UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

WALMART INC. and CURRENT LIGHTING SOLUTIONS, LLC,
Petitioner,

v.

POWER CONCEPTS, LLC,
Patent Owner.

IPR2022-00569
Patent 10,429,041 B2

Before KEVIN F. TURNER, JEFFREY S. SMITH, and DANIEL J. GALLIGAN, *Administrative Patent Judges.*

Opinion for the Board filed by *Administrative Patent Judge* JEFFREY S. SMITH.

Opinion Concurring filed by *Administrative Patent Judge* DANIEL J. GALLIGAN.

SMITH, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
Denying Patent Owner's Motion to Amend
Denying Patent Owner's Motion to Exclude
35 U.S.C. § 318(a)

I. INTRODUCTION

A. Background and Summary

Walmart Inc. and Current Lighting Solutions, LLC (collectively, "Petitioner") filed a Petition (Paper 3, "Pet.") requesting *inter partes* review of claims 1–14 of U.S. Patent No. 10,429,041 B2 (Ex. 1001, "the '041 patent") pursuant to 35 U.S.C. § 311(a), which we instituted (Paper 9, "Dec."). Patent Owner Power Concepts, LLC filed a Response to the Petition. Paper 18 ("PO Resp."). Petitioner filed a Reply (Paper 22, "Pet. Reply") and Patent Owner filed a Sur-Reply (Paper 41, "PO Sur-Reply"). Patent Owner also filed a Contingent Motion to Amend (Paper 14, "Mot."), Petitioner filed an Opposition to the Motion to Amend (Paper 20, "Opp."), Patent Owner filed a Reply to the Opposition (Paper 26, "Reply to Opp."), and Petitioner filed a Sur-Reply to the Motion to Amend (Paper 35, "Sur-Reply to Mot."). A hearing was held on June 21, 2023. Paper 51.

We have jurisdiction to conduct this *inter partes* review under 35 U.S.C. § 6. This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a). For the reasons discussed below, we determine claims 1–14 are unpatentable, and Patent Owner's Motion to Amend is *denied* with respect to proposed substitute claims 15–28.

B. Related Matters

The parties indicate that the '041 patent is the subject of *Power Concepts, LLC v. Walmart Inc.*, No. 7:21-cv-00408-TMC (D. S.C.) *See* Pet. xii; Paper 4, 2. The '041 patent is the parent of U.S. Patent No. 10,837,628 B2, which is the subject of IPR2022-00534.

C. Challenged Patent

The '041 patent relates to "a ceiling light LED retrofit kit" and discloses "a kit for installation of light emitting diode lighting mounted upon a previously-installed fluorescent lighting fixture." Ex. 1001, 1:14–17.

Figure 1 of the '041 patent is shown below:

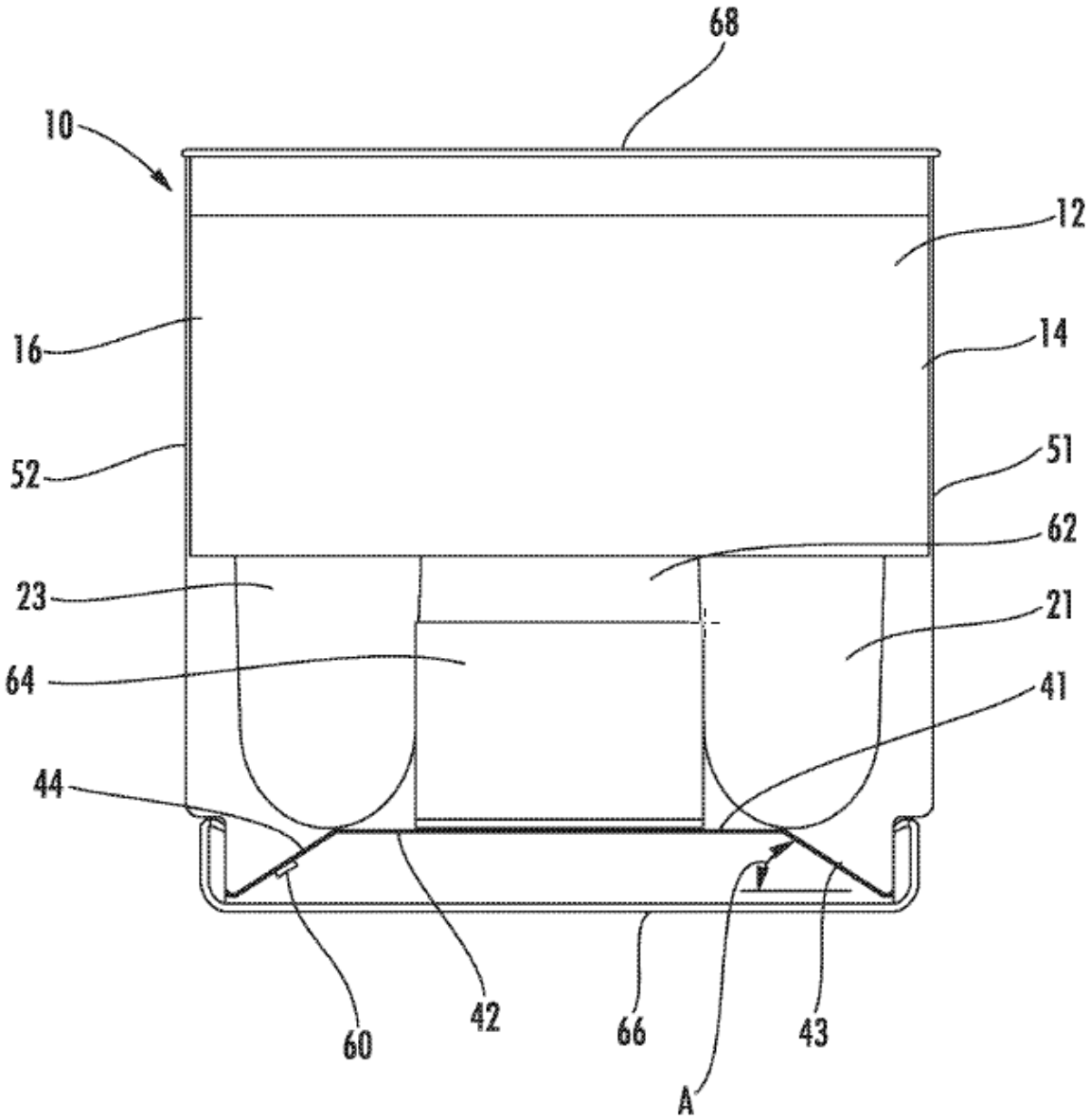


FIG. 1

Figure 1 above is an end elevation view of a ceiling light LED retrofit kit. Ex. 1001, 2:50–52. Fixture 10 includes pre-installed base 12, which has first and second longitudinal sides 14, 16, and is attached to ceiling 68 of a building. *Id.* at 3:24–27. Base 12 includes first electrical receptacle 21 (also known as a tombstone), second electrical receptacle 22 (opposite to receptacle 21 and shown in Figure 4), and third electrical receptacle 23. *Id.* at 3:27–29, 5:46–48. First and second electrical receptacles 21 and 22 are configured to receive and energize a fluorescent light tube disposed between them. *Id.* at 3:30–33. A light panel includes first side 41 facing fixture 10 and opposed second side 42. *Id.* at 3:37–39. The light panel of Figure 1 includes angled wings 43 and 44. *Id.* at 3:39–42. One or more LEDs 60 are disposed on second side 42 of the light panel, such as on angled wing 44 as shown in Figure 1. *Id.* at 3:40–45. Power supply 64 energizes LED 60 and is located within raceway 62. *Id.* at 3:45–46.

Figure 3 of the '041 patent is shown below:

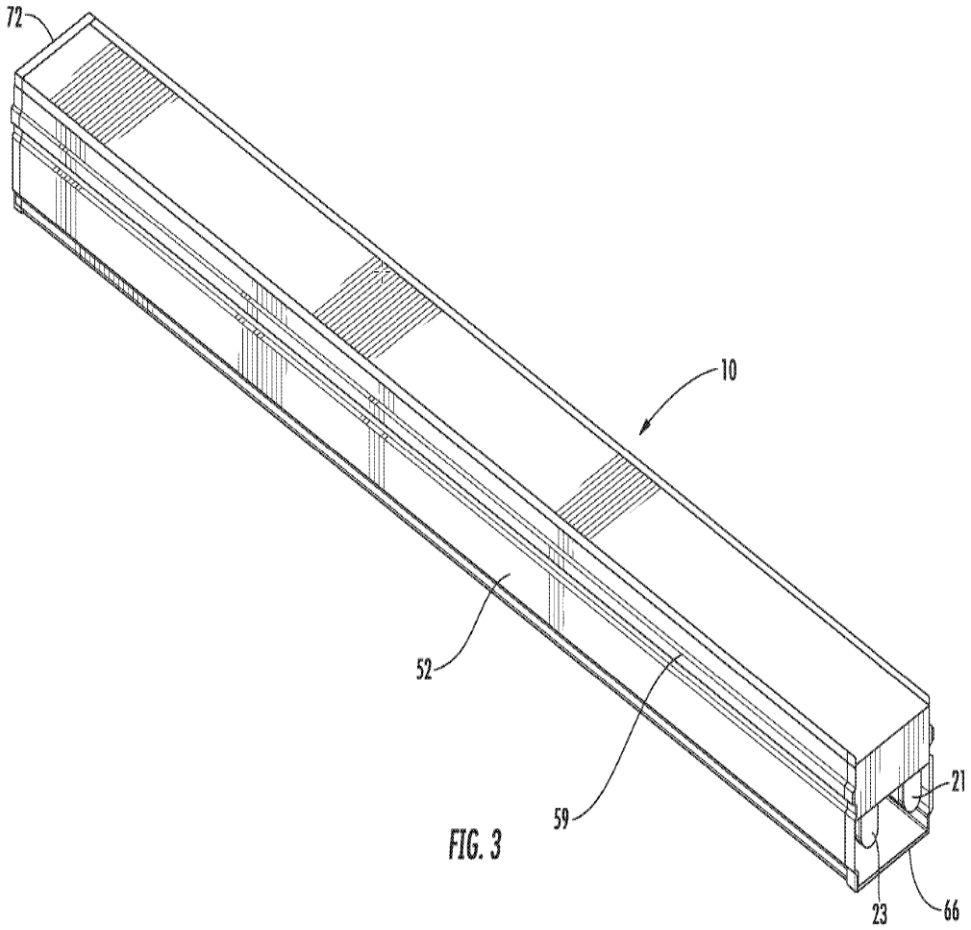


FIG. 3

Figure 3 above shows an assembled LED retrofit kit. Ex. 1001, 4:48–49. First profile 51 (shown in Figure 1) and second profile 52 extend longitudinally. *Id.* at 4:49–51. Lens 66 is attached to the first and second profiles by endcap 72. *Id.* at 4:52–54. The first and second profiles include one or more longitudinal ribs 59. *Id.* at 4:55–56.

D. Illustrative Claim

Challenged claim 1 of the '041 patent recites:

> 1. A combination for illuminating the interior of a building, comprising:
>
> a fixture having a base attached to a building ceiling, the fixture having a first tombstone and a second tombstone, wherein the first and second tombstones are adapted to receive between

them a linear fluorescent light tube, and wherein the base includes a first longitudinal side and an opposite second longitudinal side;

a retrofit kit connected to the base, the retrofit kit including a light panel, a first profile and a second profile, the light panel including a first side facing the fixture and an opposite second side, wherein the light panel, the first profile, and the second profile extend longitudinally from the first tombstone to the second tombstone and parallel one-to-another;

the fixture, including the first and second tombstones, residing above the light panel and residing between the first profile and the second profile;

a light emitting diode disposed on the second side of the light panel; and

wiring in electrical communication with the light emitting diode.

E. Evidence

Petitioner relies on the following prior art:

U.S. Patent Application Publication No. 2006/0221606 A1, published Oct. 5, 2006 (Ex. 1007, "Dowling");

U.S. Patent Application Publication No. 2012/0113628 A1, published May 10, 2012 (Ex. 1008, "Burrow");

"ILP Low Profile Webinar" video,[1] published by Industrial Lighting Products ("ILP"), Sanford, Florida, 2013,[2] (Ex. 1011).

Slides from the ILP Low Profile Webinar video, 2013 (Ex. 1009).

Screenshots from the ILP Low Profile Webinar video, 2013 (Ex. 1010) (Exs. 1009–1011 referred to collectively as "ILP Retrofit").

[1] Exhibit 1032 provides a transcript of the video.

[2] Daniel Kroencke, Vice President of Engineering for Industrial Lighting Products, Inc., testifies that the "ILP Low Profile Webinar" video and slides were publicly available in 2013. Ex. 1028.

U.S. Patent Number 7,296,911 B2, issued Nov, 20, 2007 (Ex. 1005, "Plunk")

U.S. Patent Number 7,438,441 B2, issued Oct. 21, 2008 (Ex. 1030, "Sun").

U.S. Patent Number 7,476,004 B2, issued Jan. 13, 2009 (Ex. 1031, "Chan").

Petitioner also relies on the testimony of Alfred Ducharme, Ph.D. (Exs. 1003, 1035, 1036).

