

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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

Petitioners v.

MANUFACTURING RESOURCES INTERNATIONAL, INC.

Patent Owner

Case IPR2023-00221
Patent 11,013,142

PATENT OWNER'S SUR-REPLY

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EXHIBIT LIST

Exhibit	Description	Confidentiality Designation
2001	MRI-ITC-1331_0000435123-24 (4/24/2020 Romulus Stoain email to Dunn)	Filed Publicly
2002	MRI-ITC-1331_0000435125-27, Mutual Non-Disclosure Agreement	Filed Publicly
2003	MRI-ITC-1331_0000435133-34 (5/4/2020 Romulus Stoain email to Dunn)	Filed Publicly
2004	Response to Office Action filed December 18, 2020	Filed Publicly
2005	Office Action mailed April 11, 2018, in Application No. 12/234,360	Filed Publicly
2006	Office Action mailed August 11, 2011, in Application No. 12/237,365	Filed Publicly
2007	Office Action mailed November 24, 2020, in Application No. 16/983,842	Filed Publicly
2008	Decision Denying Institution of <i>Inter Partes</i> Review of U.S. Patent No. 8,854,572 in <i>Civiq Smartscales LLC v. Manufacturing Resources International, Inc.</i> , IPR2018-00774, Paper 6 (PTAB Sep. 25, 2018)	Filed Publicly
2009	Curriculum Vitae of Dr. Himanshu Pokharna	Filed Publicly
2010	U.S. Provisional Application No. 61/138,736 (the “’736 Application”)	Filed Publicly
2011	U.S. Provisional Application 61/033,064 (the “’064 Application”)	Filed Publicly
2012	MRI-ITC-1331_0000092739	Filed Publicly
2013	<i>Certain Outdoor and Semi-Outdoor Electronic Displays</i> , Inv. No. 337-TA-1331, Day 1 Public Hearing Tr. (June 26, 2023)	Filed Publicly
2014	<i>Certain Outdoor and Semi-Outdoor Electronic Displays</i> , Inv. No. 337-TA-1331, Day 4 Public Hearing Tr. (June 29, 2023)	Filed Publicly
2015	<i>Certain Outdoor and Semi-Outdoor Electronic Displays</i> , Inv. No. 337-TA-1331, Day 5 Public Hearing Tr. (June 30, 2023)	Filed Publicly

Exhibit	Description	Confidentiality Designation
2016	<i>Certain Outdoor and Semi-Outdoor Electronic Displays</i> , Inv. No. 337-TA-1331, Transcript, Deposition of Chris Bolton (Feb. 23, 2023)	Filed Sealed in Its Entirety, Parties and Board Only
2017	Frank Incropera et al., FUNDAMENTALS OF HEAT AND MASS TRANSFER, at 670 (2006).	Filed Publicly
2018	European Patent Application No. 1 951 020 A210(“Wellhofer”)	Filed Publicly
2019	Certified translation of Japanese Patent No. 3118907 to Ohta (“Ohta”)	Filed Publicly
2020	U.S. Patent No. 6,798,655 to Nagashima, et al. (“Nagashima”)	Filed Publicly
2021	<i>Certain Outdoor and Semi-Outdoor Electronic Displays</i> , Inv. No. 337-TA-1331, Transcript, Deposition of Robert Smith-Gillespie (April 26, 2023)	Filed Publicly
2022	<i>Certain Outdoor and Semi-Outdoor Electronic Displays</i> , Inv. No. 337-TA-1331, Transcript, Deposition of Robert Smith-Gillespie (Feb. 20, 2023)	Filed Publicly
2023	<i>See IP ratings, Int’l Electrotechnical Comm’n</i> , https://www.iec.ch/ip-ratings (last visited Aug. 29, 2023) (“IEC Standards”)	Filed Publicly
2024	Declaration of Dr. Himanshu Pokharna (“Pokharna Dec.”)	Filed Publicly
2025	Samsung White Paper: Taking the Message Outdoors (Dec. 4, 2015)	Filed Publicly
2026	Website - Samsung White Paper: Taking the Message Outdoors (Dec. 4, 2015) https://insights.samsung.com/2015/12/04/taking-the-message-outdoors-with-high-brightness-display-tech-white-paper/ (last visited Sept. 26, 2023)	Filed Publicly
2027	Respondents’ Notice of Prior Art, <i>Certain Outdoor and Semi-Outdoor Electronic Displays</i> , Inv. No. 337-TA-1331 (Jan. 4, 2023).	Filed Publicly
2028	Digital Solutions for Convenience Stores, Samsung, dated 2021	Filed Publicly

Exhibit	Description	Confidentiality Designation
2029	Sung Ki Kim deposition transcript excerpts, <i>Certain Outdoor and Semi-Outdoor Electronic Displays</i> , Inv. No. 337-TA-1331 (Mar. 31, 2023)	Filed Sealed in Its Entirety, Parties and Board Only
2030	Sungsu Lee deposition transcript excerpts, <i>Certain Outdoor and Semi-Outdoor Electronic Displays</i> , Inv. No. 337-TA-1331 (Mar. 20, 2023)	Filed Sealed in Its Entirety, Parties and Board Only
2031	Wunkil Lee deposition transcript excerpts, <i>Certain Outdoor and Semi-Outdoor Electronic Displays</i> , Inv. No. 337-TA-1331 (Mar. 21, 2023)	Filed Sealed in Its Entirety, Parties and Board Only
2032	John Palmer deposition transcript excerpts, <i>Certain Outdoor and Semi-Outdoor Electronic Displays</i> , Inv. No. 337-TA-1331 (Mar. 16, 2023)	Filed Sealed in Its Entirety, Parties and Board Only
2033	U.S. Patent Application Publication No. 2006/0077636 A1 to Kim, dated Apr. 13, 2006	Filed Publicly
2034	U.S. Patent Application Publication No. 2006/0132699 A1 to Cho et al., dated Jun. 22, 2006	Filed Publicly
2035	U.S. Patent No. 7,948,575 to Oh et al., dated May 24, 2011	Filed Publicly
2036	Certified translation of Korean Unexamined Patent Application KR 10-2006-0016469 to Na, dated Feb. 22, 2006 (“Na”)	Filed Publicly
2037	U.S. Patent No. 7,800,706 B2 to Kim et al., dated Sep. 21, 2010)	Filed Publicly
2038	SEITC0027754 McDonald’s Outdoor DMB presentation, dated Mar. 2017	Filed Sealed in Its Entirety, Parties and Board Only
2039	Infringement Claim Chart for U.S. Patent No. 11,013,142, Samsung OH75 / OH85	Filed Publicly

