

**UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C.**

In the Matter of

**CERTAIN OUTDOOR AND SEMI-
OUTDOOR ELECTRONIC DISPLAYS,
PRODUCTS CONTAINING SAME,
AND COMPONENTS THEREOF**

Inv. No. 337-TA-1331

**COMPLAINANT MRI'S PETITION FOR REVIEW OF THE
INITIAL DETERMINATION ON VIOLATION OF SECTION 337**

Complainant's Petition for Review
of the Initial Determination

Inv. No. 337-TA-1331

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I. INTRODUCTION

A violation should be found in this Investigation based on Respondents' importation of the accused "Mid-Sized" and "Large-Sized" displays that infringe MRI's patents. The November 13, 2023 Initial Determination (the "ID") found for Complainant Manufacturing Resources International, Inc. ("MRI") on most disputed issues, including that Respondents infringe four of the five asserted patents and that MRI satisfies the technical and economic prongs of domestic industry for all five patents. The ID erred, however, in several key respects in reaching its determination of no violation. MRI respectfully requests review by the Commission, correction of these errors, and issuance of a final determination of violation.

First, the ID applied erroneous claim constructions in finding non-infringement of claim 12 of the '287 Patent. For the "open loop...along the backlight" term, the ID incorrectly construed the recited "backlight" to exclude a metallic rear surface despite the specification expressly stating that a metallic rear surface is a component of the "backlight." For the "closed loop" term, the ID incorrectly limited the term to a preferred donut-shaped embodiment and excluded a closed loop formed in a "rear cooling chamber" as recited, for example, in dependent claim 14. Under correct constructions, the Accused Samsung Mid-Sized Products have the recited "open loop...along the backlight" and "closed loop." The ID compounded its erroneous constructions by finding the displays are not "coolable" by the open and closed loops despite thermal diagrams, admissions by Samsung's engineer who designed the products, and testing by Respondents' expert all showing that the closed loop contributes to cooling. Finally, the ID should not have adjudicated alleged redesigns based on conflicting and late-produced evidence.

Second, the ID erred in finding invalidity of the '595 and '322 Patents based on the Kim reference. The '595 and '322 Patents are directed to specific configurations of airflow pathways

to achieve what the patents term “constricted convection.” The ID applied the claims in a way that removes the required “constriction” and found invalidity based on Kim, which instead shows expansion and has no channel that meets the claim limitation. With respect to claim 1 of the ’595 Patent, the ID further erred by finding invalidity based on the Takeuchi reference—an electromechanical display with a fundamentally different mode of operation that uses an array of mechanical elements to form an image rather than a single electronic display with a “posterior display surface.” Takeuchi does not disclose a “constricted convection plate,” a “posterior display surface,” or “two side panels,” let alone a “constricted convection channel” that is “define[d]” by those four elements. Moreover, the air flow in Takeuchi is through a space with multiple entrances needed to prevent its mechanical elements from overheating. There is no “constricted convection” taught by Kim or Takeuchi, much less clear and convincing evidence, and the ID erred by construing the claims so broadly to read inventive features out of the claims.

Third, the ID erred in finding invalidity of the ’740 and ’142 Patents based on the Karppanen reference. The asserted claims recite that the open loop ambient air flow path and the closed loop gas circulation path must pass “through” a “common heat exchanger.” The patents achieve improved cooling for large displays with high heat loads by using the recited common “heat exchanger,” distinguishing from conventional approaches that used finned arrays such as heat sinks. Yet the ID construed heat exchanger broadly to effectively sweep in any structure that transfers heat, including the finned structures distinguished as conventional in the specification, and regardless of whether air flows even pass “through” such structures. Karppanen does not teach the use of a “heat exchanger” and the ID erred in its finding of invalidity.

II. STATEMENT OF ISSUES FOR WHICH REVIEW IS SOUGHT

MRI submits that the ID’s findings with respect to non-infringement of claim 12 of the

'287 Patent, the adjudication of redesigns as to the '287 Patent, invalidity of the '595 and '322 Patents, and invalidity of the '740 and '142 Patents are erroneous and clearly erroneous and merit review. The following summarizes the issues for which MRI requests review and reversal:

1. Whether MRI has shown by a preponderance of evidence that Samsung infringes claim 12 of the '287 Patent.
2. Whether Samsung's alleged redesigns relating to the '287 Patent were ripe for adjudication.
3. Whether Samsung has shown by clear and convincing evidence that the Kim reference anticipates claim 1 of the '595 Patent, and renders obvious claims 4 and 7 of the '595 Patent and claims 4 and 5 of the '322 Patent.
4. Whether Samsung has shown by clear and convincing evidence that Takeuchi anticipates or renders obvious claim 1 of the '595 Patent.
5. Whether Samsung has shown by clear and convincing evidence that the '740 and '142 Patents are invalid in view of Karppanen and the knowledge of a POSITA or Karppanen combined with Larson.

III. BACKGROUND ON THE DISPUTE

MRI, a leader in developing and manufacturing electronic displays, is a true American success story and a rare example of a fully-domestic manufacturer. MRI was founded, is entirely located, and develops and manufactures all of its products in, Alpharetta, Georgia. Complaint, ¶2. At its Georgia headquarters, MRI and its [REDACTED] employees manufacture its displays from scratch. Tr. (Dunn) 51:4-8. For example, MRI [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]. Complaint Ex. 17C

(Confidential Declaration of Alan Brand), ¶¶ 6-12. MRI holds hundreds of U.S. and foreign

patents and William Dunn, the founder and President of MRI, is listed as an inventor on each

Asserted Patent. JX-0001 ('595 Patent); JX-0002 ('322 Patent); JX-0003 ('287 Patent); JX-0004

(’740 Patent); JX-0005 (’142 Patent). MRI is the type of industry the ITC was created to protect.

The products at issue are outdoor and semi-outdoor display products of the kind used in drive-thru menus, smart city kiosks, mixed use community kiosks, train platforms, and bus shelters. Tr. (Dunn) 52:8-53:4. When electronic displays are used outdoors and in semi-outdoor environments, they must be able to withstand large fluctuations in temperature (sub-freezing to 100+ °F) and have backlights sufficiently bright to display images visible in direct sunlight. *Id.* The use of displays outdoors in full sun and high ambient temperatures while using bright backlights results in very large heat loads. Tr. (Credelle), 1229:20-1230:11. Many of MRI’s technological advances involve innovative ways for cooling electronic displays without the need for refrigeration and while keeping interior components free of dust and moisture. MRI’s cooling technology enables the outdoor and semi-outdoor use of electronic displays. Complaint, ¶¶46-48.

Samsung made an initial attempt to enter the outdoor display market as early as [REDACTED] [REDACTED] [REDACTED].CX-1917C (Sung Ki Kim Dep. Tr.), 45:22-46:11 Samsung then sought out Mr. Dunn as a leader in the outdoor display space, and even visited MRI’s plant in Alpharetta. After its visit to MRI and [REDACTED], Samsung launched a new line of outdoor products, and these products were so successful that Samsung now has [REDACTED] [REDACTED], though MRI is still the acknowledged technological and quality leader. CX-1786C, CX-1787C; CX-1908C (Sungsu Lee Dep. Tr.), 184:15-191:8; CX-1909C (Wunkil Lee Dep. Tr.), 77:13-81:16; Tr. (Pokharna), 1233:19-1234:21.

IV. LEGAL STANDARDS

A. Commission Review

Under 19 C.F.R. § 210.43, the Commission may review an initial determination if it concludes: “(i) that a finding or conclusion of material fact is clearly erroneous; (ii) that a legal

conclusion is erroneous, without governing precedent, rule or law, or constitutes an abuse of discretion; or (iii) that the determination is one affecting Commission policy.” 19 C.F.R.

§ 210.43(b)(1). The Commission will grant review “if it appears that an error or abuse of the type described in paragraph (b)(1) of this section is present or if the petition raises a policy matter connected with the initial determination, which the Commission thinks it necessary or appropriate to address.” 19 C.F.R. § 210.43(d)(2).

“[O]nce the Commission decides to review the decision of the ALJ, the Commission may conduct a review of the findings of fact and conclusions of law presented by the record under a de novo standard.” *Certain Variable Speed Wind Turbines & Components Thereof*, Inv. No. 337-TA-641, Comm’n Op., 2010 WL 741200, at *2 (Mar. 2, 2010), *aff’d in part, vacated in part, and rev’d in part on other grounds by Gen. Elec. Co. v. Int’l Trade Comm’n*, 685 F.3d 1034 (Fed. Cir. 2012). “The Commission also may make any findings or conclusions that in its judgment are proper based on the record in the proceeding.” 19 C.F.R. § 210.45(c).

B. Redesigns

The Commission has deemed it appropriate to adjudicate infringement of non-accused products such as redesigns if they are sufficiently fixed in structure and design and that are disclosed in a timely manner during discovery. *See Certain Human Milk Oligosaccharides & Methods of Producing the Same*, Inv. No. 337-TA-1120, Comm’n Op., 2020 WL 3073788, at *11 (June 8, 2020) (“*Oligosaccharides*”). “It is [Respondents’] burden to show that the Redesign Products should be adjudicated.” *Certain Elec. Connectors & Cages, Components Thereof, & Prod. Containing the Same*, Inv. No. 337-TA-1241, Ord. No. 35 (Oct. 28, 2021).

For a redesign to be properly adjudicated by the Commission, the respondent must produce evidence showing “the redesigns are sufficiently fixed such that an infringement

determination can be made.” *Certain Audio Players & Controllers, Components Thereof, & Prods. Containing Same*, No. 337-TA-1191, Order No. 19, at *2 (Sept. 17, 2020). The evidence must not only be sufficient to show that the redesigns have a fixed structure or design, but also must be produced during fact discovery in sufficient time to allow the complainant to develop infringement contentions, obtain expert opinions, and prepare for trial on the product. *See Certain Unmanned Aerial Vehicles & Components Thereof*, Inv. No. 337-TA-1133, Comm’n Op., 2020 WL 5407477, at *14 (Sept. 8, 2020); *Certain Cloud-Connected Wood- Pellet Grills & Components Thereof*, Inv. No. 337-TA-1237, Initial Det., 2021 WL 6337517, at *12 (Dec. 6, 2021). The Commission will not adjudicate new products when their design is not yet final or too hypothetical. *Certain Digit. Video Receivers & Hardware & Software Components Thereof*, Inv. No. 337-TA-1001, Comm’n Op., 2017 WL 11249982, at *13 (Dec. 6, 2017); *see also Certain GPS Chips, Associated Software & Sys., & Prods. Containing Same*, Inv. No. 337-TA-596, Initial Det, 2010 WL 1502175, at *34-35 (Mar. 1, 2010). It is also insufficient for a respondent to assert a design around without demonstrating any plans to manufacture and/or implement its products. *See Cloud-Connected Wood-Pellet Grills*, *29; *Unmanned Aerial Vehicles* at *13); *Certain Road Construction Machines & Components Thereof*, Inv. No. 337-TA-1088, Comm’n Op., 2019 WL 6003332, at *5 n.22 (July 15, 2019).

V. INFRINGEMENT OF U.S. PATENT NO. 9,629,287

The ID errs by misconstruing claim 12 of the ’287 Patent in determining that the Accused Samsung Mid-Sized Products do not infringe. The non-infringement finding rests on an overly narrow construction of the recited “backlight” as not including a metallic plate provided on the rear surface to enhance convective heat transfer. The specification tells us that the rear surface “ideally” is a metallic or other thermally conductive material to enhance convective heat transfer.

The ID errs by construing the claim to exclude MRI's preferred embodiment.

The non-infringement finding also rests on an erroneous overly narrow construction of the recited "closed loop" as requiring a gas pathway "forming a complete loop"—a construction improperly importing the circular flow path of a preferred embodiment. The ID further narrows its "complete loop" construction to exclude a "fan within an enclosed and isolated space"—such as [REDACTED]—despite a dependent claim reciting that the "closed loop" is contained in "a rear cooling chamber." Not even Respondents advocated for such a narrow interpretation during the *Markman* proceedings, and the construction is not supported by the claims and specification.

The ID compounds its erroneous constructions by finding that the Accused Samsung Mid-Sized Products are not "coolable" by a combination of the open and closed loops despite Samsung's admissions to the contrary. Under the correct constructions, the evidence that the Mid-Sized Products have a cooling system as described and claimed by MRI is clear and more than satisfies the preponderance standard.

A. Overview of the '287 Patent

Conventional electronic displays "generally used convective heat dissipation systems that function to cool an entire interior of the display by one or more fans and fins." JX-0003 ('287 Patent) at 2:3-6. These conventional systems were not adequate to cool outdoor displays, particularly larger outdoor displays that generate significant heat and receive high levels of radiative heat transfer from the sun. *Id.* at 2:6-14. More efficient and powerful cooling systems were needed to dissipate heat for large-format outdoor displays. *Id.* at 2:14-17.

The '287 Patent is directed to an improved cooling system for electronic displays that provides greater cooling capabilities. *Id.* at 1:58-59, 2:34-36. The patent describes and claims an

electronic display that is coolable by a combination of airflows, which the patent calls “loops.” *Id.* at Abstract, claim 12. “A closed loop of isolated gas may be used with an open loop of ambient air which passes through the housing in order to cool the display.” *Id.* at Abstract. The patent uses the term “loop” generally to refer to a flow path—not to a circular shape of air flow. Indeed, as further described below, the patent even refers to straight flow paths as “loops” in the patent. *See, e.g., id.* at Figs. 3A-3E (showing open loop flow paths with dotted arrows).

Claim 12, reproduced below, is the only claim at issue. The disputed limitation is bolded.

12. An electronic display assembly comprising:

a housing;

a liquid crystal display (LCD) positioned within the housing and having a backlight;

wherein the electronic display is **coolable by a combination of a closed loop of isolated gas which circulates within the housing and an open loop of ambient air which passes through the housing and along the backlight.**

The “open loop”. The “open loop” is a flow path for external ambient air that passes through the housing to cool the display. *Id.* Claim 12 is directed to an embodiment of the invention in which the open loop (the flow of external ambient air through the device) passes “along the backlight.” The ’287 Patent explains that the positioning of the open loop along the backlight allows the “convective heat transfer from the backlight [to] be increased.” *Id.* at 3:2-5. The patent provides examples of open loops in Figs. 3A-3E. The open loops, shown by the dotted arrows in these examples, form a straight-line flow path passing through the housing and along the backlight. *Id.*, Figs. 3A-3E. Thus, even though the patent uses the term “loop,” it is not referring to the *shape* of the path (e.g., a circular shape) because loops are also shown as straight flow paths; the patent instead uses the term “loop” to refer generally to an air flow path.

The “backlight”. Particularly relevant for this Petition, claim 12 recites an LCD having a

“backlight,” and as explained above, the open loop of ambient air must pass “along the backlight.” The specification describes several components of a backlight. First, the “backlight may comprise a printed circuit board (PCB) with a plurality of lights,” LEDs for example. *Id.* at 4:64-5:2. The specification further describes a backlight that “ideally” would have “a low level of thermal resistance between the side facing the electronic display 80 and the side facing the cooling plenum.” *Id.* at 5:2-6. In this ideal backlight, “[t]he **rear surface of the backlight 140 may also be metallic, or some other thermally conductive material, to further enhance the convective heat transferring properties.**” *Id.* at 5:9-12 (emphasis added). Thus, the “backlight” of an LCD may, and ideally does, include at least lights (e.g., LEDs), printed circuit boards, and a metallic rear surface. These are all components of a backlight as claimed in the ’287 Patent.

The “closed loop.” The cooling system of the ’287 Patent also uses a “closed loop,” an example of which is an “isolated gas cooling chamber.” *Id.* at 2:39-40. Again, the word “loop” in the patent refers generally to an airflow path and not to a circular shape. *Id.* at Abstract, Figs. 3A, 3B. The patent’s description of the loop as “closed” means that the airflow pathway is substantially closed to external ambient air, as distinguished from the “open” loop freely exposed to ambient air including dust and other contaminants. *Id.* at 4:4-15. In some cases, a “rear cooling chamber” positioned behind the LCD may contain electronic components for driving the LCD so that those components are protected from dust and contaminants. *See id.* at claims 14-15.

Circulating airflow within a closed chamber forms a closed loop, and there is no requirement in the patent that the “closed loop” be configured with chambers forming a circular path around the display. While the specification describes an embodiment where the closed loop “preferably” includes a “first gas chamber” in front of the display and a “second gas chamber” behind the display with the flow path encircling the display (*id.* at 4:4-7, Fig. 2), this donut-

shaped flow path is only an embodiment and is not set forth as an affirmative requirement of the claim. The only requirement of the “closed loop of isolated gas” in claim 12 is that it “circulates within the housing,” as is shown by the fact that dependent claims are more narrowly directed to the donut-shaped flow path around the display. *See, e.g., id.* at claim 2 (reciting that the closed loop is “positioned such that gas circulation within the closed loop gas cooling chamber will cool a front surface of the electronic display), claim 6 (reciting that the closed loop “forms a continuous loop” and that the open loop “passes through” the continuous loop), claim 13 (reciting that the closed loop of isolated gas “will cool a front surface of the LCD”).

Figures 3A and 3B are non-limiting embodiments showing a vertical cross section of an electronic display assembly with closed loops and open loops along the backlight. *Id.*, Figs. 3A and 3B. The structure on the right side of Figs. 3A and 3B shows a “backlight,” and open loop “along the backlight,” and a “closed loop” separated from backlight by the closed loop. The backlight 140 is placed in close proximity to the surface of the closed loop of isolated gas (referred to as the “rear cooling chamber” 40). *Id.* at 4:42-46. Formed in between the backlight and the closed loop (rear cooling chamber 40) is an open loop of ambient air which passes through the housing and along the backlight (shown by the dotted arrows). *Id.* at 4:50-54. “The close proximity of these two elements, in part, creates the constricted convection cooling of the backlight 140” and “increases the cooling capabilities of the system.” *Id.* at 4:48-54.

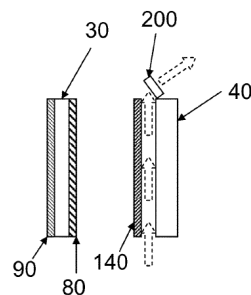


Fig. 3A

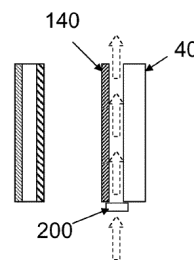


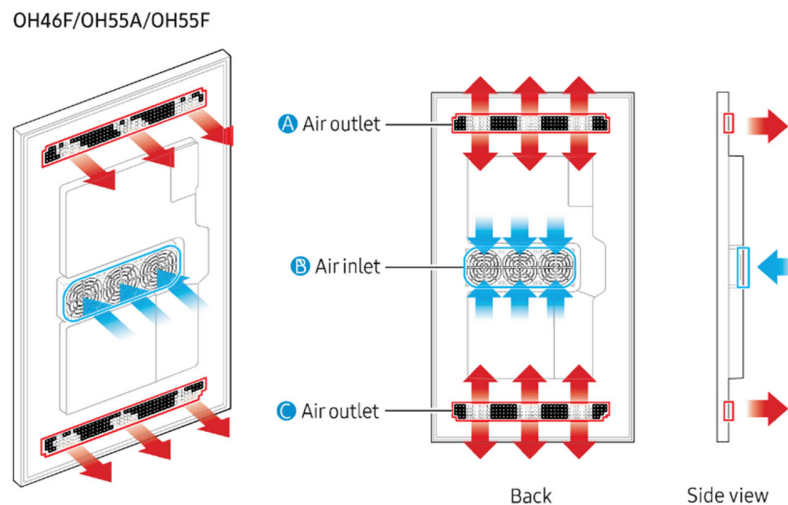
Fig. 3B

Claim 12 recites these features—a “backlight,” a “closed loop,” and an “open loop...along the backlight.” Dependent claim 13 adds limitations directed to the additional feature on the left side of Figs. 3A and 3B, the “isolated gas cooling a front surface of the LCD.”

B. The Cooling System of the Accused Samsung Mid-Sized Products

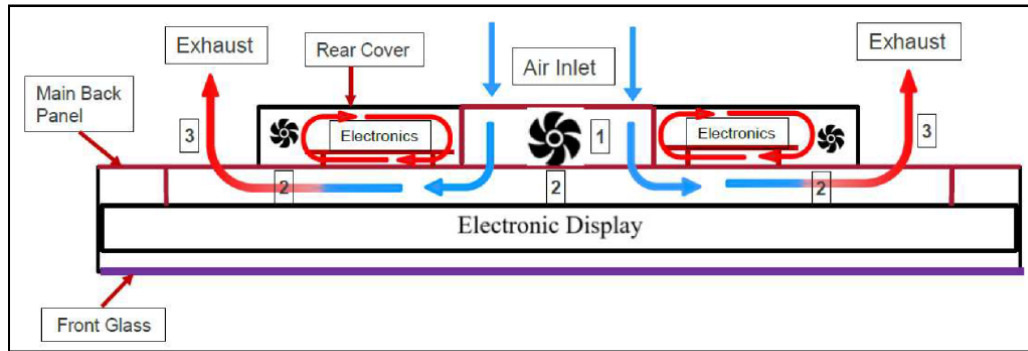
The accused products in this Investigation are outdoor and semi-outdoor electronic displays that are manufactured outside the United States and imported by Samsung Electronics. ID at 5.. Samsung’s outdoor and semi-outdoor products include its OH-series displays, which it makes in 46-, 55-, 75-, and 85-inch sizes. *Id.* At 6. The cooling systems of the 46- and 55-inch sizes are configured the same and those products are referred to as the “Accused Samsung Mid-Sized Products,” or simply as the “Mid-Sized Products.” Tr. (Pokharna) 437:21-438:8; 441:21-442:5 (confirming that the Mid-Sized Products have the same airflow path and cooling systems).

The installation guide for the Accused Samsung Mid-Sized Products states “[t]he outdoor unit uses cooling fans to take in outside air to lower the internal temperature and discharge the hot air.” CX-0044C.00004. Samsung shows cool ambient air (blue) entering through air inlets and hot air (red) exiting through air outlets after passing through the housing. *Id.*



CX-0044C.00004.

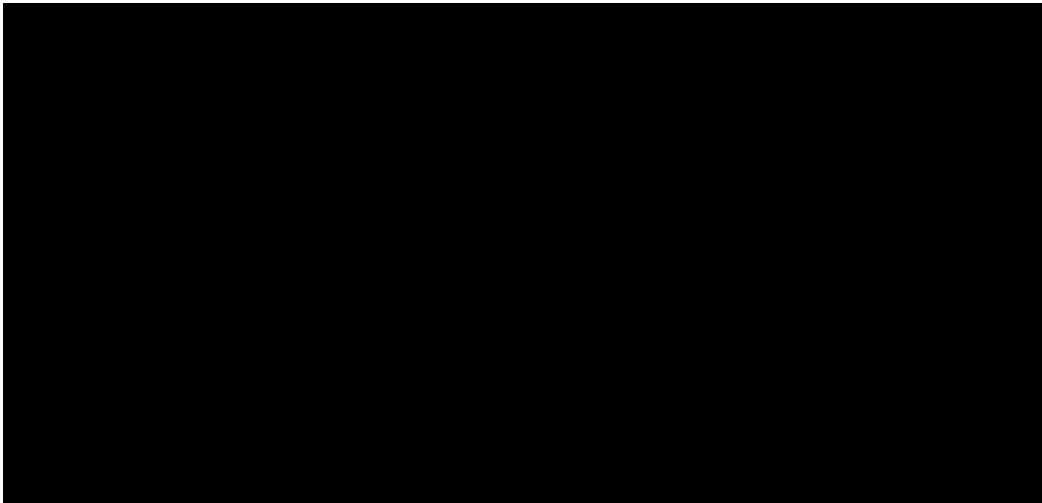
The internal operation of the cooling system is shown in the cross-sectional demonstrative below. CDX-0007C at 12; CX-1869 at 7. At the hearing, MRI's expert Dr. Pokharna explained that an open loop of ambient air enters through the inlet marked 1, passes along the back of the display in the channel marked 2, and exits at the exhaust marked 3. Tr. (Pokharna) at 439:11-25. The schematic also shows the closed loop air circulation caused by fans in the [REDACTED] formed by the rear cover that contains the electronics. *Id.*



Samsung's design specifications for the Mid-Sized Products provide a similar schematic of the "[REDACTED]" showing an [REDACTED]

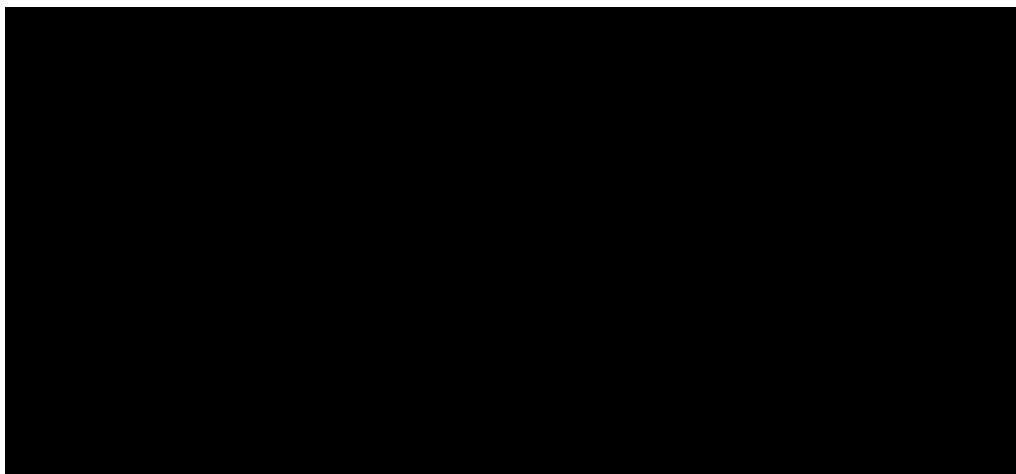
[REDACTED]. The cooling structure also includes [REDACTED]

[REDACTED]. JX-0208C.95.



