

**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

Title: ELECTRONIC DISPLAY WITH COOLING

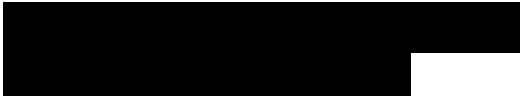
U.S. Patent No. 10,506,740

Inter Partes Review No. IPR 2023-00254

**PETITIONERS' REPLY TO
PATENT OWNER'S RESPONSE**

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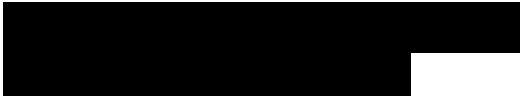
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1002	Declaration of Robert Smith-Gillespie
1003	Curriculum Vitae of Robert Smith-Gillespie
1004	International Patent Application No. PCT/FI2006/050145 with Publication No. WO2007116116A1 (“Karppanen”)
1005	United Kingdom Patent Application No. GB 2402205A (“Yare”)
1006	U.S. Patent App. Pub. No. 2009/0145581 (“Hoffman”)
1007	U.S. Patent No. 8,758,144 (“Williams”)
1008	U.S. Patent App. Pub. No. 2008/0083527 (“Horng”)
1009	U.S. Patent No. 4,488,193 (“Davis”)
1010	U.S. Patent No. 6,392,727 (“Larson”)
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1012	U.S. Patent No. 6,504,713 (“Pandolfi”)

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1013	U.S. Patent No. 5,991,153 (“Heady”)
1014	U.S. Patent No. 6,825,828 (“Burke”)
1015	E. Fred Schubert & Jong Kyu Kim, <i>Solid-State Light Sources Getting Smart</i> , 308 <i>Science</i> 1274 (2005) (“Schubert”)
1016	Military Handbook: Reliability Prediction of Electronic Equipment, DEPARTMENT OF DEFENSE, MIL-HDBK-217F (1991) (“MIL-HDBK-217F”)
1017	Allan Webber, <i>Calculating Useful Lifetimes of Embedded Processors</i> , TEXAS INSTRUMENTS INCORPORATED, SPRABX4 (Nov. 2014) (“Webber”)
1018	LIAN-TUU YEH & RICHARD C. CHU, THERMAL MANAGEMENT OF MICROELECTRONIC EQUIPMENT: HEAT TRANSFER THEORY, ANALYSIS METHODS, AND DESIGN PRACTICES (Dereje Agonafer ed., 2002) (“Yeh & Chu”)
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1023	U.S. Patent No. 4,327,803 to Mullejeans et al. (“Mullejeans”)
1024	U.S. Patent No. 5,002,118 to Olmstead et al. (“Olmstead”)
1025	U.S. Patent No. 6,244,333 to Bergh et al. (“Bergh”)
1026	Claim Construction Order, <i>Mfg. Resource Intl., Inc. v. Civiq Smartscales, LLC</i> , Civil Action No. 17-269-RGA (D. Del. Oct. 3, 2018)
1027	U.S. Patent No. 8,854,572 to Dunn (the “’572 patent”)
1028	U.S. Patent No. 9,629,287 to Dunn (the “’287 patent”)
1029	U.S. Patent No. 9,173,325 to Dunn (the “’325 patent”)
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1034	Declaration of Srikanth K. Reddy in Support of Motion for <i>Pro Hac Vice</i> Admission Under 37 C.F.R. § 42.10(c)
1034	Corrected Declaration of Srikanth K. Reddy in Support of Motion for <i>Pro Hac Vice</i> Admission Under 37 C.F.R. § 42.10(c)
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1042	https://lg-mri.com/boldvu-outdoor-lcd-displays/
1043	Excerpt of October 24, 2018 Deposition Transcript of William Dunn [CONFIDENTIAL]
1044	December 21, 2022 Complainant Proposed Claim Constructions in Investigation No. 337-TA-1331

I. INTRODUCTION

Regarding Ground 1, MRI's primary argument is that Karppanen does not disclose the claimed "heat exchanger" based on an improperly narrow construction. Under the proper interpretation, there cannot be any dispute that Karppanen discloses this limitation. Regarding Ground 2, MRI primarily argues that Yare's "closed loop" does not encircle its electronic image assembly. But the evidence establishes that a POSITA would have understood Yare to teach this, or in the alternative, that it would have been obvious to modify Yare to set its electronic image assembly back from the front cover glass in order to improve heat dissipation.

Therefore, MRI's arguments should be rejected and the challenged claims should be found unpatentable.

