

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

**SAMSUNG ELECTRONICS CO., LTD. AND SAMSUNG ELECTRONICS
AMERICA, INC.**

Petitioner

v.

MANUFACTURING RESOURCES INTERNATIONAL, INC.,

Patent Owner

U.S. Patent No. 9,173,322

Filing Date: October 7, 2014

Issue Date: October 27, 2015

Title: Constricted Convection Cooling System for an Electronic Display

Inter Partes Review No. IPR2023-00220

PATENT OWNER SUR-REPLY

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	RELATED ITC PROCEEDING	2
III.	None of the Kim Grounds Renders the Challenged Claims Unpatentable	2
A.	Claims 1-5, 7, 8:	2
1.	Ground 1: Kim in Combination with Hong Does Not Render Obvious Claims 4 or 7	2
a.	Kim’s Porous Shield Cover 140 Is Not a Constricted Convection Plate.....	3
b.	Kim Does Not Teach a Constricted Convection Plate that is “Substantially Parallel” to the Posterior Surface.....	5
c.	There Is No Motivation to Combine Kim and Hong.....	5
2.	Ground 2: Kim in Combination with Hong and Tachikawa Does Not Render Obvious Claim 5.....	7
3.	Ground 3: Kim in Combination with Hong and Takahashi Does Not Render Obvious Claim 8.....	9
4.	Ground 4: Kim in Combination with Tachikawa Does Not Render Obvious Claims 1-3.....	10
IV.	None of the Na Grounds Renders the Challenged Claims Unpatentable.....	10
A.	Claims 4, 7-13, 16:	10
1.	Ground 5: Na Does Not Render Obvious Claims 4, 8, 9, 10, and 16.....	10

a.	Na does not teach or suggest a “constricted convection plate behind the posterior surface of the display”	11
b.	Na does not disclose “a posterior surface on the rear side of the PCB”	14
c.	Na Does Not Disclose A “Constricted Convection Plate”	14
d.	Na Teaches Mounting Electronics to the Posterior Surface of Its Electronic Display	15
2.	Ground 6: Na in Combination with Kim Does Not Render Obvious Claims 7, 12, and 13	15
3.	Ground 7: Na in Combination with Tachikawa Does Not Render Obvious Claim 11	16
V.	None of the Kimura Grounds Render the Challenged Claims Unpatentable	17
A.	Claims 1-5, 7-9, 12-13, 16:	17
1.	Ground 8: Kimura Does Not Render Obvious Claims 9, 12, 13, and 16	17
a.	Kimura does not teach a “constricted convection plate” let alone one “covering a majority of the posterior display surface”	17
b.	Kimura does not teach a constricted convection plate “covering a majority of the posterior display surface”	19

c.	Kimura does not teach the claimed “means for forcing air between the constricted convection plate and the posterior surface of the electronic display”	21
d.	Kimura does not teach “the means for forcing air . . . comprises a plurality of fans placed near the entrance aperture”	21
2.	Ground 9: Kimura in Combination with Kochiyama Does Not Render Obvious Claims 1-3 and 11	22
3.	Ground 10: Kimura in Combination with Hong Does Not Render Obvious Claims 4 and 7	23
4.	Ground 11: Kimura in Combination with Hong and Kochiyama Does Not Render Obvious Claim 5	24
VI.	Ground 12: Cho Does Not Render the Challenged Claims Unpatentable	24
VII.	Objective Evidence of Non-Obviousness.....	24
VIII.	Conclusion	27

EXHIBIT LIST

Exhibit No.	Description
2001	MRI-ITC-1331_0000435123-24 (4/24/2020 Romulus Stoain email to Dunn)
2002	MRI-ITC-1331_0000435125-27, Mutual Non-Disclosure Agreement
2003	MRI-ITC-1331_0000435133-34 (5/4/2020 Romulus Stoain email to Dunn)
2004	MRI's Opening Claim Construction Brief filed in <i>In the Matter of Certain Outdoor and Semi-Outdoor Electronic Displays</i> , Inv. No. 337-TA-1331
2005	U.S. Provisional Patent Application 61/039,454
2006	Declaration of Michael Gershowitz
2007	Curriculum Vitae of Michael Gershowitz
2008	U.S. Prov. App. No. 61/039,454
2009	Samsung's Opening Claim Construction Brief, ITC Inv. No. 337-TA-1331 (Feb. 1, 2023)
2010	Order No. 13: Construing Certain Terms of the Asserted Claims of the Patents at Issue, ITC Inv. No. 337-TA-1331 (May 15, 2023)
2011	Excerpt from Samsung's Pre-Hearing Brief, ITC Inv. No. 337-TA-1331 (June 5, 2023)
2012	U.S. Patent No. 5,636,072
2013	Evidentiary Hearing Transcript (Pages 838 through 1135), ITC Inv. No. 337-TA-1331 (June 29, 2023)
2014	Internet Archive Page Showing Review of Samsung XL20 as of December 20, 2007
2015	Declaration of Robert Smith Gillespie, ITC Inv. No. 337-TA-1331 (January 17, 2023)
2016	The New Oxford American Dictionary, Second Edition (2005)