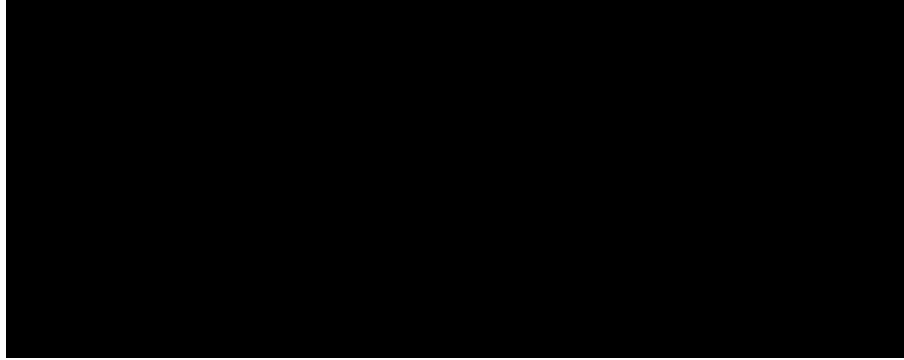
1. The Open Loop and Backlight

Photos of a teardown of an Accused Samsung Mid-Sized Product show the ambient air flow path (blue arrow) through the device from inlet to outlet passing along the backlight. The photo on the left shows the back of a Mid-Sized Product fully assembled and labeled with inlet and outlet. The photo on the right shows a disassembled view with the back lifted to expose the air flow path from inlet to outlet as designated by a blue arrow.

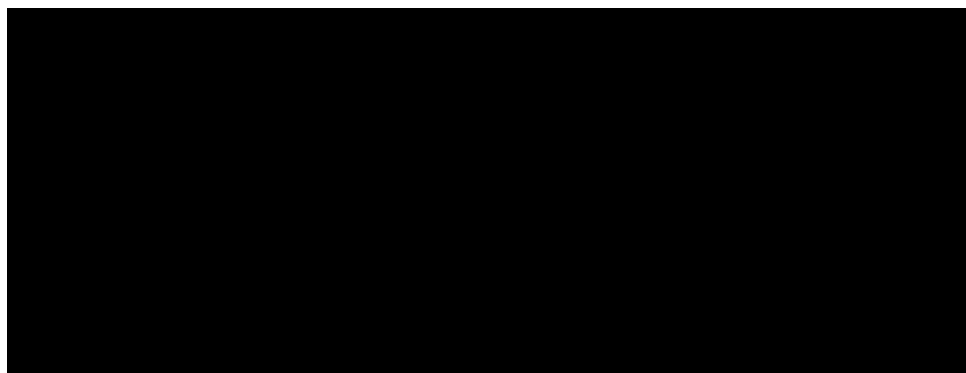


CX-0280 at 2; CDX-0007C at 30. The structure underneath the blue arrow is the backlight assembly including an  forming the rear surface of the backlight. Samsung

internally refers to this [REDACTED] *See, e.g.,*
JX-0206C at 110.



At the hearing, Samsung engineer Sungsu Lee used the diagram above to explain the function of [REDACTED]. He explained that the Mid-Sized Products are [REDACTED]
[REDACTED]
[REDACTED] Tr. (Lee) at 600:9-601:4. He further explained that the [REDACTED]
[REDACTED] *Id.* at 601:5-9 . Mr. Lee acknowledged that [REDACTED]
[REDACTED] *Id.* at 602:6-603:3.
Despite the clear function of the [REDACTED], Mr. Lee attempted to argue through a demonstrative of the edge portion of a CAD for a Mid-Sized Product that only a limited subset of these components makes up the backlight and conveniently [REDACTED].



RDX-0002C at 2. The CAD shows there are

. *Id.* Together, each of these elements—

. As seen in the photos of the assembled and disassembled display above, this assembly—

CX-0280 at 2; CDX-0007C at 30. The (colored pink in the CAD) and other elements on the opposite side of the ambient air flow from the

These are the when the product is opened up, as shown in the photos. *Id.*

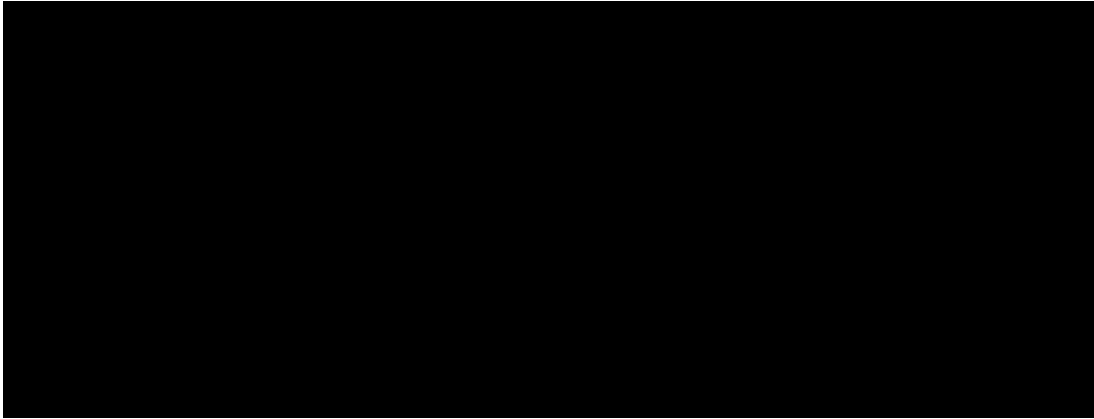
Mr. Lee admitted that the is provided in the Mid-Sized Products for the express purpose of

. Tr. (Lee) at 600:21-601:9.

2. The Closed Loop

The Accused Samsung Mid-Sized Devices include a which houses

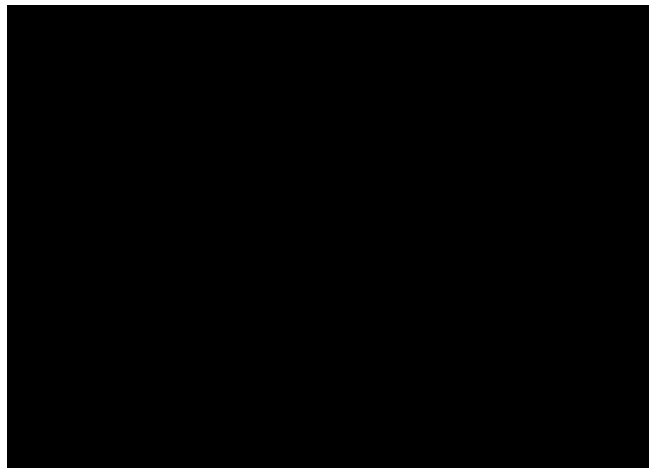
the electronics and includes fans provided for cooling the display. The photos below show the back of a Mid-Sized Product fully assembled on the left and with the back cover removed on the right to show the inside of the rear cooling chamber.



CX-280.2; CDX-7C at 24.

Dr. Pokharna explained at the hearing, using Samsung's CAD files and documentation, that the [REDACTED]. Tr. (Pokharna) at 446:7-448:21 ([REDACTED] the products have achieved an IP56 rating against moisture and dust intrusion). The image below has the cover removed to show the inside of the rear chamber. [REDACTED]

[REDACTED] annotated by Samsung.

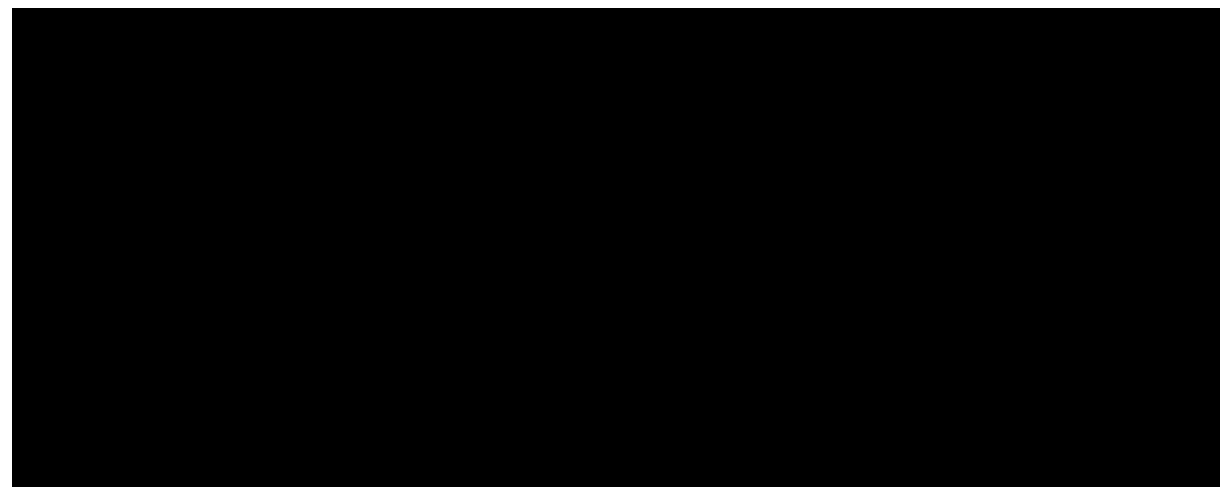


[REDACTED]

RDX-0003C at 27 (annotating RX-1130C). The rear cooling chamber includes two areas containing the [REDACTED]

[REDACTED]

[REDACTED], as can be seen in the photo below provided by Samsung.



CDX-0007C at 26, 44; RX-1128C; RX-1141C. The [REDACTED]

[REDACTED]

[REDACTED]. *Id.* This region is [REDACTED] from the open loop airflow. Tr. (Pokharna) at 446:7-447:14; 469:16-470:10.

Fans are provided in the rear cooling chamber [REDACTED]

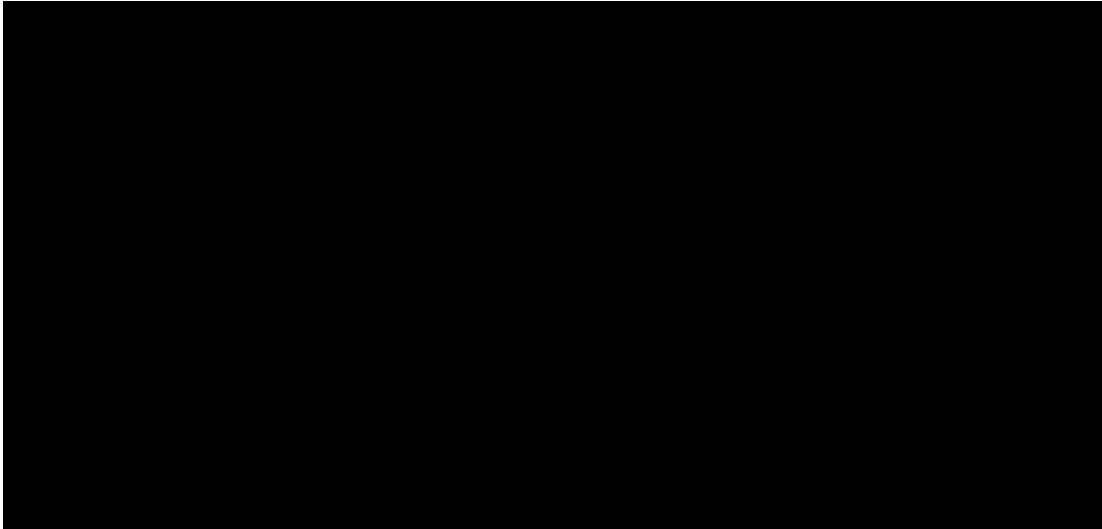
[REDACTED] Samsung's annotations show the location and direction of air flow from those fans. RDX-0003C at 27 (annotating RX-1130C). Dr. Pokharna explained at the hearing that the fans create air flow in the rear cooling chamber, and since the fans are provided [REDACTED]

[REDACTED] Tr. (Pokharna) at 448:22-449:14. Dr. Pokharna explained that [REDACTED]

[REDACTED]. *Id.* The [REDACTED]

[REDACTED]. *Id.* (explaining the law of conservation of mass means no new air is being created in [REDACTED]).

Samsung's documents and witnesses confirm that fans are provided in the rear chamber to provide cooling. The fans are identified as part of the [REDACTED] for the Mid-Sized Products. JX-0208C.95 (designated as [REDACTED]). The former Samsung engineer who designed the cooling system, Sung Ki Kim, also testified that the [REDACTED]. CX-1917C at 88:15-22 ("Q. Am I right that [REDACTED] [REDACTED]? . . . A. If your question is about this drawing that is depicted in purple and gray squares, then that's correct.").



C. The ID Erred in Finding that the Accused Mid-Sized Products Do Not Infringe Claim 12 of the '287 Patent.

The ID finds that the Accused Samsung Mid-Sized Products do not infringe claim 12 of the '287 Patent because (1) the evidence fails to show an open loop of ambient air that passes "along the backlight"; (2) the evidence fails to show a "closed loop"; and (3) to the extent the products have a "closed loop," the evidence does not show that the electronic display is

“coolable by a combination” of the open and closed loops. ID, at 105. As described below, these findings are flawed. The claim construction adopted incorrectly reads out the preferred embodiment. Under a correct interpretation of the claims, the record contains clear evidence of infringement by the Mid-Sized Products. This determination is clearly erroneous, and MRI respectfully requests review by the Commission.

1. The Mid-Sized Products have an open loop of ambient air which passes “along the backlight.”

Claim 12 of the '287 Patent recites an “open loop of ambient air which passes through the housing and along the backlight.” The open loop of ambient air in the Accused Samsung Mid-Sized Products [REDACTED]

[REDACTED]. *Supra* Section V.B.1. The parties dispute whether [REDACTED] is part of the recited “backlight.” This is a question of claim construction, and the specification answers it directly in clear and unmistakable language:

mer (LEP), or organic electro-luminescence (OEL) lights. In an exemplary embodiment, the backlight 140 would ideally have a low level of thermal resistance between the side facing the electronic display 80 and the side facing the cooling plenum. To accomplish this low level of thermal resistance, the backlight 140 may be built using metal printed circuit board (PCB) technology to further transfer heat away from the lights. **The rear surface of the backlight 140 may also be metallic, or some other thermally conductive material, to further enhance the convective heat transferring properties.** The surface may even have a plurality of

JX-0003 at 5:2-12. A plate made of metal or other thermally conductive material provided on the rear surface to enhance the heat transferring properties ***is part of the backlight*** within the meaning of the '287 Patent. The ID erred by construing the recited “backlight” to exclude this preferred embodiment from the claim scope.

LCDs require a backlight to provide illumination for the display, but the backlight

generates heat that must be removed to prevent overheating. *Id.* at 2:67-3:2. Bill Dunn, the inventor of the '287 Patent, recognized that an outdoor electronic display could be cooled more efficiently by passing cooler outside air (the “open loop of ambient air”) through the housing and “along the backlight” to remove heat through convective heat transfer. *Id.* at 4:46-54, claim 12. Tr. (Brown) 244:12-25. This innovative system, which cools an electronic display more efficiently than was possible using conventional systems, is the subject of the '287 Patent.

The '287 Patent describes a preferred embodiment of a backlight to achieve efficient cooling using the open loop of ambient air. “The backlight may include a printed circuit board (PCB) with a plurality of lights mounted to the side facing the electronic display.” *Id.* at 4:64-66. “In an exemplary embodiment, the backlight 140 would *ideally* have a low level of thermal resistance between the side facing the electronic display [i.e., the side with the lights] and the side facing the cooling plenum.” *Id.* at 5:2-6 (emphasis added). Lower thermal resistance is desirable so that heat generated by the light sources is spread across the large back surface for exposure to the ambient air flow in the open loop. In this ideal backlight, “[t]he *rear surface of the backlight 140 may also be metallic, or some other thermally conductive material, to further enhance the convective heat transferring properties.*” *Id.* at 5:9-12 (emphasis added). In a preferred embodiment, the backlight thus has lights (e.g., LEDs), printed circuit boards, and a metallic rear surface.

The Accused Samsung Mid-Sized Products is configured the same as the preferred embodiment in the '287 Patent. As shown in the CAD image below, the Mid-Sized Products have [REDACTED]

[REDACTED]. JX-0003 at 4:64-66; Tr. (Lee) at 600:9-20. As shown in the diagram, [REDACTED]

[REDACTED]. Instead, the [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]. JX-0003 at 5:9-12.; Tr. at 600:21-601:9

[REDACTED]

RDX-0002C at 2.

Samsung internally refers to [REDACTED]

[REDACTED] Samsung engineer Sungsu Lee explained that [REDACTED]

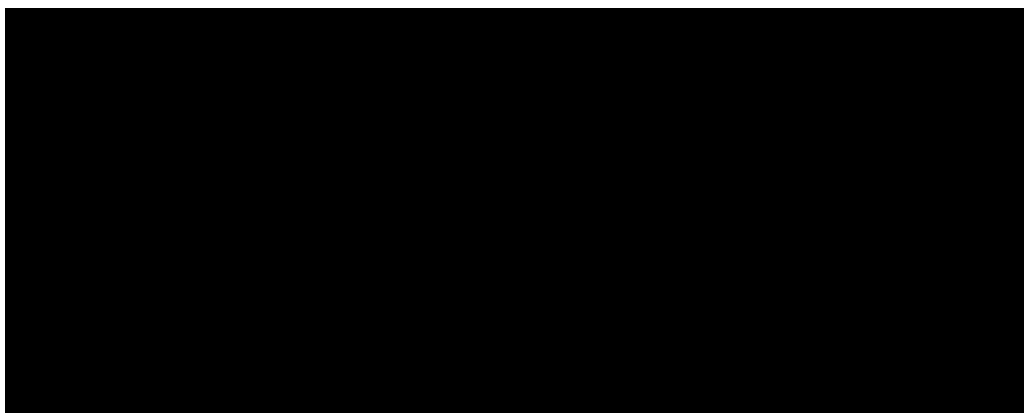
[REDACTED]

[REDACTED] as shown by the red arrows in the schematic. Tr. (Lee) at 600:9-601:9. Thus, not only are the components identified in the figure above [REDACTED]

[REDACTED]

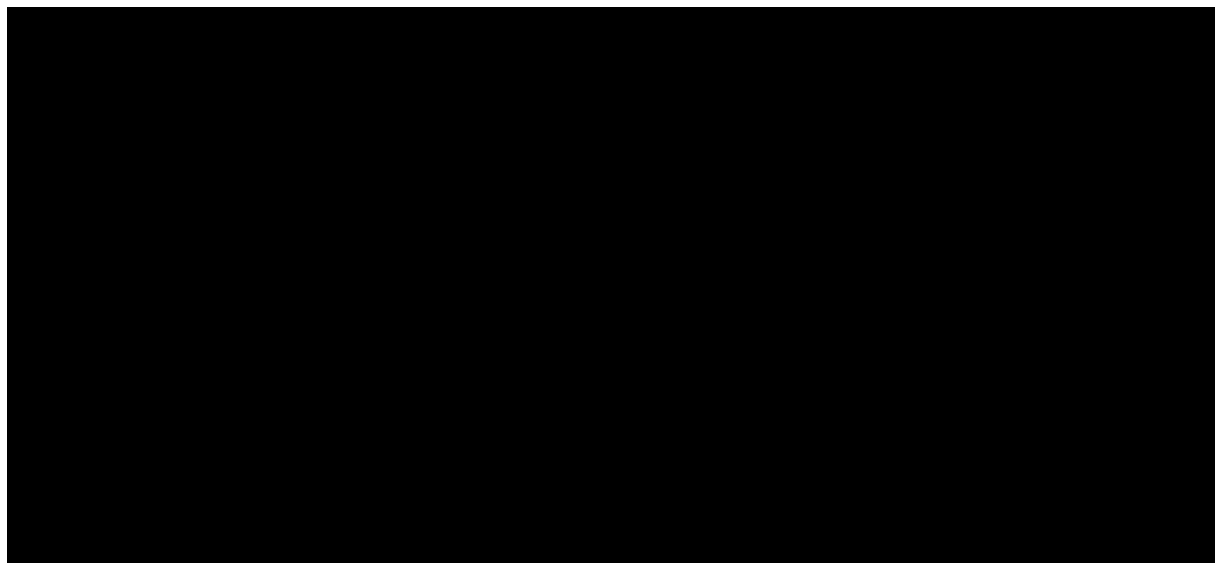
[REDACTED]

[REDACTED].



JX-0206C at 110. This heat can then be removed efficiently by 

 as shown in photos below (blue arrow).



CX-280 at 2; CDX-7C at 30. The way the Mid-Sized Products work is the same as the preferred embodiment in the '287 Patent. JX-0003 at 4:64-5:12.

The dispute between the parties is whether a metallic surface, 
,  to enhance convective heat transfer
to the open loop is part of the backlight or is a significant intervening structure between the
backlight and the open loop of ambient air. While neither party provided an express claim

construction, the dispute is fundamentally one of claim scope. Resolving this dispute necessarily required the ALJ to determine the scope of the claim term, which the Federal Circuit has found constitutes implicit claim construction. *Microsoft Corp. v. IPA Techs. Inc.*, No. 2021-1412, 2022 WL 989403, at *8–10 (Fed. Cir. Apr. 1, 2022) (conducting de novo review after finding an implicit claim construction where neither party proposed an express construction of a disputed term but nevertheless disputed the scope of the term in their arguments on the merits).¹

The ID’s implicit construction of the recited “backlight” is erroneous because it is inconsistent with the patent description and reads out a preferred embodiment. “The construction that says true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005) (*en banc*). The ID’s implicit construction fails to align with the patent’s description of the invention because it excludes the structure of the preferred backlight from the scope of the claim. It is well-established that where, as here, a claim can reasonably be interpreted to include the preferred embodiment, it is legal error to exclude it from the claim scope. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583 (Fed. Cir. 1996) (finding that a claim interpretation that excludes a preferred embodiment is “rarely, if ever, correct”); *Certain Printing & Imaging Devices & Components Thereof*, Inv. No. 337-TA-690, Comm’n Op., 2011 WL 7628059, at *8 (Nov. 2011) (reversing ALJ’s claim construction for excluding the preferred embodiment).