F. Asserted Grounds

Petitioner asserts that claims 1–14 of the '041 patent are unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–10, 12–14	103	Dowling, Burrow
1–5, 8, 9, 11, 12	103	ILP Retrofit
1–14	103	Plunk, Sun, Chan

II. ANALYSIS

A. 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*.

Petitioner asserts that it applies the plain and ordinary meaning of the challenged claims to the asserted prior art references. Pet. 5–6. Patent Owner does not explicitly construe any claim terms, but instead, implicitly

construes several claim terms in the context of Patent Owner's patentability analysis. To the extent necessary to address the parties' arguments, constructions of claim terms are addressed below in the context of our unpatentability analysis. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 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).

B. Level of Ordinary Skill in the Art

Petitioner argues that a person of ordinary skill in the art "would have had a bachelor's degree in mechanical or electrical engineering and at least two years of experience developing lighting fixtures," noting that "[t]his description is approximate and additional development experience could make up for less education and vice versa." Pet. 5 (citing Ex. 1003 ¶¶ 33–35 (Dr. Ducharme setting forth this definition)). Patent Owner's declarant, Dr. Bretschneider, agrees with this definition of the level of ordinary skill in the art. Ex. 2076 ¶ 67. With the exception of the open-ended language "at least," which introduces ambiguity as to the amount of experience level, we adopt the parties' agreed definition.

In the briefing, neither party contested the qualifications of the other party's expert to opine on matters from the perspective of a person of ordinary skill in the art. During oral argument, Patent Owner's counsel appeared to call into question Dr. Ducharme's qualifications, arguing that Petitioner "ha[s] not carried" its burden to show that "Dr. Ducharme is a person of skill in the art." Tr. 75:6–7. Patent Owner's counsel also stated that Dr. Ducharme does not have a degree in electrical engineering. Tr. 75:22–23. Upon further questioning, Patent Owner's counsel retracted the statement about Dr. Ducharme's education when it was pointed out that Dr.

Ducharme testified that he has three degrees in electrical engineering: a B.S., M.S., and Ph.D. Tr. 78:5–14; *see* Ex. 1003 ¶ 7 ("I have three degrees in electrical engineering: a B.S., M.S., and Ph.D."). We find Dr. Ducharme to have the requisite education and experience to testify from the standpoint of a person of ordinary skill in the art. *See* Ex. 1003 ¶¶ 6–8.

C. Asserted Obviousness over Dowling and Burrow

Petitioner contends that claims 1–10 and 12–14 would have been obvious over Dowling and Burrow.[3] Pet. 26–48.

1. Dowling (Ex. 1007)

Dowling discloses an LED-based lighting retrofit apparatus for fluorescent lighting fixtures. Ex. 1007, [54], [57]. Figure 3 of Dowling is shown below:

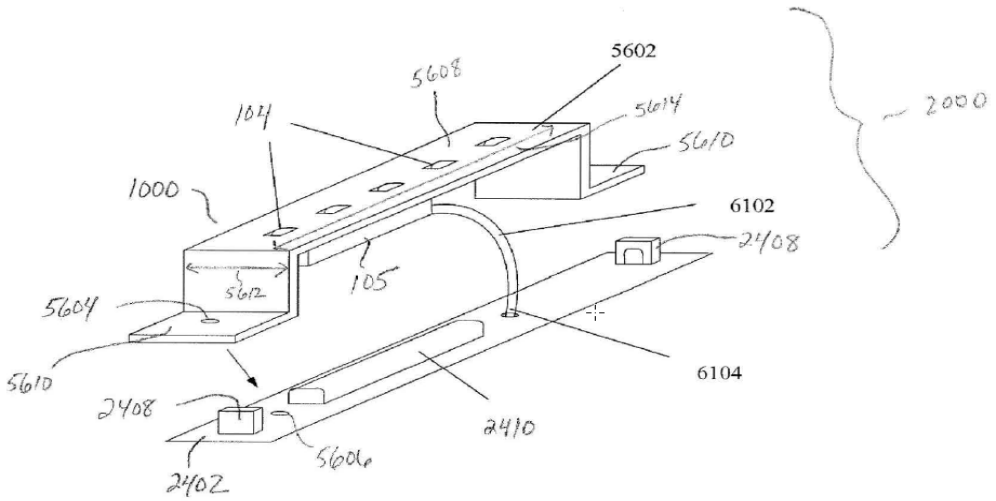


FIG. 3

Figure 3 above shows modified conventional fluorescent lighting fixture 2000 retrofitted with an LED-based retrofit subassembly 1000. Ex. 1007 ¶ 106. Ballast 2410 and fluorescent bulb connectors 2408 are

[3] For claims 1–5, 8, 9, and 12, the Petition relies on Dowling and the knowledge of a person of ordinary skill and does not cite to Burrow.

mounted on fluorescent fixture housing 2402. *Id.* ¶ 107. Retrofit subassembly 1000 is attachable to housing 2402. *Id.* Subassembly 1000 includes mechanical support 5602, to which one or more LEDs 104 are coupled. *Id.* ¶ 108. Mechanical support 5602 is configured as a U-shaped member having elevated portion 5608, and two flanking portions 5610 on opposing sides of the elevated portion. *Id.* ¶ 111. The mechanical support provides clearance between elements of the lighting apparatus included in subassembly 1000, such as controller 105, and original components of the fixture, such as ballast 2410. *Id.*

2. Burrow (Ex. 1008)

Burrow discloses a light emitting diode retrofit conversion kit for a fluorescent light fixture that includes a housing adapted to be secured to a troffer, a power supply carried by the housing, and a plurality of light emitting diodes carried by the housing. Ex. 1008, [54], [57]. Figure 13 of Burrow is shown below:

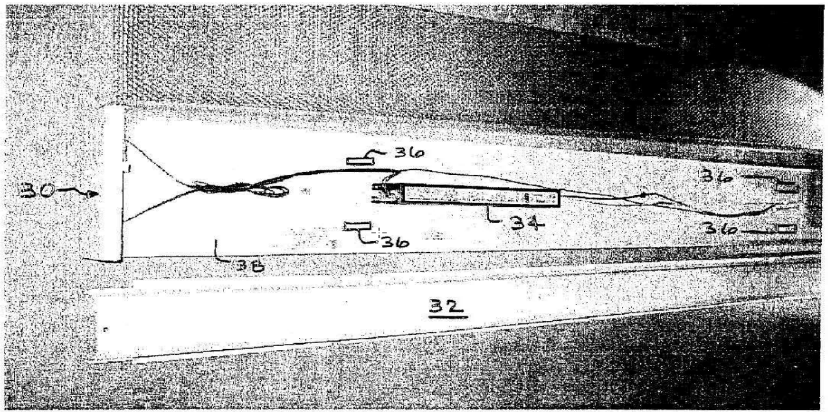


FIG. 13
(PRIOR ART)

Figure 13 above shows an existing fluorescent fixture, including troffer 30, ballast cover 32, ballast 34, tube sockets (not shown), and snap

tabs 36 located along mounting surface 38 of troffer 30. Ex. 1008 ¶ 37. Figure 1 of Burrow is reproduced below:

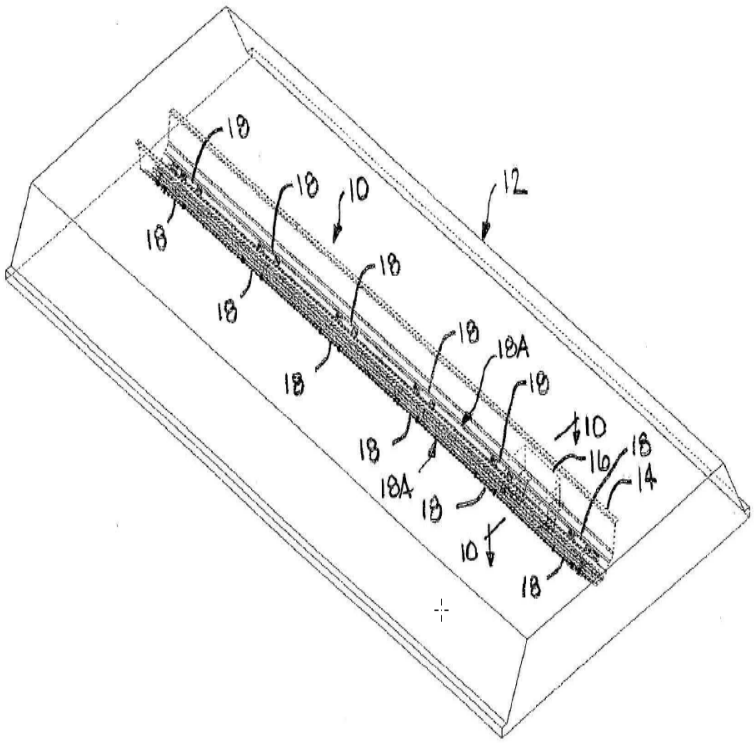


FIG. 1

Figure 1 above shows a perspective view of light emitting diode retrofit kit 10 adapted for use in fluorescent light fixture 12. Ex. 1008 ¶ 25. Kit 10 includes housing 14, power supply 16, and LEDs 18 coupled to the power supply by suitable means. *Id.* ¶ 26. Housing 14 is formed as an extrusion, and can be cut to any length. *Id.* ¶¶ 26, 38.

Figure 11 of Burrow is reproduced below:

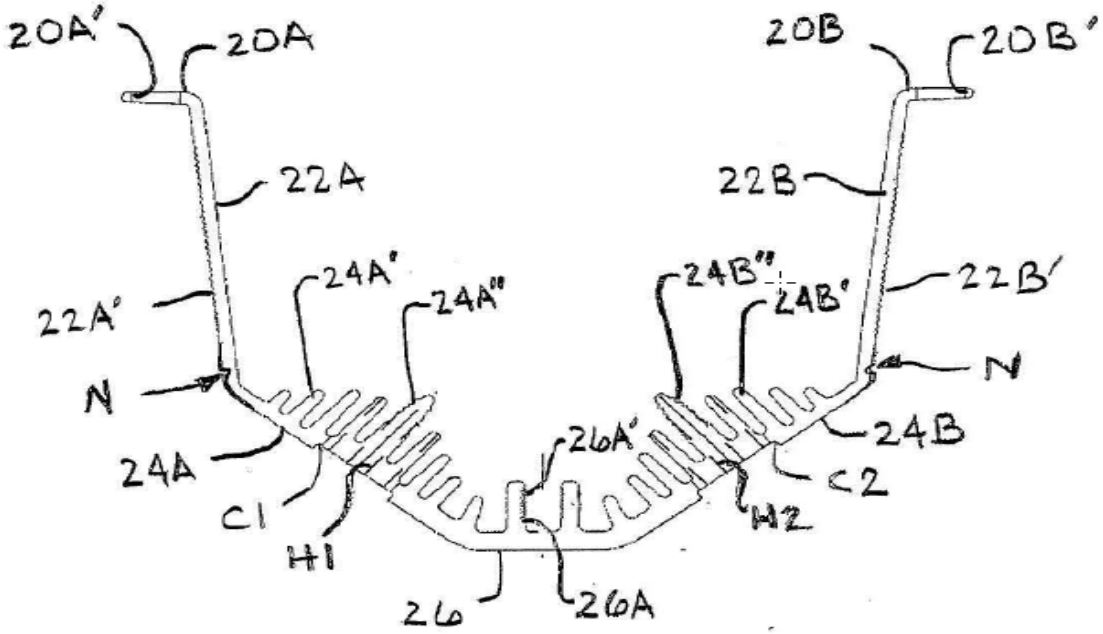


FIG. 11

Figure 11 above shows a portion of the housing of the light emitting diode retrofit kit. Ex. 1008 ¶ 22. Figure 11 shows a U-shaped embodiment of the housing including mounting flanges 20A, 20B, mounting holes 20A' and 20B', first pair of angled side walls 22A, 22B, second pair of angled side walls 24A, 24B, and bottom wall 26. *Id.* ¶¶ 27, 31.

3. Analysis of Ground 1

Independent Claim 1

The preamble of claim 1 recites a "combination for illuminating the interior of a building, comprising." Petitioner contends that Dowling discloses the preamble in describing an apparatus including LED-based light sources for retrofitting conventional lighting fixtures that create illumination

in indoor environments. Pet. 26 (citing Ex. 1007 ¶¶ 7–8; Ex. 1003 ¶¶ 125–127). To the extent that the preamble is limiting, Petitioner has shown that the prior art teaches the preamble.

Claim 1 recites "a fixture having a base attached to a building ceiling, the fixture having a first tombstone and a second tombstone, wherein the first and second tombstones are adapted to receive between them a linear fluorescent light tube, and wherein the base includes a first longitudinal side and an opposite second longitudinal side." Petitioner contends that Dowling discloses this limitation in describing a prior art fluorescent lighting fixture having tombstones for receiving fluorescent light tubes, and a base that has first and second longitudinal sides. Pet. 27–28 (citing Ex. 1007, Figs. 1, 3, and 4; Ex. 1003 ¶ 130). Petitioner contends that the base would be attached to a ceiling. *Id.* at 28 (citing Ex. 1003 ¶¶ 128–130).

