

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APOGEE LIGHTING HOLDINGS, LLC,
Petitioner,

v.

AUTRONIC PLASTICS, INC. D/B/A
CLEAR-VU LIGHTING,
Patent Owner.

Case IPR2020-01023
Patent 9,909,748 B2

Before KEVIN F. TURNER, JEFFREY S. SMITH, and
AARON W. MOORE, *Administrative Patent Judges*.

SMITH, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

A. Background

Petitioner filed a Petition requesting *inter partes* review of claims 7–10, 13, 17–19, and 22–24 of U.S. Patent No. 9,909,748 B2 (Ex. 1001, the “’748 patent”). Paper 1 (“Pet.”). On December 12, 2020, we instituted *inter partes* review of all the challenged claims. Paper 11 (“Inst. Dec.”). Patent Owner filed a Request for Rehearing. Paper 13 (“Req. Reh’g.”). Petitioner filed a Response to Patent Owner’s Request for Rehearing. Paper 15 (“Resp. Req. Reh’g.”). We issued a Decision denying the Request for Rehearing. Paper 18 (“Dec. Reh’g.”).

Patent Owner filed a Response. Paper 20 (“PO Resp.”). Petitioner filed a Reply. Paper 23 (“Reply”). Patent Owner filed a Sur-Reply. Paper 26 (“PO Sur-Reply”). A hearing was held on September 9, 2021. This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a). We determine that claims 7–10, 13, 17–19, and 22–24 are unpatentable.

B. Related Proceedings

The ’748 patent is the parent of U.S. Patent No. 10,190,760 B2 (the “’760 patent”), which is the subject of IPR2020-01024. Pet. 1; Ex. 1002, [60]. The parties identify the following district court proceedings concerning the ’748 patent: *Autronic Plastics, Inc. d/b/a Clear-Vu Lighting v. Apogee Lighting, Inc. et al.*, case nos. 2:19-cv-06268-MKB-ST (E.D.N.Y.) and 1:20-cv-00470-MKB (E.D.N.Y.). Pet. 1; Paper 5, 1.

C. Real Party-in-Interest

Petitioner identifies itself as the real party-in-interest. Pet. 1. Patent Owner identifies itself as the real party-in-interest. Paper 5, 2.

D. The '748 Patent

The '748 patent discloses a light fixture including a housing that encloses its components. Ex. 1001, 4:26–27. The light fixture has different power input options, including a high voltage input, a traditional voltage input, and a battery backup input. *Id.* at 2:4–18, 3:45–63. Figure 5 of the '748 patent is a schematic view showing different power sources that can provide electrical power to the light fixture. *Id.* at 2:65–67. Figure 5 is reproduced below.

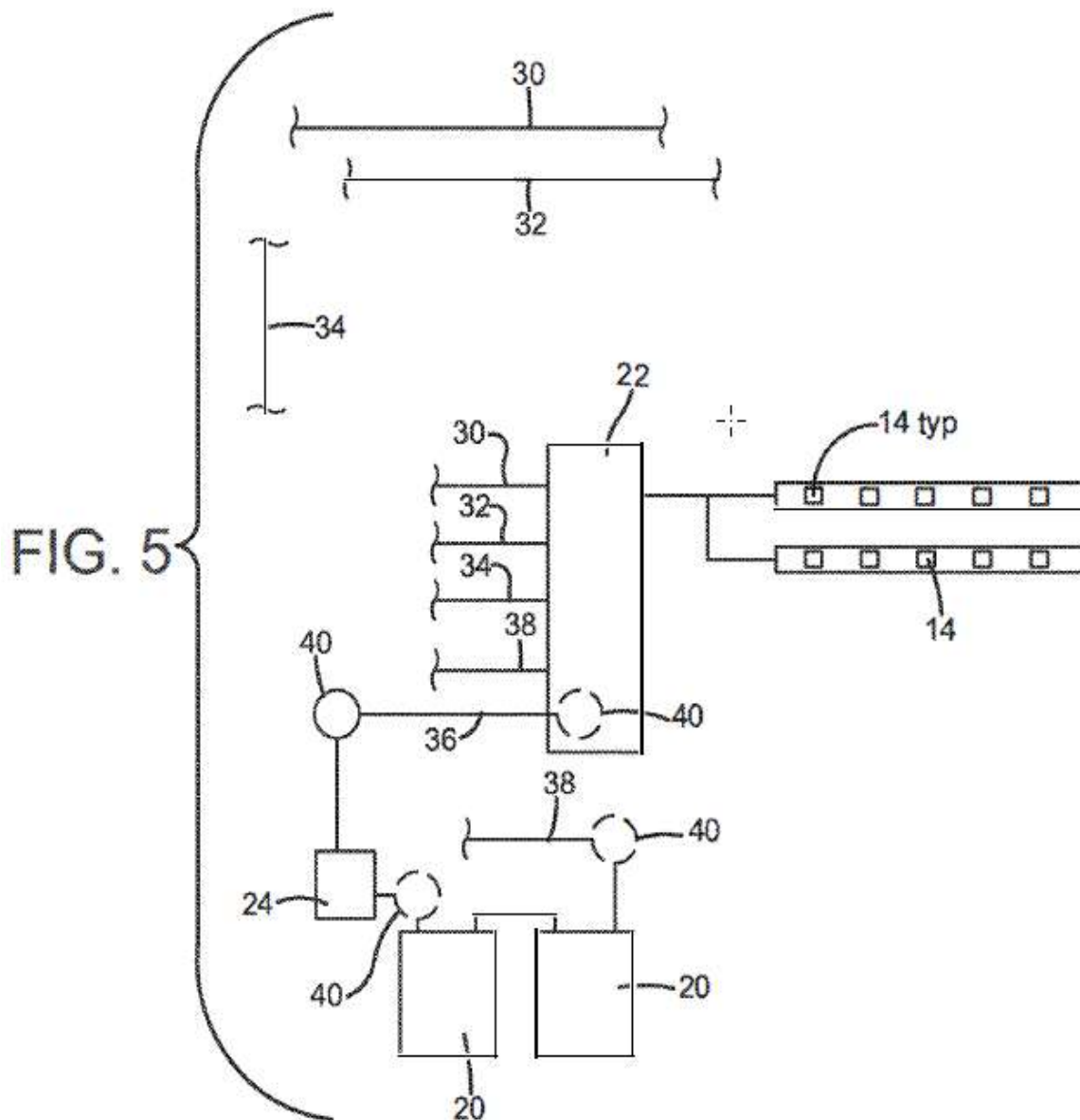


Figure 5 above shows a light fixture including LED power supply 22 that supplies power to LEDs 14. *Id.* at 3:35–40, 4:58–67, 6:9–12. Power to LED power supply 22 can be provided by one of three power sources 30, 32, 34, and also by backup battery 20 through connection 38. *Id.* at 5:25–27, 5:35–37, 7:5–7. Power source 30 provides electrical power available from a traditional power line, which is typically 110V to 277V of alternating current. *Id.* at 5:27–29. Secondary power source 32 also provides 110V to 277V of alternating current. *Id.* at 5:29–31. High voltage power source 34 includes all input voltages of 277V and higher. *Id.* at 6:12–13. High voltage power source 34 can be a “third rail” power source, between 450-1000V direct current, from which train engines draw power. *Id.* at 5:33–35. The high voltage power source is resistant to voltage spikes of up to 3 kV. *Id.* at 6:16–17. In the event that a power source fails to provide power, LED power supply 22 switches to another available power source. *Id.* at 5:40–51.

E. Illustrative Claim

The '748 patent has 24 claims, of which claims 7–10, 13, 17–19, and 22–24 are challenged in the Petition. Claims 7 and 9 are independent. Claim 7 is illustrative:

7. A LED light fixture used in a public transportation facility having a high voltage power source, and at least a first standard voltage power source; the LED light fixture comprising:

a fixture housing;

a plurality of LEDs carried by the fixture housing for providing light from the fixture housing;

an LED power supply carried within the fixture housing;

the LED power supply having a first power input connected to the first standard voltage power source and a second power input connected to the high voltage power source; and

a battery backup system connected to one of the plurality of LEDs and the LED power supply.

F. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability (Pet. 3):

Claims Challenged	35 U.S.C. §	Reference(s)/Basis
7–10, 13, 17–19, and 22–24	103	Realmuto, ¹ Roberge ²
9, 10, 13, 17–19, and 22–24	103	Realmuto, Roberge, Conley ³
7–10, 13, 17–19, and 22–24	103	Smith, ⁴ Realmuto, Applicant’s Admitted Prior Art (AAPA) ⁵
9, 10, 13, 17–19, and 22–24	103	Smith, Realmuto, Conley, AAPA

II. ANALYSIS

A. Level of Ordinary Skill in the Art

In determining whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17 (1966). “Since a determination of obviousness is made from the vantage point of a legal construct, a hypothetical person having ordinary skill in the pertinent art . . . , a person of extraordinary skill may opine on the

¹ U.S. Patent No. 7,227,278 B2 issued Jun. 5, 2007 (Ex. 1009).

² U.S. Patent No. 7,178,941 B2 issued Feb. 20, 2007 (Ex. 1010).

³ U.S. Patent No. 6,538,568 B2 issued Mar. 25, 2003 (Ex. 1011).

⁴ U.S. Patent No. 8,299,712 B2 issued Oct. 30, 2012 (Ex. 1012).

⁵ Petitioner contends that “the existing public transportation power sources recited in the preamble, including ‘a public transportation facility having a high voltage power source, and at least a first standard voltage power source’” are AAPA. Pet. 25–26. In support of this contention, Petitioner states that in a November 22, 2017 Amendment, the “applicant agreed that the existing public transportation power sources recited in the preamble were in the prior art as described in applicant’s specification at page 5.” Pet. 25 (citing Ex. 1005 (Prosecution History of ’748 patent), 32).

knowledge of this hypothetical person.” *Duramed Pharm., Inc. v. Watson Lab., Inc.* 413 Fed. Appx. 289, 296 (Fed. Cir. 2011) (citing *Moore v. Wesbar Corp.*, 701 F.2d 1247, 1253 (7th Cir. 1983) (holding that an expert of “more than the ‘ordinary skill’ required by the statute” was “well suited to assist the court in deciding what would be obvious to such a person”)).

Petitioner’s expert, Dr. Bretschneider, testifies that “a person of ordinary skill in the art [] would have a Bachelor’s degree in Electrical Engineering or an equivalent discipline, or two or more years of work experience in design of lighting fixtures and the same amount of experience working with LED light sources.” Ex. 1003 ¶ 31; Pet. 27. Patent Owner applies Petitioner’s definition of a person of ordinary skill. Prelim. Resp. 15. We rely on Dr. Bretschneider’s testimony in determining that a person of ordinary skill would have at least a Bachelor’s degree in Electrical Engineering or an equivalent discipline, or two or more years of work experience in design of lighting fixtures and the same amount of experience working with LED light sources.

The level of ordinary skill in the art may be reflected by the prior art of record. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (citing *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 163 (Fed. Cir. 1985)). Realmuto discloses an operating voltage of a lighting load as 380V DC, and that a converter will maintain this output, even while the input voltage varies. Ex. 1009, 4:60–64; see *id.* at 1:13–19, 2:50–56. We rely on this prior art disclosure in determining that a person of ordinary skill in the art would be able to control varying voltage from a high voltage power source.

Roberge discloses lighting systems that include power systems for driving light sources in high-voltage environments. Ex. 1010, Abstract; see

id. at 20:3–6, 20:29–33, 20:46–49, 21:22–33. Roberge discloses that such environments include transportation environments, and in particular, train environments. *Id.* at 5:55–60, 16:6–10, 63:3–9, 64:10–16, Fig. 55. We rely on this prior art disclosure in determining that a person of ordinary skill would be able to provide a power system for driving light sources in a high-voltage environment such as a train environment.

The level of ordinary skill in the art may also be determined from the specification. For example, claim elements that the specification does not describe in detail are presumed to be known to those of ordinary skill in the art. *In re Epstein*, 32 F.3d 1559, 1568 (Fed. Cir. 1994); *In re Fox*, 471 F.2d 1405, 1407 (CCPA 1973) (“[A]ppellant’s specification . . . assumes anyone desiring to carry out the process would know of the equipment and techniques to be used, none being specifically described.”). The specification of the ’748 patent discloses that the power source “is resistant to voltage spikes of up to 3 kV.” Ex. 1001, 6:16–17. The specification does not describe equipment or techniques that cause the power source to be resistant to such voltage spikes. Given the specification’s absence of a specific description of a device or a technique that would carry out the process of resisting voltage spikes up to 3 kV, we determine that a person of ordinary skill “desiring to carry out the process would know of the equipment and techniques to be used, none being specifically described.”

The specification does not describe specific equipment or techniques used to account for grounding issues, polarity fluctuations, ground path leakage, and changes in current flow that may occur in a high-voltage environment such as a train environment. Thus, a person of ordinary skill in the art desiring to account for such issues would know of the equipment and techniques to be used, none being specifically described.

We determine that a person of ordinary skill in the art would have a Bachelor's degree in Electrical Engineering or an equivalent discipline, or two or more years of work experience in design of lighting fixtures and the same amount of experience working with LED light sources, and would have sufficient knowledge of or experience with equipment and techniques to provide a power system for driving light sources in a high-voltage environment such as a train environment and to account for challenges that may occur in the high-voltage environment such as voltage spikes up to 3 kV, grounding issues, polarity fluctuations, voltage control challenges, ground path leakage, and changes in current flow. Our determination of the level of ordinary skill differs from Petitioner's proposed definition to address contentions based on the level of ordinary skill raised by the parties, as we discuss below. Our determination of the level of ordinary skill is unchanged from that given in our Decision to Institute, which has been unchallenged by the parties.

B. Claim Construction

In an *inter partes* review, a claim “shall be construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b).” 37 C.F.R. § 42.100(b) (2019). Under that standard, we construe 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.” *Id.*

1. “fight fixture”

Patent Owner contends that “fight fixture” recited in independent claims 7 and 9 is a typographical error and should be construed as “light

fixture.” Prelim. Resp. 21 (citing Ex. 2007, 2). We agree with Patent Owner and construe this term as “light fixture.”

2. *preamble*

Petitioner contends that the claim term “A LED light fixture used in a public transportation facility” recited in the preambles of independent claims 7 and 9 only “state[s] a purpose or intended use for the invention” and is therefore not limiting. Pet. 43 (citing *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997); *Catalina Mktg Int’l v. Coolsavings.com*, 289 F.3d 801, 809 (Fed. Cir. 2002) (“preambles describing the use of an invention generally do not limit the claims because the patentability of apparatus or composition claims depends on the claimed structure, not on the use or purpose of that structure”)). Petitioner contends that the power sources in the claim term “a high voltage power source, and at least a first standard power source” recited in the preambles of claims 7 and 9, are also recited in the bodies of those claims and therefore limit the claims. *Id.*

Patent Owner contends that the preamble recitation “used in a public transportation facility” is limiting because (a) Petitioner concedes that the power sources recited in the preamble are limiting, (b) Petitioner fails to consider how a person of ordinary skill would consider the preamble, (c) “used in a public transportation facility” provides antecedent basis for terms recited in the body of the claim, (d) “used in a public facility” affects the structure of the claim, (e) the specification characterizes “used in a public transportation facility” as important, and (f) the Examiner and Applicant treated the entire preamble as limiting during prosecution. PO Resp. 16–28. We agree with Petitioner that the term “used in a public transportation facility” recited in preamble phrase is an intended use, and disagree with

Patent Owner’s arguments to the contrary. We consider each of Patent Owner’s arguments in turn below.

(a) Petitioner’s concession that the power sources are limiting

Patent Owner contends that the preamble recitation “used in a public transportation facility” is limiting because Petitioner concedes that the preamble recitation of “a high voltage power source, and at least a first standard voltage power source” is limiting. PO Resp. 17. We are not persuaded by Patent Owner. The structural limitations, including the power sources, recited in the bodies of claims 7 and 9 do not depend on the use of the LED light fixture in a public transportation facility. Rather, the power sources recited in the preamble provide antecedent basis for ‘the first standard voltage power source,’ ‘the second standard voltage power source,’ and ‘the high voltage power source’ recited in the bodies of claims 7 and 9, and therefore are entitled to patentable weight. See Ex. 1003 ¶¶ 180–182.

(b) The understanding of a person of ordinary skill in the art

Patent Owner contends that Petitioner fails to consider how a person of ordinary skill in the art would understand the entirety of the preamble in view of the claim and disclosure as a whole. *Id.* (citing Ex. 2022 ¶ 91). We are not persuaded. Dr. Bretschneider testifies that the “public transportation facility” is not a structural limitation of the claimed “LED light fixture,” because the LED light fixture is structurally complete. Ex. 1003 ¶¶ 63, 180. Dr. Bretschneider testifies that the claim “does talk about a high-voltage power source and a standard voltage power source, but a person of ordinary skill wouldn’t read those as being mandated only in a public transportation facility because, honestly, I don’t know how anyone would be able to do a design that you could only use there.” Ex. 2021, 115:23–116:6; see *id.* at

115:15–22, 116:7–22. Dr. Bretschneider’s testimony is consistent with the understanding of a person of ordinary skill as shown by the prior art. For example, Roberge teaches using its lighting system in a wide range of environments including airline and other transportation environments, interior environments, stairs, playing fields, ceiling tiles, hangars, warehouses, house environments, train environments, and many other environments. Ex. 1010, 62:43–63:9, Figs. 51–55.

