

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD. and SAMSUNG ELECTRONICS
AMERICA, INC.,
Petitioner,

v.

MANUFACTURING RESOURCES INTERNATIONAL, INC.
Patent Owner.

IPR2023-00221
Patent 11,043,142 B2

Before JAMESON LEE, JO-ANNE M. KOKOSKI, and
MINN CHUNG, *Administrative Patent Judges*.

LEE, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Samsung Electronics Co., Ltd and Samsung Electronics America, Inc. (“Petitioner”) filed a Petition requesting an *inter partes* review of claims 1–15 (“challenged claims”) of U.S. Patent No. 11,043,142 B2 (Ex. 1001, “the ’142 patent”) pursuant to 35 U.S.C. §§ 311–319. Paper 1. Manufacturing Resources International, Inc. (“Patent Owner”) filed a Preliminary Response. Paper 7 (“Prelim. Resp.”). With authorization from the Board, and agreed to by Patent Owner, Petitioner filed a Corrected Petition (Paper 9) that does not change the substance of what was initially filed, without need for Patent Owner to file any revision to the Preliminary Response. The Corrected Petition substitutes for and replaces the initially filed petition. Hereinafter, we refer to the Corrected Petition as “Petition” or “Pet.”

We have authority to determine whether to institute review under 35 U.S.C. § 314 and 37 C.F.R. § 42.4. Upon consideration of the contentions and the evidence of record before us, we conclude Petitioner has shown a reasonable likelihood that it would prevail in establishing unpatentability of at least one challenged claim of the ’142 patent. Accordingly, we institute an *inter partes* review of all challenged claims of the ’142 patent on all grounds set forth in the Petition.

II. BACKGROUND

A. *Real Parties-in-Interest*

Petitioner identifies Samsung Electronics Co., Ltd, Samsung Electronics America, Inc., Samsung SDS Co., Ltd., Samsung SDS America, Inc., Coates Signco Pty Limited, Coates US Inc., and Industrial Enclosure Corporation d/b/a Palmer Digital Group as the real parties-in-interest. Pet. 2. Patent Owner identifies only itself as the real party-in-interest. Paper 5, 2.

B. Related Matters

Each party identifies the following district court litigation involving the '142 patent as related matter: *Manufacturing Resources, Inc. v. Samsung Electronics Co., Ltd. et al.*, No. 2:22-cv-00320 (E.D. Tex.). Pet. 2; Paper 5, 2. Each party identifies the following proceeding before the United States International Trade Commission involving the '142 patent as related matter: *In re Certain Outdoor and Semi-Outdoor Electronic Displays, Products Containing Same, and Components Thereof*, Investigation No. 337-TA-1331. Pet. 2; Paper 5, 2.

Patent Owner identifies the following *inter partes* review proceedings before the Board as related matters: IPR2023-00199, IPR2023-00220, IPR2023-00254, and IPR2023-00255. Paper 5, 2.

C. The '142 Patent

The '142 patent relates to systems and methods for cooling electronic image assembly or display. Ex. 1001, code (57); 1:60–62. The disclosed embodiments include two separate flow paths for gas through an electronic display. *Id.* at 2:41–42. The first flow path is a closed loop and the second flow path is an open loop. *Id.* at 2:42–44. The '142 patent describes:

The closed loop path travels across the front surface of the image assembly, continues to the rear of the display where it may enter a heat exchanger, finally returning to the front surface of the image assembly. The open loop path may draw ambient gas (ex. ambient air) through the rear of the display (sometimes through a heat exchanger, behind an image assembly, or both) and then exhausts it out of display housing. A heat exchanger may be used to transfer heat from the circulating gas to the ambient gas. In alternative embodiments, the ambient gas may also be forced behind the image assembly (sometimes a backlight), in order to cool the image assembly and/or backlight assembly (if a backlight is necessary for the particular type of display being used).

Id. at 2:44–57. Figure 2A is reproduced below:

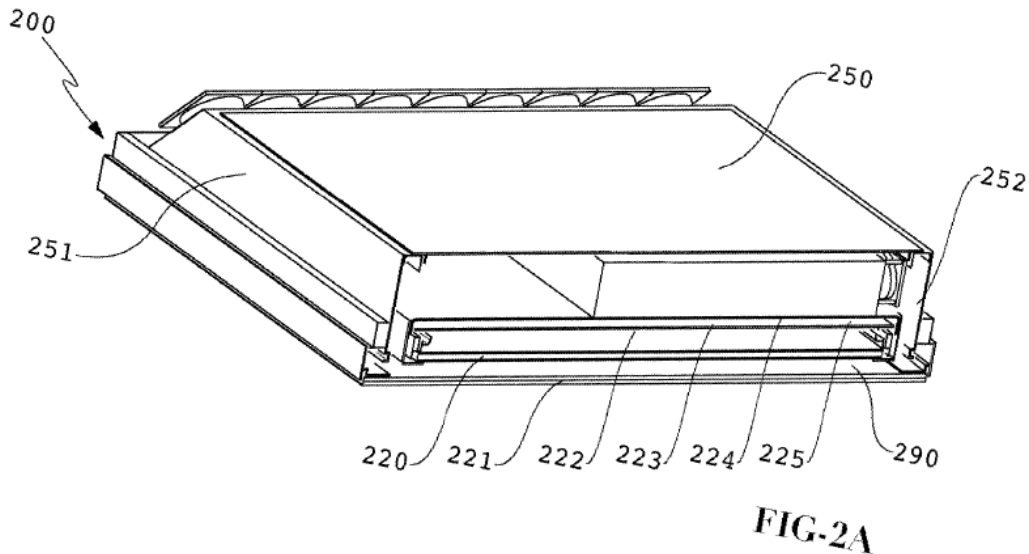


Figure 2A is a perspective section view of an embodiment showing the closed loop and open loop channels in a cooling system for an electronic display. *Id.* at 3:5–6.

Rear cover 250 and side covers 251 and 252 together seal overall display 200. *Id.* at 5:50–53. Image assembly 220 is near the front of display 200. *Id.* at 5:53–54. Image assembly 220 may be an LCD, light emitting diode (LED), organic light emitting diode (OLED), field emitting displays (FED), light emitting polymers (LEP), plasma displays, or any other flat/thin display. *Id.* at 5:55–60. Front display surface 221, optionally comprising several layers for polarizing light to reduce glare or reflections, may be made of any transparent material and is placed in front of image assembly 220, defining channel 290 through which a circulating gas may flow. *Id.* at 5:60–67. The '142 patent refers to channel 290 as a “*closed loop*” path. *Id.* at 6:7–8 (emphasis added).

Figure 2B is reproduced below:

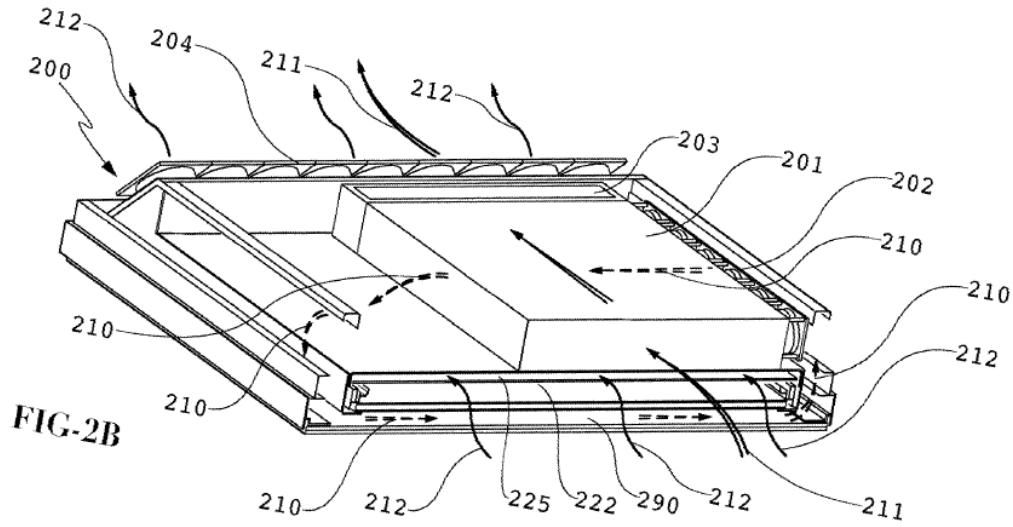


Figure 2B is a perspective section view similar to Figure 2A but with rear and side covers removed. *Id.* at 3:7–9.

The closed loop air flow is in channel 290 and the open air flow is ambient air 211 through heat exchanger 201. *Id.* at 6:7–8, 6:38–40, 6:49–51. There may be an optional additional open channel 225. *Id.* at 6:40–44. Image assembly 220 may be an LCD stack with backlight assembly 222 which has rear surface 223. *Id.* at 6:13–25. A second surface 224 may be placed behind rear surface 223. *Id.* at 6:26–28. “The space between the rear surface 223 of the backlight and the second surface 224 may define an additional optional *open loop channel* 225 through which ambient gas may travel in order to cool the backlight assembly 222 (or image assembly 220 if no backlight is used).” *Id.* at 6:28–33 (emphasis added).

Closed loop fan assembly 202 propels circulating gas 210 around closed loop 290. *Id.* at 6:37–38. Open loop fan assembly 203 exhausts ambient air 211 through heat exchanger 201. *Id.* at 6:49–51. Additional optional open loop fan assemblies may be used to exhaust ambient gas which has traveled through optional open channel 225. *Id.* at 6:40–44. The

'142 patent describes that in the illustrated embodiment, ambient gas 211 and 212 do not mix with circulating gas 210. *Id.* at 6:52–53.

Figure 3 is reproduced below:

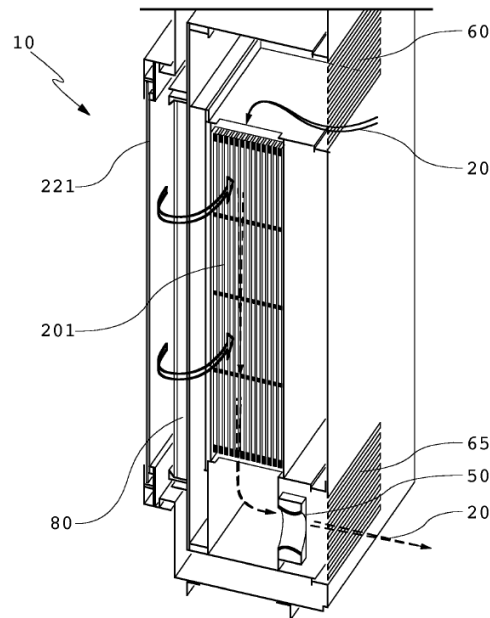


Figure 3 is a perspective sectional view of an embodiment where ambient gas is ingested only into heat exchanger 201 and not into any additional channels such as channel 225 shown in Figures 2A and 2B. *Id.* at 3:10–12.

Figure 3 shows inlet 60 and exhaust apertures 65 for ambient gas 20. *Id.* at 6:63–65. Fans 50 draw ambient gas 20 into inlet aperture 60 and through heat exchanger 201. *Id.* at 7:1–3. In this embodiment, the image assembly is designated by reference numeral 80 rather than reference numeral 220 as in Figures 2A and 2B. *Id.* at 7:5–10. The '142 patent describes: “This heat may be transferred to the circulating gas as it passes through the channel between the front display surface 221 and the image assembly 80, where this heat may then be transferred to the ambient gas 20 and expelled from the display.” *Id.* at 7:32–36.

The '142 patent describes another embodiment, shown in Figure 4 (not reproduced herein), including a cross-flow heat exchanger. *Id.* at 3:13–15. In this embodiment, “[t]he heat exchanger 201 may accept circulating gas 400 in one direction while accepting ambient gas 310 in a substantially perpendicular direction such that heat may transfer between the two gases.” *Id.* at 7:47–50.

Claims 1, 6, and 12 are independent and reproduced below:¹

[1pre] A cooling system for an electronic image assembly, the cooling system comprising:

[1a] a housing for the electronic image assembly;

[1b] a cover panel forming a forward portion of the housing, wherein the cover panel is located forward of, and at least some distance from, the electronic image assembly and is configured to permit viewing of images displayed at the electronic image assembly through said cover panel;

[1c] a closed loop airflow pathway passing through the housing, wherein said closed loop airflow passes around said electronic image assembly and is configured to accommodate circulating gas, and wherein at least a portion of said closed loop airflow pathway extends between said electronic image assembly and said cover panel;

[1d] an open loop airflow pathway for ambient air passing through said housing and behind said electronic image assembly;

[1e] at least one air circulation device positioned to force the circulating gas through the closed loop airflow pathway when activated; and

[1f] at least one polarizer located at an inward facing surface of said cover panel and configured to prevent at least

¹ The bracketed captions correspond to those used by Petitioner to reference the claim elements. *See* Pet. 109–114. We use them here for ease of reference, understanding, and consistency.

determining an identifier assigned to the entity based at least some sunlight striking said cover panel from traveling beyond said at least one polarizer.

Ex. 1001, 9:55–10:13.

[6 pre] A cooling system for an electronic image assembly, the cooling system comprising:

[6a] a housing for the electronic image assembly;

[6b] a transparent cover panel forming a front portion of the housing, the transparent cover panel located forward of, and at least some distance from, the electronic image assembly;

[6c] an open loop airflow pathway passing through the housing behind the electronic image assembly;

[6d] 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;

[6e] an inlet located at a first portion of said housing for ingesting ambient air from said open loop airflow pathway;

[6f] an exhaust located at a second portion of said housing for exhausting said ambient air from said open loop airflow pathway;

[6g] an air circulation device positioned along said open loop airflow pathway between said inlet and said exhaust, wherein said air circulation device is configured to force said ambient air through the open loop airflow pathway when activated;

[6h] a gas circulation device positioned along said closed loop gas circulation pathway to force circulating gas around the closed loop gas circulation pathway when activated;

[6i] a heat exchanger located rearward of the electronic image assembly, wherein 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 part of said closed loop gas circulation pathway; and

[6j] one or more solar energy reduction layers located at said transparent cover panel, wherein each of said one or more solar energy reduction layers is configured to prevent a portion of solar energy entering said transparent cover panel from thermally interacting with the circulating gas at said portion of said closed loop gas circulation pathway passing between said transparent cover panel and said electronic image assembly or thermally interacting with said electronic image assembly.

Id. at 10:32–11:6.

[12pre] A method for cooling an electronic image assembly, said method comprising the steps of:

[12a] placing said [the] electronic image assembly within a housing;

[12b] forcing circulating air through a closed loop airflow pathway within said housing, wherein at least a portion of said closed loop airflow pathway extends between an electronic image assembly and a cover panel forming a front portion of said housing and spaced apart from said electronic image assembly, wherein said cover panel is configured to permit viewing of images displayed at the electronic image assembly through said cover panel;

[12c] forcing ambient air through a second airflow pathway within said housing, wherein said second airflow pathway extends behind said electronic image assembly; and

[12d] providing one or more solar energy reduction layers at an inward facing surface of said cover panel, wherein each of said one or more solar energy reduction layers is configured to reduce an amount of solar energy transferred to said circulating air in at least said portion of said closed loop airflow pathway.

Id. at 11:26–12:16.

D. Evidence relied on by Petitioner

Petitioner relies on the following document references:²

² The '142 patent issued from Application No. 16/933,932, filed July 20, 2020, which is a continuation of Application No. 15/789,331, filed Oct. 20, 2017, now Patent No. 10,506,740, which is a continuation of Application No. 14/834,034, filed August 24, 2015, now Patent No. 9,801,305, which is a continuation of Application No. 14/050,464, filed Oct. 10, 2013, now Patent No. 9,119,325, which is a continuation of Application No. 12/641,468, filed Dec. 8, 2009, now Patent No. 8,654,302, which is a continuation-in-part of Application No. 12/411,925, filed Mar. 26, 2009, now Patent No. 8,854,595, and a continuation-in-part of Application No. 12/556,029, filed Sept. 9, 2009, now Patent No. 8,373,841, and a continuation-in-part of Application No. 12/234,307, filed Sept. 19, 2008, now Patent No. 8,767,165, and a continuation-in-part of Application No. 12/234,360, filed Sept. 19, 2008, and a continuation of Patent Application No. 12/237,365, filed Sept. 24, 2008, now Patent No. 8,879,042, and a continuation-in-part of Application No. 12/235,200, filed Sept. 22, 2008, and a continuation-in-part of Application No. 12/620,330, filed Nov. 17, 2009, now Patent No. 8,274,622, and a continuation-in-part of Application No. 12/556,209, filed Sept. 9, 2009, now Patent No. 8,379,182. Ex. 1001, codes (21), (22), (63). The '142 patent also claims priority to Provisional Application No. 61/138,736, filed Dec. 18, 2008, Provisional Application No. 61/039,454, filed Mar. 26, 2008, Provisional Application No. 61/095,615, filed Sept. 9, 2008, Provisional Application No. 61/033,064, filed Mar. 3, 2008, Provisional Application No. 61/053,713, filed May 16, 2008, Provisional Patent Application No. 61/057,599, filed May 30, 2008, Provisional Application No. 61/076,126, filed June 26, 2008, and Provisional Application No. 61/115,533, filed Nov. 17, 2008, and Provisional Application No. 61/095,616, filed Sept. 9, 2008. *Id.*, code (60). Petitioner has not challenged the '142 patent's entitlement to the earlier filing date of any ancestral application.