Patent Owner, relying on the testimony of Dr. Bretschneider, contends that a person of ordinary skill would not invert the fixture shown in Figure 1 of Dowling, because doing so would change the heat characteristics of the device, would require further testing, would degrade performance of the LEDs, and would result in a less efficient fixture with a shorter lifespan, all of which would render the device inoperable for its intended purpose. PO Resp. 24–25 (citing Ex. 2076 ¶¶ 106–130, 405–412); *see id.* at 9–10 (citing Ex. 2076 ¶¶ 279–284); PO Sur-Reply 2–5 (citing Ex. 2076 ¶¶ 78–84, 102–115, 120, 175–176, 280–284). Patent Owner further contends that Petitioner has not provided any reasoning as to why a person of ordinary skill would modify Dowling by inversion. PO Resp. 7–8 (citing Ex. 2076 ¶¶ 95–96). Patent Owner contends that inverting Dowling runs counter to the goals of the '041 patent, and that Dowling exaggerates the efficiency of its device. *Id.* at 8 (citing Ex. 2076 ¶¶ 258–272).

Petitioner contends that Dowling teaches retrofitting a fluorescent fixture hanging from a ceiling or recessed within a ceiling, and that a person of ordinary skill would have understood that the fluorescent fixture could have been directly attached to a ceiling. Pet. Reply 2–6 (citing Ex. 1007 ¶¶ 7, 9, 11, 106, 112, claims 1, 2, 13; Ex. 1036 ¶¶ 26–34; Ex. 1042, 93–94). Petitioner contends that a person of ordinary skill would have understood that the LED-retrofit assembly is constructed from a material such as metal that provides a thermal path for effectively dissipating heat. *Id.* at 6 (citing Ex. 1007 ¶ 111; Ex. 1036 ¶¶ 35–39; Ex. 1042, 93). Petitioner further contends that Dowling incorporates Dowling II (Ex. 1044), which is directed to thermal management of LEDs using heat sinks and fans. *Id.* Petitioner contends that a person of ordinary skill would have understood that the heat sinks and fans taught by Dowling II would dissipate heat. *Id.* at 6–7 (citing Ex. 1044, 65:50–66:3, Fig. 124; Ex. 1036 ¶¶ 40–43, 59).

We disagree with Patent Owner's arguments because they are based on the false premise that Dowling does not disclose retrofitting a ceiling fixture. Dowling's disclosure is directed to "retrofitting conventional lighting fixtures," which include "recessed fixtures (e.g., wherein the housing is concealed behind a ceiling or wall)." Ex. 1007 ¶¶ 7, 9. Thus, Petitioner does not propose modifying Dowling by inverting the disclosed device. Rather, Petitioner inverts certain figures of Dowling to show how the device is implemented in the ceiling configuration disclosed in Dowling. *See, e.g.*, Pet. 28–29 (showing orientation of devices of Figures 4 and 10 when used in a ceiling configuration).

In its Sur-reply, Patent Owner makes the following argument:

> The disclosed orientation of Dowling is intentional. Response at 9-10; EX2076 at ¶¶280-284; EX1007 at ¶0117

> (disclosing that the "mechanical support" of Dowling "may be configured to fit over any surface that includes a corner, such as a corner of . . . a floor . . .."). A POSA would have no motivation to invert Dowling to create a downward-emitting light fixture, and would understand that inverting an LED lighting system that originally had its heated side facing up would be significantly less efficient, would reduce lifespan, and would exhibit other performance defects. EX2076 at ¶120.

PO Sur-reply 2–3 (alterations by Patent Owner). Paragraph 117 of Dowling discloses:

> FIG. 9 depicts a subassembly configuration according to another embodiment including an L-shaped mechanical support 6702 in which LED light sources 104 are disposed substantially in lines along two planes that are substantially perpendicular to each other. The support 6702 may be configured to fit over any surface that includes a corner, *such as a corner of a wall, a ceiling, a floor, a rectangular fixture, or the like*.

Ex. 1007 ¶ 117 (emphasis added). As the emphasized disclosure makes plain, Patent Owner omitted "ceiling" from its parenthetical rather than address the plain disclosure of the reference.

Based on Dowling's disclosure of retrofitting a ceiling fixture, we find that Petitioner's orientation of certain figures as inverted represents how a person of ordinary skill in the art would have understood Dowling's retrofit kits in a ceiling application. Thus, we do not agree with Patent Owner that Petitioner's contentions rely on modifying Dowling to invert the device.

Patent Owner's inoperability arguments fail because, even if "inverting Dowling would dramatically reduce the heat transfer coefficient, which would degrade the performance of the LEDs resulting in a less efficient fixture with a shorter lifespan," as asserted by Patent Owner (PO Resp. 25), the device still is operable. Indeed, Dr. Bretschneider's testimony confirms that Dowling would still function in a ceiling, albeit less

efficiently. *See, e.g.*, Ex. 2076 ¶ 412 (testifying that a person of ordinary skill in the art "would be aware that installing Dowling's inverted embodiment of figure 4 in the recess of a housing mounted to a ceiling would further degrade the heat dissipation capabilities, resulting in even higher operating temperatures and further reductions in lifetime and efficiency"). The claims do not recite any amount of efficiency, heat dissipation, or LED lifespan, and, therefore, Patent Owner's arguments based on such unclaimed characteristics are unavailing.

We have considered the testimony of both Dr. Ducharme and Dr. Bretscheider. We find Dr. Ducharme's testimony, which relies on the teachings of Dowling and the background knowledge of a person of ordinary skill, more credible. Dowling discloses that the fixture could be a down-lighting fixture. Ex. 1007 ¶ 9. In particular, Dowling discloses that modified fixture 2000 could be recessed, such that housing 2402 is concealed behind a ceiling; or could be an under-cabinet fixture. *Id.* ¶¶ 9, 114; *see id.* at Fig. 1, ¶¶ 11–12 (describing a conventional lighting fixture), 105, 106 ("[T]he modified fixture 2000 in which the [LED-based retrofit] assembly 1000 is retrofitted may be a conventional fluorescent lighting fixture (as illustrated, for example, in FIG. 1)."), 107. Dowling discloses that the subassembly may include a support that can fit over any surface that includes a corner, such as a ceiling. *Id.* ¶ 117; *see* Ex. 1036 ¶ 28 (citing Ex. 1050 (Dr. Ducharme testifies that a person of ordinary skill would have understood that the fixture could be attached directly to the ceiling).

Dr. Bretschneider does not address Dowling's disclosure of ceiling fixtures that provide down-lighting. We rely on the testimony of Dr. Ducharme, the teachings of Dowling, and the knowledge of a person of ordinary skill in finding that when a conventional down-lighting fixture is

recessed in a ceiling, or mounted to a ceiling, a person of ordinary skill would have inverted Dowling's retrofit kit as contended by Petitioner, in order to provide a down-lighting fixture that directs light downward. Further, Dr. Bretschneider's testimony that Dowling exaggerates the efficiency of its device as shown by Exhibit 2016 is inconsistent with Exhibit 2016, which shows that a person of ordinary skill would have expected LEDs to surpass fluorescent lighting in terms of efficiency at the time of invention. *See* Ex. 2076 ¶¶ 261, 266 (citing Ex. 2016), 270; Ex. 2016, 19, 22.

With respect to heat dissipation, Dr. Ducharme's testimony, which relies on the teachings of Dowling and the knowledge of a person of ordinary skill, is more credible than Dr. Bretschneider's testimony. Dowling discloses that "the mechanical support 5602 may be made of a thermally conductive material (e.g., metal) so as to provide a thermal conduction path to transmit heat from the vicinity of the LEDs 104 and/or the controller 105 so as to be dissipated by the housing 2402 of the fixture." Ex. 1007 ¶ 111. Dowling also incorporates Dowling II by reference, which discloses removing heat using a fan. *Id.* ¶ 61; Ex. 1044, Fig. 124, 65:50–66:3. Dowling II further discloses using a processor to control the fan to allow cooling to take place in different amounts and at different times, in order to make "a tradeoff between the negative effects of heat on the lifetime of the LEDs and the negative effects of noise on the environment." Ex. 1044, 8:8–23.

Dr. Bretschneider does not address Dowling's disclosure of using a thermally conductive material to dissipate heat. *See* Ex. 2076 ¶¶ 106–130, ¶¶ 279–284. Although Dr. Bretschneider does testify to the disadvantages of using a fan to dissipate heat, Dr. Bretschneider does not address Dowling's

disclosure, through incorporation of Dowling II, of controlling the fan in order to make a tradeoff between the negative effects of not using a fan and the negative effects of using a fan. *See id.* ¶¶ 112–115. Further, Patent Owner and Dr. Bretschneider have not provided persuasive evidence to show that the known techniques of thermal management were insufficient to dissipate 10 W of heat generated by a group of LEDs that emit 2,950 lumens. *See* Ex. 2076 ¶ 140.

It is not necessary to show that a combination is "the *best* option, only that it be a *suitable* option." *PAR Pharm., Inc. V. TWI Pharms., Inc.*, 773 F.3d 1186, 1197–98 (Fed. Cir. 2014). "[A] given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine." *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006). "Instead, the benefits, both lost and gained, should be weighed against one another." *Id.* That is what we have here, with Dowling II's disclosure that a lighting fixture can cool itself with a fan "at times when cooling is most necessary (such as when the environment of the LEDs heats up), and at times when cooling is most convenient (such as when people are absent)" in order to provide "a tradeoff between the negative effects of heat on the lifetime of the LEDs and the negative effects of noise on the environment." Ex. 1044, 8:8–23. Neither Patent Owner nor Dr. Bretschneider address Dowling II's teaching of making a tradeoff between the negative effects of using and the negative effects of not using a fan.

Patent Owner contends that Petitioner does not provide any motivation for using the fan of Dowling II to dissipate heat in the fixture of Dowling. PO Sur-Reply 4. We disagree. First, Dowling incorporates by reference Dowling II, which means that Dowling II is part of the disclosure

of Dowling, rather than a separate document to be combined with Dowling. *See Advanced Display Sys., Inc. v. Kent State Univ.*, 212 F.3d 1272, 1282 (Fed. Cir. 2000) ("Incorporation by reference provides a method for integrating material from various documents into a host document . . . by citing such material in a manner that makes clear that the material is effectively part of the host document as if it were explicitly contained therein."); MPEP 2163.07(b). Second, Dowling II's reason to use a fan is explicit, namely, that "fans allow for cooling to take place" by "remov[ing] heat from the environment of the LEDs." Ex. 1044, 8:8–9, 65:55–56. "[I]f a technique," such as providing a fan, "has been used to improve one device, and a person of ordinary skill would recognize that it would improve similar devices in the same way," namely, by removing heat, "using the technique is obvious unless its application is beyond his or her skill." *KSR*, 550 U.S. at 417.

Patent Owner, responding to Petitioner's contention that "the number and spacing of the LEDs would be a design choice" (Pet. Reply 9–10), contends that a person of ordinary skill would not add LEDs or change the spacing of LEDs in Dowling's device, because spacing requirements were defined by industry standards set by a trade association, and also because changing the spacing would create thermal issues. PO Sur-Reply 5 (citing Ex. 2076 ¶¶ 78–84, 175–176, 280–284). We disagree with Patent Owner for the reasons given in the following paragraph. We further highlight that the scope of the claim encompasses a retrofit kit having one light emitting diode, and that Dowling discloses that its retrofit kit may have one light emitting diode, in which case spacing of LEDs would not be an issue. *See* Ex. 1007 ¶¶ 82 ("apparatus 100 . . . may include one . . . light source[]" such as "one . . . light emitting diode[]."), 111.

We rely on the testimony of Dr. Ducharme (Ex. 1036 ¶¶ 6, 8–14, 21–43) and the teachings of Dowling and Dowling II in finding that the prior art teaches methods of thermal management of Dowling's retrofit device that would have resulted in an operable device attached to a ceiling that complies with industry standards. Further, the '041 patent itself does not disclose any methods of thermal management of the retrofit kit or of complying with industry standards. *See* Ex. 1036 ¶¶ 4–6. "In the absence of such a specific description, we assume that anyone desiring to carry out [thermal management of a retrofit kit attached to a ceiling in compliance with industry standards] would know of the equipment and techniques to be used." *In re Epstein*, 32 F.3d 1559, 1568 (Fed. Cir. 1994). The '041 patent "assumes anyone desiring to carry out the process [of thermal management] would know of the equipment and techniques to be used, none being specifically described." *In re Fox*, 471 F.2d 1405, 1407 (CCPA 1973). Therefore, we find that effective thermal management techniques for a retrofit kit for a fluorescent lighting fixture attached to a ceiling, in compliance with industry standards, were within the knowledge of a person of ordinary skill, and that such person would have used the known thermal management techniques to sufficiently dissipate heat from such retrofit device. We find that Petitioner has demonstrated that Dowling teaches this limitation of claim 1.

Claim 1 recites "a retrofit kit connected to the base, the retrofit kit including a light panel, a first profile and a second profile, the light panel including a first side facing the fixture and an opposite second side, wherein the light panel, the first profile, and the second profile extend longitudinally from the first tombstone to the second tombstone and parallel one-to-another." Petitioner contends that Dowling discloses this limitation in the

embodiment of a retrofit shown in Figure 10, which describes two opposite sides, or profiles, that extend longitudinally and are parallel to one another, and a light panel with a first side facing the fixture and an opposite second side. Pet. 29 (citing Ex. 1007 ¶ 118, Fig. 10). Petitioner contends that Dowling teaches that the retrofit can be attached to the base of a fixture, and that a person of ordinary skill would understand that the length of the retrofit would extend longitudinally from one tombstone to the other in order to cover the tombstones and to provide a similar light profile as the fluorescent fixture. *Id.* (citing Ex. 1003 ¶¶ 132–134).