We determine that Petitioner has persuasively shown that person of ordinary skill in the art would understand the term “used in a public transportation facility” recited in the preamble phrase “A LED [l]ight fixture used in a public transportation facility” is an intended use, because a person of ordinary skill would understand that the LED light fixture is structurally complete and would be used in a wide range of environments as Dr. Bretschneider testifies and as Roberge teaches.

(c) Whether “used in a public transportation facility” provides antecedent basis for the body of the claim

Patent Owner contends that the preamble recitation “used in a public transportation facility” is limiting because this term supplies antecedent basis for the body of the claim. PO Resp. 18. First, Patent Owner contends that the high voltage power source and the standard voltage power source recited in the body of the claim are part of the “public transportation facility” recited in the preamble because Dr. Bretschneider testifies that the LED light fixture must be connected to the high voltage power source in order to practice the claim. *Id.* at 19 (citing Ex. 2021, 111:15–114:4, 119:19–121:7 (Dr. Bretschneider, when asked “to practice this claim you have to actually connect the second power input to the high-voltage power source, right?” answered “Yes.”)). We are not persuaded by Patent Owner’s contention.

We agree with Dr. Bretschneider that the second power input is connected to the high voltage power source as recited in the body of the claims. Thus, as we stated above, the high voltage power source is entitled to patentable weight. We also agree with Dr. Bretschneider that the high voltage power source could be located in a facility other than a public transportation facility, and the LED light fixture, when connected to the source, would still function as claimed. Ex. 2021, 115:15–116:22; Ex. 1003 ¶¶ 63, 180; see Ex. 1010, 62:43–63:9, Figs. 51–55 (showing an LED light fixture used in a wide range of environments).

Next, Patent Owner contends that the preamble recitation “used in a public transportation facility” is limiting because (1) it recites a structural feature of the invention rather than an intended use, (2) it cannot be separated into two separate portions, and (3) the portion of the preamble that is relied upon for antecedent basis in the body of the claims is intertwined with the remainder of the preamble. PO Resp. 19–21 (citing *Bio-Rad Labs., Inc. v. 10X Genomics Inc.*, 967 F.3d 1353 (Fed. Cir. 2020)). According to Patent Owner, the phrase “a public transportation facility having a high voltage power source, and at least a first standard voltage power source” means that the public transportation facility has the claimed voltage sources, and therefore, is significantly intermeshed with the body of the claim. *Id.*

We disagree. In claims 7 and 9, unlike the claim in *Bio-Rad*, the preamble recitation of “used in a public transportation facility” expresses an intended use. Dec. Reh’g. 4. Further, the bodies of claims 7 and 9, unlike the body of the claim in *Bio-Rad*, do not recite the disputed preamble term. *Id.* Also, the claim term “high voltage power source” is not intertwined with the preamble term “used in a public transportation facility,” because the “high voltage power source” is structurally complete by itself. See Ex. 1003

¶¶ 63, 180. Here, as in *Catalina*, deleting “used in a public transportation facility” from the preamble does not affect the structural definition or operation of the claimed LED light fixture itself. *Catalina*, 289 F.3d at 810.

Further, here, as in *Catalina*, the specification in its entirety does not make the location of the high voltage power source an additional structure for the claimed high voltage power source, because the specification does not limit the high voltage power source to being located in a public transportation facility. See Ex. 1001, 1:21–26, 2:12–18, 2:42–43, 5:31–35, 5:52–62, 6:12–13. For example, the specification discloses that a high voltage source of electrical power is “the third rail from which train engines drawn power.” Ex. 1001, 5:31–34. However, the next sentence of the specification states that the high voltage source “can be 450V-1000V direct current or commonly about 600V.” Ex. 1001, 5:34–35; see *id.* at 2:49–54 (stating that the particular structure of the embodiments used in the detailed description is not intended to limit the disclosure). Thus, the specification describes the high voltage power source in terms of what the source, not the third rail, “can be,” which indicates that the patentee intended the high voltage third rail located in a public train facility as a non-limiting example, and that the scope of the claim encompasses other high voltage power sources than those found in a public transportation facility. *Id.*; see Req. Reh’g. 12; Dec. Reh’g. 5–6.

(d) Whether deleting “used in a public transportation facility” affects the structure of the claim

Patent Owner contends that construing the preamble term “used in a public transportation facility” as non-limiting as asserted by Petitioner renders the claim incoherent. PO Resp. 21–22. According to Patent Owner, the claim as construed by Petitioner would then recite “A LED [l]ight fixture

used in a public transportation facility having a high voltage power source, and at least a first standard voltage power source,” which improperly changes the meaning of the claim, because the recited high voltage power source is not part of the LED light fixture. *Id.*

We disagree with Patent Owner’s arguments. As Patent Owner has stated, Dr. Bretschneider testifies that, to practice the claim, the second power input must be connected to a high voltage power source. PO Resp. 19 (citing Ex. 2021, 111:15–114:4, 119:19–121:7). We agree with this testimony. Dr. Bretschneider further testifies that a person of ordinary skill would understand that claimed power sources connected to the claimed LED power supply could be located anywhere, and the claimed LED light fixture would operate as claimed. Ex. 2021, 115:15–116: 22; Ex. 1003 ¶¶ 63, 180–182. Dr. Bretschneider’s testimony provides persuasive evidence that a person of ordinary skill would not give weight to the preamble term “used in a public transportation facility,” and would read the claim to mean that the second power input of the LED light fixture must be connected to a high voltage power source. Here, as in *Catalina*, deletion of the phrase “used in a public transportation facility” from the preamble of the claim does not affect the structural definition or operation of the claimed LED light fixture itself.

(e) Consideration of the specification

Patent Owner contends that the preamble term “used in a public transportation facility” is structure that is repeatedly characterized as important in the specification, and is therefore limiting. PO Resp. 23–24 (citing *Poly-Am., L.P. v. GSE Lining Tech., Inc.*, 383 F.3d 1303, 1310 (Fed. Cir. 2004)). Patent Owner contends that the title of the ’748 patent includes the phrase “public transportation facility,” and that the technical field “particularly relates to LED light fixtures configured for use in public

transportation facilities where lighting failures are more critical than other facilities.” PO Resp. 24 (citing Ex. 1001, 1:18–20).

However, the preamble in *Poly-America* recited a “blown-film textured liner,” where the disputed term “‘blown-film’ [did] not state a purpose or intended use of the invention, but rather disclose[d] a fundamental characteristic of the claimed invention.” *Poly-Am.*, 383 F.3d at 1310. In contrast, the claim term “used in a public transportation facility” states an intended use of the LED light fixture, and is not an essential structure or fundamental characteristic of the light fixture. Here, the “patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use of the invention.” *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1309 (Fed. Cir. 1999).

Further, we are not persuaded that the specification characterizes a public transportation facility as a fundamental characteristic or essential structure of the light fixture. The technical field describes that the disclosure “relates to LED light fixtures configured for use in public transportation facilities where lighting failures are more critical than other facilities.” Ex. 1001, 1:15–20. The technical field then describes that the “disclosure also relates to light fixtures usable in *public facilities*,” not just public transportation facilities, “which provide a plurality of power options and wherein the normal-use light fixture may be used as part of an emergency lighting system drawing power from a battery backup system.” Ex. 1001, 1:21–26; *see id.* at 3:29–33. Thus, the technical field is not limited to using the LED light fixture in a train facility having a third rail, but rather, includes using the LED light fixture in public facilities as part of an emergency lighting system, which, as Dr. Bretschneider testifies, describes

“a broad swath of the lighting industry, quite a few different locations.”

Ex. 2021, 131:9–19; Ex. 1003 ¶¶ 82, 118. We credit Dr. Bretschneider’s testimony in determining that the technical field of emergency lighting encompasses quite a few different locations beyond public transportation facilities.

Patent Owner cites the specification’s disclosure of what Patent Owner contends are problems uniquely associated with using LED light fixtures and power sources in public transportation facilities. PO Resp. 25. The alleged unique problems include (a) corrosion from humid air found in public transportation facilities, (b) the underground location of high traffic areas of public transportation facilities, (c) traditional lighting in public transportation facilities require bulb changes, (d) avoiding direct contact between stainless steel and aluminum in hot humid environments because of corrosion, (e) charging a battery with a third rail voltage source, (f) using a RuBee protocol for communicating in underground transportation facilities, (g) identifying a third rail as a high voltage power source, and (h) having a power source that resists voltage spikes of up to 3 kV. PO Resp. 25–26 (citing Ex. 1001, 3:45–47, 9:30–34, 1:40–47, 4:41–54, 6:54–59, 8:14–17, 5:31–34, 6:15–17).

We are not persuaded that such problems are unique to public transportation facilities. For example, the corrosion of metal caused by hot humid environments is a problem in many places. Dr. Bretschneider testifies that “Hot, humid environments are common. A good portion of the world lives in hot, humid environments. I grew up in Florida. The whole state fits that description.” Ex. 2021, 143:22–144:3. Similarly, we are not persuaded that the problem of changing light bulbs is unique to lighting fixtures in public transportation facilities. Nor are we persuaded that voltage

spikes are unique to public transportation facilities. *See* Ex. 2021, 127:9–21. Nor are we persuaded that problems associated with lighting and communication in underground transportation facilities are unique to underground transportation facilities. *See* Ex. 2021, 132:12–133:3, 140:2–8; Ex. 1003 ¶ 118. We are not persuaded that the problems that Patent Owner contends are unique to public transportation facilities are in fact unique to public transportation facilities.

Further, we are not persuaded that every problem identified by Patent Owner is a problem for public transportation facilities in general. For example, the third rail is not a voltage source found in all public transportation facilities. *See* Ex. 2021, 138:22–25. To the extent that problems related to the third rail are unique to a high voltage third rail from which train engines draw power, the preamble term “a public transportation facility” is not limited to a public transportation facility that has a third rail. *See* Ex. 2021, 139:6–7; Ex. 1019, 153:22–154:5. Rather, “public transportation facility” includes many facilities that do not have a third rail, such as airports, bus stations, and shipping facilities, which further indicates that the patentee did not intend the preamble term “used in a public transportation facility” to limit the claim to only a transportation facility having a third rail as proposed by Patent Owner. *Id.*

(f) Consideration of the prosecution history

Patent Owner contends that the preamble term “used in a public transportation facility” was treated as limiting by the Examiner and Applicant. PO Resp. 27–28. We disagree. During prosecution, the Examiner did not construe the preamble as limiting, but rather, simply stated that the “power sources [which] are the subject matter of the preamble is the work of another.” Ex. 1005, 87–88. The Examiner made this statement in a

rejection of claim 19 (which issued as claim 7 of the '748 patent) under 35 U.S.C. § 102 as anticipated by Smith (Ex. 1012). Significantly, the Examiner did not map the preamble term “used in a public transportation facility” to any disclosure of Smith, which means that the Examiner treated the preamble as non-limiting. *See id.* That is, if the Examiner had treated the preamble as limiting, then the Examiner would not have made a 102 rejection, because the Examiner did not find that Smith discloses the preamble term “public transportation facility.”

Further, in the reasons for allowance, the Examiner explained in more detail that the claims “require the light fixture to have a power supply with multiple power inputs connected to these power sources,” and that the prior art “does not have the multiple power inputs.” *Id.* at 12. The Examiner’s statement in the reasons for allowance regarding the claimed power sources, along with the Examiner’s silence in the reasons for allowance regarding the term “used in a public transportation facility,” is consistent with our analysis that the power sources, and not the public transportation facility, were given patentable weight by the Examiner, and are entitled to patentable weight.

The applicant’s response to the 102 rejection also shows that the applicant did not treat the preamble as limiting, because the applicant did not argue that Smith does not disclose the preamble term “used in a public transportation facility.” Rather, the applicant contended that Smith does not disclose multiple power inputs. *Id.* at 32.

We are also not persuaded by Patent Owner’s contention that the Examiner’s search for public transportation facility shows that the Examiner gave patentable weight to this term. PO Resp. 27. The Manual of Patent Examining Procedure (MPEP) states that the Examiner’s search should cover subject matter that is described in the specification, in addition to

covering subject matter that is claimed. MPEP § 904.03 (“It is not normally enough that references should be selected to meet only the terms of the claims alone . . . but the search should, insofar as possible, also cover all subject matter which the examiner reasonably anticipates might be incorporated into applicant’s amendment.”).

(g) Conclusion

We determine that the preamble term “public transportation facility” is not part of the structure of any limitation of the claimed LED light fixture recited in the body of the claim, was not treated as limiting during prosecution, and is an intended use of the claimed LED light fixture which is not entitled to patentable weight.

3. “high voltage power source”

The parties and the Board have proposed four different constructions of this term. First, in the Petition, Petitioner proposes that each claim term in the challenged claims be given its plain and ordinary meaning. Pet. 26. Second, Patent Owner proposes construing “high voltage power source” as “an electrical power source from which public transportation vehicles draw power (e.g. the ‘third rail’).” PO Resp. 28. Third, in the Decision to Institute, we construed “high voltage power source” as “a power source having a voltage of 250 Volts or higher, such as solar panels that generate from 250 to 600 Volts.” Dec. 12–13. Fourth, in Petitioner’s Response to Patent Owner’s Request for Rehearing, and again in Petitioner’s Reply, Petitioner proposes adopting a construction of “high voltage power source” as “a source of power that is 277 Volts or higher.” Resp. Req. 13; Reply 16. Of these four proposed constructions, we determine that only Patent Owner’s construction is incorrect and that the term “high voltage power

source” can encompass the remaining three proposed constructions. We need not clearly delineate the scope of the term and resolve which of the remaining three constructions is correct, because the prior art relied on in the Petition teaches the “high voltage power source” under any of the remaining three constructions.

(a) Patent Owner’s proposed construction

Patent Owner contends that the intrinsic record supports Patent Owner’s proposed construction, because the specification discloses that the high voltage source is the third rail from which trains draw power. PO Resp. 29–30. Patent Owner contends that the specification explains that an LED power supply configured to accept power from the claimed high voltage power source includes the capability of accepting unique characteristics and a wide range of voltages, including large intermittent spikes presented in high voltage sources used to power mass transit vehicles. *Id.* Patent Owner contends that a person of ordinary skill in the art would understand that the ’748 patent as a whole suggests the inventors were focused on the third rail high voltage power because the patent describes a power supply configured to accept third rail high voltage. *Id.* at 30–31. Patent Owner contends that its proposed construction does not read a limitation from a preferred embodiment into the claims, because the only disclosed embodiments require an LED light fixture having an LED power supply that converts the high voltage input provided by the third rail into a lower direct current suitable for powering LEDs. *Id.* at 35.

We disagree with Patent Owner. The Federal Circuit has held that “it is improper to read limitations from a preferred embodiment described in the specification – even if it is the only embodiment – into the claims absent a clear indication in the intrinsic record that the patentee intended the claims

to be so limited.” *Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1327 (Fed. Cir. 2012); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1323 (Fed. Cir. 2005) (en banc) (“[C]laims may embrace different subject matter than is illustrated in the specific embodiments in the specification.”). The intrinsic evidence including the specification and the prosecution history indicates that the patentee intended the scope of “high voltage power source” to encompass more than the third rail from which train engines draw power.

“high voltage power source” disclosed in the specification

The technical field describes that the disclosure “relates to LED light fixtures configured for use in public transportation facilities where lighting failures are more critical than other facilities.” Ex. 1001, 1:15–20. The technical field then describes that the “disclosure also relates to light fixtures usable in public facilities,” not just public transportation facilities, “which provide a plurality of power options and wherein the normal-use light fixture may be used as part of an emergency lighting system drawing power from a battery backup system.” Ex. 1001, 1:21–26; *see id.* at 3:29–33. Thus, the technical field is not limited to using the LED light fixture in a train facility having a third rail, but, rather, includes using the LED light fixture in public facilities as part of an emergency lighting system, which, as Dr. Bretschneider testifies, describes “a broad swath of the lighting industry, quite a few different locations.” Ex. 2021, 131:9–19; Ex. 1003 ¶ 82.

The summary of the disclosure describes that the “light fixture can be configured for a high voltage input such as a 600 Volt input power supply and connected to a 600 Volt input,” (Ex. 1001, 2:12–15), and describes this and other examples of the light fixture as “preceding non-limiting aspects” where “[s]pecific terms used in that description are intended to refer only to the particular structure of the embodiments . . . and are not intended to

define or limit the scope of the disclosure.” Ex. 1001, 2:42–43, 49–53.

Thus, the summary states that the particular structures of embodiments, such as the structure of the third rail, are not intended to define or limit the scope of the disclosure, which is the opposite of limiting the claimed “high voltage power source” to the structure of the third rail located in a train facility as contended by Patent Owner.

The detailed description does give an example of a “high voltage source of electrical power greater than 277V” as “the high voltage ‘third rail’ power source 34 from which train engines drawn power.” Ex. 1001, 5:31–34. However, the next sentence discloses that the “source 34 can be 450V-1000V direct current or commonly about 600V.” Ex. 1001, 5:34–35. The specification’s disclosure that the “source,” rather than “third rail,” “can be 450V-1000V direct current or commonly 600 V” is the opposite of limiting the source to the third rail from which train engines draw power. *Id.*; *see id.* at 2:49–54. Further, Patent Owner acknowledges that “the specification includes some other examples of power sources that the LED fixture can be configured to accommodate.” Req. Reh’g. 12.