Exhibit	Description	Confidentiality Designation
2040	Samsung OH product sales spreadsheet, CX-1728C	Filed Sealed in Its Entirety, Parties and Board Only
2041	SEITC0028579 Samsung Market Requirements Document, Outdoor LCD Signage, dated Apr. 23, 2021, and English translation	Filed Sealed in Its Entirety, Parties and Board Only
2042	SEITC0035224 Samsung teardown of MRI Outdoor 86” product, dated Mar. 24, 2016, and English translation	Filed Sealed in Its Entirety, Parties and Board Only
2043	SEITC0035259 Samsung teardown photos of MRI 55” product	Filed Sealed in Its Entirety, Parties and Board Only
2044	MRI-ITC-1331_0000046205 MRI Sales Detail	Filed Sealed in Its Entirety, Parties and Board Only
2045	Declaration of Alan Brand, <i>Certain Outdoor and Semi-Outdoor Electronic Displays</i> , Inv. No. 337-TA-1331 (Aug. 19, 2022)	Filed Sealed in Its Entirety, Parties and Board Only
2046	MRI-ITC-1331_0000444713 MRI Sales Detail	Filed Sealed in Its Entirety, Parties and Board Only
2047	Article – Sunlight and Solar Clearing, https://lg-mri.com/sunlight-and-solar-clearing/ (last visited Sept. 26, 2023)	Filed Publicly
2048	Letter from Chris Bolton (Vertigo Group) to Bill Dunn (MRI), dated Apr. 6, 2009	Filed Sealed in Its Entirety, Parties and Board Only

Exhibit	Description	Confidentiality Designation
2049	Trademark and Technology License Agreement, dated Feb. 18, 2014	Filed Sealed in Its Entirety, Parties and Board Only
2050	Joint Venture and Limited Liability Company Agreement, dated Jan. 8, 2014	Filed Sealed in Its Entirety, Parties and Board Only
2051	License Agreement, dated Aug. 27, 2008	Filed Sealed in Its Entirety, Parties and Board Only
2052	Confidential Agreement, dated Jan. 22, 2020	Filed Sealed in Its Entirety, Parties and Board Only
2053	Samsung Outdoor Installation Guide	Filed Publicly
2054	Claim Chart for U.S. Patent No. 11,013,142, MRI 75" & 86" Units	Filed Publicly
2055	Intentionally Omitted	
2056	Intentionally Omitted	
2057	Declaration of Andrea A. Anderson in Support of PO's Unopposed Motion for Pro Hac Vice Admission	Filed Publicly
2058	<i>Certain Outdoor and Semi-Outdoor Electronic Displays</i> , Inv. No. 337-TA-1331, Excerpts of Transcript, Deposition of Robert Smith-Gillespie (April 26, 2023)	Filed Publicly

I. Introduction

Petitioners rely heavily on an Initial Determination issued in co-pending ITC Investigation No. 337-TA-1331. As indicated by its title, the Initial Determination is not final. It is currently under review by the Commission, relies on evidence that is inadmissible in an IPR proceeding, and reaches conclusions based on theories not presented in the Petition. That aside, Petitioners take contrary positions regarding that Initial Determination—urging there was ample evidence to support the ITC’s finding on Karppanen but insufficient evidence to accept its finding on Yare.

These contrary positions are not isolated, Petitioners at the same time urge that a heat exchanger must have fins on both sides of a wall, yet map a heat exchanger to structures with fins on only one side of a wall. Petitioners otherwise err by skipping over the majority of the claim language and specification to reach their foregone conclusion that any thermal management device is a heat exchanger. Those errors notwithstanding, secondary considerations confirm that the challenged claims are not obvious.

II. Petitioners Improperly Rely on an Initial Determination from the Parallel ITC Proceeding.

A. Petitioners Inconsistently Apply the ITC’s Findings First Urging them Reliable and Next Suggesting they are Based on an “Incomplete Record” where they Confirm Patentability.

Petitioners’ own inconsistency demonstrates why the Initial Determination of the ITC is unreliable. Petitioners urge the Board to follow the ITC’s conclusions

regarding Karppanen. *See* Paper 28, Reply, 4, 11, 14, 18. Petitioners even ask the Board to accept the ITC's conclusions regarding *other* patents as evidence of the '142 Patent's validity. *Id.* at 4 (referring to the conclusions drawn regarding U.S. 9,629,287). Yet Petitioners urge the Board to ignore that the ITC found that Yare does not invalidate the claims because it does not disclose a closed loop that travels in front of the electronic image assembly. *Id.* at 15-16. Petitioners suggest that the ITC did not have the complete record. This ignores the fulsome discovery authorized by the ITC and that Petitioners presented testimony from the same expert regarding the same two references—Yare and Larson. Nevertheless, the ITC confirmed that the Petitioner failed to show invalidity. *Id.*

The Board should reject Petitioners' disingenuous suggestion that the Initial Determination is reliable (on Karppanen) and unreliable (on Yare). Rather, the Board should discount the Initial Determination as evidence of patentability.