Petitioner also contends that Dowling discloses this limitation in the embodiment of a retrofit kit shown in Figure 4, which describes a light panel with a first side facing toward the fixture and a second opposite side. Pet. 30 (citing Ex. 1007, Fig. 4). Petitioner contends that Dowling discloses that the retrofit has first and second profiles, and that the retrofit kit extends longitudinally from a first to a second tombstone, and is attached to the fixture using screws. *Id.* (citing Ex. 1007 ¶ 108; Ex. 1003 ¶¶ 135–136).

Patent Owner contends that the retrofit kit of Dowling is directed to non-analogous applications. PO Resp. 8. Patent Owner, relying on Dr. Bretschneider's testimony, contends that Dowling is concerned with complex lighting applications common to light shows and special effects and would not be suitable for indoor commercial and retail lighting applications. *Id.* at 8–9 (citing Ex. 1007 ¶¶ 81, 88–90, 109–110; Ex. 2076 ¶¶ 273–275). According to Patent Owner, Dowling requires multiple, differently colored LEDs which require their own drivers and other hardware, in order to produce white light. *Id.* at 9 (citing Ex. 2076 ¶¶ 274–279). Patent Owner contends that the coordination of multiple LED color sources to provide the white light needed to illuminate commercial and office interiors creates

inefficiencies that frustrate the goal of a retrofit. *Id.* at 8–9 (citing Ex. 2076 ¶¶ 274–279).

Patent Owner's contentions appear to implicitly construe the claim to require a white LED that illuminates an office interior. However, the challenged claims do not recite applications relating to commercial, retail, and office lighting. Similarly, the challenged claims do not recite limiting the color of the LED to white light. Further, the specification does not disclose that the color of the light emitted by the LED is white. The specification, in the background section, does mention that "[f]luorescent lighting is commonly used in commercial building and office interiors," but does not limit claim 1 to commercial building and office interiors. *See* Ex. 1001, 1:21–22. Rather, the specification discloses that the fixture may include a base attached to the interior ceiling of a building, without requiring the building to be either a commercial or an office building. *Id.* at 3:24–25; *see id.* at 2:7–10. Patent Owner's contentions are not commensurate with the scope of the claims read in light of the specification. Dowling's disclosure of colored LEDs and applications common to light shows are within the scope of claim 1.

Even were we to accept Patent Owner's construction of claim 1, we disagree that Dowling is not directed to interior lighting and that Dowling requires multiple LEDs, along with multiple drive circuits and additional hardware, in order to produce white light. Dowling discloses that the lighting apparatus can facilitate "various interior lighting conditions" and that "a lighting fixture retrofitted with the apparatus 100 may be employed in . . . interior . . . lighting" such as "retail/consumer environments." Ex. 1007 ¶¶ 81, 90. Dowling discloses that "*one* . . . light source[] that include[s] *one* . . . LED[]" generates "essentially white light." *Id.* ¶ 88

(emphasis added); *see id.* ¶¶ 21, 22, 26–28, 82, 89, 90, 109, 127. Therefore, we disagree with Patent Owner and Dr. Bretschneider, and find that Dowling's disclosure of employing its lighting fixture in interior lighting such as retail and commercial environments, along with Dowling's disclosure of using one LED that generates white light, suggests a retrofit kit having an LED that generates white light for interior uses such as commercial, retail, and office lighting, without requiring multiple drive circuits and additional hardware. We find that Petitioner has demonstrated that Dowling teaches this limitation of claim 1.

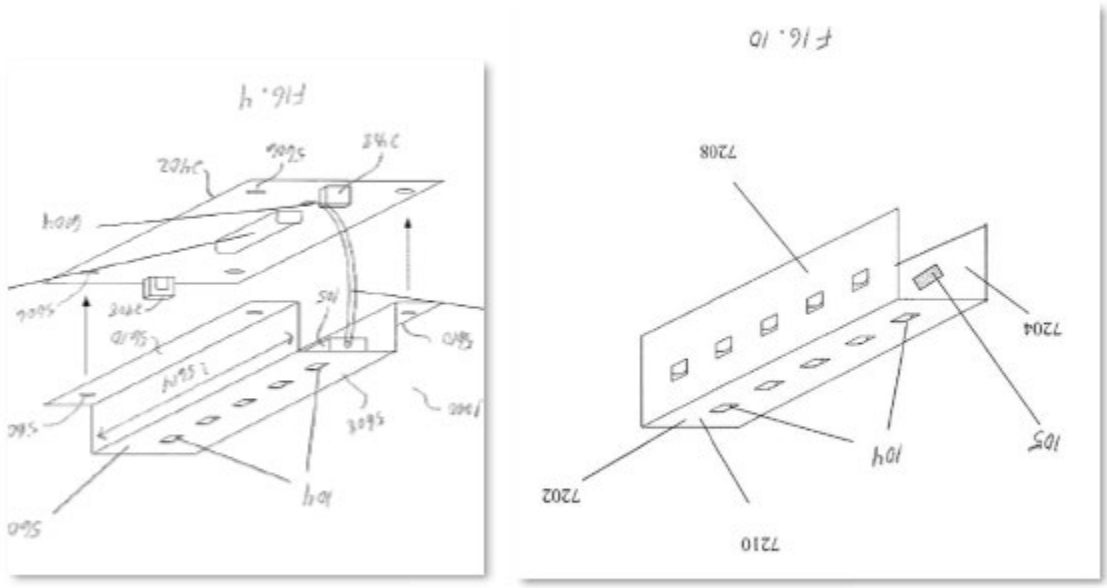
Claim 1 recites "the fixture, including the first and second tombstones, residing above the light panel and residing between the first profile and the second profile." Petitioner contends that Dowling's embodiment shown in Figure 10 discloses this limitation in describing that the retrofit kit would attach to the fixture of Figure 1 such that the fixture would reside above the light panel and between the profiles of the retrofit kit. Pet. 30–31 (citing Ex. 1007, Fig. 10; Ex. 1003 ¶ 138). Petitioner also contends that Dowling's embodiment shown in Figure 4 discloses this limitation in describing a fixture with tombstones residing about the light panel, and that at least a portion of the fixture resides between the first and second profiles. *Id.* (citing Ex. 1007, Fig. 4; Ex. 1003 ¶ 139).

Patent Owner contends that Dowling does not disclose inverting the device, and that Petitioner has not provided a reason why a person of ordinary skill would invert the device. PO Resp. 26 (citing Ex. 2076 ¶¶ 413–423). We disagree with Patent Owner and Dr. Bretschneider, and agree with Dr. Ducharme, for the reasons given above.

Claim 1 recites "a fixture having a base attached to a building ceiling" and further recites "the fixture, including the first and second tombstones,

residing above the light panel." Petitioner contends that Dowling's conventional lighting fixture shown in Figure 1 would be inverted when attached to a ceiling. Pet. 27–28. Petitioner contends that Dowling's retrofit kit shown in Figures 4 and 10 would also be inverted when attached to the ceiling fixture. *Id.* at 28–31.

Inverted Figures 4 and 10 of Dowling as shown in the Petition are reproduced below:



Dowling, Figs. 4 and 10 (inverted)

Petitioner states that Figures 4 and 10 above show two U-shaped retrofit embodiments, inverted "to demonstrate how [they] would be attached to a ceiling fixture." Pet. 19; *see id.* at 27–28 (citing Ex. 1003 ¶¶ 128–130). Petitioner contends that inverted Figures 4 and 10 of Dowling show the claimed "fixture, including the first and second tombstones, residing above the light panel." *Id.* at 30–31 (citing Ex. 1007, Figs. 4 and 10; Ex. 1003 ¶¶ 138–139). We find that Petitioner has demonstrated that Dowling teaches this limitation of claim 1.

Claim 1 recites "a light emitting diode disposed on the second side of the light panel." Petitioner contends that Dowling discloses LEDs residing on the second side of a light panel as shown in Figures 4 and 10. Pet. 32 (citing Ex. 1007, Figs. 4 and 10; Ex. 1003 ¶¶ 142–143). We find that Petitioner has demonstrated that Dowling teaches this limitation of claim 1.

Claim 1 recites "wiring in electrical communication with the light emitting diode." Petitioner contends that Dowling discloses this limitation in describing a controller that outputs signals through wiring to drive the LEDs to produce varying intensities of light. Pet. 32–33 (citing Ex. 1007 ¶¶ 83, 110, 118, Figs. 2, 3, and 10; Ex. 1003 ¶¶ 144–146). We find that Petitioner has demonstrated that Dowling teaches this limitation of claim 1.

Patent Owner contends that Petitioner does not provide motivation to combine the teachings of Dowling and Burrow. PO Resp. 37. However, for claim 1, the Petition relies on Dowling and the knowledge of a person of ordinary skill to show that claim 1 is unpatentable. *See* Pet. 26–33. Further, we find that the Petition does provide sufficient motivation to combine the teachings of Dowling and Burrow, as discussed below in our analysis of claims 6 and 10. *See* Pet. 47–48.

Secondary Considerations of Non-Obviousness

Patent Owner contends that commercial success and copying are two objective indicia of non-obviousness. PO Resp. 64–65. Petitioner argues that Patent Owner has not established a nexus between the merits of the claimed invention and the objective evidence. Pet. Reply 27. We agree with Petitioner.

As stated by the Federal Circuit,

> [f]or objective evidence of secondary considerations to be relevant, there must be a nexus between the merits of the claimed

> invention and the objective evidence. *See In re GPAC*, 57 F.3d 1573, 1580 (Fed. Cir. 1995). A showing of nexus can be made in two ways: (1) via a presumption of nexus, or (2) via a showing that the evidence is a direct result of the unique characteristics of the claimed invention
>
> A patent owner is entitled to a presumption of nexus when it shows that the asserted objective evidence is tied to a specific product that "embodies the claimed features, and is coextensive with them." *Brown & Williamson Tobacco Corp. v. Philip Morris, Inc.*, 229 F.3d 1120, 1130 (Fed. Cir. 2000).

Volvo Penta of the Americas, LLC v. Brunswick Corp., -- F.4th --, No. 2022-1765, 2023 WL 5440530, at *5 (Fed. Cir. Aug. 24, 2023).

Patent Owner argues that its "products are coextensive with the claims of the '628 patent" and "embod[y] each of the elements identified in at least the independent claims." PO Resp. 65 (citing Ex. 2078 ¶¶ 9, 14). Thus, Patent Owner attempts to establish a presumption of nexus.

Petitioner contends that Patent Owner has not demonstrated that its products are coextensive or nearly coextensive with the challenged claims. Pet. Reply 27. Petitioner contends that Patent Owner has only offered a statement from the inventor that the products are coextensive with substitute claims, but that neither Patent Owner nor its expert have offered any analysis of Patent Owner's products. *Id.* (citing Ex. 2078 ¶ 9). Although Patent Owner responds in its Sur-Reply, we do not consider Patent Owner's arguments in the Sur-Reply for the reasons given in the Order Granting Petitioner's Motion to Strike. Paper 46.

We agree with Petitioner that Patent Owner has not met its burden to establish a nexus between the objective evidence and the merits of the claimed invention for the reasons given by Petitioner. The declaration testimony of the inventor, that "the product embodies the features claimed in

the claims and is coextensive with them" (Ex. 2078 ¶ 9), does not provide an analysis of Patent Owner's product with respect to the claims and thus does not demonstrate nexus. Patent Owner does not attempt to establish nexus by arguing that the objective evidence is a direct result of the unique characteristics of the claimed invention. Thus, Patent Owner has not demonstrated nexus.

Further, Patent Owner does not sufficiently substantiate its commercial success argument by including information such as sales in the relevant market, market share, growth in market share, replacing units sold, or of dollar amounts. *See Kansas Jack, Inc. v. Kuhn*, 719 F.2d 1144, 1151 (Fed. Cir. 1983). Patent Owner also does not provide any evidence explaining the substantial similarity of the alleged copying product to the claimed invention. *See Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010).

Having considered all the evidence and arguments of record, we conclude that Petitioner has demonstrated, by a preponderance of the evidence, that Dowling and the knowledge of a person of ordinary skill, would have taught or suggested the limitations of claim 1 to a person of ordinary skill and that claim 1 would have been obvious to a person of ordinary skill.

Dependent Claims 2–10

Claim 2 recites "the first profile extends from the light panel to the first longitudinal side and is attached to the first longitudinal side." Claim 3 recites "the second profile extends from the light panel to the second longitudinal side and is attached to the second longitudinal side." Petitioner contends that Dowling discloses the limitations of claims 2 and 3 in describing an elevated portion to which an LED is coupled, and two flanking

portions on opposite sided of the elevated portion to facilitate attaching the apparatus to the conventional fixture. Pet. 35 (citing Ex. 1007, claim 4). Petitioner further contends that Dowling discloses the limitations of claims 2 and 3 as illustrated in the embodiments of annotated Figures 4 and 10. *Id.* at 34–35 (citing Ex. 1007, Figs. 4 and 10; Ex. 1003 ¶¶ 147–155).