Name	Patent Document	Exhibit
Karppanen ³	WO 2007/116116 A1	1004
Larson ⁴	US 6,392,727	1005
Yare ⁵	UK 2,402,205 A	1006

Petitioner also relies on the Declaration of Robert Smith-Gillespie. Ex. 1002.⁶ In citing to Karppanen and Yare, we refer to the actual page numbers of the references rather than the Bates numbers added by Petitioner.

E. Asserted Grounds of Unpatentability

Petitioner asserts that the challenged claims of the '142 patent are unpatentable based on the following grounds:

Claims Challenged	35 U.S.C. § ⁷	Reference(s)/Basis
1–15	103	Karppanen, Larson
1–15	103	Yare, Larson

Pet. 4–5.

³ Published October 18, 2007. Ex. 1004, code (43).

⁴ Issued May 21, 2002, based on Application No. 09/224,591, filed Dec. 31, 1998. Ex. 1005, codes (21) (22) (45).

⁵ Application published December 1, 2004. Ex. 1006, code (43).

⁶ Patent Owner's Preliminary Response does not rely on the testimony of any expert witness.

⁷ The Leahy-Smith America Invents Act, Pub. L. No. 112–29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. §§ 102 and 103. Based on the record before us, we preliminarily determine that the '142 patent has an effective filing date prior to the effective date of the applicable AIA amendments (March 16, 2013). We, therefore, refer to the pre-AIA version of 35 U.S.C. § 103.

III. ANALYSIS

A. *Level of Ordinary Skill in the Art*

Petitioner asserts that a person of ordinary skill in the art as of March 3, 2008,

would have possessed a bachelor's degree in a pertinent discipline, such as mechanical engineering, physics, product design, or a related field. (Ex. 1002, ¶ 39.) Such a person would also have 2–4 years of experience in working with electronic displays and have an understanding of product design issues and failure modes associated with electronic displays. (*Id.*) Alternatively, a POSITA would have had 5–7 years of experience in the field working with electronic displays and have a similar understanding of product design issues and failure modes associated with electronic displays. (*Id.*)

Pet. 6.

Patent Owner has not in its Preliminary Response stated its assertion on the level of ordinary skill in the art. Patent Owner also has not disputed Petitioner's assertion.

At this preliminary stage and on this record, we adopt Petitioner's articulation, both alternatives, as the level of ordinary skill in the art. They appear consistent with what is reflected by the content of the applied prior art references. *Cf. Okajima v. Bourdeau*, 261 F.3d 1350, 1354–55 (Fed. Cir. 2001) (the applied prior art may reflect an appropriate level of skill).

B. *Claim Construction*

We use the same claim construction standard that would be used to construe a claim in a civil action under 35 U.S.C. § 282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent. 37 C.F.R. § 42.100(b)

(2022). The claim construction standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc) is applicable.

Claim terms are generally given their ordinary and customary meaning as would be understood by one with ordinary skill in the art in the context of the specification, the prosecution history, other claims, and extrinsic evidence including expert and inventor testimony, dictionaries, and learned treatises, although extrinsic evidence is less significant than the intrinsic record. *Phillips*, 415 F.3d at 1312–17. Usually, the specification is dispositive, and it is the single best guide to the meaning of a disputed term. *Id.* at 1315.

The specification may reveal a special definition given to a claim term by the patentee, or the specification or prosecution history may reveal an intentional disclaimer or disavowal of claim scope by the inventor. *Id.* at 1316. If an inventor acts as his or her own lexicographer, the definition must be set forth in the specification with reasonable clarity, deliberateness, and precision. *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1249 (Fed. Cir. 1998). The disavowal, if any, can be effectuated by language in the specification or the prosecution history. *Poly-Am., L.P. v. API Indus., Inc.*, 839 F.3d 1131, 1136 (Fed. Cir. 2016).

Only those claim terms that are in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Realtime Data, LLC v. Iancu*, 912 F.3d 1368 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

“closed loop”

The term “closed loop” is recited in each independent claim. Petitioner asserts that in related district court litigation involving related patents directed to cooling of electronic displays using closed and open loops, the district court construed “closed loop” as “gas pathway within a display housing containing gas that is essentially isolated from external air.” Pet. 13 (citing Ex. 1023, 1). Petitioner asserts that the district court’s construction is the proper construction, in light of the specification and the prosecution history of the ’142 patent. *Id.*

Petitioner explains:

The ’142 patent refers to the gas/air, circulating through a closed loop as the “circulating gas/air” and also as the “isolated gas.” (Ex. 1001, 9:64–10:3, 10:7–9, 10:56–58, 11:30–12:6 (claims reciting circulating gas/air), 3:30–[39], 3:50–52 (referring to gas in the closed loop as “circulating gas” and “isolated gas”), FIG. 1.)

Moreover, during prosecution, the Applicant distinguished the claimed invention from prior art reference U.S. Patent No. 5,869,919 (Ex. 1027) (“Sato”), by arguing that Sato did not disclose a “closed loop” because in Sato, ambient air entered and exited the display unit. (Ex. 1022, pp. 323–324 (Office Action dated 9/30/2020 at 3–4), pp. 254–55 (Response filed on 12/18/2020 at 17–18).) Thus, Applicant argued that the gas/air in the closed loop was isolated from ambient air.

Id. at 13–14.

Patent Owner did not propose its own construction of “closed loop.” Nor has Patent Owner alleged that Petitioner’s proposed construction is incorrect. Rather, Patent Owner asserts that Petitioner proposed its construction “without any analysis,” and simply asks the Board to adopt the district court’s construction “without any discussion or citation to evidence in support of those constructions.” Prelim. Resp. 19–20. Patent Owner

asserts that Petitioner engaged in improper incorporation by reference from the district court's claim construction reasoning. *Id.* at 20.

We disagree that Petitioner has not provided reasoning. We also do not find that Petitioner's simply noting the district court's claim construction for "closed loop" constitutes improper incorporation by reference.

However, because Patent Owner does not dispute at this stage that what Petitioner, in its substantive analysis, has identified as a closed loop in Karppanen and Yare is a closed loop as recited in the challenged claims, we need not construe "closed loop" for purposes of this Decision.

Neither party proposed an express construction for any other term. We find that no express claim construction of any claim term is necessary at this stage of the proceeding.

C. Alleged Obviousness of Claims 1–15 over Karppanen and Larson

1. The Law on Obviousness

A claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious to a person having ordinary skill in the art to which said subject matter pertains. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) where in evidence, so-called secondary considerations, including commercial success, long-felt but unsolved needs, failure of others, and unexpected results. *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966).

When evaluating a combination of teachings, we must also “determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). “[T]here must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Kahn*, 441 F.3d at 988.

2. Overview of *Karppanen*

Karppanen is an international patent application titled “Electronic Information Board.” Ex. 1004, code (54). It relates to an electronic information board comprising a frame, a flat display element for presenting information, and electronic equipment for controlling the display element. *Id.* at 1:3–5. The flat display element can be a TFT LCD display or plasma display. *Id.* at 3:21–23. The information board has a display casing for the display element and a device casing for the electronic equipment needed for controlling the display element. *Id.* at 3:28–30. “Cooling elements have also been arranged in the display casing for transferring heat from the display casing to the outside of the display casing.” *Id.* at 3:30–32.

Karppanen describes:

TFT LCD displays are used to some extent in the implementation of public electronic information boards. The problem is that when used in environments having high temperatures, the temperature of the display devices easily rise too high. On the other hand, in cold environments there is the danger that the temperatures of the display devices fall too low. In both situations it is important that the temperatures at different points inside the display device can be kept as constant as possible. Then the display device operates in the widest possible range of operating temperatures, and local temperatures do not cause exceeding of the specifications given to the display element.

Id. at 1:24–32.

Figure 2 of Karppanen is reproduced below:

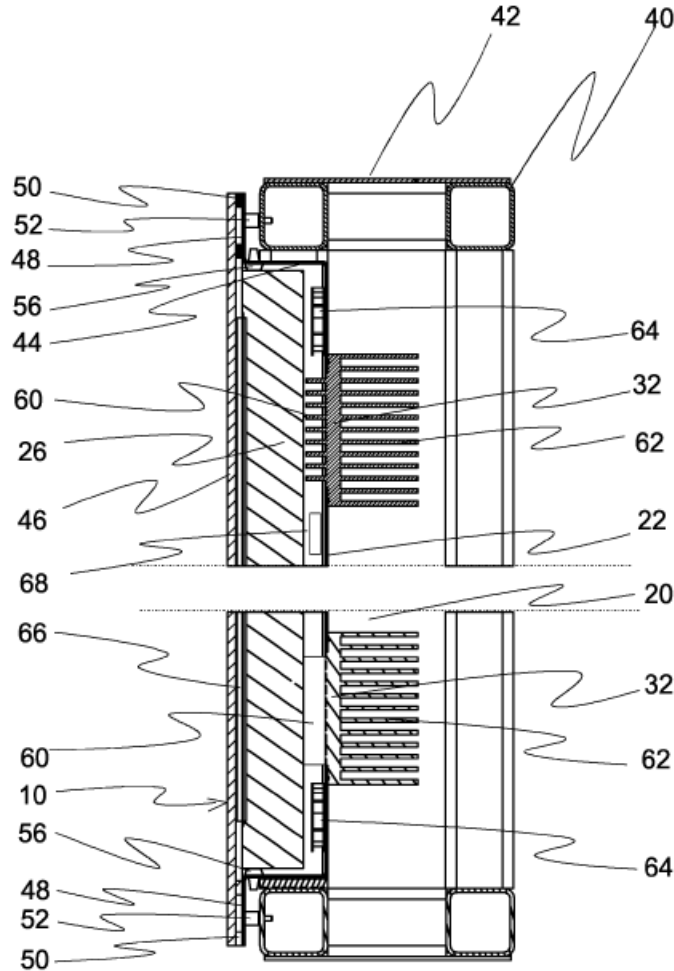


Fig. 2

[Figure 2 is a cross-sectional view of one embodiment of Karppanen's electronic information board (Ex. 1004, 6:7–8)]

The information board has frame 40 to an edge of which is fastened lining plate 42. Ex. 1004, 7:27–30. Display casing 10 comprises backwall 22, transparent front plate 46, and edge part 44. *Id.* at 7:31–32. Edge part 44 has flange-like fastening collar 48 running in the direction of the front plate and is fastened to the frame by fastening means 52. *Id.* at 7:32–34. Transparent front plate 46 is fastened to the fastening collar of the edge parts

by means of sealing elements 50 so that the edge parts of the front plate and the back wall form a closed display casing. *Id.* at 7:35–38.

Inside the display casing is display element 26. *Id.* at 8:4. In the backwall of the display casing, there are cooling elements 32 which have first heat transfer part 60 extending to the inside of the display casing and second heat transfer part 62 extending to cooling space 20 outside the display casing. *Id.* at 8:13–16. The cooling elements transfer excess thermal energy from the display casing to the cooling space, from which space it is further conducted by air flow produced by cooling fans 36 out of the entire device. *Id.* at 8:19–22. First cooling element 32 in the upper half of Figure 2 is in the form of cooling fins. *Id.* at 9:1–3. Second cooling element 32 in the lower half of Figure 2 is in the form not of fins but a conduction element set against the surface of display element 26. *Id.* at 9:13–16. Karppanen describes that either fins or a conduction element, or both, can be used. *Id.* at 9:17–19.

Inside the display casing on back wall 22 are fans 64 which circulate air in the space between display element 26 and the walls of display casing 10. *Id.* at 9:3–5. Ducting 66 are arranged between display casing 10 and display element 26 so that air flow circulating the display element and equalizing the temperatures can be effected by fans 64 which force the air of the inner casing to flow past front plate 46 of the device. *Id.* at 9:5–8.

Karppanen describes that from cooling space 20 thermal energy is conducted by air flow produced by cooling fans out of the entire device. *Id.* at 9:19–22. In one embodiment, “there are ventilator slots or holes on the opposite sides of the cooling space for enabling air flow from the outside of the information board to the cooling space and from the cooling space back to the outside of the information board.” *Id.* at 4:19–22. Karppanen

describes that “[i]n the cooling space there is preferably at least one cooling fan for circulating air through the cooling space.” *Id.* at 4:22–23.

3. Overview of *Larson*

Larson relates to display devices, and more particularly to a method and apparatus for reducing unwanted reflections in displays. Ex. 1005, 1:7–9. A polarized display is provided which has reduced reflectiveness in its output to maintain high contrast output and high illumination levels, and achieve less expensive production. *Id.* at 1:62–66. *Larson* describes:

A polarizer is disposed adjacent to a cover glass in front of the display. Light intended to be transmitted through the display is transmitted by the polarizer. Light reflected after passing through the polarizer is further attenuated as it intercepts the polarizer following reflection.

Id. at 1:66–2:3.

Figure 2 of *Larson* is reproduced below:

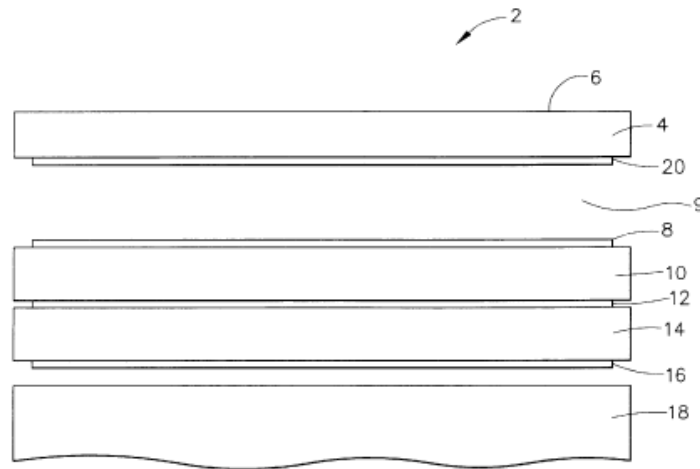


FIG. 2

Figure 2 shows the structure of a polarized display according to *Larson*. *Id.* at 2:16–17.

Display 2 includes cover glass 4, front gap 9, front polarizer 8, first substrate 10, liquid crystal layer 12, second substrate 14, rear polarizer 16,

auxiliary polarizer 20, and backlight 18. *Id.* at 2:32–36. First and second substrates 10, 14 comprise conventional LCD transparent substrates. *Id.* at 2:63–64. Larson describes:

The front and rear polarizers 8, 16 suitably comprise conventional polarizers for use in conjunction with LCDs. The front and rear polarizers 8, 16 may be oriented in any suitable manner to selectively transmit light from the backlight 18 to the viewer through the front and rear polarizers 8, 16 and the liquid crystal layer 12.

Id. at 2:57–62. Auxiliary polarizer 20 is preferably aligned in the same direction as front polarizer 8. *Id.* at 3:19–22. “Alignment of the polarizers 8, 20 in the same direction minimizes the attenuation of light coming from the backlight 18. This allows maximum transmission of the light with little to no attenuation of the light.” *Id.* at 3:21–24.

Larson additionally describes:

Reflected light, however, initially passes through the cover glass and is polarized by the auxiliary polarizer 20. By removing one of the polarizations before it reaches the gap 9, the reflections from each of the interfaces between the auxiliary polarizer 20 and front polarizer 8 are reduced by around 50%. This allows for reduced overall reflections, or can be used to reduce the reflectance requirements for any antireflection coatings which may be applied to the front and auxiliary polarizers 8, 20.

Id. at 3:24–34.

4. *Independent Claim 1*

a) *Recitation [Ipre]*

In its preamble, claim 1 recites: “A cooling system for an electronic image assembly, the cooling system comprising.” Ex. 1001, 9:55–56.