Exhibit No.	Description
2017	Meriam-Webster's Collegiate Dictionary, Eleventh Edition (2008)
2018	Updated Joint Claim Construction Statement, ITC Inv. No. 337-TA-1331 (March 8, 2023)
2019	Evidentiary Hearing Transcript (Open Sessions, Pages 1 through 273), ITC Inv. No. 337-TA-1331 (June 26, 2023)
2020	CX-0280, ITC Inv. No. 337-TA-1331 (Photographs of Samsung OHF product)
2021	User Manual for OH46F OH55F
2022	Samsung's Post-Hearing Reply Brief (Public Version), ITC Inv. No. 337-TA-1331 (June 5, 2023) (Excerpts)
2023	Driving LEDs versus CCFLs for LCD backlighting, EE Times, by Tom Novitsky and Bill Abbott (2007).
2024	Technical Data Sheet: Reverse Package Chip LED with Inner Lens, Everlight Electronics Co. (Jan. 24, 2008)
2025	Samsung White Paper: Taking the Message Outdoors (Dec. 4, 2015)
2026	Website - Samsung White Paper: Taking the Message Outdoors (Dec. 4, 2015) https://insights.samsung.com/2015/12/04/taking-the-message-outdoors-with-high-brightness-display-tech-white-paper/ (last visited Sept. 26, 2023)
2027	Respondents' Notice of Prior Art, <i>Certain Outdoor and Semi-Outdoor Electronic Displays</i> , Inv. No. 337-TA-1331 (Jan. 4, 2023).
2028	Digital Solutions for Convenience Stores, Samsung, dated 2021
2029	Sung Ki Kim deposition transcript excerpts, <i>Certain Outdoor and Semi-Outdoor Electronic Displays</i> , Inv. No. 337-TA-1331 (Mar. 31, 2023)
2030	Sungsu Lee deposition transcript excerpts, <i>Certain Outdoor and Semi-Outdoor Electronic Displays</i> , Inv. No. 337-TA-1331 (Mar. 20, 2023)
2031	Wunkil Lee deposition transcript excerpts, <i>Certain Outdoor and Semi-Outdoor Electronic Displays</i> , Inv. No. 337-TA-1331 (Mar. 21, 2023)

Patent Owner Sur-reply for *Inter Partes* Review No. IPR2023-00220
U.S. Patent No. 9,173,322

Exhibit No.	Description
2032	John Palmer deposition transcript excerpts, <i>Certain Outdoor and Semi-Outdoor Electronic Displays</i> , Inv. No. 337-TA-1331 (Mar. 16, 2023)
2033	U.S. Patent Application Publication No. 2006/0077636 A1 to Kim, dated Apr. 13, 2006
2034	U.S. Patent Application Publication No. 2006/0132699 A1 to Cho et al., dated Jun. 22, 2006
2035	U.S. Patent No. 7,948,575 to Oh et al., dated May 24, 2011
2036	Certified translation of Korean Unexamined Patent Application KR 10-2006-0016469 to Na, dated Feb. 22, 2006 (“Na”)
2037	U.S. Patent No. 7,800,706 B2 to Kim et al., dated Sep. 21, 2010)
2038	SEITC0027754 McDonald’s Outdoor DMB presentation, dated Mar. 2017
2039	RESERVED
2040	Samsung OH product sales spreadsheet, CX-1728C
2041	SEITC0028579 Samsung Market Requirements Document, Outdoor LCD Signage, dated Apr. 23, 2021, and English translation
2042	SEITC0035224 Samsung teardown of MRI Outdoor 86” product, dated Mar. 24, 2016, and English translation
2043	SEITC0035259 Samsung teardown photos of MRI 55” product
2044	MRI-ITC-1331_0000046205 MRI Sales Detail
2045	Declaration of Alan Brand, <i>Certain Outdoor and Semi-Outdoor Electronic Displays</i> , Inv. No. 337-TA-1331 (Aug. 19, 2022)
2046	MRI-ITC-1331_0000444713 MRI Sales Detail
2047	Article – Sunlight and Solar Clearing, https://lg-mri.com/sunlight-and-solar-clearing/ (last visited Sept. 26, 2023)
2048	Letter from Chris Bolton (Vertigo Group) to Bill Dunn (MRI), dated Apr. 6, 2009

Exhibit No.	Description
2049	Trademark and Technology License Agreement, dated Feb. 18, 2014
2050	Joint Venture and Limited Liability Company Agreement, dated Jan. 8, 2014
2051	License Agreement, dated Aug. 27, 2008
2052	Confidential Agreement, dated Jan. 22, 2020
2053	Samsung Outdoor Installation Guide
2054	RESERVED
2055	Complainant MRI's Petition for Review of the Initial Determination on Violation of Section 337 (PUBLIC VERSION)
2056	Complainant MRI's Response In Opposition Respondents' Contingent Petition for Review of the Final Initial Determination Finding No Violation (PUBLIC VERSION)
2057	April 26, 2023 Deposition of Robert Smith-Gillespie (Excerpts)

I. INTRODUCTION

Each of the Grounds proposed in the Petition fails to establish invalidity of any challenged claim.

For example, Kim does not disclose the claimed “constricted convection plate.” Rather, Petitioner reads this core feature out of claims 1-8 entirely, alleging any airflow behind a display meets the limitation. Further, Petitioner misidentifies part of Na’s internal display structure as the “posterior display surface” (claims 1-3) or “posterior surface of the electronic display” (claims 9-16) contrary to Petitioner’s own expert testimony and its previous ITC arguments.

As a third example, even assuming *arguendo* Kimura’s driving circuit is the claimed “constricted convection plate,” a POSITA would have known that Kimura’s driving circuit would not “cover[] a majority of the posterior display surface” (as required by claims 9, 12, 13, and 16) and would not have had reason to enlarge this heat generating component.

Petitioner’s secondary references similarly fail as they do not teach the recited limitations. Petitioner also provides no adequate motivation to combine. And even if Petitioner had, the strong evidence of non-obviousness, including evidence of commercial success, long-felt need, copying, and industry praise demonstrate the claims are patentable.

II. RELATED ITC PROCEEDING

Petitioner leans heavily on the ALJ’s Initial Determination in the parallel ITC proceeding to form its Reply. However, the International Trade Commission has no authority to make rulings on patent validity, and its decisions on patent issues have no preclusive effect. *Texas Instruments Inc. v. Cypress Semiconductor Corp.*, 90 F.3d 1558, 1569 (Fed. Cir. 1996). Moreover, the ALJ’s Initial Determination is flawed, for example, by failing to apply the same claim construction for both infringement and validity.¹ *See e.g.*, Ex. 2056, 25-28.

III. None of the Kim Grounds Renders the Challenged Claims Unpatentable

A. Claims 1-5, 7, 8:

1. Ground 1: Kim in Combination with Hong Does Not Render Obvious Claims 4 or 7

The combination of Kim and Hong fail to teach a “constricted convection plate” let alone one “substantially parallel to the posterior display surface.” There is also no motivation to combine Kim and Hong.