Patent Owner, relying on the testimony of Dr. Bretschneider, contends that Dowling does not teach the limitations of claim 2, because the embodiments relied on in the Petition would show individual, widely-spaced LEDs instead of a uniform light source, which would not be appropriate for lighting the interior of commercial offices and runs counter to the objectives of the '041 patent. PO Resp. 26–27 (citing Ex. 2076 ¶¶ 424–427). Petitioner, relying on testimony of Dr. Ducharme, contends that a person of ordinary skill would have understood Dowling was designed to retrofit fluorescent fixtures attached to a ceiling. Pet. Reply 9 (citing Ex. 1036 ¶ 47). Petitioner contends that neither the claims nor the specification is directed to a given orientation of the LEDs on the profiles, and that a person of ordinary skill would have understood how to modify Dowling's structure to provide a given light output. *Id.* at 9–10 (citing Ex. 1036 ¶ 48).

We agree with Petitioner and Dr. Ducharme. We find that Dr. Bretschneider's testimony, that a person of ordinary skill in the art would know that light generated by this configuration would not be appropriate for commercial building and office interior lighting, is inconsistent with Dowling, which teaches that the lighting apparatus can facilitate "various interior lighting conditions" and that "a lighting fixture retrofitted with the apparatus 100 may be employed in . . . interior . . . lighting" such as "retail/consumer environments." Ex. 1007 ¶¶ 81, 90. We further highlight that providing a uniform light source rather than a light source that shows

widely-spaced LEDs is not recited in claim 2. Therefore, Patent Owner's contentions are not commensurate with the scope of claim 2.

Patent Owner contends that the number and spacing of LEDs are defined by an industry standard set by a trade association. PO Sur-Reply 5 (citing Ex. 2076 ¶¶ 175–176). Patent Owner also contends that adding LEDs and changing the spacing would create thermal management issues. *Id.* (citing Ex. 2076 ¶¶ 78–84, 280–284). With respect to the thermal management issues, we disagree with Patent Owner and find that addressing thermal management issues was within the knowledge of a person of ordinary skill for the reasons given in our analysis of claim 1. Further, the '041 patent itself does not disclose any methods of complying with industry standards, and Dr. Ducharme testifies that a person of ordinary skill would have been aware of these standards when designing LED retrofit assemblies. *See* Ex. 1036 ¶¶ 6–12. In the absence of a specific description of complying with industry standards in the '041 patent, we agree with Dr. Ducharme that complying with the number and spacing of LEDs defined by industry standards was within the knowledge of a person of ordinary skill. *Epstein*, 32 F.3d at 1568; *Fox*, 471 F.2d at 1407.

Further, we find that Dowling teaches "*one* . . . light source[] that include[s] *one* . . . LED[]." Ex. 1007 ¶ 88. We further highlight that the scope of claim 2 encompasses "a light emitting diode" as recited in base claim 1. In Dowling's embodiment of one light source with one LED, the spacing of LEDs is not an issue. Patent Owner's contention is inconsistent with the teachings of Dowling and is not commensurate with the scope of the claim. We find that Petitioner has demonstrated that Dowling teaches this limitation of claim 2.

For claim 3, Patent Owner relies on its contentions presented for claim 1. We disagree with Patent Owner for the reasons given in our analysis of claim 1. We find that Petitioner has demonstrated that Dowling teaches this limitation of claim 3.

Claim 4 recites "the first profile, second profile, light panel, and base define therebetween a raceway, wherein the wiring resides in the raceway." Petitioner contends that Dowling discloses this limitation in describing that the light panel and first and second profiles, when attached to the base, define a raceway between them. Pet. 36–37 (citing Ex. 1007, Fig. 4). Petitioner further contends that Dowling discloses that the controller and wiring to power the LEDs can be located in the raceway. *Id.* at 37 (citing Ex. 1007 ¶¶ 110, 118; Ex. 1003 ¶¶ 156–160). Patent Owner relies on its contentions presented for claim 1. We disagree with Patent Owner for the reasons given in our analysis of claim 1. We find that Petitioner has demonstrated that Dowling teaches this limitation of claim 4.

Claim 5 recites "a lens attached to the light panel proximate to the second side and distal to the fixture." Petitioner contends that Dowling discloses this limitation in describing that the retrofit kit may incorporate a lens attached to a light panel. Pet. 38 (citing Ex. 1007 ¶ 24, Fig. 7). Petitioner contends that using a lens to cover an LED light panel was known to a person of ordinary skill. *Id.* at 38–39 (citing Ex. 1003 ¶¶ 161–164); *see* Ex. 1003 ¶ 90 (A person of ordinary skill "would understand that the use of a lens was common at the time of invention to: (1) reduce glare, (2) diffuse light . . . , (3) protect or hide . . . light panels [and] (4) enhance the appearance of the fixture."), ¶ 91. Dr. Ducharme cites Figure 7 of Dowling as an "example[] of the use of a lens (130) proximate to the second side of

the light panel (1000B) and distal to the fixture with embodiments." Ex. 1003 ¶ 164.

Patent Owner, relying on the testimony of Dr. Bretschneider, contends that the claimed "light emitting diode" as properly construed includes an integrated lens, because LEDs used in lighting typically have such an integrated lens. PO Resp. 28 (citing Ex. 2076 ¶¶ 431–434). Dr. Bretschneider testifies that the fact that Dowling's lens is an integral component of the LED means that the lens is part and parcel with the LED itself. Ex. 2076 ¶ 431.

We disagree with Patent Owner and Dr. Bretschneider about the scope of the claimed "light emitting diode." Looking at the intrinsic evidence, neither the claim nor the specification defines the light emitting diode as including an integrated lens. With respect to Dr. Bretschneider's analysis of Dowling's lens described in paragraph 24, we disagree with Dr. Bretschneider's conclusion that Dowling's lens does not teach a lens as claimed. Ex. 2076 ¶ 431 (citing Ex. 1007 ¶ 24).

Dowling describes lenses as "other optical components" and "optical elements," whether integrated with an LED or not, which indicates that a person of ordinary skill would have considered the LED and the lens as different optical components, whether integrated or not. *See* Ex. 1007 ¶ 24 (The "light source may include as an integral component . . . other optical components" such as "lenses."); ¶ 99 (The "lighting apparatus . . . may include one or more optical elements" such as "lenses."). We find that Dowling shows that a person of ordinary skill would have considered the lens and the LED as separate components. *See Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1584 (Fed. Cir. 1996) (The Federal Circuit held that "prior art references may [indicate] what all those skilled in

the art generally believe a certain term means."); *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 991 (Fed. Cir. 1995). Therefore, we disagree with Dr. Bretschneider that a person of ordinary skill would have considered the lens of Dowling as the LED as claimed. The scope of "light emitting diode" does not include a lens that is typically integrated with the light emitting diode. We find that the lens described in paragraph 24 of Dowling teaches a "lens" as claimed.

Further, Petitioner's contention relies on the lens shown in Figure 7 of Dowling. Pet. 38–39. Dr. Ducharme testifies that lenses were well known in the art, that they were used for various reasons (e.g., reduce glare and hide light panels), and that "the decision to use a lens, particularly with LED lights given the focused nature of the emitted light, the type, design and placement of said lens were all common design choices at the time of the invention." Ex. 1003 ¶¶ 90, 163. Dr. Ducharme cites Figure 7 as an "example[] of the use of a lens (130) proximate to the second side of the light panel (1000B) and distal to the fixture with embodiments." Ex. 1003 ¶ 164.

Patent Owner contends that subassembly 1000A shown in Figure 7 of Dowling corresponds to the claimed second side, because the Petition identifies component 5608 shown in Figures 3 and 4 of Dowling as having a second side, and subassembly 1000A of Figure 7 corresponds to component 5608 of Figures 3 and 4. PO Resp. 28–30 (citing Ex. 2076 ¶¶ 435–444). Patent Owner contends that lens 130 shown in Figure 7 of Dowling is proximate to the fixture and distal to the second side, which Patent Owner contends is subassembly 1000A. *Id.* As discussed above, however, Dr. Ducharme cites Figure 7 as an *example* of the use of a lens. Dr. Ducharme also testifies that conventional fixtures that are being retrofitted may contain

a lens cover, in which case the same lens cover could simply be used after retrofitting. Ex. 1032 ¶ 52; *see* Pet. Reply 10.

Patent Owner contends that a person of ordinary skill would not modify any embodiment of Dowling with a lens, because adding such a lens would reduce the light emitted from the device, and would reduce efficiency by trapping heat and increasing LED temperature. PO Resp. 30 (citing Ex. 2076 ¶¶ 442–444). However, Dowling teaches that the benefits of using a lens include changing the spatial distribution and the propagation direction of the light. Ex. 1007 ¶ 99; *see* Ex. 1003 ¶¶ 90–91 (Dr. Ducharme testifies about the known benefits of incorporating a lens into the retrofit, such as reducing glare, diffusing light, protecting or hiding light panels, and enhancing appearance). Neither Patent Owner nor Dr. Bretschneider explain how the disadvantages of using a lens would outweigh the benefits. Further, effective thermal management techniques were within the knowledge of a person of ordinary skill as discussed above in our analysis of claim 1. We find that a person of ordinary skill would have used the known thermal management techniques to sufficiently dissipate heat from a retrofit device that includes a lens. We find that Petitioner has demonstrated that Dowling teaches this limitation of claim 5.

Claim 6 recites "the light panel has a first angled wing and a second angled wing, the first and second angled wings residing at an acute angle to the horizontal." Petitioner contends that the combination of Dowling and Burrow teaches this limitation. Pet. 39–40. Petitioner contends that Burrow discloses a U-shaped retrofit kit for mounting to previously installed fluorescent lighting fixtures. *Id.* (citing Ex. 1008 ¶ 27, Figs. 10 and 11). Petitioner contends that because both Burrow and Dowling disclose U-shaped retrofit kits, a person of ordinary skill in the art would have modified

the horizontal light panel of Dowling to include the angled wings of Burrow to yield the benefits of providing a specific angle necessary for desired light output and dispersing light at a particular angle. *Id.* at 40 (citing Ex. 1003 ¶¶ 165–168), 47 (citing Ex. 1008 ¶ 39; Ex. 1003 ¶¶ 196–197, 199).

Patent Owner relies on its contentions presented for claim 1. PO Resp. 30 (citing Ex. 2076 ¶ 445). We disagree with Patent Owner for the reasons given in our analysis of claim 1. We find that Petitioner has demonstrated that the combination of Dowling and Burrow teaches this limitation of claim 1.

Patent Owner presents several arguments contending that the Petition does not provide a reason to combine the teachings of Dowling and Burrow. PO Resp. 37–39. Patent Owner contends that Burrow discloses that tombstones should normally be removed. *Id.* at 11–12 (citing Ex. 2076 ¶¶ 289–300). Patent Owner contends that Burrow's power supply, lighting hardware, and wires are located within the housing, and would operate at high temperatures which would reduce efficiency and lifetime of the retrofit kit. *Id.* Patent Owner contends that adding tombstones to Burrow would degrade the device's thermal management. *Id.* Patent Owner contends that the vent holes and cooling fins of Burrow would not provide significant dissipation of heat. *Id.* at 12. Patent Owner contends that the Burrow device would emit less light than the fluorescent tube it is intended to replace. *Id.* (citing Ex. 2076 ¶ 309).

Dr. Ducharme testifies that both Dowling and Burrow understood and recognized similar techniques for effectively cooling LEDs to ensure proper operation. Ex. 1036 ¶¶ 69–70 (citing Ex. 1007 ¶ 111; Ex. 1008 ¶ 39; Ex. 1044). We agree with Dr. Ducharme because his testimony is supported by the teachings of Dowling and Burrow. We further highlight that Petitioner

relies on Dowling to teach tombstones, and Burrow to teach angled wings. Patent Owner's contentions do not address Petitioner's combination.

Patent Owner, relying on the testimony of Dr. Bretschneider, contends that a person of ordinary skill in the art "would not look to Burrow" because the aluminum housing taught by Burrow would have been difficult and time-consuming for installation. PO Resp. 13 (citing Ex. 2076 ¶¶ 301–308). It is not clear what legal assertion Patent Owner is making here. Patent Owner's argument about not looking to a reference sounds of an analogous art argument, but Patent Owner made no such argument in its papers and confirmed during oral argument that it is not arguing that the asserted references are non-analogous. Tr. 40:24–41:10. We find that Burrow is analogous art to the '628 patent because it is in the same field of endeavor – LED retrofit kits. Ex. 1008, [57] (disclosing a "light emitting diode retrofit conversion kit adapted for use in a fluorescent light fixture"); Ex. 1001, claim 1. Dr. Ducharme testifies that aluminum "is the best conductive metal material traditionally available for heat dissipation." Ex. 1036 ¶ 56. Dr. Ducharme testifies that a person of ordinary skill would have understood that aluminum is pliable and easy to bend into various form factors like those shown in Burrow and Dowling. *Id.*

With respect to Dr. Bretschneider's testimony that a person of ordinary skill would not use aluminum because aluminum materials are heavy, thick, and difficult to shape or form (Ex. 2076 ¶ 302), we find that Dr. Bretschneider's testimony is inconsistent with the knowledge of a person of ordinary skill as shown by the disclosure of Burrow. Ex. 1008 ¶¶ 26, 39. Although Dr. Bretschneider relies exclusively on his personal knowledge in testifying that Burrow's aluminum "retrofit would be extremely cumbersome to an installer for overhead applications as this weight would

need to be held above head-height and extended out from the installer's body for significant periods of time" (Ex. 2076 ¶ 302), Dr. Bretschneider does not testify, nor cite to any facts to show, that installing the aluminum retrofit would have been beyond the installer's ability.