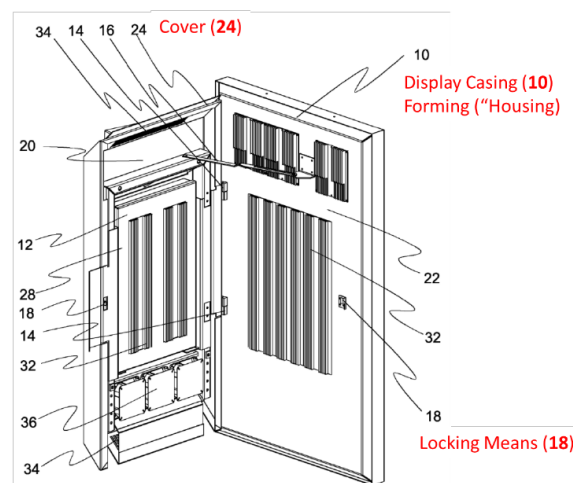
Petitioner asserts that Karppanen discloses such a cooling system. Pet. 21 (citing Ex. 1002 ¶¶ 140–145). Petitioner also cites (*id.* at 28) to Karppanen’s Abstract, which describes an electronic information board having a display

casing, a device casing, and cooling space between the two casings for cooling elements in the display casing and the device casing. Ex. 1004, code (57). The display casing has cooling elements for transferring heat from the display casing to the cooling space, and the device casing has cooling elements for transferring heat from the device casing to the cooling space. *Id.* On opposite sides of the cooling space are ventilator slots and fans are provided for enabling air flow through the cooling space. *Id.*

Petitioner’s assertions are supported by the cited evidence. At this stage, Patent Owner does not present counter-argument in this regard. We are sufficiently persuaded that Karppanen discloses “[a] cooling system for an electronic image assembly.”⁸

b) Limitation [1a]

Claim 1 recites: “a housing for the electronic image assembly.” *Id.* at 9:57. Petitioner asserts that Karppanen discloses an electronic image assembly with a housing formed by a cover and a display casing. Pet. 23 (citing Ex. 1002 ¶¶ 146–150). On page 24 of the Petition, Petitioner produces an annotated version of Figure 1 of Karppanen, reproduced below:



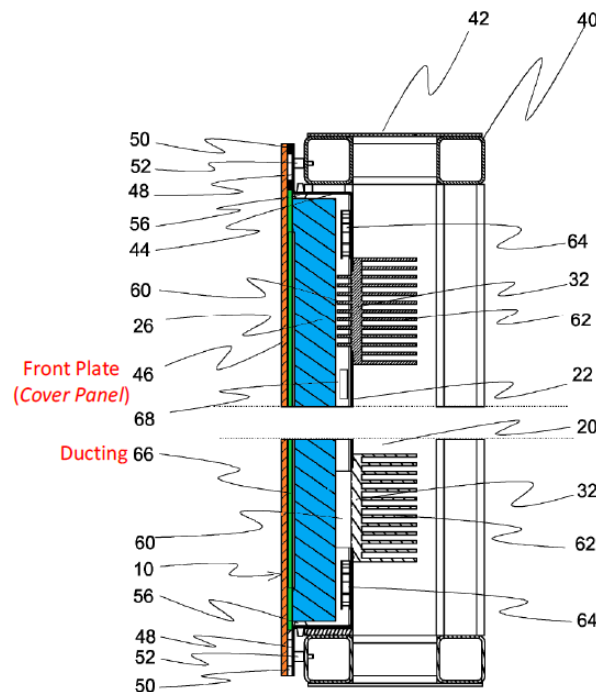
⁸ It is not necessary to determine whether the preamble recitation is limiting.

Figure 1 is a perspective view of an electronic information board according to Karppanen. Ex. 1004, 6:4–5 (color annotations added by Petitioner).

Petitioner identifies display element 26 as the electronic image assembly, and explains that cover 24 and display casing 10 together form a housing for the electronic image assembly. Pet. 24 (citing Ex. 1002 ¶ 150). At this stage, Patent Owner does not present counter-argument in this regard. We are sufficiently persuaded that Karppanen discloses limitation [1a].

c) Limitation [1b]

Claim 1 recites “a cover panel forming a forward portion of the housing, wherein the cover panel is located forward of, and at least some distance from, the electronic image assembly and is configured to permit viewing of images displayed at the electronic image assembly through said cover panel.” Ex. 1001, 9:58–63. On page 26 of the Petition, Petitioner produces an annotated version of Figure 2 of Karppanen, reproduced below:



[Figure 2 is a cross-section of an embodiment of Karppanen’s electronic information board (Ex. 1004, 6:7–8) (color annotations by Petitioner)]

Petitioner explains that Karppanen's display casing 10 forms a part of the housing and that display casing 10 includes back wall 22 and transparent front plate 46. Pet. 24–25 (citing Ex. 1004, 7:31–8:2; Ex. 1002 ¶ 152). Petitioner identifies transparent front plate 46 as “a cover panel forming a forward portion of the housing.” *Id.* at 25 (citing Ex. 1004, Fig.1; Ex. 1002 ¶ 152).

Petitioner further identifies ducting 66 as facilitating air flow circulating the display element and fans 64 which force air from within the casing to flow past front plate 46. Pet. 25 (citing 9:3–8). Petitioner then explains: “Annotated Figure 2 shows that the front plate 46 (highlighted orange) is located in front of the display element 26 (highlighted blue), and is separated from the display element 26 by the ducting 66 (highlighted green).” *Id.* at 26.

With regard to these assertions, Patent Owner does not present counter-arguments at this stage of the proceeding. Petitioner's assertions are supported by the cited evidence. We are sufficiently persuaded that Karppanen discloses limitation [1b].

d) Limitation [1c]

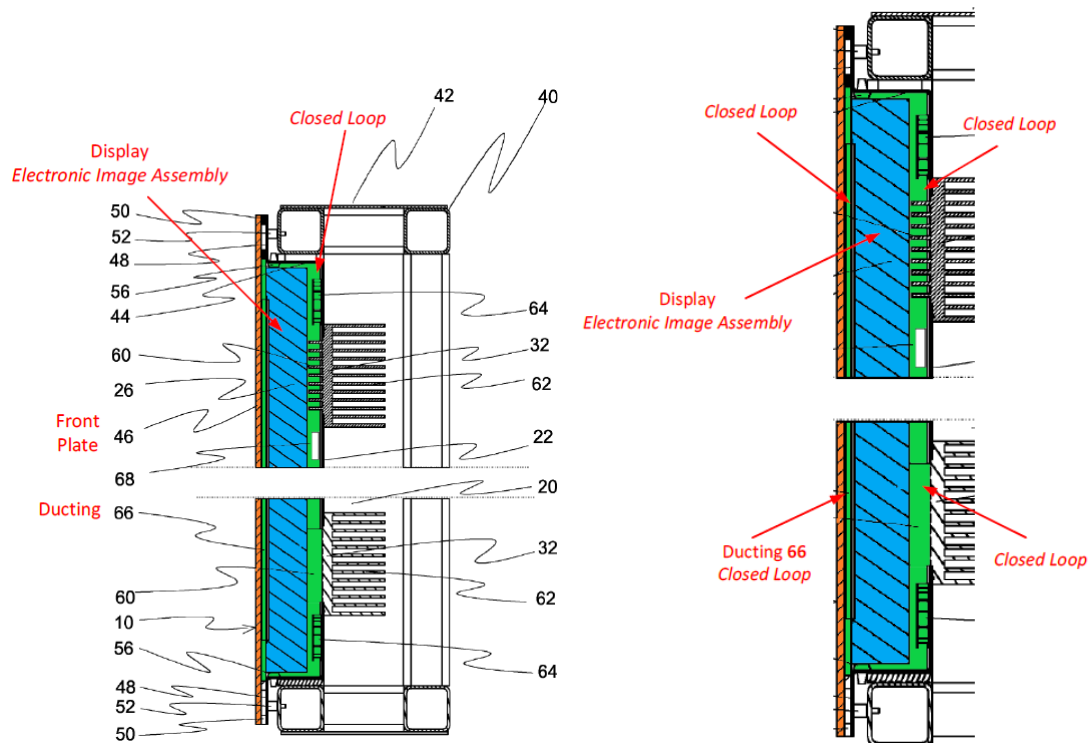
Claim 1 further recites: “a closed loop airflow pathway passing through the housing, wherein said closed loop airflow passes around said electronic image assembly and is configured to accommodate circulating gas, and wherein at least a portion of said closed loop airflow pathway extends between said electronic image assembly and said cover panel.” Ex. 1001, 9:64–10:3. Petitioner asserts Karppanen discloses this closed loop in the form of ducting 66. Pet. 27 (citing Ex. 1002 ¶¶ 155–161).

Petitioner cites to the following passage in Karppanen:

Inside the display casing on the back wall 22 there are fans 64, which circulate air in the space between the display element and the walls of the display casing. Suitable ducting 66 has been arranged between the display casing and the display element so that an air flow circulating the display element and equalizing the temperatures can be arranged by means of the fans. The fans 64 force the air of the inner casing to flow past the front plate 46 of the device.

Ex. 1004, 9:3–8 (cited at Pet. 27).

On pages 28–29 of the Petition, Petitioner presents an annotated full and an annotated partial version of Karppanen's Figure 2 to illustrate Karppanen's disclosure of limitation [1c]:



[Figure 2 is a cross-section of an embodiment of Karppanen's electronic information board (Ex. 1004, 6:7–8) (color annotations by Petitioner)]

Petitioner explains:

The space (highlighted green) between the display element 26 (highlighted blue) and the back wall 22, and the ducting 66

(also highlighted green) in front of the display element 26 but behind the front plate 46 (highlighted orange), form a closed pathway (highlighted green). This closed pathway is within the “housing” and thus “through the housing.” (Ex. 1002, ¶157). It is also around the display element 26 (the “electronic image assembly”). Because the display casing 10 is closed and weatherproof, the closed pathway is a “gas pathway within a display housing containing gas that is essentially isolated from external air,” (*see* Ex. 1023, p.1), i.e., “a closed loop airflow pathway passing through the housing.” (Ex. 1002, ¶157.)

Pet. 29–30.

Petitioner further explains that the two annotated versions of Figure 2 together show a closed passage way (highlighted in green) is formed around display element 26 (highlighted blue), and thus “around said electronic image assembly.” *Id.* at 30. Petitioner also reasons that because the ’142 patent describes “air may be used as the gas for both loops,” the closed passage way shown “is configured to accommodate circulating gas.” *Id.* (citing Ex. 1001, 5:24–25; Ex. 1002 ¶ 160).

Additionally, Petitioner explains that because the closed passage way includes ducting 66 (highlighted green) which is in front of display element (highlighted blue), at least a portion of the closed loop airflow pathway extends between the electronic image assembly and the cover panel, as claimed. *Id.* (citing Ex. 1002 ¶ 161).

With regard to these assertions, Patent Owner does not present counter-arguments at this stage. Petitioner’s assertions are supported by the cited evidence. We are sufficiently persuaded that Karppanen discloses limitation [1c].

e) Limitation [1d]

Claim 1 recites: “an open loop airflow pathway for ambient air passing through said housing and behind said electronic image assembly.”

Ex. 1001, 10:4–6. Petitioner asserts that Karppanen discloses this open loop airflow pathway because Karppanen’s system includes cooling space that has ventilator slots to allow ambient air to enter and exit the system. Pet. 31 (citing Ex. 1004 ¶¶ 162–165). Petitioner specifically cites (*id.*) to the following portion of Karppanen:

In normal use, the display casing [10] and the device casing [12] are turned against each other to a closed position and locked to each other by locking means 18 on one side of the casings. In the closed position, there remains a cooling space 20 between the display casing and the device casing, delimited by the cover 24 and the display casing (Fig. 2).

Ex. 1004, 7:7–11.

In the first edge of the cover 24 pointed downward and the second edge pointed upward there are ventilator slots 34, which enable the movement of air from the outside of the device to the cooling space and from the cooling space back to the outside of the device. When required, the ventilator slots can be provided with filters in order to prevent the access of impurities to the ventilation space. In the cover 24 there are cooling fans 36, by which the circulation of air through the cooling space is regulated.

Id. at 7:16–22.

On page 32 of the Petition, Petitioner provides an annotated version of Figure 1 of Karppanen, reproduced below:

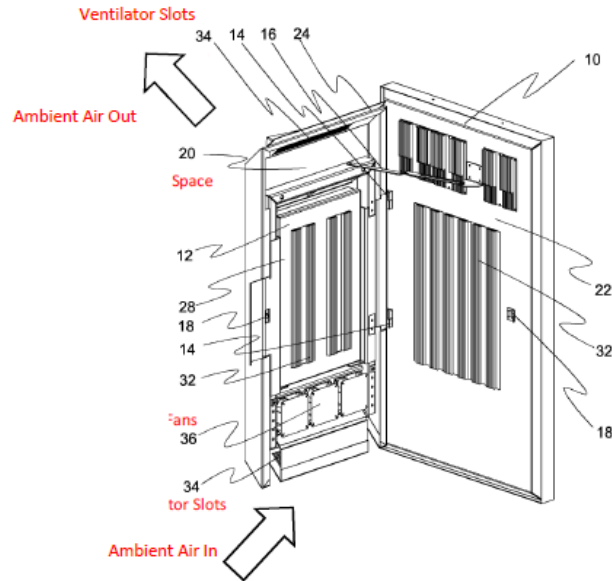
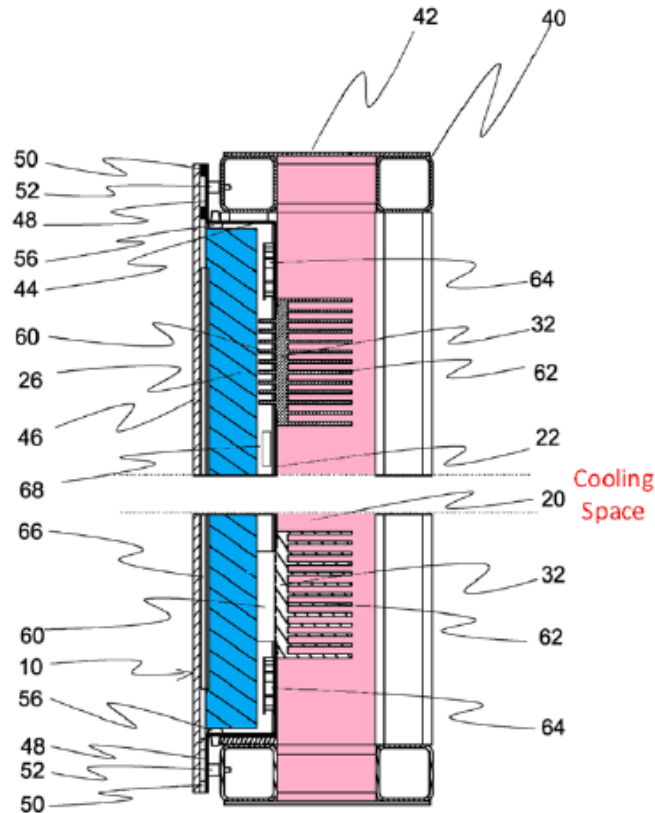


Figure 1 is a perspective view of an electronic information board according to Karppanen. Ex. 1004, 6:4–5 (color annotations added by Petitioner).

Petitioner explains that cooling space 20 is in an open loop because air from the atmosphere is drawn in inside cooling space 20, passes therethrough, and is exhausted, i.e., looped back, to the atmosphere. Pet. 32 (citing Ex. 1001, 7:16–22). Also, Petitioner explains that because cooling space 20 is between display casing 10 and device casing 12 and is delimited by cover 24 and display casing 10, ambient air passing through cooling space 20 passes through the housing as is required by limitation [1d]. *Id.* at 32–33 (citing Ex. 1001, 7:9–11; Ex. 1002 ¶ 164).

On page 33 of the Petition, Petitioner provides an annotated version of Figure 2 of Karppanen, reproduced below:



[Figure 2 is a cross-section of an embodiment of Karppanen’s electronic information board (Ex. 1004, 6:7–8) (color annotations by Petitioner)]

Petitioner explains that cooling space 20 (highlighted pink) as an open loop airflow pathway is located behind display element 26 (highlighted blue) as electronic image assembly, as claimed. Pet. 33 (citing Ex. 1002 ¶ 165).

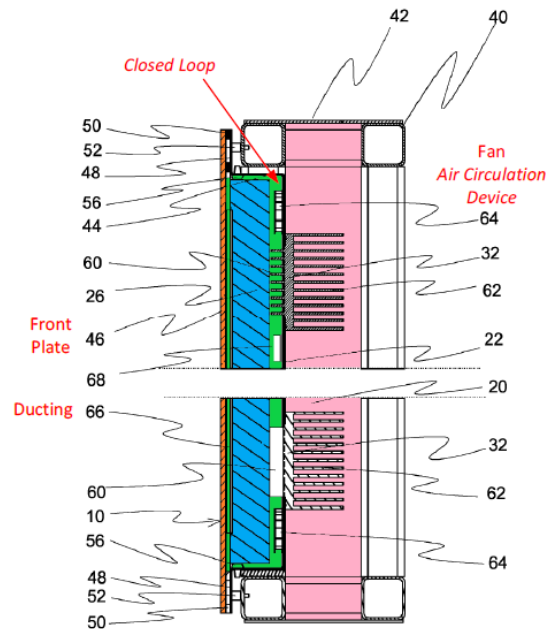
With regard to these assertions, Patent Owner does not present counter-arguments at this stage of the proceeding. Petitioner’s assertions are supported by the cited evidence. We are sufficiently persuaded that Karppanen discloses limitation [1d].

f) Limitation [1e]

Claim 1 recites: “at least one air circulation device positioned to force the circulating gas through the closed loop airflow pathway when activated.” Ex. 1001, 10:7–9. Petitioner asserts that Karppanen discloses this claim

element because Karppanen's system includes fans 64 which force the air circulating in the closed pathway. Pet. 33–34.

On page 40 of the Petition, Petitioner produces an annotated version of Figure 2 of Karppanen, reproduced below:



[Figure 2 is a cross-section of an embodiment of Karppanen's electronic information board (Ex. 1004, 6:7–8) (color annotations by Petitioner)]

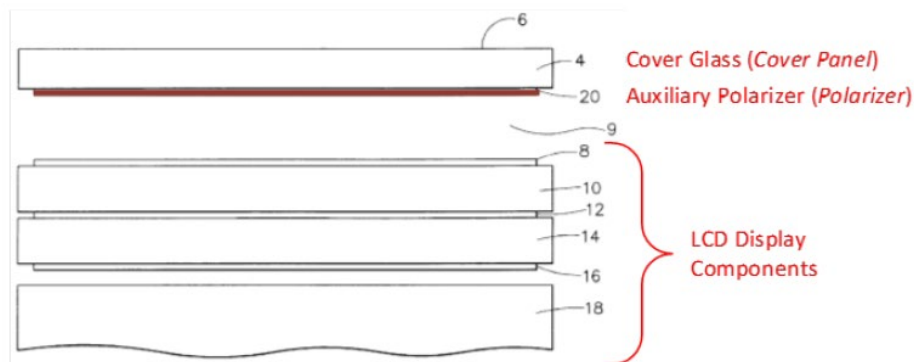
Petitioner explains that Karppanen discloses fans 64 which circulate air in the space between display element 26 (highlighted blue) and the walls of the display casing and which force the air of the inner casing to flow past front plate 46 (highlighted orange). Pet. 34 (citing Ex. 1004, 9:3–8, Fig. 2). The closed loop passage way is highlighted in green. *Id.* at 35–36.