¹ By contrast, the Federal Circuit has held that a judge does not conduct implicit claim construction where he or she merely makes factual findings that do not implicate a determination of the scope of a claim term. *See, e.g., Apple Inc. v. Uniloc 2017 LLC*, 843 F. App’x 281, 286 (Fed. Cir. 2021); *Google Inc. v. SimpleAir, Inc.*, 682 F. App’x 900, 905 (Fed. Cir. 2017). Such is not the case here where the dispute is fundamentally about the scope of the claim.

The ID addresses, in a single sentence, the specification's statement that a backlight may have a "rear surface" of a "thermally conductive material." ID at 109. The ID finds that this statement "does not mean that any thermally conductive surface would be considered part of the backlight by one of skill in the art." *Id.* This is simply incorrect. A POSITA would understand from the specification that when the '287 Patent states that an open loop of ambient air must pass "along the backlight," the backlight may include a thermally-conductive metal surface provided to enhance the convective heat transferring properties. JX-0003, at 5:9-12. This is precisely how the invention works in the preferred embodiment. A metal plate lowers the thermal resistance between the heat-generating LEDs on one side of the backlight and the ambient air flow on the opposite side. *Id.* at 5:2-17. Cooler ambient air passes along the rear surface of the backlight thereby removes heat generated from the LEDs more efficiently. *Id.* at 4:50-54. This configuration "increases the cooling capabilities of the system." *Id.* As Sungsu Lee testified, Samsung provided [REDACTED]

[REDACTED]. Tr. (Lee) at 600:21-601:9. A POSITA would understand from the specification itself that this structure is within the scope of the claim.

The ID erred by effectively reading out the "rear surface" of the backlight. The claimed invention works by passing ambient air along this rear surface and the ID removes it from the definition of the backlight. The statement in the patent that the rear surface of the backlight "**may also be** metallic, or some other thermally conductive material" (JX-0003 at 5:9-12) does not mean that it is optional whether or not to consider a thermally conductive rear surface to be part of the backlight. *See, e.g., Certain Mobile & Portable Elec. Devices Incorporating Haptics (Including Smartphones & Laptops) & Components Thereof*, Inv. No. 337-TA-990, 1004 (Consolidated), Order No. 27, at 35 (Feb. 8, 2017) (construing "pressure" to cover examples of

levels of pressure that “may be defined, for example” in the specification and rejecting Respondents’ and Staff’s construction because it “would not fit all of the examples set forth” in the specification). Again, this is describing a preferred embodiment. By stating that the rear surface “may also be metallic,” the specification does not **require** all backlights to have a metal rear surface. But the backlight preferably does have a metal rear surface to maximize the efficiency of the open loop cooling, and when present, the metal rear surface is part of the “backlight” within the meaning of the patent.

The ID states that “Samsung’s witnesses and expert provided persuasive testimony, supported by the documentary evidence, that the [REDACTED] [REDACTED] ...” ID at 109. But as described above, Sungsu Lee describes Samsung’s [REDACTED] [REDACTED] in the specification. JX-0003, 5:9-12. Moreover, only one of Samsung’s two technical experts, Dr. Neikirk, expressed an opinion that [REDACTED]. Tr. (Neikirk), 670:20-672:6; RDX-0003C.31 (citing RX-1142C). Dr. Neikirk’s cursory analysis ignores the ’287 Patent specification and does not even attempt to explain how a thermally-conductive metal plate for enhancing heat transfer is not part of the recited backlight when the specification expressly states that it is. Dr. Neikirk simply contends that the [REDACTED] [REDACTED]. Tr. (Neikirk) at 671:16-672:3. Like Sungsu Lee, Dr. Neikirk’s description dovetails with the patent’s description of a “backlight” and **supports** a finding of infringement under the proper claim scope.

The ID further states that “MRI has not identified a Samsung document or testimony from a Samsung witness that identifies [REDACTED]” and instead

relies on “Samsung document JX-206C [which] states that the [REDACTED] [REDACTED] ID at 109 (citing JX-206C at 18).

This is both a legally and factually erroneous. *First*, it is legally erroneous to elevate a one-off statement in extrinsic evidence (a Samsung marketing document to McDonalds) above the intrinsic record when construing claim 12. *Vasudevan Software, Inc. v. MicroStrategy, Inc.*, 782 F.3d 671, 678 (Fed. Cir. 2015) (defendant's marketing materials could not be used as extrinsic evidence of claim term's plain and ordinary meaning because “language used in marketing materials directed to potential customers can mean something quite different from the language used in a patent directed to persons skilled in the art”). Samsung’s internal [REDACTED] terminology has no bearing on whether a person of ordinary skill in the art would understand a metallic rear surface to form part of a “backlight” within the meaning of the ’287 Patent. The ID should have construed the “backlight” term based on the patent’s description instead of Samsung documents.²

Second, the statement in the ID that MRI did not identify any evidence from Samsung that identifies [REDACTED] is factually clearly erroneous. The most notable fact witness to provide testimony about the accused products was Sung Ki Kim, the former Samsung engineer who actually designed the Accused Samsung Mid-Sized Products.

² Even if Samsung’s document were relevant, its statement that [REDACTED] (JX-0206C at 18) does not support a construction that a [REDACTED]. That statement is making the straightforward point that [REDACTED]. It does not say that [REDACTED] At most, the statement is ambiguous. Moreover, page 17 of the same document identifies the [REDACTED] Samsung [REDACTED]” which suggests that even [REDACTED]. JX-0206C at 17.

CX-1917C. Mr. Kim testified that the [REDACTED] [REDACTED]
[REDACTED]. CX-1917C, 91:1-96:14. Samsung's own former engineer and the designer for the Mid-Sized Products thus admitted that backlights include mechanical components including [REDACTED]
[REDACTED]. *Id.* The ID relegated this evidence to a footnote and dismissed it as "unclear" because Mr. Kim testifies to components "for" a backlight. ID at 110, n.36. In context, however, it is crystal clear that Mr. Kim is testifying regarding the mechanical components of the backlight itself. He was asked to identify components of backlights and testified that the typical components of a backlight include "mechanical components." CX-1917C at 93:13-20. The follow-up question asked him to describe those mechanical components he had *already identified as being part of a backlight*. CX-1917C at 95:17-96:9. He answered that the mechanical components include [REDACTED]
[REDACTED] *Id.* at 95:17-96:9.

In addition to Sung Ki Kim, three technical experts who testified at the hearing agreed that the structure of a "backlight" includes more than just the individual light sources and that the plain meaning of the term includes [REDACTED]
Complainant's expert, Tom Credelle, explained that [REDACTED] [REDACTED]
[REDACTED] include LEDs, a light guide plate, optical films, and a mechanical structure that holds the other components in place. Tr. (Credelle), 330:15-331:19. Complainant's expert Dr. Himanshu Pokharna agreed that a POSITA would understand that edge-lit backlights include

³ Sungsu Lee likewise referred to the [REDACTED] of the accused products as the "chassis." Tr. at 602:6-603:3. So does JX-206C, the Samsung marketing document that the ID relies upon in its analysis of the recited "backlight." ID at 109; JX-206C at 18.

not only the LEDs around the perimeter but also a light guide plate for dispersing the light from the LEDs, reflectors and films for dispersing the light evenly, and structural elements on the back that hold everything together. Tr. (Pokharna), 457:18-458:20. Respondents' expert, Smith-Gillespie, also agreed during cross examination that edge-lit backlights include a light guide, reflector sheets, optical films, and additional housings. Tr. (Smith-Gillespie), 1074:20-1075:4.

The ID commits clear error and fails to address the Credelle or Pokharna testimony about the structure of backlights.⁴ And like Sung Ki Kim, the ID addresses Mr. Smith-Gillespie's testimony only in a footnote, characterizing it as "general" and not specific to the accused product. ID. at 110, n. 36. This analysis misses the point. Mr. Smith-Gillespie's testimony that backlights typically include numerous components including optical components and mechanical housings sheds light on the plain and ordinary meaning of "backlight" and is consistent with the patent's description of the metal rear surface forming part of the backlight itself. The Smith-Gillespie testimony need not—indeed should not—have been specific to the accused products because claims are not construed based on the accused products. *Wilson Sporting Goods Co., v. Hillerich & Bradsby Co.*, 442 F.3d 1322, 1330-31 (Fed. Cir. 2006) (repeating the well-established rule that "claims may not be construed with reference to the accused device" and "a court may not use the accused product or process as a form of extrinsic evidence").

It was erroneous for the ID to exclude the preferred embodiment from the scope of the

⁴ The ID only acknowledges Dr. Pokharna's opinion that the "along the backlight" term means that there are "no significant intervening structures" between the backlight and the open loop. ID at 109, n.35. The ID is correct that the "along the backlight" term requires no significant intervening structures between the backlight and the open loop. With a correct construction of the "backlight" term, the Mid-Sized Products have [REDACTED] whereas the prior art does not.

claim. The plain and ordinary meaning of the recited “backlight” must include these features of the preferred—indeed the “ideal”—embodiment of the claims. Under the correct construction,

[REDACTED]

[REDACTED]

[REDACTED]”

2. The Mid-Sized Products have a “closed loop of isolated gas.”

Claim 12 of the ’287 Patent recites a “closed loop of isolated gas which circulates within the housing.” JX-0003 at claim 12. During claim construction, Complainant proposed that “closed loop” should have its plain and ordinary meaning, and Respondents proposed that “closed loop” should be construed as a “gas pathway within a display housing containing gas that is essentially isolated from ambient air.” EDIS Doc. ID 792078 (Updated Joint Claim Construction Statement) at 5. The parties agreed that the “closed loop” term referred to a gas pathway distinct from the second airflow pathway referred to as an “open loop” in the claims. As stated by Respondents during claim construction briefing, “[t]he parties’ dispute as to this term concerns the point at which an otherwise ‘open’ loop becomes a ‘closed’ loop and thus falls within the scope of the claim—i.e., *how ‘closed’ an airflow pathway must be from external air* (e.g., ambient air).” EDIS Doc. ID 789175 (Respondents’ Opening Claim Construction Br.) at 28 (emphasis added). Neither side contended that a “closed loop” is restricted to an airflow pathway having a particular shape of airflow, namely a donut-shaped circular path. This makes sense, because the patent uses the word “loop” to describe airflow pathways regardless of shape, including ambient air flowing through a display in a straight path from an inlet to an outlet. JX-0003 at claims 1, 12, 18, 21; Figs. 3A-3E. Nothing in the patent indicates that a “closed loop” or an “open loop” require a particular shape, and the patent never limits the word “loop” to an

airflow pathway that circles back on itself. Both parties correctly understood that the distinction of loops as “open” and “closed” is not describing shapes of flow paths (straight, circular, or otherwise) but rather is distinguishing between flow paths “open” to ambient air and “closed” to ambient air.

The ALJ first construed “closed loop” erroneously as a “gas pathway, forming a complete loop within a display housing.” ID at 112. MRI introduced expert testimony that the Accused Samsung Mid-Sized Products have [REDACTED]

[REDACTED].” Tr. (Pokharna) at 448:22-449:24 (explaining that [REDACTED]). The ID

then further erred and construed the claim, holding without explanation that the claim cannot “read onto any fan within an enclosed and isolated space.” ID at 112. There is no rule or canon of claim construction that would prevent the recited “closed loop of isolated gas” from reading onto a fan circulating gas within an enclosed and isolated space. The ordinary meaning of

“closed” refers to an enclosed space, and as used in claim 12 reciting a “closed loop of *isolated gas*,” refers to an enclosed and isolated space. Tr. (Pokharna) at 444:15-447:14. As explained,

the parties agreed that “loop” in the patent refers generally to a gas pathway, which would be created by a fan within the enclosed and isolated space. *Id.* at 449:7-14; EDIS Doc. ID 789175

(Respondents’ Opening Claim Construction Br.) at 28. Thus, the plain and ordinary meaning of “closed loop” includes a fan that forms a gas pathway within an enclosed and isolated space.

Moreover, this plain and ordinary meaning is consistent with the specification, which describes that the cooling system may include an “isolated gas cooling chamber.” JX-0003 at 2:39-40. In

some cases, a “rear cooling chamber” positioned behind the LCD may contain electronic components for driving the LCD, [REDACTED]

. See *id.* at claims 14-15; *supra* Section V.B.2.

The ID does not expressly describe what is meant by “complete loop” in its analysis of the ’287 Patent,⁵ but based on the infringement analysis under which a closed compartment containing fans is not sufficient to form a closed loop (ID at 112), it is apparent that the ID further interpreted the “complete loop” construction to require a structure that forms a circular flow path such as the “donut-shaped” one around the display shown for example by dotted arrows in the preferred embodiment of Figure 2.

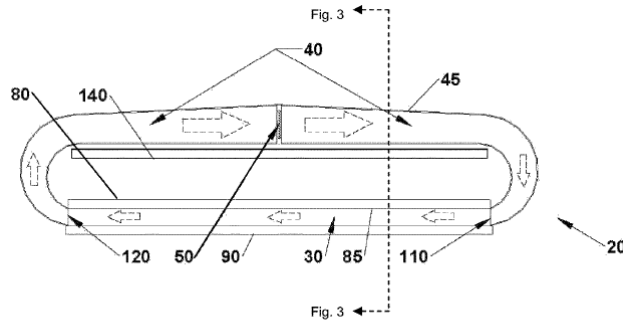


Fig. 2

JX-0003, Fig. 2.

By interpreting the “complete loop” claim construction to require a structure forming a circular flow path like the one shown in Figure 2 and excluding flow paths formed by fans within an enclosed and isolated space (ID at 112), the ID errs by importing a preferred embodiment into the claims. The Federal Circuit has warned against the “danger of reading limitations from the specification into the claim...” *Phillips*, 415 F.3d at 1323. “Though understanding the claim

⁵ In its analysis of the “closed loop” in the ’740 Patent, the ID characterizes a “closed loop” as “e.g., a path that circles back upon itself” and as “gas [that] circulates and returns to its starting location.” ID at 130. This is inconsistent with its analysis of the ’287 Patent, under which isolated gas that repeatedly circulates and returns to fans in an enclosed and isolated space does not form a “closed loop.” Compare ID at 112 with ID at 130.

language may be aided by the explanations contained in the written description, it is important not to import into a claim limitations that are not a part of the claim. For example, a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment.” *Superguide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004) (citation omitted). “[I]t is improper to read limitations from a preferred embodiment described in the specification—even if it is the only embodiment—into the claims absent a **clear indication in the intrinsic record** that the patentee intended the claims to be so limited.” *Liebel–Flarsheim v. Medrad, Inc.*, 358 F.3d 898, 913 (Fed. Cir. 2004) (emphasis added); *Polaris Innovations Ltd. v. Brent*, 48 F.4th 1365, 1377 (Fed. Cir. 2022).

The specification of the ’287 Patent provides no such “clear indication” that claim 12 should be limited to the “complete” loop of the preferred embodiment as interpreted by the ID. Nor does anything in the specification prevent forming a closed loop within an enclosed and isolated space. To the contrary, the specification actually describes an “isolated gas cooling chamber.” JX-0003 at 2:39-40. The specification’s example that includes a first chamber in front of the display and a second chamber behind the display with gas traversing between the two chambers is only an exemplary embodiment. *Id.* at 3:51-60; *see also id.* at Abstract. There is nothing that indicates, much less clearly indicates, that MRI intended its claims to be limited to a “complete loop” as interpreted by the ID. The key distinction to achieve the cooling needed for outdoor displays is between air flow paths that are “closed” and “open” to outside ambient air. The “closed loop” flow path is closed to ambient air, thereby allowing circulation of an isolated gas and protecting sensitive components from dust and other contaminants. *See id.* at 4:9-15; claim 15 (reciting that the closed loop includes “one or more electronic components for driving the LCD positioned within the rear cooling chamber”). The “open” loop, by contrast, brings

cooler outside air through the system to increase the cooling capabilities. *See id.* at 4:48-54. The ID erred by failing to recognize the context in which the patent specification describes “closed” and “open” loops, by reading in a preferred embodiment, and by excluding from claim 12 distinct gas pathways that are “enclosed and isolated” but not a circular like a donut.

The claims are also instructive. “Differences among claims can...be a useful guide in understanding the meaning of particular claim terms. For example, the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim.” *Phillips*, 415 F.3d at 1314-15. Here, several independent claims recite a closed loop generally without a limitation on the shape of the closed loop. JX-0003 at claim 1 (“gas-containing closed loop gas cooling chamber”), claim 12 (“closed loop of isolated gas which circulates within the housing”), claim 21 (“closed loop of cooling gas adapted for circulation within the electronic display housing”). Other dependent claims, by contrast, are more narrowly directed to the embodiment having a circular flow path around the front of the display. *See, e.g., id.* at claim 2 (reciting that the closed loop is “positioned such that gas circulation within the closed loop gas cooling chamber will cool a front surface of the electronic display), claim 6 (reciting that the closed loop “forms a continuous loop” and that the open loop “passes through” the continuous loop), claim 13 (reciting that the closed loop of isolated gas “will cool a front surface of the LCD”). The differentiation between independent claims broadly reciting a “closed loop” and their dependent claims more narrowly claiming particular configurations of closed loops raises an un rebutted presumption that the dependent claims—including claim 12—are not limited to those configurations. *Liebel-Flarsheim*, 358 F.3d at 910; *Hill-Rom Servs., Inc. v. Stryker Corp.*, 755 F.3d 1367, 1376 (Fed. Cir. 2014) (“independent claims are presumed to be broader” than their dependent claims).

Claim 14, which depends from claim 12, is particularly instructive. Claim 14 recites “a rear cooling chamber positioned behind the LCD and containing the closed loop of isolated gas.” *Id.* This unmistakably means that ***claim 12 is broad enough to encompass a “closed loop of isolated gas” that is contained by “a rear cooling chamber positioned behind the LCD.”*** “An independent claim impliedly embraces more subject matter than its narrower dependent claim.” *Intamin Ltd. v. Magnetar Techs., Corp.*, 483 F.3d 1328, 1335 (Fed. Cir. 2007) (construing “intermediaries” of independent claim to cover, *inter alia*, “non-magnetic intermediaries” in dependent claim); *Dow Chem. Co. v. United States*, 226 F.3d 1334, 1341-42 (Fed. Cir. 2000) (holding that an independent claim should be given broader scope than a dependent claim to avoid rendering the dependent claim redundant).. The ID erred by interpreting claim 12 to exclude a “fan within an enclosed and isolated space” (ID at 112), thereby excluding from the claim scope a closed loop formed by a “rear cooling chamber positioned behind the LCD” as recited in claim 14. Without a clear indication that claim 12 excludes a closed loop formed by a fan within an enclosed and isolated space, the ID was wrong to depart from plain and ordinary meaning and restrict the scope in this manner.

Under a proper construction the Accused Samsung Mid-Sized Products have a “closed loop of isolated gas.” Indeed, MRI showed that the Mid-Sized Products have the recited “closed loop” even under a proper understanding of the ID’s “forming a complete loop” construction. The Mid-Sized Products were designed [REDACTED]. *Supra* Section V.B.2. Complainant’s expert, Dr. Pokharna, explained with simple physics that the [REDACTED]. The [REDACTED]. [REDACTED]. Tr. (Pokharna) at [REDACTED].

448:22-449:14. The law of conservation of mass means [REDACTED]

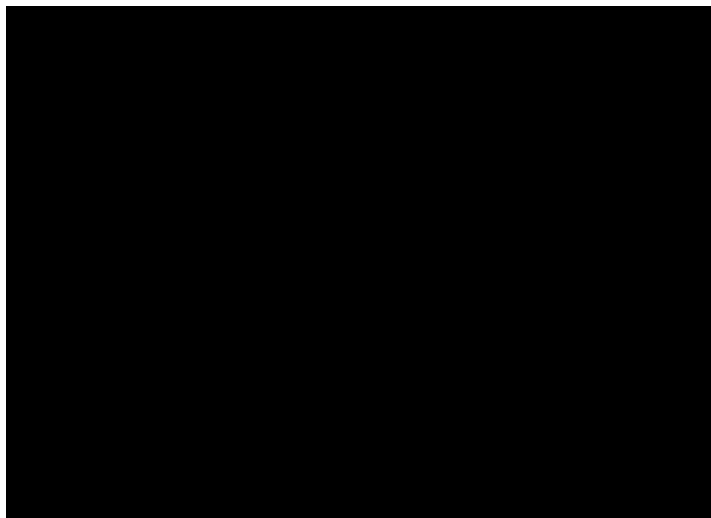
[REDACTED]. *Id.* This

means the [REDACTED]

[REDACTED] to form a “complete loop.” *Id.* This cycle repeats again

and again and again, [REDACTED].

Id.



RDX-0003C at 27 (annotating RX-1130C).

The ID even acknowledges in footnote 39 the possibility that there is a “closed loop” and expressly finds that [REDACTED] ID at 113 n.39. But the ID

nevertheless finds non-infringement because [REDACTED]

[REDACTED] ID at 112. The ID does not explain, however, how [REDACTED]

[REDACTED] is relevant to the infringement analysis. It is not. Indeed, even the preferred embodiments in the specification include multiple sub-compartments. JX-0003 at 4:4-9 (“first gas chamber 40” and “rear cooling chamber 40”). *Vitronics*, 90 F.3d at 1583 (finding that a claim interpretation that excludes a preferred embodiment is “rarely, if ever, correct”). The ID

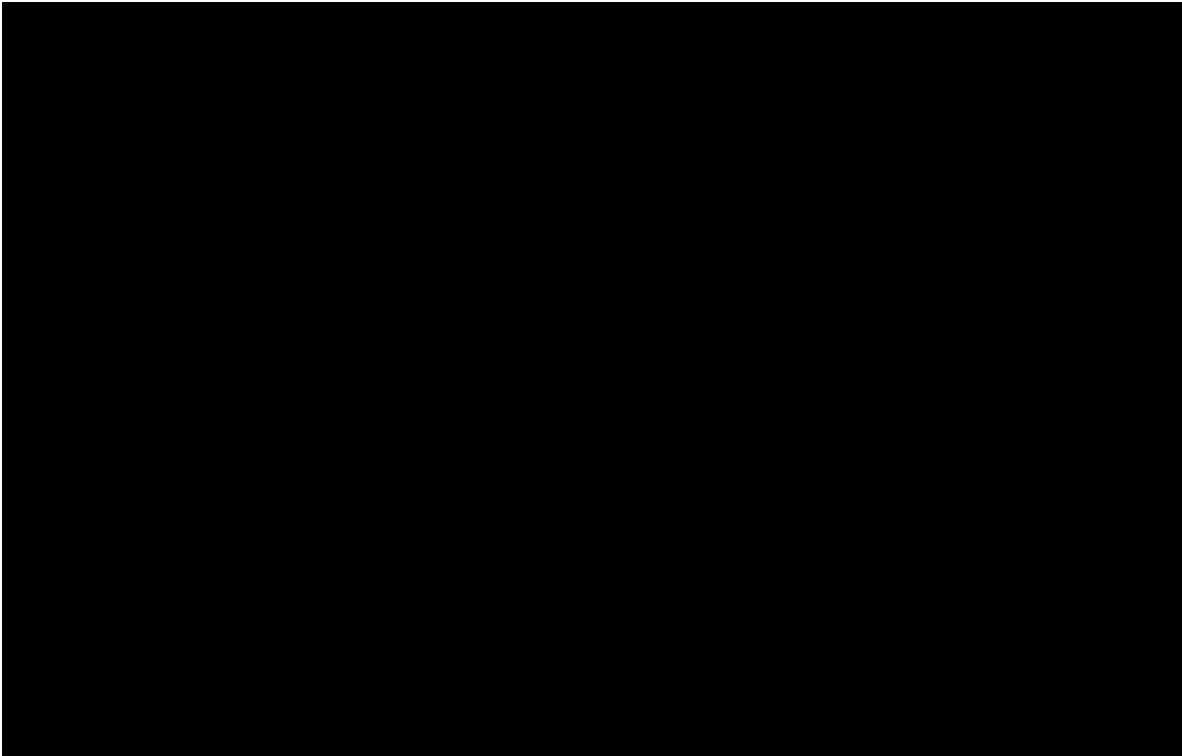
is referring to [REDACTED]

[REDACTED]. Tr. (Pokharna) at 533:10-17. Dr. Pokharna explained that those areas are [REDACTED] (*id.* at 533:18-24) such that [REDACTED]. *Id.* at 448:22-449:14. Under any reasonable construction and regardless of terminology, this is a “closed loop,” a “complete loop,” a “continuous loop,” a “rear cooling chamber,” and a distinct flow path from the open loop. The ID clearly errs by finding non-infringement on the basis of the [REDACTED].