For example, the specification discloses that “the high voltage input voltage provided by the third rail” is “typically a 450-1000 VDC voltage,” but that the “external high voltage input voltage includes all input voltages of 277 Volts and higher.” Ex. 1001, 6:9–13; *see id.* at 2:49–54; *see* Ex. 2021 48:13–23 (Dr. Bretschneider testifies that 277 Volts is a common voltage in commercial and industrial environments), 134:13–16 (Dr. Bretschneider testifies that the third rail power supplies that he is familiar with have ranged from 450 Volts to 1000 Volts). Here, the specification discloses that the high voltage power source can provide voltages that are much less than the 450-1000 VDC provided by the third rail, which shows that in some

embodiments, a high voltage power source other than the third rail provides the high voltage. *Id.*

“high voltage power source” during prosecution

During prosecution, the applicant identified page 5 of the application, which is found on column 3, line 45 to column 4, line 3 of the '748 patent, as describing the prior art power sources recited in the preamble, including the “high voltage power source.” *See* Ex. 1005, 32, 182. This section of the detailed description discloses that the “[l]ight fixture 2 is configured for use in public transportation locations where high voltage electricity supplies are available. Each light fixture 2 disclosed herein is can be configuration accept and use the available high voltage electrical power.” Ex. 1001, 3:45–49. This section of the detailed description gives an example of a high voltage power source as “a 600 Volt power source.” Ex. 1001, 3:58. This section of the detailed description does not disclose an LED light fixture that receives power from a third rail located in a train station. Rather, this section simply discloses that the light fixture receives power from a high voltage electricity supply, and provides an example of a high voltage power source as “a 600 Volt power source.”

During prosecution, the applicant did not cite to the specification’s disclosure of the third rail as describing the “high voltage power source,” but instead, cited to a portion of the specification that disclosed a general description of “a 600 Volt power source.” We determine that the prosecution history shows that the applicant did not intend to limit the claimed “high voltage power source” to the third rail. *See* Ex. 1005, 32, 182. The intrinsic evidence including the specification and the prosecution history indicates that the applicant intended the scope of “high voltage power

source” to encompass more than the third rail from which train engines draw power.

“high voltage power source” as understood by a skilled artisan

We also find that Patent Owner’s proposed construction of “high voltage power source” as “an electrical power source from which public transportation vehicles draw power (e.g. the ‘third rail’)” improperly relies on the devices that use power from the source, rather than the attributes of the source itself, to construe this term. We are not persuaded that the meaning of “high voltage power source” depends on which devices actually use power from the source, especially given that the claim does not recite any device other than the LED power supply that receives power from the source. A person of ordinary skill would understand that a high voltage power source that does not provide power to a public transportation vehicle is still a high voltage power source. *See* Ex. 1003 ¶¶ 80–83; Ex. 1008, 441, 459, 465, 523, 582, 617; Ex. 1009, 2:13–14, 2:26–33, 4:9–10, 4:60–64; Ex. 1010, Abstract, 20:47–49, 21:27–33, 63:3–9, 64:10–21; Ex. 2021, 32:18–33:11.

Conclusion

We determine that the specification and prosecution history indicate that the patentee intended that the high voltage power source be not limited to a specific structure, nor to a specific location, nor by which devices draw power from it. *See Dealertrack*, 674 F.3d at 1327; *Phillips*, 415 F.3d at 1323. Reading “high voltage power source” in light of the specification, we do not “define or limit the scope of the” claimed high voltage power source “only to the particular structure of the embodiments” disclosed in the specification, such as a third rail of a train facility from which electric

vehicles draw power. Ex. 1001, 2:49–53. We do not construe “high voltage power source” as proposed by Patent Owner.

(b) The remaining proposed constructions

To resolve the controversy of this proceeding, we need not determine whether Petitioner’s proposed construction under the plain and ordinary meaning, Petitioner’s second proposed construction, or our construction in the Decision to Institute is the correct construction, because the term “high voltage power source” encompasses any of the remaining three proposed constructions, and under any of these constructions, the prior art relied on in the Petition teaches the claimed “high voltage power source.” We determine the scope of “high voltage power source” under each of these constructions in order to address Patent Owner’s contentions here and in our analyses of the unpatentability grounds.

Construing “high voltage power source” under its plain and ordinary meaning.

In the Petition, Petitioner proposes that each claim term in the challenged claims be given its plain and ordinary meaning. Pet. 26. We determine that the plain and ordinary meaning of “high voltage power source” is a source of power that is high voltage.

Construing “high voltage power source” as a source of power that is 277 Volts or higher

In Petitioner’s Response to Patent Owner’s Request for Rehearing, and again in Petitioner’s Reply, Petitioner proposes adopting a construction of “high voltage power source” as “a source of power that is 277 Volts or higher.” Resp. Req. 13; Reply 16. This proposed construction is consistent with the plain and ordinary meaning of “high voltage power source,” with the additional construction of “high voltage” to mean “277 Volts or higher.”

Petitioner contends that this proposed construction is supported by the express disclosure in the specification that the “external high voltage input voltage includes all input voltages of 277 Volts and higher.” Reply 16 (citing Ex. 1001, 6:12–13, 5:31–32, 6:10–11, 5:60–61, 5:34–35); *see* Ex. 2021, 122:2–14.

Patent Owner contends that Petitioner proposes this construction for the first time in Reply, and therefore this proposed construction should not be considered. PO Sur-Reply 8. We disagree. Petitioner presented this construction for the first time in its Response to Patent Owner’s Request for Rehearing. Resp. Req. 13. We then addressed this proposed construction in our Rehearing Decision. Reh’g. Dec. 10. Further, Petitioner’s proposed construction of “high voltage power source” relies on the specification’s disclosure that the “external high voltage input voltage includes all input voltages of 277 Volts and higher,” which Patent Owner quotes in Patent Owner’s own proposed construction of “high voltage power source.” PO Resp. 29. Also, Patent Owner’s expert, Dr. Karlicek, testifies that the ’748 patent discusses that high voltage includes 277 volts and higher. Ex. 1019, 113:7–114:21. Patent Owner has had notice of Petitioner’s proposed construction and an opportunity to respond to it. *See Genzyme Therapeutic Products Ltd. v. Biomarin Pharmaceutical Inc.*, 825 F.3d 1360, 1368.

Patent Owner contends that the construction of “high voltage power source” should focus on the source of the power, not the magnitude of the voltage as proposed by Petitioner. PO Sur-Reply 8. Patent Owner contends that Petitioner relies on the specification’s disclosure of the external high input voltage, which is a magnitude of voltage, to construe the “high voltage power source.” PO Sur-Reply 9. Patent Owner also contends that the “high voltage power source” is a structural limitation that is disclosed in the

specification as the third rail, not a magnitude, and therefore, should be construed as such. PO Sur-Reply 9–11. Patent Owner contends that “the specification only supports the construction of ‘high voltage power source’ to mean ‘electrical power source from which public transportation vehicles draw power (e.g., the ‘third rail’).’ The specification does not provide other examples of ‘high voltage sources.’” *Id.*

We are not persuaded. Contrary to Patent Owner’s contention, the specification repeatedly discloses the high voltage power source as a source of power, where the power is a voltage at or above a specific magnitude, such as 600V, 450V-1000V, or 277 Volts and higher. Ex. 1001, 2:13–14, 3:58, 3:60, 5:34–35, 5:44, 5:55, 5:60–61, 6:12–13. Petitioner’s proposed construction is consistent with the specification’s examples of the high voltage power source as a source of power where the power is a voltage at or above a specific magnitude. Further, we disagree with Patent Owner’s contention that the specification limits the “high voltage power source” to the structure of the third rail, for the reasons discussed above. *See* Ex. 1001, 2:49–54; *see Dealertrack*, 674 F.3d at 1327; *Phillips*, 415 F.3d at 1323.

We determine that Petitioner’s proposed construction of “high voltage power source” as a source of power that is 277 volts or higher is the same as the plain and ordinary meaning of “high voltage power source” as a source of power that is high voltage, but includes the additional construction of “high voltage” as 277 volts or higher. We determine that construing “high voltage” as 277 volts or higher is consistent with the ’748 patent’s disclosure that “high voltage input voltage includes all input voltages of 277 Volts and higher.”

Construing “high voltage power source” as a power source having a voltage of 250 Volts or higher

In our Decision to Institute, we determined that the scope of “high voltage power source,” read in light of the specification as it would be interpreted by one of ordinary skill in the art, encompasses at least a power source having a voltage of 250 Volts or higher, such as solar panels that generate from 250 to 600 Volts. Dec. Inst. 12–13.

Patent Owner contends that this construction improperly relies on extrinsic evidence to construe “high voltage power source.” PO Resp. 31–32 (citing *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1584–85 (Fed. Cir. 1996)). Patent Owner contends that the specification already explains what a high voltage power source is in sufficient detail, such that the Board’s use of extrinsic evidence to interpret the limitation is improper. *Id.* at 32. Patent Owner contends that the Board’s construction that the “high voltage power source encompasses at least a power source having a voltage of 250 Volts or higher, such as solar panels that generate from 250 to 600 Volts” is inconsistent with the disclosure of the ’748 patent, because the specification never mentions 250 volts or solar panels. *Id.*

We disagree with Patent Owner’s contention that the specification explains the high voltage power source in sufficient detail such that relying on extrinsic evidence is improper. We also disagree with Patent Owner’s contention that because the specification never mentions 250 volts, the high voltage power provided by the “high voltage power source” excludes 250 volts. The specification describes a high voltage power source as a source of power that is high voltage, where high voltage *includes* all input voltages of 277 Volts and higher. Ex. 1001, 6:12–13; *see id.* at 2:14, 3:46, 3:58, 5:34–35. The word “includes” as used in the specification indicates that lower

voltages are not excluded. Further, the specification describes 277 Volts as both a standard voltage and a high voltage, where the distinguishing factor is whether the voltage is alternating current or direct current. See *id.* at 5:27–29, 6:9–13. The Decision’s construction that a high voltage power source encompasses at least a power source having a voltage of 250 volts or higher is consistent with the Specification’s disclosure that a high voltage power source includes all direct current voltages of 277 Volts and higher but does not exclude a lower voltage, and that the range of standard voltages and the range of high voltages overlap, where the distinguishing factor is whether the voltage is alternating or direct current.

We are also not persuaded by Patent Owner’s contention that, because the specification does not mention solar panels, the scope of high voltage power source excludes solar panels. PO Resp. 32–33. Patent Owner acknowledges that “the specification includes some other examples of power sources that the LED fixture can be configured to accommodate.” Req. Reh’g. 12. Several examples in the specification describe the high voltage power source as a source of power, where the power is high voltage, but do not describe the structure that provides the high voltage. See Ex. 1001, 2:14, 3:46, 3:58, 5:34–35, 5:44, 5:55, 5:60–61, 6:12–13; see *id.* at 2:49–54. Further, the specification’s disclosure of the third rail as a source that provides 450-1000 Volts, and the disclosure that high voltage includes all input voltages of 277 Volts and higher, indicates that “high voltage power source” encompasses a source other than the third rail that provides 450-1000 Volts. Thus, the specification indicates that the patentee intended that the high voltage power source is not limited to a specific structure. See *Dealertrack*, 674 F.3d at 1327; *Phillips*, 415 F.3d at 1323. The Decision’s construction that the scope of high voltage power source encompasses solar

panels that provide voltage of 250-600 Volts is consistent with the specification's disclosure that the high voltage power source includes a source of electrical power of 277 Volts or higher, does not exclude a lower voltage, and does not limit the source to a specific structure that provides the high voltage.

Patent Owner contends that Realmuto discloses a power supply with a single input that accepts power from the Multi-Function Power Control Unit ("MFPCU"), but does not disclose that the power supply would have an input that accepts power from the solar power source. PO Response 33. We disagree with Patent Owner's contention that the MFPCU of Realmuto does not teach the claimed "LED power supply" that has multiple power inputs for the reasons given below in our analysis of the LED power supply.

Patent Owner contends that Realmuto discloses high voltage of 250-400 volts, but does not disclose a high voltage power source. PO Response 33-34. We disagree. Realmuto discloses solar panels that generate from 250 to 600 volts to power a DC Load. Ex. 1009 4:60-64. Realmuto also discloses additional examples of high voltage power sources as a wind turbine, a fuel cell, and an engine driven cogeneration device. Ex. 1009, 2:13-14, 2:31-33, 4:7-10, 4:60-61. Thus, contrary to Patent Owner's contention, Realmuto discloses several high voltage power sources. Our reviewing court has stated that "prior art references may [indicate] what all those skilled in the art generally believe a certain term means." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1584 (Fed. Cir. 1996); *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 991 (Fed. Cir. 1995). The prior art indicates that those skilled in the art believe a "high voltage power source" encompasses the high voltage power sources described by Realmuto, including the solar panels, the wind turbine, the fuel cell, and the

engine driven cogeneration device; and that “high voltage” encompasses 250 to 600 volts.

Patent Owner further contends that the ’748 patent expressly states that the claimed “high voltage” must include voltages well beyond 400 volts, and that the typical high voltage is 450-1000 volts and can include voltage spikes of up to 3kV. Here, Patent Owner implicitly proposes construing “high voltage” to mean a voltage well beyond 400 volts that includes voltage spikes of up to 3kV. However, the specification explicitly discloses that “high voltage input voltage includes all input voltages of 277 Volts and higher.” Ex. 1001, 6:12–13; *see id.* at 5:31–32. Contrary to Patent Owner’s contention, the scope of “high voltage,” read in light of the specification, encompasses voltages well below 400 volts. Patent Owner’s proposed construction of “high voltage” is inconsistent with the specification.

Patent Owner contends that Realmuto’s use of high voltage is inconsistent with the National Electric Code, which defines high voltage as voltages above 600 volts. PO Response 34. Here, Patent Owner proposes a second construction of “high voltage” to mean a voltage above 600 volts. However, as discussed above, the scope of “high voltage,” read in light of the specification, encompasses voltages well below 600 volts, because the specification explicitly discloses that “high voltage input voltage includes all input voltages of 277 Volts and higher.” Patent Owner’s second proposed construction of “high voltage” is inconsistent with the specification.

Patent Owner contends that the term “high voltage power source” at issue in the claims of the ’748 patent and the ’760 patent should be construed the same in both patents, because both contain the term “high voltage power source” and share substantially the same specification. PO Resp. 35–36 (citing *Nestle USA, Inc. v. Steuben Foods, Inc.*, 884 F.3d 1350,

1351–52 (Fed. Cir. 2018)). We are not persuaded by Patent Owner’s contention. Claim 7 of the ’748 patent recites “a high voltage power source” without further limiting the claimed “high voltage.” In contrast, claim 1 of the ’760 patent expressly recites “a high voltage power source having a voltage of 450 to 1000 Volts,” which expressly limits the “high voltage” to 450 to 1000 Volts.

The Decision’s construction of “high voltage power source” as a power source having a voltage of 250 Volts or higher, such as solar panels that generate from 250 to 600 Volts, is the same as the plain and ordinary meaning of “high voltage power source” as a source of power that is high voltage, but with the additional construction of “high voltage” as 250 volts or higher. We determine that construing “high voltage” as 250 volts or higher is consistent with the specification’s disclosure that a high voltage power source includes all direct current voltages of 277 Volts and higher but does not exclude a lower voltage, and is also consistent with what those skilled in the art believe “high voltage” encompasses.

Conclusion

As set forth above, we determine that the term “high voltage power source” can encompass the three remaining proposed constructions. No further claim construction of this term is required because we find that the prior art relied on in the Petition teaches a “high voltage power source” under any of these three constructions for the reasons given below in our analyses of the unpatentability grounds.

To the extent necessary to address the parties’ unpatentability arguments, construction of additional claim terms are addressed below in the context of the unpatentability analysis. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Matal*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (only

terms that are in controversy need to be construed, and only to the extent necessary to resolve the controversy).

C. Asserted Obviousness over Realmuto and Roberge

1. Realmuto (Ex. 1009)

Realmuto discloses a power control system including a network of functional blocks housed in a single enclosure, providing DC power to a DC load, and sharing AC and DC power inputs. Ex. 1009, Abstract. The DC load is a device that consumes power, such as a light emitting diode (LED). *Id.* at 2:14–17. Figure 1 of Realmuto is reproduced below.