II. RELATED ITC PROCEEDING

In the time since MRI filed its Response, Administrative Law Judge Monica Bhattacharyya issued a Final Initial Determination on Violation of Section 337 in related matter *Certain Outdoor and Semi-Outdoor Electronic Displays, Products Containing Same, and Components Thereof*, Investigation No. 337-TA-1331 ("ITC proceeding"). Ex. 1035. The ALJ held that Respondents had shown by clear and convincing evidence that claims 1 and 5 of the '740 patent are invalid as anticipated and obvious over Karppanen [Ground 1]. Ex. 1035, 245–58, 272–73. The ALJ also found that claims 1 and 5 are not obvious over Yare [Ground 2]. *Id.*, 266 –72, 273–

74. The ALJ credited testimony from Mr. Smith-Gillespie, who also submitted a declaration in this proceeding (Ex. 1002).

III. GROUND 1: KARPPANEN RENDERS THE CHALLENGED CLAIMS UNPATENTABLE

MRI's response regarding Ground 1 is focused on two arguments: Karppanen (1) does not disclose a "closed loop" ; and (2) does not disclose a "heat exchanger." Neither of these arguments disrupts the conclusion that Karppanen invalidates the challenged claims.

A. Karppanen Discloses a "Closed Loop"

Karppanen discloses a "closed loop" under both parties' proposed constructions. POR, 10.

MRI does not dispute that Karppanen discloses a "closed loop" under the ALJ's construction, which is "a gas pathway forming a complete loop within a display housing." *See* POR, 19–21. Indeed, Karppanen discloses that fans inside the display casing circulate air in the space created by ducting 66 between the display element and the display casing with gas circulating in a "complete loop" within the housing. Ex. 1004, 9:3–8; *see also id.*, 3:28–32, 4:32–36.

MRI argues that Karppanen does not disclose that its closed loop is "essentially isolated from external air" as required under Samsung's proposed construction. POR, 19. Karppanen, however, clearly discloses this. The '740 patent states that "[p]referably, the gas which travels through the closed loop should be

substantially clear . . . [t]he gas which travels through the closed loop would also preferably be substantially free of contaminants and/or particulate (ex. dust, dirt, pollen, water vapor, smoke, etc.) in order to prevent an adverse effect on the image quality and damage to the internal electronic components.” Ex. 1001, 5:22–30. Consistent with this disclosure, Karppanen discloses that its electronic display is placed into a “closed display casing” that has been made “weatherproof,” and that its device casing is closed through the use of “sealing elements.” Ex. 1004, 6:17–24, 4:6–8, 7:35–38; Ex. 1002, ¶ 122.

MRI argues that Karppanen is “silent as to the IP rating of the enclosure or whether dust and water can enter the system” and that “[a]t most, Karppanen makes reference to a ‘waterproof’ display casing.” POR, 19–20. First, there is no basis, other than conclusory expert testimony, for MRI’s attempt to equate an IP rating with the “closed loop” limitation. *See id.*, 19. Indeed, though MRI’s expert Dr. Pokharna opines that an enclosure must be rated IP55 to be “substantially free from contaminants and/or particulate (Ex. 2024, ¶ 78), he acknowledged that entirely *open loop* systems in the prior art, which use filters to keep out dust and contaminants, have been rated IP56. Ex. 2015, 1279:12–16. Accordingly, an IP rating cannot be used to distinguish a closed loop from an open loop, and Karppanen’s silence as to IP rating does not indicate that it fails to disclose this limitation. Second, MRI ignores the relevant disclosures of Karppanen and

mischaracterizes its disclosure that its display is “weatherproof.” Karppanen’s electronic information board is “suitable for installation outdoors.” Ex. 1004, 3:8–15. Karppanen describes that its ventilator slots “can be provided with filters in order to prevent the access of impurities to the ventilation space,” indicating that dust and contaminants should not enter. Ex. 1004, 7:19–21. Thus, should the Board adopt Samsung’s construction for “closed loop,” it should find that Karppanen discloses this claim element. Notably, the ALJ found that Karppanen discloses a “closed loop of isolated gas” for purposes of U.S. Patent No. 9,629,287, finding Mr. Smith-Gillespie’s testimony “persuasive and supported by Karppanen’s disclosure.” Ex. 1035, 244–45. The ALJ found Dr. Pokharna’s testimony on this issue unpersuasive. *Id.*

B. Karppanen Discloses or, in View of the Knowledge in the Art, Renders Obvious the Claimed “Heat Exchanger”

The parties’ dispute regarding claims 1, 8, and 11 comes down to the meaning of “heat exchanger.” MRI does not dispute that Karppanen discloses a “heat exchanger” under the plain and ordinary meaning as proposed by Samsung. Instead, MRI attempts to improperly limit the claimed “heat exchanger.” MRI’s proposed construction is not supported by the claim language, intrinsic or extrinsic evidence. Further, even if the Board were to adopt MRI’s narrowed construction, the prior art still renders obvious the challenged claims.