With regard to these assertions, at this stage of the proceeding Patent Owner does not present counter-arguments. Petitioner's assertions are supported by the cited evidence. We are sufficiently persuaded that Karppanen discloses limitation [1e].

g) Limitation [If]

Claim 1 recites: “at least one polarizer located at an inward facing surface of said cover panel and configured to prevent at least some sunlight striking said cover panel from traveling beyond said at least one polarizer.” Ex. 1001, 10:10–13. Petitioner asserts the combined teachings of Karppanen and Larson teach this polarizer, “because Larson discloses a polarizer disposed between a cover glass and an LCD display.” Pet. 34–35 (citing Ex. 1002 ¶¶ 169–178). Petitioner asserts that Larson discloses a polarizer as an absorbing layer that can absorb ambient light and provide a “high contrast output at high ambient illumination levels.” *Id.* at 35 (citing Ex. 1005, 1:11–17, 1:22–27, 2:33–39).

On page 35 of the Petition, Petitioner presents an annotated version of Larson’s Figure 2, reproduced below:

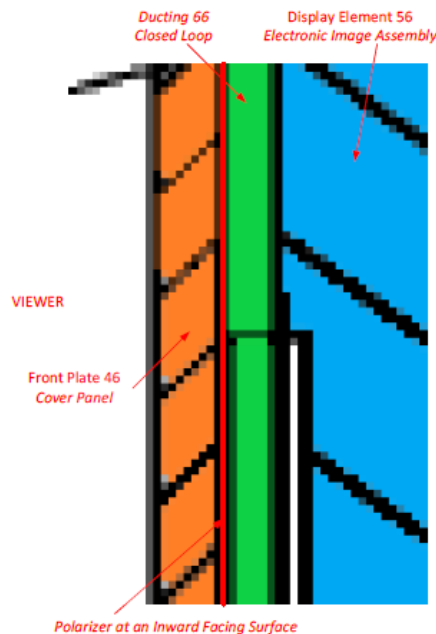


[Figure 2 shows a polarized display of Larson. Ex. 1005, 2:16–17]

Petitioner explains that, as shown in Larson’s Figure 2, display 2 includes cover glass 4, front gap 9, and auxiliary polarizer 20. Pet. 35 (citing Ex. 1005, 2:33–39). Petitioner further explains that Larson describes auxiliary polarizer 20 may be bonded to cover glass 4 between front gap 9 and cover glass 4. *Id.* (citing Ex. 1005, 3:13–19). Petitioner still further explains that because auxiliary polarizer 20 is bonded to cover glass 4 which

is a cover panel, Larson discloses “at least one polarizer located at an inward facing surface of said cover panel.” *Id.* (citing Ex. 1002 ¶ 174).

Petitioner asserts that one with ordinary skill in the art would have modified Karppanen’s system to include Larson’s auxiliary polarizer 20 on Karppanen’s front plate 46, as shown in an illustration on page 36 of the Petition, reproduced below:



Pet. 36. The figure is Petitioner’s illustration of how a polarizer (highlighted in red) would be included in Karppanen’s system by one with ordinary skill in the art following the teachings of Larson, i.e., by bonding to an inside surface of front plate 46 (highlighted in orange). *Id.* at 35–36.

Petitioner presents motivations for one with ordinary skill in the art to modify Karppanen as discussed above in light of Larson. Pet. 57–63. One relates to a reflectance problem described by Larson at the boundaries between Larson’s cover glass 4, air gap 9, and polarizer 8. *Id.* at 59 (citing Ex. 1005, 1:30–32). In that regard, Larson states: “[r]eflectances associated

with the boundaries between the cover glass 4, the gap 9, and the front polarizer 8 are especially pronounced.” Ex. 1005, 1:30–32.

Petitioner explains that Larson describes two solutions for the reflectance problem, one that applies an antireflective coating to the rear surface of cover glass 4, and one that includes auxiliary polarizer 20 between front gap 9 and cover glass 4. *Id.* at 60 (citing Ex. 1005, 2:50–56, 3:13–15). According to Petitioner, one of ordinary skill in the art would have understood that these two solutions may be used separately or together, as Petitioner uses the conjunctive/disjunctive term “and/or” to refer to these solutions when discussing the understanding of one with ordinary skill in the art. *Id.* at 61. Larson does indicate that both auxiliary polarizer 20 and antireflective coating on cover glass 4 may be present: “The addition of the antireflection coating to the rear of the cover glass 4 tends to reduce reflections at the boundary between the cover glass 4 and the auxiliary polarizer 20 or, if the auxiliary polarizer is omitted, the front gap 9.” Ex. 1005, 2:52–56.

Petitioner explains that “[one of ordinary skill in the art] would have recognized that the problem of reflectance at the boundaries may exist in Karppanen’s system as well, due to the ducting 66, i.e., the air gap between the front plate 46 and the display element 26.” *Id.* at 59 (citing Ex. 1002 ¶ 132). Petitioner further explains that the benefits to be achieved by making the modification to include a polarizer is to minimize reflectance at the gap and also to reduce the need for any anti-reflective coating. *Id.* at 62.

Petitioner presents another motivation for one with ordinary skill in the art to modify Karppanen as discussed above in light of Larson. It is based on Larson’s description that auxiliary polarizer 20 is an absorbing polarizer and that the auxiliary polarizer minimizes attenuation of light

coming from backlight 18. Pet. 60 (citing Ex. 1005, 3:19–24; Ex. 1002 ¶ 133). Petitioner asserts that “[one with ordinary skill in the art] would have also recognized that an absorbing polarizer can absorb at least some polarizations of the ambient light, such as sunlight, which can help improve the contrast and reduce the heating of the display caused by the sunlight.” *Id.* at 62 (citing Ex. 1002 ¶ 136).

Petitioner further explains that one with ordinary skill in the art would have understood the proposed combination as use of known techniques (anti-reflective materials and/or polarizer) to improve a similar apparatus in the same way to yield predictable results, and would have expected the combination to succeed. *Id.* at 62–63 (citing Ex. 1002 ¶¶ 137–138).

With respect to the foregoing, Patent Owner does not present counter-arguments or evidence, except for its discussion of objective evidence of nonobviousness. We are sufficiently persuaded that properly combined teachings of Karppanen and Larson disclose limitation [1f].

h) Conclusion

We have considered all of the arguments and evidence before us, both for and against obviousness, including Patent Owner’s contentions regarding objective evidence of nonobviousness, discussed below, and weighed the evidence accordingly. The evidence of obviousness is very strong and the evidence of nonobviousness is very weak. Petitioner has shown a reasonable likelihood that it would prevail in establishing obviousness of claim 1 over Karppanen and Larson.

5. Dependent Claims 2–5

Claims 2–5 each depend, directly or indirectly, from claim 1. Ex. 1001, 10:14–30. Petitioner addresses them on pages 36–44 of the Petition. Pet. 36–44. For claims 2 and 5, Petitioner relies on additional

teachings from Larson. *Id.* at 36–37, 44. Petitioner accounts for a corresponding motivation to combine. *Id.* at 57–63. For claims 3 and 4, Petitioner relies on additional teachings of Karppanen. *Id.* at 37–44.

At this stage of the proceeding, Patent Owner does not present counter-arguments or evidence, except for its discussion of objective evidence of nonobviousness. We are sufficiently persuaded that properly combined teachings of Karppanen and Larson disclose all of the limitations of each of dependent claims 2–5.

We have considered all of the arguments and evidence before us, both for and against obviousness, including Patent Owner’s contentions regarding objective evidence of nonobviousness, discussed below, and weighed the evidence accordingly. The evidence of obviousness is very strong and the evidence of nonobviousness is very weak. Petitioner has shown a reasonable likelihood that it would prevail in establishing obviousness of each of claims 2–5 over Karppanen and Larson.

6. *Independent Claim 6*

Petitioner addresses claim 6 on pages 44–52 of the Petition. Petitioner notes substantial similarities between claims 1 and 6. Pet. 44–52. For instance, Petitioner asserts that recitation [6 pre] and limitation 6[a] are identical, respectively, to recitation [1 pre] and limitation [1a]. Pet. 44. Petitioner notes non-substantive differences. For example, where claim 1 recites “forward portion,” claim 6 recites “front portion” (*id.*); where claim 1 recites “closed loop airflow pathway,” claim 6 recites “closed loop gas circulation pathway” (*id.* at 45); where claim 1 recites “extends between,” claim 6 recites “passes between” (*id.*); where claim 1 recites “air circulation device,” claim 6 recites “gas circulation device” (*id.* at 48); where claim 1 recites a pathway “passing through the housing,” claim 6 recites a pathway

“contained within the housing” (*id.* at 46); where claim 1 recites “circulating gas through the closed loop,” claim 6 recites “circulating gas around the closed loop” (*id.* at 49). Petitioner explains that circulating gas through the closed loop is the same as circulating gas around the closed loop, because the path is a loop. *Id.* (citing Ex. 1002 ¶ 224).

Petitioner explains that limitation [6c] is essentially the same as limitation [1d]. Pet. 45. Petitioner explains that limitation [6d] is essentially the same as limitation [1c]. *Id.* at 45–46. Petitioner explains that limitation [6h] is essentially the same as limitation [1e]. *Id.* at 48–49.

At this stage of the proceeding, Patent Owner does not dispute the above-noted comparison by Petitioner of similarities between claim 1 and claim 6. We are sufficiently persuaded thereby and proceed further on that basis.

Petitioner specifically accounts for limitations that are present in claim 6 but not in claim 1. *Id.* at 44–52. Limitation 6[b] requires the cover panel to be “transparent.” Petitioner explains that Karppanen’s “front plate 46” which Petitioner relies on as the cover panel, is described as “transparent.” *Id.* at 45 (citing Ex. 1004, 7:31–35). Patent Owner does not dispute, on the current record, that Karppanen’s front plate 46 is described as being transparent. We are sufficiently persuaded that Karppanen’s front plate 46, relied on by Petitioner as the claimed cover panel, is transparent.

Limitation [6e] recites: “an inlet located at a first portion of said housing for ingesting ambient air into said open loop airflow pathway.” Petitioner explains that in Karppanen’s system, cover 24 (which forms a part of the housing) includes vents 34 (“an inlet”) at the bottom (“a first portion of said housing”) for ingesting ambient air into cooling space 20 (“said open loop airflow pathway”). Pet. 41 (citing Ex. 1002 ¶¶ 194–196). On page 42

of the Petition, Petitioner provides an annotated version of Figure 1 of Karppanen, reproduced below:

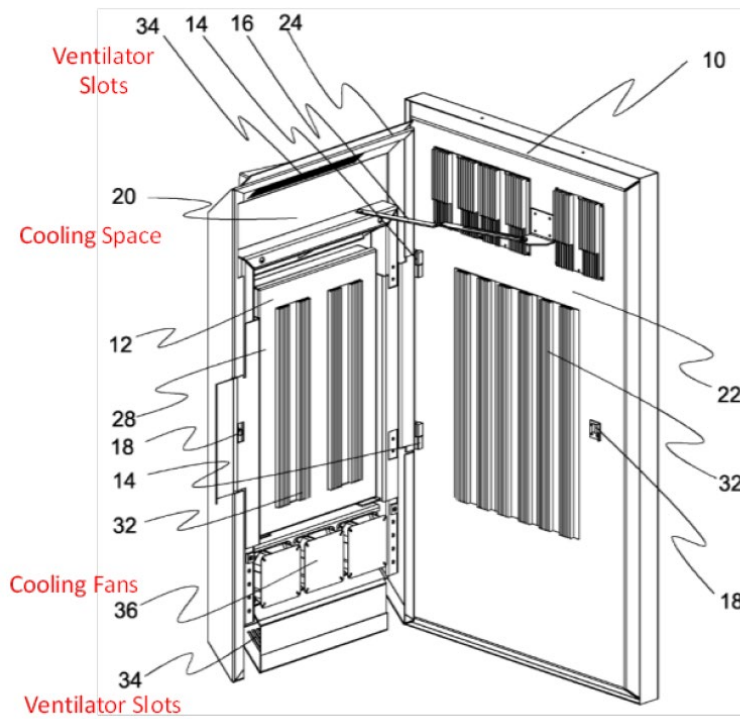


Figure 1 is a perspective view of an electronic information board according to Karppanen. Ex. 1004, 6:4–5 (color annotations added by Petitioner).

Petitioner additionally cites to Karppanen which describes:

In the first edge of the cover 24 pointed downward and the second edge pointed upward there are ventilator slots 34, which enable the movement of air from the outside of the device to the cooling space and from the cooling space back to the outside of the device. . . . When required, the ventilator slots can be provided with filters in order to prevent the access of impurities to the ventilation space. In the cover 24 there are cooling fans 36, by which the circulation of air through the cooling space is regulated.

Ex. 1004, 7:16–22 (cited at Pet. 42).

With regard to these assertions, Patent Owner does not present counter-arguments at this stage. Petitioner's assertions are supported by the cited evidence. We are sufficiently persuaded that Karppanen discloses limitation [6e].

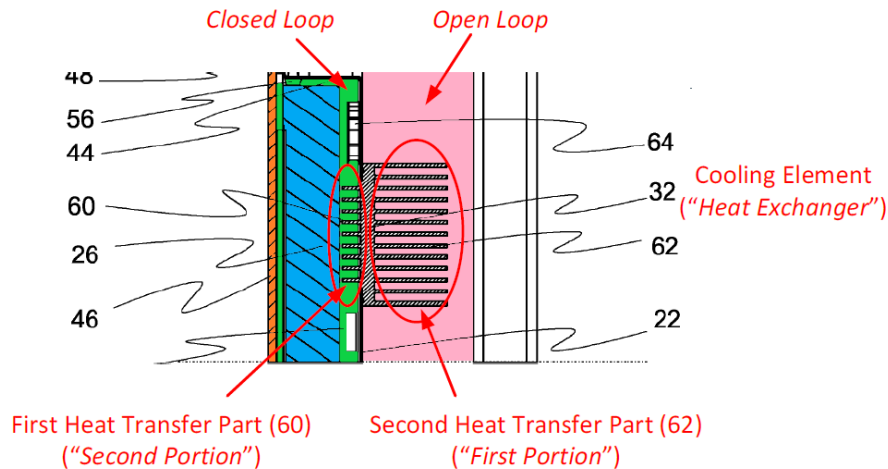
Limitation [6f] recites: "an exhaust located at a second portion of said housing for exhausting said ambient air from said open loop airflow pathway." Ex. 1001, 10:48–50. Petitioner explains that in Karppanen's system, cover 24 (which forms a part of the housing) includes vents 34 ("an exhaust") at the top ("a second portion of said housing") for exhausting ambient air from cooling space 20 ("said open loop airflow pathway"). Pet. 42–43 (citing Ex. 1002 ¶¶ 197–199). With regard to these assertions, Patent Owner does not present counter-arguments at this stage of the proceeding. Petitioner's assertions are supported by the cited evidence. We are sufficiently persuaded that Karppanen discloses limitation [6f].

Limitation [6g] recites: "an air circulation device positioned along said open loop airflow pathway between said inlet and said exhaust, wherein said air circulation device is configured to force said ambient air through the open loop airflow pathway when activated." Ex. 1001, 10:51–55. Petitioner explains that "Karppanen's system includes fans 36 to force ambient air through the cooling space 20." Pet. 47 (citing Ex. 1002 ¶¶ 218–221). Petitioner already explained, in the context of limitation [1d], that cooling space 20 is in an open loop pathway because air from the atmosphere is drawn in inside cooling space 20, passes therethrough, and is exhausted to the atmosphere. *Id.* at 32 (citing Ex. 1001, 7:16–22; Ex. 1002 ¶ 164). Patent Owner does not dispute these assertions of Petitioner at this stage, which we find to be supported by the cited evidence. We are sufficiently persuaded that Karppanen discloses limitation [6g].

Limitation [6i] recites: “a heat exchanger located rearward of the electronic image assembly, wherein 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 part of said closed loop gas circulation pathway.” Ex. 1001, 10:59–63.

Petitioner asserts that Karppanen discloses cooling element 32, which is a heat exchanger, that is disposed behind display element 26. Pet. 37 (citing Ex. 1002 ¶¶ 184–186). Petitioner asserts that in the backwall of Karppanen’s display casing 10, there are cooling elements 32 which have first heat transfer part 60 extending to the inside of the display casing and second heat transfer part 62 extending to cooling space 20 outside the display casing. *Id.* at 38 (citing Ex. 1004, 8:13–16, Fig. 2). Petitioner also explains that second heat transfer part 62 (“first portion” as claimed) of cooling element 32 forms a part of cooling space 20 which is in the open loop airflow pathway. *Id.* at 39–40 (citing Ex. 1002 ¶¶ 187–190). Petitioner further explains that first heat transfer part 60 (“second portion” as claimed) of cooling element 32 forms a part of the closed pathway within display casing 10. *Id.* at 40–41 (citing Ex. 1002 ¶¶ 191–193).