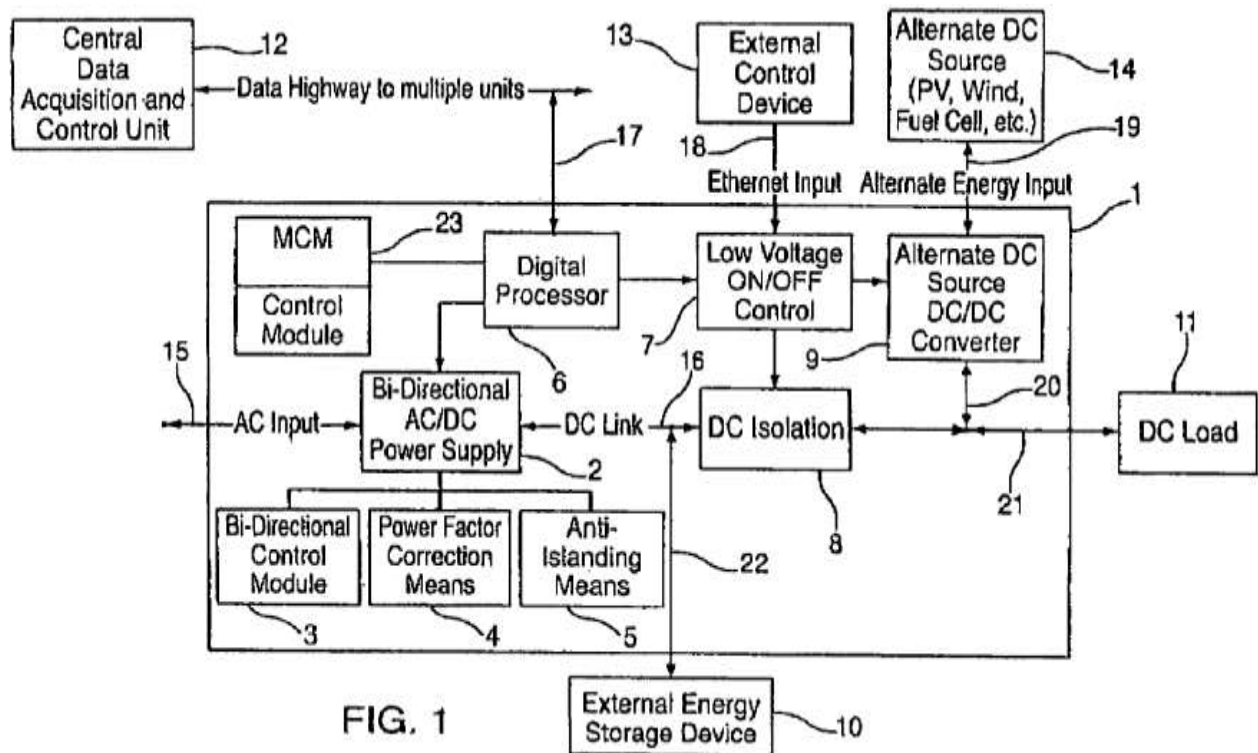


Figure 1 of Realmuto above shows Multi-Function Power Control Unit (MFPCU) 1 with connector 15 for AC input, connector 19 for DC input from DC source 14, and connector 22 for battery power input from external energy storage device 10. Ex. 1009, 1:13–19, 1:27–35, 4:2–10, 4:22–29. The MFPCU also includes connector 21 to power DC Load 11. *Id.* at 1:61–

62, 2:13–18, 2:26–28, 2:43–47, 4:14, 4:19–25, 4:60–64. DC source 14 generates high voltage, from 250 to 600 volts. *Id.* at 2:13–14, 4:60–64. AC input 15 generates single phase 208-277 VAC or three phase 208-480 VAC. *Id.* at 1:36–39.

2. Roberge (Ex. 1010)

Roberge discloses a linear lighting system that includes a power system for driving light sources in high-voltage environments. Ex. 1010, Abstract; *see id.* at 20:3–49, 21:22–33, Figs. 1, 2, 55. Roberge discloses that such environments include transportation environments, and in particular, train environments. *Id.* at 5:55–60, 16:6–10, 63:3–9, 64:10–16, Fig. 55. Figure 56 of Roberge, reproduced below, depicts such a lighting system.

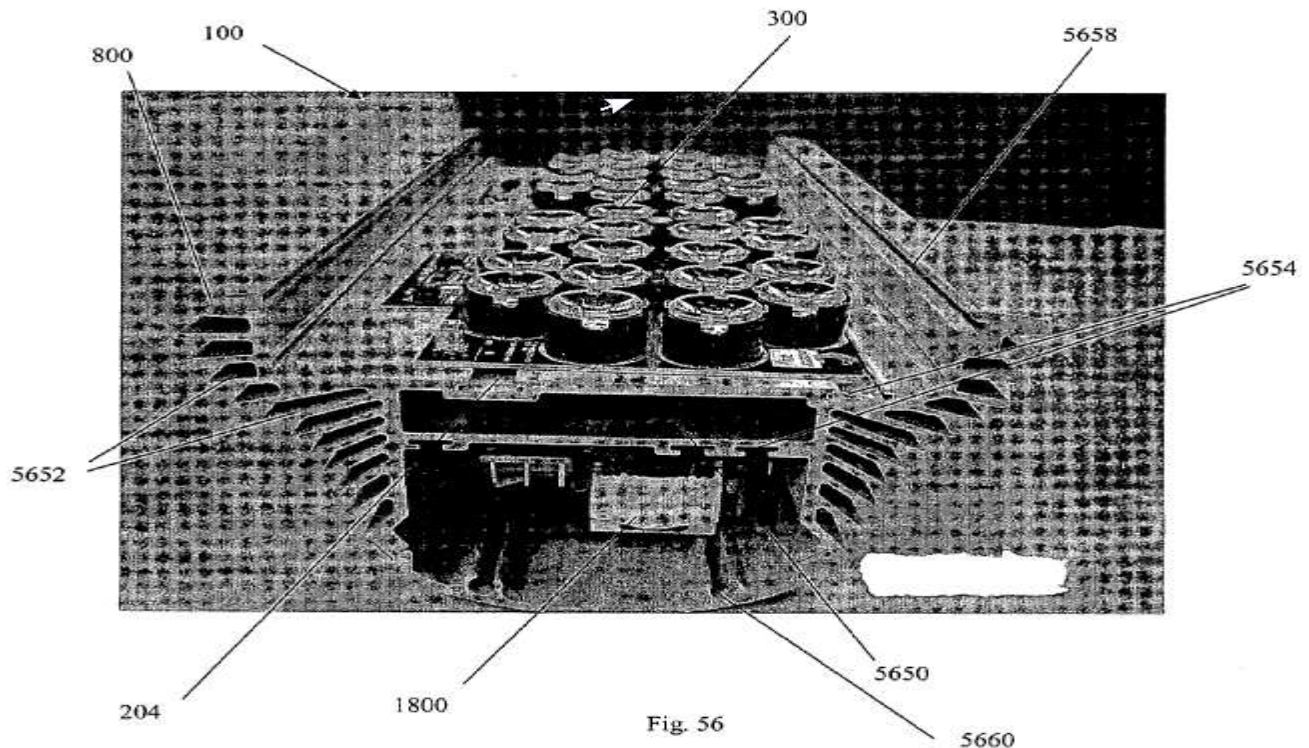


Figure 56 above shows lighting system 100 including LEDs 300, power facility 1800 for powering the LEDs, and housing 800. Ex. 1010, 64:31–42; *see id.* at 4:43–52, 15:35–39, 18:28–29. Examples of power

facility 1800 include an AC power source, a DC power source, batteries, and solar-based power sources. *Id.* at 20:29–35. The power facility includes power conversion devices that convert power received by an external power source to a form suitable for operating the lighting fixture. *Id.* at 20:35–39.

3. Analysis of claim 7

Undisputed contentions

Claim 7 recites “[a] LED light fixture . . . having a high voltage power source, and at least a first standard voltage source.” Petitioner contends Realmuto discloses a high voltage power source and a standard AC voltage power source. Pet. 43–44 (citing Ex. 1009, 1:36–39, 4:60–61, Fig. 1; Ex. 1003 ¶ 182).

Claim 7 recites “a fixture housing.” Petitioner contends Roberge discloses an LED light fixture with a fixture housing. Pet. 35–36 (citing Ex. 1010, 15:37–39, Figs. 56, 63, 71).

Claim 7 recites “a plurality of LEDs carried by the housing for providing light from the fixture housing.” Petitioner contends Roberge discloses a lighting fixture that includes LED light sources carried by a housing. Pet. 38–39 (citing Ex. 1010, 4:50–52, 15:35–39, Fig. 56).

Claim 7 recites “an LED power supply carried within the fixture housing.” Petitioner contends that Figure 56 of Roberge discloses power facility 1800 carried within housing 800 of lighting system 100. Pet. 56.

Claim 7 recites “a battery backup system connected to one of the plurality of LEDs and the LED power supply.” Petitioner contends Realmuto discloses external energy storage device 10 connected to the MFPCU power supply 1 via input line 22. Pet. 34 (citing Ex. 1009, Fig. 1). Petitioner contends Realmuto discloses that the external energy storage device can be a battery. *Id.* (citing Ex. 1009, 4:26–28).

Patent Owner does not dispute that Realmuto and Roberge teach the above limitations of claim 7, therefore, any such arguments are waived. *See Novartis AG v. Torrent Pharms. Ltd.*, 853 F.3d 1316, 1330 (Fed. Cir. 2017); *NuVasive*, 842 F.3d at 1380–81; Paper 12, 6 (“Patent Owner is cautioned that any arguments for patentability not raised in the response may be deemed waived.”). Petitioner’s analysis for each of the limitations, supported by the testimony of Dr. Bretschneider, which we credit, is persuasive.

Disputed contentions

a. LED power supply

Claim 7 recites “the LED power supply having a first power input connected to the first standard voltage power source and a second input connected to the high voltage power source.” Petitioner contends Realmuto discloses a power supply, or Multi-Function Power Control Unit (MFPCU), with an AC input connected to a standard utility AC power source, and a DC input connected to a high voltage DC power source. Pet. 32–33 (citing Ex. 1009, 1:33–39, 2:15–18, 4:62–67, 5:4–6, Fig. 1; Ex. 1003 ¶¶ 158–160). Petitioner contends Realmuto discloses that the power supply provides DC power to a DC load, such as a light emitting diode. Pet. 33–34 (citing Ex. 1009, 1:14–16, 2:15–18; Ex. 1003 ¶¶ 162–163).

Patent Owner contends that the MFPCU is not an LED power supply. PO Sur-Reply 14. In particular, Patent Owner contends that LEDs require a current source, which can provide a suitable form of power, and an LED power supply is designed to provide a constant current to LEDs. PO Sur-Reply 14 (citing Ex. 1019, 38–39, 127–128, 145–146). Patent Owner contends that, unlike the MFPCU, an LED power supply is a power supply with a controlled current output that can monitor current flows to LEDs for

improved efficiency. PO Sur-Reply 14 (citing Ex. 1019, 39–40, 127–128). According to Patent Owner and Dr. Karlicek, an LED power supply can keep pushing the controlled current (e.g. constant current) and modify the voltage to maintain the constant current level for appropriately energizing LEDs. PO Sur-Reply 15 (citing Ex. 1019, 127–130, 145–146); see Ex. 2022 ¶¶ 63, 101, 108, 109.

Patent Owner’s contention is based on construing the claimed “LED power supply” to mean a power supply with a controlled current output that can monitor current flows to LEDs for improved efficiency. Patent Owner did not advance such a construction in Patent Owner’s Response nor its expert’s declarations. Therefore, this construction is untimely.

However, even were we to consider Patent Owner’s proposed construction of “LED power supply” as timely, we disagree with this construction. Neither claim 7 nor the specification of the ’748 patent supports Patent Owner’s proposed construction. The specification of the ’748 patent discloses that the “LED power supply 22 converts the high voltage . . . into a lower direct current voltage suitable for powering the LEDs 14.” Ex. 1001, 6:9–12. “The current control circuit receives the smooth driving voltage . . . and provides a driving current to the LEDs.” Ex. 1001, 6:44–46. “In one exemplary embodiment, the current control circuit is integral with the printed circuit board of each LED strip 14. Alternatively, they may be incorporated into the power source and the power source may include separate outputs for each light engine to which it is connected.” Ex. 1001, 6:48–53.

Thus, the disclosure of the ’748 patent explicitly describes at least one embodiment where the power supply 22 provides power to the current control circuit, and where the current control circuit is integral with the

printed circuit board of the LED strip, not with the power supply. In this embodiment, the current control circuit, not the power supply, provides current to the LEDs. Therefore, the scope of the claimed “LED power supply,” read in light of the specification, does not require a current source that generates a controlled current flow to LEDs. Patent Owner’s contention is not commensurate with the scope of the claim as read in light of the specification.

Patent Owner also contends that Realmuto’s MFPCU is designed to provide a pre-determined voltage, but not to modify the pre-determined voltage for generating a controlled current flow to LEDs. PO Sur-Reply 14–15 (citing Ex. 1009, 1:7–9, 1:40–48, 4:50–56). However, Realmuto teaches that the MFPCU controls current to the LEDs. Ex. 1009, 2:13–17, 2:50–62 (“The digital processor [of the MFPCU] . . . may provide the following controls: dynamic . . . current control supplied by an alternate DC source.”); 10:19–30 (explaining that the digital processor controls amps supplied by each of the power sources and controls amps delivered to the load).

As we stated above in our determination of the level of ordinary skill, a person of ordinary skill would have sufficient knowledge of or experience with equipment and techniques to provide a power system for driving light sources in a high-voltage environment such as a train environment and to account for challenges that may occur in the high voltage environment such as changes in current flow. We are persuaded by the Petition and supporting evidence that controlling current from the MFPCU to the LEDs was not “uniquely challenging or difficult for one of ordinary skill in the art” who could control current supplied from a power source and delivered to the load as taught by Realmuto. See *Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007) (citing *KSR*, 550 U.S. at 419). Thus, even

were we to accept Patent Owner's construction as timely, and even if such construction were consistent with the specification, Realmuto teaches that the MFPCU generates a controlled current flow to LEDs.

Patent Owner contends that Petitioner has failed to show how or why a person of ordinary skill in the art would be motivated to combine the MFPCU with an LED power supply that supplies constant current. PO Sur-Reply 16 (citing Ex. 1019, 127–130, 145–146). As discussed above, Patent Owner's contention that the claimed LED power supply supplies a constant current is not commensurate with the scope of the claim. Further, as discussed above, Patent Owner's contention that Realmuto's MFPCU cannot supply constant current is inconsistent with the teachings of Realmuto.

Patent Owner contends that the DC load of Realmuto contains its own power supply, and that one would not power an LED with the MFPCU because Realmuto lists examples of a DC load as a DC motor or an AC motor, and further discloses that the DC load may feed power backwards for short durations, such as during braking of a motor. PO Sur-Reply 17–18 (citing Ex. 1009, 2:14–20, 4:14–17). Patent Owner contends that a person of ordinary skill in the art would understand that a DC load cannot feed power backwards to the MFPCU without its own power supply. PO Sur-Reply 17. This is unpersuasive because the motor is only one example of a suitable DC load. Patent Owner does not show that Realmuto would only be suitable for DC loads that generate power and, indeed, the passage quoted by Patent Owner states that the load “*can* generate power” “on some occasions” and “*may* feed power backwards.” PO Sur-Reply 17 (emphasis added) (quoting Ex. 1009, 4:14–16).

Patent Owner contends that Realmuto does not disclose “the LED power supply having a first power input connected to the first standard

voltage power source and a second power input connected to the high voltage power source” as claimed, because the DC power source of Realmuto is not connected to an LED power supply. PO Resp. 38.

Petitioner contends the DC load of Realmuto contains its own power supply because Realmuto lists a lighting ballast of a fluorescent light as an example of a DC load. PO Resp. 39; PO Sur-Reply 16. Patent Owner contends that the driver of an LED is equivalent to the ballast of a fluorescent light, therefore, the MFPCU of Realmuto powers the power supply/driver of the LED rather than the LED. PO Resp. 39–41; PO Sur-Reply 16–17. Dr. Karlicek provides similar testimony, also relying on Realmuto’s disclosure. Ex. 2022 ¶¶ 63, 101, 108, 109. Patent Owner’s contention is not commensurate with the scope of “LED power supply” as read in light of the specification, for the reasons given above.

Further, Realmuto discloses that the DC load is “a device that consumes power, such as a lighting ballast; lamp; solid state lighting, such as a light emitting diode (LED).” Ex. 1009, 2:14–19. Realmuto then describes the increase in efficiency of a lighting ballast that uses Realmuto’s invention. Ex. 1009, 3:15–27. However, Realmuto discloses an example of a DC load as an LED, not the driver of the LED. Similarly, Realmuto discloses an example of a DC load as a lamp, not the ballast or driver of the lamp. When Realmuto intended to describe the ballast of the fluorescent light, rather than the fluorescent light itself, as the DC load, Realmuto did so. If Realmuto intended to describe the driver of the LED, rather than the LED, as the DC load, Realmuto was able to do so. Patent Owner’s contention and Dr. Karlicek’s testimony are inconsistent with the literal disclosure of Realmuto. Further, to the extent that Patent Owner’s contention is based on construing the claimed “LED power supply” as a constant current source, we

are not persuaded because (a) such a construction is not commensurate with the scope of the claim, and (b) even if it were, is taught by Realmuto's MFPCU as discussed above.

What a reference teaches is a question of fact. *In re Baird*, 16 F.3d 380, 382 (Fed. Cir. 1994); *In re Beattie*, 974 F.2d 1309, 1311 (Fed. Cir. 1992). The Petition and supporting evidence persuasively show that the MFPCU of Realmuto teaches an "LED power supply" as claimed. Dr. Bretschneider testifies that "Realmuto discloses that its power supply (MFPCU) can be used to provide power to [a] light emitting diode (LED)." Ex. 1003 ¶ 125; see *id.* at ¶¶ 120–122. Dr. Bretschneider's testimony is consistent with Realmuto, which discloses that the "power supply" of the MFPCU "powers a DC load . . . such as a light emitting diode." Ex. 1009, 2:13–17. We credit Dr. Bretschneider's testimony in determining that Realmuto discloses an "LED power supply" within the scope of claim 7 as read in light of the '748 patent's specification. Ex. 1001, 6:9–12 ("The LED power supply 22 converts the high voltage . . . into a lower direct current voltage suitable for powering the LEDs 14."), 6:48–52 ("In one exemplary embodiment, the current control circuit is integral with the printed circuit board of each LED strip 14," not with the LED power supply 22).

In an email to the Board on July 20, 2021, Petitioner contended that most of Patent Owner's contentions related to the LED power supply in Patent Owner's Sur-Reply are new arguments, and requested permission to file a motion to strike the new arguments. In particular, Petitioner contended that Patent Owner's construction of the claimed "LED power supply" in its Sur-Reply as a controlled current output that can monitor current flows to LEDs was not raised in Patent Owner's Preliminary Response, Patent Owner's Request for Rehearing, Patent Owner's Response, or its expert's

declarations. We agree with Petitioner that this construction and these arguments are untimely, because Patent Owner did not present this construction and arguments that rely on this construction until the Sur-Reply. However, we need not remove the new construction and new arguments from the record, because this construction and these arguments, even if they were timely, are unpersuasive.

b. the preamble

Patent Owner contends that Realmuto does not disclose the preamble of claim 7 as properly construed, because a person of ordinary skill would consider the preamble as limiting in its entirety. PO Resp. 41–42. We disagree with Patent Owner for the reasons given in our claim construction above. Further, even were we to construe the preamble term an “LED [l]ight fixture used in a public transportation facility” as having patentable weight, this is taught by the combination of Realmuto and Roberge.