B. The ITC's Findings are Based on a Different Record and Evidence that was not Presented or Even Admissible at the PTAB.

The ITC's conclusions were based on different evidence and grounds that the Petitioner did not assert. The ITC's conclusions are thus neither relevant nor reliable, and reliance upon those conclusions is unfairly prejudicial to MRI.

The Initial Determination addressed only two claims of the Challenged Patent and includes no analysis whatsoever regarding claims 1-5, 7-9, and 11-15, which are

all at issue here. Further, the Initial Determination analyzed multiple prior art grounds and references that were never presented as grounds in this proceeding, including Karppanen in view of U.S. Patent No. 8,758,144 (“Williams”). *See* Reply, 11 (citing Ex. 1030 at 255-56, 277-78). It is improper to rely upon a new ground not at issue in the Petition. *See, e.g., B/E Aerospace, Inc. v. MAG Aerospace Indus., LLC*, Case IPR2014-01510 (PTAB Apr. 28, 2015) (Reply); *Palo Alto Networks, Inc. v. Juniper Networks, Inc.*, Case IPR2013-00369 (PTAB Feb. 5, 2014) (Paper 37).

Putting aside the different scope of evidence and challenged claims, the Initial Determination is otherwise unreliable and prejudicial. The ITC’s standards of proof and admissibility are different from the PTAB’s. *Id.* at 1569; 37 C.F.R. § 42.62 (Federal Rules of Evidence apply in IPR proceedings, including the rule against hearsay); 19 C.F.R. § 210.37 (*all* “[r]elevant, material, and reliable evidence shall be admitted” as evidence at an ITC hearing). Evidence which is *inadmissible* here, such as hearsay, is *admissible* at ITC hearings. *Certain Electrical Connectors and Cages*, Inv. No. 337-TA-1241, Order No. 40 at 5, n.1 (Nov. 1, 2021). These conclusions which are based on evidence that would not be admissible here should be afforded no weight.

C. As a Matter of Law the ITC Lacks the Authority to Invalidate a Patent and the ITC’s Finding are not Binding on the PTAB.

As Director Vidal explained, the ITC lacks authority to invalidate a patent.

Memorandum Re: Interim Procedure for Discretionary Denials in AIA Post-Grand Proceedings with Parallel District Court Litigation, UPSTO 6 (June 21, 2021) (citing *Tandon Corp. v. U.S.I.T.C.*, 831 F.2d 1017, 1019 (Fed. Cir. 1987)). “Therefore, an ITC determination cannot conclusively resolve an assertion of patent invalidity, which instead requires either district court litigation or a PTAB proceeding to obtain patent cancellation.” *Id.*; see also *Texas Instruments Inc. v. Cypress Semiconductor Corp.*, 90 F.3d 1558, 1569 (Fed. Cir. 1996) (holding ITC decisions are not binding on district courts).

D. The ITC’s Initial Determination—As Indicated By Its Title—Is Non-Final and Subject to Review.

Using the Initial Determination as affirmative evidence of invalidity is additionally unreliable because it is not the final determination of the ITC. The Initial Determination, though labeled “Final,” is not the final ruling of the Commission. Before the Commission issues its own independent factual and legal findings, it reviews both the Initial Determination and the parties’ challenges to the factual and legal findings of the ITC. 19 C.F.R. 210.45(c). The parties challenged at least twelve of the ITC’s findings in the Initial Determination. See *Certain Outdoor and Semi-Outdoor Electronic Displays*, Inv. No. 337-TA-1331, Summary of Complainant

MRI's Petition for Review, at 3 (Nov. 27, 2023) (Public Version EDIS # 809707), *Certain Outdoor and Semi-Outdoor Electronic Displays*, Inv. No. 337-TA-1331, Respondents' Contingent Petition for Review, at 5-6 (Nov. 27, 2023) (Public Version EDIS # 809711). Thus, the findings in the Initial Determination may be modified, reversed, set aside, or remanded. The Board should afford such a preliminary finding no weight.

In the Matter of CERTAIN OUTDOOR AND SEMI- OUTDOOR ELECTRONIC DISPLAYS, PRODUCTS CONTAINING SAME, AND COMPONENTS THEREOF	Inv. No. 337-TA-1331
FINAL INITIAL DETERMINATION ON VIOLATION OF SECTION 337	

Ex. 1030.

The Initial Determination should not be evidence of patentability in this proceeding. *HTC Corp. v. Tech. Props. Ltd.*, No. 5:08-cv-00882-PSG, 2013 WL 4782598, at *2-3 (N.D. Cal. Sept. 6, 2013) (excluding an Initial Determination from the ITC as evidence under Rule 403). Because the ITC considered evidence that would not be admissible in the instant proceeding, the conclusions reached in the Initial Determination—which may be changed and modified in the Commission Decision—are unduly misleading and prejudicial. Any probative value of the narrowly overlapping claims addressed in the Initial Determination and this

proceeding is outweighed by the preliminary nature and prejudicial effect of relying upon the Initial Determination. The Board should afford Exhibit 1030 no weight, to the extent it is accepted at all.

III. Petitioners’ Arguments Regarding Karppanen in View of Larson Fail to Demonstrate Invalidity.

The combination of Karppanen and Larson does not teach a heat exchanger and the required closed loop as required by claims 1-15. Further, Karppanen fails to teach a polarizer, anti-reflective film, and solar energy reduction layer—and any proposed combination with Larson to obtain those elements is the mere application of hindsight rationalization to reach the elements of the claimed invention.