The ID also finds that the Mid-Sized Products do not infringe because they “[REDACTED] [REDACTED] and the evidence fails to show by a preponderance that one of ordinary skill in the art would view [REDACTED] as providing an airflow loop.” ID at 112. This is inexplicable because nothing in claim 12, the ID’s claim construction, or the specification of the ’287 Patent prohibits airflow in the closed loop from being [REDACTED]. Indeed, the closed loop recited in claim 12 may have fans which cause turbulent and well-mixed air flow. Moreover, there is nothing in the claims or specification of the ’287 Patent that would support requiring laminar or unmixed airflow. Respondents’ expert, Dr. Neikirk, agreed with this at the hearing. Tr. (Neikirk), 759:9-15 (“Q. You would agree that the words ‘laminar’ and ‘turbulent’ do not appear in the ’287 patent, Dr. Neikirk? A. Agree. Q. And neither ‘laminar’ nor ‘turbulent’ appears in the tentative claim construction of the term closed loop, correct? A. No, they do not.”); Tr. (Pokharna), 455:10-456:4 (explaining that “the kind of flow there is not relevant to my analysis” of the closed loop of isolated gas).

The evidence shows that there are [REDACTED] [REDACTED] of the Mid-Sized Products and that [REDACTED]

[REDACTED]. MRI offered a Samsung development document for the Mid-Sized Products showing the [REDACTED]. CX-1857C at 28. That document circles the [REDACTED] with blue arrow, further explaining that the layout of the [REDACTED] *Id.*



CX-1857C at 28. Remarkably, the ID rejects this evidence because “[t]his document only shows [REDACTED].” ID at 112

n.38. As Dr. Pokharna explained, simple physics requires [REDACTED]

[REDACTED]. Tr. at 448:22-449:14. That the arrows in the Samsung diagram only show [REDACTED]

[REDACTED]. The ID’s apparent finding that airflow [REDACTED] is clear error.

In conclusion, the ID erred by taking an unduly restrictive view of the recited “closed

loop of isolated gas.” The ID should not have excluded a fan circulating an isolated gas within an enclosed and isolated space from the scope of the claim. Under the plain and ordinary meaning, the Accused Samsung Mid-Sized Products have [REDACTED]

[REDACTED] forming the required “closed loop.” Indeed, the ID should have found this to be a “closed loop” even under the construction requiring “forming a complete loop within a display housing.” The ID erred in its construction and clearly erred in its infringement analysis.

3. The Mid-Sized Products are “coolable by a combination” of the open and closed loops.

Claim 12 recites that the electronic display is “coolable by a combination of [the] closed loop...and [the] open loop....” The ID compounds its erroneous constructions of the open and closed loop terms by finding insufficient evidence that the Accused Samsung Mid-Sized Products satisfy this limitation. The evidence proves that the Accused Samsung Mid-Sized Products are “coolable by a combination” of the open and closed loops. Indeed, cooling the display is the *very purpose* of the cooling system for Samsung’s outdoor displays. There is no dispute that the open loop contributes to cooling, so the dispute centers on the closed loop. Respondents’ expert, Dr. Neikirk, agreed that the “coolable” limitation is met if there is any condition under which the display is cooled by the open and closed loops. Cross examination revealed that his own product testing showed cooling that meets this limitation. Moreover, Sung Ki Kim, the engineer who developed the accused products, admitted that [REDACTED]

[REDACTED]. And Samsung’s thermal diagrams show that the configuration of the OH products [REDACTED]

[REDACTED]. There is overwhelming evidence of infringement, and with no counter evidence showing lack of cooling under any conditions by the closed loop,

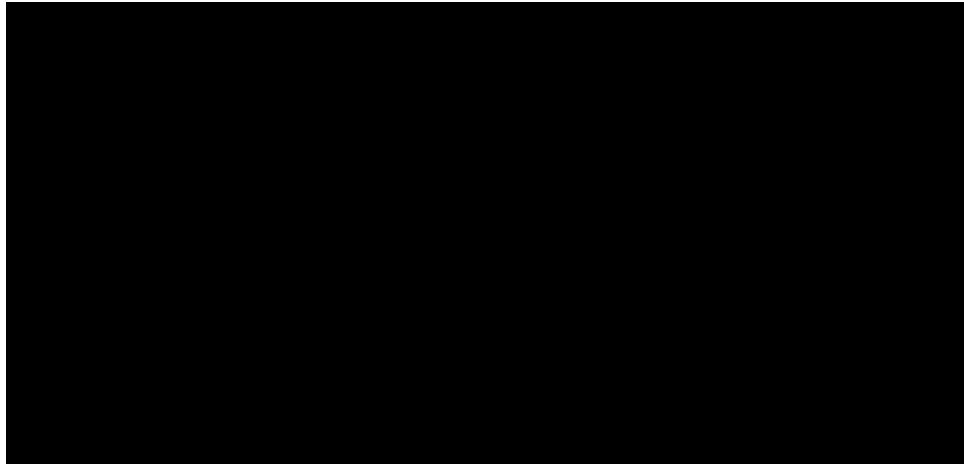
the evidence necessarily meets the applicable preponderance standard. Complainant respectfully requests review and correction of the ID's clearly erroneous determination of non-infringement.

As an initial matter, claim 12 does not recite cooling by the closed loop alone. Claim 12 instead recites that the electronic display is “coolable” (i.e., able to be cooled) by the “combination” of the recited open and closed loops. In other words, the open and closed loops work together to contribute to cooling. Respondents’ expert, Dr. Neikirk, testified that the “coolable” limitation is met if there is any condition under which the open and closed loops operate to cool the display. Tr. (Neikirk) at 737:1-6 (Q....So you agree that if it cools under some conditions, that it would practice the claim limitation, correct? A. So this is an apparatus claim. If a condition was identified such that it did, in fact, cool, then under those conditions, it would practice the claim, yes.”). The claim does not require cooling under all conditions and there is no limitation reciting the amount of cooling required or the relative contributions to cooling of the display by the open and closed loops. Again, the claim simply recites that the display is “coolable by the combination” of loops.⁶

The record evidence shows that the electronic display of the Mid-Sized Products is coolable by the open and closed loops working together. Indeed, Samsung identifies both the [REDACTED]” for the Mid-Sized Products. JX-208C

⁶ The ID states that “[i]t appears undisputed that this claim limitation requires both the claimed closed and open loops to contribute to cooling of the display (and is not met, for example, by only one of the loops serving to cool the display). ID at 113-14. MRI submits that, by the express language of the claim, the display must be “coolable by the combination” of the operation of these loops. The open and closed loops of the Mid-Sized Products are indisputably part of a comprehensive cooling system for the product and that cooling system, by the combined operation of the open and closed loops, operates to cool the display as discussed herein. *See* JX-0208C at 95 (showing the overall “[REDACTED]”).

at 95 (blue [REDACTED]).



The ID finds that “[REDACTED]
[REDACTED].” ID at 114 (emphasis added)
(discussing JX-208C at 95). The ID apparently concedes at least the possibility that the closed
loop contributes to cooling the display but ultimately concludes that it does not. ID at 114. The
ID errs by failing to recognize that, [REDACTED]
[REDACTED], the closed loop contributes to the overall cooling of the display as explained by
Complainant’s expert and conceded by Samsung’s own witnesses.

Dr. Pokharna explained the operation of the cooling system, including the contributions
of the closed loop. Tr. (Pokharna) at 459:2-463:1. The Mid-Sized Products [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]. *Id.* at 459:2-460:14. In this manner, [REDACTED]
[REDACTED]
[REDACTED] the closed loop thus contributes to cooling. *Id.*

Dr. Pokharna also referred to Samsung’s thermal resistance diagram showing how the

open and closed loops work together to cool the display. Tr. (Pokharna) at 460:15-462:5. Samsung's thermal resistance analysis expressly shows the contribution of the closed loop to cooling. JX-0206C at 22. In the "Conventional" arrangement (on top, highlighted orange), the electronics ($T_{electronics}$) have a direct thermal path to the LCD backlight (T_{optics} , T_{LED} , $T_{chassis}$). The heat from the electronics ($Q_{in, electronics}$) thus has a direct thermal path to heat the display. *Id.* In the Samsung OH products (on bottom, highlighted blue), by contrast, [REDACTED]

[REDACTED]. *Id.* [REDACTED] thereby work together to remove that heat to ambient (T_{amb}) and together contribute to cooling.

CDX-7C at 35; JX-206C at 22.

The ID acknowledges that "this document may show that *the overall design of the product* ([REDACTED]) *results in a better overall cooling performance* than a conventional design." ID at 115 (emphasis added). Yet, the ID

nevertheless finds—without explanation—this evidence “insufficient” to show that “the asserted closed loop aids in cooling the display.” *Id.* MRI respectfully submits that this evidence is not insufficient. The document expressly shows [REDACTED] as the ID expressly found. In claim 12, it is the overall design of the product—the “combination” of the open loop and closed loop—that must be able to cool the display and this evidence shows that is exactly how the Mid-Sized Products operate.

The ID additionally credits Dr. Neikirk’s “testimony that the back cover of the product is made of plastic (an insulator) and that he would therefore expect [REDACTED] [REDACTED].” ID at 115 (citing Tr. (Neikirk) at 672:15-673:25). But even if [REDACTED] [REDACTED]. Indeed, Dr. Neikirk admitted that [REDACTED]. Tr. (Neikirk), 673:20-25 (“Q. But is air -- [REDACTED] [REDACTED] [REDACTED]

This is enough to satisfy the “coolable” limitation. Again, it is the open and closed loop in “combination” that must be able to cool the display to satisfy claim 12. The claim does not require cooling by the closed loop alone and does not specify any absolute or relative amounts of cooling required to be provided by the closed loop. Even if [REDACTED] [REDACTED] [REDACTED] [REDACTED]

[REDACTED]. *Id.* By keeping the [REDACTED]

[REDACTED], the closed loop is working in “combination” with the open loop to achieve effective cooling.⁷

The patent itself contemplates cooling in this manner. Indeed, in claims 14 and 15, which depend from claim 12, the patent recites “a rear cooling chamber positioned behind the LCD and containing the closed loop of isolated gas” and “one or more components for driving the LCD positioned within the rear cooling chamber.” JX-0003 at claim 15. The evidence shows that the Mid-Sized Products work in this same way.

Samsung’s own former engineer Sung Ki Kim—the designer of the Mid-Sized Products—admitted that [REDACTED]

[REDACTED]:

Q: Am I right that [REDACTED] to provide cooling for the display?

* * *

THE WITNESS: If your question is about this drawing that is depicted in purple and gray squares, then that’s correct.

CX-1917C at 88:15-22 (referring to the [REDACTED] in JX-208C at 95).

Follow up questions confirmed that the [REDACTED] in the figure labeled

⁷ In footnote 42, the ID states that “even if the asserted closed loop compartment provides a lower thermal load on the open loop with fans than without fans, this does not show that the closed loop aids in cooling the display.” ID at 115 n.42. This statement does not make sense because lowering thermal load plainly contributes to cooling. *See, e.g.*, Tr. (Pokharna) at 460:11-14 (explaining that lowering thermal load by removing heat makes it “less of a burden”).

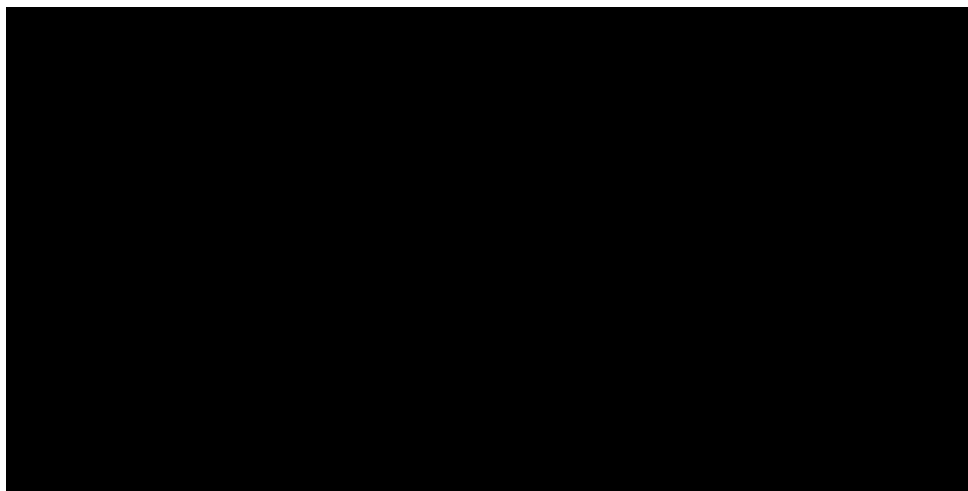
[REDACTED] and Sung Ki Kim again confirmed that those [REDACTED]
[REDACTED]. *Id.* at 89:4-18 (“Q: And [REDACTED] are provided there to provide cooling for the display; is that right?... THE WITNESS: Well, [REDACTED], then I believe the purpose of those [REDACTED] are as stated.”).

The ID rejects Mr. Kim’s admission, finding “Mr. Kim simply testified that the [REDACTED]
[REDACTED] the purpose ‘as stated’ in the relevant document” and that the document discussed [REDACTED].⁸ ID at 115; *see also* ID at 114 (discussing JX-208C). This parsing of Mr. Kim’s admission ignores the context: Mr. Kim had *already admitted on the page before* that “[REDACTED]
[REDACTED].” *Id.* at 88:15-22. This testimony comports with Samsung’s documents and Dr. Pokharna’s testimony regarding the same and cannot be disregarded.

The ID also improperly faults Dr. Pokharna’s testimony, which relies on Samsung’s own documents and fact witness testimony, as “unsupported by actual data” while at the same time ignoring Dr. Neikirk’s test data that [REDACTED]. ID at 115, 116 n.43. The test that Dr. Neikirk performed and relied on in his testimony showed [REDACTED]
[REDACTED] Dr. Neikirk summarized his test data in the chart below. His test with a closed [REDACTED]
[REDACTED] was conducted at a *higher* average ambient temperature than his test [REDACTED]. Despite the higher ambient temperature, the average temperature on the front surface of the display is *lower* when [REDACTED]

⁸ When Mr. Kim said “the purpose of those [REDACTED] are as stated,” he was admitting that the purpose of the fans are as stated *in the question*—i.e., to provide cooling for the display. But regardless, his testimony on the page before (CX-1917C at 88:15-22) removes any ambiguity that the fans are provided in the rear chamber to provide cooling for the display.

█. Dr. Neikirk's testing undisputedly shows cooling of the display by █; the display is cooler when the █ are on despite higher ambient temperatures. Tr. (Neikirk) 742:5-743:3.



CDX-0008C.3 (excerpting CX-2589C).

Again, Dr. Neikirk agreed that cooling under all conditions is not required, and that the “coolable” limitation is met if there is any condition under which the display is cooled by the open and closed loops. Tr. (Neikirk), 736:12-737:6. Dr. Neikirk's testing shows that under his test conditions the █. It was clear error for the ID credit Dr. Neikirk's at the hearing testimony regarding cooling by the closed loop while ignoring his actual test data that shows cooling.

Finally, the ID entirely ignores the configuration of the closed loop, █

█

█. It is undisputed that the closed loop █

█

█, as seen in the photograph below.

[REDACTED]

CDX-7C at 26, 44; RX-1128C; RX-1141C. Dr. Pokharna and Dr. Neikirk agreed on this point. Tr. at 470:4-7. Dr. Neikirk then was presented with infrared (IR) images during cross examination that show the hot back surface of the display (colored yellow in the image of the rear surface with [REDACTED]) versus cooler regions of the closed loop (colored blue in the image of the [REDACTED]). The yellow back surface of the display corresponds to a [REDACTED] [REDACTED].

[REDACTED]

CDX-0008C.5 (JX-0185C). This evidence shows that the [REDACTED] [REDACTED], thereby working in combination with the open loop of

ambient air to effect cooling. The ID errs by ignoring this evidence altogether.

In conclusion, claim 12 requires that the display be “coolable” by the “combination” of the open loop and closed loop. The evidence, including Samsung’s documents and fact and expert testimony and testing, overwhelmingly shows that the open loop and closed loop of the Accused Samsung Mid-Sized Products together form the cooling structure of those products. The Mid-Sized Products thus meet the “coolable” limitation and infringe claim 12. MRI respectfully requests that the Commission review and correct the clearly erroneous infringement analysis for this element of the ’287 Patent.

D. The ID Erred by Adjudicating the Alleged Redesign

Samsung asserts redesigns of the [REDACTED] products that it alleges do not infringe claim 12 of the ’287 Patent. The ID issued a determination that the alleged redesign does not infringe. ID at 117-22. The ID’s rulings that the *Oligosaccharides* factors favored adjudication of the “[REDACTED]” and the “[REDACTED]” redesigns, that the redesigns were sufficiently disclosed during discovery, were sufficiently fixed in design, and do not infringe the ’287 Patent are clearly erroneous and should be overturned.

Samsung’s evidence regarding the structure of the redesigns is conflicting, continually changing, and produced far too late, depriving MRI the opportunity to take sufficient discovery and MRI’s experts sufficient time to analyze them. Accordingly, Samsung has failed to meet its burden and present sufficient evidence that the redesigns have a fixed structure or design. Moreover, Samsung produced evidence of its alleged redesigns far too late, depriving MRI of a fair opportunity to take discovery. The redesigns are not ripe for adjudication.

Samsung’s first disclosure that it had any redesigns or might introduce any for adjudication was three days before MRI’s final contentions were due, on February 28, 2023,

when Samsung served an interrogatory response stating that it had [REDACTED]
[REDACTED] (CX-1771C-CX-1772C). *See* CX-1889C at 63 (Interrogatory No. 27). That day, in an email separate from the interrogatory response, Samsung also informed MRI that the redesigns were [REDACTED] but samples were available for inspection at counsel’s office in Boston. The interrogatory response did not rely upon or even mention the product samples or indicate that the CAD files had a different configuration than the samples. The CAD files of the redesigns produced on February 28 (CX-1771C, CX-1772C) showed products where [REDACTED]
[REDACTED]. Tr. (Pokharna) at 472:2-14.

Samsung’s disclosure of the redesigns was so late that MRI was given an extension for its final infringement contentions. On March 13, 2023, MRI served final infringement contentions, relying on the recently produced CADs (CX-1771C, CX-1772C) and pointing out [REDACTED]
[REDACTED]. Tr. (Pokharna) at 472:2-14. Given the late disclosure and that Samsung’s supplemental interrogatory response only identified the CAD files of the redesigns, and made no mention of the product samples, MRI did not inspect the samples to evaluate infringement. A week later, on March 20, 2023—four days before the close of fact discovery—Samsung informed MRI of [REDACTED] with the CAD files previously produced and produced photos of the redesigns but *did not* produce CAD files. These new photos showed multiple designs, all of which were *different* than the structure previously disclosed and discussed in MRI’s infringement contentions. Dr. Pokharna was asked to analyze the evidence and testified that some

“[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]. So I could not really understand what the design is. [REDACTED]
[REDACTED]...I could not provide any -- any analysis because I couldn't see what the design is." Tr. (Pokharna) at 472:16-24; *see* JX-0266C; JX-0303C; JX-0304C.

MRI received these photos roughly **12 hours** before the start of the deposition of Wunkil Lee, Samsung's corporate representative regarding Samsung's redesigns. During his deposition Mr. Lee confirmed that the February 28 CADs showed products [REDACTED]
[REDACTED]. *Id.* at 45:9-16, 46:2-5, 46:7-47:1. Mr. Lee stated that the redesigns in the March 20 photos (JX-0266C) [REDACTED]. CX-1909C (Wunkil Lee Dep. Tr.), 52:8-19. After the Lee deposition ended, when MRI could no longer ask questions, Samsung produced new CADs for the redesigns (JX-0308C; JX-0309C). The next day, at deposition of Jongpil Seo, Samsung informed MRI that Mr. Seo was the Samsung witness prepared to discuss the CADs produced the preceding day. MRI's questioning of Mr. Seo regarding the CADs of the redesigns was extremely limited due to (a) the fact that counsel did not yet have access to the CAD files, (b) counsel was not informed that Mr. Seo would be designated to discuss the CADs until the beginning of the deposition so was unable to prepare, and (c) Mr. Seo's extremely limited knowledge of the redesigns. CX-1911C (Jongpil Seo Dep. Tr.), 39:17-40:1, 42:16-20, 43:18-44:3, 115:4-10, 119:16-20. On the final day of fact discovery Samsung supplemented its interrogatory response to identify the new CAD files and photos. CX-1889C, 64. ***This disclosure, on the last day of discovery, was the first identification of the documents which Samsung now relies on as accurately reflecting the redesign structure.***

"It is [Respondents'] burden to show that the Redesign Products should be adjudicated."
Certain Elec. Connectors & Cages, Components Thereof, & Prod. Containing the Same, Inv.

No. 337-TA-1241, Ord. No. 35 (Oct. 28, 2021). The respondent must show “the redesigns are sufficiently fixed such that an infringement determination can be made.” *Certain Audio Players & Controllers*, Order No. 19, at *2; *Certain Digital Video Receivers & Hardware & Software Components Thereof*, Inv. No. 337-TA-1001, Comm’n Op. at *13 (Dec. 6, 2017).

It is not possible to tell from Samsung’s discovery production what the fixed structure of the redesigns is, much less to analyze whether it infringes. Samsung produced conflicting documents, some [REDACTED] (e.g., JX-0303C), some [REDACTED] (e.g., JX-0277C), others [REDACTED] (e.g., JX-0266C), and others [REDACTED]. JX-0215C; CX-1771C. Each of these documents was identified under Rule 210.29(c) in Samsung’s verified interrogatory responses regarding redesigns. CX-1889C.63-64 (Samsung’s Verified Interrogatory Responses). Samsung’s redesign deponent admitted that certain photos of the redesigns showed a product [REDACTED] --even where other photos in the production showed [REDACTED] in the product. CX-1909C (Deposition Transcript of Wunkil Lee) at 49:16-50:1, 50:15-21, 57:9-13. Moreover, this same witness testified that if a customer so desired, [REDACTED] might be added back into the redesign. CX-1909C (Wunkil Lee Dep. Tr.) at 59:1-19.

The ID commits clear error by completely ignoring and not even discussing the conflicting evidence regarding the structure of the alleged redesign. In addition, even the evidence supposedly showing that the redesigns lacked [REDACTED] indicate that this design was not fixed—JX-0266C shows a product that [REDACTED]. Tr. at 472:15-22. If the design was fixed as having [REDACTED]. And if the redesigns were fixed in design, it is unclear why Samsung would provide one set of CADs on

February 28, 2023, and then provide updated CADs on March 20, 2023, and to produce photographs of various designs. To counter this evidence of a design in flux, Samsung's only evidence is hearing testimony of Sungsu Lee stating the redesigns are operational and [REDACTED] RPostHB at 15. Mr. Lee's testimony at the hearing was cursory, completely uncorroborated, and opposite to his deposition testimony ([REDACTED])

[REDACTED] Tr. (Lee), 636:7-17. Mr. Lee's testimony should be disregarded.

The ID glosses over most of the convoluted history above and finds that the redesigns were sufficiently fixed in design, relying primarily on the fact that "Samsung made samples of the redesigned products available for inspection." ID at 120. The ID does not cite, and Samsung did not provide, any other documentary evidence such as internal testing, approvals for production, or manufacturing documentation showing that the designs were final. At the hearing Samsung's witness stated he was unaware as to whether the products have gone through any of the external testing or certification processes necessary to bring the product to market, which further suggests that the redesigns were not yet fixed. Tr. (Lee) 636:24-637:7.