¹ Patent Owner has challenged these initial determinations—made under a different record—and the ITC is assessing them. *See* Ex. 2055; *see also Google LLC v. Ecolfactor, Inc.*, IPR2021-01218, Paper 22 (PTAB Feb. 6, 2023) (“we do not find the ITC finding persuasive” as “[d]ifferent records can lead to different results.”).

a. Kim's Porous Shield Cover 140 Is Not a Constricted Convection Plate

Petitioner leverages hindsight to reimagine Kim's vague teachings as disclosing a channel; they do not. *See* Patent Owner Response (POR) at 22-25. Petitioner agrees a "constricted convection plate" is "a plate configured to form part of a constricted convection channel." Reply, 2. But Kim's shield cover does not "form part of a constricted convection channel" or any other sort of channel.

Petitioner asserts that Kim's "shield cover 140 may be formed in diverse shapes such that the flowing air produced by the cooling fan 210 can be efficiently guided," but that says nothing about a channel. Reply, 3 (citing Ex. 1005, 4:59-63). Indeed, Kim teaches "a guide member (not shown) that guides the cooling air generated by the cooling fan 210 in various directions"—the opposite of a channel. Ex. 1005, 5:53-55. Petitioner's Reply also relies on Kim's teaching that "cooling fan 210 can efficiently cool the LEDs widely distributed on the plane of the backlight unit 130" but Kim's center cooling fan necessarily requires airflow in "various directions" to cool those "LEDs widely distributed on the plane." Reply, 3 (citing Ex. 1005, 5:34-38).

Petitioner asserts the arrows in Kim's Fig. 5 cross-section demonstrate airflow through a "channel," but a POSITA would understand that there is *also* airflow into and out of the page, not shown by such arrows, because air is flowing

to the other air slits 117' distributed throughout the shield cover in all directions as shown in Kim's Fig. 2. Ex. 2006, ¶ 64.

Petitioner also asserts the claims do not require a four-sided channel. As terms coined by the '322 Patent to reflect its structure, the meaning of the terms "constricted convection plate" and "constricted convection channel" must be derived from the specification and prosecution history and must be construed "only as broadly as is provided for by the patent itself." *Goldenberg v. Cytogen, Inc.*, 373 F.3d 1158, 1164, (Fed. Cir. 2004); *Phillips*, 415 F.3d at 1316. In the '322 Patent, a constricted convection channel directs air in only a single direction—from a single entrance to the channel exit—and is bounded on four sides. *See* Ex. 1001, Figs. 4, 5A-5F, 6, 8, and 9; Ex. 2006, ¶¶ 61-62.

To the extent there is any ambiguity as to the plain and ordinary meaning of "channel," Mr. Gershowitz's unrebutted expert testimony—which was not available at the ITC—is that a channel's sides must encompass a full 360 degrees consistent with a "duct" or "tubular passage." Ex. 2006, ¶ 61; Ex. 2016.

Contrary to Petitioner's reply arguments, there is no tension between MRI's infringement positions at the ITC and its validity positions here. *See* Reply, 5. At the ITC, Samsung's products were found to practice claim 4 despite the presence of openings on the plate because those openings did not stop a high velocity stream of cooling air from being directed through a four-sided channel from an entrance at

the bottom of the constricted convection plate through an exit at the top. Ex. 1040, 67-68, 72-74.

In stark contrast, Kim teaches cooling air will flow through air slits 117' located in all directions throughout shield cover 140. POR, 23-24; Ex. 1005, 7:57-62; Ex. 2013, 1066:13-15, 1067:13-1068:9; Ex. 2006, ¶¶ 64-65.

b. Kim Does Not Teach a Constricted Convection Plate that is “Substantially Parallel” to the Posterior Surface

Petitioner does not dispute that Kim's Fig. 2 shows shield cover 140 has substantial topology or that the posterior surface of Kim's backlight assembly 130 includes portions that jut out, yet Petitioner has not identified any teaching in Kim's specification that discloses or suggests these two complex three-dimensional objects should be substantially parallel to one another. Kim is completely silent on the issue. Thus, Petitioner reads more into the cross-section of Fig. 5 than is permissible by law and fails to show that Kim discloses or suggests this limitation. *See* POR, 25-26.

c. There Is No Motivation to Combine Kim and Hong

Petitioner's untimely pivot away from the arguments in the Petition should be rejected. *See Wasica Fin. GmbH v. Cont'l Auto. Sys., Inc.*, 853 F.3d 1272, 1281 (Fed. Cir. 2017) (rejecting arguments that “amount to an entirely new theory of *prima facie* obviousness absent from the petition.”)

Because Petitioner cannot support the Petition's assertion that a POSITA would have been motivated to modify Kim's backlight unit to include Hong's PCB, it attempts to pivot to a more generic argument about motivation to "incorporate a PCB into Kim's display." *See* Reply, 6-7. The Petition, however, asserts "a POSITA as of March 3, 2008 would have been motivated to modify Kim's backlight unit to include Hong's PCB with multiple LEDs mounted to its front side." Paper 3, 39 (emphasis added); *see also id.*, 40 (asserting "Hong's PCB would have been suitable" for use in Kim). Because the Petition's proposed combination involves a metal core PCB, that unclaimed feature of Hong's PCB is relevant to the motivation to combine. *See Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1370 (Fed. Cir. 2016) (finding no motivation to combine due to one reference's "quantitative deblocking" requirement even though that requirement was not part of the claimed invention).

Petitioner's Reply does not attempt to refute the arguments in Patent Owner's Response as to why the Petition's claims of "similarities between Hong's and Kim's backlight configurations" and "cost savings" are inaccurate. *See* POR, 27-30. Accordingly, Petitioner has failed to prove Ground 1 renders any claim of the '322 patent obvious.