1. Plain and Ordinary Meaning of “Heat Exchanger”

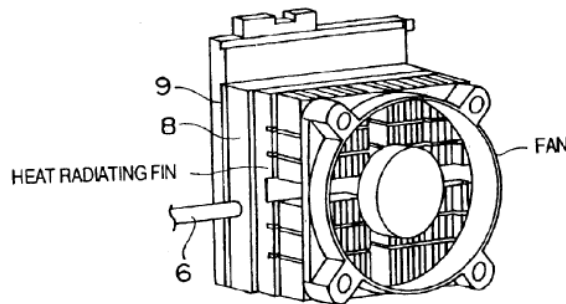
The parties agree that “heat exchanger” as recited in the ’740 patent claims is subject to its plain and ordinary meaning, but dispute what that plain and ordinary meaning is. *See* POR, 10–11. The plain and ordinary meaning of “heat exchanger” is broad and not limited to “a device that uses alternating, enclosed channels or tubes of fluid” as MRI argues. *See id.*, 11. Under Samsung’s plain and ordinary meaning, a POSITA would understand that the claimed “heat exchanger” is a device used to transfer heat from the closed loop pathway, i.e. the circulating gas, to the open loop pathway, i.e. the ambient gas, which includes finned heat sinks as disclosed by Karppanen. Pet. 25–27; Ex. 1002, ¶¶ 123, 129.

Both parties’ experts agreed at the ITC hearing that a “heat exchanger” is a broad term covering many types of structures. Ex. 2014, 998:12–18 (Smith-Gillespie) (“heat exchanger” broadly encompasses a device designed to transfer heat from a relatively hotter body to a relatively cooler body); Ex. 2015, 1251:1–1252:18 (Pokharna) (discussing textbook describing a heat exchanger as a device “exchanging heat between two fluid streams that are not mixed together”). Dr. Pokharna has repeatedly confirmed this understanding. *See* Ex. 2024, ¶ 96 (“Though persons of skill in the art will sometimes refer to a device that moves heat as a heat exchanger . . .”); Ex. 1036, 19:8–25 (testifying that “[a] heat exchanger, typically, is used to remove heat from one fluid stream to other fluid stream,

typically” and is a “pretty broad term” where “there are literally hundreds of kinds of heat exchangers,” but is “broadly used for exchanging heat from one fluid stream to other fluid stream.”).

MRI’s position here that the plain and ordinary meaning of “heat exchanger” is limited to a specific type of “channel/tube” heat exchanger is belied by Dr. Pokharna’s deposition testimony. At deposition, Dr. Pokharna referred to a finned heat sink disclosed in another reference, Nagashima (Ex. 2020), as a “heat exchanger,” even though it does not comprise the “channel/tube” structure that MRI and Dr. Pokharna contend is necessary to satisfy that term. Ex. 2020, 41:23–42:9. Nagashima does not use the term “heat exchanger,” but describes a “heat radiating fin” provided on the “heat receiving head.” Ex. 1037, 7:9–19. When asked how a POSITA would understand the direction of airflow generated by the fan (as seen in Nagashima’s Figure 6B below), Dr. Pokharna explained “it could be taking in air from the inlet . . . and it will go *through the heat exchanger* and then finds its way out of the chassis . . .”). Ex. 1037, 41:23–42:9 (emphasis added).

FIG. 6B



MRI likewise acknowledges that “skilled artisans may colloquially refer to an object that is exchanging heat as a heat exchanger.” POR, 26. To the extent MRI and Dr. Pokharna argue that “the heat exchanger claimed by the patent is more specific” (*see id.*) or “narrower” (Ex. 2024, ¶ 96) than its plain and ordinary meaning, MRI has not argued disclaimer or alternative lexicography, nor would any such argument be supported.

The specification supports Samsung’s understanding. The abstract describes that “[a] heat exchanger may be used to transfer heat from the circulating gas to the ambient gas.” Ex. 1001, Abstract; *see also id.*, 4:11–13 (“By using the heat exchanger 101, heat may be transferred from the circulating gas to the ambient gas.”). The specification goes on to explain: “[i]n a preferred embodiment, the heat exchanger **101** would be a crossflow heat exchanger. However, *many types of heat*

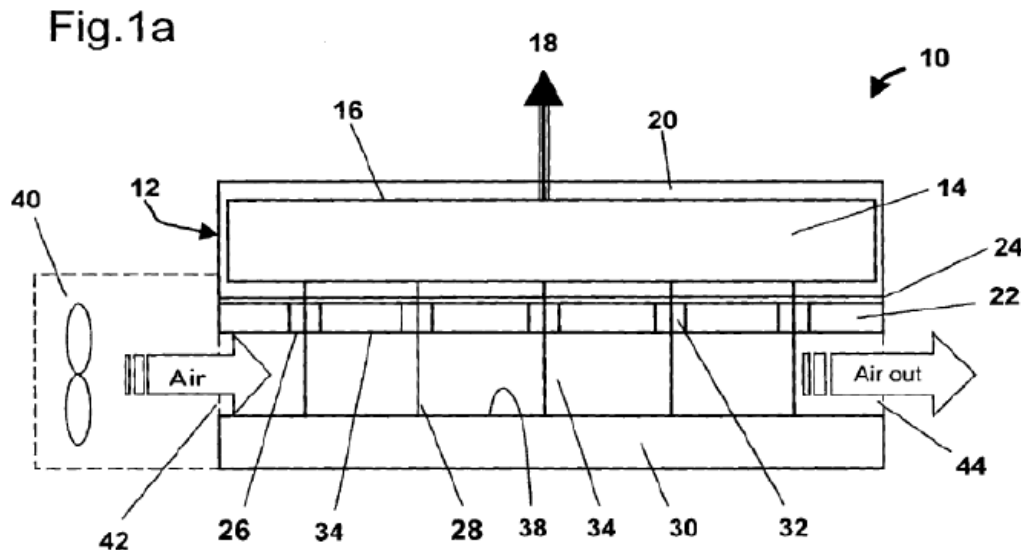
exchangers are known and can be used with any of the embodiments herein.” Id., 4:18–22 (emphasis added).¹