The ID's analysis commits clear legal error by conflating the importation requirement of *Oligosaccharides* with the requirement that the redesign be sufficiently fixed in design. *Oligosaccharides* puts forth a four-part test, each part of which must be satisfied. Proof of importation is not a substitute for proof of fixed design. The ID also appears to erroneously take the fact that a physical sample was provided to be sufficient proof that the products were fixed in design, again reading out the fixed in design requirement. The ID cites cases where a redesign was found to be fixed in design because samples had been produced. But in those cases, unlike

here, there was no conflicting evidence showing differing structures.

The ID supports its non-infringement finding by saying that “MRI has provided no argument that the redesigned products infringe the ’287 Patent and thus has not met its burden of proving infringement.” ID at 121. This completely ignores the fact that Samsung’s conflicting product redesigns made it impossible for MRI to understand the actual alleged redesign for which Respondents seek adjudication, and thus made it impossible to argue infringement. *See, e.g., Tr. (Pokharna)* at 476:5-9 (“So, Dr. Pokharna, did you form an opinion on whether Samsung’s allegedly redesigned OH46B product infringes claim 12 of the ’287 patent? A. There was not sufficient detail for me to provide that.”)

For a redesign to be adjudicated, the evidence must be produced during fact discovery in sufficient time to allow the complainant to develop infringement contentions, obtain expert opinions, and prepare for trial on the product. *See Unmanned Aerial Vehicles*, 2020 WL 5407477, at *14; *Certain Cloud-Connected Wood-Pellet Grills*, 2021 WL 6202649, at *12. Here Samsung’s production was far too late to provide MRI with a fair opportunity to do any of the above. Samsung’s first disclosure of what it claims to be the actual redesign structure was after MRI’s final infringement contentions had been provided and only 11 days before MRI’s expert report on infringement was due. Samsung produced photos introducing new structures 12 hours before the deposition on redesigns, produced CAD files after the deposition on redesigns, and only identified its reliance on this evidence in supplemental interrogatory responses on the last day of discovery. This prejudicial “late disclosure was insufficient to provide [MRI] with a fair opportunity to address the redesign.” *Certain Cloud-Connected Wood-Pellet Grills*, 2021 WL 6202649, at *12. Just because MRI’s experts did their best to do whatever they could in the limited time available to them does not mean that they had sufficient time to analyze the

evidence or that MRI was not severely prejudiced. Any finding that the redesigns were sufficiently disclosed in discovery is clearly erroneous and should be reversed.

VI. VALIDITY OF U.S. PATENT NOS. 8,854,595 AND 9,173,322

The ID correctly found Respondents infringed claims 1, 4 and 7 of the '595 Patent, and claims 4 and 5 of the '322 Patent (the “Infringed '595 and '322 Patent Claims”).

The ID erred, however, in finding the Infringed '595 and '322 Patent Claims were invalid in view of Kim and Claim 1 of the '595 Patent was invalid in view of Takeuchi. Each of the Infringed '595 and '322 Patent Claims recites a “constricted convection plate” and by extension a “constricted convection channel”—the core feature of the claimed invention. *See* JX-0001 at 9:62-10:37; JX-0002 at 10:9-25; Final ID at 36; (construing “constricted convection plate” as a “plate configured to form part of a constricted convection channel”) (citing Order No. 13).

The ID found Kim and Takeuchi taught both a “constricted convection plate” and “constricted convection channel,” but there is no teaching of these features in either reference. *See* ID at 175-187, 189-193, 201, and 215. In Kim, air is introduced into a chamber or “space” behind the backlight unit, where it is allowed to expand freely throughout the chamber. *Tr.* (Credelle) 1162:22-1163:13. Takeuchi similarly teaches a spacious cooling “chamber” where multiple entrances are needed to prevent its mechanical actuators from overheating the system. RX-1367 (Takeuchi), [0040]-[0041]. In contrast to Kim and Takeuchi, the '595 and '322 Patents require four walls that direct air through the length of a constricted channel, such that the narrow channel increases the speed of the air flowing immediately behind the backlight assembly for targeted cooling of the posterior display surface. *Infra* Section VI.A. By finding Kim and Takeuchi teach the “constricted convection plate” and “constricted convection channel,” the ID reads these inventive features out of the claims.

Moreover, the ID made a slew of additional errors in analyzing specific claim limitations and finding them met by each reference based solely on the vagueness of their disclosures and the conclusory testimony of Respondents' expert, Mr. Smith-Gillespie. Compounding these errors, in multiple instances, the ID held—contrary to Commission precedent—that (i) Respondents were entitled to replace the invalidity theories disclosed in their Pre-Hearing Brief with new theories presented for the first time at trial, and (ii) MRI was not permitted to explain how these untimely new theories lacked merit because its rebuttals were not made pre-emptively.

A. Overview of the '595 and '322 Patents

The '595 and '322 Patents describe a system for cooling an electronic display having a posterior display surface. JX-1001,⁹ at Abstract, 2: 43-59, Claim 1.

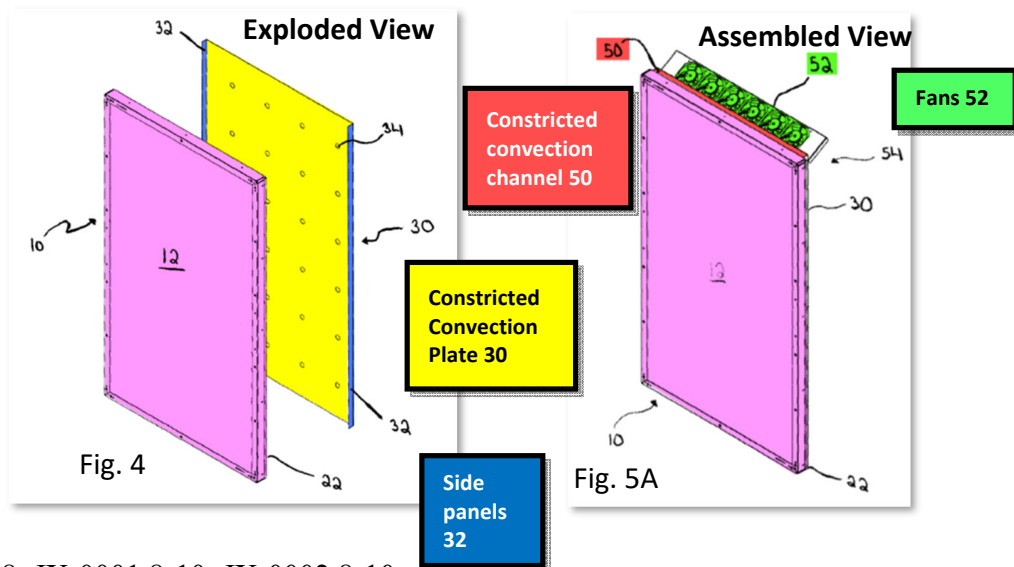
Although liquid crystal displays (LCDs) have existed for decades, prior to the early 2000s, their use was limited to small displays in personal computing devices, generating relatively small amounts of heat, working “in an air-conditioned environment, typically.” Tr. (Credelle), 1188:1-10. At the beginning of the 2000s, larger LCDs of 32-inches and above began to appear in the market, but screens of this size would overheat in outdoor environments. Tr. (Credelle), 1187:20-1189:4, 1229:20-1230:11.

At the time of the invention in 2008, conductive and convective heat transfer systems for cooling electronic displays were known. *See* JX-0001, 1:52-58. However, “[t]hese systems of the past generally attempt[ed] to remove heat from the electronic components in a display through as many sidewalls of the display as possible” and generally attempted to “cool an entire interior of

⁹ The '595 Patent (JX-0001) and '322 Patent (JX-0002) share a common specification. For convenience, when discussing the specification of both patents, generally, JX-0001 will be cited.

the display by one or more fans and fins.” JX-0001, 1:52-58, 2:8-11; *see also* Tr. (Credelle) at 1156:8-1159:2 (providing overview of prior art). Counterintuitively, and in contrast to the conventional approach of attempting to maximize the volume of airflow into a cooling chamber to improve cooling, the ’595 and ’322 Patents teach how to *constrict* the airflow to maximize cooling. Tr. (Credelle), 312:6-313:8. The ’595 and ’322 Patent use fans to direct cooling air through a narrow channel immediately behind the display to remove heat directly and specifically from the electronic display’s posterior display surface. JX-0001, 1:53-55, 6:30-37. A posterior view of one “typical” electronic display 10 around which the constricted convection cooling system can be formed is shown in Figure 2 of the ’595 Patent. JX-1001, 4:39-41; *see also id.* at Fig. 6-7 (showing another electronic display having a posterior display surface 22).

The “constricted convection channel” is formed behind the posterior surface of the thin panel display using a constricted convection plate as depicted in the annotated Fig. 4 and 5A from the ’595 and ’322 Patents below:

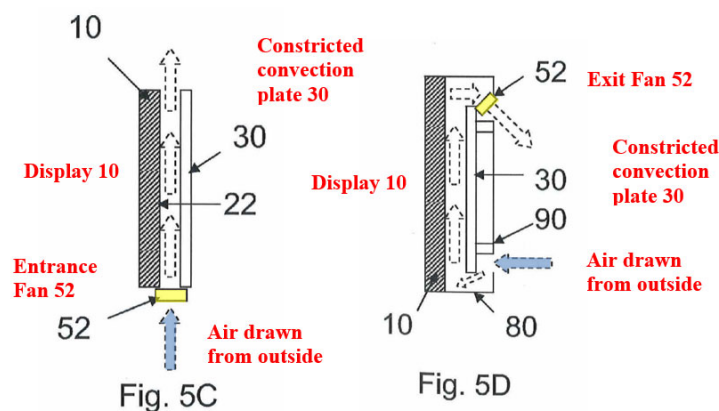


CDX-0006.8; JX-0001.8-10; JX-0002.8-10.

As shown above, the constricted convection plate includes “angled side panels 32 ...

adapted to extend from the constricted convection plate 30 and make contact with the display posterior 22 and direct air through the constricted convection channel 50 (shown in Fig. 5).” JX-0001, 5:1-5. In the assembled view (above, right), cooling air is moved into or out of the narrow “constricted convection channel 50” (colored red) by the action of the fans 52 (colored green).

Air can be directed between the fans and channel via housing or septa elements as shown in, for example, Fig. 5D below. JX-0001, 6:1-13.



Although the small cross-sectional area of the narrow airflow path limits the volume of cooling air flowing through the system, the '595 and '322 Patents teach that “the narrowing of the airflow path” by the constricted convection channel unexpectedly “increases the effectiveness of the heat transfer” from the display to the air. JX-0079¹⁰ at [0032]. This is because the speed of the cooling air is accelerated when it passes through the narrow channel immediately behind the display. Tr. (Dunn) 72:4-13.

B. The ID Erred in Finding the '595 and '322 Claims Invalid in View of Kim

¹⁰ The '595 Patent claims priority to U.S. Prov. App. No. 61/039,454 (“the '454 Provisional”), which is incorporated by reference into the '595 patent. *See* Ex. JX-0001, 1:7-10, 23-28.

1. Kim's Disclosure

Unlike the '595 and '322 Patents, Kim teaches the use of air slits 117 to encourage air flow in all directions.

Kim's air slits 117' are visible throughout the periphery of its shield cover 140 in Fig. 2 as shown to the right in green.

CDX-0011.23; Tr. (Credelle)

1164:3-13. Kim teaches "[t]he air

which flows through the heat

generating parts is discharged to

the outside (in a 'Y' or 'Z'

direction shown in FIG. 2) through

the plurality of air slits 117' of the

shield cover 140 and the plurality of air slits 117 of the rear casing 115 so that heat generated

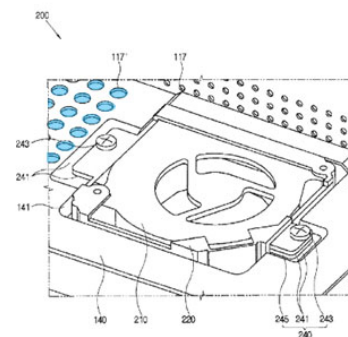
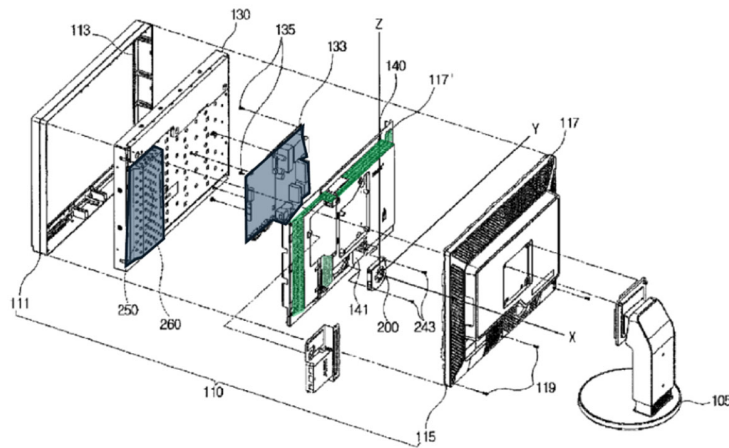
from the heat generating parts is emitted." RX-1396 (Kim), at 7:57-62; *see also id.* 4:58-61

(describing the "plurality of air slits 117' through which flowing air produced by the cooling fan 210 comes in and out").

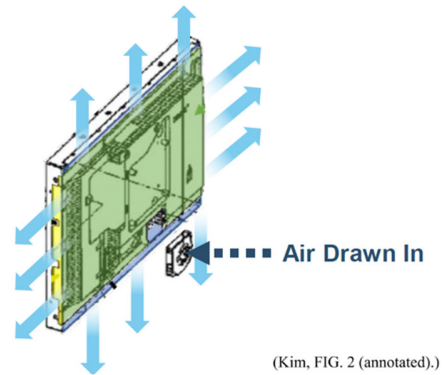
Kim's air slits 117' can be seen in greater detail in FIG. 4 (right, with air slits 117' highlighted blue) showing their presence is not limited to only the periphery of shield cover 140.

Pre-hearing, Respondents contended that Kim's "air slits 117' are located at the top and bottom of the constricted convection plate (the shield plate is bordered by a finned heat sink on each side)." Resp. Pre-HB at 99.

FIG. 2



At trial, however, Mr. Smith-Gillespie admitted on cross-examination that Kim’s cooling air does not flow in a single constricted path but instead will flow out of the slits in Kim’s back plate in the all four directions shown (“top,” “bottom,” “left,” and “right”) in the modified version of Fig. 2 (to the right) showing shield cover 140 in place against the back of the display. Tr. (Smith-Gillespie), 1066:13-15, 1067:13-1068:9 (disputing only the scale of the arrows but not the directions); *see* Complainants’ Post-Hearing Reply Brief at 60. Thus, showing expansion of the air flow in all four directions.



Additionally, pre-hearing, Respondents contended “[t]he air slits **117**’ constitute the “**entrance**” and “**exit**” to the constricted convection channel.” Resp. Pre-HB at 99. As explained further below, Respondents presented a new, entirely different mapping of the “entrance” of the “constricted convection channel” at the hearing.

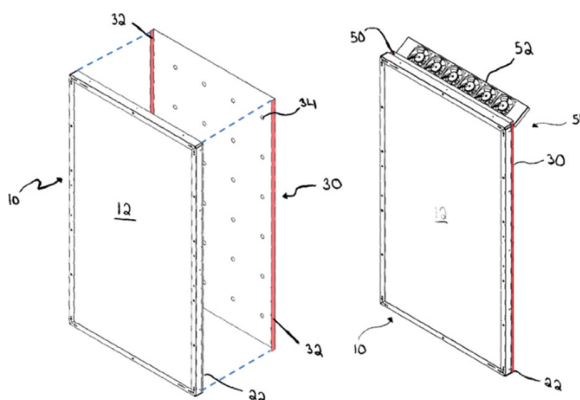
Further, although Kim’s shield cover 140 depicted in Fig. 2 includes side tabs (colored yellow in the figure above for consistency with Respondents’ annotations), they are not in the airflow path once the unit is assembled. Tr. Credelle (1162:6-1163:13). Rather, as Mr. Credelle explained, “Kim’s design, like the prior art, is describing a method to take a fan and blow air into a housing that contains the electronics, controller boards and power supplies and ... driver circuits, and the back of the display module. It’s specifically designed to have unconstrained airflow going every which way. It says the cooling airflow through a space among the backlight unit, the circuit boards and the shield cover is where the cooling air flows.” Tr. (Credelle) 1162:22-1163:5; RX-1396.10 at 5:9-14 (“...the cooling air flows through a space among the backlight unit 130, the circuit board 133 and the shield cover 140.”) This is precisely the

conventional approach—removing heat by moving air through as many sidewalls as possible—distinguished in the Background of the '595 and '322 Patents. JX-0001, 1:52-58, 2:8-11.

2. Kim Does Not Disclose a “Constricted Convection Plate” or “Channel.”

The Final ID analyzed Kim’s purported disclosure of “constricted convection” primarily in the context of Claim 1 of the '595 Patent. *See* Final ID at 189-196, 201, and 215. Claim 1 of the '595 Patent recites a “constricted convection plate” and “constricted convection channel.”¹¹

As described in the '595 Patent, these elements require a channel “immediately behind the display posterior 22” where the side panels “make contact with the display posterior 22 and direct air through the constricted convection channel 50 (shown in Fig. 5)” *See e.g.*, JX-0001, 5:1-5, 5:37-39. Annotated Fig. 4 and 5A of the '595 Patent (shown right) show how side panels 32 (red) are positioned parallel to the air flow through constricted convection channel 50, so that air is constrained by the sides of the channel and directed through it. JX-0001, Figs. 4, 5A.



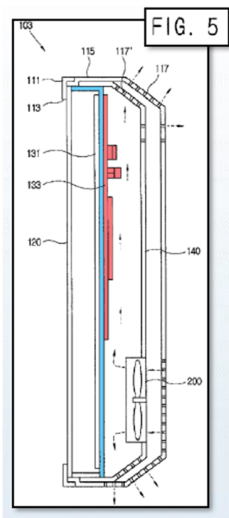
In the '595 and '322 Patents, each constricted convection channel directs air in only a single direction towards a single exit and is always bounded on four sides. *See* JX-1001, Figs. 4, 5A, 5B-5F, 6, 8, and 9. This is reflected not only in the specification, but also in the '595

¹¹ Claims 4 and 5 of the '322 Patent do not expressly recite the channel but the ALJ’s construction of “constricted convection plate” properly recognizes that the plate must form a “constricted convection channel.” *See* ID at 36.

Patent's claim language expressly requiring "two side panels placed adjacent to the constricted convection plate and the posterior display surface, defining a constricted convection channel having an entrance and an exit." JX-0001 ('595 Patent), 9:66-10:4.

As terms coined by the '595 and '322 Patents 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. Respondents' infringing products follow the embodiments of the specification and include narrow, four-sided channels less than an inch deep but spanning a large portion of the display from entrance to exit. *See* ID at 55-58, 66-67, 73. When assessing invalidity, however, the ID gave no effect to the specification. By finding these terms encompass the "space" within the bounds of Kim's porous shield cover 140, the ID implicitly read both the "constricted" and "channel" requirements out of the claim entirely.

3. The ID Clearly Erred in Finding Kim Discloses a "Channel."



The ID found that Kim teaches a "constricted convection channel" because "the air slits disclosed by Kim allow air to flow out (as identified in Figure 5 of Kim), but air flow is constricted and provides an identified air flow path from the fan to the air slits on the periphery through the area between the shield cover and the backlight unit, as shown in Figure 5." ID at 192. However, as explained above, Kim, as a whole, discloses air slits 117' that are located throughout shield cover 140 that actually cause the air to expand through the slits and not constrict through a channel as required by

the claims.

The ID relies on Kim's Figure 5, but that figure (shown to the left with backlight 130 highlighted blue and driving circuit 133 highlighted red) is merely a two-dimensional cross section. CDX-0006.89. Figure 5 does not show a channel nor does Kim describe one. Figure 5 shows air flowing "from the fan to the air slits" in that cross section. But that says nothing about the multitude of *other* paths the air in Kim's design takes into and out of Kim's full array of air slits 117', including ones on the left and right of the shield cover 140 as shown in Fig. 2 and described above. As explained above, air enters through the sole fan and then expands in all directions and finally exits through the air slits 117': up, down, left, and right. Kim thus does not teach a "channel," it teaches the opposite: unconstrained flow throughout Kim's internal "space."

Apparently recognizing this flaw, the ID further relies upon Kim's statement that "the shield cover 'may be formed in diverse shapes such that the flowing air produced by the cooling fan 210 can be efficiently guided,' thus indicating a guided airflow" to conclude there is a channel implied in Kim. ID at 192-193 (citing RX-1396 (Kim), at 4:61-63). But this too is incorrect. This teaching implicitly concedes that the Fig. 5 embodiment relied upon by Respondents and the ID does not include a guided airflow. And the only details Kim provides regarding how air would be "efficiently guided" are incompatible with a *channel*: "fan cover 220 may comprise a guide member (not shown) that guides the cooling air generated by the cooling fan 210 in *various directions*." RX-1396 (Kim), at 5:52-55 (emphasis added). The constricted convection channel of the '595 and '322 Patent does not merely guide air in "various directions." The constricted convection channel is, as explained above, a four-sided channel that directs air from one end of the channel (i.e., the entrance) to the other end of the channel (i.e., the exit).

The ID's reliance on Kim's vague teaching that the shield cover could be "formed in diverse shapes" to find the "constricted convection channel" limitation taught by Kim is clear

error for multiple reasons. First, Kim’s teaching about other “diverse shapes” that could be formed is simply boilerplate regarding the potential for undisclosed modifications to Kim’s design, and “[p]rior art that must be modified to meet the disputed claim limitation does not anticipate the claim.” *Enplas Display Device Corp. v. Seoul Semiconductor Co., Ltd.*, 909 F.3d 398, 405 (Fed. Cir. 2018). Second, Kim’s teaching about forming “diverse shapes” to “guide” airflow is facially ambiguous, and “ambiguous references do not, as a matter of law, anticipate a claim.” *Wasica Finance GmbH v. Cont’l Auto. Sys., Inc.*, 853 F.3d 1272, 1284 (Fed. Cir. 2017).

Figure 5—the other disclosure of Kim relied upon by the ID—is *also* undisputedly ambiguous. At trial, Samsung’s expert, Mr. Smith-Gillespie admitted on cross-examination that he could not tell whether Kim’s Figure 5 cross-section was a side view or a top down view. Tr (Smith-Gillespie) 1056:2-13 (“I’m not sure that it is a side view. I think it might actually be a view down through the display, a horizontal cross-section.”).

Thus, after trial, there was simply no evidence sufficient to support a finding that Kim discloses the “channel” limitations of the Infringed ’595 and ’322 Patent Claims. The ID’s contrary findings were therefore clearly erroneous.

4. The ID Clearly Erred in Finding Kim Discloses A “Constricted Convection” Plate or Channel

“Anticipation requires that a single reference ‘describe the claimed invention *with sufficient precision and detail* to establish that the subject matter existed in the prior art.’” *Wasica*, 853 F.3d at 1284 (citation omitted, emphasis original).

Kim describes “a space formed 55 between the shield cover 140 and the backlight unit 130” wherein the shield cover, which “may be formed in diverse shapes,” includes a “plurality of air slits 117’ through which flowing air produced by the cooling fan 210 comes in and out.”

4:54-63. Respondents, and ultimately, the ID, rely on this vague disclosure as a blank slate on which to project the claimed invention. *See* ID at 190-192. But, as noted above, “ambiguous references do not, as a matter of law, anticipate a claim.” *Wasica*, 853 F.3d at 1284. As also explained above, air slits 117’ are included throughout Kim’s shield cover 140 to allow air to freely flow from the fan outward on all sides through slits 117 in the rear cover 115. The expansive airflows of Kim do not teach “constricted convection,” they teach away from it. As explained above, the ’595 and ’322 Patent do not permit such expansive airflows; they require a narrow, four-sided channel that directs air from one end of the channel (i.e., *the* entrance) to the other end of the channel (i.e., *the* exit). The narrowing of the channel’s single airflow path immediately behind the posterior display surface increases the speed of the air directed through the channel and—even though the volume of air traveling through the display’s housing is decreased—the effectiveness of the heat transfer from the display is counter-intuitively increased. None of this is taught by or even consistent with the teachings of Kim.