On page 41 of the Petition, Petitioner provides an annotated version of an upper part of Karppanen’s Figure 2, reproduced below:



[Figure 2 is a cross-section of an embodiment of Karppanen's electronic information board (Ex. 1004, 6:7–8) (color annotations by Petitioner)]

As illustrated in the above-reproduced figure, fins which form first heat transfer part 60 of cooling element 32 extend into the closed loop pathway which is colored green, and fins which form second heat transfer part 62 of cooling element 32 extend into the open loop pathway which is colored pink.

At this stage of the proceeding, Patent Owner does not dispute these assertion of Petitioner, which we find to be supported by the cited evidence. We are sufficiently persuaded that Karppanen discloses limitation [6i].

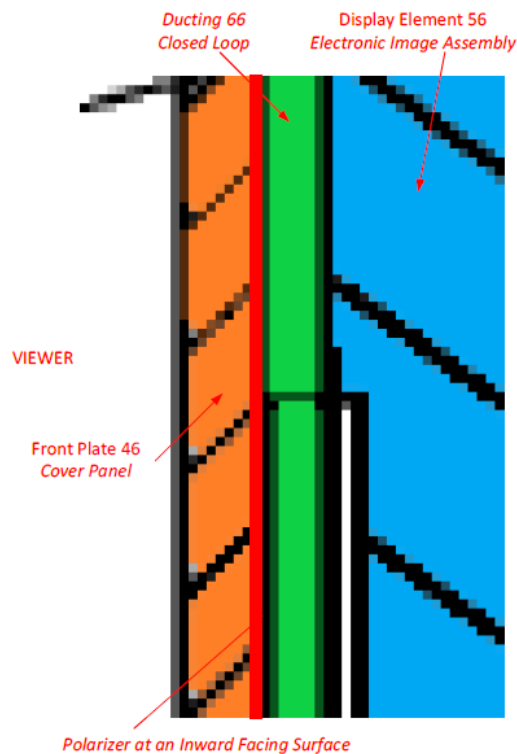
Limitation [6j] recites:

one or more solar energy reduction layers located at said transparent cover panel, wherein each of said one or more solar energy reduction layers is configured to prevent a portion of solar energy entering said transparent cover panel from thermally interacting with the circulating gas at said portion of said closed loop gas circulation pathway passing between said transparent cover panel and said electronic image assembly or thermally interacting with said electronic image assembly.

Ex. 1001, 10:64–11:6. Petitioner explains that the “polarizer” of limitation [1f] discussed above satisfies the requirements of limitation [6j].
Pet. 50.

Petitioner asserts that Larson’s polarizer is a solar energy reduction layer. *Id.* (citing Ex. 1002 ¶ 229). Petitioner also notes that claim 8 of the ’142 patent recites: “at least one of said one or more solar energy reduction layers comprise a polarizer.” *Id.* Petitioner explains that because Larson’s polarizer 20 is located “at an inward facing surface of said cover panel,” it is located “at said transparent cover panel.” *Id.* at 50 (citing Ex. 1002 ¶ 230).

On page 51 of the Petition, Petitioner provides an annotated version of part of Karppanen’s Figure 2, reproduced below, showing the position of a polarizer added according to the teachings of Larson as explained above in the context of limitation [1f]:



[Figure 2 is a cross-section of an embodiment of Karppanen’s electronic information board (Ex. 1004, 6:7–8) (color annotations by Petitioner)]

In this figure, transparent front plate 46 is colored orange, a portion of the closed loop is colored green, display element 26 (misabeled in the Figure as element 56) is colored blue, and Larson’s polarizer 20 (added to

Karppanen) is colored red. Pet. 50. Petitioner asserts that the polarizer is configured to prevent at least some sunlight striking the cover panel from traveling beyond the cover panel, because the polarizer is an absorbing polarizer. *Id.* at 51–52. Petitioner asserts that Larson discloses a polarizer as an absorbing layer that can absorb ambient light and provide a “high contrast output at high ambient illumination levels.” *Id.* at 35 (citing Ex. 1005, 1:11–17, 1:22–27, 2:33–39).

Alternatively, Petitioner asserts:

Moreover, Larson discloses that an “antireflection coating[] **6** may be added to one or **both sides** of the cover glass **4**.” (Ex. 1005, 1:34–36, FIG. 1.) The antireflection coating can also block some wavelengths, i.e., some incident solar energy from entering the cover glass **4** (“**said transparent cover panel**”) from reaching the gap **9**, i.e., the front portion of the closed loop in Karppanen’s system. (Ex. 1002, ¶ 233.)

Id. at 52.

According to Petitioner, either Larson’s polarizer 20 or antireflection coating 6, when incorporated into Karppanen’s system, satisfy the claimed one or more solar energy reduction layers. *Id.* Petitioner discusses motivation to combine the teachings of Karppanen and Larson on pages 57–63 of the Petition, as we have already discussed above in the context of limitation [1f].

With respect to the foregoing, at this stage Patent Owner does not present counter-arguments or evidence, except for its discussion of objective evidence of nonobviousness. We are sufficiently persuaded that properly combined teachings of Karppanen and Larson, adding either Larson’s polarizer 20 or Larson’s antireflection coating 6 to Karppanen, disclose limitation [6j].

We have considered all of the arguments and evidence before us, both for and against obviousness, including Patent Owner's contentions regarding objective evidence of nonobviousness, discussed below, and weighed the evidence accordingly. The evidence of obviousness is very strong and the evidence of nonobviousness is very weak. Petitioner has shown a reasonable likelihood that it would prevail in establishing obviousness of claim 6 over Karppanen and Larson.

7. *Dependent Claims 7–11*

Claims 7–11 each depend, directly or indirectly, from claim 6. Ex. 1001, 11:7–25. Petitioner addresses them on pages 52–54 of the Petition. Pet. 52–54. For claims 8–11, Petitioner relies on additional teachings from Larson. *Id.* at 53–54. Petitioner accounts for a corresponding motivation to combine. *Id.* at 57–63. For claim 7, Petitioner relies on additional teachings of Karppanen. *Id.* at 52–53.

At this stage of the proceeding, Patent Owner does not present counter-arguments or evidence, except for its discussion of objective evidence of nonobviousness. We are sufficiently persuaded that properly combined teachings of Karppanen and Larson disclose all of the limitations of each of dependent claims 7–11.

We have considered all of the arguments and evidence before us, both for and against obviousness, including Patent Owner's contentions regarding objective evidence of nonobviousness, discussed below, and weighed the evidence accordingly. The evidence of obviousness is very strong and the evidence of nonobviousness is very weak. Petitioner has shown a reasonable likelihood that it would prevail in establishing obviousness of each of claims 7–11 over Karppanen and Larson.

8. *Independent Claim 12*

Claim 12 is a method claim. Ex. 1001, 11:26–12:16. Petitioner addresses claim 12 on pages 54–56 of the Petition. The steps of claim 12 correspond to functions performed by various elements of claims 1 and 6. Petitioner relies on its analysis of claims 1 and 6 to explain the alleged unpatentability of claim 12. Pet. 54–56. For instance, Petitioner asserts Karppanen discloses [12pre] “for the reasons provided for element 1[pre].” *Id.* at 54. Petitioner also asserts: “Karppanen discloses [limitation [12a]] for the reasons provided for 1[a] under Ground 1.” *Id.* Petitioner further asserts: “For the reasons provided for 1[b], 1[c], and 1[e] under [alleged obviousness over Karppanen and Larson], Karppanen in view of Larson teaches all of the limitations of 12[b].” *Id.* at 55. As another example, Petitioner asserts: “For the reasons provided for claim elements 1[d] and 6[g] under [alleged obviousness over Karppanen and Larson], Karppanen in view of Larson teaches element 12[c].” *Id.* at 55–56. As still another example, Petitioner asserts: “the combination of Karppanen and Larson teaches [limitation [12d] for the reasons provided in [alleged obviousness over Karppanen and Larson] for claim elements 1[f] and 6[j].” *Id.* at 56.

At this stage of the proceeding, Patent Owner does not present counter-arguments or evidence beyond those it has asserted for claims 1 and 6, which we have already addressed above. After having fully considered Patent Owner’s contentions on objective evidence of nonobviousness, discussed below, we are sufficiently persuaded that properly combined teachings of Karppanen and Larson disclose all of the recitations and limitations of claim 12.

We have considered all of the arguments and evidence before us, both for and against obviousness, including Patent Owner’s contentions regarding

objective evidence of nonobviousness, discussed below, and weighed the evidence accordingly. The evidence of obviousness is very strong and the evidence of nonobviousness is very weak. Petitioner has shown a reasonable likelihood that it would prevail in establishing obviousness of claim 12 over Karppanen and Larson.

9. *Dependent Claims 13–15*

Claims 13 and 15 each depend from claim 12. Ex. 1001, 12:17–29. Claim 14 depends from claim 13. *Id.* at 12:20–22. Petitioner accounts for the additional limitations of these dependent claims on pages 56–57 of the Petition. Pet. 56–57. For claims 13 and 14, Petitioner relies on additional teachings from Larson. *Id.* Petitioner accounts for a corresponding motivation to combine. *Id.* at 57–63. For claim 15, Petitioner relies on additional teachings of Karppanen. *Id.* at 57.

At this stage, Patent Owner does not present counter-arguments or evidence, except for its discussion of objective evidence of nonobviousness. After having fully considered Patent Owner’s contentions on objective evidence of nonobviousness, discussed below, we are sufficiently persuaded that properly combined teachings of Karppanen and Larson disclose all of the limitations of each of dependent claims 13–15.

We have considered all of the arguments and evidence before us, both for and against obviousness, including Patent Owner’s contentions regarding objective evidence of nonobviousness, discussed below, and weighed the evidence accordingly. The evidence of obviousness is very strong and the evidence of nonobviousness is very weak. Petitioner has shown a reasonable likelihood that it would prevail in establishing obviousness of each of claims 13–15 over Karppanen and Larson.

D. Alleged Obviousness of Claims 1–15 over Yare and Larson

1. Overview of Yare

Yare relates to a display cabinet including a sealed airtight compartment for mounting a display system, and a heat transfer means such as a heat exchanger to dissipate heat from the airtight compartment to the surrounding environment through thermal communication with an unsealed atmospheric zone. Ex. 1006, code (57). Yare states that its cabinet has improved cooling facilities and is particularly suitable for use in providing large scale displays in public places. Ex. 1006, 1:4–6. Specifically, Yare describes:

In a preferred embodiment, a zone of the cabinet containing the display system is sealed to the external environment. The sealed zone includes an internal cooling system that is not open to atmospheric air. Atmospheric air is drawn into a separate zone that allows heat to be exchanged between the two zones. Heat is then removed by expulsion of the heated atmospheric air from the casing.

Id. at 2:8–12.

Regarding the zone into which atmospheric air is drawn, Yare describes:

The display cabinet may further comprise an atmospheric zone, the heat transfer means being arranged to communicate heat from the substantially atmospherically sealed zone to the atmospheric zone.

The atmospheric zone may include air transfer means arranged to draw air from outside the cabinet and expel air in the atmospheric zone heated by the heat transfer means.

The air transfer means may include one or more fans.

The heat transfer means may comprise a heat exchanger.

Id. at 2:19–29.

Regarding the sealed zone, Yare describes:

The substantially atmospherically sealed zone may include air circulation means arranged to circulate air along the heat transfer means.

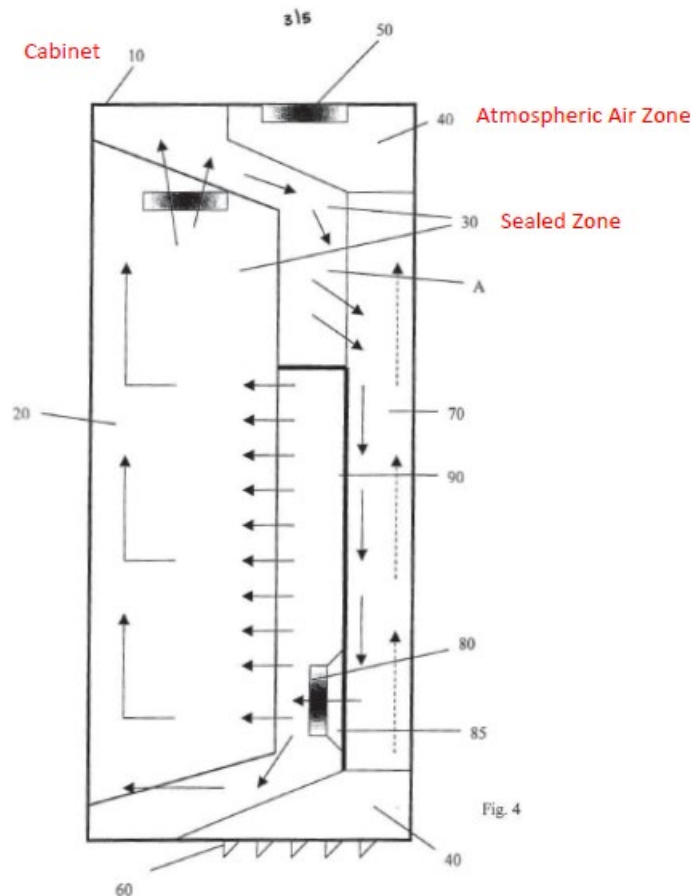
The air circulation means may include a baffle plate.

The substantially atmospherically sealed zone may include air pressurisation means arranged to project air within the atmospherically sealed zone [to] circulate air along the mounted display.

The air pressurisation means may include one or more fans.

Id. at 3:1–11.

Figure 4 of Yare, annotated by Petitioner and appearing on page 26 of the Petition, is reproduced below:



[Figure 4 is a partial cross-sectional view of a system according to Yare, with color annotations by Petitioner]

In the above-reproduced Figure, “[d]otted arrows show movement of air in the atmospheric air zone 40 whilst solid arrows show movement of air in the sealed zone 30.” Ex. 1006, 4:25–27.

Yare describes:

Air is drawn through the atmospheric air zone 40 by fans 50. As the air is drawn through the atmospheric air zone 40 it passes across one or more surfaces of the heat exchanger 70. Similarly, air within the sealed zone 30 is drawn into the heat exchanger 70 behind the baffle plate 90 by the fans 80 at point A and passes across one or more other surfaces of the heat exchanger 70.

Air is circulated within the sealed zone 30 due to operation of the fans 80 within the cabinet and fans 25 within the display 20. Air coming into contact with hot components of the display 20 absorbs some of the heat, Due to operation of the fans 25 and 80 and orientation of the baffle plate 90, air within the sealed zone 30 is directed along one or more surfaces of the heat exchanger 70 around the baffle plate 90. Heat is transferred by the heat exchanger 70 from hot air in the sealed zone 30 to cooler atmospheric air within the atmospheric air zone 40. Heated air in the atmospheric air zone 40 is eventually ejected from the cabinet via exhausts in the fans 50.

The cooled air in the sealed zone is then forced through the fans 80 at the base of the heat exchanger 70 into a pressure zone 85.

As air is forced into the pressure zone 85, existing air in the pressure zone 85 is forced through vents in the rear portion 35 of the display 20. The air circulates around the display 20, aided by standard internal cooling system of the display 20. In the illustrated embodiment, the internal cooling system includes the fans 25, The air is heated by hot components as it circulates, and is drawn upwards by the fans 25 within the display unit and blown out of the rear portion 35 for the cycle to continue.

Id. at 4:29–5:20.

Yare also describes that “[v]arious forms of display system may be used, for example, plasma, LCD, TFT, CRT, LED, rear projection or any similar technology.” *Id.* at 6:31–32.

2. *Independent Claim 1*

a) *Recitation [1 pre]*

In its preamble, claim 1 recites: “A cooling system for an electronic image assembly, the cooling system comprising.” Ex. 1001, 9:55–56.

Petitioner asserts that Yare discloses such a cooling system. Pet. 63.