A. Petitioners Fail to Support their “Plain and Ordinary” Meaning of Heat Exchanger.

Independent claim 6, and dependent claims 3 and 15 require a “heat exchanger.” But the same claims further recite that that the heat exchanger itself forms part of the open loop and closed loop pathways. *See, e.g.*, claim 6 (“a first portion of said heat exchanger forms part of said open loop airflow pathway, and wherein a second portion of said heat exchanger forms a part of said closed loop gas circulation pathway”).

“Heat exchanger” is a term of art in this field, and it is used according to its ordinary meaning in the context of the ’142 Patent. Ex. 2024 at ¶¶ 43-46, 60-61. The claim language describing the concept that the heat exchanger must *form* the loop

pathways confirms that the heat exchanger referred to in claims 3, 6, and 15 is the thermal class of devices containing tubes or channels for fluid to pass through and transfer heat. *Id.* ¶¶ 43-44, 84. The '142 Patent specification describes heat exchangers in depth, and in all embodiments, the described heat exchangers are thermal management devices containing tubes/channels for fluid-to-fluid thermal transfer. *Id.*, ¶¶ 43-46; Ex. 1001, 4:25-5:14; Paper 17, Patent Owner Response (“POR”), 20-21. Similarly, the '736 Provisional—incorporated by reference in the '142 Patent specification—describes the heat exchanger and shows the signature tubes/channels of a heat exchanger device. *See* Ex. 2010, 4:52-5:11, Pictures 5-7.

Petitioners never deny that a “heat exchanger” is a term of art. In fact, Petitioners’ expert, Smith-Gillespie, has acknowledged that the claimed “heat exchanger” is different from other thermal management devices. Ex. 1002 at ¶¶ 61-62; Ex. 2058 at 34:15-38:5-11. Despite this, Petitioners propose that the plain and ordinary meaning of heat exchanger “is a device used to transfer heat from the closed loop pathway, i.e. the circulation gas, to the open loop pathway, i.e. the ambient gas.” Reply, 5. Petitioners adopt this broad definition so that they can map Karppanen’s heat sinks—which are not heat exchangers—to this claim element. *Id.* at 4.

Petitioners’ broad definition reads out the limitation “heat exchanger” and thus the claimed invention. As a matter of simple thermodynamics, any material

located between a hotter area and a cooler area will transfer heat from the area of higher temperature to the area of lower temperature. Ex. 2024, ¶ 94, Ex. 2015 1252:4-18. Thus, under Petitioners’ construction, *any* structure with two air pathways of different temperature meets the claim. To arrive at this conclusion, Petitioners ignore the clear disclosure of the specification and instead rely upon extrinsic evidence.

1. Petitioners Confuse “Many” with “Any” to Support their Attempt to Map “Any” Structure to a “Heat Exchanger”.

Petitioners consistently confuse the concept that there are *many* heat exchangers with the incorrect suggestion that *any* structure across which heat transfers is a heat exchanger. For example, in their Reply, Petitioners point to one sentence in the ’142 Patent specification that “*many*” types of heat exchangers are known to support the conclusion that *any* device can be a heat exchanger. Reply at 7-8 (citing Ex. 1001 4:22-25 (“However, *many* types of heat exchangers are known and can be used with any of the embodiments herein.”)). In the ’142 Patent specification, this sentence follows the preferred embodiment—a cross-flow heat exchanger—and precedes a section describing heat exchangers in greater detail. *Compare* Ex. 1001, 4:21-23, *with id.*, 4:25-5:14. The remainder of the specification consistently describes all of these heat exchangers as having channels or tubes that form the airflow pathway and allow two separated fluids to pass through and

exchange heat. *See, e.g., id.*, 4:29-31; 4:35-37; 4:42-44; 4:55-57. The statement regarding “**many**” heat exchangers merely confirms what all other evidence in this proceeding has shown: there are many kinds of heat exchangers, and all of them use a channel/tube structure for two contained alternating fluid streams to exchange heat.

Petitioners repeatedly point to isolated testimony regarding the overall function of a heat exchanger—to exchange heat from one fluid to another—to justify the idea that **any** device which transfers heat from one fluid to another is a heat exchanger. *See* Reply, 5 (quoting Ex. 1031, 19:8-9 (“[a] heat exchanger, typically, is used to remove heat from one fluid stream to another, typically”). These isolated statements **do** describe the high-level functional principle of a heat exchanger. However, these statements are offered by Petitioners as the definition of a heat exchanger. Instead, when all these statements are viewed in the full context, they describe and evidence that heat exchangers are a **category** of thermal management device, which is not met by **all** thermal management devices.

For example, Petitioners point to the first two sentences from the “Heat Exchangers” chapter of the Incropera textbook (Ex. 2016) to support the idea that any solid wall which exchanges heat between two fluids at different temperatures is a heat exchanger. Reply, 9. However, this chapter—consisting of 37 pages—describes **many** different heat exchanger configurations. Ex. 2016, 675-712. Each of these configurations—including the simplest design—includes enclosed tubes

through which alternating fluids flow and exchange heat. *See id.* at 676-77 (describing “*shell-and-tube*” heat exchangers) (emphasis in original). In Incropera, these *many* types of heat exchangers described in Chapter 11 are described separately from other devices which transfer heat between warm bodies to cooler bodies. *See, e.g., id.* (describing heat sinks in Chapters 3 and 5 on conduction methods). Thus, Incropera confirms the understanding that *many* forms of channeled and tubed heat exchangers exist, but not all thermal management devices are heat exchangers.

Petitioners selectively quote from introductory sentences in both the specification and extrinsic evidence—ignoring the greater context of the surrounding description. In so doing, Petitioners violate the rule that the meaning of claim terms must be derived from the claims and specification 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 v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005). By ignoring the surrounding claim language and entire disclosures of the specification, Petitioners arrive at a plain and ordinary meaning that is broader than provided for by the patent itself.