Because Kim is a Samsung reference, Respondents’ attempts to capitalize on its vague disclosure to reimagine its teachings stand out as particularly disingenuous. Samsung tried and failed to make its own outdoor displays at the [REDACTED]. [REDACTED]. At his deposition, Samsung engineer Sung Ki Kim explained that Samsung began researching development of outdoor LCD displays around [REDACTED]. CX-1917C (Sung Ki Kim Depo. Tr.) at 45:22-46:11. Samsung did not begin producing a *working* outdoor electronic display product until [REDACTED]. *Id.* at 46:16-21. That display did not use a constricted convection channel; it used air-conditioning to cool the display. *Id.* at 47:17-20. Samsung first released an outdoor electronic display that did not use refrigeration (referred to as the “OHD” series) sometime between [REDACTED]. *Id.* at 49:9-17.

However, the OHD series [REDACTED]. *Id.* at 51:1-9. At the same time, the [REDACTED].¹²

Around the same time, Samsung obtained and [REDACTED]. *See, e.g.,* CX-1786C, CX-1787C, CX-1788C ([REDACTED]); *see also* CX-1908C (Sungsu Lee Depo. Tr.) at 184:15-191:8; CX-1909C (Wunkil Lee Depo. Tr.) at 77:13-81:16 (discussing CX-1787C and showing how Samsung [REDACTED] [REDACTED]. Thereafter, Samsung released new outdoor displays (the OHF series), which practice the Infringed '595 and '322 Patent Claims. The OH55F product—the first Samsung product to practice MRI's technology—achieved [REDACTED] [REDACTED], whereas Samsung's predecessor "46-inch and 55-inch OHD designs" had [REDACTED] [REDACTED]. CX-1728C. Samsung's internal documents showed its market share [REDACTED] (prior to entry into the outdoor display market that MRI pioneered) to [REDACTED] (after initial launch of the OHF series) and [REDACTED]. CX-1719C at 6-7, 29.

The fact that Samsung only developed its commercially successful designs years after the time of the invention, after experiencing failures with other designs, and only after MRI's own successful product was in the market (and torn down in Samsung's offices), is strong evidence that the ordinarily skilled artisan would not have found MRI's constricted convection plate and channel within Kim's vague disclosures at the time of the invention.

Thus, the ID clearly erred in finding the claimed "constricted convection plate" ('595 Patent elements [1b], [4g], '322 Patent element [4g] in the Final ID) and "constricted convection

¹² From 2015-2017, the years the OHD display was on the market, the products generated about [REDACTED] in U.S. sales in 2015; [REDACTED] in U.S. sales in 2016 and 2017 and then [REDACTED] in 2018. *See* CX-1728C (Samsung sales data).

channel” (’595 Patent elements [1d], [4g], ’322 Patent element [4g] in the Final ID) were first disclosed in Kim despite its silence as to those novel features. *See* ID at 189-196, 201, 208, 215.

5. The ID Clearly Erred in Finding Kim Discloses a “Constricted Convection Channel Having An Entrance and an Exit.”

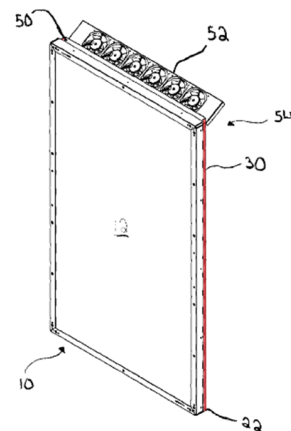
The ID also clearly erred in finding Kim discloses a “constricted convection channel having an entrance and an exit” as recited in Claims 1, 4 and 7 of the ’595 Patent. ID at 195-196.

First, the ID erred by failing to follow the Investigation’s Ground Rules when analyzing the limitation. As noted above, Respondents’ Pre-Hearing Brief asserted “[t]he air slits 117’ constitute the ‘entrance’ ... to the constricted convection channel.” Resp. Pre-HB at 99 (emphasis added). Respondents’ Post-Hearing Brief, however, asserted for the first time that “Kim’s constricted convection channel ... includes an ‘entrance’ through cooling fan 210.” Respondents’ Post-Hearing Brief at 81 (emphasis added). Respondents’ theory that “cooling fan 210” constituted an alleged entrance to the constricted convection channel was waived under Ground Rule 9.2 when it was not set forth in detail in the pre-hearing brief. Yet the ID found “[t]here is no dispute that the cooling fan 200, when operating as an inlet fan, provides an entrance to the space behind the posterior display surface or that this space has at least one exit” and concluded on this basis there was a “constricted convection channel having an entrance and an exit.” ID at 195-196. This finding was clearly erroneous and an abuse of discretion because Respondents’ theory mapping cooling fan 200 as “an entrance” to the alleged constricted convection channel was waived. *Certain Fitness Devices, Streaming Components Thereof, and Systems Containing Same*, Inv. No. 337-TA-1265, Comm’n Op. at 18–25 (Mar. 23, 2023) (reversing ID and finding theory not included in Pre-Hearing Brief was waived under the ALJ’s Ground Rules); *see also* Ground Rule 9.2

Moreover, the ID erred in finding Kim teaches a “constricted convection channel having an entrance and an exit” because it implicitly found that any “space” is a “constricted convection channel” regardless of how many entrances or exits it has. There is no dispute that Kim discloses a space behind its backlight 130 and that cooling fan 200 is one entrance to that *space*. Kim, however, does not teach the claimed “constricted convection channel having an entrance and an exit” because air exits that space through air slits 117’ located to the left and right of cooling fan 200 as well as above and below it. Tr. (Credelle) 1160:20-1161:3, 1162:22-1163:13; RX-1396 (Kim), at 7:57-62. This is inconsistent with the plain language of the claims requiring a four-sided “constricted convection channel having an entrance and an exit” and broadens the claims to encompass the very systems the specification the “constricted convection channel” was designed to replace. JX-0001 at 1:52-2:14; Tr. (Credelle) 1162:22-1163:13. The ID erred by effectively reading the requirement for a “channel having an entrance and an exit” out of the claims entirely.

6. The ID Clearly Erred in Finding Kim Discloses a “Channel” That is “Defin[ed]” By Two Side Panels, a Constricted Convection Plate and the Posterior Display Surface

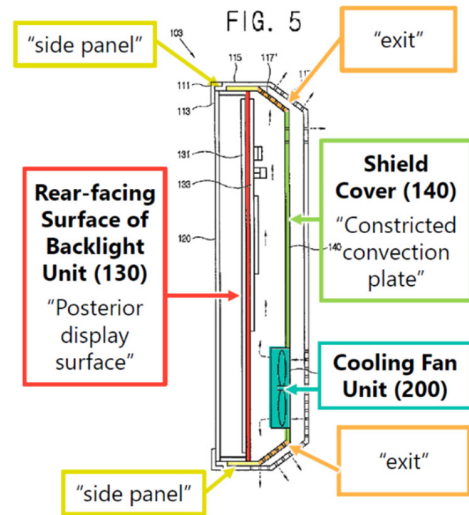
The ID mistakenly found that MRI “ignores the[] role” of the alleged side panels identified by Respondents “in enclosing the space between the constricted convection plate and posterior display surface, including the vertical airflow path.” ID at 195-196. The side panels 32 of the ’595 Patent are shown again to the right in red. Air moving through constricted convection channel 50 cannot flow through side panels 32 shown in 5A; the side panels “direct air through the constricted convection channel 50 (shown in Fig. 5).” JX-0001, 5:1-5.



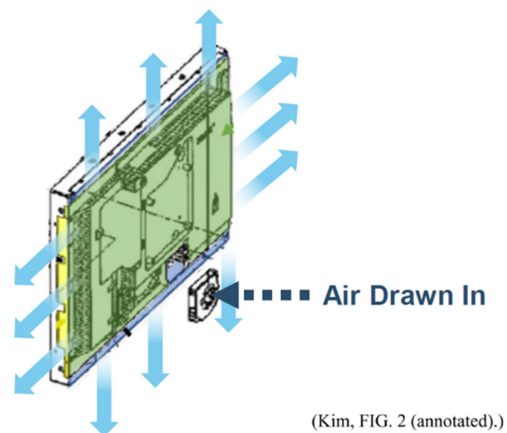
Respondents alleged there were two sets of “side panels” taught by Kim that purportedly

serve the same role: a set at the top and bottom of shield cover 140 and a set at the left and right of shield cover 140.

The first two alleged side panels in Fig. 5 are shown in Respondents' annotated figure to the right. RPHB at 98 (citing RX-1396 (Kim), FIG. 5 (annotated)). The yellow annotations of alleged "side panels" in Fig. 5 are not consistent with the side panels described and claimed in the '595 Patent. Kim's Fig. 5 depicts air flowing towards these alleged side panels and then right past them on its way to air slits 117'. They are not in the airflow path and do not "define" the claimed channel as required. Tr. (Credelle) 1161:18-23. Likewise, the second set of alleged "side panels" identified by Respondents are the yellow annotations made to Kim's Fig. 2 below.



As with the alleged top and bottom side panels of Fig. 5, the parties' experts confirmed at trial that air flows towards and past these alleged side panels on its way out of Kim's shield cover on the left and right sides as shown in Complainant's modified Fig. 2 (right). Tr. (Credelle) 1162:22-1163:5; Tr. (Smith-Gillespie), 1066:13-15, 1067:13-1068:9 (disputing only the scale of the arrows but not the directions). Because the two alleged side panels in Fig. 2 are pressed against the sides of backlight 130, they—like the alleged side panels of Fig. 5—do not come into contact with any of the cooling air and cannot possibly "define" part



(Kim, FIG. 2 (annotated).)

of a channel and direct air the cooling air through it. Tr. (Credelle) 1161:18-23, 1162:6-8.

Accordingly, the ID erred in finding the alleged side panels annotated by Respondents “defin[e] a constricted convection channel having an entrance and an exit.” This finding implicitly construed the claim so broadly that the requirement was read out of the claims.

7. Kim Does Not Render Obvious ’595 Patent Claims 4 and 7, or ’322 Patent Claims 4 and 5.

In addition to finding Kim anticipates Claim 1 of the ’595 Patent, the ID further found Kim renders obvious Claims 4 and 7 of the ’595 Patent and Claims 4 and 5 of the ’322 Patent. ID at 197-203, 213-217. For each claim, the ID found that Kim alone taught the recited “constricted convection plate” and “constricted convection channel” and relied upon the same analysis used for Claim 1 of the ’595 Patent in concluding those elements were met. *See* ID at 189-193, 201, and 215. Because the ID’s analysis of claim 1 of the ’595 Patent clearly erred for the reasons explained in sections VI.B.1-6 above, the ID also erred in finding Kim renders obvious Claims 4 and 7 of the ’595 Patent and Claims 4 and 5 of the ’322 Patent for the same reasons.

8. The ID Further Clearly Erred in Its Analysis of Claim 7 of the ’595 Patent.

Dependent claim 7 of the ’595 Patent requires claim 4’s “fan positioned to draw air through the constricted convection channel” to be “placed near the exit of the constricted convection channel.” As explained above, Kim does not teach a “constricted convection channel.” Because Respondents rely entirely on Kim to assert this limitation of independent claim 4 is met by the combination of Kim and Hong, Respondents failed to show dependent claim 7 is obvious. The ID erred in finding otherwise.

The ID further (i) clearly erred in finding Respondents set forth a *prima facie* case of obviousness for the “fan positioned to draw air through the constricted convection channel”

based on the theory set forth in their pre-hearing brief, which went unsupported by expert testimony at trial, (ii) abused its discretion in finding—contrary to Commission precedent—that MRI waived its ability to respond to the untimely expert testimony Respondents actually proffered at trial and asserted for the first time in their Post-Hearing Brief, (iii) abused its discretion in finding Respondents had not waived their untimely new theory when they failed to raise it in their Pre-Hearing Brief, and (iv) clearly erred in finding Respondents untimely new theory rendered claim 7 obvious. *See* ID at 203.

Respondents’ Timely But Inadequate and Abandoned Optimization Theory

Respondents’ Pre-Hearing Brief asserted “it would have been obvious to a POSITA based on Kim’s disclosures to optimize the fan location such that the fan would be placed near the exit of the channel.” Respondents’ Pre-Hearing Brief at 104-105. In other words, Respondents’ asserted an alleged embodiment of Kim other than the one that allegedly rendered obvious independent claim 4 of the ’595 Patent, met the additional limitation of dependent claim 7 of the ’595 Patent, but provided no details on this new embodiment.

Complainant’s Pre-Hearing Brief responded to this previously disclosed theory that a POSITA would modify Kim’s fan location to meet claim 7’s limitation. *See* Complainants’ Pre-Hearing Brief at 154. Respondents’ theory lacked credibility because during claim construction, Respondents’ expert, Mr. Smith-Gillespie, provided sworn testimony that fans placed near an exit (what he termed “drawing” fans) and fans placed near an entrance (what he termed “forcing” fans) are significantly different in purpose and used in different arrangements that befit them. *See id.* (citing CX-1970 (Declaration of Robert Smith-Gillespie), ¶¶ 42-45). Moreover, Respondents’ contentions that claim 7 was met by some undisclosed, modified embodiment of Kim where the airflow was “changed in various ways according to the arrangement of the heat generating parts,

the number of cooling fans **210**, etc.” failed to set forth a *prima facie* case of obviousness. Without expert testimony “explain[ing] in detail how *each claim element* is disclosed in the prior art,” Respondents could not have met the clear and convincing evidence standard for establishing invalidity as a matter of law. *See e.g., Schumer v. Laboratory Computer Systems, Inc.*, 308 F.3d 1304, 1315–16, (Fed. Cir. 2002) (emphasis added). Because Respondents were to rely on a *different* embodiment of Kim to satisfy claim 7 than they relied upon for claim 4, Mr. Smith-Gillespie would have needed to explain at trial how this modified version of Kim would have satisfied each element of independent claims 4 *and* dependent claim 7. Respondents did not disclose that Mr. Smith-Gillespie would provide such testimony in their Pre-Hearing Brief, and thus could not have possibly carried their burden at trial.

Indeed, Respondents did not even attempt to have Mr. Smith-Gillespie follow through with Respondents’ contradictory and insufficient theory at trial. In their Post-Hearing Brief, Respondents cited vague disclosures from Kim about alternative fan arrangements, along with attorney argument about how a POSITA would have modified Kim to create some new embodiment that satisfied the element of claim 7 (but not the elements of independent claim 4). Respondents’ Post-Hearing Brief cited no expert testimony in support.

“[T]he party asserting invalidity also bears the initial procedural burden of going forward to establish a legally sufficient *prima facie* case of invalidity. If this burden is met, the party relying on validity is then obligated to come forward with evidence to the contrary.” *Ralston Purina Co.*, 772 F.2d 1570, 1573 (Fed. Cir. 1985). Because Respondents elicited no expert testimony supporting the theory of obviousness set forth in their Pre-Hearing Brief, Respondents failed to meet their burden and MRI did not put forth evidence on that abandoned theory.

The ID found in a footnote that “Respondents have shown that Kim discloses that the

intake and discharge directions of the air may be changed such that the fan is generally acting as an exhaust fan.” ID at 203. But that says nothing about whether a POSITA would have modified Kim in a way that reaches the claimed invention. Respondents failed to provide any testimony from Mr. Smith-Gillespie regarding how exactly a POSITA would have modified Kim if exhaust fans were used. The Pre-Hearing Brief asserted Kim’s fan could “be placed in a central portion or an upper portion of the shield cover **140**, if necessary” but Respondents did not offer testimony explaining whether that modification was, in fact, necessary, what other modifications would be necessary as a result, what the airflows would be, or how each claim element of claims 4 and 7 would be satisfied. Indeed, Mr. Smith-Gillespie’s trial testimony, which was relied upon by the ID, was that “the arrows [showing directions of air flow] can’t be determined without actually, you know, measuring some airflows” citing the Bernoulli effect as to why air could be going “in the opposite direction” of what was expected. Tr. (Smith-Gillespie) at 1112:7-16.

Under the law, Respondents failed to make a prima facie showing obviousness for claim 7 of the ’595 patent and failed to meet their burden to show the claim was invalid by clear and convincing evidence based on the theory disclosed in their Pre-Hearing Brief.

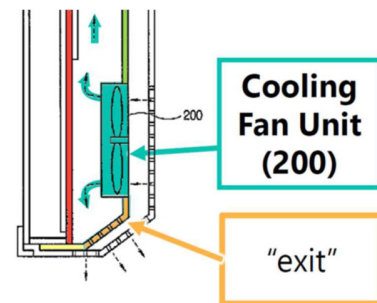
Respondents’ Untimely and Inadequate Fig. 5 Theory

Rather than attempt to have Mr. Smith-Gillespie support Respondents’ pre-hearing theories at trial, Respondents devised and presented an untimely new theory: that Kim’s Fig. 5 itself shows the claimed fan near an alleged exit at the bottom of the figure. *See* Tr. 951:23-952:19 (Smith-Gillespie). This theory was then set forth for the first time in post-trial briefing. *See* Respondents’ Post-Hearing Brief at 87 (citing their expert’s conclusory trial testimony).

MRI’s Post-Hearing Brief addressed the gaping hole in Mr. Smith-Gillespie’s new theory. *See* Complainant’s Post-Hearing Brief at 139. Mr. Smith-Gillespie contended the “fan . . .

placed near the exit of the constricted convection channel” limitation was taught in Kim by identifying air slits at the bottom of the shield cover as an alleged “exit of the constricted convection channel” near the fan at the bottom. Tr. (Smith-Gillespie) 951:25-952:19. Air may both enter and exit Kim’s shield cover at the bottom, near the fan in Fig. 5, but that air never travels through any channel—as evident in the excerpt from Mr. Smith-Gillespie’s demonstrative (RDX-0007.0050) to the right. *See* Complainant’s Post-Hearing Brief at 139; *see also* Tr. (Credelle) 1164:16-23. In the ’595 Patent, and in Samsung’s infringing products, air travels through the constricted convection channels a substantial distance (multiple feet) before exiting the channel—consistent with the plain and ordinary meaning of a “channel.”

Even though Complainant could not have pointed out this obvious flaw in Respondents’ last-minute invalidity theory until after the argument was made, the ID found Complainant had waived its ability to respond to Respondents’ untimely argument under Ground Rule 9.2 by not preemptively rebutting it in the Pre-Hearing Brief—while arbitrarily ignoring Complainant’s own violation of Ground Rule 9.2 in not raising the invalidity theory in its Pre-Hearing Brief.



The ID’s ruling, which penalizes Complainant for failing to preemptively rebut a meritless argument that Respondent had not yet presented, represents a clear abuse of discretion. *See e.g., Certain Radio Frequency Identification (“RFID”) Products and Components Thereof*, Inv. No. 337-TA-939, Comm’n Op. at 38 (explaining “because Respondents did not set forth a prima facie case of invalidity based on [the prior art reference] before the evidentiary hearing, [Complainant] was not required to come forward with opposing evidence . . . Rather, it is Respondents that have waived their invalidity defense based on [that art] by failing to set forth in

detail their contentions.”)

The ID’s ruling on this issue contravenes Commission precedent as well as the fundamental principles of procedural fairness, particularly the right to respond to new arguments.

When the smokescreen of the purported Ground Rule violation is stripped away, the ID’s error in finding that the fan in Fig. 5 of Kim is near the exit of a constricted convection channel is plain to see. The ID’s finding that air entering and exiting Kim’s housing at nearly the same location travels “through” a “channel,” and, specifically, a “constricted convection channel” as described in the ’595 patent reads the “channel,” “constricted convection channel,” “through the constricted convection channel,” and “the exit to the constricted convection channel” limitations out of the claim. The ID gave none of those words effect when analyzing invalidity.

C. The ID Erred in Finding Claim 1 of the ’595 Patent Invalid in view of Takeuchi.

The ID also erred in finding Takeuchi anticipates or renders obvious Claim 1 of the ’595 Patent. ID at 175-187. The ID found Takeuchi discloses a system for cooling an “electronic display having a posterior display surface” even though Takeuchi’s electromechanical display does not have a posterior display surface. The ID also found Takeuchi discloses “a constricted convection plate placed posterior to the posterior display surface” and “two side panels placed adjacent to the constricted convection plate and the posterior display surface, defining a constricted convection channel having an entrance and an exit” even though Takeuchi does not disclose a “constricted convection plate,” a “posterior display surface,” or “two side panels,” let alone a “constricted convection channel” that is “define[d]” by those four elements. Takeuchi’s partition plate 53 forms part of its spacious rear cooling chamber with multiple entrances needed to prevent its mechanical elements from overheating; it includes no teaching of any constricted

convection channel. As with Kim, the ID erred in construing Claim 1 of the '595 Patent so broadly that the inventive features were read out of the claim. The ID further erred by finding Takeuchi discloses the claimed “housing” even though Respondents failed to meet their burden to show Takeuchi’s display is “contained within a housing” as construed.

1. Takeuchi Does Not Disclose an “A System for Cooling an Electronic Display Having a Posterior Display Surface.”

i. The ID erred in analyzing Claim element [1a]

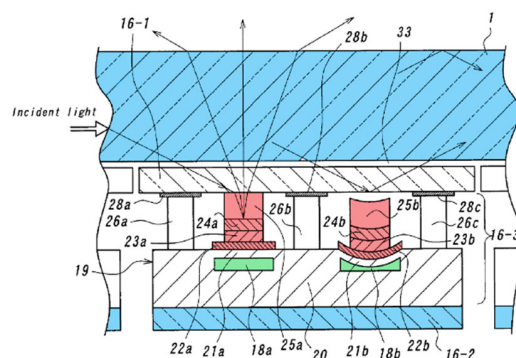
The ID erred in analyzing claim element [1a] by (i) construing the term “posterior display surface” to read on multiple, distinct surfaces, (ii) implicitly construing claim element [1a] to encompass displays that do not have a posterior display surface, and (iii) construing the term “posterior display surface” to encompass surfaces that “do[] not include the LED light sources along the edges of the display.” *See* ID at 176-180. The ID also abused its discretion in finding MRI waived its right to respond to untimely arguments and evidence raised by Respondents related to these findings. *Id.* at 179.

ii. Takeuchi’s Electromechanical Display

Takeuchi discloses a display unlike any described in the '595 Patent. The '595 Patent explains that the disclosed cooling system may be used in conjunction with various displays including LCD, OLED, and plasma displays. JX-0001, 4:16-27. Claim 1 of the '595 Patent provides further specificity by reciting an “electronic display having a posterior display surface.” Takeuchi, in contrast, teaches a “unique display system” that is fundamentally different from the claimed “electronic display having a posterior display surface” of the '595 Patent. RX-1367 (Takeuchi), [0004], [0005]. There is no LCD or other electronic screen in Takeuchi. Rather, Takeuchi discloses an *electromechanical* display where individual mechanical actuators physically move elements away from contact with the system’s light guide plate to create a dark

spot on the display at the location of each individual picture element. Tr. (Credelle), 1165:2-1166:10. Takeuchi's Fig. 3 (below, right) depicts the mechanical movement of its actuators (*see* red and green elements) and the effect on incident light.

The '595 Patent does not describe or claim a cooling system for such electromechanical displays. To the contrary, the claims specifically exclude such displays. One simple test for confirming whether Takeuchi's electromechanical system falls within the scope of the claims is considering whether it has the recited "posterior display surface."



iii. Takeuchi's Lack of a Posterior Display Surface

In Fig. 3 of Takeuchi above, the plurality of *distinct* surfaces (1, 16, and 17) Respondents pointed to as the claimed "posterior display surface" are colored blue and shown in a detailed side view depicting one full panel element 16, 17 with the two neighboring panel elements cutoff on the edges. They are plainly distinct surfaces and separate from one another. It is undisputed that this layered mosaic of elements is unlike anything described in the '595 Patent.