There is also no claim language compelling MRI’s interpretation, nor does MRI argue that there is. *See generally* POR, § VI. Instead, MRI cites the ’740 patent’s description that “[t]he heat exchanger 101 may be a cross-flow, parallel flow, or counter-flow heat exchanger.” *Id.*, 11 (citing Ex. 1001, 4:23–38). But this language refutes MRI’s argument on its face: it makes clear that the heat exchanger “*may be*”—but need not *necessarily* be—one of the three types of exchangers listed. Further, the preceding sentence, as noted above, states that “many types of heat exchangers are known and can be used with any of the embodiments herein.” Ex. 1001, 4:20–22. This express recognition that there are “many” types of

¹ MRI’s argument that Samsung treats “heat exchanger” as a means-plus-function limitation is off base. POR, 17. First, as MRI notes, “a claim term that does not use ‘means’ will trigger the rebuttal presumption that § 112 ¶ 6 does not apply.” *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1369 (Fed. Cir. 2002). Samsung does not argue that this presumption should not apply; nor does MRI. Regardless, “a term need not connote a precise physical structure in order to avoid the ambit of that provision” and both expert’s testimony establish that “an artisan of ordinary skill would understand this term to have an ordinary meaning.” *Id.*, 1369–70.

exchangers forecloses MRI's suggestion that the specification intended the three examples listed to be exhaustive. The Federal Circuit has "repeatedly cautioned" that "claims should not be limited 'to preferred embodiments or specific examples in the specification.'" *VLSI Tech. LLC v. Intel Corp.*, 53 F.4th 646, 652 (Fed. Cir. 2022); *see also Maalouf v. Microsoft Corp.*, No. 2022-1164, 2023 WL 2182284, at *3 (Fed. Cir. Feb. 23, 2023) ("[t]he Board properly declined to import a portion of an exemplary embodiment from the specification into the claim").

MRI's proposed construction is also inconsistent with the prosecution history. As recognized by the Board (Paper 11 (Institution Decision), 26 n. 8), during prosecution MRI did not dispute the examiner's conclusion that the prior art reference Thielemans teaches airflow "through" Thielemans's "heat exchanger," described as "a heat sink 22 in the form of a heat transporting plate," as shown below. Ex. 1031.237-47; Ex. 1030, ¶ [0049], Fig. 1a.



And MRI never tried to distinguish Thielemans on this basis during prosecution. Instead, MRI sought a broad claim scope of the claimed “heat exchanger.”² MRI’s sole response now is to argue that the applicant’s “decision to focus on other flaws of Thielemans” “would not lead a POSITA to ignore the ’740 Patent specification and claim language.” POR, 26–27. But it is only MRI that urges that relevant information be ignored. *See, e.g., Elekta Ltd. v. Zap Surgical Sys., Inc.*, 81 F.4th 1368, 1375 (Fed. Cir. 2023) (finding prosecution history supported motivation to combine where “during prosecution, the patentee notably did not argue that prior art references directed to imaging devices were not relevant art.”).

MRI’s position is also inconsistent with the academic literature on which Dr. Pokharna relies. Dr. Pokharna admitted that “Fundamentals of Heat and Mass Transfer,” which published in 2006 (Ex. 2017), and that MRI refers to as “the dominant thermal management text used at the time of the invention,” broadly

² The plain and ordinary meaning is also reflected by the construction MRI initially sought (and then dropped) for “heat exchanger” in the ITC Proceeding: “[a] device for transferring heat from one fluid to another without allowing them to mix.” Ex. 1044.

describes a heat exchanger as a device “exchanging heat between two fluid streams that are not mixed together.” Ex. 2015, 1251:1–1252:18; Ex. 2017, 676.

MRI misleadingly cites to Mr. Smith-Gillespie’s testimony concerning the ’064 provisional. POR, 13, 24. Mr. Smith-Gillespie explained that the disclosure in paragraph 42 “[m]ore likely defines a heat sink” where “there’s fins on the outsides of this cooling chamber, 40, and it’s just [a] flat plate on the other side.” Ex. 2021, 73:22–74:7. He explained how this differs from Karppanen’s cooling element 32, which would be a “heat exchanger” in the context of the ’740 patent. *See id.*, 74:16–75:3 (“So in Karppanen, we have a fin array in an – in an airflow area that is part of a fin array that’s in another airflow area. So the close[d] loop has a fin array inside of it that captures the heat from the air and transfers it directly to the fin array in the open loop.”). This is not an “arbitrary” distinction as MRI states (POR, 24); indeed, as MRI acknowledges, the claims require that the “heat exchanger” be a “part of the pathway of the closed and open loops.” *See, e.g.*, POR, 11–12.