Specifically, Petitioner asserts Yare discloses cabinet 10 having “improved cooling facilities,” which is a cooling system, and display 20. *Id.* (citing Ex. 1002 ¶¶ 281–284). Petitioner notes that Yare describes a number of different display systems may be used, including an LCD display. *Id.* at 64 (citing Ex. 1006, 6:31–32). Petitioner identifies Yare’s LCD display as the claimed electronic image assembly. *Id.* at 65. Petitioner’s assertions are supported by the cited evidence. At this stage, Patent Owner does not present counter-argument in this regard. We are sufficiently persuaded that Yare discloses “[a] cooling system for an electronic image assembly.”⁹

b) *Limitation [1a]*

Claim 1 recites: “a housing for the electronic image assembly.” Ex. 1001, 9:57. Petitioner asserts that Yare discloses limitation [1a] because Yare’s cabinet 10 is a housing for display 20 which is an electronic image assembly. Pet. 65 (citing Ex. 1002 ¶¶ 285–287; Ex. 1006, 1:4–6, 4:4–6). Patent Owner does not present counter-argument in this regard at this stage of the proceeding. We are sufficiently persuaded that Yare discloses limitation [1a].

c) *Limitation [1b]*

Claim 1 recites “a cover panel forming a forward portion of the housing, wherein the cover panel is located forward of, and at least some

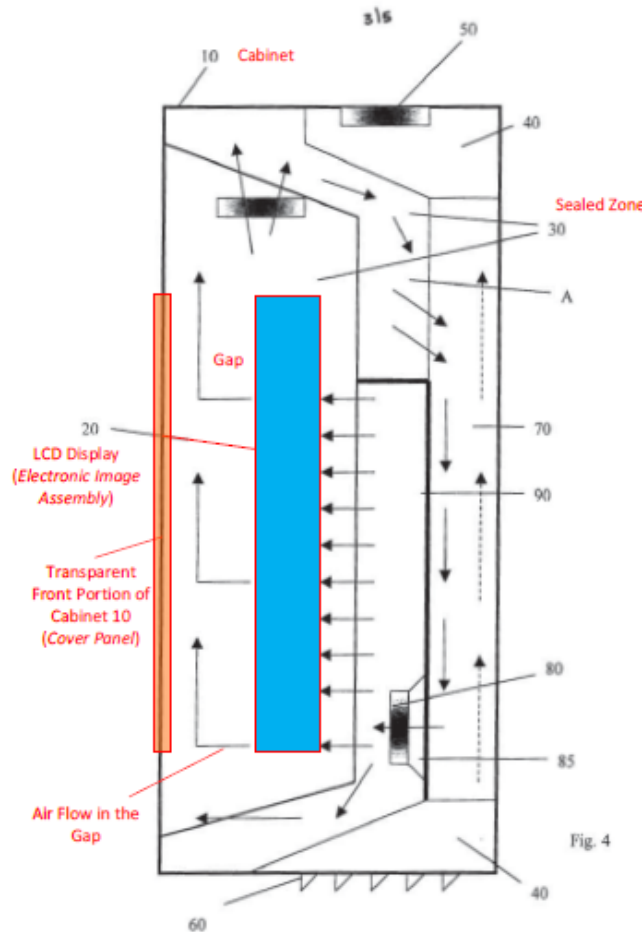
⁹ It is not necessary to determine whether the preamble recitation is limiting.

distance from, the electronic image assembly and is configured to permit viewing of images displayed at the electronic image assembly through said cover panel.” Ex. 1001, 9:58–63.

Petitioner asserts that Yare individually and also in combination with Larson discloses limitation [1a]. Pet. 66.

With respect to Yare individually, Petitioner asserts that one with ordinary skill in the art would have understood that at least a portion of the front part of Yare’s cabinet 10 would be transparent to allow viewers to view contents displayed on display 20, because one with ordinary skill in the art would have understood that the LCD or other type of display could not be viewed otherwise. *Id.* at 66–67 (citing Ex. 1002 ¶ 289; Ex. 1006, 1:4–6, 4:4–5).

On page 69 of the Petition, Petitioner provides an annotated version of Figure 4 of Yare, reproduced below:



[Figure 4 of Yare shows a partial cross section of Yare’s display system (Ex.1006, 3:25–27)]

Petitioner asserts that the transparent front portion at the front of cabinet 10, highlighted in orange in the annotated figure above, is a cover forming a forward portion of the housing (cabinet 10). *Id.* at 67 (citing Ex. 1002 ¶ 290). Petitioner explains that although the figure does not actually show the location of the display 20 within cabinet 10, the “L” shaped arrows “indicate that a part of the air flow within the sealed zone 30 occurs in front of the display 20 [highlighted in blue].” *Id.* at 69. Thus, Petitioner asserts one with ordinary skill in the art “would understand that the transparent portion of the display cabinet 10 is not in contact with, but is spaced apart from the display 20, which would allow an airflow in the front

of the display 20.” *Id.* at 69–70 (citing Ex. 1002 ¶ 292). On that basis, Petitioner asserts Yare “teaches or at least suggests” limitation [1b]. *Id.* at 70.

At this stage, Patent Owner does not present counter-argument in this regard. We are sufficiently persuaded that Yare discloses limitation [1b]. Yare does not have to expressly state this feature to disclose the same to one with ordinary skill in the art. The pertinent question is whether one skilled in the art would reasonably understand or infer from the prior art reference that the claim element is disclosed. *See Eli Lilly v. Los Angeles Biomedical Research Institute*, 849 F.3d 1073, 1074–1075 (Fed. Cir. 2017); *In re Baxter Travenol Labs.*, 952 F.2d 388, 390 (Fed. Cir. 1991). “[I]t is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom.” *In re Preda*, 401 F.2d 825, 826 (CCPA 1968).

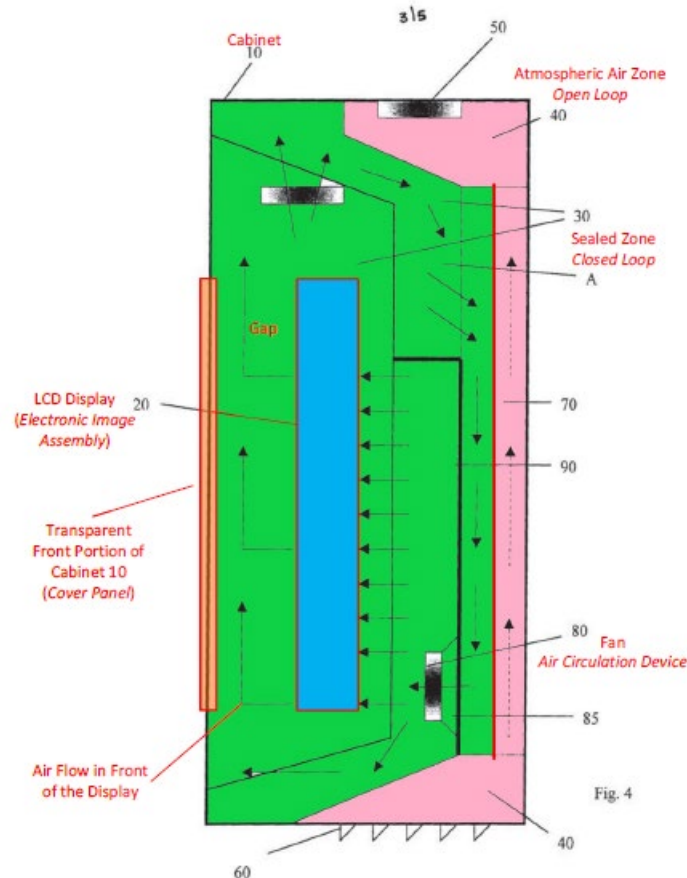
Based on the same reasoning, we also are sufficiently persuaded that Yare alone reasonably would have suggested to one with ordinary skill in the art limitation [1b]. We need not reach Petitioner’s alternative contention that the combined teachings of Yare and Larson would have disclosed limitation [1b].

d) Limitation [1c]

Claim 1 further recites: “a closed loop airflow pathway passing through the housing, wherein said closed loop airflow passes around said electronic image assembly and is configured to accommodate circulating gas, and wherein at least a portion of said closed loop airflow pathway extends between said electronic image assembly and said cover panel.” Ex. 1001, 9:64–10:3. Petitioner asserts Yare discloses this closed loop pathway because “Yare’s cabinet 10 includes a sealed zone 30 through

which air is circulated around the display 20, without contamination from atmospheric air, duct, etc.” Pet. 72 (citing Ex. 1002 ¶¶ 300–306).

On page 73 of the Petition, Petitioner produces an annotated version of Figure 4 of Yare, reproduced below:



[Figure 4 of Yare shows a partial cross section of Yare’s display system (Ex.1006, 3:25–27)]

Petitioner notes that Yare describes: “Air is circulated within the sealed zone 30 (highlighted green) due to operation of the fans 80 within the cabinet and fans 25 within the display 20.” Pet. 72 (citing Ex. 1006, 5:1–2). Petitioner also explains that because sealed zone 30 (highlighted green) is contained within cabinet 10 (the housing), and because sealed zone 30 and ambient air zone 40 are sealed from each other, sealed zone 30 (highlighted

green) is a closed loop airflow pathway passing through the housing and surrounding the electronic image assembly (display 20). *Id.* at 73–74.

Petitioner further explains that a portion of the airflow in sealed zone 30 extends along a pathway between the front of display 20 (electronic image assembly) and the transparent front portion of cabinet 10 (cover panel). *Id.* at 74 (citing Ex. 1002 ¶ 305).

With respect to the foregoing assertions regarding limitation [1c], Patent Owner does not present counter-argument at this stage of the proceeding. Petitioner’s assertions are supported by the cited evidence. We are sufficiently persuaded that Yare discloses limitation [1c].

Alternatively, Petitioner asserts that Larson discloses a cover panel located at some distance from a display in a housing, and that in light of Larson’s teachings, the combined teachings of Yare and Larson disclose limitation [1c]. *Id.* We need not reach this alternative contention, because Yare alone discloses limitation [1c].

e) Limitation [1d]

Claim 1 recites: “an open loop airflow pathway for ambient air passing through said housing and behind said electronic image assembly.” Ex. 1001, 10:4–6. Petitioner asserts that Yare discloses this limitation because Yare’s system includes atmospheric zone 40 within display cabinet 10. Pet. 74 (citing Ex. 1002 ¶¶ 307–311).

Petitioner also asserts that as shown in the annotated figure reproduced above within the discussion of limitation [1c], atmospheric zone 40 (highlighted pink) is the open loop airflow pathway for ambient air passing through the housing, and is behind display 20 which is the electronic image assembly. *Id.* at 75. Petitioner explains that Yare’s atmospheric air zone 40 is an open loop airflow pathway because outside air is drawn

through vents 60 into atmospheric air zone 40 by fans 50 and then expelled from cabinet 10. *Id.* at 74 (citing Ex. 1002 ¶ 308; Ex. 1006, 4:11–16).

With regard to these assertions, Patent Owner does not present counter-argument at this stage. Petitioner’s assertions are supported by the cited evidence. We are sufficiently persuaded that Yare discloses limitation [1d].

f) Limitation [1e]

Claim 1 recites: “at least one air circulation device positioned to force the circulating gas through the closed loop airflow pathway when activated.” Ex. 1001, 10:7–9. Petitioner asserts that Yare discloses this limitation because Yare’s display cabinet 10 includes fans 80 and 25 within sealed zone 30 which is the closed loop airflow pathway. *Id.* at 76 (citing Ex. 1002 ¶¶ 312–315).

Petitioner notes that Yare describes: “The cabinet 10 includes a heat exchanger 70 mounted on a baffle plate 90. Also mounted on the baffle plate 90 are fans 80.” Ex. 1006, 4:18–19 (cited at Pet. 92). Petitioner also cites to the following description in Yare: “Air is circulated within the sealed zone 30 due to operation of the fans 80 within the cabinet and fans 25 within the display 20.” *Id.* at 5:1–2 (cited at Pet. 92).

Petitioner explains that because air is circulated within sealed zone 30 due to operation of fans 80, fan 80 is one air circulation device positioned to force circulating gas through the closed loop airflow pathway when activated. Pet. 77–78 (citing Ex. 1002 ¶ 314).

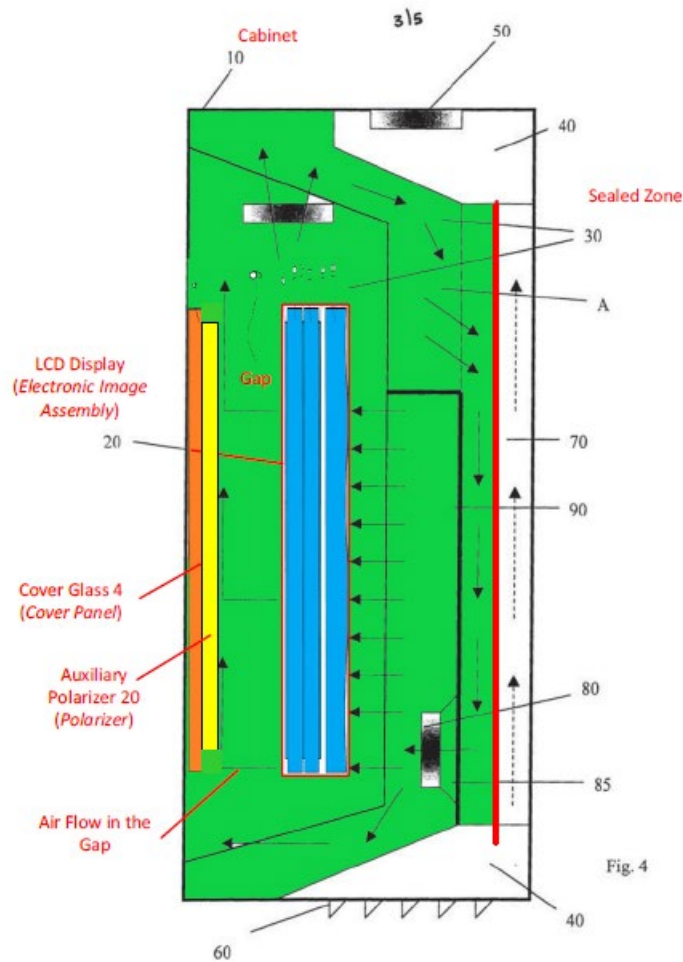
At this stage of the proceeding, with regard to these assertions, Patent Owner does not present counter-argument. Petitioner’s assertions are supported by the cited evidence. We are sufficiently persuaded that Yare discloses limitation [1e].

g) Limitation [If]

Claim 1 recites: “at least one polarizer located at an inward facing surface of said cover panel and configured to prevent at least some sunlight striking said cover panel from traveling beyond said at least one polarizer.” Ex. 1001, 10:10–13. Petitioner asserts the combined teachings of Yare and Larson teach this polarizer, “because, as discussed for this claim element under [obviousness ground over Karppanen and Larson], Larson discloses a polarizer disposed between a cover glass and an LCD display.” Pet. 78 (citing Ex. 1002 ¶¶ 316–326). Petitioner asserts that Larson discloses a polarizer as an absorbing layer that can absorb ambient light and provide a “high contrast output at high ambient illumination levels.” *Id.* at 35 (citing Ex. 1005, 1:11–17, 1:22–27, 2:33–39).

Petitioner explains that, as shown in Larson’s Figure 2, display 2 includes cover glass 4, front gap 9, and auxiliary polarizer 20. *Id.* (citing Ex. 1005, 2:33–39). Petitioner further explains that Larson describes auxiliary polarizer 20 may be bonded to cover glass 4 between front gap 9 and cover glass 4. *Id.* (citing Ex. 1005, 3:13–19). Petitioner still further explains that because auxiliary polarizer 20 is bonded to cover glass 4 which is a cover panel, Larson discloses “at least one polarizer located at an inward facing surface of said cover panel.” *Id.* (citing Ex. 1002 ¶ 174).

Petitioner asserts that Yare’s system, modified to incorporate Larson’s polarized display, would appear as follows, as presented on page 79 of the Petition:



Pet. 78–79. The figure is Petitioner’s illustration of how a polarizer would have been included in Yare’s system by one with ordinary skill in the art following the teachings of Larson. *Id.*

Petitioner presents motivations for one with ordinary skill in the art to modify Yare as discussed above in light of Larson. Pet. 101–105. One relates to a reflectance problem described by Larson at the boundaries between Larson’s cover glass 4, air gap 9, and polarizer 8. *Id.* at 103 (citing Ex. 1005, 1:30–32). In that regard, Larson states: “[r]eflectances associated with the boundaries between the cover glass 4, the gap 9, and the front polarizer 8 are especially pronounced.” Ex. 1005, 1:30–32.

Petitioner explains that Larson describes two solutions for the reflectance problem, one that applies an antireflective coating to the rear surface of cover glass 4, and one that includes auxiliary polarizer 20 between front gap 9 and cover glass 4. Pet. 103 (citing Ex. 1005, 2:50–56, 3:13–15). According to Petitioner, one of ordinary skill in the art would have understood that these two solutions may be used separately or together, as Petitioner uses the conjunctive/disjunctive term “and/or” to refer to these solutions when discussing the understanding of one with ordinary skill in the art. *Id.* at 104. Larson does indicate that both auxiliary polarizer 20 and antireflective coating on cover glass 4 may be present: “The addition of the antireflection coating to the rear of the cover glass 4 tends to reduce reflections at the boundary between the cover glass 4 and the auxiliary polarizer 20 or, if the auxiliary polarizer is omitted, the front gap 9.” Ex. 1005, 2:52–56.

Petitioner explains that “[one of ordinary skill in the art] would have recognized that Yare’s display may also have a high reflectance problem at the boundary between the front surface of the cabinet 10 and the gap through which air flow can occur, i.e., the air gap similar to Larson’s gap 9.” Pet. 103–104 (citing Ex. 1002 ¶ 275). Petitioner further explains that the benefits to be achieved by making the modification to include a polarizer is to minimize reflectance at the gap and also to reduce the reflective requirements for any antireflection coating. *Id.* at 104.

Petitioner presents another motivation for one with ordinary skill in the art to modify Yare as discussed above in light of Larson. It is based on Larson’s description that auxiliary polarizer 20 is an absorbing polarizer. Pet. 103 (citing Ex. 1005, 3:19–24; Ex. 1002 ¶ 133). Petitioner asserts that “[one with ordinary skill in the art] would have also recognized that an

absorbing polarizer can absorb at least some polarizations of the ambient light, which can help improve contrast and reduce the heating of the display. *Id.* at 104 (citing Ex. 1002 ¶ 277).

Petitioner further explains that one with ordinary skill in the art would have understood the proposed combination as use of known techniques (anti-reflective materials and/or polarizer) to improve a similar apparatus in the same way to yield predictable results, and would have expected the combination to succeed. *Id.* at 104–105 (citing Ex. 1002 ¶¶ 278–279).

