppressed, nor does it state that a circular polarizer is required to sufficiently suppress reflection. *Id.* In view of this disclosure, a POSITA would have understood Nakamura to be explaining that a linear polarizer could have sufficiently suppressed reflection in various applications. Ex. 1003, ¶238.

A POSITA additionally would have found it obvious to choose a linear polarizing plate for use in Nakamura in applications using an LCD display, which Nakamura discloses. Ex. 1003, ¶239; Ex. 1004, [0055], [0078]. '836 Patent Claim 2 is not limited to any particular type of display, and it was common in 2009 to use linear polarizing plates in conjunction with LCD displays. Ex. 1003, ¶239.

To the extent Patent Owner argues that a POSITA would not have found it obvious to select a linear polarizer or replace the circular polarizer in Nakamura's Fig. 2 embodiment with a linear polarizer in view of Nakamura alone, they would have found it obvious to do so in view of Nakamura combined with Slobodin. Ex. 1003, ¶240.

A POSITA would have been motivated to combine Nakamura and Slobodin for at least the reasons discussed in Section VII.C above, as well as those discussed below. Ex. 1003, ¶¶241-250.

Slobodin teaches that a "polarizing material may be incorporated onto the outer surface of the touch sensor to help control the surface reflections from the touch sensor." Ex. 1005, [0009]; *see also* Ex. 1003, ¶242. In some systems, "a

linear polarizer may be applied to the outer surface of the touch sensor with its pass axis aligned with the output polarizer of the underlying display.” *Id.* “The linear polarizer may absorb over 50% of the light incident on the touch sensor, reducing the surface reflections by the same amount, while passing almost all of the light emitted by the underlying display.” *Id.*

In other systems, designers may choose to have light incident on the surface of the touch sensor both “linearly polarized and then rotated to circular polarization, absorbing over 50% of the incident light.” *Id.*; *see also* Ex. 1003, ¶243. This “circularly polarized incident light that passes into the touch sensor may partially reflect off of the various surface interfaces in the touch sensor and display.” *Id.* Because circularly polarized light changes orientation when it reflects, “the reflected light may be absorbed in the circular polarizer on the reflected path, substantially eliminating internal touch sensor reflections.” *Id.*

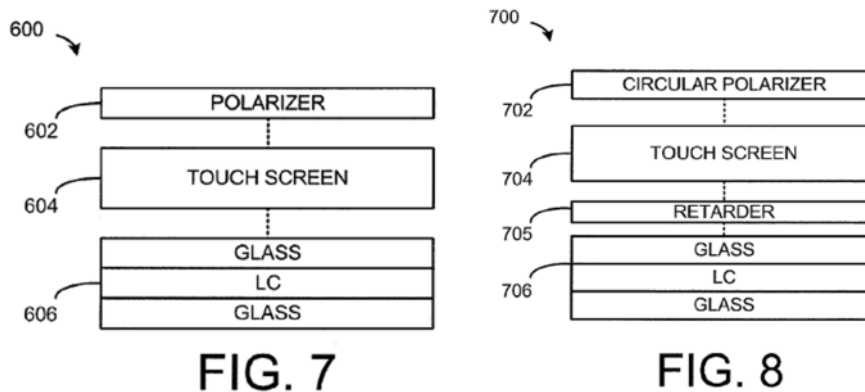
However, Slobodin explains, “in touch sensors that incorporate birefringent materials, such as polyethylene terephthalate (PET), the opportunity to improve the optical performance of the display may be limited.” *Id.*, [0010]; *see also* Ex. 1003, ¶244.