MRI lastly cites to Dr. Pokharna’s unsupported, vague statement “that commercial sources for thermal management devices also classify heat exchangers separately from other devices such as heat sinks, heat pipes and finned surfaces.” POR, 15 (citing Ex. 2024, ¶ 61). In any case, the claim language, specification, and prosecution history all support a finding that the patentee did not intend to so limit the claims to any particular type of heat exchanger.

Notably, in the ITC proceeding, the ALJ adopted Samsung’s plain and ordinary meaning proposal and rejected the same narrowed construction for “heat exchanger” that MRI proposes here. Relying on the specification, prosecution history, and extrinsic evidence, the ALJ found that “[t]he evidence of record shows that the term ‘heat exchanger,’ as used in the patent, has a broad meaning and is not limited to the heat exchangers specifically described.” Ex. 1035, 252. The ALJ also credited Mr. Smith-Gillespie’s testimony that the heat exchanger disclosed by Williams (Ex. 1007), which Dr. Pokharna agreed in the ITC proceeding discloses a heat exchanger, closely resembles Karppanen’s device. Ex. 1035, 253–54. Although Mr. Smith-Gillespie’s declaration addressed Williams (Ex. 1002, ¶¶ 140–42), MRI and Dr. Pokharna fail to address Williams here.

2. Karppanen Discloses a “Heat Exchanger” as a POSITA Would Have Understood the Plain and Ordinary Meaning

MRI does not dispute that Karppanen discloses a “heat exchanger” under Samsung’s proposed plain and ordinary meaning. *See* POR, 22–28; Pet., 31–33. On a similar record, the ALJ found that Karppanen’s cooling elements 32 “constitutes a ‘heat exchanger’ within the meaning of the ’740 patent.” Ex. 1035, 255.

3. Air Travels “Through” Karppanen’s Heat Exchanger as Claimed

MRI argues that even if Karppanen’s “heat exchanger” falls within the scope of the claims, elements 1[e] and 1[f] and 17[f] and 17[g], which recite air traveling

“through” the heat exchanger, further require the “channel/tube structure” of the heat exchanger. POR, 28–29.

MRI’s argument relies on a misinterpretation of the claim language, which does not require the specific “channel/tube structure” asserted by MRI. Claim 1 recites “a common heat exchanger located in the pathway of both the closed loop gas circulation path and the open loop ambient air flow path,” where the circulating gas and ambient air move “through the common heat exchanger.” MRI emphasizes the word “through,” arguing that the claim language requires the flow paths to pass *through* the device, and argues that this means the device must have tubes or channels. *Id.*, 29. The word “through” is not so narrowly defined, which is confirmed by the prosecution history and the testimony of Dr. Pokharna as discussed above (*see supra* III.B.1), and it easily reaches a finned heat sink like the one disclosed in Karppanen. In Karppanen’s system, heated air in the closed loop within the display casing (10) passes *through* the fins of the first part (60), and relatively cooler ambient air passes *through* the fins of the second part (62) within the cooling space. Ex. 1004, 8:13–27. MRI cannot dispute that air from the open loop and gas from the closed loop is flowing “through” Karppanen’s heat exchanger under the plain and ordinary meaning of “through.” *See Pet.*, 27–32.

MRI also argues that claim 11, which recites that the heat exchanger “includes first and second gas pathways, the first and second gas pathways being isolated from

each other,” also requires “the channel/tube structure of the heat exchanger.” POR, 29. Despite MRI’s contention, that is not recited in the plain claim language. Karppanen’s heat exchanger includes two pathways that are isolated from each other as required by claim 11. Pet., 50–53.

Notably, in the ITC proceeding, the ALJ, crediting Mr. Smith-Gillespie’s testimony, found that “the plain and ordinary meaning of ‘through’ encompasses air flowing between fins, and the evidence shows the circulating gas (and ambient gas) in Karppanen [is] flowing between the fins in their respective airflow pathways.” Ex. 1035, 257.

4. Karppanen Renders Obvious a “Heat Exchanger” Under MRI’s Proposed Construction

Even if a narrower construction of “heat exchanger” were adopted by the Board, MRI has not overcome Samsung’s showing of obviousness. *See* Pet., 29–30. Heat exchangers with the configurations described in the exemplary embodiments of the ’740 patent were known for decades before 2008, and were known to improve heat extraction efficiency. *See* Pet., 29; *see also KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 401 (2007) (“if a technique has been used to improve one device, and a [POSITA] would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.”).