In particular, Roberge teaches that its lighting systems include power systems for driving light sources in high-voltage environments such as a train facility. Ex. 1010, Abstract, 20:29–49, 21:22–33, 63:7, 64:16–17. Roberge then describes the same power supplies that are also described by Realmuto as high voltage power supplies. Ex. 1010, 20:33–34, 21:1–2, 21:20–21; Ex. 1009, 2:31–33, 4:7–10, Fig. 1. Dr. Bretschneider testifies that the public transportation facilities of Roberge would include a high voltage power source, such as those taught by Realmuto. Ex. 1003 ¶¶ 153–154, 180–185, Ex. 2021, 138:22–25. Dr. Karlicek also testifies that public transportation facilities would include a high voltage power source. Ex. 1019, 152:15–21. We credit Dr. Bretschneider’s testimony as well as the teachings of the references themselves in determining that the combination of Realmuto and Roberge teaches “[a] LED [l]ight fixture used in a public

transportation facility having a high voltage power source, and at least a first standard voltage power source,” even were we to give weight to “used in a public transportation facility.”

c. “high voltage power source”

Petitioner contends that Realmuto teaches this limitation in describing that the alternate DC input of the MFPCU can receive power from alternate high voltage DC power sources between 250 to 600 VDC. Pet. 33 (citing Ex. 1003 ¶ 160; Ex. 1009, 4:62–67. Patent Owner contends that the solar power source of Realmuto is not a high voltage power source as claimed. PO Resp. 42–47. Patent Owner’s contention is based on Patent Owner’s proposed construction of “high voltage power source” as an electrical power source from which public transportation vehicles draw power (e.g. the ‘third rail’), and on Patent Owner’s proposed construction of “high voltage” as 600 volts and higher, which we find unpersuasive as discussed above in our claim construction.

Realmuto discloses high voltage DC power sources that provide high voltage of 250-600 volts. Ex. 1009, 2:13–14, 4:61–64. Further, Applicant’s admitted prior art teaches “a high voltage power source” as claimed, including a 600 volt power source for use in public transportation facilities, besides the third rail, as discussed above in our claim construction and below in our analysis of the background knowledge of a person of ordinary skill. See Ex. 1005 32, 182; Ex. 1003 ¶ 154. Whether construing “high voltage power source” under the plain and ordinary meaning, under Petitioner’s proposed construction of “a source of power that is 277 Volts or higher,” or under our preliminary construction of “a power source having a voltage of 250 Volts or higher, such as solar panels that generate from 250 to 600

Volts,” both Realmuto and Applicant’s admitted prior art teach “a high voltage power source” as claimed.

The examples of high voltage DC power sources taught by Realmuto, which include solar panels, wind turbines, and fuel cells, are also taught by Roberge. Ex. 1009, 2:13–14, 2:32–33, 4:9–10, 4:60–61; Ex. 1010, 20:29–49, 21:1–2, 21:18–33; Abstract. Roberge also teaches that the power sources provide high voltage. Ex. 1010, 20:3–6 (“In embodiments the housing 1402 may house drive circuitry for a high-voltage embodiment.”), 20:47–49 (“[P]ower supplies may provide . . . high-voltage output.”), Abstract (“The linear lighting systems may include power systems for driving light sources in high-voltage environments.”). Roberge teaches “a high voltage power source” under at least the plain and ordinary meaning.

d. Reasons to combine

Petitioner provides several reasons to combine the teachings of Realmuto and Roberge, which Patent Owner disputes. Pet. 28–30, 39–45; PO Resp. 50–58; PO Sur-Reply 23–25.

(i) Background knowledge of a person of ordinary skill

The initial dispute over reasons to combine relates to the background knowledge of a person of ordinary skill. See Pet. 25–26, 29; PO Resp. 47–50. The Supreme Court has recognized that the use of evidence of the skilled artisan’s background knowledge is foundational to a proper obviousness analysis. See *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 401 (2007) (“To determine whether there was an apparent reason to combine the known elements in the way a patent claims, it will often be necessary to look . . . to the background knowledge possessed by a person having ordinary skill in the art.”). Patent Owner contends that Petitioner misuses the AAPA because the AAPA is implicitly part of the basis of Petitioner’s obviousness

arguments, and because the AAPA does not amount to general knowledge of a person of ordinary skill. PO Resp. 48.

Support for the motivation to combine Realmuto and Roberge

Petitioner contends that “incorporating the power supply and battery backup of Realmuto, into the LED lighting fixture of Roberge, in a train or public transit environment, would provide an environment that is known to include multiple sources of power, as the applicant admitted as AAPA during prosecution.” Pet. 30 (citing Ex. 1005, 32; Ex. 1003 ¶ 154). Patent Owner contends that Petitioner improperly relies on the AAPA as the basis of its obviousness ground. PO Resp. 48; *see also id.* at 49 (quoting Pet. 30).

We disagree with Patent Owner. The basis of Petitioner’s obviousness ground is the prior art Realmuto and Roberge patents. Pet. 30–46. Petitioner properly relies on the AAPA as substantial evidence that a person of ordinary skill in the art would have known that a public transportation facility has a high voltage power source and a traditional 110–277 Volt power source. Pet. 30; *In re NTP, Inc.*, 654 F.3d 1279, 1304 (Fed. Cir. 2011) (holding that AAPA provided substantial evidence that a particular claim limitation would have been known to artisans at the time of the invention); *see Koninklijke Philips v. Google*, 948 F.3d 1330, 1339 (Fed. Cir. 2020) (“Admissions in the specification regarding the prior art are binding on the patentee for purposes of later inquiry into obviousness.”); *see id.* at 1337 (“As *KSR* established, the knowledge of such an artisan is part of the store of public knowledge that must be consulted when considering whether a claimed invention would have been obvious.”)); *see* USPTO Memorandum, Treatment of Statements of the Applicant in the Challenged Patent in *Inter Partes* Reviews Under § 311 (Aug. 18, 2020) at 8–9 (“the Board need not deny a petition that properly points to general knowledge to

satisfy a claim limitation”).⁶ Petitioner properly uses this evidence of the background knowledge possessed by someone of ordinary skill in the art in conjunction with the prior art patents to support Petitioner’s obviousness argument.

Demonstration of the general knowledge

Patent Owner contends that the AAPA does not amount to the general knowledge of a person of ordinary skill, because, with respect to Patent Owner’s proposed construction of the term “high voltage power source,” a person of ordinary skill in the art would not, as a matter of general knowledge, know that such power source could be used to power an LED light. PO Resp. 48–50 (citing Ex. 2022 ¶¶ 85–86, 125). To the extent Patent Owner’s argument relies on Patent Owner’s construction of “high voltage power source” as limited to only a power source from which electric vehicles draw power, we disagree for the reasons discussed above in our claim construction.

We also disagree with Patent Owner’s understanding of Applicant’s admission. Applicant’s admission of existing high voltage power supplies available at public transportation facilities is not limited to a train facility’s third rail from which electric vehicles draw power. During prosecution, Applicant stated to the Examiner that the “rejection cites the existing power sources in the public transportation facilities as meeting the preamble limitations. The Applicant notes this prior art is described in Applicant’s specification at page 5 where the power sources are described.” Ex. 1005, 32. Page 5 of the specification states that:

⁶ Available at https://www.uspto.gov/sites/default/files/documents/signed_aapa_guidance_memo.pdf.

Light fixture 2 is configured for use in public transportation locations where high voltage electricity supplies are available. Each light fixture 2 disclosed herein is can be configuration accept and use the available high voltage electrical power. In one embodiment, the light fixture 2 is connected to both the high voltage input as well as a traditional 110-277 Volt line power.

Ex. 1005, 182. Page 5 of the specification gives an example of a high voltage power source as simply “a 600 Volt power source.” *Id.* Page 5 of the specification does not mention a third rail, nor a train facility, nor an electric vehicle drawing power from a power source. If Applicant had intended its admission of existing high voltage power sources available in public transportation facilities to be limited to only a power source from which electric vehicles draw power, then Applicant would have cited to the portions of the specification that disclose this type of power source. But instead, Applicant cited to a much broader description of high voltage power sources available in public transportation locations, and admitted that this broader description is the prior art, which shows that Applicant intended the prior art “high voltage power source” described in the specification to include more than a source from which electric vehicles draw power.

The broad scope of Applicant’s admission about existing high voltage power sources available at public transportation facilities is consistent with the extrinsic evidence of the background knowledge of a person of ordinary skill in the art, such as the prior art references and the expert testimony. With respect to the prior art references, Realmuto teaches examples of high voltage power sources that include solar power, wind power, a fuel cell, and an engine driven cogeneration device. Ex. 1009, 2:31–33, 4:7–10, Fig. 1. Roberge also teaches these power sources, as well as their use in high voltage environments such as public transportation facilities. Ex. 1010,

6:59, 16:10, 20:33–34, 20:47–49, 21:1, 21:20–21, 21:27–31, 62:45–46, 62:54, 63:7, 64:16, Fig. 55, Abstract (“The linear lighting system may include power systems for driving lighting sources in high-voltage environments.”).

With respect to expert testimony, Dr. Bretschneider testifies that a “public transportation facility would have the types of voltage inputs that Realmuto was meant to be used with.” Ex. 1003 ¶ 184; *see id.* at ¶ 185. Dr. Bretschneider testifies that a high voltage power source available at public transportation facility may be a source other than the third rail. Ex. 2021, 138:22–25 (“As I stated, even public transportation facilities may not have access to a third-rail power source, but they may have access to a high-voltage power source.”). In contrast, Dr. Karlicek testifies in his second declaration that “a person of ordinary skill in the art would not possess knowledge regarding the power sources of a public transportation facility” (Ex. 2022 ¶ 86). However, Dr. Karlicek’s second declaration testimony is inconsistent with his deposition testimony, where he testified that “I believe that a person of ordinary skill in the art would know that those particular power sources were available” at public transportation facilities. (Ex. 1019, 152:15–21). Dr. Karlicek’s second declaration testimony is also inconsistent with the teachings of the prior art patents and the scope of Applicant’s admission. We find Dr. Bretschneider’s testimony to be more credible, because Dr. Bretschneider’s testimony is consistent with the teachings of the prior art patents and with the scope of Applicant’s admission.

We find that the background knowledge of a person of ordinary skill in the art would have included knowledge of high voltage power sources in public transportation facilities available for use in powering LEDs, including high voltage power sources other than the third rail, as evidenced by the

AAPA, the prior art patents, and Dr. Bretschneider’s testimony. *KSR*, 550 U.S. at 401; *Philips*, 948 F.3d at 1338 (The “Board relied on expert evidence . . . in concluding that pipelining was . . . within the general knowledge of the skilled artisan.”).

(ii) Reasons to combine references

Petitioner provides three examples of motivation. Pet. 28–30, 42. First, Petitioner contends that incorporating the MFPCU of Realmuto into the LED lighting fixture of Roberge would have yielded the benefit of selecting from a variety of power inputs. Pet. 28, 30. Second, Petitioner contends that locating the MFPCU of Realmuto into the LED lighting fixture of Roberge would have yielded the benefits of simplifying installation as well as manufacturing. Pet 29, 42. Third, Petitioner contends that a person of ordinary skill who desired to use the MFPCU of Realmuto in a dusty or dirty environment would have combined the MFPCU with the LED lighting fixture of Roberge to yield the benefit of protecting the MFPCU of Realmuto from environmental elements such as dust and dirt. Pet. 30. Petitioner also provides reasons to combine the teachings of Realmuto and Roberge under the Supreme Court’s flexible and expansive approach to the obviousness inquiry. Pet. 28–30; see *KSR*, 550 U.S. at 415, 417. The Petition’s reasons to combine are supported by Dr. Bretschneider, who provides persuasive testimony that a person of ordinary skill would have combined the MFPCU of Realmuto and the LED light fixture of Roberge in the manner claimed, and would have had a reasonable expectation of success in doing so. Ex. 1003 ¶¶ 82, 149–55, 169, 173, 178–79, 184–85.

Petitioner’s first motivation statement

Petitioner contends that the train or public transit environment of Roberge “would provide an environment that is known to include multiple

sources of power.” Pet. 30 (citing Ex. 1003 ¶¶ 153–54), 45–46 (citing Ex. 1003 ¶¶ 184–85). Petitioner contends that a person of ordinary skill “would understand that the power supply of Realmuto would provide a variety of power inputs, including AC utility power, alternative high voltage DC power sources, as well as DC power from external energy storage devices, to power the LED lighting fixture of Roberge.” Pet. 28 (citing Ex. 1003 ¶ 148).

“The presence or absence of a motivation to combine references in an obviousness determination is a pure question of fact.” *In re Gartside*, 203 F.3d 1305, 1316 (Fed. Cir. 2000). Evidence of a motivation to combine prior art references “may flow from the prior art references themselves.” *See Brown & Williamson Tobacco Corp. v. Philip Morris Inc.*, 229 F.3d 1120, 1125 (Fed. Cir. 2000). We find that evidence of Petitioner’s first motivation to combine the references, namely, to yield the benefit of providing inputs from a variety of power sources, flows from Dr. Bretschneider’s testimony and from the prior art references themselves.

Roberge discloses an LED lighting fixture, which includes a housing and a power supply located within the housing. Ex. 1010, 4:43–52, 64:31–42, Figs. 2, 56; Ex. 1003 ¶¶ 131–33. Roberge discloses that the LED lighting fixture may be installed in high voltage environments, such as a public transportation environment. Ex. 1010, 5:55–60, 16:6–12, 20:47–49, 21:27–31, 63:6–9, 64:10–21, Abstract, Fig. 55; Ex. 1003 ¶¶ 129–30. A person of ordinary skill would have understood that the public transportation environment of Roberge has standard AC and high voltage DC power sources, such as those taught by Realmuto. Ex. 1005 32, 182; Ex. 1003 ¶¶ 153–54, 184–85; Ex. 1009, 2:31–33, 4:7–10, Fig. 1; Ex. 1010, 5:59, 16:10, 20:33–34, 21:1, 21:20–21, 63:7, 64:16, Abstract, Fig. 55; Ex. 1019,

152:15–21; Ex. 2021 138:22–25. Although Roberge discloses that its power supply uses AC power, DC power, or batteries, Roberge does not explicitly disclose that its power supply has multiple inputs, including an AC power input, a DC power input, and a battery input. *See* Ex. 1010, 20:29–39; Ex. 1003 ¶ 134.

Realmuto discloses an MFPCU for an LED light that provides a variety of power inputs, including an AC power input, a high voltage DC power input, and a battery input. Ex. 1009, 1:17–19, 1:33–39, 2:13–17, Fig. 1; Ex. 1003 ¶¶ 120–26. Realmuto teaches that the MFPCU yields the benefit of providing power from the battery or the high voltage DC power source to the load in the event that the main AC power supply fails. Ex. 1009, 4:22–26; Ex. 1009 5:14–16; Ex. 1003 ¶¶ 147–48. Dr. Bretschneider testifies that a person of ordinary skill would have understood that using another power source for the LED light fixture when the main power source fails yields the benefit of providing illumination to allow persons in the area a chance to depart to safety. Ex. 1003 ¶ 82.

A person of ordinary skill in the art would have used the MFPCU of Realmuto as the power supply in the LED light fixture of Roberge, which is located in a public transportation facility, to yield the predictable benefit of providing the LED light fixture with the ability to select from a variety of power inputs as taught by Realmuto. Ex. 1009, 1:13–19. A person of ordinary skill would have understood that selecting from a variety of power inputs allows the LED light fixture to switch to an alternate power source in the event that the main AC power source fails, as taught by Realmuto. Ex. 1009, 1:17–19, 4:22–26, 5:14–20, Fig. 4. A person of ordinary skill would have understood that using another power source for the LED light fixture when the main AC power source fails allows the LED light fixture to

provide illumination so that persons in the area have a chance to depart to safety. Ex. 1003 ¶ 82.

We find that evidence for Petitioner’s first motivation to combine the references, namely, to yield the benefit of providing inputs from a variety of power sources, flows from the prior art itself as well as from Dr. Bretschneider’s testimony. *Brown*, 229 F.3d at 1125. We find that the prior art and Dr. Bretschneider’s testimony show that a person of ordinary skill would have had a reasonable expectation of success in providing inputs from a variety of power sources to an LED light fixture by combining the teachings of Realmuto and Roberge.

Petitioner’s second motivation statement

Petitioner contends that locating the power supply of Realmuto within the LED lighting fixture of Roberge would have simplified installation, because electrical connections between the power supply and the LEDs would not have to be made in the field. Pet. 29 (citing Ex. 1003 ¶ 151), 42 (citing Ex. 1003 ¶ 179). Petitioner further contends that locating the power supply of Realmuto inside the LED lighting fixture of Roberge would have simplified manufacturing quality control and performance verification, because the performance of Realmuto’s power supply and the LEDs would both be verified during assembly. Pet. 42 (citing Ex. 1003 ¶ 179). We find that evidence of Petitioner’s second motivation to combine the references flows from Dr. Bretschneider’s testimony.

Realmuto discloses an MFPCU including a power supply to power an LED that includes an AC power input, a DC power input, and a battery input. Ex. 1009, 1:33–39, 2:13–17, Fig. 1. Realmuto does not explicitly disclose that the MFPCU is “carried within the fixture housing” as claimed.