With respect to the foregoing, Patent Owner does not present counter-arguments or evidence, except for its discussion of objective evidence of nonobviousness at this stage. Petitioner’s assertions are supported by the cited evidence. We are sufficiently persuaded that properly combined teachings of Yare and Larson disclose limitation [1f].

h) Conclusion

We have considered all of the arguments and evidence before us, both for and against obviousness, including Patent Owner’s contentions regarding objective evidence of nonobviousness, discussed below, and weighed the evidence accordingly. The evidence of obviousness is very strong and the evidence of nonobviousness is very weak. Petitioner has shown a reasonable likelihood that it would prevail in establishing obviousness of claim 1 over Yare and Larson.

3. Dependent Claims 2–5

Claims 2–5 each depend, directly or indirectly, from claim 1. Ex. 1001, 10:14–30. Petitioner addresses them on pages 80–89 of the Petition. Pet. 80–89. For claims 2 and 5, Petitioner relies on additional teachings from Larson. *Id.* at 80, 89. Petitioner accounts for a

corresponding motivation to combine. *Id.* at 101–105. For claims 3 and 4, Petitioner relies on additional teachings of Yare. *Id.* at 80–89.

At this stage of the proceeding, Patent Owner does not present counter-arguments or evidence, except for its discussion of objective evidence of nonobviousness. We are sufficiently persuaded that properly combined teachings of Yare and Larson disclose all of the limitations of each of dependent claims 2–5.

We have considered all of the arguments and evidence before us, both for and against obviousness, including Patent Owner’s contentions regarding objective evidence of nonobviousness, discussed below, and weighed the evidence accordingly. The evidence of obviousness is very strong and the evidence of nonobviousness is very weak. Petitioner has shown a reasonable likelihood that it would prevail in establishing obviousness of each of claims 2–5 over Yare and Larson.

4. *Independent Claim 6*

Petitioner addresses claim 6 on pages 90–98 of the Petition. Pet. 90–98. Petitioner notes substantial similarities between claims 1 and 6. *Id.* For instance, Petitioner asserts that recitation [6 pre] and limitation 6[a] are identical, respectively, to recitation [1 pre] and limitation [1a]. *Id.* at 90.

Petitioner also notes non-substantive differences. For example, where claim 1 recites “forward portion,” claim 6 recites “front portion” (Pet. 44); where claim 1 recites “airflow pathway,” claim 6 recites “gas circulation pathway” (*id.* at 45); where claim 1 recites “extends between,” claim 6 recites “passes between” (*id.*); where claim 1 recites “air circulation device,” claim 6 recites “gas circulation device” (*id.* at 48); where claim 1 recites a pathway “passing through the housing,” claim 6 recites a pathway “contained within the housing” (*id.* at 46); where claim 1 recites “circulating

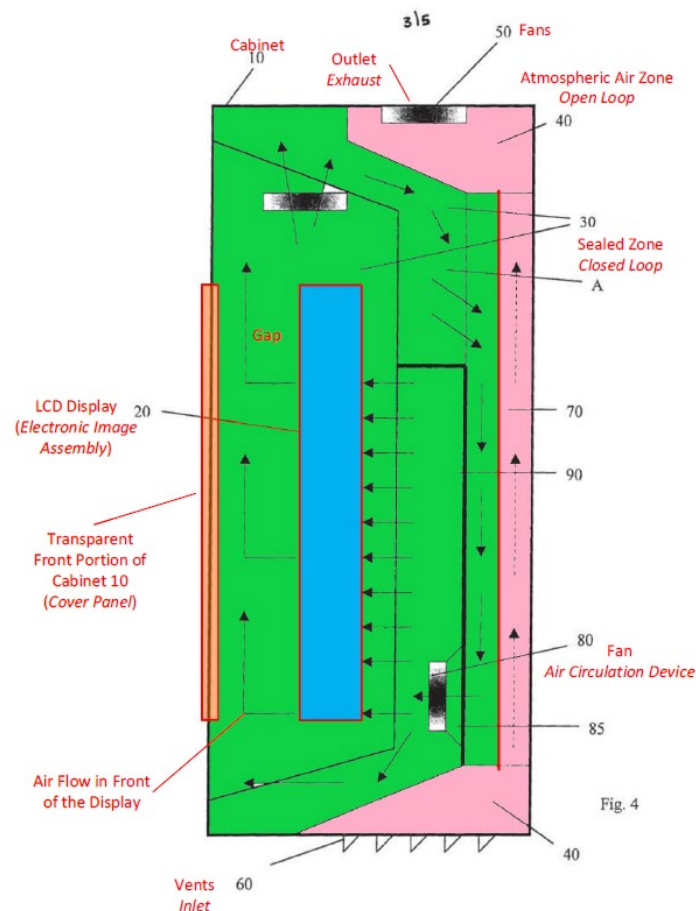
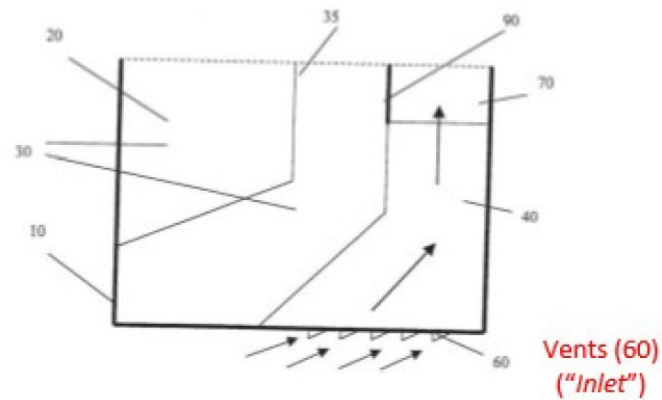
gas through the closed loop,” claim 6 recites “circulating gas around the closed loop” (*id.* at 49). Petitioner explains that circulating gas through the closed loop is the same as circulating gas around the closed loop, because the path is a loop. *Id.* (citing Ex. 1002 ¶ 224).

Petitioner explains that limitation [6c] is essentially the same as limitation [1d]. *Id.* at 90. Petitioner explains that limitation [6d] is essentially the same as limitation [1c]. *Id.* at 91–93. Petitioner explains that limitation [6h] is essentially the same as limitation [1e]. *Id.* at 94–96.

Patent Owner does not dispute the above-noted comparison by Petitioner of similarities between claim 1 and claim 6. We are sufficiently persuaded thereby and proceed further on that basis.

Petitioner specifically accounts for limitations that are present in claim 6 but not in claim 1. *Id.* at 90–98. Limitation 6[b] requires the cover panel to be “transparent.” Petitioner explains that one of ordinary skill in the art would have understood that at least a portion of the front surface of Yare’s cabinet 10 would be transparent, to allow viewing of display 20. Pet. 90 (citing Ex. 1002 ¶ 352). Patent Owner does not dispute that assertion at this stage. We are sufficiently persuaded that a portion of the front surface of Yare’s cabinet 10 is transparent.

Limitation [6e] recites: “an inlet located at a first portion of said housing for ingesting ambient air into said open loop airflow pathway.” Ex. 1001, 10:45–47. On pages 103 and 105 of the Petition, Petitioner presents annotated versions of Figures 2 and 4 of Yare, reproduced below:



Each of Figures 2 and 4 of Yare is a partial cross sectional view of the display system shown in Yare's Figure 1. Ex. 1006, 3:27.

Petitioner points to Yare's vents 60 as drawing outside air into atmospheric air zone 40 which is an open loop airflow pathway. Pet. 86. Petitioner explains that air from outside of cabinet 10 is drawn through vents

60 into atmospheric air zone 40 by fans 50 and is then expelled from cabinet 10. *Id.* (citing Ex. 1006, 4:11–14, Fig. 1–4). Petitioner further explains that the bottom of cabinet 10 is a first portion of the housing and that vents 60 provide an inlet located at that first portion of the housing. *Id.* at 87 (citing Ex. 1002 ¶ 341). Petitioner identifies outside air as ambient air. *Id.*

With regard to these assertions, Patent Owner does not present counter-arguments at this stage. Petitioner’s assertions are supported by the cited evidence. We are sufficiently persuaded that Yare discloses limitation [6e].

Limitation [6f] recites: “an exhaust located at a second portion of said housing for exhausting said ambient air from said open loop airflow pathway.” Ex. 1001, 10:48–50. On pages 88 of the Petition, Petitioner presents Figure 3 of Yare, reproduced below:

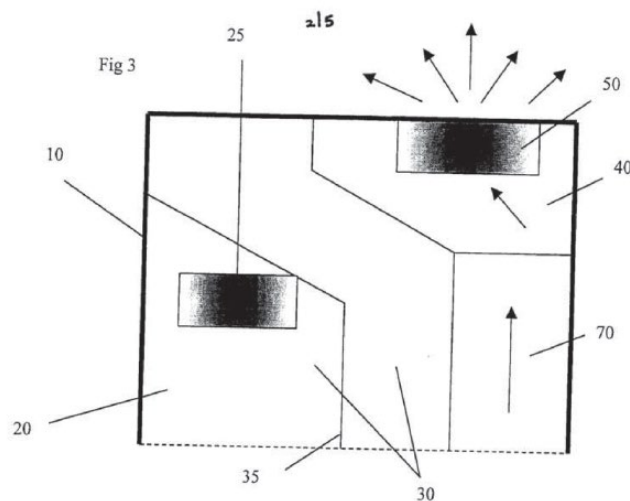


Figure 3 of Yare is a partial cross sectional view of the display system shown in Yare's Figure 1. Ex. 1006, 3:27.

Petitioner identifies the top of cabinet 10 as a second portion of the housing and explains that the outlet at the top of cabinet 10 is an exhaust

located at that second portion of the housing for expelling air from atmospheric zone 40 which is “said open loop airflow pathway.” Pet. 89.

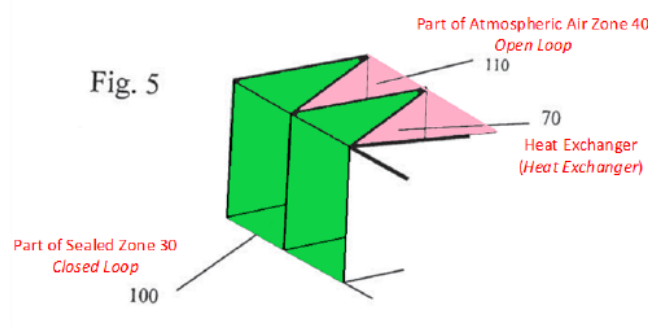
At this stage, Patent Owner does not present counter-arguments in this regard. Petitioner’s assertions are supported by the cited evidence. We are sufficiently persuaded that Yare discloses limitation [6f].

Limitation [6g] recites: “an air circulation device positioned along said open loop airflow pathway between said inlet and said exhaust, wherein said air circulation device is configured to force said ambient air through the open loop airflow pathway when activated.” Ex. 1001, 10:51–55. Petitioner explains that “Yare’s system includes fans 50 to force ambient air through the atmospheric air zone 40.” Pet. 93 (citing Ex. 1002 ¶¶ 366–370). Petitioner already explained, in the context of limitation [1d], that Yare’s atmospheric air zone 40 is in an open loop airflow pathway for ambient air. *Id.* at 74. At this stage, Patent Owner does not dispute these assertion of Petitioner, which we find to be supported by the cited evidence. We are sufficiently persuaded that Yare discloses limitation [6g].

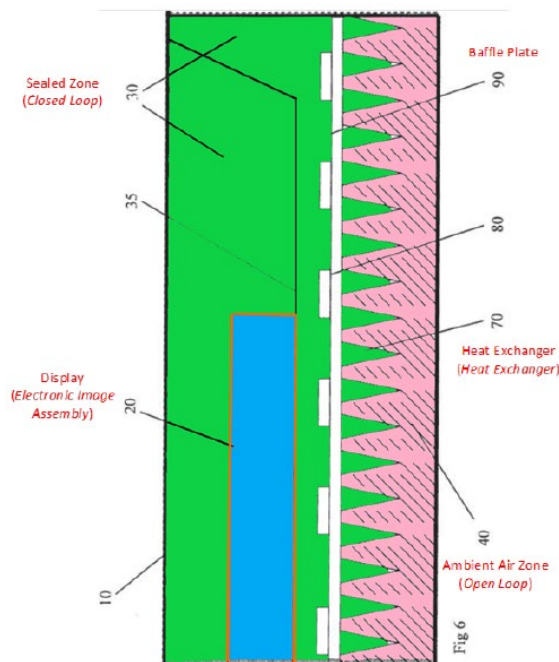
Limitation [6i] recites: “a heat exchanger located rearward of the electronic image assembly, wherein a first portion of said heat exchanger forms part of said open loop airflow pathway, and wherein a second portion of said heat exchanger forms part of said closed loop gas circulation pathway.” Ex. 1001, 10:59–63.

Petitioner asserts that Yare discloses heat exchanger 70 mounted on baffle plate 90 within cabinet 10. Pet. 80 (citing Ex. 1002 ¶¶ 328–330 Ex. 1006, 4:18, Figs. 1, 4, 6). Petitioner explains that heat exchanger 70 is formed from corrugated metal and sealed at the top and bottom on the inner side to prevent atmospheric air 110 and recirculating air 100 within sealed zone 30 from mixing. *Id.* at 80–81 (citing Ex. 1006, 6:7–11).

On pages 81 and 82 of the Petition, Petitioner produces an annotated partial version of Yare's Figure 5 and an annotated version of Yare's Figure 6, reproduced below:



[Figure 5 is a perspective view of a part of Yare's heat exchanger (Ex. 1006, 3:28–29) (color annotations by Petitioner)]



[Figure 6 is a cross-section of an embodiment of Yare's display system (Ex. 1006, 6:25–26, 30–31 (color annotations by Petitioner)]

Petitioner explains that the rear (right) side of heat exchanger 70 is a first portion that forms a part of atmospheric air zone 40 (highlighted pink) which is an open loop airflow pathway. Pet. 82–83 (citing Ex. 1002 ¶¶ 331–333). Petitioner explains that the front (left) side of heat exchanger 70 is a

second portion that forms a part of sealed zone 30 (highlighted green), which is a closed loop airflow pathway. *Id.* at 85 (citing Ex. 1002 ¶ 337).

At this stage, Patent Owner does not dispute these assertion of Petitioner, which we find to be supported by the cited evidence. We are sufficiently persuaded that Yare discloses limitation [6i].

Limitation [6j] recites:

one or more solar energy reduction layers located at said transparent cover panel, wherein each of said one or more solar energy reduction layers is configured to prevent a portion of solar energy entering said transparent cover panel from thermally interacting with the circulating gas at said portion of said closed loop gas circulation pathway passing between said transparent cover panel and said electronic image assembly or thermally interacting with said electronic image assembly.

Ex. 1001, 10:64–11:6.

Petitioner explains that the “polarizer” discussed above for limitation [1f] satisfies the requirements of limitation [6j]. Pet. 96 (citing Ex. 1002 ¶¶ 377–384). Petitioner relies on the same reasoning it provided for limitation [1f]. *Id.* For instance, Petitioner asserts that Larson discloses a polarizer as an “absorbing layer[]” that can absorb ambient light and provide a high contrast output at high ambient illumination levels. Pet. 35 (citing Ex. 1005, 1:11–17, 1:22–27, 2:33–39). Petitioner discusses motivation to combine the teachings of Yare and Larson on pages 101–105 of the Petition, as we have discussed above in the context of limitation [1f].

With respect to the foregoing, Patent Owner does not present counter-arguments or evidence at this stage, except for its discussion of objective evidence of nonobviousness. After having fully considered Patent Owner’s contentions on objective evidence of nonobviousness, discussed below, we

are sufficiently persuaded that properly combined teachings of Yare and Larson disclose limitation [6j].

We have considered all of the arguments and evidence before us, both for and against obviousness, including Patent Owner's contentions regarding objective evidence of nonobviousness, discussed below, and weighed the evidence accordingly. The evidence of obviousness is very strong and the evidence of nonobviousness is very weak. Petitioner has shown a reasonable likelihood that it would prevail in establishing obviousness of claim 6 over Yare and Larson.

5. *Dependent Claims 7–11*

Claims 7–11 each depend, directly or indirectly, from claim 6. Ex. 1001, 11:7–25. Petitioner addresses them on pages 98–99 of the Petition. Pet. 98–99. For claims 8–11, Petitioner relies on additional teachings from Larson. *Id.* Petitioner accounts for a corresponding motivation to combine. *Id.* at 101–105. For claim 7, Petitioner relies on additional teachings of Yare. *Id.* at 98.

At this stage of the proceeding, Patent Owner does not present counter-arguments or evidence, except for its discussion of objective evidence of nonobviousness. We are sufficiently persuaded that properly combined teachings of Yare and Larson disclose all of the limitations of each of dependent claims 7–11.

We have considered all of the arguments and evidence before us, both for and against obviousness, including Patent Owner's contentions regarding objective evidence of nonobviousness, discussed below, and weighed the evidence accordingly. The evidence of obviousness is very strong and the evidence of nonobviousness is very weak. Petitioner has shown a

reasonable likelihood that it would prevail in establishing obviousness of each of claims 7–11 over Yare and Larson.