2. Petitioners’ Plain and Ordinary Meanings of what Constitutes a Heat Exchanger are Ever Shifting.

Petitioners inconsistently apply their own proffered plain and ordinary meaning of heat exchanger—sometimes concluding that devices which transfer heat from a closed loop to an open loop *are not* a heat exchanger. For example, in Thielemans, a newly asserted reference that was not part of any ground in the Petition, Petitioners argue a thermal plate between an open and closed loop is the claimed “heat exchanger.” Reply, 8-9. Petitioners then point to a thermal plate in the ’064 Provisional and conclude that same structure is not a heat exchanger. *Id.* at 10. Petitioners make this conclusion despite the clear disclosure that the plate, which contained fins on the other side, transfers heat from the hotter open loop to the cooler closed loop. *Id.* (quoting Smith-Gillespie Ex. 2021, 73:22-75:3). Doing so confirms that Petitioners’ changing “plain meaning” is improper.

Petitioners again inconsistently apply their definition of a heat exchanger to the newly asserted Nagashima reference, which was not part of any ground in the Petition. Petitioners point to a heat sink in Nagashima, which has fins on only one side of the device, as falling within the scope of a heat exchanger. *Id.*, at 6.¹ However,

¹ During Dr. Pokharna’s deposition, Petitioners introduced Nagashima, a reference not asserted in this Petition. *See* Ex. 1032. Petitioners asked how Nagashima

this application of Petitioners’ plain and ordinary meaning of heat exchanger is contrary to its assertion that such a one-sided finned structure cannot be a heat exchanger in the ’064 Patent. *Compare id.*, with *id.* at 10.

Petitioners state that *any* device that transfers heat from a hotter fluid to a cooler fluid should be considered a heat exchanger. *Id.* at 5. Petitioners then attempt to justify Smith-Gillespie’s finding that the ’064 Provisional does not describe a heat exchanger by saying only devices which have fins in both the open and closed loops can be a heat exchanger. *Id.* at 10. Petitioners then conversely argue that the single-sided finned structures in Nagashima and the zero finned structures in Thielemans constitute heat exchangers. *Id.* at 6, 8-9. Petitioners’ lack of coherency in their application of their own proffered plain and ordinary meaning of heat exchanger illustrates demonstrates that this construction is improper.

disclosed the airflow pathways claimed in a different patent—which does not claim a heat exchanger. *See* Ex. 1032, 40:13-42:9. Dr. Pokharna referred to Nagashima’s heat sink—in passing—as a heat exchanger. *Id.* at 41:23-42:9. Such use was in keeping with what Dr. Pokharna has repeatedly asserted: “persons of skill in the art will sometimes refer to a device that moves heat as a heat exchanger.” Dr. Pokharna did not opine that Nagashima disclosed the heat exchangers claimed in the ’142 Patent.

B. Karppanen Does Not Teach a Heat Exchanger.

Karppanen does not teach a heat exchanger or any structure that resembles the multiple channeled device that forms the open loop and closed loop pathways. Instead, Karppanen describes three different thermal management devices that may be used within its enclosure to facilitate cooling: (1) a finned plate, (2) a heat sink, or (3) a thermoelectric device called a “Peltier element.” Ex. 2024, ¶¶ 85-93, 165. To read over the flaw, Petitioners tie themselves in mental knots to explain why a heat sink should fall within the scope of a heat exchanger. In so doing, Petitioners forego the proper claim interpretation methodology, which looks first to the claim language, then to the specification, then the prosecution history, and, only if needed, extrinsic evidence. *Phillips*, 415 F.3d at 1317.

The surrounding claim language in claims 3, 6, and 15 indicate that the heat exchanger must form part of the loop pathway itself—supporting the conclusion that the heat exchanger is a tubed/channeled device. The specification consistently refers to heat exchangers as containing channels or tubes for gas and airflow. Ex. 1001 at 4:4:25-5:14; Ex. 2010 (“Heat Exchanger for an Electronic Display”) 4:52-5:11, Pictures 5-7. A POSITA would not agree that *any* device which transfers heat is a heat exchanger. Indeed, a POSITA would understand from the specification that a finned structure such as those described in Karppanen were inadequate to provide the cooling necessary for the outdoor applications that were the subject of Mr.

Dunn’s invention. Ex. 1001 2:1-7, 2:16-29. Instead, a POSITA would recognize that the heat exchanger referenced in the ’142 Patent refers to the channeled and tube structure of a heat exchanger device. This heat exchanger is not described or named in Karppanen, and as a result Petitioners’ arguments fail.

C. Larson Teaches Away from Using its System to Reduce Thermal Energy Entering the System.

Larson teaches away from using its system to *prevent* energy from entering the system as its polarizers are intended to *absorb* energy entering the system. POR, 51; Ex. 1005 (Larson) 3:19-20, 3:59-60. Petitioners fail to rebut this evidence. Instead, Petitioners merely argue that Larson’s teaching away from reducing energy entering this system is an “unsupported attorney argument.” Reply, 14.

Petitioners are incorrect. Dr. Pokharna opined in Paragraph 171 that “Larson does not once mention the issue of heat stress and thermal management of display systems, and even describes its technology as ‘absorbing’ solar energy—rather than deflecting and preventing that energy from entering the system.” Ex. 2024. Dr. Pokharna went on to explain that “Larson’s teaching of ‘absorbing’ solar energy would teach away from combining it with a system like Karppanen that expressly teaches its purpose is to reduce thermal load.” *Id.*

Petitioners’ failure to address this expert testimony underscores that the combination is little more than hindsight rationalization. Indeed, there is no reliable

evidence of a motivation to combine. For example, Petitioners again rely upon the finding in the Initial Determination that both Karppanen and Larson “indicate the importation of display contrast and heat reduction.” Reply, 14. However, Petitioners point to no disclosures in Karppanen or Larson to verify this statement. Nor could they. Larson does not discuss heat reduction—a separate and distinct problem from optical display contrast. *See generally*, Ex. 1005.