Roberge explicitly discloses a fixture housing, and a plurality of LEDs carried by the fixture housing. Ex. 1010, 15:37–39, Figs. 56, 63, 71.

Dr. Bretschneider testifies that a person of ordinary skill would have located the MFPCU of Realmuto inside Roberge’s fixture housing LEDs to yield the benefit of simplifying installation, because electrical connections between the power supply and the LEDs would not have to be made in the field. Ex. 1003 ¶¶ 151, 178–79. Dr. Bretschneider testifies that the combination would also yield the additional benefit of simplifying manufacturing quality control and performance verification, because the performance of the power supply and the LEDs would both be verified during assembly. *Id.* Dr. Bretschneider further testifies that locating the MFPCU inside of a fixture housing would have been obvious to a person of ordinary skill, because the fixture housing was a known, conventional part of LED fixtures at the time of invention. Ex. 1003 ¶¶ 169, 173, 178–79; *see* Ex. 1019 74:25–75:11.

Dr. Bretschneider provides persuasive testimony that a person of ordinary skill in the art would have located the MFPCU of Realmuto inside Roberge’s fixture housing that carries a plurality of LEDs to yield the benefits of simplifying installation as well as simplifying quality control and performance verification during manufacturing, and would have had a reasonable expectation of success in doing so.

Petitioner’s third motivation statement

Petitioner contends that a person of ordinary skill who desired to use the power supply of Realmuto in the public transportation environment of Roberge, would have wanted to protect Realmuto’s power supply from environmental elements such as dust and dirt by incorporating the power

supply within the housing of Roberge's LED light fixture. Pet. 30 (citing Ex. 1003 ¶ 155; Ex. 1010 63:5–7).

We find that evidence of Petitioner's third motivation to combine the references flows from Dr. Bretschneider's testimony. Dr. Bretschneider testifies that a person of ordinary skill who desired to use the power supply of Realmuto to power LEDs in public transportation facility would have wanted to protect the power supply from the dust and dirt found in such an environment. Ex. 1003 ¶ 155. Dr. Bretschneider testifies that a person of ordinary skill would have incorporated the power supply of Realmuto within Roberge's fixture housing that carries a plurality of LEDs to yield the benefit of protecting the power supply from dust and dirt. *Id.*; *see id.* at ¶¶ 169, 173. Dr. Bretschneider provides persuasive testimony that a person of ordinary skill in the art would have located the MFPCU within Roberge's fixture housing to yield the benefit of protecting Realmuto's power supply from dust and dirt, and would have a reasonable expectation of success in doing so.

Expansive and flexible approach to combining references

In addition to these motivation statements, Petitioner contends that Roberge teaches locating a power supply within an LED light fixture, and that a person of ordinary skill could have housed Realmuto's power supply and battery backup within Roberge's LED light fixture. Pet. 28–29 (citing Ex. 1003 ¶¶ 149–152), 45. Petitioner contends that the combination would yield the predictable results of having a power supply within an LED light fixture without altering or hindering the functions performed by the power supply of Realmuto or the LED lighting fixture of Roberge. Pet. 28–29, 45 (citing Ex. 1003 ¶ 184).

The Supreme Court has stated that “[t]he obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 419 (2007); *see id.* at 415. Engagement with the question of obviousness requires an “expansive and flexible approach” where “a court *must* ask whether the improvement is more than the predictable use of prior art elements according to their established functions. *Id.* at 415, 417 (emphasis added). “[W]hen a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result.” *Id.* at 416.

Dr. Bretschneider testifies that a person of ordinary skill would have used the power supply of Realmuto with the LED light fixture of Roberge, because the vast majority of LED light fixtures have an internal power supply, such as the LED light fixture taught by Roberge. Ex. 1003 ¶¶ 149–50. Dr. Bretschneider testifies that the combination would have yielded the predictable result of having a power supply within an LED light fixture without altering or hindering the function performed by the power supply of Realmuto or the LED light fixture of Roberge. Ex. 1003 ¶ 151; *see id.* at ¶¶ 152, 184–85; Ex. 1019, 74:25–75:11.

We credit Dr. Bretschneider’s testimony and Dr. Karlicek’s testimony in determining that altering the known structure of Roberge’s LED lighting fixture by substituting the power supply of Roberge with the known MFPCU of Realmuto would have done no more than yield the predictable result of an LED lighting fixture with an internal power supply that selects power from a variety of power sources as taught by Realmuto. *KSR*, 550 U.S. at 416; Ex. 1003 ¶¶ 149–53, 169, 178–79, 184–85; Ex. 1019, 74:25–75:11. The Petition and supporting evidence persuasively shows that the ’748 “patent simply

arranges old elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement,” therefore, “the combination is obvious.” *KSR*, 550 U.S. at 417.

Patent Owner’s contentions regarding the reasons to combine

Patent Owner contends that neither Petitioner nor its expert cite to or provide a reasonable motivation for a person of ordinary skill in the art to combine the teachings of Roberge and Realmuto, even in view of the AAPA, to arrive at the challenged claims. PO Resp. 50–53 (citing Ex. 2022 ¶¶ 123–32). Patent Owner contends that Petitioner’s expert has failed to explain how the specific references would be combined, which combinations of elements in specific references would be retained, which jettisoned, how those choices would have yielded a predictable result, or how any specific combination would operate or read on the asserted claims. PO Resp. 52. Patent Owner also contends that Petitioner’s expert did not provide an articulated reason why a person of ordinary skill would have selected these references and combined them in the manner claimed. PO Resp. 52–53.

We disagree with Patent Owner. As discussed above, the evidence presented by the Petition and Dr. Bretschneider persuasively shows that a person of ordinary skill would have used the MFPCU of Realmuto as the power supply in the LED light fixture of Roberge to provide a variety of power inputs, would have placed the MFPCU of Realmuto inside of the LED light fixture of Roberge to protect the MFPCU of Realmuto from dirt and dust as well as to simplify installation and manufacturing, and that substituting the known MFPCU of Realmuto for the known power supply of Roberge does no more than yield predictable results. Pet. 28–30, 42; Ex. 1003 ¶¶ 145–55, 169, 173, 178–79.

Patent Owner contends that Roberge does not disclose an LED light fixture having a plurality of inputs for multiple power sources. PO Resp. 53 (citing Ex. 2022 ¶ 114). Patent Owner’s argument is unpersuasive, as it is directed to Roberge individually rather than the combination of Realmuto and Roberge proposed by Petitioner. *See Bradium Techs. LLC v. Iancu*, 923 F.3d 1032, 1050 (Fed. Cir. 2019) (“A finding of obviousness . . . cannot be overcome ‘by attacking references individually where the rejection is based upon the teachings of a combination of references.’”) (quoting *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986)); *In re Mouttet*, 686 F.3d 1322, 1332–33 (Fed. Cir. 2012) (holding that “the test for obviousness is what the combined teachings of the references would have suggested to those having ordinary skill in the art”). Petitioner relies on Roberge to teach an LED light fixture, and Realmuto to teach an LED power supply that has a plurality of inputs from multiple power sources. Pet. 28–30, 32–38, 43–46. We are persuaded that the combination of Realmuto and Roberge teaches an LED light fixture having an LED power supply with a plurality of inputs from multiple power sources as discussed above.

Patent Owner contends that Roberge does not disclose that the train environment has a source from which the trains draw power, and a separate standard voltage power source. PO Resp. 53. Patent Owner further contends that Roberge does not disclose the power sources available in the train environment, nor any features unique to a train environment that may be relevant to designing light fixtures. PO Resp. 53–54 (citing Ex. 2022 ¶¶ 112–14). Patent Owner also contends that Roberge never suggests that the LED light fixture of Roberge should use the high voltage source powering the trains as a source for the LED lights. *Id.*

We are not persuaded. First, to the extent that Patent Owner’s contention relies on Patent Owner’s construction of the claim terms “high voltage power source” and “public transportation facility,” we find that the scope of “high voltage power source” is not limited to a voltage source from which electric vehicles draw power, and that “public transportation facility” is not entitled to patentable weight, as discussed above in our claim construction. Patent Owner’s contention is not commensurate with the scope of the claim as we have construed it. Second, Patent Owner’s argument is unpersuasive, as it is directed to Roberge individually rather than to the combination of Realmuto and Roberge proposed by Petitioner. The combination of Realmuto and Roberge teaches the claimed “high voltage power source” as correctly construed. Further, even were we to give weight to “public transportation facility” and to construe it narrowly as a train facility as Patent Owner proposes, Roberge teaches an LED light fixture used in a high voltage transportation environments including a train facility.

In particular, Roberge teaches that its lighting systems include power systems for driving light sources in high-voltage environments such as a train facility. Ex. 1010, Abstract, 20:29–49, 21:22–33, 63:7, 64:16–17. Roberge then describes the same power supplies (solar power, wind, and fuel cell) that are also described by Realmuto as high voltage power supplies. Ex. 1010, 20:33–34, 21:1–2, 21:20–21; Ex. 1009, 2:31–33, 4:7–10, Fig. 1. Dr. Bretschneider testifies that the public transportation facilities of Roberge would include a high voltage power source, such as those taught by Realmuto. Ex. 1003 ¶¶ 153–154, 184–185, Ex. 2021, 138:22–25. Dr. Karlicek also testifies that public transportation facilities would include a high voltage power source. Ex. 1019, 152:15–21. We credit Dr.

Bretscheider’s testimony as well as the teachings of the references themselves in determining that the combination of Realmuto and Roberge teaches an LED light fixture that can draw power from the claimed “a high voltage power source” in a public transportation facility, even were we to give patentable weight to “public transportation facility.”

Patent Owner contends that Petitioner’s “assertion that the combination would be predictable . . . is not enough,” because “the claim is not rendered obvious without a sufficient motivation to combine the references.” PO Resp. 51–52, 54–56 (citing Ex. 2022 ¶¶ 125–27). We are not persuaded that Petitioner did not provide sufficient motivation, for the reasons discussed above. Further, we disagree with Patent Owner’s contention that showing the predictable use of prior art elements according to their established functions is not enough, because it is inconsistent with the Supreme Court’s flexible and expansive approach to obviousness. See *KSR*, 550 U.S. at 415, 417.

As discussed above, we credit Dr. Bretschneider’s testimony in determining that the combination of Realmuto and Roberge teaches that the ’748 “patent claims a structure already known in the prior art (Roberge’s LED lighting fixture) that is altered by the mere substitution of one element (Roberge’s single input power supply) for another known in the field (Realmuto’s MFPCU that includes a multiple input power supply)” and does no more “than yield a predictable result” of an LED lighting fixture that selects power from a variety of power sources. *KSR*, 550 U.S. at 416; Ex. 1003 ¶¶ 149–52, 184–185; see *Uber Techs., Inc. v. X One, Inc.*, 957 F.3d 1334, 1340 (Fed. Cir. 2020) (Reversing the Board’s determination of lack of motivation, stating that “because Okubo’s terminal-side plotting and Konishi’s server-side plotting were both well known in the art, and were the

only two identified, predictable solutions for transmitting a map and plotting locations, it would have been obvious to substitute server-side plotting for terminal-side plotting in a combination of Okubo and Konishi.”) (citing *KSR*, 550 U.S. at 421).

Patent Owner contends that Petitioner’s use of AAPA is an improper attempt to supplement the disclosures of the cited prior art references and also to supplement Petitioner’s motivation to combine. PO Resp. 55–56 (citing Ex. 2022 ¶ 125). As discussed above in our analysis of the background knowledge of a person of ordinary skill (Section II.C.3.d.(i)), we determine that the Petition properly uses AAPA as evidence of the background knowledge of a person of ordinary skill, and properly uses the background knowledge to support its obviousness argument. *KSR*, 550 U.S. at 401; *Philips*, 948 F.3d at 1337–39.

Patent Owner contends that Petitioner relies on the MFPCU as the LED power supply, but that the MFPCU is a completely separate device from the LED power supply. PO Resp. 56–57 (citing Ex. 2022 ¶ 127). We disagree with Patent Owner for the reasons given in our analysis of the claimed LED power supply above.

Patent Owner contends that a person of ordinary skill in the art would face physical challenges standing in the way of placing high voltage and standard voltage power supply components in a singular housing, especially in harsh environments such as those found in transportation facilities. PO Resp. 57 (citing Ex. 2022 ¶ 127). Patent Owner contends that the hazards associated with internal components being exposed to third rail high voltage power warrants caution when designing LED light fixture housings, and therefore a person of ordinary skill in the art would not have been motivated

to place power supply components of Realmuto into the fixture of Roberge to arrive at the claimed LED light fixture. *Id.*

Patent Owner's contention relies on Patent Owner's construction of "high voltage power source" to mean a voltage source from which electric vehicles draw power. We disagree with this construction as discussed in our claim construction above. Patent Owner's contention is not commensurate with the scope of the claim. As discussed above, under the correct construction of "high voltage power source," we credit Dr. Bretscheider's testimony as well as the teachings of the references themselves in determining that the combination of Realmuto and Roberge teaches an LED light fixture that can draw power from "a high voltage power source" in a public transportation facility as claimed. Ex. 1003 ¶¶ 145–155, 183–185; Ex. 1010, 5:55–60, 62:45–46, 63:7, 64:16. We credit Dr. Bretscheider's testimony in determining that placing the MFPCU that has standard voltage and high voltage power inputs in the LED lighting fixture of Roberge in a public transportation environment would have been "within the grasp of a person of ordinary skill in the relevant art." *KSR*, 550 U.S. at 427.

Patent Owner contends that a person of ordinary skill in the art would not have been motivated to include Realmuto's high voltage DC power source, which is a solar energy source, into the fixture housing of Roberge, which is a closed structure located in a tunnel as shown in Figure 55. PO Sur-Reply 23–25. We are not persuaded. Contrary to Patent Owner's contention, Roberge teaches "solar-based power sources" as well as their use in public transportation facilities, including the train facility shown in Fig. 55. Ex. 1010, 6:55–60, 16:6–12, 20:33–34, 21:1–2, 21:18–21, 63:4–9, 64:10–21, Fig. 55. Further, the high voltage DC power source of Realmuto is not limited to solar panels, and also includes wind power and a fuel cell.

Ex. 1009 4:7–10, Fig. 1. Similarly, Roberge discloses using wind power and a fuel cell. Ex. 1010, 21:1, 21:18–21. Both references also teach using a standard AC power source. Ex. 1009, 1:36–39, 2:28–30; Ex. 1010 20:33–34. We find that the similarity of the AC and DC power sources used to provide power to the LEDs in both references, including solar power, wind power, and fuel cells, suggests to a person of ordinary skill in the art the compatibility of using the high voltage DC power sources taught by Realmuto to provide power to the LEDs in the LED lighting fixture of Roberge. *See In re Hyon*, 679 F.3d 1363, 1366 (Fed. Cir. 2012) (affirming an obviousness determination where two “references both teach processes directed to making the same class of products” and minor differences between the disclosures did not “negate the motivation to combine”).

Conclusion

For the reasons set forth by Petitioner and explained above, we are persuaded that Realmuto and Roberge teach all of the limitations of claim 7, and that a person of ordinary skill would have combined the teachings of the references to achieve the LED light fixture recited in the claim and would have had a reasonable expectation of success in doing so. Dr. Bretschneider’s testimony provides sufficient evidence of motivation that a person of ordinary skill would have used the MFPCU of Realmuto as the power supply within the LED lighting fixture of Roberge and would have had a reasonable expectation of success in doing so. Dr. Bretschneider’s testimony also provides persuasive evidence that the combination of Realmuto and Roberge teaches that the ’748 “patent claims a structure already known in the prior art (Roberge’s LED light fixture) that is altered by the mere substitution of one element (Roberge’s power supply) for another known in the field (Realmuto’s MFPCU)” and does no more “than

yield a predictable result” of an LED lighting fixture that selects power from a variety of power sources. Petitioner has proven by a preponderance of the evidence that claim 7 would have been obvious over Realmuto and Roberge.

4. Claim 8

Claim 8 depends from claim 7 and further recites “a battery charger; the battery charger being powered by one of the LED power supply and the high voltage power source.” Petitioner contends that Realmuto discloses the battery charger in describing that the AC input 15 supplies power to AC/DC Supply 2, which rectifies AC and provides regulated DC voltage to an external energy storage device. Pet. 46–47 (citing Ex. 1009, 1:57–60, 1:64–65, Fig. 1; Ex. 1003 ¶ 186. Petitioner contends that Realmuto discloses the battery charger being powered by one of the LED power supply and the high voltage power source in describing that the AC/DC supply, or battery charger, is powered by the MFPCU power supply. Pet. 47 (citing Ex. 1009, 1:57–60, 1:64–65, 5:6, Fig. 1; Ex. 1003 ¶ 188).

Patent Owner does not argue separately dependent claim 8. Petitioner’s analysis for claim 8, supported by the testimony of Dr. Bretschneider, which we credit, is persuasive that claim 8 would have been obvious over Realmuto and Roberge.

5. Claim 9

Claim 9 recites the same elements as claim 7, but further recites “a battery self-test circuit that generates data representative of the status of the battery backup system and a wireless communication device that transmits the data.” Petitioner contends that this limitation is taught either by Realmuto alone or by the combination of Realmuto and Roberge. Pet. 49. Petitioner contends that Realmuto teaches central data acquisition and

control unit 12 that sends control signals to the digital processor to cause the digital processor to send back battery status information such as volts, amps, and/or power delivered/supplied by the external energy storage device. Pet. 49–51 (citing Ex. 1009, 2:51–54, 3:3–4, Fig. 1; Ex. 1003 ¶¶ 196–197).