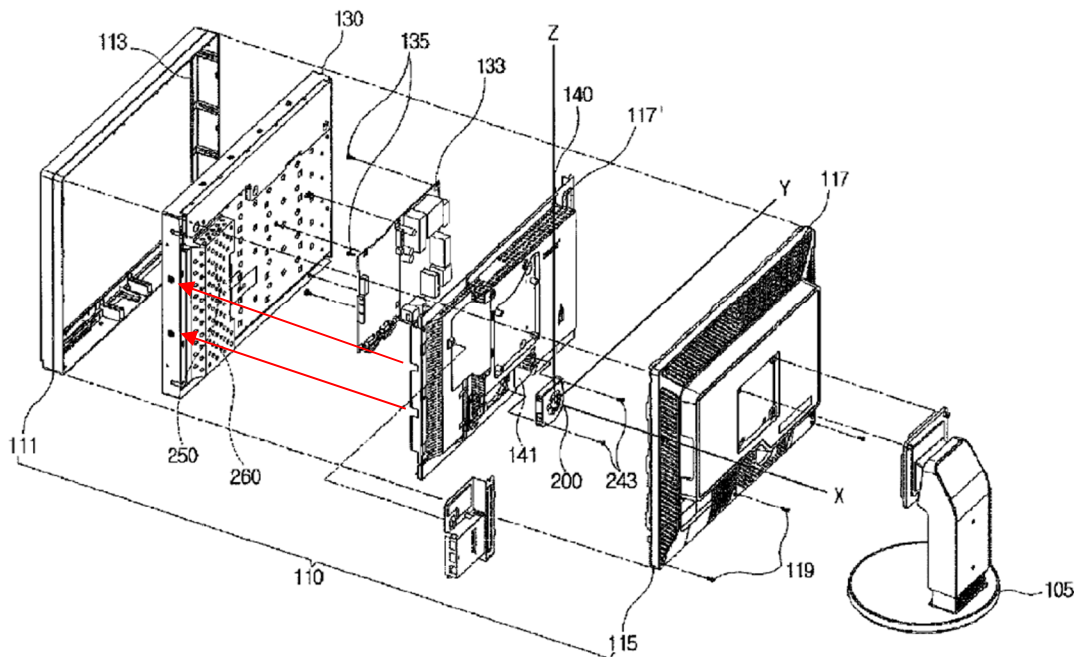
2. Ground 2: Kim in Combination with Hong and Tachikawa Does Not Render Obvious Claim 5

Petitioner's attempt to rewrite the claim should be rejected. Claim 5 expressly requires "at least one bracket which connects the posterior surface with the constricted convection plate."

At his deposition, Mr. Smith-Gillespie acknowledged he had "never seen brackets placed on the back of displays" at the time of the invention. Ex. 2057, 85:6-8; *see also id.*, 85:20-22 ("Generally, mounting points would be provided on flanges along the edges, not along the back.") To address this deficiency, Petitioner now improperly attempts to read the requirement that the bracket connect "the posterior surface with the constricted convection plate" out of the claim by asserting claim 5 is met even where alleged brackets connect the alleged constricted convection plate to the *sides* of a display rather than the posterior surface as recited. Reply, 8-9.

Petitioner's reliance on Mr. Smith-Gillespie's testimony to assert the alleged brackets attach to the posterior surface omit his acknowledgement that the "little circles" on the side of Kim's backlight correspond to the "little channels" in the alleged brackets so that the "brackets" are "mated up with th[e] side of the backlight unit." Ex. 2013, 1058:15-19, 1059:14-20; *see also* Kim, Fig. 2 (below) with red arrows showing the mating.

FIG. 2



While Petitioner alternatively asserts a POSITA would have been motivated to modify Kim's design "with the brackets disclosed by Tachikawa to improve Kim's display serviceability and structural strength," (Pet. at 46), it does not explain how Tachikawa's brackets would improve the serviceability or structural strength of Kim. *See* POR, 31-32; Ex. 2006, ¶¶ 78-79.

Moreover, Kim already has a means for affixing the shield cover 140 to backlight unit 130 wherein Kim's alleged "brackets"—unlike those of Tachikawa—are positioned on the sides "so that they are not impeding airflow within the region behind the backlight unit 130." Ex. 2006, ¶ 77. Because adding

Tachikawa's brackets behind Kim's backlight unit would cause a disadvantage (by interfering with Kim's airflow) with no corresponding benefit, this is not a combination a POSITA would have made. *See Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324, 1331-1332 (Fed. Cir. 2019) ("The benefits, *both lost and gained*, should be weighed against one another.") (emphasis in original) (citation omitted); POR, 31-32.

3. Ground 3: Kim in Combination with Hong and Takahashi Does Not Render Obvious Claim 8

As explained in Patent Owner's Response (at 32-33), the Petition does not set forth how Takahashi's teachings could be implemented in Kim's design to obtain any of the advantages Petitioner alleges. The Petition makes the conclusory claim that Takahashi's through-holes could be used on Kim's shield cover 140 to "gain access to and service electrical components associated with heat-generating parts such as the LED driver board 133." *See* Petition at 50-51.

However, merely adding Takahashi's through-holes to Kim's shield cover provides no such benefit. Takahashi's air guide plate covers only a small portion of the display. *See* Ex. 1008, Fig. 1(B). Accordingly, removing screws using Takahashi's through-holes enables removal of Takahashi's substrate 3 "without needing to remove the air guide plate, thereby making it possible to unmount the

substrate ***by moving it downward***’ so it can be serviced. Ex. 1008, [0014]
(emphasis added).

In contrast, adding Takahashi’s through-holes to Kim’s shield cover 140 would serve no purpose because even if Takahashi’s through-holes were utilized to unscrew the circuit board 133 from the backlight, Kim’s circuit board 133 could nevertheless not be moved downward or otherwise removed for servicing because Kim’s shield cover 140—unlike Takahashi’s small air guide plate—covers the entirety of the display. There is no way to extract unscrewed circuit board 133 for servicing without further modification of Kim’s design.

The Petition fails to explain what that further modification of Kim would be or how the modified system would meet the limitations of independent claim 4.