During claim construction, Respondents requested and obtained a construction of this term to ensure that the "back side of the backlight" in a "typical" display, like the LCD shown in Figure 2 of the '595 patent, was construed as the "posterior display surface." *See* EDIS Doc. ID 791574 (Markman Hearing Tr.) at 82:20-83:11 (citing JX-0001, column 4, Fig. 2). Indeed, the specification expressly states the claimed invention utilizes "typical" displays of the era and the "posterior display surface may be the posterior surface of the backlight assembly or the posterior surface of any other thin panel display assembly (OLED, plasma, etc.)." JX-0001 at 4:39-41,

2:51-54 (emphasis added); *see also* EDIS Doc. ID 791574 (Markman Hearing Tr.) at 83:19-24 (citing the same).

The Markman Order confirmed “the specification refers to the claimed posterior surface in a specific way, which does not appear to be a mere application of commonly understood words.” Order No. 13, 41. The ALJ’s construed posterior display surface as “‘rear-facing surface of the display assembly’ to reflect the examples given in the specification while recognizing that they are not definitional.” *Id.* at 42 (citing JX-0001 at 2:49-54). Typical electronic displays at the time of the invention utilized a thin panel display assembly that includes a singular posterior surface. *See e.g.*, Tr. (Credelle) 337:13-24 (explaining electronic displays at the time of the invention commonly had assemblies with “a metal back frame”).

In stark contrast, Takeuchi disparages those thin panel display assemblies precisely because they *have* a posterior display surface. Takeuchi proudly states: “[t]he display system of the type specified differs from known liquid crystal display (LCD) or plasma display (PDP) in that it does not basically require a seal structure. Thus, it is possible to realize a display system having a divided panel structure that is highly suitable for upsizing and reduction in thickness of the panel without particular difficulties.” RX-1367 (Takeuchi) at [0005] (emphasis added); *see also* Complainant’s Pre-Hearing Brief at 145 (citing the same). Takeuchi’s “divided panel structure” is precisely what Mr. Smith-Gillespie pointed to as a purported “posterior display surface” in his conclusory trial testimony. Tr. (Smith-Gillespie) at 930:13-25. But as shown above, Takeuchi’s divided panel structure includes multiple distinct surfaces.

iv. The ID’s Erroneous Construction of Posterior Display Surface As Encompassing Multiple, Distinct Surfaces

Because Respondents failed to identify a “rear-facing surface of the display assembly” in

accordance with the Markman Order’s construction of “posterior display surface” and instead identified multiple distinct surfaces (1, 16 and 17) as an alleged “posterior display surface,” they failed to meet their clear and convincing evidence burden for proving invalidity.

The ID, however, disregarded the specification and *erred* by further construing the “posterior display surface” so that it encompasses the numerous, discrete surfaces of Takeuchi’s dozens of frame elements 16 and 17 and light guide plate 1. *See* ID at 179 (finding the claimed “posterior display surface” could be “made up of distinct pieces.”); *see also* Takeuchi at Fig. 2, Fig. 3 (showing the separation between elements 16, 17 and 1). This construction is necessarily incorrect because it is inconsistent with the use of the term “posterior display surface” in both the specification and the claims. *See Wonderland Nurserygoods Co., Ltd. v. Baby Trend, Inc.*, 727 F. App’x 1017, 1018-1019 (Fed. Cir. 2018) (reversing anticipation and obviousness findings because the PTAB erred in construing the claim term “a fabric member” to mean “one or more pieces of fabric” when “[t]he preferred embodiment, depicted in Figure 3, shows the fabric member as a single element.”) (emphasis added).

2. The ID’s Erroneous Construction of Posterior Display Surface As Encompassing Surfaces That Do Not Include the Light Sources Along the Edges of the Display

The ID erred a second time in analyzing this claim element by implicitly construing “the posterior display surface” of claim 1 to encompass surfaces that “do[] not include the LED light sources along the edges of the display” despite Respondents’ admission in its Pre-Hearing Brief that this was a claim requirement. *See* Respondents’ Pre-Hearing Brief at 39.

The ID refused to consider MRI’s argument based on Respondents’ admission and on Mr. Smith-Gillespie’s trial testimony explaining Takeuchi’s LED light sources were “nested around the outside of the frame to illuminate the light guide plate” as shown in Figure 1 (Tr.

(Smith-Gillespie) 927:17-928:3, 929:16-18), because Complainant had not addressed these points in its pre-hearing brief. *See* ID at 179. However, Respondents had not admitted that the posterior display surface must “include the LED light sources along the edges of the display” before trial, and Mr. Smith-Gillespie had also never explained that Takeuchi includes LED light “nested around the outside of the frame” before trial. Complainant could not have raised its argument based on these admissions until after they were made. As explained in Section VI.B.8, Ground Rule 9.2 should not be interpreted to preclude a party from responding to new evidence and theories not available to it until after its Pre-Hearing Brief is filed.

The full record makes clear that the claimed posterior display surface must cover any light sources of the backlight, but the posterior display surfaces identified by Mr. Smith-Gillespie do not. The ID thus erred in finding Takeuchi teaches this claim element.

3. The ID Abused Its Discretion in Applying Ground Rule 9.2 Only Against Complainant

Notably, in concluding Takeuchi’s display was an “electronic display” the Final ID *itself* relied upon Mr. Smith-Gillespie’s untimely testimony that Takeuchi is a “light-emitting display that utilizes LEDs around the circumference of the display” even though Respondents had not disclosed that theory in its Pre-Hearing Brief. Pre-hearing, the only theory Respondents disclosed for believing Takeuchi was an “electronic” display was the specification’s statement that the invention could be used with “displays of other types including those not yet discovered” (even though Takeuchi was known well before the time of the invention).¹³ *See* Respondents’ Pre-Hearing Brief at 109. Thus, Respondents—who bear the burden—waived their invalidity defense

¹³ Takeuchi published March 6, 2003. *See* RX-1367.

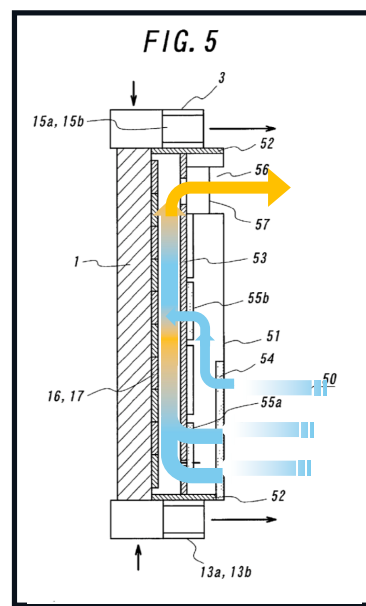
under Ground Rule 9.2. *Certain Radio Frequency Identification (“RFID”) Prods. & Components Thereof*, Inv. No. 337-TA-939, Comm’n Op. at 38. In contrast, Complainant did not waive its right to respond to new theories and evidence. *Id.*

The ID thus abused its discretion—and violated Commission precedent—by selectively applying Ground Rule 9.2 against Complainant and not Respondents. Because the ID’s basis for concluding Takeuchi discloses an “electronic display having a posterior display surface” was not presented in Respondents’ Pre-Hearing Brief, the ID must be reversed.

4. The ID Erred in Finding Takeuchi Discloses “a Constricted Convection Plate Placed Posterior to the Posterior Display Surface...Defining a Constricted Convection Channel Having an Entrance and an Exit.”

As explained above in the context of Kim, constricted convection is a key feature of the ’595 Patent. *See* Section VI.B.2-4. This feature is not taught by Takeuchi. Like Kim, Takeuchi discloses its electromechanical display utilizes a rear “chamber” for cooling its mechanical elements. RX-1367 (Takeuchi), [0040].¹⁴ While Respondents point to Takeuchi’s partition plate 53 as a constricted convection plate, Fig. 5 of Takeuchi (reproduced with annotations above, on the right) shows that, rather than a solid plate that forms part of a

constricted convection channel, ambient air flows *through* partition plate 53 via intake vents in multiple locations to create the open air cooling “chamber” behind the electromechanical



¹⁴ In contrast, Takeuchi discloses its light sources are cooled by the fans described in U.S. Patent Appl. No. 10/075,101. RX-1367 (Takeuchi), [0006].

display—rather than a channel. RX-1367, [0040]-[0041]. Takeuchi explains the additional airflow introduced in the middle of the cooling chamber is necessary “to cool the back sides of the light guide plate 1 and the panels 16, 17 substantially uniformly.” RX-1367 (Takeuchi), [0041].

As explained above, however, the ’595 Patent requires constricting the flow of cooling air using a narrow, four-sided channel that increases the speed of the air contacting the posterior display surface when it is directed through the channel. Takeuchi’s cooling chamber design, in contrast, would slow the air flowing into and out of it.

At the time of the invention, the state of the art for cooling displays was to use “a large set of fans” or “air-conditioning units” and an “open enclosure” or “box” with “as many holes and sidewalls and vents as they could manage to carry the heat out of the box” and “multiple points of ingress of air in order to cool the entire surface.” Tr. (Credelle), 1156:18-1159:2. The additional vents, while slowing the speed of the air, would permit a greater volume of air to flow into and out of these prior art chambers. During cross-examination, Mr. Smith-Gillespie admitted that Takeuchi likewise teaches that a POSITA “need[ed] vents more than just on the bottom” of partition plate 53, and that they should also be put “in the middle.” Tr. (Smith-Gillespie), 1049:17-1050:3. Mr. Smith-Gillespie further agreed it was his view that Takeuchi does not teach “the size of the fans” to be used so “the skilled artisans who are making something like Takeuchi, they may use different size fans, they may use different size plenums, they may put that plate closer or further away.” Tr. (Smith-Gillespie), 1052:5-11.

The ID found that Takeuchi teaches a “constricted convection plate” based on its broad disclosure of “a partition plate for forming a flow path of the fluid in contact with the back of the light guide plate” (RX-1367 (Takeuchi), [0011]) and used for “limiting the flow path of the fluid

in contact with the back of the light guide plate” (*id.* at [0013]). But Mr. Smith-Gillespie confirmed on cross-examination that it was not his view that “no matter how big you make those openings, no matter what size fan, no matter how close or far away the plate is, you’re always going to have a constricted convection channel.” Tr. (Smith-Gillespie), 1053:15-21. Thus, both parties’ experts agreed Takeuchi provides no express teaching of a “constricted convection plate ... defining a constricted convection channel,” nor is one inherently present. Takeuchi is, at best, agnostic to the size of the openings and the depth of the chamber adjacent to partition plate 53. Because of Takeuchi’s vagueness, Mr. Smith-Gillespie admitted he “d[id]n’t know what every single possible...implementation of Takeuchi is.” Tr. (Smith-Gillespie), 1054:8-12. The Federal Circuit recently reiterated the legal error involved in finding a claim limitation to be obvious because the prior art’s “broad teachings...would allow” for the claim limitation to be met. *In re Asset Guard Prods., Inc.*, 2022 WL 1097363, *5–6 (Fed. Cir. 2022) (*nonprecedential*). “To reach an obviousness conclusion, the [factfinder] ha[s] to find a reason a relevant artisan would have arrived at the claimed invention, with [each] particular claimed property.” *Id.*

Mr. Smith-Gillespie provided no explanation for why a skilled artisan at the time of the invention would have sought to restrict the openings in Takeuchi’s partition plate 53, narrowed its cooling chamber, and added side panels to implement a constricted convection channel. He opined only that “it is obvious to the skilled artisan to optimize the placement of the partition and the size of the holes and the fans so that you get the constricted convection channel.” Tr. (Smith-Gillespie), 1055:8-12). The Federal Circuit has rejected the use of such conclusory expert opinion to supply a “key limitation...missing from the prior art reference in dispute.” *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1366 (Fed. Cir. 2016).

The ID erred by ignoring the shortcomings in Respondents’ evidence and accepting Mr.

Smith-Gillespie's conclusory opinions as satisfying Respondents' burden on invalidity.

5. The ID Erred in Finding Takeuchi Discloses “Two Side Panels Placed Adjacent to the Constricted Convection Plate and the Posterior Display Surface, Defining a Constricted Convection Channel Having an Entrance and an Exit.”

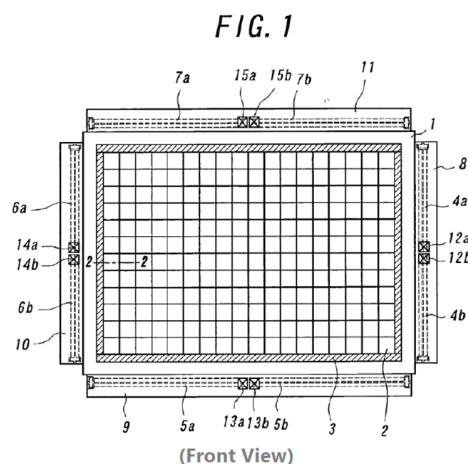
Like Kim, Takeuchi also does not disclose the claimed “two side panels . . . defining a constricted convection channel having an entrance and an exit.” As with Kim, Respondents added yellow highlighting to Takeuchi's side view to identify alleged side panels on the top and bottom of Takeuchi. *See* Respondents' Post-Hearing Brief at 74. These two purported side panels at the upper and lower regions of Takeuchi's cooling chamber cannot be the claimed “side panels” because they are not in the airflow path and thus do not define a constricted convection channel. *See e.g.*, JX-0001, 4:66-5:5, Fig. 4 (showing side panels 32 positioned parallel to the air flow in order to direct air through the channel).

Respondents' Pre-Hearing Brief further contended that two additional “side panels” not shown in Fig. 5 were on the left and right sides of Takeuchi's display based solely on Takeuchi paragraph [0023]. Respondents' Pre-Hearing Brief at 112-13. Takeuchi, however, never discloses side panels on the right and left sides of the alleged constricted convection channel in paragraph [0023] or elsewhere. Tr. (Credelle), 1170:3-10; *see also* RX-1367 (Takeuchi).

At trial, Mr. Smith-Gillespie asserted “[o]ne would see those same 52 elements [from Takeuchi's side view] if a horizontal cross-section were taken through the display, so that forms a sealed chamber, with the exception of a pair of inlets and an outlet.” Tr. (Smith-Gillespie) at 932:24-933:8. Mr. Credelle explained, however, that Takeuchi did not, in fact, disclose side panels, and that the sides would be open because it would provide additional input for filtered air to cool the sides. Tr. (Credelle) at 1170:3-16. The ID erred by crediting the testimony of Mr.

Smith-Gillespie over that of Mr. Credelle because Mr. Smith-Gillespie's testimony contradicts Takeuchi's express disclosure stating "[t]hermal insulating materials 52 are applied to the inner surface portions of the rear cover 51 in its upper and lower regions adjacent to the light sources and cooling fans 13a, 13b; 15a, 15b." RX-1367 (Takeuchi), [0040]; *see also* Complainant's Pre-Hearing Brief citing Takeuchi, [0040].

Respondents, for the first time at trial, asserted Takeuchi's Fig. 1 (right) shows the "front view" of Takeuchi's Fig. 5. RDX-0007.0015; Tr. (Smith-Gillespie) 927:17-928:9. Takeuchi's Fig. 1 shows cooling fans 13a, 13b; 15a, 15b are at the top and bottom of Takeuchi's system, respectively, whereas cooling fans 14a, 14b and 12a, 12b are at the left and right sides. Takeuchi expressly discloses insulating materials 52 (i.e., the alleged side panels) are applied only to the "upper and lower regions" adjacent to the top fans 15a, 15b and lower fans 13a, 13b and excludes use of those components adjacent to side fans 14a, 14b and 12a, 12b. RX-1367 (Takeuchi), [0040]. This is consistent with Mr. Credelle's testimony but not Mr. Smith-Gillespie's. The Federal Circuit has held that courts "must disregard the testimony of an expert that is plainly inconsistent with the record." *Homeland Housewares, LLC v. Whirlpool Corp.*, 865 F.3d 1372, 1378-9 (Fed. Cir. 2017) (disregarding expert's testimony that was contradicted by the references). Accordingly, the ID clearly erred in crediting Mr. Smith-Gillespie's testimony that insulating materials 52 are also on the left and right sides of Takeuchi—contrary to its disclosure—and finding his opinion was "clearly supported by Takeuchi" based on the very paragraph [0040] that refutes it. ID at 184.



Mr. Smith-Gillespie also argued it would have been obvious to a POSITA to *modify* Takeuchi to include side panels on the right and left sides to prevent contamination and improve air flow. Tr. (Smith-Gillespie), 934:17-23; *see also Respondents* Pre-Hearing Brief at 112-113. While Respondents assert that the use of side panels would “prevent contamination,” Takeuchi expressly teaches the use of filtered air intakes to prevent contamination, so this argument is once again contrary to the reference. RX-1367 (Takeuchi), [0041]. Likewise, Respondents’ claim that side panels would “improve airflow” are similarly contrary to the reference. Takeuchi teaches that the air in its cooling chamber “has a temperature that increases with cooling” and teaches that additional filtered intake vents permit additional “fresh ambient air” to enter the system so that it can be cooled “substantially uniformly.” *Id.*, [0041]. Thus, according to Takeuchi, additional filtered intake vents on the sides—not side panels—would “improve airflow” and promote uniform cooling by maximizing the amount of cooling air introduced into the chamber. Tr. (Credelle), 1170:11-16. Respondents made no credible showing it would have been obvious to add the claimed “side panels” to Takeuchi.

The ID clearly erred by finding Mr. Credelle’s opinion that filtered intake vents would be used on the sides rather than the claimed side panels “fails to address Takeuchi’s disclosures that a ‘cooling chamber’ is created and that ambient air is introduced through filters in the partition plate.” ID at 185. Even Mr. Smith-Gillespie agreed that Takeuchi discloses a “sealed chamber” even though air flows into the chamber through multiple filtered openings. *See* Tr. (Smith-Gillespie) at 932:19-933:8 (explaining it is “sealed, except for entrances and exits”). And while Takeuchi discloses air is introduced into the chamber through filters in the partition plate, it also expressly states that ambient air is introduced into the cooling chamber through filter 54, which is on rear cover 51—not on the partition plate. RX-1367 (Takeuchi), [0041]. Rear cover 51 is the

same element that Mr. Smith-Gillespie contends would form the sides of the chamber and *if* the sides were covered with insulating materials 52, form side *panels*. *See id.* at [0040]. But Takeuchi teaches insulating materials 52 are only on the top and bottom. Thus, Mr. Credelle’s opinion—and only his opinion—is consistent with Takeuchi’s disclosures. The ID clearly erred in finding otherwise.

The ID also explained that “Takeuchi discloses filters as openings in a ‘cover’ or ‘plate,’” which implies a finding that the claimed “side panels” encompass side “covers” or “plates” that include openings for air intake. The ID thus erred in implicitly construing the phrase “two side panels ... defining a constricted convection channel” to encompass side “covers” or “plates” that include openings for air intake as that would ignore both the claim language and the specification as described in Sections VI.A and VI.B.2 above. *See* JX-0001, 5:1-5 (explaining the side panels “direct air through the constricted convection channel 50”).

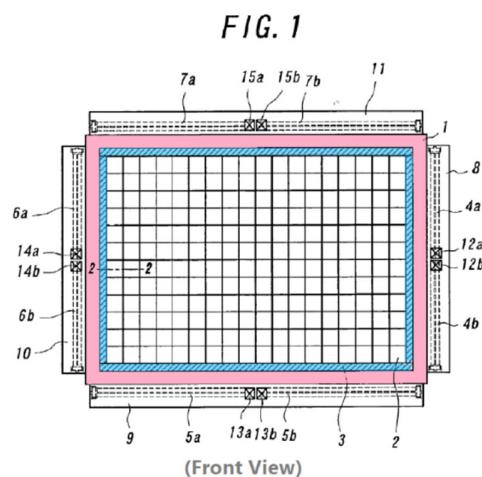
6. The ID Erred in Finding Takeuchi Discloses a “Display . . . Contained in a Housing.”

The ID construed Claim 1 of the ’595 Patent to require the claimed “electronic display” to be “contained within the bounds” of the “housing.” *See* ID at 52. In their Pre-Hearing Brief, Respondents identified Takeuchi’s “electronic display” as the light guide plate 1 and panel elements 16 and 17. *See* Respondents’ Pre-Hearing Brief at 112 (labelling “Light Guide Plate (1) / Panels (16, 17) as “electronic display”). At trial, Mr. Smith-Gillespie identified Takeuchi’s “frame 3” and “rear cover” 51 as the “housing” that purportedly contains Takeuchi’s display. Tr. (Smith-Gillespie) 931:14.

Respondents—for the first time at trial—put forth Takeuchi’s Fig. 1 as showing the “front view” of Takeuchi’s Figure 5 embodiment. *Compare* RDX-0007.0015; Tr. (Smith-

Gillespie) 927:17-928:9 to Respondents' Pre-Hearing Brief at 108-113. Based on Mr. Smith-Gillespie's trial testimony, Respondents cannot have shown Takeuchi discloses a display contained within a housing.

As shown to the right using Respondents' demonstrative, Takeuchi's alleged display includes light guide plate 1 (colored pink in additional annotations), which extends outside the bounds of "frame 3" (colored blue in additional annotations) and, at its corners, extends outside the bounds of *all other* components of the system. RDX-0007.0015 (annotated) (citing RX-1367 (Takeuchi), Figs. 1, 5); *see also* RX-1367, Fig. 3 (confirming that, as shown in Fig. 1, frame 3 is *between* panels 16, 17 and light guide plate 1); *see also* RX-1367 (Takeuchi) Fig. 5 (showing rear cover 51 is behind light guide plate 1 and thus cannot contain it on the top, bottom, left, or right).



Accordingly, Respondents failed to meet their burden of proving Takeuchi invalidates claim 1 of the '595 Patent by clear and convincing evidence because they failed to show Takeuchi teaches a "display . . . contained within a housing." The ID clearly erred by construing Claim 1 of the '595 Patent more broadly for invalidity purposes than for infringement. Compare ID at 52 to ID at 179-80.

The ID also erred in finding Complainant's failure-of-proof argument on this issue was waived because it is well-established at the ITC that, "any point in the investigation," a party can assert that the opposing party "failed to satisfy its burden of proof." *Certain Gas Sprint Nailer Products and Components Thereof*, 337-TA-1082, Order No. 18 at 2-3 (EDIS Doc. ID 655509)

(Aug. 31, 2018).

VII. VALIDITY OF U.S. PATENT NOS. 10,506,740 AND 11,013,142

The ID erred by construing the claimed “heat exchanger” to have “broad meaning” and on this basis finding that the Karppanen reference renders obvious claims 1 and 5 of the ’740 Patent and claims 6 and 10 of the ’142 Patent.

The ’142 Patent describes conventional heat transfer systems of the past relied on moving “heated air...into convectively thermal communication with fins.” JX-0004, 1:61-2:2. This conventional approach “enjoyed a measure of success in the past” but there was a need for “even greater cooling capabilities,” particularly for larger outdoor displays used outdoors in direct sunlight. *Id.* at 2:3-33. To solve this problem and achieve greater cooling capabilities than were possible in conventional systems using fins, the ’740 and ’142 Patents provide two separate flow paths, an “open loop” and a “closed loop.” *Id.* at 2:37-40. To transfer heat from the closed loop to the open loop flow path, the patents force both the open and closed loops “through a heat exchanger” that is common to both flow paths. *Id.* at 2:40-48. Forcing these loops through a heat exchanger for efficient heat transfer is a key feature of MRI’s invention that enables the system to achieve greater cooling than the prior art approach of moving air “into convectively thermal communication with fins.” *Id.* at 2:1-2.

The ID errs by construing the claim contrary to the context provided by this intrinsic record, which demonstrates that the plain and ordinary meaning of the claimed “heat exchanger” in the ’740 and ’142 Patents does not include simply moving air into convectively thermal communication with fins. This was the conventional approach distinguished in the patent. The ID erred by elevating extrinsic evidence over this intrinsic record to find that the recited “heat exchanger can generally refer to a type of device used to implement ‘[t]he process of heat

exchange between two fluids that are at different temperatures” including finned structures. ID at 252 (citations omitted). On the basis of assigning the recited “heat exchanger” this “broad meaning”—which also effectively reads out the requirement of flow paths “through” the common heat exchanger—the ID concludes that Karppanen’s “cooling fins” are a “heat exchanger.” MRI respectfully requests review and correction of the ID’s erroneous analysis of the validity of the ’740 and ’142 Patents in view of Karppanen.