Dr. Pokharna's declaration does not support MRI's contention that "modifying Karppanen to include a heat exchanger would neither be an obvious nor a straightforward modification." POR, 27 (citing Ex. 2024, ¶ 97). Instead, Dr. Pokharna merely opined that another reference (Wellhöfer) that Samsung did not rely on in its Petition "taught that integrating an air-to-air heat exchanger were not easily adaptable" because of their "inflexible design." Ex. 2024, ¶ 97. But Wellhöfer's vague teachings do not support a conclusion that it would be beyond the skill of an ordinarily skilled artisan to modify Karppanen's heat exchanger.

Thus, even if the Board were to adopt MRI's claim construction for "heat exchanger," the Board should find the challenged claims obvious.

IV. GROUND 2: YARE RENDERS THE CHALLENGED CLAIMS UNPATENTABLE

MRI's primary contention is that Yare does not expressly disclose that its electronic image assembly would be encircled by a "closed loop" of air. *See* POR, 37–43. But even if Yare's disclosure were insufficient to convey that teaching, MRI cannot overcome the evidence showing that it would have been obvious for a POSITA to have spaced Yare's electronic image assembly, such as an LCD, within Yare's cabinet back from the front cover glass such that Yare in view of the knowledge in the art renders obvious the challenged claims.

Similar to its arguments for Karppanen, MRI further argues that Yare does not disclose that air flows “through” its heat exchanger. MRI’s argument depends on an erroneous and unsupported interpretation of the claim language.

A. Yare, in View of the Knowledge in the Art, Discloses the Recited “Closed Loop”

MRI argues that Yare does not disclose *any* information regarding the configuration of its electronic display. POR, 37. As recognized by MRI, however, Yare discloses that its cabinet configurations would be adaptable to all different types of displays. POR, 38–39. Even with Yare’s alleged “silence” (*see id.*), a POSITA would have understood how these displays were typically configured (Ex. 1002, ¶¶ 293–98).

In the ITC proceeding, the ALJ found that the evidence “did not show, clearly and convincingly, that Yare disclosed a closed loop gas circulation path ‘about the electronic image assembly,’” and rather, that Yare discloses “one within the electronic image assembly.” Ex. 1035, 268–70. The ALJ, however, did not have the complete record that is before the Board. For instance, the ALJ noted Mr. Smith-Gillespie’s testimony regarding the known spacing of electronic displays from the front display surface, but found that his brief testimony at the hearing—in contrast to the more extensive testimony provided in his declaration—fell short of clear and convincing evidence to support obviousness. *Id.*, 270. As set forth in the Petition and declaration of Mr. Smith-Gillespie, a POSITA would have understood that an

ideal location for the electronic image assembly would have led to the closed loop of air (which MRI does not dispute exists) encircling it as recited in challenged claims 1, 5, 8, and 17. Pet., 69–70; Ex. 1002, ¶¶ 283–86. Accordingly, Yare in view of the knowledge in the art discloses this limitation.

B. Air Travels “Through” Yare’s Heat Exchanger as Claimed

MRI does not dispute that Yare discloses a “heat exchanger.” See POR, 44–47; Pet., 70–72. MRI argues, as it does for Ground 1, that claims 1, 11, and 17 require the “channel/tube structure of a heat exchanger.” POR, 45–46. For the reasons described above, MRI’s interpretation is incorrect. MRI does not dispute that Yare discloses this claim element under Samsung’s proper interpretation. See Pet. 73–75; 76–78.

Notably, the ALJ rejected MRI’s same claim construction arguments and credited Mr. Smith-Gillespie’s testimony, finding that “[t]he evidence shows that this limitation [of claim 1] is met” by Yare. Ex. 1035, 271. The ALJ also relied on Dr. Pokharna’s agreement that the Yare heat exchanger comprises “channels,” and found that “MRI’s position that air flowing in these ‘channels’ is only flowing

‘along’ channels and not ‘through’ the channels is inconsistent with the plain and ordinary meaning of the word.” *Id.*, 271–72.³

Even if the more narrow definition sought by MRI were applied, these configurations of heat exchangers were known, and it would have been well within the POSITA’s ability to implement one in Yare’s design. *See* Pet., 78–82. MRI vaguely argues that “such modifications were not simple” and “required re-working of the electronic display that would have been beyond the skill of a POSITA,” but does not explain why. POR, 47; Ex. 2024, ¶ 142. As explained above (*supra* III.B.4), MRI and Dr. Pokharna’s citation to Wellhöfer’s vague disclosure does not support a finding that it would have been beyond the skill of a POSITA to implement a heat exchanger under MRI’s narrowed construction, as set forth in the Petition.

³ The ALJ also noted that, as here, Dr. Pokharna’s testimony regarding heat exchangers is inconsistent, as his position “that heat exchangers necessarily require ‘flow channels through which you have the two fluids, the heating or the cooling fluid going through it’ is at odds with his argument that Yare discloses a heat exchanger even though—according to Dr. Pokharna—it has air flowing ‘along it’ and not ‘through it.’” Ex. 1035, 255 n. 102.

V. THERE ARE NO SECONDARY CONSIDERATIONS OF NONOBVIOUSNESS

MRI has failed to establish that any secondary considerations of nonobviousness exist or that they have a nexus to the Challenged Claims. Indeed, in the ITC proceeding, the ALJ found MRI's alleged secondary considerations were "not entitled to significant weight." Ex. 1035, 288.