Petitioner contends that Realmuto teaches that control unit 12 monitors and controls the operation from a central location, and that a bi-directional data line is used to communicate with multiple units. Pet. 51 (citing Ex. 1009, 2:21–25, 4:37–43, 5:24–25, 9:38–41, Fig. 1; Ex. 1003 ¶ 198). Petitioner further contends that Realmuto teaches a wireless communication device to control all output circuits. Pet. 51 (citing Ex. 1009, 2:21–25; Ex. 1003 ¶ 198).

Petitioner contends that Roberge teaches using network and wireless protocols to communicate with the lighting unit. Pet. 51 (citing Ex. 1010, 6:23–27, Fig. 2). Petitioner contends that Roberge teaches a processor configured to monitor power as controlled by a user interface, while a controlled predetermined power is provided without requiring feedback from the load, where the power facility includes AC power sources, DC power sources, and batteries. Pet. 51–52 (citing Ex. 1010, 41:64–67, 27:25–28, 20:29–36; Ex. 1003 ¶ 199). Petitioner contends that a person of ordinary skill in the art would have used a wireless communication device to transmit battery status information since monitoring the status of the power supplies and batteries by both wired and wireless communications, as taught by Realmuto and Roberge, yield predictable results. Pet. 52 (citing Ex. 1003 ¶ 200).

Realmuto discloses that the MFPCU includes digital processor 6 that sends data about the volts, amps, and/or power delivered/supplied by the external energy storage device to central data and acquisition control unit 12

via network of bi-directional lines 17, which teaches the claimed “battery self-test circuit that generates data representative of the status of the battery and transmits the data over a network.” Ex. 1009, 2:50–54, 3:3–4, 5:23–25, Figs. 1, 5; Ex. 1003 ¶¶ 196–197. Although Realmuto does not explicitly disclose that the network is a wireless network, Realmuto does disclose using a wireless communication device to communicate with the MFPCU, which suggests using a wireless network as network 17. Ex. 1009, 2:21–23; Ex. 1003 ¶ 198. What Realmuto implicitly suggests, Roberge makes explicit. Roberge discloses a wireless communication device, or network interface, that allows the LED lighting fixture to communicate using wireless protocols. Ex. 1010, 6:23–29; Ex. 1003 ¶ 199. Using a wireless communication device as taught by both Realmuto and Roberge to transmit data generated by the digital processor about the status of the battery as taught by Realmuto is the “combination of familiar elements according to known methods” that “does no more than yield [the] predictable results” of generating data about the status of the battery and transmitting the data using the wireless communication device. See *KSR*, 550 U.S. at 416; Ex. 1003 ¶ 200.

Patent Owner argues independent claims 7 and 9 together in Response and Sur-Reply. See PO Resp. 38–58; Sur-Reply 13–21, 23–25. We disagree with Patent Owner’s arguments for the reasons explained in our analysis of claim 7 above. Petitioner’s analysis for claim 9, supported by the testimony of Dr. Bretschneider, which we credit, is persuasive that claim 9 would have been obvious over Realmuto and Roberge.

6. Claims 10, 13, 17–19, and 22–24

Claim 10 depends from claim 9 and recites “an activation switch for the battery self-test circuit.” Petitioner contends that Realmuto discloses this

limitation in describing a request for data about the status of the battery from the data acquisition and control unit to the digital processor. Pet. 52–53 (citing Ex. 1009, 2:63–65, 3:3–4; Ex. 1003 ¶ 202). Petitioner further contends that Roberge discloses this limitation in describing a user interface that provides control directly to the lighting unit through a switch, and that a processor is configured to monitor power, including battery power, as controlled by the user interface. Pet. 53 (citing Ex. 1010, 5:27–33, 20:29–36, 41:64–67, Fig. 2; Ex. 1003 ¶ 202).

Claim 13 depends from claim 9 and recites “a sensor in communication with the wireless communication device.” Petitioner contends that Roberge teaches this limitation in disclosing a photo sensor integrated with the lighting unit and monitored by a processor, where the processor wirelessly communicates with a control facility. Pet. 53–54 (citing Ex. 1010, 6:23–29, 30:45–48, Fig. 2; Ex. 1003 ¶ 204).

Petitioner contends that Realmuto teaches this limitation in disclosing a control unit, a wireless communication device, and current and voltage sensors sampling various sources and load points, where data about volts, amps, and power from the power sources are sent to the control unit. Pet. 54 (citing Ex. 1009, 2:51–3:8, 4:38–39, Fig. 1; Ex. 1003 ¶ 205). Petitioner contends that a person of ordinary skill would have transmitted the data collected by the sensors to the control unit using the wireless communication device to yield the predictable result of transmitting sensor data wirelessly. Pet. 54–55 (citing Ex. 1003 ¶ 206).

Claim 17 depends from claim 9 and recites “the first power input is adapted to be connected to a first standard voltage power source of 110 to 277 Volts.” Petitioner contends that Realmuto discloses this limitation in describing an AC input that connects to a standard AC voltage power source,

such as a single phase 208-277 VAC or three phase 208-480 VAC. Pet. 55 (citing Ex. 1009, 1:36–39; Ex. 1003 ¶ 207).

Claim 18 depends from claim 9 and recites “the second power input is adapted to be connected to a high standard voltage power source of 600 Volts.” Petitioner contends that Realmuto discloses this limitation in describing an alternate DC input that connects to an alternate DC voltage power source which can generate high voltage power in the range of 250-600 VDC. Pet. 55–56 (citing Ex. 1009, 4:60–61; Ex. 1003 ¶ 208).

Claim 19 depends from claim 9 and recites “the battery backup system is carried by the fixture housing.” Petitioner contends that Roberge discloses this limitation in describing a power facility carried within the housing of the lighting unit, where the power facility can include a battery. Pet. 56 (citing Ex. 1010, 20:61, 21:15–16; Ex. 1003 ¶ 209).

Claim 22 depends from claim 9 and recites “a mounting bracket; the fixture housing removably carried by the mounting bracket.” Petitioner contends that Roberge discloses this limitation in describing a bracket mechanism for the housing of the lighting system, where the bracket is connected by a knob to a plate of the housing, and the housing can be removed from the bracket by removing the knob. Pet. 57 (citing Ex. 1010, 65:19–35, Fig. 58; Ex. 1003 ¶ 211).

Claim 23 depends from claim 22 and recites “a spacer disposed between the mounting bracket and the fixture housing.” Petitioner contends Roberge discloses this limitation in describing a washer disposed between the mounting bracket and the fixture housing. Pet. 58 (citing Ex. 1010, 65:19–35; Ex. 1003 ¶ 212).

Claim 24 depends from claim 9 and recites “the LED power supply automatically switches between the power sources.” Petitioner contends

Realmuto discloses this limitation in describing control and internal pathways to select a variety of power inputs, and that during a utility power outage, power delivered by the AC input is shut down and power to supply the load is supplied by the external energy device and the alternate DC source. Pet. 59 (citing Ex. 1009, 1:16–19, 5:14–20; Ex. 1003 ¶ 213).

Patent Owner does not argue separately dependent claims 10, 13, 17–19, and 22–24. Petitioner’s analysis for claims 10, 13, 17–19, and 22–24, supported by the testimony of Dr. Bretschneider, which we credit, is persuasive that claims 10, 13, 17–19, and 22–24 would have been obvious over Realmuto and Roberge.

D. Asserted Obviousness over Roberge, Realmuto, and Conley

1. Conley (Ex. 1011)

Conley discloses an emergency lighting remote monitoring and control system that schedules self-tests for the emergency lights, and stores the test results. Ex. 1011, Abstract. Figure 1 shows a block diagram of the system and is reproduced below.

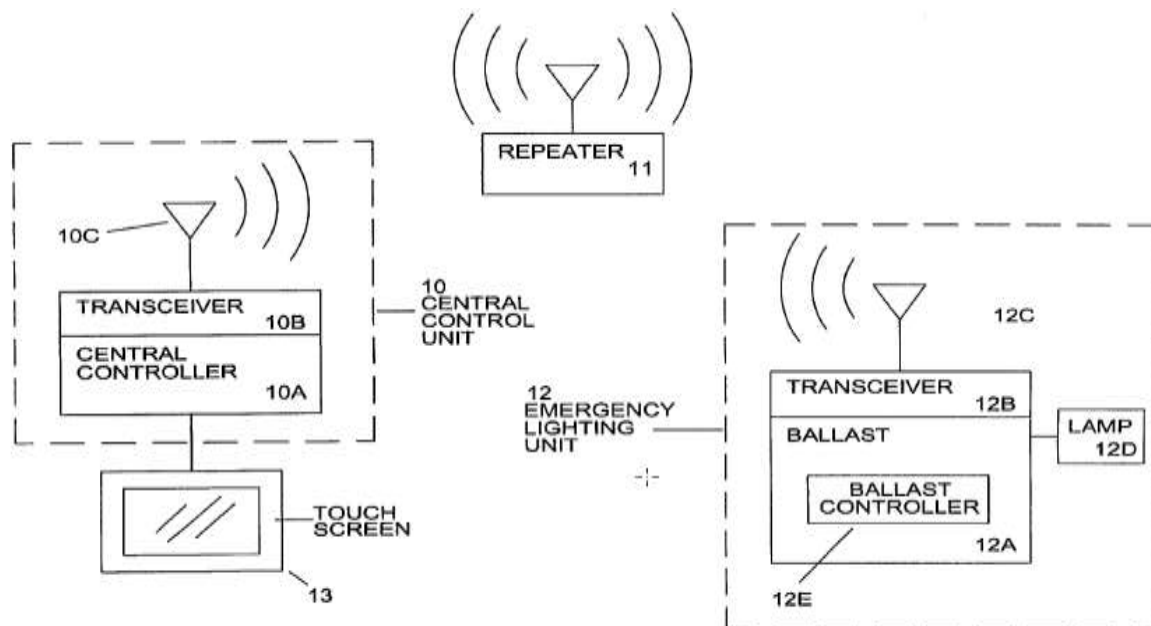


FIG. 1

Figure 1 above shows central control unit 10, repeater 11, emergency lighting unit 12, and user interface 13. Ex. 1011, 3:63–66. Central control unit 10 sends commands, such as an initiate self-test command, to emergency lighting unit 12. *Id.* at 4:14–23. The initiate self-test command causes lighting unit 12 to initiate a self-test, including a battery voltage test and a lamp current test. *Id.* at 4:24–27. The emergency lighting unit communicates the results of the self-test to the central control unit. *Id.* at 6:37–43.

2. Discussion

Petitioner contends that the limitations of claim 9 that are also recited in claim 7 are taught by the combination of Realmuto and Roberge for the reasons given in the Petition’s discussion of obviousness over Realmuto and Roberge. Pet. 62–63. We agree with Petitioner for the reasons given in our discussion of claim 7 above.

Claim 9 recites “a battery self-test circuit that generates data representative of the status of the battery backup system and a wireless communication device that transmits the data.”

Petitioner contends that Conley discloses lighting for emergency situations. Pet. 60 (citing Ex. 1011, Fig. 10). Petitioner contends that Conley discloses an emergency lighting monitoring and control system that controls and monitors the emergency lights in a building and is capable of performing tests of the backup power source. *Id.* (citing Ex. 1011, Abstract). Petitioner contends that safety codes typically require a brief test to be performed each year. *Id.* (citing Ex. 1011, 1:25–28).

Petitioner contends Conley discloses a control unit remotely located from the lighting unit that sends an initiate test command to the lighting unit to cause the lighting unit to initiate self-tests, including a battery voltage test

and a lamp current test. Pet. 64 (citing Ex. 1011, 4:17–27, Fig. 3; Ex. 1003 ¶ 229). Petitioner contends Conley discloses that a ballast controller, or battery self-test circuit, of the lighting unit transmits the test results in status data to the control unit via a wireless transceiver, where the status data include data such as which tests passed, which tests failed, and the value of parameters measured during the tests. Pet. 64–65 (citing Ex. 1011, 6:37–42, Fig. 3; Ex. 1003 ¶ 230).

Petitioner contends that a person of ordinary skill in the art would have used the emergency lighting and control system of Conley with the LED lighting fixture of Roberge, that includes the power supply of Realmuto, to yield the benefits of providing the ability to perform necessary tests of the fixture to satisfy safety codes as taught by Conley, and to reduce labor costs associated with such testing and reporting. Pet. 61–62 (citing Ex. 1011, 2:55–56; Ex. 1003 ¶¶ 217, 222). Petitioner also contends that combining the known monitoring and control system of Conley with the known LED lighting fixture of Roberge and the known power supply of Realmuto is the combination of familiar elements according to known methods that does no more than yield the predictable result of an LED lighting fixture of Roberge that includes the power supply of Realmuto and the monitoring and control system of Conley. *Id.* (citing Ex. 1003 ¶¶ 218–221).

Patent Owner argues independent claims 7 and 9 together in the Response and the Sur-Reply. See PO Resp. 38–58; Sur-Reply 13–21, 23–25. We disagree with Patent Owner’s arguments for the reasons explained in our analysis of claim 7 above. Patent Owner also contends that Conley does not cure the deficiencies of the other references, and that Petitioner fails to provide a proper motivation to combine Conley with the remaining

references. PO Resp. 58. We disagree.

We determine that the Petition and supporting evidence persuasively show that a person of ordinary skill would have combined the emergency lighting and control system of Conley, including the battery self-test circuit, with the LED lighting fixture taught by the combination of Realmuto and Roberge, to yield the benefits of performing necessary tests of the emergency lighting system in order to satisfy safety codes as taught by Conley, and to reduce labor costs associated with such testing and reporting. We also determine that combining the known emergency lighting system of Conley with the known LED lighting fixture of Roberge and the known power supply of Realmuto is the combination of familiar elements according to known methods that does no more than yield the predictable results of an LED lighting fixture that selects power from a variety of inputs, and performs necessary tests of the emergency lighting system. Petitioner's analysis for claim 9, supported by the testimony of Dr. Bretschneider, which we credit, is persuasive that claim 9 would have been obvious over Realmuto, Roberge, and Conley.

Patent Owner also presents arguments for this ground together with arguments for all grounds, which we find unpersuasive for the reasons given in our analysis of the obviousness ground based on Realmuto and Roberge. *See generally* PO Resp.; PO Sur-Reply.

Claim 10 depends from claim 9 and recites “an activation switch for the battery self-test circuit.” Petitioner contends that Conley discloses this limitation in describing a lighting unit that includes a test button, or activation switch, that causes the lighting unit to initiate a self-test. Pet. 65 (citing Ex. 1011, 5:56–57; Ex. 1003 ¶ 231).

Claim 13 depends from claim 9 and recites “a sensor in

communication with the wireless device.” Petitioner contends that Conley discloses this limitation in describing an A/D converter that is part of the ballast controller, or battery self-test circuit, that measures voltages across a battery, and that the ballast controller communicates the value of parameters measured during the tests, such as the voltage across the battery, via the wireless transceiver. Pet. 66 (citing Ex. 1011, 6:37–42; Ex. 1003 ¶ 232).

Petitioner contends that the limitations of claims 17–19 and 22–24 are taught by Realmuto or Roberge for the reasons given in the Petition’s discussion of obviousness of these claims over Realmuto and Roberge. Pet. 66–67.

Patent Owner does not argue separately dependent claims 10, 13, 17–19, and 22–24. Petitioner’s analysis for claims 10, 13, 17–19, and 22–24, supported by the testimony of Dr. Bretschneider, which we credit, is persuasive that claims 10, 13, 17–19, and 22–24 would have been obvious over Realmuto, Roberge, and Conley.

E. Asserted Obviousness over Smith, Realmuto, and AAPA

1. Smith (Ex. 1012)

Smith discloses a light unit with internal power failure detection. Ex. 1012, Title. Smith discloses that the light unit includes a power input to receive power from an external power source, a solid state light element interconnected to the power source, and a back-up power source interconnected to the solid state light element and the power input to provide power to the light element when power is not provided from the power input. *Id.*, Abstract. Figure 3 of Smith is reproduced below.