IV. Yare in View of Larson Fails to Render the Challenged Claims Obvious.

Yare in view of Larson fails to render the Challenged Claims obvious because neither teaches (1) a closed loop which passes around the electronic image assembly and (2) necessary structural elements of the heat exchanger as required by claims 1-15. Further, Yare fails to teach a polarizer, anti-reflective film, and solar energy reduction layer—and any proposed combination with Larson to obtain those elements is the mere application of hindsight rationalization to reach the elements of the claimed invention.

A. Yare in View of Larson Does Not Disclose a Closed Loop that Travels Around the Electronic Image Assembly, Between the Front Glass and Electronic Image Assembly Front Surface.

Throughout their Reply, Petitioners maintain that the Initial Determination “credited testimony from Mr. Smith-Gillespie, who also submitted a declaration on behalf of Samsung in this proceeding (Ex. 1002).” Reply, 2; *see also id.* at 4, 14, 18. Petitioners omit, however, the portion of the Initial Determination that struck Smith-

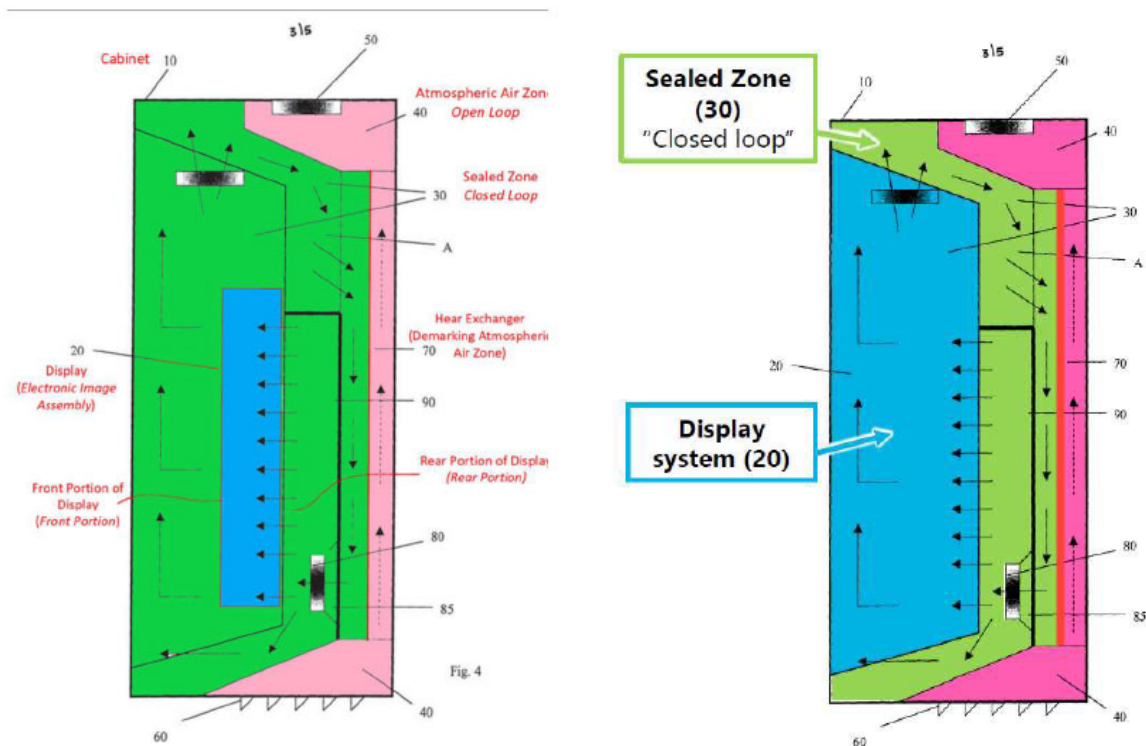
Gillespie’s testimony on Yare. The ITC struck this testimony after it became clear that Smith-Gillespie had changed his opinions upon realizing he made an error in his original declaration—the same opinions submitted in his declaration in this proceeding.

Yare does not disclose “a closed loop gas circulation pathway contained within the housing, *wherein a portion of said closed loop gas circulation pathway passes between said transparent cover panel and said electronic image assembly*” as required by claims 6, 1, and 12. Yare does not describe the electronic image assembly placed inside of its cabinet, and thus does not disclose anything regarding airflow around that unnamed component. POR, 40-47; Ex. 2024, ¶¶ 127-133. Instead, Yare merely states a fully formed electronic display product may be placed in to Yare’s cabinet, and air is sealed in the cabinet. POR, 44-47; Ex. 2024, ¶¶ 69, 129-32, 177. Petitioners misread Yare to conflate “electronic display” with “electronic image assembly,” and arbitrarily draw a blue rectangle into the Figures of Yare in an unsupported and faulty attempt to show a closed loop pathway that is not otherwise disclosed in Yare. *Id.*

During his deposition, Smith-Gillespie conceded that the “display 20” of Yare did not refer to just an electronic image assembly but a fully formed display containing its own internal fan cooling system. *See* Ex. 2058, 137:1-138:10 (conceding Yare discusses a display 20 with its own internal fan system); *id.*,

138:15-139:11 (conceding the different forms of display products listed in Yare would each have a “somewhat” different cooling system).

This testimony that the display 20 is a fully formed product with its own cooling system is inconsistent with Smith-Gillespie’s prior conclusion that display 20 is an electronic image assemble (i.e. only the panel portion of an electronic image assembly) and that the L-shaped arrows and Larson show airflow around that assembly. *Compare* 1030 at 264 (Smith-Gillespie’s annotation of Fig. 4—the same as his annotation in this Petition), *with id.* at 265 (Smith-Gillespie’s annotation of Fig. 4 at the hearing).