A. Long Felt Need, Failure, and Copying

MRI fails to identify any evidence of a long-felt but unmet need that has any nexus to the Challenged Claims. While MRI claims that there was a need for outdoor displays with cooling technology (POR, 56), the claims are not limited to outdoor displays. *See ABT Sys., LLC v. Emerson Elec. Co.*, 797 F.3d 1350, 1362 (Fed. Cir. 2015) (rejecting argument of long-felt need that "ignores the scope of claim 1, which does not set forth limits on how long or how often periodic fan operation is to be performed"). Moreover, MRI does not set forth how the Challenged Claims satisfy any alleged unsolved need, given that prior art such as Karppanen and Yare disclosed cooling systems for outdoor displays. *See* Ex. 1035, 289–90 (rejecting MRI's similar long-felt need argument).

MRI also has not established any failure of others. First, there is no evidence that Samsung failed. Sung Ki Kim's testimony that Samsung started researching outdoor displays around 2005 but did not launch a product until 2010–2012 does not establish "a decade of failures." *See* POR, 57–58 (citing Ex. 2029, 45:22–47:22);

Ex. 1035, 290 (“[T]he evidence regarding ‘failure by others’ is unpersuasive.”).

There is no evidence that Samsung worked on the display continuously during that time or that it had any difficulties. Second, MRI has not established that “these prior attempts failed because the devices lacked the claimed features.” *See Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1313 (Fed. Cir. 2006).

MRI’s citation of a Samsung slide deck and photographs that include comparative analysis of [REDACTED] products do not establish copying. POR, 61 (citing Exs. 2042, 2043). Indeed, MRI has not identified any features of the [REDACTED] that Samsung allegedly copied. *Iron Grip Barbell Co., Inc. v. USA Sports, Inc.*, 392 F.3d 1317, 1325 (Fed. Cir. 2004) (“copying requires the replication of a specific product”).

Moreover, by the time of Samsung’s competitor analysis of [REDACTED], Samsung had already fully designed the cooling scheme for its products. Ex. 1038, 612:11–13, 613:14–25, 614:1–18 (Lee); Ex. 2040 (showing sales of [REDACTED] units in 2016); Ex. 2042, 65 (showing photographs and test results of Samsung OH55F and OH85F). While MRI asserts that Samsung disassembled [REDACTED] in “early 2016,” Samsung engineer Sungsu Lee testified that the March 24, 2016 date on the slide deck cover is incorrect, as confirmed by a photograph of the [REDACTED] within the slide deck that indicates an October 2016 manufacturing date. Ex. 1038, 611:23–612:10; Ex. 2042, 34, 69; Ex. 1035,

292. Moreover, comparative product analysis is a common industry practice. Ex. 1038, 611:6–22; Ex. 1035, 292 n. 117 (“a tear-down of another company’s product is not unusual.”); Ex. 1039, 159:10–24. Accordingly, there is no evidence of copying.

B. Commercial Success

MRI did not attempt to prove a nexus between the alleged commercial success of its own or Samsung’s products and the Challenged Claims, nor is it entitled to a presumption of nexus. A rebuttable presumption of nexus arises only where “the patentee shows that the asserted objective evidence is tied to a specific product and that product embodies the claimed features, and is coextensive with them.” *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (cleaned up). “[I]f the patented invention is only a component of a commercially successful machine or process, the patentee is not entitled to a presumption of nexus.” *Id.* (cleaned up).

MRI’s conclusory claims of coextensiveness should be rejected. POR, 58, 60. And regardless, coextensiveness requires more than a showing that the claims cover a product practicing the patents. *Fox Factory*, 944 F.3d at 1377 (rejecting “attempt to reduce the coextensiveness requirement to an inquiry into whether the patent claims broadly cover the product that is the subject of the evidence of secondary considerations.”). Whether a product is coextensive with the patent depends on,

among other things, the significance of unclaimed features. *Id.* at 1374–75. Neither MRI nor its expert has undertaken such an analysis.

As the ALJ found, both Samsung’s and MRI’s products have numerous unclaimed features. Ex. 1035, 296–97. Indeed, Samsung’s marketing documents identify a number of “features” and “highlights” such as “Magic Protection Glass,” “Slim Design,” “IP56” certification, “excellent visibility” with a high contrast ratio, and “Remote Management.” *See, e.g.*, Exs. 1040, 1041. Likewise, MRI’s products identify a number of features unrelated to the Challenged Claims such as “Unsurpassed Image Quality,” “Extreme Outdoor Durability,” “Intelligent Self-Optimization,” and “IoT Empowered Architecture.” *See e.g.*, Ex. 1042. These features are important to customers and drive sales. Ex. 1043, 312:4–314:22, 316:16–321:4. Accordingly, these products are not coextensive with the Challenged Claims.