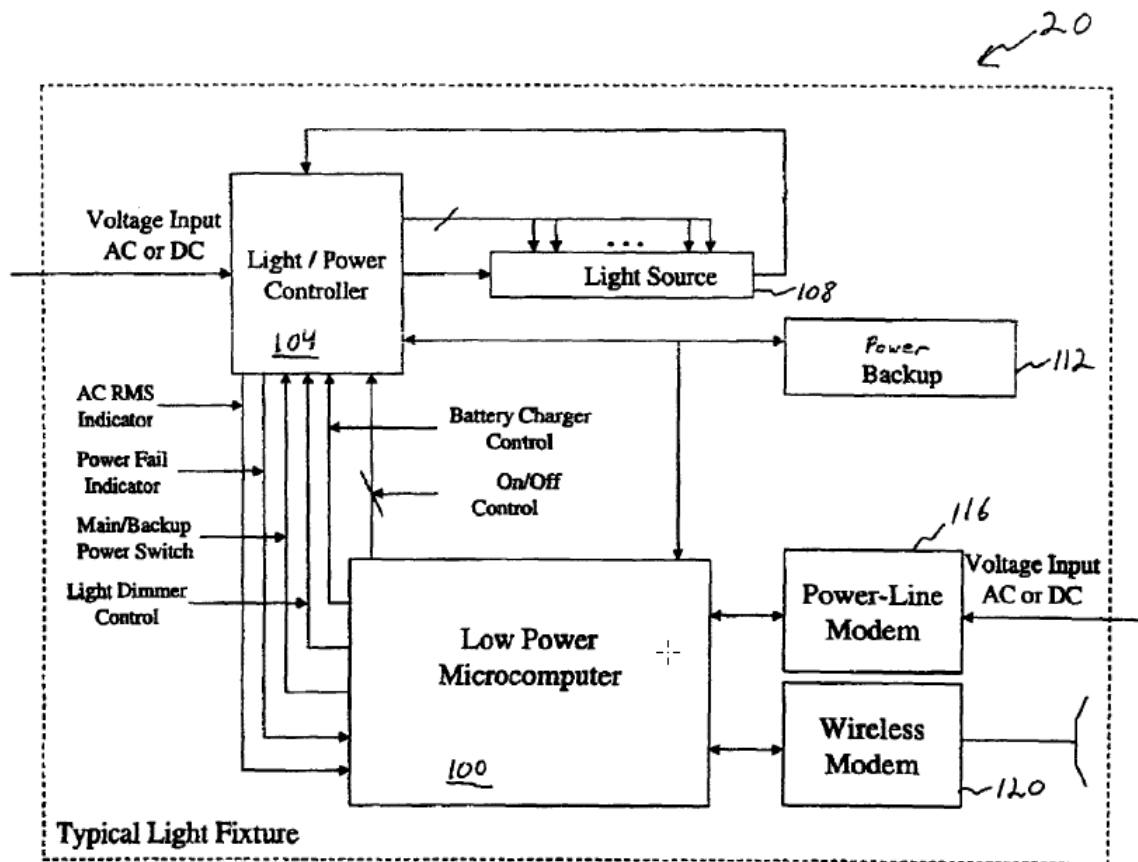


Fig. 3

Figure 3 above shows components of an LED light unit 20. Ex. 1012, 4:1–2. Light/power controller 104 converts incoming alternating current to direct current to power light source 108, and can switch from AC-to-DC power to back-up DC power from back-up power source 112 when a power failure is detected. Ex. 1012, 4:15–16, 4:20–29, 4:51–54. Light source 108 may be an array of LEDs. *Id.* at 4:29–30. LED light unit 20 includes a housing. *Id.* at 2:48–53, Fig. 1. Included within the housing are LED elements 28 and batteries 34. *Id.* at 2:53–55, 2:62–65, Fig. 1.

2. Discussion

Claim 7 recites “[a] LED light fixture . . . having a high voltage power source, and at least a first standard voltage power source.” Petitioner

contends Smith discloses an LED light unit 20, and the AAPA discloses “a high voltage power source, and at least a first standard voltage power source.” Pet. 73–74 (citing Ex. 1012, Fig. 1; Ex. 1003 ¶ 252). Petitioner further contends that even were the preamble term “used in a public transportation facility” given patentable weight, the AAPA discloses an LED light fixture used in a public transportation facility. Pet. 73; *see id.* at 25–26 (citing Ex. 1005, 32, 87 and stating that the “applicant agreed that the existing public transportation power sources recited in the preamble were in the prior art as described in applicant’s specification at page 5”). Page 5 of the specification recites

Light fixture 2 is configured for use in public transportation locations where high voltage electricity supplies are available. Each light fixture 2 disclosed herein is can be configuration accept and use the available high voltage electrical power. In one embodiment, the light fixture 2 is connected to both the high voltage input as well as a traditional 110-277 Volt line power.

Ex. 1005, 182; *see id.* at 32.

Claim 7 recites “a fixture housing.” Petitioner contends Smith discloses a housing carrying LED elements, electronic components to operate the LED elements, and batteries. Pet. 71 (citing Ex. 1012, 2:53–55, 2:62–65, Fig. 1; Ex. 1005, 88; Ex. 1003 ¶ 248).

Claim 7 recites “a plurality of LEDs carried by the fixture housing for providing light from the fixture housing.” Petitioner contends Smith discloses an array of LEDs located within the housing for providing light from the fixture housing. Pet. 71–72 (citing Ex. 1012, 2:53–55, Fig. 1; Ex. 1005, 88; Ex. 1003 ¶ 249).

Claim 7 recites “an LED power supply carried within the fixture housing.” Petitioner contends Smith discloses that the housing includes an

LED power supply and batteries. Pet. 72–73 (citing Ex. 1012, 2:62–65, Fig. 3; Ex. 1005, 88; Ex. 1003 ¶ 250).

Claim 7 recites “the LED power supply having a first power input connected to the first standard voltage power source and a second power input connected to the high voltage power source.” Petitioner contends Realmuto discloses this limitation for the reasons given in the discussion of obviousness over Realmuto and Roberge. Pet. 69.

Claim 7 recites “a battery backup system connected to one of the plurality of LEDs and the LED power supply.” Petitioner contends Smith discloses a battery backup system interconnected to the power input and to the solid state light elements. Pet. 69–70 (citing Ex. 1012, 1:45–47, Fig. 3; Ex. 1005, 88; Ex. 1003 ¶ 247).

Petitioner contends that incorporating the power supply of Realmuto within the LED light fixture of Smith, for use in a public transportation facility having a high voltage power source and a standard voltage power source as taught by the AAPA, would have yielded the predictable benefit of providing the LED light fixture with the ability to use a variety of available power inputs for use, instead of only a single power input. Pet. 67–68 (citing Ex. 1012, 5:16–18, 6:55–58, Ex. 1009, 1:17–19, 1:36–39, 4:22–36, 4:60–61; Ex. 1003 ¶¶ 239–242). Petitioner contends that using the power supply element of Realmuto in place of the power supply element of the LED light fixture of Smith for use in a public transportation facility having a high voltage source and a standard voltage source as taught by the AAPA would have been the substitution of one known element for another yielding the predictable result of providing multiple power inputs, instead of a single power input. Pet. 68 (citing Ex. 1003 ¶ 243).

Patent Owner contends that Realmuto does not disclose “the LED

power supply having a first power input connected to the first standard voltage power source and a second power input connected to the high voltage power source” as claimed, nor the preamble as construed according to Patent Owner, nor the claimed “high voltage power source” as construed by Patent Owner. PO Resp. 38–47. We disagree with Patent Owner for the reasons given above in our analysis of the unpatentability of claim 7 over Realmuto and Roberge.

Patent Owner contends that Petitioner does not provide sufficient reasoning as to why a person of ordinary skill in the art would have combined the references in the manner claimed. PO Resp. 50–53, 58–60. We disagree. The Petition and supporting evidence persuasively show that a person of ordinary skill in the art would have incorporated the power supply of Realmuto within the LED light fixture of Smith, for use in a public transportation facility having a high voltage power source and a standard voltage power source as taught by the AAPA, to yield the predictable benefit of providing the LED light fixture with the ability to use a variety of available power inputs for use, instead of only a single power input. A person of ordinary skill would have understood that this provides the benefit of switching to an alternate power source when the main power source fails, as taught by Realmuto. Ex. 1009, 4:22–26, 5:14–20, Fig. 4. A person of ordinary skill would have understood that it is important for the LED light fixture to provide illumination in an emergency, such as when the main power supply fails, so that people are able to exit the facility. Ex. 1003 ¶ 82; Ex. 1005, 32; Ex. 1011, 1:12–19; Ex. 1012, 6:43–66.

The Petition and supporting evidence also persuasively show that using the power supply element of Realmuto in place of the power supply element of the LED light fixture of Smith in a public transportation facility

having standard and high voltage power sources as taught by the AAPA would have been the substitution of one known element for another yielding the predictable result of providing multiple power inputs, instead of a single input, in order to switch to an alternate power source when the main power source fails, so that people are able to exit the public transportation facility. Ex. 1003 ¶¶ 82, 243; Ex. 1005, 32, 182; Ex. 1009, 4:22–26, 5:14–20, Fig. 4; Ex. 1012, 6:43–66.

Patent Owner contends that Petitioner’s reliance on the AAPA is hindsight reasoning, and that Petitioner improperly relies on the AAPA to teach claim limitations. PO Resp. 50, 58–60. However, as discussed above, we determine that the AAPA properly constitutes substantial evidence that a person of ordinary skill in the art would have known that a public transportation facility has a high voltage power source besides the third rail and a traditional 110-277 Volt power source. *In re NTP, Inc.*, 654 F.3d at 1304. Further, “it is appropriate to rely on admissions in a patent’s specification when assessing whether that patent’s claims would have been obvious.” *Philips*, 948 F.3d at 1339. “Admissions in the specification regarding the prior art are binding on the patentee for purposes of a later inquiry into obviousness.” *Id.* (quoting *PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1362 (Fed. Cir. 2007)); see USPTO Memorandum, Treatment of Statements of the Applicant in the Challenged Patent in *Inter Partes* Reviews Under § 311 (Aug. 18, 2020) at 8–9 (“the Board need not deny a petition that properly points to general knowledge to satisfy a claim limitation”).⁷ We are not persuaded by Patent Owner’s

⁷ Available at https://www.uspto.gov/sites/default/files/documents/signed_aapa_guidance_memo.pdf.

contention that Petitioner's reliance on the AAPA is defective.

Patent Owner also presents arguments for this ground together with arguments for all grounds, which we find unpersuasive for the reasons given in our analysis of the obviousness ground based on Realmuto and Roberge. *See generally* PO Resp.; PO Sur-Reply.

Claim 8 recites “a battery charger; the battery charger being powered by one of the LED power supply and the high voltage power source.” Petitioner contends that Smith discloses this limitation in describing a microcontroller that monitors the back-up power source and switches back-up power charging voltage from the power controller on and off. Pet. 74–76 (citing Ex. 1012 4:20–29; Ex. 1003 ¶¶ 253–254). Patent Owner does not argue claim 8 separately.

Claim 9 recites several limitations that are recited in claim 7. Petitioner contends that these limitations are disclosed by Realmuto and Smith for the reasons given in its analysis of claim 7. Pet. 77–78. Claim 9 further recites “a battery self-test circuit that generates data representative of the status of the battery backup system and a wireless communication device that transmits the data.” Petitioner contends that Realmuto discloses this limitation for the reasons given in its previous analysis of claim 9. Pet. 78.

Patent Owner argues independent claims 7 and 9 together in the Response and the Sur-Reply. We disagree with Patent Owner's arguments for the reasons explained in our analysis of claim 7 above.

Claims 10, 13, 17, and 18 depend from claim 9. Petitioner contends that the limitations in claims 10, 13, 17, and 18 are taught by Realmuto for the reasons given in the Petition's previous analyses of these claims. Pet. 78–79. Patent Owner does not argue claims 10, 13, 17, and 18 separately.

Claim 19 depends from claim 9 and recites “the battery backup

system is carried by the fixture housing.” Petitioner contends this limitation is disclosed by Smith in describing a battery backup system within the light fixture, as explained by the Examiner during prosecution. Pet. 79–80 (citing Ex. 1012, Fig. 3; Ex. 1005, 88; Ex. 1003 ¶ 266). Patent Owner does not argue claim 19 separately.

Claim 22 depends from claim 9 and recites “a mounting bracket; the fixture housing removably carried by the mounting bracket.” Petitioner contends that Smith teaches this limitation in disclosing light units adapted to be installed in a conventional manner to the appropriate power outlet or receptacle. Pet. 80–81 (citing Ex. 1012, 3:27–33; Ex. 1003 ¶ 267). Petitioner contends that a person of ordinary skill in the art would have included a mounting bracket to the light units of Smith for the benefit of mounting and removing the light, as suggested by Smith’s teaching that the fixture is removably carried by a conventional light socket or outlet. Pet. 81 (citing Ex. 1012, 2:23–36, 4:3–7; Ex. 1003 ¶¶ 118, 267. Patent Owner does not argue claim 22 separately.

Claim 23 depends from claim 22 and recites “a spacer disposed between the mounting bracket and the fixture housing.” Petitioner contends that Smith teaches this limitation in disclosing light units adapted to be installed in a conventional manner to the appropriate power outlet or receptacle. Pet. 81 (citing Ex. 1012, 3:27–33). Petitioner contends that a person of ordinary skill in the art would have included a spacer between the mounting bracket and the fixture housing of Smith, as suggested by Smith’s teaching that the fixture is removably carried by a conventional light socket or outlet. Pet. 81–82 (citing Ex. 1012, 2:23–36, 4:3–7; Ex. 1003 ¶¶ 119, 268. Patent Owner does not argue claim 23 separately.

Claim 24 depends from claim 9 and recites “the LED power supply

automatically switches between the power sources.” Petitioner contends that Smith discloses this limitation in describing an LED light unit with a battery back-up that switches to battery power when there is a power outage or when the public utility is at peak usage periods. Pet. 82 (citing Ex. 1012, 3:1–10, Figs. 3–5; Ex. 1003 ¶ 269; Ex. 1006, 72). Patent Owner does not argue claim 24 separately.

Petitioner’s analysis for claims 7–10, 13, 17–19, and 22–24, supported by the testimony of Dr. Bretschneider, which we credit, is persuasive that claims 7–10, 13, 17–19, and 22–24 would have been obvious over Smith, Realmuto, and AAPA.

F. Asserted Obviousness over Smith, Realmuto, Conley, and AAPA

Petitioner contends that the limitations of claim 9 that are also recited in claim 7 are taught by the combination of Smith, Realmuto, and AAPA for the reasons given in the Petition’s discussion of obviousness over Smith, Realmuto, and AAPA. Pet. 85–86. Claim 9 further recites “a battery self-test circuit that generates data representative of the status of the battery backup system and a wireless communication device that transmits the data.” Petitioner contends that Conley discloses this limitation for the reasons given in Petitioner’s analysis of obviousness over Realmuto, Roberge, and Conley.

Petitioner contends that combining the teachings of Conley with those of Smith, Realmuto, and the AAPA provides the benefit of providing tests necessary to satisfy safety codes in a structure where light is important for safety reasons, such as a public transportation facility. Pet. 83–84 (citing Ex. 1011, Abstract, 1:25–28, 2:55–56; Ex. 6:61–63; Ex. 1003 ¶ 272).

Petitioner also contends that combining the teachings of Conley with those of Smith, Realmuto, and AAPA is the combination of known elements that

yields the predictable result of having a monitoring and control system within an LED light fixture for use in a public transportation facility having a high voltage power source and a first standard voltage power source. Pet. 84 (citing Ex. 1003 ¶¶ 273–275).

Claims 10 and 13 depend from claim 9. Petitioner contends that the limitations of claims 10 and 13 are taught by Conley for the reasons given in Petitioner’s previous analysis of claims 10 and 13 as unpatentable over Realmuto, Roberge, and Conley. Pet. 86. Patent Owner does not separately argue claims 10 and 13.

Claims 17 and 18 depend from claim 9. Petitioner contends that the limitations of claims 17 and 18 are taught by Realmuto for the reasons given in Petitioner’s previous analysis of claims 17 and 18 as unpatentable over Realmuto and Roberge. Pet. 86. Patent Owner does not separately argue claims 17 and 18.

Claims 19 and 22 depend from claim 9, and claim 23 depends from claim 22. Petitioner contends that the limitations of claims 19, 22, and 23 are taught by Smith for the reasons given in Petitioner’s previous analysis of claims 19, 22, and 23 as unpatentable over Smith, Realmuto, and AAPA. Pet. 86–87. Patent Owner does not separately argue claims 19, 22, and 23.

Claim 24 depends from claim 9. Petitioner contends that the limitation of claim 9 is taught by Realmuto for the reasons given in Petitioner’s previous analysis of claim 24 as unpatentable over Realmuto and Roberge. Pet. 87. Patent Owner does not separately argue claim 24.

Patent Owner presents arguments for this ground together with arguments for the obviousness ground based on Smith, Realmuto, and AAPA, which we find unpersuasive as discussed above. PO Resp. 58–60. Patent Owner also presents arguments for this ground together with

arguments for all grounds, which we find unpersuasive for the reasons given in our analysis of the obviousness ground based on Realmuto and Roberge. *See generally* PO Resp.; PO Sur-Reply.

We agree with the Petition and supporting evidence that combining the teachings of Conley with those of Smith, Realmuto, and the AAPA would have provided the benefit of providing tests necessary to satisfy safety codes for an emergency lighting system used in a public transportation facility, where switching to an alternate power source when the main power source fails allows the lighting system to provide light so that people can safely exit the public transportation facility. Ex. 1003 ¶¶ 82, 243; Ex. 1005, 32, 182; Ex. 1009, 4:22–26, 5:14–20, Fig. 4; Ex. 1011, 1:13–28; Ex. 1012, 6:43–66. Petitioner’s analysis for claims 9, 10, 13, 17–19, and 22–24, supported by the testimony of Dr. Bretschneider, which we credit, is persuasive that claims 9, 10, 13, 17–19, and 22–24 would have been obvious over Smith, Realmuto, AAPA, and Conley.

IV. CONCLUSION

As summarized in the table below, the Petition and supporting evidence has shown by a preponderance of the evidence that claims 7–10, 13, 17–19, and 22–24 of the ’748 patent are unpatentable.⁸

⁸ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding. *See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not shown Unpatentable
7–10, 13, 17–19, 22–24	103	Roberge, Realmuto	7–10, 13, 17– 19, 22–24	
9, 10, 13, 17–19, 22–24	103	Roberge, Realmuto, Conley	9, 10, 13, 17– 19, 22–24	
7–10, 13, 17–19, 22–24	103	Smith, Realmuto, AAPA	7–10, 13, 17– 19, 22–24	
9, 10, 13, 17–19, 22–24	103	Smith, Realmuto, Conley, AAPA	9, 10, 13, 17– 19, 22–24	
Overall Outcome			7–10, 13, 17– 19, 22–24	

V. ORDER

Therefore, it is:

ORDERED that claims 7–10, 13, 17–19, and 22–24 of the '748 patent are unpatentable; and

FURTHER ORDERED because this is a final written decision, the parties to this proceeding seeking judicial review of our Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

Case IPR2020-01023

Patent 9,909,748 B2

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