4. Ground 4: Kim in Combination with Tachikawa Does Not Render Obvious Claims 1-3

Ground 4 fails for the same reasons as discussed above with respect to Grounds 1 and 2. *Supra* III.A.1-2.

IV. None of the Na Grounds Renders the Challenged Claims Unpatentable

A. Claims 4, 7-13, 16:

1. Ground 5: Na Does Not Render Obvious Claims 4, 8, 9, 10, and 16

Ground 5 fails due to the Petition’s mis-mapping of claim elements in a manner that defies the express disclosures of Na, Petitioner’s ITC claim construction arguments, and the testimony of its expert.

a. Na does not teach or suggest a “constricted convection plate behind the posterior surface of the display”

For claims 9-13 and 16, Petitioner’s Reply argument that “Na’s areal light source device 100 is a backlight assembly” such that “reflective plate 110” is the “posterior surface of the display” falls flat because Na expressly and repeatedly explains that “backlight unit 500” includes both areal light source device 100 as well as “storage container 200.” *See e.g.*, Ex. 1010, 4. Petitioner’s expert, Mr. Smith-Gillespie testified that the “posterior surface of the electronic display”² comprises “the most posterior portion” of the display assembly. Ex. 2013, 930:23-25. Within Na’s backlight unit 500, storage container 200 is posterior to areal light source device 100. *See e.g.*, Ex. 1010, Figs. 1, 13 (showing storage container 200 is the most posterior component in Na’s backlight unit 500 and its liquid crystal

² Mr. Smith-Gillespie references the “posterior display surface,” but the parties agree “posterior display surface” in claims 1-3 and “posterior surface of the electronic display” in claim 9-16 should be construed the same way. *See e.g.*, Ex. 2009, n.3.

display device 800). And the most posterior portion of storage container 200 is bottom plate 210. *Id.* Thus, even under *Petitioner's* expert's test for identifying the "posterior surface of the electronic display," it is necessarily Na's bottom plate 210 (i.e., the most posterior portion of Na's display and backlight).

Indeed, at the ITC, *Petitioner* prevailed in having "posterior surface of the electronic display" construed as "rear-facing surface of the display assembly" by asserting that "there is no disclosure in either the specification, prosecution history or claims where the 'posterior display surface' could not be anything other than *the* rear-facing surface of the display assembly." Ex. 2009, 27-28 (emphasis added). Having successfully urged the ITC to adopt its construction of "posterior display surface" / "posterior surface of the electronic display," judicial estoppel prevents *Petitioner* from taking a clearly inconsistent position in this proceeding.³ *New Hampshire v. Maine*, 532 U.S. 742, 749 (2001).

³ Notably, in the ITC, after *Petitioner* obtained its requested construction of "posterior surface of the electronic display" shortly before the evidentiary hearing, it withdrew Na as a prior art reference. *See Reply*, 2, n.1.

Claims 9-13 and 16 each require “a constricted convection plate behind the posterior surface of the display.” Na does not disclose *any* structure placed behind its bottom plate 210, so it cannot have disclosed a constricted convection plate.

There is no contradiction between the '322 patent's disclosure that the posterior surface “may be the posterior surface of a backlight assembly” and the fact that every example of a posterior surface in the specification is the most posterior portion on the outside of a display module. Even Petitioner's expert admits a POSITA would understand that the backlight of an electronic display module is at the rear of the display module. Ex. 1002, ¶43 (“A lighting assembly (backlight unit or “BLU”) is housed *behind* the LCD panel”) (emphasis added). Hence, the most posterior portion on the outside of an electronic display with a backlight will necessarily be “the posterior surface of a backlight assembly.” Ex. 2006, ¶¶ 90-91. This is demonstrated by Na itself where Na's bottom plate 210 is the most posterior portion of both the display 800 and the backlight unit 500. *See e.g.*, Ex. 1010, Fig. 13.

Petitioner's Reply does not even attempt to defend the Petition's contentions for Claim 16, which expressly requires “the electronic display comprises an LED backlight LCD display where the posterior surface is *the* rear surface of a backlight assembly.” *Compare* POR, 39-40 and Reply, 12-13. It is beyond question that

bottom plate 210 is *the* rear surface of Na's backlight assembly 500. Ex. 1010, 4, Figs. 1-3, 13; Ex. 2006, ¶ 91.

b. Na does not disclose “a posterior surface on the rear side of the PCB”

Petitioner's Reply (at 12-13) fails to explain how its reading of “posterior surface on the rear side of the PCB” for Ground 5 would not render the “posterior surface” language superfluous. *See* POR, 40-41.

c. Na Does Not Disclose A “Constricted Convection Plate”

Petitioner's Reply does not explain how Na's bottom plate 210 could constitute a “constricted convection plate” that is “configured to form a constricted convection channel” when external air is sucked into Na's rear cooling chamber through fifty inlets on the alleged constricted convection plate. Compare POR, 42 and Reply, 13. Rather, Petitioner misconstrues Mr. Gershowitz's testimony (from another IPR proceeding) to introduce a *new* invalidity theory where through-holes are present only in sidewalls 220 and 250 but not in sidewalls 230 and 240.

Petitioner, however, misses Na's teaching that “the through-holes may be formed on a bottom plate *and* in any one or more of the first to fourth sidewalls.” *See* Ex. 1010, p. 5. Na does not teach forming through-holes in “any one or more of the first to fourth sidewalls” but not the bottom plate, so its new invalidity theory has no support in Na. *Id.*; POR, 59-60. Accordingly, this untimely and unsupported

new theory of unpatentability need not be considered. *See Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F. 3d 1359, 1367-68 (Fed. Cir. 2015) (affirming Board’s refusal to consider alternative embodiment raised for the first time in Petitioner’s Reply).

d. Na Teaches Mounting Electronics to the Posterior Surface of Its Electronic Display

Petitioner’s Reply also does not dispute that Na neither teaches nor suggests “an electronic display comprising a front display surface and a posterior surface where no electronics are mounted to the posterior surface of the electronic display” as required by independent claim 9 and its dependent claims. *Compare* POR, 42-43 and Reply, 12-13. The ’322 Patent teaches “the constricted convection plate 30 and the display posterior 22 define a constricted convection cooling channel 50 *immediately* behind the display posterior 22” as shown in Figs. 5A-5F. Ex. 1001, 5:37-39; *see also* Ex. 1001, 6:17-27 (further explaining that preferably “hardware [is] located behind the constricted convection plate 30”).