The ITC thus struck this inconsistent testimony. *Id.* at 260-65. The Board should similarly discount Smith-Gillespie’s improper analysis of Yare. In particular because Smith-Gillespie’s modified testimony confirms that Yare does not disclose the flow of cooling air between the front of the electronic image assembly and the front glass. Because Yare does not teach anything regarding airflow within the electronic display, and whether any air would flow between whatever electronic image assembly and front glass portion, Yare fails to render the Challenged Claims obvious.

B. Petitioners Provide No Reply to the Lack of Motivation to Combine Yare with Larson.

A POSITA would not be motivated to combine Yare with Larson for many reasons—at least one of which is Larson’s teaching away from energy reduction. As with the Karppanen ground above, Petitioners do not respond to MRI’s affirmative evidence regarding the lack of motivation. Reply, 18. Instead, Petitioners merely urge the Board accept their motivation to combine because it should accept Karppanen’s motivation to combine with Larson. This is irrelevant to a combination involving Yare and cannot carry Petitioners’ burden of proof.

V. Secondary Considerations of Nonobviousness.

A. There is Nexus to All of the Evidence Presented.

MRI established at the ITC that: (1) it has a domestic industry, i.e., that MRI makes practicing products in the United States, and (2) that Samsung’s accused

products practice the claimed invention. Ex. 1030 at 137-42, 167-72. Thus, there is a presumption of nexus to the practicing products made by MRI and by Petitioners. *PPC Broadband, Inc. v. Corning Optical Commc'ns RF, LLC*, 815 F.3d 734, 747 (Fed. Cir. 2016).

B. Long-Felt but Unmet Need for Effective Cooling

Samsung's White Paper² tells the story of the development of outdoor displays in its own words. Ex. 2025. Customers wanted to "tak[e] the message outdoors" using digital displays but confronted a big obstacle that prevented this: heat from the sun and the backlight and electronics inside the display. Ex. 2025, 2-3. Samsung does not dispute there was a long-felt need for displays with effective cooling to enable use outdoors and instead argues that "the claims are not limited to outdoor displays." Reply, 19.

Samsung confuses the *long-felt need* with the *claimed invention* that meets the need. The Federal Circuit's recent *Volvo Penta* opinion is instructive. *Volvo Penta of the Americas, LLC v. Brunswick Corp.*, 81 F. 4th 1202 (Fed. Cir. 2023). There,

² Samsung notes that the ITC did not give significant weight to MRI's secondary consideration evidence. Reply, at 19. The ITC record was different and did not include Samsung's White Paper tying the long-felt need for outdoor displays and later commercial success to cooling innovations.

the Court identified “safe wakesurfing on stern-drive boats” as a long-felt need, even though the claims were directed to “a tractor-type stern drive for a boat” without any mention of wakesurfing in the claims. *Id.* at 1206, 1214. The Court found error in the Board’s failure to give weight to this unmet need for a safer drive for wakesurfing. *Id.* at 1214. Likewise here, there was a long-felt need for outdoor displays (which require effective cooling), and MRI developed and claimed displays with an effective cooling system that enabled use outdoors. Like *Volvo Penta*, MRI’s invention met the need where others had not.³

Samsung asserts there was no unsolved need because Karppanen and Yare disclosed cooling systems for outdoor displays. Reply, 19. This is incorrect. As the ’142 Patent explains, there were conventional heat transfer systems that “enjoyed a measure of success in the past” but “even greater cooling capabilities” were needed for outdoor use. Ex. 1001, 1:61-2:25. Karppanen and Yare were typical conventional approaches that the patent explains were not sufficient. Karppanen simply placed heated air “into convectively thermal communication with fins,” which was conventional and inadequate. Ex. 1001, 2:6-7. Yare offered no cooling over the front surface of the display, an approach that “is not adequate” especially when solar

³ In *ABT Sys. LLC v. Emerson Elec. Co.*, 797 F.3d 1350, 1362 (Fed. Cir. 2015), unlike here, the prior art taught a system that met the alleged unmet need. *Id.*

radiation becomes a major factor for large-format displays. Ex. 1001, 2:15-29; *supra* Section IV. And significantly, Samsung offers no evidence of any product based on Karppanen or Yare that met the undisputed long-felt need detailed in its White Paper.

C. Failure of Others

Testimony from Samsung former engineer Sung Ki Kim establishes failures spanning a decade. Samsung was researching outdoor LCD displays by 2005 but did not have a product. Ex. 2029, 46:7-15. Samsung contends the challenged claims would have been obvious, but Samsung did not create a product at that time. Samsung did not launch a product until 2010-2012 and even then, resorted to air conditioning. Ex. 2029:46:16-47:22. Samsung later introduced its OHD product in 2013-2015, which proved a failure because the “generated heat, was not being taken out well.” Ex. 2029, 51:1-9. In 2016, Samsung launched its infringing OHF product line (including heat exchangers) that finally proved successful. Ex. 2029, 53:1-4.

Samsung argues there is “no evidence ... that it had any difficulties,” which is incorrect based on Mr. Kim’s testimony. Samsung also argues there is no evidence that it worked “continuously during that time,” but there is no requirement that failures be continuous to serve as evidence of nonobviousness. Finally, Samsung argues that MRI has not established that the failures were due to the lack of the claimed features. This ignores Samsung’s repeated failed products lacking the claimed features, which contrast with its ultimate success using the inventions of the

challenged claims. POR, 57-58.