With respect to bending stress of aluminum, Dr. Bretschneider does cite to Exhibit 2062 to support his testimony that installing Burrow's aluminum retrofit using the snap tabs of an existing troffer would require bending the retrofit such that the bending stress would exceed the elastic limit of aluminum. Ex. 2076 ¶ 306 (citing Ex. 2062). However, Dr. Bretschneider does not explain how Exhibit 2062 supports this conclusion. Rather, Exhibit 2062 lists several applications of aluminum, including pipe, railings, furniture, and architectural extrusions, along with various mechanical, thermal, and electrical properties of aluminum. Absent from Exhibit 2062 and Dr. Bretschneider's testimony is any analysis of how installing Burrow's aluminum retrofit would exceed the bending stress of the aluminum retrofit.

Patent Owner contends that a person of ordinary skill would have understood that Dowling's retrofit kit with a changed orientation, and the retrofit kit having configuration of Burrow, have suboptimal thermal management, and combining Dowling and Burrow would result in the poor thermal management to be compounded. PO Resp. 37–38 (citing Ex. 2076 ¶ 503); PO Sur-Reply 7–8 (citing Ex. 2076 ¶¶ 499–506). To the extent that Patent Owner's contention is based on the premise that both Dowling and Burrow have poor thermal management, which would adversely affect the performance of the LED, we disagree for the reasons given in our analysis of claim 1. *See* Ex. 1036 ¶¶ 58–59, 66–70. As discussed above, in the absence of specific descriptions of thermal management techniques in the

'041 patent, we find that anyone desiring to carry out thermal management of a retrofit kit attached to a ceiling in compliance with industry standards would know of the equipment and techniques to be used. Further, we find that Patent Owner's contentions are inconsistent with the teachings of known thermal management techniques described in Dowling and Burrow. Ex. 1007 ¶ 111; Ex. 1008 ¶ 39. To the extent that Patent Owner's contention is based on the premise that Dowling requires multiple colors of LEDs, we disagree. *Id.* 38. As discussed above, Dowling discloses LEDs that emit white light. Ex. 1007 ¶¶ 21, 22, 26–28, 82, 88, 89, 90, 109, 127.

Patent Owner contends that Dowling uses multiple colors of LEDs, which requires multiple power supplies. PO Resp. 38 (citing Ex. 2076 ¶ 504). However, Petitioner asserts that Dowling discloses using an LED that generates white light. *See* Pet. Reply 13 (citing Ex. 1036 ¶ 71; Ex. 1007 ¶¶ 20–22). We agree with Dr. Ducharme and find that Dowling teaches "*one* . . . light source[] that include[s] *one* . . . LED[]" that generates "essentially white light." Ex. 1007 ¶ 88 (emphasis added). We further highlight that the scope of claim 6 encompasses "a light emitting diode" as recited in base claim 1. Patent Owner's contention is inconsistent with the teachings of Dowling and is not commensurate with the scope of the claim.

Patent Owner contends that Petitioner does not provide motivation to combine Dowling and Burrow. PO Resp. 37. Petitioner contends that a person of ordinary skill would have modified Dowling to include the angled wings of Burrow for the benefit of accommodating any angle necessary for the desired light output. Pet. 47 (citing Ex. 1008 ¶ 39; Ex. 1003 ¶¶ 196–197, 199). Dr. Ducharme testifies that Burrow teaches the advantage of LEDs sitting in channels formed in the housing at a specific angle for light output. Ex. 1003 (citing Ex. 1008 ¶ 39). Dr. Ducharme testifies that, as a result, the

design can be easily modified to accommodate any angle. *Id.* We rely on the teachings of Burrow and the testimony of Dr. Ducharme in finding that a person of ordinary skill would have modified Dowling to include the angled wings of Burrow for the benefit of accommodating any angle necessary for the desired light output. Claim 7 recites "the light emitting diode resides on one of the first angled wing and the second angled wing." Petitioner contends that the combination of Dowling and Burrow teaches this limitation. Pet. 40–41. Petitioner contends that Burrow discloses that light emitting diodes reside on the angled wings of the light panel. *Id.* at 40 (citing Ex. 1008 ¶ 35, Fig. 10). Petitioner contends that a person of ordinary skill in the art would have modified the light panel of Dowling to include the angled wings with LEDs as taught by Burrow to yield the benefit of providing a certain orientation of light. *Id.* at 40–41 (citing Ex. 1003 ¶¶ 169–171); 47 (citing Ex. 1008 ¶ 39; Ex. 1003 ¶¶ 196–197, 199). Patent Owner relies on its contentions presented for claim 1. PO Resp. 30 (citing Ex. 2076 ¶ 446). We disagree with Patent Owner for the reasons given in our analysis of claim 1. We find that Petitioner has demonstrated that Dowling teaches this limitation of claim 7.

Claim 8 recites "the first profile, the second profile, and the light panel are integral." Claim 9 recites "the first profile, the second profile, and the light panel are connected to one another." Petitioner contends that Dowling discloses the limitations of clams 8 and 9 in describing that the light panel and the first and second profiles are integral and are connected to one another. Pet. 41 (citing Ex. 1007, Figs. 4 and 10; Ex. 1008, Figs. 10 and 11; Ex. 1003 ¶¶ 172–173). For claims 8 and 9, Patent Owner relies on its contentions presented for claim 1. PO Resp. 30–31 (citing Ex. 2076 ¶¶ 447–448). We disagree with Patent Owner for the reasons given in our analysis

of claim 1. We find that Petitioner has demonstrated that Dowling teaches these limitations of claims 8 and 9.

Claim 10 recites "the first profile and the second profile each include a rib extending longitudinally." Petitioner contends that the combination of Dowling and Burrow teaches this limitation. Pet. 42–43. Petitioner contends that Burrow discloses that both the first profile and the second profile include ribs, and that the ribs extend longitudinally along each profile. *Id.* at 42 (citing Ex. 1008 ¶ 28, Figs. 1, 10A, and 11). Petitioner contends that because both Dowling and Burrow disclose a U-shaped retrofit kit, a person of ordinary skill in the art would have modified the profiles of Dowling to include the ribs of Burrow to yield the benefit of providing increased strength and rigidity. *Id.* at 42–43 (citing Ex. 1003 ¶¶ 174–176); 47–48.

Patent Owner contends that the ribs of the '041 patent exist in three-dimensional space, and the ribs of Burrow have length, but no width or height. PO Resp. 31 (citing Ex. 2076 ¶¶ 452–454). According to Patent Owner, the ribs of Burrow do not meet the claim because the ribs have no angular discontinuity. *Id.* (citing Ex. 2076 ¶ 455). Claim 10 recites that the profiles "each include a rib extending longitudinally." Claim 10 does not recite ribs that exist in three-dimensional space, nor ribs that have angular discontinuity. Patent Owner's contention is not commensurate with the scope of the claim.

Patent Owner contends that the ribs of Burrow have no utility when combined with the device of Dowling, because the ribs increase costs and impede heat dissipation. PO Resp. 31–32 (citing Ex. 2076 ¶¶ 456–460); PO Sur-Reply 6 (citing Ex. 2076 ¶ 459). Petitioner contends that the devices of Dowling and Burrow are both constructed of a thermally efficient metal,

such as aluminum as taught by Burrow. Pet. Reply 11 (citing Ex. 1007 ¶ 111; Ex. 1008 ¶ 39). Petitioner contends that a person of ordinary skill would have understood that Burrow teaches heat sink fins to assist in dissipating heat. *Id.* at 11–12 (citing Ex. 1008 ¶¶ 28–30, Figs. 10A and 11; Ex. 1036 ¶¶ 56–59).

We agree with Petitioner and Dr. Ducharme, that a person of ordinary skill would have used known thermal management techniques, such as those taught by Dowling and Burrow, to effectively dissipate heat. Pet. Reply 11–12 (citing Ex. 1007 ¶ 111; Ex. 1008 ¶ 39; Ex. 1036 ¶¶ 56–59); *see id.* at 12–14 (citing Ex. 1036 ¶¶ 66–73). We also find that effective thermal management techniques for a retrofit kit for a fluorescent lighting fixture attached to a ceiling, in compliance with industry standards, were within the knowledge of a person of ordinary skill, and that such person would have used the known thermal management techniques to sufficiently dissipate heat from such retrofit device, for the reasons given in our analysis of claim 1. *In re Epstein*, 32 F.3d at 1568; *In re Fox*, 471 F.2d at 1407.

Patent Owner contends that a person of ordinary skill, viewing Dowling's thermal management as insufficient, would not invert Dowling. PO Sur-Reply 5–6 (citing Ex. 2076 ¶¶ 405–412). We disagree for the reasons given above and in our analysis of claim 1.

Patent Owner contends that Petitioner has not explained why a person of ordinary skill would bend the structure of Dowling to resemble Burrow, given Petitioner's contention that the claimed rib serves no purpose. PO Sur-Reply 6. Patent Owner mischaracterizes Petitioner's contention. Petitioner contends that "the claimed ribs are not disclosed as providing a function that would modify or inhibit the ability for heat generated by the LEDs to be dissipated." Pet. Reply 11. We agree with Petitioner. The '041

patent, including its disclosure of the rib, does not disclose any methods of thermal management of the retrofit kit or of complying with industry standards. *See* Ex. 1036 ¶¶ 4–6.

Patent Owner contends that neither Dowling nor Burrow discusses the need for a longitudinal rib to provide structural support. PO Resp. 38–39 (citing Ex. 2076 ¶ 505). Petitioner contends that Burrow discloses ribs that extend horizontally along each profile (22A and 22B). Pet. 42. Burrow discloses that a "first pair of side walls 22A and 22B are . . . provided with a plurality of 'cooling' fins or ribs 22A' and 22B', respectively." *Id.* (quoting Ex. 1008 ¶ 28); *see* Ex. 1003 ¶ 175 (quoting Ex. 1008 ¶ 28); Ex. 1036 ¶ 58 (citing Ex. 1008 ¶¶ 28–30, Figs. 10A and 11; Ex. 1044). Thus, Burrow explicitly provides a reason for a person of ordinary skill to use ribs that extend horizontally along each profile 22A and 22B, namely, for cooling. Pet. 42. Further, although Burrow does not explicitly teach that the ribs provide structural support, we are persuaded by Dr. Ducharme's testimony that a person of ordinary skill would have understood that the ribs provide structural support. Ex. 1003 ¶ 176. We find that Petitioner and Dr. Ducharme have demonstrated that a person of ordinary skill would have had a reason to combine the teachings of Dowling and Burrow.

We find that Petitioner has demonstrated that Dowling teaches this limitation of claim 10.

Having considered all the evidence and arguments of record, we conclude that Petitioner has demonstrated, by a preponderance of the evidence, that the combination of Dowling and Burrow would have taught or suggested the limitations of claims 2–10 to a person of ordinary skill and that claims 2–10 would have been obvious to a person of ordinary skill.

Independent Claim 12

The preamble of claim 12 recites a "method for retrofitting a ceiling fixture, comprising the steps of." Petitioner contends that Dowling discloses the preamble for the reasons given in Petitioner's analysis of the preamble of claim 1. Pet. 43 (citing Ex. 1003 ¶ 177). To the extent the preamble is limiting, we find that Petitioner has shown that Dowling teaches the preamble.

Claim 12 recites "1) identifying a ceiling fixture having a pre-installed base with a first longitudinal side and a second longitudinal side." Petitioner contends that Dowling discloses this limitation for the reasons given in Petitioner's analysis of claim 1. Pet. 43 (citing Ex. 1003 ¶¶ 178–179). Patent Owner relies on its contentions presented for claim 1. We disagree with Patent Owner for the reasons given in our analysis of claim 1. We find that Petitioner has demonstrated that Dowling teaches this limitation of claim 12.

Claim 12 recites "2) providing a ceiling light LED retrofit kit adapted to conceal the pre-installed base, the ceiling light LED retrofit kit comprising: a first profile, an opposing second profile, a light panel disposed between the first profile and the opposing second profile, a light emitting diode, and a lens." Petitioner contends that Dowling discloses this limitation in describing an LED retrofit kit adapted to conceal a pre-existing light fixture. Pet. 44 (citing Ex. 1007, Figs. 4 and 10). Petitioner contends that Dowling discloses that the retrofit kit has first and second opposing profiles, a light panel disposed between the profiles and at least one light emitting diode on the light panel, and that a lens may be used with any embodiment. *Id.* at 45 (citing Ex. 1007 ¶¶ 24, 99, Fig. 7; Ex. 1003 ¶¶ 180–182).

Patent Owner contends that Petitioner has not explained why a person of ordinary skill would have modified Dowling by inversion. PO Resp. 33–34 (citing Ex. 2076 ¶¶ 477–483). We disagree with Patent Owner for the reasons given in our analysis of claim 1.