In stark contrast, Na teaches connecting its driving circuit 214 flush against bottom plate 210 with no bracket or gap between the two. *See e.g.*, Ex. 1010, Fig. 3. Thus, Ground 5 fails to render obvious claims 9-13 and 16 for this additional reason.

2. Ground 6: Na in Combination with Kim Does Not Render Obvious Claims 7, 12, and 13

Ground 6 fails for the same reasons as Ground 5 (*e.g.*, Na does not disclose a constricted convection plate behind the posterior surface of the display).

Additionally, Petitioner's Reply does not address how Kim's external housing would contribute to the "efficient cooling of the posterior surface of an LCD" when Na is directed only to the cooling of its backlight's interior. *Compare* POR, 43-44, Reply, 14. Instead, the Reply (at 14) asserts the proposed combination of Na and Kim would "control[] the flow of air that contacts" Na's driving circuits, but this new and unexplained theory was not included with the Petition and should not be considered. *Qualcomm Inc. v. Apple Inc.*, 24 F. 4th 1367, 1377 (Fed. Cir. 2022) (motivation to combine raised for the first time on reply was untimely).

3. Ground 7: Na in Combination with Tachikawa Does Not Render Obvious Claim 11

Ground 7 fails for the same reasons as Ground 5. As explained above, areal light source 100, which is inside Na's backlight and display, is not the "posterior surface of the electronic display." *See* Section IV.A.1.a *supra*.

Additionally, as explained in Patent Owner's Response, Tachikawa provides no disclosure for placing brackets *within* a backlight as the Petition proposes for Na's backlight 500. *See* POR, 44-46 (citing Ex. 2006, ¶¶ 107-109). Mr. Smith-Gillespie's opinion that "the rear side surface of Na's areal light source 100 would be fitted with brackets" merits no weight because it is made without any support

from the reference itself and again conflicts with Petitioner’s construction for the posterior surface. *See* Ex. 1002, ¶ 259. The Board “*must* disregard the testimony of an expert that is plainly inconsistent with the record.” *Homeland Housewares, LLC v. Whirlpool Corporation*, 865 F.3d 1372, 1378-79, (Fed. Cir. 2017).

The Petition relies on Tachikawa’s teachings that “PDP 10 is housed in the cabinet 30 in a state of being supported by two brackets 20 on the rear side” and “[e]ach of the two brackets 20 is connected to a stand member (not shown).” Pet. at 77 (citing (Ex. 1026, [0019])). This disclosure of brackets connecting a stand to the rear side of a cabinet are not pertinent to Ground 7, where Na’s alleged posterior surface is within the display.

V. None of the Kimura Grounds Render the Challenged Claims Unpatentable

A. Claims 1-5, 7-9, 12-13, 16:

1. Ground 8: Kimura Does Not Render Obvious Claims 9, 12, 13, and 16

Kimura does not make obvious a “constricted convection plate,” “a constricted convection plate ... covering a majority of the posterior display surface,” or “means for forcing air between the constricted convection plate and the posterior surface of the electronic display.”

a. Kimura does not teach a “constricted convection plate” let alone one “covering a majority of the posterior display surface”

As explained in Patent Owner's Response, the Petition's interpretation of Kimura's driving circuit 19 as a "constricted convection plate" is based solely on the arrows in Kimura's Fig. 9. It is black letter law that "in an obviousness analysis, prior art should be viewed as a whole." *See Impax Laboratories Inc. v. Lannett Holdings Inc.*, 893 F.3d 1372, 1379-81 (Fed. Cir. 2018) (affirming finding of non-obviousness where alleged element was, in fact, "barely mentioned" in the prior art reference). Kimura, as a whole, makes clear the unidirectional film of air cooling the backlight is solely the result of Kimura's unique fan's "vane angle control means" (i.e., driving circuit 19 plays no role). *See* Ex. 1004, ¶ 90, claims 1, 7; Ex. 2006, ¶¶ 111-112, 114. Mr. Smith-Gillespie's hindsight interpretation of Kimura should thus be rejected.

Indeed, Kimura's driving circuit 19 is not even a "plate." As explained in Patent Owner's Response, a POSITA would not understand Kimura's driving circuit 19 to be a "plate" because—while the claim does not recite a *specific* material composition for the plate—the plain and ordinary meaning of "plate" implies a sheet of metal or other sturdy material *used to strengthen a device*. *See* POR, 48; Ex. 2016 (defining "plate" as "a thin, flat sheet or strip of metal or other material, typically one used to join or strengthen things or forming part of a machine.") Petitioner's Reply invokes the ALJ's opinion on whether Kimura's driving circuit 19 is a plate, but Mr. Gershowitz's testimony was not available to

the ALJ.

Petitioner has not established Kimura discloses a constricted convection plate.

b. Kimura does not teach a constricted convection plate “covering a majority of the posterior display surface”

Claim 9 further requires “a constricted convection plate ... covering a majority of the posterior display surface.” Petitioner’s Reply invokes the ITC ALJ’s opinion in support of its arguments. However, even without Mr. Gershowitz’s expert testimony, the ALJ recognized that Kimura’s driving circuit 19 would not cover a majority of the posterior display surface. Ex. 1048, 222-223.

Petitioner’s citations to the court of Customs and Patent Appeals decisions in *Wagner* and *Wolfensperger* are inapposite. It is well-established under the law today—and at the time of the invention—that “[f]igures in a patent are not drawn to scale unless otherwise indicated.” See *Hockerson-Halberstadt, Inc. v. Avia Group Int’l*, 222 F.3d 951, 956, (Fed. Cir. 2000) (citing e.g., *Manual of Patent Examining Procedure* 2125). Accordingly, Kimura’s Fig. 9 “may not be relied on to show particular sizes” because “the specification is completely silent on the issue.” *Id.*

Moreover, Petitioner offers no evidence supporting the alleged connection between the length of a display and its driving circuit. In contrast, Mr. Gershowitz

has explained that there is none—as evidenced by, for example, Kim and Na. POR, 48-49 (citing Ex. 2006, ¶¶ 114-115).