D. Copying

The facts show that Samsung failed to develop its own product and then created a successful infringing product while having access to the claimed design. POR, 60-61. Copying “requires duplication of features of the patentee’s work based on access to that work.” *Institut Pasteur & Universite Pierre Et Marie Curie v. Focarino*, 738 F.3d 1337, 1347-48 (Fed. Cir. 2013). This is exactly what Samsung did. Indeed, Samsung does not dispute that it performed teardowns and thereafter released its own products incorporating key features of the product it tore down. Reply, 20-21. Samsung’s teardown analysis details heat exchangers in the pathway of the open and closed loops, a feature of the inventive cooling system which Samsung incorporated into the cooling system of its own large-format OH displays. Ex. 2042, 61-63; Ex. 2039, 7-8, 11, 13. Samsung resorts to disputing the precise date of its teardown analysis but cannot dispute it had access during product development of its copy-cat product. Ex. 2030, 189:16-191:1. Samsung also cites testimony of its engineer that it was a common practice “for Samsung to review outdoor displays of

other companies,” suggesting that Samsung’s copying culture⁴ somehow negates its copying. Reply, 21 (citing Ex. 1038, 6:11:22). It does not, and instead supports a finding of nonobviousness.

E. Commercial Success

Samsung does not dispute that Samsung and MRI’s products practice the challenged claims and are commercially successful.⁵ POR, 59-61. Samsung instead argues that MRI is not entitled to a presumption of nexus because the products are not coextensive with the claims. Reply, 21-22. First, almost all of the “features” and “highlights” that Samsung identifies (at 22) are, in fact, features or benefits of MRI’s invention discussed in the ’142 Patent, including the cover glass with solar reduction layer which Samsung terms “Magic Glass” (Ex. 1001, 5:63-6:12), “slim design” (*id.*, 5:11-14), water and dust resistant “IP56” certification (*id.*, 5:28-49), and “excellent visibility” (*id.*, 5:25-28, 9:25-35). And providing “Extreme Outdoor Durability” by

⁴ Samsung was recognized as a “fast follower” and “not an innovator.” *Apple, Inc. v. Samsung Elecs. Co., Ltd.*, No. 12-CV-00630-LHK, 2014 WL 7496140, at *8 (N.D. Cal. Aug. 27, 2014).

⁵ There is no requirement that commercial success evidence be domestic. *See Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1255 (Fed. Cir. 1989).

protecting against overheating is a key feature of the invention.

Furthermore, even if there were other product features, “[i]t is not necessary ... that the patented invention be solely responsible for the commercial success, in order for this factor to be given weight....” *Oren Techs., LLC v. Proppant Express Investments LLC*, No. 2019-1778, 2021 WL 3120819, at *7 (Fed. Cir. July 23, 2021).

Finally, regardless of whether there is a presumption, the evidence shows that the success of MRI’s and Samsung’s products is attributable to the effective cooling systems. Indeed, there was no market for outdoor LCD displays until MRI’s patented inventions and a market would not exist but for the inventions. Exs. 2001, 2025. This is shown by the White Paper in which Samsung observed that “[t]he many barriers that limited how digital screens could be used outdoors and in direct sunlight have all come down.” Ex. 2025, 2. Earlier adopters failed, but “years of insights and experience” and “engineering advances” made putting screens outdoors “entirely possible.” *Id.* Samsung recognized that ***MRI was the “pioneer” who “entered into a virgin space”*** and Samsung wanted to form a “collaboration in the outdoor space.” Ex. 2001. This is strong evidence that the market for outdoor displays is attributable to MRI’s pioneering technology. *Id.* Marketing documents show that thermal management was the leading focus of Samsung’s effort to sell to its largest customer. Ex. 2038, 8-27. And Samsung customer John Palmer, who is an integrator for Samsung OH displays for end users, testified that customers requested Samsung

displays because of their cooling systems. Ex. 2032, 118:6-119:8. This evidence ties the commercial success to the claimed inventions.

F. Industry Praise and Licensing

Samsung attacks the White Paper for not mentioning MRI and attacks Romulus Stoain's email for not identifying specific products. Reply, 23. These attacks miss the mark. The White Paper shows the need, importance, and enormous challenge to provide effective cooling. Ex. 2025. And the Stoain email shows that Samsung recognized it was Bill Dunn that pioneered the outdoor space with his technology. Ex. 2001. This direct praise is entitled to significant weight.

Samsung attacks John Palmer's testimony as purportedly failing to establish what features create "the desirable effect" in the infringing products. Reply, 23. This is nonsensical. The testimony is clear: customers want Samsung because sunlight causes other displays to get hot and develop black spots where the liquid crystals are overheated. Ex. 2032, 118:21-119:8. In other words, the demand for Samsung is driven by its ability to prevent overheating, which is accomplished by the infringing cooling system.

Finally, Samsung argues that MRI's licenses lack a nexus because they encompass patents other than the '142 Patent. Reply, 24. Samsung's cited case actually supports giving some weight to licenses even where they are not limited to the single patent at issue. *Shoes by Firebug LLC v. Stride Rite Children's Grp., LLC*,

962 F.3d 1362, 1373 (Fed. Cir. 2020). Here, Samsung's main competitor, LG, has not only licensed MRI's patents but has entered a JV for marketing MRI's products. Exs. 2049, 2050. And another licensee specifically licenses the '142 Patent family. Ex. 2051, 10. Together with the other string evidence, these licenses warrant weight as evidence of nonobviousness.

VI. Conclusion

The Board should confirm non-obviousness of all challenged claims.

Dated: January 30, 2024

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CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that this Preliminary Response contains 5,590 words according to the word-processing program used to prepare this paper. The foregoing word count complies with the 5,600 word type-volume limit specified by 37 C.F.R. § 42.24(b)(2).

Dated: January 30, 2024

Respectfully submitted,

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CERTIFICATE OF SERVICE

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

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