A birefringent material is one that exhibits different refractive indices for light polarized in different directions. Ex. 1003, ¶245. This means that when light passes through a birefringent material, it effectively splits into two rays, each with

a different speed and polarization. *Id.* This phenomenon is also known as double refraction. *Id.*

Slobodin further explains that this limitation on optical performance in birefringent materials “may be even more pronounced if a touch sensor polarizer is attached to the outer surface of the touch sensor.” Ex. 1005, [0010]; *see also* Ex. 1003, ¶246. Even when a circular polarizer is used, the birefringent layers pollute the linearly polarized light emitted from the underlying display and some of the desired light may be absorbed by the polarizer on the outer surface of the touch sensor, reducing image uniformity. *Id.* Additionally, “incident light that is controlled by the circular polarizer is similarly polluted, reducing the effectiveness of the incident light control normally afforded by the circular polarizer.” *Id.*

In line with this discussion of how linear polarizers may be preferable in certain situations, while circular polarizers may be preferable in others, Slobodin describes two display system embodiments that utilize each type of polarizer in detail, a linear polarizer in Fig. 7 and a circular polarizer in Fig. 8. Ex. 1003, ¶247; Ex. 1005, [0050]-[0052], Figs. 7-8:



While the Fig. 7 polarizer is labeled as simply a “polarizer,” in view of Slobodin’s extension discussion of the differences between linear and circular polarizers and Fig. 8’s disclosure of a circular polarizer, a POSITA would have understood that Fig. 7’s polarizer is a linear polarizer. Ex. 1003, ¶248; *see also* Ex. 1005, [0009]-[0010], [0050]-[0052], Figs. 7-8.

Slobodin thus teaches that, in certain touch sensors, including those incorporating birefringent materials, the benefits that circular polarizers often provide cannot fully be taken advantage of. Ex. 1003, ¶249. And as discussed above, Nakamura states only that the “polarizing plate” it utilizes needs to “suppress ambient light reflection,” without requiring a particular amount of suppression or type of polarizer, which a POSITA would have understood to mean that a linear polarizer could have sufficiently suppressed reflection in certain situations. *Id.*; Ex. 1004, [0029], [0061]. For example, in applications of Nakamura that included birefringent materials, a POSITA would have been

motivated to use a simpler and less expensive linear polarizer, as taught by Slobodin. Ex. 1003, ¶249; Ex. 1005, [0009]-[0010] (explaining that a “linear polarizer may absorb over 50% of the light incident on the touch sensor,” which cannot be meaningfully improved on when birefringent materials are used), [0023] (explaining how Slobodin’s teachings may improve performance by “reducing reflectance within the system, simplifying manufacturing and/or reducing manufacturing costs while retaining the advantages of prior touch sensors”).

Thus, it would have been obvious to a POSITA to select a linear polarizer or replace the circular polarizer in Nakamura’s Fig. 2 embodiment with a linear polarizer like the one taught by Slobodin. Ex. 1003, ¶250.

IX. SECONDARY CONSIDERATIONS

Petitioner is not aware of any secondary considerations that would overcome the strong showing of obviousness provided by the Petition. Ex. 1003, ¶251.

Further, any attempt by Patent Owner to rely on alleged secondary considerations cannot overcome the showing of obviousness detailed above. *Tokai Corp. v. Easton Enters., Inc.*, 632 F.3d 1358, 1370 (Fed. Cir. 2011).

X. CONCLUSION

For the foregoing reasons, Petitioner respectfully requests the Board institute review of the ’836 patent and cancel all Challenged Claims.

Inter Partes Review

United States Patent No. 8,803,836

Date: July 10, 2025

Respectfully submitted,

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CERTIFICATE OF WORD COUNT

The undersigned certifies that the foregoing PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 8,803,836 UNDER 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42 ET SEQ. complies with the type volume limitation in 37 C.F.R. § 42.24(a)(1)(i). According to the utilized word-processing system's word count, the petition—excluding the caption, table of contents, a table of authorities, mandatory notices under § 42.8, certificate of service, certificate of word count, or listing of exhibits, and claim listing—contains 13,103 words.

Dated: July 10, 2025

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CERTIFICATE OF SERVICE

The undersigned hereby confirms that the foregoing PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 8,803,836 UNDER 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42 ET SEQ. and associated Exhibits 1001-1009 were caused to be served on July 10, 2025 via overnight courier upon the following counsel of record for Patent Owner:

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Oak Brook, IL
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Re: Paneltouch Technologies LLC; U.S. Patent No. 8,803,836

Courtesy copies were also served via email on Patent Owner's counsel of record in a related district court litigation styled *Paneltouch Technologies LLC v. BOE Technology Group Co., Ltd.*, No. 2:25-cv-00245 (E.D. Tex.):

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