6. *Independent Claim 12*

Claim 12 is a method claim. Ex. 1001, 11:26–12:16. Petitioner addresses claim 12 on pages 99–100 of the Petition. The steps of claim 12 correspond to functions performed by various elements of claims 1 and 6. Petitioner relies on its analysis of claims 1 and 6 to explain alleged unpatentability of claim 12. Pet. 99–100.

Petitioner asserts “12[pre] and 12[a] correspond to 1[pre] and 1[a], respectively. *Id.* at 99. Petitioner asserts “claim element 12[b] corresponds to 1[b], 1[c], and 1[e].” *Id.* Petitioner asserts “claim element 12[c] corresponds to 1[d] and 6[g].” *Id.* at 100. Petitioner asserts “12[d]” is “substantially the same as claim elements 1[f] and 6[j].” *Id.* These comparisons are facially correct and without dispute from Patent Owner.

At this stage of the proceeding, Patent Owner does not present counter-arguments or evidence beyond those it has asserted for claims 1 and 6, which we have already addressed above. We are sufficiently persuaded that properly combined teachings of Yare and Larson, as discussed above in the context of claims 1 and 6, disclose all of the recitations and limitations of claim 12.

We have considered all of the arguments and evidence before us, both for and against obviousness, including Patent Owner’s contentions regarding objective evidence of nonobviousness, discussed below, and weighed the evidence accordingly. The evidence of obviousness is very strong and the evidence of nonobviousness is very weak. Petitioner has shown a

reasonable likelihood that it would prevail in establishing obviousness of claim 12 over Yare and Larson.

7. *Dependent Claims 13–15*

Claims 13 and 15 each depend from claim 12. Ex. 1001, 12:17–29. Claim 14 depends from claim 13. *Id.* at 12:20–22. Petitioner accounts for the additional limitations of these dependent claims on pages 100–101 of the Petition. Pet. 100–101. For claims 13 and 14, Petitioner relies on additional teachings from Larson. *Id.* at 100. Petitioner accounts for a corresponding motivation to combine. *Id.* at 101–105. For claim 15, Petitioner relies on additional teachings of Yare. *Id.* at 100–101 (citing Ex. 1002 ¶ 403).

Patent Owner does not present counter-arguments or evidence in its Preliminary Response, except for its discussion of objective evidence of nonobviousness. We are sufficiently persuaded that properly combined teachings of Yare and Larson disclose all of the limitations of each of dependent claims 13–15.

We have considered all of the arguments and evidence before us, both for and against obviousness, including Patent Owner’s contentions regarding objective evidence of nonobviousness, discussed below, and weighed the evidence accordingly. The evidence of obviousness is very strong and the evidence of nonobviousness is very weak. Petitioner has shown a reasonable likelihood that it would prevail in establishing obviousness of each of claims 13–15 over Yare and Larson.

E. *Objective Evidence of Nonobviousness*

Patent Owner asserts that there are secondary considerations, in the form of objective evidence on nonobviousness, which support nonobviousness: (1) industry praise, (2) commercial success; (3) long-felt need and unsuccessful attempts by others, and (4) copying. Prelim.

Resp. 14. However, with regard to such secondary considerations, Patent Owner submits only Exhibits 2001, 2002, and 2003, and states: “Evidence of each of these categories has been produced in the corresponding ITC litigation subject to a protective order and thus is not separately addressed here, but will be addressed if the Board institutes a proceeding.” *Id.* at 14 n.3.

Exhibits 2001–2003 relate to alleged industry praise and constitute the only objective evidence of nonobviousness submitted by Patent Owner at this stage of the proceeding for consideration. For reasons discussed below, the evidence of nonobviousness is very weak, for lack of a showing of nexus.

It is well established that in order to be accorded substantial weight to secondary considerations in an obviousness analysis, the evidence of secondary considerations must have a nexus to the claims, i.e., there must be a legally and factually sufficient connection between the evidence and the patented invention. *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019); *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324, 1332 (Fed. Cir. 2019).

A patentee is entitled to a presumption of nexus “when 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*, 944 F.3d at 1373 (emphasis added). Objective evidence of nonobviousness must be commensurate in scope with the claims. *In re Kulling*, 897 F.2d 1147, 1149 (Fed. Cir. 1990). Where nexus cannot be presumed, “the patent owner is still afforded an opportunity to prove nexus by showing that the evidence of secondary considerations is the ‘direct result

of the unique characteristics of the claimed invention.”” *Fox Factory*,
944 F.3d at 1373–74.

According to Patent Owner, an entity related to Petitioner, i.e., Samsung SDS America,¹⁰ praised Patent Owner’s technical achievements and sought to enter into a “Mutual Non-Disclosure Agreement” (Ex. 2002) with Patent Owner in exploring Patent Owner as a partner in producing outdoor display systems. Prelim. Resp. 15–16. Exhibit 2001 is an email, dated April 24, 2020, from a representative of Samsung SDS America (Romulus Stoain) to a representative of Patent Owner (Bill Dunn), which states:

What you have done at MRI it’s impressive and unique; I bet it was not easy entering into a virgin space and then shortly after being able to pioneer a new business model based on turnkey solution for DOOH [Digital Out of Home], raising the bar for high quality standards.

Per our conversation, I see loads of opportunities for collaboration in the outdoor space (smart city, transit, rail, etc) where we can embrace the MRI technology and blended in with Samsung displays. Our customers will benefit from quality products and executions.

Ex. 2001. Exhibit 2003 is an email from Romulus Stoain to Bill Dunn, dated May 4, 2020, which states:

Checking to see if you had a chance to review the NDA [Non-Disclosure Agreement] and also to determine how can we collaborate?

¹⁰ Samsung America SDS is identified as a real party-in-interest in this proceeding. Pet. 2.

I spoke internally and Samsung Electronics is looking for a key partner in outdoor enclosures.

Ex. 2003.¹¹

Patent Owner asserts that “all of the secondary considerations relate to [Patent Owner’s] products and the objective evidence ties directly to the claimed features, i.e., heat transfer systems that enable ‘**all weather, outdoor**, daylight viewable LCD products.’” Prelim. Resp. 17.

To the extent there is any praise in the two emails (Exhibits 2001 and 2003), no specific product has been identified and Patent Owner has not shown that any of its products include all the features of any challenged claim. Nor does either email specifically identify a technical feature that is the subject of any praise or recognition. Although the emails do express an interest in outdoor displays, that general category of product, i.e., outdoor, does not identify any specific technical feature which has impressed Samsung SDS America. Further, none of the challenged claims has an “outdoor” requirement and each challenged claim includes additional features not referred to in either the Exhibit 2001 email or the Exhibit 2003 email. Thus, no claim has been shown by Patent Owner as coextensive with any of its products, even assuming that a specific product was praised by Samsung SDS America through the two emails.

Accordingly, Patent Owner has not shown sufficient nexus between Exhibits 2001–2003 and any challenged claim. Patent Owner also asserts that Petitioner should have first addressed the Exhibit 2001 email, the Exhibit 2003 email, and Exhibit 2002, as objective evidence of nonobvious

¹¹ Patent Owner refers to the Exhibit 2003 email as including language referring to “discussion relative to **all weather, outdoor**, daylight viewable LCD products” (Prelim. Resp. 16), but we see no such language in the email.

but did not do so in the Petition. Prelim. Resp. 17–19. For the same reason discussed above on a lack of sufficient showing of nexus, Exhibits 2001–2003 are too general and vague to impose on Petitioner an obligation to address them in the Petition, in the first instance, as objective evidence of nonobviousness. Thus, based on the record presented, we decline to impose such an obligation on Petitioner.

For the foregoing reasons, we determine that the objective evidence of nonobviousness is very weak.

F. Discretionary Denial under 35 U.S.C. § 325(d)

Patent Owner contends that we should exercise discretion to deny institution under 35 U.S.C. § 325(d) based on the framework set forth in *Advanced Bionics, LLC v. Med-El Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 (PTAB Feb. 13, 2020) (precedential) and *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 (PTAB Dec. 15, 2017) (precedential as to Section III.C.5, first paragraph). Prelim. Resp. 4.

1. Two-Part Framework

The Board applies a two-part framework in considering whether to exercise discretion to deny institution under § 325(d):

- (1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and
- (2) if either condition of first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.

Advanced Bionics, Paper 6 at 8 (footnote omitted).

Within that framework, the Board considers a number of non-exclusive factors set forth in *Becton. Advanced Bionics*, Paper 6 at 9–11.

The factors are:

(a) the similarities and material differences between the asserted art and the prior art involved during examination; (b) the cumulative nature of the asserted art and the prior art evaluated during examination; (c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection; (d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art; (e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and (f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments.

Becton, Paper 8 at 17–18 (footnote omitted).

Factors (a), (b), and (d) relate to whether the art or arguments presented in the Petition are the same or substantially the same as those previously presented to the Office. *Adv. Bionics*, Paper 6 at 10. Factors (c), (e), and (f) “relate to whether the petitioner has demonstrated a material error by the Office” in its prior consideration of that art or arguments. *Id.* Only if the same or substantially the same art or arguments were previously presented to the Office do we then consider whether petitioner has demonstrated a material error by the Office. *Id.* “At bottom, this framework reflects a commitment to defer to previous Office evaluations of the evidence of record unless material error is shown.” *Id.* at 9.

2. *Analysis*

a) *Prior Art Presented During Examination*

Petitioner asserts that “[t]he prior art relied upon was not relied upon by the examiner or otherwise used.” Pet. 105 (emphasis omitted). Petitioner

also acknowledges that “[t]he Karppanen, Yare, and Larson prior art references were cited on the face of the ’142 patent as having been sent to the examiner by the applicant, but were otherwise not discussed during prosecution.” *Id.* at 5.

Petitioner appears to take the position that unless a prior art reference is specifically applied or discussed by the Examiner, the prior art reference has not been considered or evaluated by the Examiner. We disagree with that point of view. All of the references cited on the face of the ’142 patent may not have been specifically applied or discussed by the Examiner. Yet, all of them are properly deemed to have been considered by the Examiner by reason of their being cited on the face of the challenged patent.

We also consider the extent of any overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art. In that regard, Patent Owner has not pointed to any significant or meaningful overlap and we do not see any. In particular, there is nothing to indicate that the Examiner applied prior art substantially similar to either Karppanen or Yare.

Based on the foregoing, and our consideration of *Becton* factors (a), (b), and (d), we find that, under the first part of the two-part framework of *Advanced Bionics*, the prior art presented in the Petition are the same as those previously presented to the Office. We now proceed to the second part of the two-part framework of *Advanced Bionics*, i.e., whether Petitioner has demonstrated that the Office erred in a manner material to the patentability of the challenged claims.

We consider the extent of the Examiner’s evaluation of the prior art now applied by Petitioner. Patent Owner asserts that each of Karppanen, Yare, and Larson was specifically called to the Examiner’s attention by the

Applicant during prosecution. Prelim. Resp. 6. Patent Owner explains: “These statements [from Applicant to Examiner] were made in direct response to the Examiner’s criticism of the quantity of art included in the IDS and expressly identified both (1) the reference and (2) the relevance of that reference, i.e., that it had been used in a rejection of a related application.” *Id.*

It is inaccurate for Patent Owner to say that Karppanen was specifically brought to the attention of the Examiner. Patent Owner clarified that “with respect to Karppanen, Patent Owner expressly noted that a U.S. Publication claiming priority to Karppanen was used in rejecting a related application.” Prelim. Resp. 6 (citing Ex. 2004, 12). We have reviewed the prosecution history (Exhibit 2004) and note that the Applicant did not inform the Examiner that the referenced U.S. Publication (“US 2009/0279240 Karppanen”) claims priority to Karppanen (WO2007/116116 A1) that is the prior art reference in this proceeding. We do not find that Karppanen was specifically brought to the attention of the Examiner, as Patent Owner asserts.¹²

In light of the foregoing, we do not know the extent to which the Examiner considered Karppanen, Yare, and Larson. On this record, the Examiner made no statement regarding their disclosures.

Petitioner points us to the Examiner’s indication of allowable subject matter as “**an open loop airflow pathway passing through the housing behind the electronic image assembly; a closed loop gas circulation**

¹² With respect to Yare and Larson, the Applicant did inform the Examiner that they were applied in a rejection of claims in a related application. Ex. 2004, 12, 15.

pathway contained within the housing, [apparatus claims]” and “wherein said airflow pathway defines a closed loop and said air in said airflow pathway comprises circulating gas [method claim].” Ex. 1022, 331–332 (cited at Pet. 106).

As discussed above in Section III.C.4 and Section III.D.2, we determine that Petitioner sufficiently establishes that Karppanen and Yare each disclose these features referred to by the Examiner as constituting allowable subject matter. Further, Petitioner asserts: “The open air pathway element was added for the very reason that the examiner told the applicant that the prior art considered did not teach it. (Ex. 1022, pp.331–32.) As explained above, both Karppanen and the uncited Yare teach this claim element.” Pet. 106. On this record, Patent Owner does not dispute Karppanen and Yare each disclose “an open loop airflow pathway passing through the housing behind the electronic image assembly,” and “a closed loop gas circulation pathway contained within the housing.”

Based on the foregoing, and our consideration of *Becton* factors (c), (e), and (f), we find that, under the second part of the two-part framework of *Advanced Bionics*, Petitioner has shown the Examiner’s failure to appreciate the disclosure of such features in Karppanen and in Yare constitutes Office error in a manner material to patentability of the challenged claims.

b) Prior Art Asserted Against a Related Patent

Patent Owner identifies US Patent No. 8,854,572 (“’572 patent”), as a patent acknowledged by Petitioner as related to the ’142 patent. Prelim. Resp. 11. Patent Owner also identifies IPR2018-00774 as a prior *inter partes* review proceeding before the Board in which the claims of the ’572

patent were challenged.¹³ *Id.* Patent Owner further identifies Yare as a reference applied by the petitioner in IPR2018-00774 against claim 1 of the '572 patent. *Id.* Patent Owner notes that the Board in IPR2018-00774 determined that the petitioner there did not show a reasonable likelihood of prevailing on establishing claim 1 of the '572 patent is anticipated by Yare or would have been obvious over Yare. *Id.* (citing Ex. 2008, 12–13).

According to Patent Owner, the requirement in claim 1 of the '572 patent that was found not sufficiently met by the petition in IPR2018-00774, i.e., a single gap formed between a planar surface and the rear of an electronic display, through which cooling air is forced, is also required by the claims of the '142 patent. *Id.* at 11–12. The actual limitations in claim 1 of the '572 patent, which give rise to that requirement, read as follows: “placing a substantially planar surface adjacent to the rear surface of the electronic display to define a gap between the planar surface and the electronic display” and “forcing cooling air through that gap.”¹⁴ Ex. 3007.

Patent Owner explains:

Similarly, the claims of the '142 Patent require such a single gap through which cooling air is forced. See Claim 1 (“wherein said loop airflow passes **around said electronic image assembly** and is configured to accommodate circulating gas, and wherein at least a portion of said closed loop airflow pathway **extends between said electronic image assembly and said cover panel** . . . at least one air circulation device positioned to **force the circulating gas through** the closed loop airflow pathway when activated”); Claim 6 (“wherein a portion of said

¹³ There is no overlap between the petitioner and real parties-in-interest of petitioner in IPR2018-00774 and Petitioner and real parties-in-interest of Petitioner in this proceeding.

¹⁴ Patent Owner did not provide a copy of the '572 patent. We enter it as Exhibit 3007 a copy of the '572 patent that was filed as Exhibit 1001 in IPR2018-00774.

closed loop gas circulation pathway **passes between said transparent cover panel and said electronic image assembly** . . . a gas circulation device positioned along said closed loop gas circulation pathway **to force circulating gas around the closed loop** gas circulation pathway when activated”); Claim 12 (“**forcing circulating air through a closed loop airflow pathway** within said housing, wherein at least a portion of said closed loop airflow pathway **extends between an electronic image assembly and a cover panel** forming a front portion of said housing and **spaced apart from said electronic image assembly**”).

Prelim. Resp. 12. The assertions are misplaced and unpersuasive.

None of the above-referenced limitations of claims 1, 6, and 12 of the ’142 patent pertains to a gap defined by a substantially planar surface and “the rear surface” of the electronic image assembly. Thus, Yare can meet all of the above-noted limitations of claims 1, 6, and 12, even though the Board determined that Yare was insufficient to meet claim 1 of the ’572 patent in IPR2018-00774 for purposes of instituting review.

The Board in IPR2018-00774 noted there that the petitioner had identified two gaps between the substantially planar surface and the rear surface of the electronic display, not one gap as claimed, and failed to reconcile the discrepancy. Ex. 2018, 12–13. This problem does not exist with the claims of the ’142 patent, because there is no requirement in the claims of the ’142 patent of a gap defined by a substantially planar surface and the “rear portion” of the electronic image assembly. The pertinent issue simply is not the same.

3. *Conclusion*

For the foregoing reasons, we decline to exercise discretion under 35 U.S.C. § 325(d) to deny the Petition.

IV. CONCLUSION

For the foregoing reasons, we conclude that the information presented in the Petition and Preliminary Response establishes a reasonable likelihood that Petitioner would prevail in showing that claims 1–15 of the '142 patent are unpatentable.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that *inter partes* review of all challenged claims, i.e., claims 1–15 of the '142 patent, is hereby instituted on all grounds stated in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; the trial will commence on the entry date of this decision.

IPR2023-00221
Patent 11,043,142 B2

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