At the ITC, Mr. Smith-Gillespie admitted that—contrary to the Petition’s arguments—“Kimura doesn’t tell us the size of the driving circuit.” Ex. 2013, 1083:15-17. Nevertheless, Mr. Smith-Gillespie opined at the ITC that the driving circuit 19 “would need to cover the entire display surface because it says in Kimura at paragraph 78 that the backlight unit is cooled uniformly.” Ex. 2013, 965:5-7. Mr. Smith-Gillespie makes the same conclusory assertion in this proceeding: that a driving circuit enlarged to cover the entire display surface would ensure “the entire backlight is cooled uniformly.” Ex. 1002, ¶ 274.

However, as explained in the Patent Owner Response, a POSITA would know that enlarging the heat-generating driving circuit 19 and placing it close to the posterior display surface would cause the top of Kimura’s display to become hotter than the bottom and thus violate Kimura’s teaching that “backlight unit 18 is cooled uniformly.” POR, 50-52. Petitioner’s Reply identifies no flaws in Mr. Gershowitz’s expert analysis. Mr. Smith-Gillespie’s contrary opinion includes no underlying analysis or evidence; it is merely an unsupported conclusion that cannot meet Petitioner’s burden to show obviousness. *See TQ Delta, LLC v. CISCO Systems, Inc.*, 942 F.3d 1352, 1358-63 (Fed. Cir. 2019) (“Conclusory expert testimony does not qualify as substantial evidence.”)

c. Kimura does not teach the claimed “means for forcing air between the constricted convection plate and the posterior surface of the electronic display”

Claim 9 further requires “a means for forcing air between the constricted convection plate and the posterior surface of the electronic display.” The Federal Circuit has made clear that “the PTO may not disregard the structure disclosed in the specification corresponding to [means-plus-function claim] language when rendering patentability determinations.” *In re Donaldson Co., Inc.*, 16 F.3d 1189, 1193, (Fed. Cir. 1994) (en banc); *Al-Site Corp. v. VSI Intern., Inc.*, 174 F.3d 1308 (Fed. Cir. 1999) (“§ 112, ¶ 6 procedures restrict a functional claim elements’ ‘broad literal language ... to those means that are ‘equivalent’ to the actual means shown in the patent specification.”). While Kimura discloses a fan, Petitioner has not shown Kimura’s peculiar cooling fan 20 is equivalent to fan 52 disclosed in the ’322 patent’s specification or that it performs the same function. *See* POR, 52-54.

d. Kimura does not teach “the means for forcing air . . . comprises a plurality of fans placed near the entrance aperture”

The record is clear that Kimura expressly teaches the use of only a single fan. POR, 54-55; Ex. 1004, [0088], [0090]; Ex. 2006, ¶ 119. Mr. Smith-Gillespie misidentified Kimura’s multiple vanes as multiple fans even though a POSITA would understand a single fan to include multiple vanes and a single *motor*. *Id.*; Ex. 2006, ¶¶ 119-120; Ex. 2017, 3. Adding a second motor to create a second fan

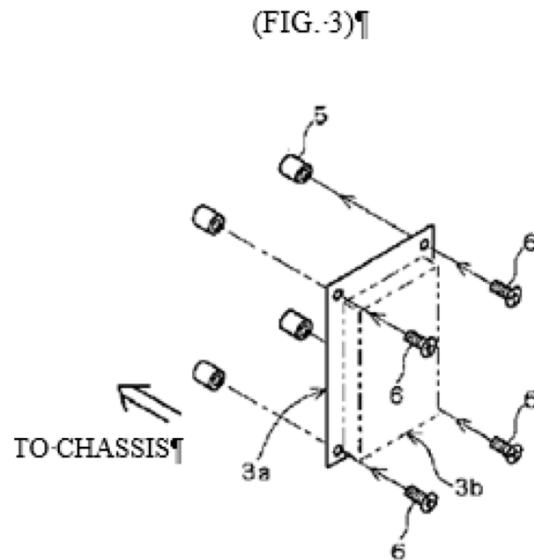
would create a gap in the air flow, ruin Kimura’s “film” of air and render it inoperable for its intended purpose. POR, 55; Ex. 2006, ¶ 120. Accordingly, this is not a modification a POSITA would make to Kimura.

Petitioner’s Reply also asserts use of multiple fans would “prevent vane deformation during operation,” but Kimura already solves the problem through use of support frames 35. *See* Ex. 1004, [0088]. Likewise, Petitioner’s Reply asserts use of multiple fans would “increase the wind-producing area” but Kimura’s single fan already extends the length of the display as shown in Kimura’s Fig. 10.

2. Ground 9: Kimura in Combination with Kochiyama Does Not Render Obvious Claims 1-3 and 11

Petitioner contends Kimura’s driving circuit would be attached to the posterior surface of its electronic display in the manner shown by Figure 3 of Kochiyama (right). Pet. 90-91.

Petitioner contends this configuration satisfies the “no electronics are mounted to the posterior surface of the electronic display” limitation. *Id.*, 95. Patent Owner agrees that electronics are not “mounted to the posterior surface of the electronic display” when there is intervening structure, such as a bracket, between them.



However, Kochiyama—even in combination with Kimura—does not teach or suggest “at least one bracket which connects the posterior display surface with the constricted convection plate” because neither reference discloses a constricted convection plate. POR, 56. Kochiyama’s teachings regarding brackets extend only to connecting electronic circuits. *Id.* Moreover, Petitioner’s Reply does not dispute Patent Owner’s contention that a POSITA would not have looked to Kochiyama’s plasma display for potential modifications to Kimura. *See* POR, 58.