A. Overview of the ’740 and ’142 Patents

The ’740 and ’142 Patents share the same specification and are directed to cooling systems for electronic displays. JX-0004, 1:55-57.¹⁵ In the Background, the patents describe “systems of the past” which “have relied primarily on fans for moving internal air (or ingested ambient air) within the housing past the components to be cooled and out of the display.” *Id.* at 1:64-67. In some cases, these conventional systems moved heated air “*into convectively thermal communication with fins.*” *Id.* at 2:1-2 (emphasis added). Those prior art approaches did not work for applications that needed “greater cooling capabilities,” particularly for outdoor displays with “larger screen sizes” when “placed in environments having high ambient temperatures...and even placed in direct sunlight.” *Id.* at 2:3-33.

At the heart of MRI’s invention is the use of a “heat exchanger” to provide greater cooling capability than was possible using the conventional approach of placing air into “convectively thermal communication with fins.” *Id.* at 2:1-2, 2:37-58, claim 1. The ’740 and ’142 Patents provide two separate flow paths—an “open loop” of ambient air and a “closed loop” of circulating gas. *Id.* at 2:37-40, claim 1. Forming part of the flow path of both the open

¹⁵ Citations herein are to the specification of the ’740 Patent.

loop and the closed loop is a “heat exchanger” that is common to both flow paths and that “transfer[s] heat from the circulating gas to the ambient gas.” *Id.* at 2:40-48. Both the open loop and closed loop “enter” and then pass “through” the common heat exchanger. *Id.*

Claim 1 of the ’740 Patent expressly recites that the “common heat exchanger” is “located in the pathway of both the closed loop gas circulation path and the open loop ambient air flow path.” *Id.*, claim 1. The claim further recites that devices (e.g., fans) are provided to force circulating gas and ambient air “through the common heat exchanger.” *Id.* Claim 6 of the ’142 Patent similarly recites a “heat exchanger” wherein the heat exchanger “forms part of said open loop airflow pathway” and “forms part of said closed loop gas circulation pathway.” JX-0005, claim 6. Devices (e.g., fans) are provided to force ambient air and circulating gas “through” those airflow pathways. *Id.*

The specification states that “heat exchangers” are a known type of thermal management devices. JX-0004 at 4:20-22 (“[M]any types of heat exchangers are known and can be used with any of the embodiments herein.”). Specifically, there are three known types of heat exchangers: “cross-flow, parallel flow, or counter-flow heat exchanger[s],” referring to the relative directions of airflow “through” the heat exchanger. *Id.* at 4:22-23. Notably, nowhere does the specification suggest that any finned structure or heat sink that permits heat transfer between two flow paths is a heat exchanger. To the contrary, the specification describes blowing heated air “into convectively thermal communication with fins” as conventional, and MRI’s innovative approach instead passed open and closed loops “through” a “heat exchanger” to provide more cooling than was possible with prior art finned structures. *Id.* at 2:1-6.

The ’740 and ’142 Patents claim priority to a series of provisional applications that are incorporated by reference into the specification. The earliest provisional application was filed

March 3, 2008, U.S. Provisional Application No. 61/033,064 (the “’064 Provisional”). CX-0179. It describes heat transfer between open and closed loops through finned structures, showing examples in Figures 6 to 9. *Id.*, Figs. 6-9. Indeed, claim 10 of the provisional recites that the cooling chamber “includes fins to increase the surface area for heat transfer.” *Id.*, claim 10. Yet, the ’064 Provisional never refers to these structures as a “heat exchanger.” *See* CX-0179.

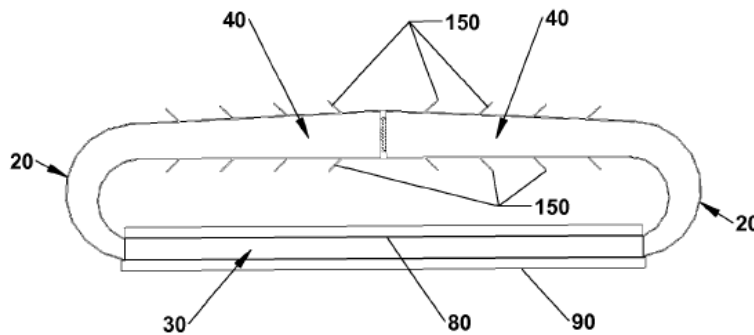


Fig. 7

A later provisional application filed December 18, 2008, U.S. Provisional Application No. 61/138,736 (the “’736 Provisional”), first describes use of a “heat exchanger” common to the open and closed loops. CX-0123. The ’736 Provisional is entitled “Heat Exchanger for an Electronic Display,” and is the first application priority chain to use the term “heat exchanger.” *Id.* at 7. The ’736 Provisional expressly distinguishes the heat exchanger from convective heat transfer using fins, as described, for example, in the earlier ’064 Provisional. *Id.* at [0003]. The ’736 Provisional describes heat exchanger in the traditional manner consistent with the ’740 and ’142 Patents, explaining that “[e]ach loop passes through a heat exchanger at the rear of the display in order to transfer heat from the closed loop gas to the open loop gas.” *Id.* at [0007].

B. The ID Erred in Finding the ’740 and ’142 Patents Invalid in View of Karppanen

The ID found claims 1 and 5 of the ’740 Patent obvious in view of Karppanen and the

knowledge of a POSITA. The ID found claims 6 and 10 of the '142 Patent obvious in view Karppanen combined with Larson. Both findings rested on Karppanen as teaching a “heat exchanger” and flow paths “through” the heat exchanger as recited in the claims. Each of these invalidity determinations rests on an overbroad construction of the recited “heat exchanger” that reads on conventional approaches distinguished by the specification and that reads out a key innovative feature of MRI’s invention—flow paths “through” a “heat exchanger” to effect greater heat transfer than was possible using conventional approaches. MRI respectfully requests review and reversal of the ID’s erroneous obviousness determinations.

1. The ID Erroneously Construed “Heat Exchanger” to Encompass “Fins,” Which Were Distinguished as Conventional.

The ID erroneously held that “heat exchanger” has “broad meaning” and “can generally refer to a type of device used to implement ‘[t]he process of heat exchange between two fluids that are at different temperatures and separated by a solid wall.’” ID at 252. The ID effectively reads “heat exchanger” functionally to cover any structure that permits heat transfer between two fluids (gas is a low viscosity fluid). *Id.* On the basis of its admittedly “broad meaning” construction, the ID finds “that the cooling fins structure disclosed by Karppanen constitutes a ‘heat exchanger’ within the meaning” of the '740 and '142 Patents. ID at 255, 277-78.

Claim construction must rest, first and foremost, on the intrinsic record including the claims, the specification, and the prosecution history. *Phillips*, 415 F.3d at 1317 (explaining that extrinsic evidence is “less significant than the intrinsic record in determining the legally operative meaning of claim language” (internal quotations and citations omitted)). “The construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.” *Id.* at 1316 (citation

omitted). The ID erred in its analysis by failing to give proper weight to the context provided by the intrinsic record and instead elevating extrinsic evidence over the intrinsic record. Indeed, the analysis in the ID acknowledged MRI's arguments regarding the specification and prosecution history yet simply dismissed the intrinsic record out of hand as not amounting to disclaimer. ID at 252, 255. The ID instead relied on extrinsic evidence, including statements in the Incropera reference, Williams reference, and Yare reference as supporting a "broad meaning," and relies heavily on expert testimony rather than a fair evaluation of the intrinsic record. ID at 252-56. Elevating extrinsic evidence to reach a construction that does not align with the claims and specification is legally erroneous under *Phillips*.

The recited "heat exchanger" should be given its plain and ordinary meaning, which does not encompass finned structures that were conventional in the art as shown by Karppanen. Rather, heat exchangers are known classes of devices that provide flow paths for fluid streams to pass through to effect heat transfer.

To construe "heat exchanger," one must first look at the context provided by the claims themselves. "[T]he claims themselves provide substantial guidance as to the meaning of particular claim terms," and "the context of the surrounding words of the claim also must be considered in determining the ordinary and customary meaning of those terms." *Phillips*, 415 F.3d at 1314. Claim 1 recites that the "common heat exchanger" is "located in the pathway of both the closed loop gas circulation path and the open loop ambient air flow path." JX-0004, claim 1. Claim 1 further recites that devices (e.g., fans) are provided to force circulating gas and ambient air "through the common heat exchanger." *Id.* Claim 6 of the '142 Patent similarly recites a "heat exchanger" wherein the heat exchanger "forms part of said open loop airflow pathway" and "forms part of said closed loop gas circulation pathway." JX-0005, claim 6.

Devices (e.g., fans) are provided to force ambient air and circulating gas “through” those airflow pathways. *Id.* The claims tell us that a heat exchanger is a device that allows airflow to pass “through.” Indeed, the claimed heat exchanger forms “part” of the “pathway” for the airflows, meaning that the “heat exchanger” is not simply any device that contacts or permits heat transfer from the airflow pathway, as the ID erroneously held. In context, the claims “most naturally” cover only the known types of devices that provide flow paths “through” the device, thereby permitting heat transfer between the separate flows.

Claims “must be read in view of the specification of which they are a part.” *Phillips*, 415 F.3d at 1315 (citation omitted). “Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.” *Id.* Here the specification supports the meaning most naturally demanded by the claims. The specification states that “[t]he heat exchanger 101 may be a cross-flow, parallel flow, or counter flow heat exchanger.” JX-0004, 4:20-23. This is not describing an embodiment; these are the “types of heat exchangers” that “are known and can be used with any of the embodiments herein.” *Id.* at 4:20-22. Each has distinct fluid flow paths that pass “through” the heat exchanger as recited by the claims themselves. What is not described as a “heat exchanger” is a finned structure or heat sink. To the contrary, the specification describes use of fins as conventional. “[S]ystems of the past have relied primarily on fans for moving internal air (or ingested ambient air) within the housing” and “[i]n some cases, the heated air is moved into convectively thermal communication with fins.” *Id.* at 1:64-2:2. This conventional approach is not MRI’s invention. MRI invented passing open and closed loop flow paths “through” a “heat exchanger” to provide “even greater cooling capabilities” than were possible using the finned approach of the prior art. *Id.* at 2:3-6, 2:37-48. The ID erred by construing the claims broadly to read on the very prior art approach distinguished in the patent. The ID asserts lack of

“disclaimer.” ID at 255. MRI respectfully submits that, by distinguishing from use of fins, the ’740 and ’142 Patents has disclaimed that conventional approach. Moreover, regardless of whether there is disclaimer, claims must be construed in a manner that “most naturally” aligns with the claims and specification. *Phillips*, 415 F.3d at 1316. Here, the plain and ordinary meaning does not extend to the conventional use of “fins” as taught for example by Karppanen.

The prosecution history is also instructive here and “provides evidence of how...the inventor understood the patent.” *Phillips*, 415 F.3d at 1317. Specifically, the chain of priority applications demonstrates that Mr. Dunn did not understand finned structures to be a heat exchanger and instead understood heat exchangers to have their plain and ordinary meaning, which requires hot and cold flow paths that pass through the device. The earliest priority application, the ’064 Provisional, disclosed transferring heat from a closed loop to an open loop through a finned structure. CX-1979, Figs. 6-7, [0042]. But the ’064 Provisional did not describe this structure as a “heat exchanger.” To the contrary, it was not until the ’736 Provisional filed in December 2008 that MRI described a “Heat Exchanger for an Electronic Display.” CX-0123 at 7. The ’736 Provisional expressly distinguishes from convective heat transfer using fins, as described for example in the earlier ’064 Provisional. *Id.* at [0003]. The ’736 Provisional instead describes “heat exchangers” according to their plain and ordinary meaning—devices with flow paths that pass “through” and that permit heat transfer between the separate flow paths. *Id.* at [0007]. The priority applications thus further support the plain and ordinary meaning of “heat exchanger” as asserted by MRI.

Extrinsic evidence is “less significant than the intrinsic record in determining ‘the legally operative meaning of claim language.’” *Phillips*, 415 F.3d at 1317. “[A] court should discount any expert testimony ‘that is clearly at odds with the claim construction mandated by the claims

themselves, the written description, and the prosecution history, in other words, with the written record of the patent.” *Id.* at 1318 (citation omitted). The ID errs by elevating expert testimony and other extrinsic evidence above the construction mandated by the intrinsic record. In finding that a “heat exchanger” is effectively anything that exchanges heat between fluid flows, the ID quotes from one sentence from the “Heat Exchanger” chapter in a textbook that says a heat exchanger operates by “[t]he process of heat exchange between two fluids that are at different temperatures and separated by a solid wall.” ID at 252 (quoting CX-2092.00676). That partial sentence, when properly read in the context of the entire chapter, merely provides an introductory statement regarding how heat exchangers work. In fact, that sentence is the very first sentence of the entire chapter. CX-2092.00676 (“The process of heat exchange between two fluids that are at different temperatures and separated by a solid wall occurs in many engineering applications.”). The remainder of that chapter, including that page, describes the same channel/tube device for multiple fluid flow paths that is described in the ’740 and ’142 Patents. *See id.* (detailing that heat exchangers are classified by the flow arrangements of the channels/tubes, including cross flow, counter flow, and parallel flow).

Indeed, the ID states that MRI’s arguments regarding the intrinsic record “do not carry significant weight” in light of expert testimony and other extrinsic evidence. ID at 255. This violates the proper claim construction analysis mandated by *Phillips*. 415 F.3d at 1317 (holding that extrinsic evidence is “less significant than the intrinsic record in determining the legally operative meaning of claim language” (quotation omitted)). The ID also errs by holding the specification and prosecution history are not informative as to the scope of the plain and ordinary meaning of “heat exchanger” because there is no formal disclaimer over the scope of the term “heat exchanger.” ID at 255. Again, claims must be construed in the context of the intrinsic

record regardless of formal disclaimer. *Medrad, Inc. v. MRI Devices Corp.*, 401 F.3d 1313, 1319 (Fed. Cir. 2005) (“We cannot look at the ordinary meaning of the term ... in a vacuum. Rather, we must look at the ordinary meaning in the context of the written description and the prosecution history.”).

A POSITA would not conclude that a “heat exchanger” broadly encompasses *any structure* that transfers heat from a hotter to a cooler fluid. As Dr. Pokharna explained, such an interpretation would encompass *any* and *every* material—including the windows of the courthouse. Tr. (Dr. Pokharna) 1252:4-15. And importantly, Respondents put forward no intrinsic or extrinsic evidence for its construction of heat exchanger as broadly covering anything exchanging heat from hotter to cooler flows. Rather, Respondents offered only unsupported expert testimony that a POSITA in 2008 would understand “heat exchanger” means anything “that transfers heat from a hot source to a cold sink.” Tr. 998:12-999:5. Respondents’ own expert proceeded to contradict this testimony by taking the position that the metal plate between the cooler open loop and hotter closed loop in the Mid-Sized Products was not a heat exchanger despite heat transfer across that plate. *Id.* (Neikirk) 672:15-673:19; Resp. Mot. Sum. Determination, (Motion Dkt. No. 1331-007) at 17. Respondents’ contradictory positions highlight the untethered nature of their interpretations from the intrinsic record itself.

In sum, the plain and ordinary meaning of the claims requires a common “heat exchanger” to be a device with fluid flows that pass “through” and that forms part of the flow path of the open and closed loops. This is a known type of thermal management device and may be “cross-flow, parallel flow, or counter-flow.” JX-0004, 4:20-23. The plain and ordinary meaning does not include finned structures or heat sinks. The ID erred by sweeping finned structures and heat sinks into the scope of the claim because those structures were distinguished

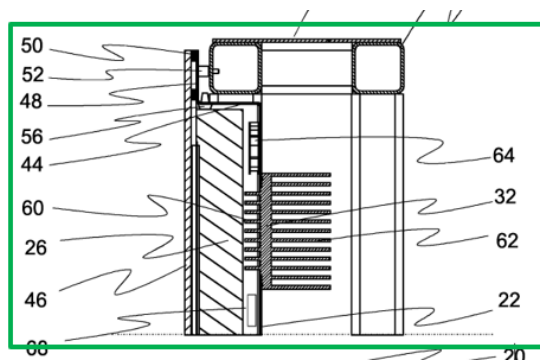
as conventional in the intrinsic record, and accordingly, a POSITA reading the claims in the context of the written description would not understand such structures to fall within the plain and ordinary meaning of the term. MRI respectfully requests that the Commission review and correct the ID's overbroad claim construction.

2. Under the Correct Construction, Karppanen Does Not Render Obvious the Asserted Claims

Karppanen discloses three thermal management devices, none of which are a heat exchanger: (1) a finned plate, (2) a heat sink, or (3) a thermoelectric device called a "Peltier element." Tr. at 1253:17-125:13 (Dr. Pokharna). The ID found that the finned plate embodiment teaches a "heat exchanger." ID at 252. Under the correct construction, none of these three devices teaches a "heat exchanger" and the ID's findings are clearly erroneous.

i. Karppanen's Finned Wall is Not a Heat Exchanger.

Karppanen suggests that one such configuration of the cooling elements 32 is to have two sets of fins extending into each space. *Id.*, 8:16-22; Tr. 1253:21-1254:9 (Dr. Pokharna). This configuration is seen in the top portion of Figure 2, excerpted below.

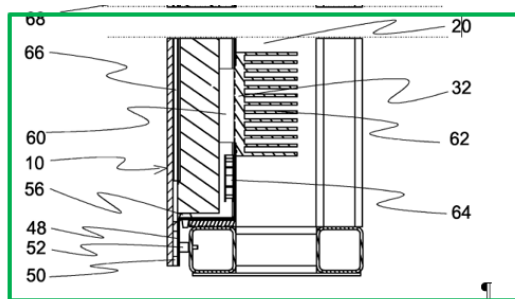


A POSITA would understand Karppanen's disclosure of a finned wall is the conventional approach distinguished in the Background of the '740 and '142 Patents. JX-0004, 2:1-2. *See* JX-0004, 1:61-2:2; JX-0005, 1:66-2:7 (In some cases, the air is moved into convectively thermal

communication with fins.”). As explained above, the patents distinguish this prior art approach upon which MRI’s invention improved. Indeed, even Karppanen explained that the fins of the cooling elements alone may not be sufficient to transfer heat out of the electronic display in “particularly hot conditions,” such as when large format outdoor displays are placed in direct sunlight. CX-2259 (Karppanen) 8:25-27 (“In particularly hot conditions, heat transfer based merely on cooling fins may be sufficiently efficient.”); JX-0004 at 2:3-33. Karppanen cooling elements are heat fins, and are not a “heat exchanger” as claimed in the ’740 and ’142 Patents. Moreover, as Dr. Pokharna explained, open loop and closed loop air does not pass “through” the finned structure and those structures do not form part of the open and closed loop flow paths. Tr. at 1255:14-25. Rather, air flows over or along those fins which extend into the flow paths but do not themselves form the flow paths themselves. *Id.*

ii. Karppanen’s Heat Sink and Peltier Device are Not Heat Exchangers.

Karppanen describes a second embodiment where the cooling elements 32 are a heat sink. CX-2259 (Karppanen) 8:29-36; Tr. (Pokharna) 12524: 12-24. In this embodiment, the first heat transfer part 60 is attached to rear portion of the display, directly conducting heat from the display to the cooling space 20. CX-2259 (Karppanen) at 8:30-32. This embodiment is depicted in the bottom portion of Figure 2, excerpted below.



Heat sinks also utilize the finned approach distinguished by the specification. In the

context of the intrinsic record, a POSITA would not understand a heat sink to be a heat exchanger “through” which open and closed loop air passes. *See* Tr. (Dr. Pokharna) 1249:13-1252:3. Heat sinks use conduction to move heat from a solid body to a fluid, and do not contain enclosed channels for two airflow pathways to transfer heat from one fluid to another. Thus, this embodiment of Karppanen is not a heat exchanger.

Karppanen describes a third embodiment where the cooling elements 32 are Peltier devices. CX-2259, 9:19-20. A Peltier device is an thermoelectric heat transfer device that pumps heat from lower temperatures to higher temperatures, not a heat exchanger. Tr. (Dr. Pokharna) at 1254:25-1255:13.

Because none of the embodiments disclosed in Karppanen describe a heat exchanger, much less a heat exchanger with open loop and closed loop air passing “through,” the prior art does not render obvious claims 1 and 5 of the ’740 Patent or claims 6 and 10 of the ’142 Patent.¹⁶

VIII. CONCLUSION

¹⁶ The ID cannot rely on Williams as teaching the “heat exchanger” that is missing from Karppanen. This ground was never presented. As to the ’740 Patent, Respondents only argued that Karppanen in view of the knowledge of a POSITA rendered claims 1 and 5 obvious and never asserted a combination with Williams. *See* Resp. PHB at 116-122. As to the ’142 Patent, Respondents only argued that Karppanen in view of Larson rendered claims 1 and 5 obvious—and Respondents did not rely on Williams as part of its obviousness ground. *Id.* at 122-30. The ID’s consideration and adoption of these waived positions, in violation of the Ground Rules, was clearly erroneous.

Moreover, even *if* Respondents had not waived the argument that Karppanen in view of Williams rendered the Asserted Claims obvious, the obviousness claim fails as a matter of law and fact. First, Williams is not prior art under Sections 102 or 103 because it was published April, 23 2009, after the priority date of the Asserted Patents. Thus, any obviousness claim would fail as a matter of law. Additionally, the obviousness claim would fail because Respondents presented no motivation to combine Karppanen with Williams, instead only asserting modifications of Karppanen based on knowledge of a POSITA. Tr. (Smith-Gillespie) 1004:21-1007:8. Thus, again, the ID makes legal errors unsupported by law and fact in holding Karppanen in view of Williams renders obvious the Asserted Claims.

MRI respectfully requests that the Commission review and reverse the ID with respect to each of the issues addressed in this Petition and issue a finding of violation of Section 337.

Dated: November 27, 2023

Respectfully submitted,

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PUBLIC VERSION

CERTIFICATE OF SERVICE

I, Bruce Nelson, hereby certify that the attached document has been served upon the following parties as indicated below on November 27, 2023.

The Honorable Lisa R. Barton Secretary to the Commission U.S. International Trade Commission 500 E Street SW, Room 112-A Washington, DC 20436	☒ Via EDIS ☐ Via First Class Mail ☐ Via Express Delivery ☐ Via Hand Delivery
The Honorable Monica Bhattacharyya Administrative Law Judge U.S. International Trade Commission 500 E Street SW, Room 317 Washington, DC 20436	☐ Via First Class Mail ☐ Via Express Delivery ☐ Via Hand Delivery ☒ Via Electronic Mail at Bhattacharyya337@usitc.gov
Patrick J. McCarthy Goodwin Procter LLP 1900 N Street, N.W. Washington, D.C. 20036 Darryl M. Woo Goodwin Procter LLP Three Embarcadero Center San Francisco, CA 94111-4003 Yoona Lee Elizabeth J. Low Goodwin Procter LLP 601 Marshall St. Redwood City, CA 94063 Srikanth K Reddy Douglas J. Kline Christie L. Larochelle Harrison Gunn Kara Grogan Goodwin Procter LLP 100 Northern Avenue Boston, MA 02210	☐ Via FedEx ☐ Via International Express Delivery ☐ Via Hand Delivery ☒ Via Electronic Mail at DG-Samsung-MRI@goodwinlaw.com

PUBLIC VERSION

Naomi L. Birbach, Goodwin Procter LLP The New York Times Building 620 Eighth Avenue New York, New York 10018-1405 <i>Counsel for Respondents</i>	
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/s/ Bruce Nelson
Bruce Nelson

CERTIFICATE OF SERVICE

I, Pamela A. Freitik, hereby certify that the attached document has been served upon the following parties as indicated below on December 4, 2023.

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Counsel for Respondents

/s/ Pamela A. Freitik

Pamela A. Freitik