Patent Owner contends that Dowling's retrofit kit shown in Figure 10 has multiple light panels facing different directions, which would create glare and negatively impact the aesthetics, and would not be usable as interior lighting. PO Resp. 34–35 (citing Ex. 2076 ¶¶ 226–229, 474). Dr. Ducharme testifies that a person of ordinary skill would use a lens for the benefit of reducing glare. Ex. 1003 ¶ 90. We agree, and find that a person of ordinary skill, when using the embodiment shown in Figure 10 of Dowling, would use a lens to reduce glare. Further, Petitioner also relies on the embodiment shown in Figure 4 of Dowling, which only uses one light panel. Pet. 44–45 (citing Ex. 1007, Fig. 4; Ex. 1003 ¶¶ 180–181). Patent Owner does not allege that glare would be an issue for the embodiment of Figure 4.

Patent Owner contends that a person of ordinary skill would not include a lens in the retrofit kit of Dowling for the reasons given in Patent Owner's analysis of claim 5. PO Resp. 35–36 (citing Ex. 2076 ¶¶ 484–488). We disagree for the reasons given in our analysis of claim 5. We find that Petitioner has demonstrated that Dowling teaches this limitation of claim 12.

Claim 12 recites "3) connecting the first profile to the first longitudinal side, and the second profile to the second longitudinal side of the pre-installed base." Petitioner contends that Dowling discloses this limitation for the reasons given in Petitioner's analysis of claims 2 and 3. Pet. 45 (citing Ex. 1007, Figs. 4 and 10; Ex. 1003 ¶¶ 183–184). We find that Petitioner has demonstrated that Dowling teaches this limitation of claim 12.

Claim 12 recites "4) connecting the light emitting diode to the light panel." Petitioner contends that Dowling discloses this limitation in describing at least one LED connected to the light panel as shown in Figures 4 and 10. Pet. 45 (citing Ex. 1007, Figs. 4 and 10; Ex. 1003 ¶ 185). We find that Petitioner has demonstrated that Dowling teaches this limitation of claim 12.

Claim 12 recites "5) covering the light panel with the lens." Petitioner contends that Dowling discloses this limitation in describing a lens covering a light panel. Pet. 46 (citing Ex. 1007 ¶¶ 24, 99, Fig. 7; Ex. 1003 ¶¶ 186–189). Patent Owner contends that a person of ordinary skill would not have modified any embodiment of Dowling with a lens for the reasons given in Patent Owner's analysis of claim 5. We disagree for the reasons given in our analysis of claim 5. We find that Petitioner has demonstrated that Dowling teaches this limitation of claim 12.

Having considered all the evidence and arguments of record, we conclude that Petitioner has demonstrated, by a preponderance of the evidence, that the combination of Dowling and Burrow teaches the limitations of claim 12 to a person of ordinary skill and that claim 12 would have been obvious to a person of ordinary skill.

Dependent Claims 13 and 14

Claim 13 recites "the light panel includes a first angled wing and a second angled wing." Petitioner contends that the combination of Dowling and Burrow teaches this limitation for the reasons given in Petitioner's analysis of claim 6. Pet. 46 (citing Ex. 1008 ¶ 27, Figs. 10 and 11; Ex. 1003 ¶¶ 190–193). Patent Owner relies on its contentions presented for claim 12. PO Resp. 36 (citing Ex. 2076 ¶ 497). We disagree with Patent Owner for the reasons given in our analysis of claim 12. We find that Petitioner has

demonstrated that the combination of Dowling and Burrow teaches this limitation of claim 13.

Claim 14 recites "disposing the light emitting diode on one of the first angled wing and the second angled wing." Petitioner contends that the combination of Dowling and Burrow teaches this limitation for the reasons given in Petitioner's analysis of claim 6. Pet. 46 (citing Ex. 1008 ¶ 27, Figs. 10 and 11; Ex. 1003 ¶¶ 194–199). Patent Owner relies on its contentions presented for claims 12 and 13. PO Resp. 36–37 (citing Ex. 2076 ¶ 498). We disagree with Patent Owner for the reasons given in our analysis of claim 12. We find that Petitioner has demonstrated that the combination of Dowling and Burrow teaches this limitation of claim 14.

Having considered all the evidence and arguments of record, we conclude that Petitioner has demonstrated, by a preponderance of the evidence, that the combination of Dowling and Burrow teaches or suggests the limitations of claims 13 and 14 to a person of ordinary skill and that claims 13 and 14 would have been obvious to a person of ordinary skill.

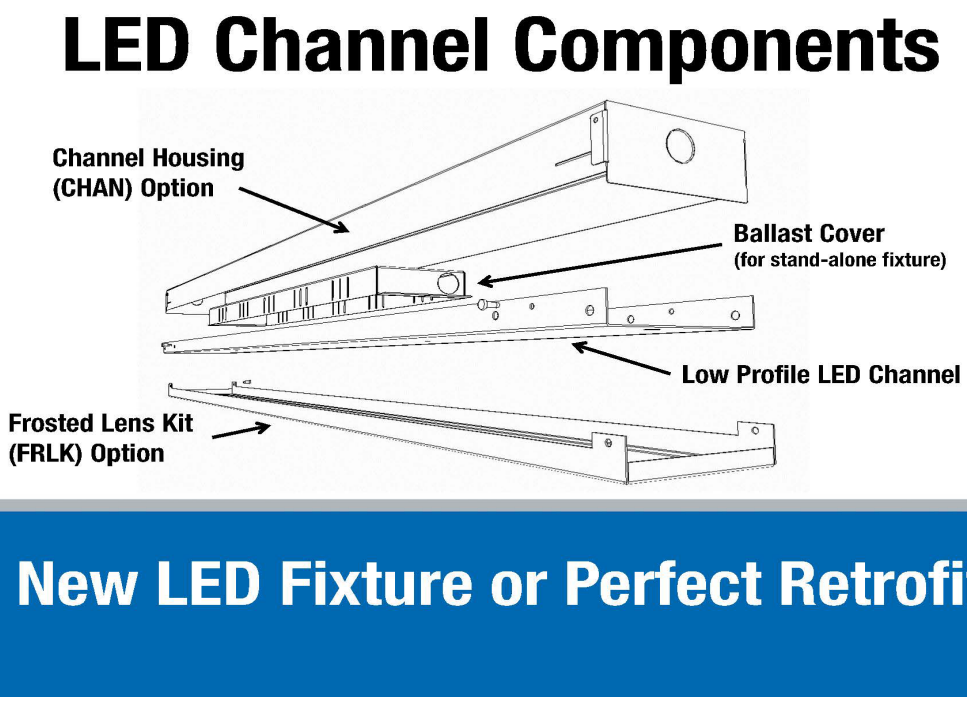
D. Asserted Obviousness over ILP Retrofit

Petitioner contends that claims 1–5, 8, 9, 11, and 12 would have been obvious over ILP Retrofit. Pet. 48–65.

1. ILP Retrofit (Exs. 1009–1011, 1032)

Exhibit 1011 is a video entitled "Low Profile Channel LED Fixture or Retrofit." Pet. x. Exhibit 1010 is a set of screenshots of the video of Exhibit 1011. *Id.* Exhibit 1032 is a transcript of the video of Exhibit 1011. *Id.* at xi. Exhibit 1009 is a set of webinar slides entitled "Low Profile Channel LED Fixture or Retrofit." *Id.* We refer to these exhibits collectively as "ILP Retrofit."

ILP Retrofit discloses an LED lighting product designed to retrofit a ceiling-mounted fluorescent lighting fixture. Slide 5 of Exhibit 1009 is reproduced below:



Slide 5 above shows components of the ILP Retrofit product, including a low profile LED channel that includes LEDs positioned on a side of a light panel opposite the previous light fixture and a lens. Ex. 1009, 5.

2. Analysis of Ground 2

Independent Claim 1

The preamble of claim 1 recites a "combination for illuminating the interior of a building, comprising." Petitioner contends that ILP Retrofit discloses the preamble in describing an LED retrofit and that a person of ordinary skill would have understood that its purpose is to light the interior of a building. Pet. 49 (citing Ex. 1011, 6:25; Ex. 1010, 28; Ex. 1009, 8; Ex. 1003 ¶¶ 200–202). To the extent that the preamble is limiting, we find that ILP Retrofit teaches the preamble.

Claim 1 recites "a fixture having a base attached to a building ceiling, the fixture having a first tombstone and a second tombstone, wherein the first and second tombstones are adapted to receive between them a linear fluorescent light tube, and wherein the base includes a first longitudinal side and an opposite second longitudinal side." Petitioner contends that ILP Retrofit discloses this limitation in describing an LED lighting device used to retrofit ceiling light fixtures having a base and having first and second tombstones, wherein the tombstones are adapted to receive between them a fluorescent light tube. Pet. 50–51 (citing Ex. 1011, 6:59, 6:25; Ex. 1010, 30, 28; Ex. 1009, 9, 8; Ex. 1003 ¶¶ 203–204).

Patent Owner, relying on testimony of Dr. Bretschneider, contends that the cove lighting embodiment of ILP Retrofit does not attach to a ceiling, but rather, attaches to a wall and directs light upward to the ceiling and the upper wall. PO Resp. 40–41 (citing Ex. 1011, 6:59, Ex. 1010, 30; Ex. 1009, 9; Ex. 2076 ¶¶ 509–511). Petitioner also contends that ILP Retrofit included other embodiments used with fixtures attached to a ceiling, which Dr. Bretschneider does not dispute. *Id.* (citing Ex. 1011, 6:25; Ex. 1010, 28; Ex. 1009, 8); *see* Ex. 1036 ¶ 79. We rely on Dr. Ducharme's testimony in finding that ILP Retrofit includes embodiments used with fixtures attached to a ceiling. Ex. 1036 ¶ 79; *see* Ex. 1003 ¶ 122 ("The ILP Retrofit teaches an LED lighting product designed to retrofit a ceiling-mounted fluorescent lighting fixture." (citing Ex. 1010, 19)). Dr. Ducharme's testimony is consistent with ILP Retrofit's depiction of a retrofit kit attached to a housing above it (i.e., a ceiling housing) and with LEDs directing light down through a lens cover. Ex. 1010, 19; Ex. 1009, 5.

Patent Owner contends that all embodiments other than the cove lighting embodiment disclosed by ILP Retrofit do not show tombstones. PO

Resp. 41 (citing Ex. 2076 ¶¶ 507–508, 512–515). Patent Owner contends that ILP expressly teaches removing tombstones and that Petitioner has not provided a reason for a person of ordinary skill to modify the fixture of ILP Retrofit to leave the tombstones in place. *Id.* (citing Ex. 1032, 6:13–24; Ex. 2076 ¶ 514). However, Petitioner acknowledges that ILP Retrofit teaches removing tombstones and provides reasons for a person of ordinary skill to leave the tombstones in place, as we discuss in our analysis of the next limitation. *See* Pet. 12–14, 52–53. Therefore, we disagree with Patent Owner for the reasons given in our analysis of the next limitation.

Patent Owner contends that Petitioner has not identified the base of the fixture. PO Resp. 41 (citing Ex. 2076 ¶¶ 516–517). Petitioner contends that Slide 8 of Exhibit 1009 discloses that the retrofit kit "[e]asily installs into an [e]xisting [c]hannel [h]ousing." Pet. Reply 17–18 (citing Ex. 1009, 8; Ex. 1036 ¶ 82) (emphasis omitted, first alteration in original); *see* Pet. 50–51 (citing Ex. 1009, 8). In addition, Petitioner identifies the base of the fixture as shown in modified Slide 5 of Exhibit 1009. Pet. 52 (citing Ex. 1009, 5; Ex. 1003 ¶¶ 203–204). We agree with Petitioner that the Petition identifies the base of the fixture for the reasons given by Petitioner and Dr. Ducharme. We find that Petitioner has demonstrated that ILP Retrofit teaches this limitation of claim 1.

Claim 1 recites "a retrofit kit connected to the base, the retrofit kit including a light panel, a first profile and a second profile, the light panel including a first side facing the fixture and an opposite second side, wherein the light panel, the first profile, and the second profile extend longitudinally from the first tombstone to the second tombstone and parallel one-to-another." Petitioner contends that ILP Retrofit discloses this limitation in describing a retrofit kit connected to a base, where the retrofit kit includes a

light panel as shown in Slide 5 of Exhibit 1009. Pet. 52 (citing Ex. 1009, 5; Ex. 1010, 19; Ex. 1011, 4:12).

Petitioner contends that although ILP Retrofit teaches removal of the tombstones prior to installation of the retrofit kit, ILP Retrofit does teach that the retrofit kit extends from where the first tombstone resided to where the second tombstone resided. Pet. 53. Petitioner contends that a person of ordinary skill, in deciding whether to remove the tombstones or to leave the tombstones in place, would have considered whether leaving the tombstones in place would reduce labor costs, reduce installation time, and reduce costs of disposing of hazardous materials. *Id.* at 12–14 (citing Ex. 1003 ¶¶ 72–73, 81–82; Ex. 1005, 1:64–2:2, 2:6–17, Fig. 11; Ex. 1006; Ex. 1007; Ex. 1013); *see id.* at 53 (citing Pet. 12–14). Petitioner contends that a person of ordinary skill in the art would have modified the depth of the LED channel to accommodate the height of the tombstones by increasing the length of the profiles and would have done so using ordinary skill and common tools available at the time of invention. *Id.* at 53 (citing Ex. 1003 ¶¶ 205–207).