For these reasons, MRI has also failed to present evidence sufficient to establish that sales of its own or Samsung’s products are attributable to the features of the Challenged Claims. *See Ormco*, 463 F.3d at 1312 (“[I]f the commercial success is due to an unclaimed feature of the device, the commercial success is irrelevant.”). Further, MRI’s broad statement that its “sales increased...shortly after the claimed priority date of the ’740 Patent” does not “confirm[] the commercial success is tied to the novel aspects of the ’740 Patent.” POR, 61. While the ’740

patent issued in 2019, MRI relies on sales data dating back to 2008. MRI did nothing to show that any alleged increase in sales starting in 2008 was related to the products it claims are coextensive. It also did nothing to show that technical aspects of the Challenged Claims were implemented during that time period causing the alleged increase in sales. MRI also has not offered any evidence regarding Samsung's market share aside from a single document regarding Samsung's *global* market share, which includes other Samsung products beyond those that MRI alleges practice and/or are coextensive with the Challenged Claims. *See* POR, 62–63 (citing Ex. 2041, 29–30). This is insufficient to demonstrate commercial success.

C. Industry Praise and Licensing

MRI relies on Romulus Stoain's April 24, 2020 generic email to Samsung SDS (POR, 65–66) to allege industry praise, but this email does not identify any specific technical feature of MRI's products, let alone a specific product that embodies, and is coextensive with, the elements of the Challenged Claims. *See* Ex. 1035, 293–94; Paper 11, 60–63. Samsung's white paper (POR, 64–65) likewise fails to praise, or even mention, MRI. Ex. 2025. MRI also mischaracterizes the testimony of John Palmer, the corporate representative of a Samsung customer, whose "testimony does not indicate whether it is the patented features of the cooling system, as opposed to other aspects of the liquid crystal display, that creates the desirable effect." Ex. 1035, 298.

With respect to licensing, MRI fails to establish a nexus. *See* POR, 66 (citing Exs. 2049, 2051, 2052). The licenses either fail to mention [REDACTED] or list numerous other intellectual property rights in addition to [REDACTED]. *See* Exs. 2049, 2051, 2052; *Shoes by Firebug LLC v. Stride Rite Children’s Grp., LLC*, 962 F.3d 1362, 1372–73 (Fed. Cir. 2020) (“Because the licenses include numerous intellectual property rights in addition to the ’038 and ’574 patents, the agreements on their face do not establish a nexus . . .”).

VI. MR. SMITH-GILLESPIE’S TESTIMONY IS ENTITLED TO WEIGHT

MRI argues that Mr. Smith-Gillespie’s testimony should be given little weight based on alleged errors and inconsistencies. POR, 7–9. MRI is incorrect, and the two cases that it cites do not support its request.

First, MRI’s attempt to attribute alleged “basic scientific errors” to Mr. Smith-Gillespie is disingenuous at best. Mr. Smith-Gillespie has the requisite knowledge and experience in thermal management, as explained in his declaration and CV. Ex. 1002, ¶¶ 6–16; Ex. 1003. MRI identifies one statement from Mr. Smith-Gillespie’s declaration that it asserts is incorrect, and in doing so MRI misconstrues Mr. Smith-Gillespie’s opinion. Mr. Smith-Gillespie did not testify that fans alone reduce the temperature of ambient air. Rather, Karppanen’s use of cooling fans 36 contribute to a reduction in the temperature of the ambient air within Karppanen’s system. *See* Ex. 1004, 7:21–25.

Second, there are no inconsistencies in Mr. Smith-Gillespie’s definition of a POSITA as reflected in his declaration. *See* Ex. 1002, ¶ 39. And nothing in his deposition contradicts that testimony. Ex. 2022, 72:2–73:7.

Finally, neither of the cases MRI cites support giving “little weight” to Mr. Smith-Gillespie’s testimony here. *See Fanduel, Inc. v. Interactive Games LLC*, 966 F.3d 1334, 1343–44 (Fed. Cir. 2020) (holding “there was no need for the Board to rely on an expert to corroborate its reading of the asserted disclosures”); *Yorkey v. Diab*, 601 F.3d 1279, 1284 (Fed. Cir. 2010) (noting that “the Board was well within its discretion to give more credibility to [one expert’s testimony] unless no reasonable trier of fact could have done so.”).

VII. CONCLUSION

Samsung respectfully requests that the Board find all challenged claims unpatentable.

Respectfully submitted,
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CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that the foregoing Petitioners' Reply to Patent Owner's Response complies with the type-volume limits of 37 C.F.R. § 42.24(c) because it contains 5,509 words according to the word-processing system used to prepare this reply, excluding the words in the Table of Contents, Table of Authorities, Table of Exhibits, Certification Under § 42.24(d), and Certificate of Service, as set forth in 37 C.F.R. § 42.24(c).

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CERTIFICATE OF SERVICE

A copy of this Petitioners' Reply to Patent Owner's Response together with the additional exhibits identified in the above Table of Exhibits have been served on counsel for Patent Owner upon the following addresses as listed in Patent Owner's Mandatory Notices:

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