Accordingly, Ground 9 fails for additional reasons beyond those of Ground 8.

3. Ground 10: Kimura in Combination with Hong Does Not Render Obvious Claims 4 and 7

Patent Owner’s arguments for Ground 10 fail for the same reasons described above for Grounds 8 and 9 as well as for the reasons described above for Ground 1 regarding combining Kim and Hong. Sections V.A.1, V.A.2, III.A.1.c *supra*.

Contrary to Petitioner’s Reply argument, there is no conflict between Mr. Gershowitz’s deposition testimony acknowledging LEDs would be mounted to a substrate with “electrically conductive connections or interconnect as well as mechanical support” and his explanation that a POSITA would have been aware of other LED substrates than PCBs and other configurations than the one in Hong. Ex. 2006, ¶ 133. Petitioner failed to provide any reasoning for why a POSITA

would have found Hong's backlight configuration suitable for Kimura. *See* Ex. 2006, ¶ 131-134.

4. Ground 11: Kimura in Combination with Hong and Kochiyama Does Not Render Obvious Claim 5

Ground 11 fails for the same reasons described above for Grounds 9 and 10.

VI. Ground 12: Cho Does Not Render the Challenged Claims Unpatentable

Petitioner's Reply does not rebut Patent Owner's Response pertaining to Cho, thus conceding the failure of Ground 12.

VII. Objective Evidence of Non-Obviousness

Samsung does not challenge MRI's secondary considerations evidence and instead argues there is no nexus between that evidence and the challenged claims. Reply, 21-25. However, the real-world evidence shows the claimed invention was not obvious at the time to Samsung (owner of both the Kim and Na references) or others skilled in the art, because the secondary considerations tie strongly to MRI's innovation and to the products that undisputedly embody the claims. POR, 62-75.

Samsung does not dispute its OH line of outdoor electronic display products experienced commercial success for the first time upon their practicing claims 9, 12, 13, and 16 of the '322 Patent (*i.e.*, the launch of the 46-inch and 55-inch OHF series). POR, 66-70, 72-73.

Samsung also does not dispute there was a long-felt need for displays with effective cooling to enable use outdoors and instead argues that “the claims are not limited to outdoor displays.” Reply, 19. Samsung confuses the *long-felt need* with the *claimed invention* that meets the need. See *Volvo Penta of the Americas, LLC v. Brunswick Corp.*, 81 F. 4th 1202 (Fed. Cir. 2023) (holding Board erred by not finding a long-felt need for “safe wakesurfing on stern-drive boats” that was met by patent claims that mentioned neither safety nor wakesurfing).⁴

Samsung contends it never failed, but Sung Ki Kim’s testimony establishes Samsung’s *repeated* failure over the course of many years to solve the need for effective cooling until Samsung finally duplicated MRI’s claimed invention. POR, 64-66.

Samsung argues it is common practice to tear down its competitor products,⁵

⁴ *ABT Systems v. Emerson Elec. Co.*, 797 F.3d 1350, 1362 (Fed. Cir. 2015), does not support Samsung’s argument. There, unlike here, the prior art taught an HVAC system with periodic fans that met the alleged unmet need. *Id.*

⁵ During the relevant time period, Samsung was recognized as a “fast follower” and “not an innovator” by its own admissions. *Apple, Inc. v. Samsung Electronics Co., Ltd.*, No. 12-CV-630-LHK, 2014 WL 7496140, *8 (N.D. Cal. Aug. 27, 2014).

but “copying” merely “requires duplication of features of the patentee’s work based on access to that work.” *Institut Pasteur & Universite Pierre Et Marie Curie v. Focarino*, 738 F.3d 1337, 1347-48 (Fed. Cir. 2013). Samsung does not dispute that its 46- and 55-inch OHF products duplicated MRI’s claimed invention or that it had access to MRI’s work. *See* POR, 70-72.

Samsung cites features of its *current* (i.e., 2023) OHA, OHB series products to assert other features drive demand, but the relevant point in time for assessing the claimed cooling system’s impact on sales was the introduction of the OHF series. After Samsung copied claims 9, 12, 13 and 16 and replaced its failing OHD products with the infringing OHF line of products, its OH-series sales immediately increased nearly two orders of magnitude. POR, 72-73.

Moreover, but for the cooling system of the claimed invention the continued success of the OHA and OHB products would have been impossible because the products would not have been operable outdoors. Samsung itself has acknowledged there was no market for outdoor electronic displays until MRI’s pioneering inventions paved the way for a market that otherwise would not exist. POR, 74-75.

Samsung’s attempt to rely on the ALJ’s findings at the ITC fall flat because those findings were not in line with Federal Circuit precedent (*e.g.*, *Volva Penta*) and were under a different record missing important evidence like Samsung’s

White Paper (Ex. 2025) acknowledging the long-felt but unmet need for sufficient cooling systems for outdoor electronic displays. POR, 63.

VIII. Conclusion

Petitioner fails to establish that any of claims 1-5, 7-13, or 16 are unpatentable.

Dated: January 30, 2024

Respectfully submitted,

By: /John C. Alemanni/
John C. Alemanni
Reg. No. 47,384
Lead Counsel for Patent Owner

CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that this Preliminary Response contains 5,595 words according to the word-processing program used to prepare this paper. The foregoing word count complies with the 5,600 word type-volume limit specified by 37 C.F.R. § 42.24(b)(2).

Dated: January 30, 2024

Respectfully submitted,

/John C. Alemanni/

John C. Alemanni

Reg. No. 47,384

Lead Counsel for Patent Owner

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing **PATENT OWNER'S SUR-REPLY** has been served electronically via email upon the following:

Sanjeet Dutta – sdutta@goodwinlaw.com
Douglas J. Kline – dkline@goodwinlaw.com
Srikanth Reedy – sreddy@goodwinlaw.com
Naomi L. Birbach – nbirbach@goodwinlaw.com

Dated: January 30, 2024

By: /s/ John C. Alemanni

John C. Alemanni

Reg. No. 47,384

Lead Counsel for Patent Owner