Patent Owner, relying on the testimony of Dr. Bretschneider, contends that ILP Retrofit does not disclose a retrofit kit as it is known to a person of ordinary skill. PO Resp. 41–42 (citing Ex. 2076 ¶¶ 531–534). According to Patent Owner, the embodiments of ILP Retrofit are replacement fixtures, even when used with an existing housing. *Id.* at 42 (citing Ex. 1032, 3:16–3:43; Ex. 2076 ¶ 365); *see id.* at 15–16. Patent Owner argues that, "based on the definition provided by the foremost industry safety standards organization [Designlights Consortium (DLC)], an LED retrofit is a physical or electrical modification of an existing lighting fixture to provide an LED light source." PO Resp. 4 (citing Ex. 2076 ¶¶ 162–174; Ex. 2036, 14). Dr. Bretschneider relies on the Designlight Consortium's (DLC's) definition of

retrofit, which excludes tube replacements, to support his testimony. Ex. 2076 ¶ 163 (citing Ex. 2036, 14). The "DCL defines 'retrofit kits' for troffers as products that require physical or electrical alterations to the existing fixture." Ex. 2036, 15.

We disagree with Patent Owner's construction of retrofit kit. In construing the claim term "retrofit kit," Patent Owner relies on "extrinsic evidence," which "is less significant than the intrinsic record in determining the legally operative meaning of the claim language." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1317 (Fed. Cir. 2005) (en banc). Dr. Bretschneider does not address the intrinsic evidence, including the claim and the specification, in construing the claim term "retrofit kit." Turning to the intrinsic evidence, "the claims of a patent define the invention to which the patentee is entitled the right to exclude." *Phillips*, 415 F.3d at 1312. Here, claim 1 recites "the retrofit kit including," then recites the elements of the retrofit kit, namely, "a light panel, a first profile and a second profile." The claim does not recite any limitation of the retrofit kit that requires physical or electrical alterations to the existing fixture. *See id.* ("if we once begin to include elements not mentioned in the claim, in order to limit such claim . . ., we should never know where to stop").

Further, "claims must be read in view of the specification, of which they are a part." *Id.* at 1315. "[T]he specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term." *Id.* The specification discloses that the "invention is directed toward a ceiling light LED retrofit kit; more specifically, a kit for installation of light emitting diode lighting mounted upon a previously-installed fluorescent lighting fixture." Ex. 1001, 1:14–17. Thus, the specification does not define a retrofit kit as a product

that requires physical or electrical alterations to the existing structure, but rather, discloses the "invention" of a "retrofit kit" as "a kit for installation of light emitting diode lighting mounted upon a previously-installed fluorescent lighting fixture." *Id.*

To the extent that certain embodiments in the specification make physical or electrical alterations to the existing structure, the specification discloses that "[r]eference will now be make in detail to the presently preferred embodiments of the invention, one or more examples of which are illustrated in the drawings. Each example is provided by way of explanation of the invention, and not by way of limitation of the invention." Ex. 1001, 3:11–15; *see id.* at 5:64–6:3. Further, 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*, 415 F.3d at 1323 ("[C]laims may embrace different subject matter than is illustrated in the specific embodiments in the specification."). The intrinsic evidence indicates that the patentee intended the scope of "retrofit kit" to encompass more than a fixture that requires physical or electrical alterations. Given that neither the claim nor the specification requires physical or electrical alterations to the existing fixture, we decline to read such limitations into the claim.

Further, the extrinsic evidence provided by ILP Retrofit discloses "[t]he [p]erfect LED Retrofit Kit" that "[e]asily [i]nstalls into an [e]xisting [c]hannel [h]ousing for the [p]erfect LED [r]etrofit." Ex. 1009, 8; *see Vitronics*, 90 F.3d at 1584. Dr. Ducharme testifies that when "one desires to replace the light fixture," one option is to "convert the existing light fixture

into a more efficient lighting fixture," which "is known as retrofitting." Ex. 1003 ¶ 52. Dr. Ducharme's testimony and the prior art are both consistent with the meaning of retrofit kit as used in the '041 patent. Given that the extrinsic evidence provided by Dr. Bretschneider is inconsistent with both the intrinsic evidence and the extrinsic evidence provided by ILP Retrofit and Dr. Ducharme, we rely on the intrinsic evidence in finding that ILP Retrofit teaches a "retrofit kit" within the scope of claim 1.

Patent Owner, relying on the testimony of Dr. Bretschneider, contends that a person of ordinary skill would have understood that leaving the tombstones in place would interfere with the low profile of the devices of ILP Retrofit. PO Resp. 42 (citing Ex. 2076 ¶¶ 520–526). Patent Owner contends that a person of ordinary skill would have understood that removing tombstones would be quick and easy, and would improve the aesthetics of the overall assembly. *Id.* However, neither Patent Owner nor Dr. Bretschneider address Dr. Ducharme's testimony, that a person of ordinary skill would weigh the benefits of removing the tombstones against the benefits of leaving the tombstones in place when deciding whether to remove the tombstones. Ex. 1003 ¶¶ 72–73; *see id.* ¶¶ 74–85. "[A] given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine." *Medichem*, 437 F.3d at 1165. "Instead, the benefits, both lost and gained, should be weighed against one another." *Id.* We rely on the testimony of Dr. Ducharme in finding that when the benefits of leaving the tombstones in place outweigh the benefits of removing them, a person of ordinary skill would leave the tombstones in place.

Patent Owner, relying on the testimony of Dr. Bretschneider, contends that the claim requires a base of a preexisting fixture, and that the base of the

channel housing embodiment of ILP Retrofit is a new ceiling fixture. PO Resp. 42–44 (citing Ex. 2076 ¶¶ 526–530). Patent Owner further contends that the channel housing option would not come with tombstones installed, because it is a new device. *Id.* at 44 (citing Ex. 2076 ¶ 526); PO Sur-Reply 8–11 (citing Ex. 2076 ¶¶ 354–403, 509–527). Petitioner, relying on the testimony of Dr. Ducharme, contends that ILP Retrofit discloses that the "Perfect LED Retrofit Kit easily installs into an existing channel housing." Pet. Reply 17–18 (citing Ex. 1009, 8; Ex. 1011, 6:25; Ex. 1010, 28; Ex. 1036 ¶ 82) (cleaned up). We have considered the conflicting testimonies of Dr. Bretschneider and Dr. Ducharme. We agree with Dr. Ducharme that the channel housing does include a base of a preexisting fixture because this testimony is supported by the explicit disclosure of ILP Retrofit, which describes that "the perfect LED retrofit kit easily installs into an existing channel housing." Ex. 1036 ¶ 82; Ex. 1009, 8; *see* Ex. 1032, 0:13 ("this is a . . . retrofit."), 1:01–1:08 ("this product is appropriate for . . . retrofitting."), 1:12–1:20, 4:13–4:28, 6:09–6:51, 8:40. We also agree with Dr. Ducharme, that the preexisting fixture would have included tombstones which a person of ordinary skill would not remove in certain circumstances. Ex. 1036 ¶ 83. We find that Petitioner has demonstrated that ILP Retrofit teaches this limitation of claim 1.

Claim 1 recites "the fixture, including the first and second tombstones, residing above the light panel and residing between the first profile and the second profile." Petitioner contends that ILP Retrofit discloses this limitation in describing the fixture residing above the light panel and between the profiles. Pet. 54–55 (citing Ex. 1011, 6:25, 6:37; Ex. 1032, 6:25, 6:37; Ex. 1010, 28, 29; Ex. 1009, 8). Petitioner contends that had the tombstones not been removed, the fixture and unremoved tombstones would

reside between the first and second profiles. *Id.* at 55 (citing Ex. 1003 ¶ 208). We find that Petitioner has demonstrated that ILP Retrofit teaches this limitation of claim 1.

Claim 1 recites "a light entitling diode disposed on the second side of the light panel." Petitioner contends that ILP Retrofit discloses LEDs residing on the second side of the light panel. Pet. 55–56 (citing Ex. 1011, 2:16; Ex. 1010, 13; Ex. 1009, 4; Ex. 1003 ¶¶ 209–210). We find that Petitioner has demonstrated that ILP Retrofit teaches this limitation of claim 1.

Claim 1 recites "wiring in electrical communication with the light emitting diode." Petitioner contends that ILP Retrofit discloses this limitation in describing wiring in connection with the light emitting diodes. Pet. 56 (citing Ex. 1011, 8:58; Ex. 1010, 36; Ex. 1009, 11; Ex. 1003 ¶¶ 211–212). We find that Petitioner has demonstrated that ILP Retrofit teaches this limitation of claim 1.

Having considered all the evidence and arguments of record, we conclude that Petitioner has demonstrated, by a preponderance of the evidence, that ILP Retrofit and the knowledge of a person of ordinary skill, would have taught or suggested the limitations of claim 1 to a person of ordinary skill and that claim 1 would have been obvious to a person of ordinary skill.

Dependent Claims 2–5, 8, 9, and 11

Claim 2 recites "the first profile extends from the light panel to the first longitudinal side and is attached to the first longitudinal side." Claim 3 recites "the second profile extends from the light panel to the second longitudinal side and is attached to the second longitudinal side." Petitioner contends that ILP Retrofit discloses these limitations in describing that the

first and second profiles of the retrofit kit attach to first and second longitudinal sides of the fixture base. Pet. 57–58 (citing Ex. 1011, 4:12, 6:25–37; Ex. 1010, 19; Ex. 1009, 5; Ex. 1003 ¶¶ 213–216).

Patent Owner relies on its contentions presented in Patent Owner's analysis of claim 1. PO Resp. 44–45 (citing Ex. 2076 ¶¶ 541–542). We disagree with Patent Owner for the reasons given in our analysis of claim 1. We find that Petitioner has demonstrated that ILP Retrofit teaches the limitations of claims 2 and 3.

Claim 4 recites "the first profile, second profile, light panel, and base define therebetween a raceway, wherein the wiring resides in the raceway." Petitioner contends that ILP Retrofit discloses this limitation in describing a raceway where electrical connections are made when the profiles are attached to the longitudinal sides of the pre-existing base. Pet. 58 (citing Ex. 1011, 4:12; Ex. 1010, 19; Ex. 1009, 5; Ex. 1003 ¶¶ 217–218). Patent Owner relies on its contentions presented in Patent Owner's analysis of claim 1. PO Resp. 45 (citing Ex. 2076 ¶ 543). We disagree with Patent Owner for the reasons given in our analysis of claim 1. We find that Petitioner has demonstrated that ILP Retrofit teaches this limitation of claim 4.

Claim 5 recites "a lens attached to the light panel proximate to the second side and distal to the fixture." Petitioner contends that ILP Retrofit discloses this limitation in describing a frosted lens that attaches to the light panel proximate to the second side and distal to the fixture. Pet. 59–60 (citing Ex. 1011, 5:30; Ex. 1010, 25; Ex. 1009, 7; Ex. 1003 ¶¶ 219–220).

Patent Owner contends that a person of ordinary skill would not have added the frosted lens to the retrofit kit because the lens was not safety certified and did not undergo standardized efficiency testing. PO Resp. 45 (citing Ex. 2076 ¶¶ 545–551), 50–51 (citing Ex. 2076 ¶¶ 581–586); PO Sur-

Reply 11–12 (citing Ex. 2076 ¶¶ 125–130, 203–211, 365, 382–403, 546). Patent Owner contends that a person of ordinary skill would have understood that the lens would reduce efficiency, reduce light output, and add to the operating cost of the retrofit kit. PO Resp. 45.

We disagree with Patent Owner. Given that the '041 patent does not disclose techniques to address safety issues, reduced efficiency, or increased operating costs when attaching the lens to the light panel, we find that such techniques were within the level of ordinary skill. *In re Epstein*, 32 F.3d at 1568; *In re Fox*, 471 F.2d at 1407; *see* Ex. 1036 ¶ 92. ILP Retrofit discloses that "the frosted lens kit installs over the top of the channel [and] diffuses the light." Ex. 1032, 5:33–5:40, *see id.* at 3:59–4:01 ("We have a frosted lens kit to go over the top of the LEDs."), 4:07–4:18 (The lens "diffuses the light and makes the fixture have a soft glow. . . . This product is appropriate for . . . retrofitting."). We agree with Dr. Ducharme, that a person of ordinary skill would have used the lens of ILP Retrofit to diffuse the light and make the fixture have a soft glow such that the light is more delicate on the eyes as taught by ILP Retrofit. Ex. 1036 ¶ 86. We find that Petitioner has demonstrated that ILP Retrofit teaches this limitation of claim 5.

Claim 8 recites "the first profile, the second profile, and the light panel are integral." Claim 9 recites "the first profile, the second profile, and the light panel are connected to one another." Petitioner contends that ILP Retrofit discloses these limitations in describing a U-shaped structure in which the light panel and the first and second profiles are integral and are connected together. Pet. 60–61 (citing Ex. 1011, 4:12, Ex. 1010, 19; Ex. 1009, 5).

Patent Owner relies on its contentions presented in Patent Owner's analysis of claim 1. PO Resp. 45–46 (citing Ex. 2076 ¶¶ 552–553). We

disagree with Patent Owner for the reasons given in our analysis of claim 1. We find that Petitioner has demonstrated that ILP Retrofit teaches the limitations of claims 8 and 9.

Claim 11 recites "an endcap connected to the first profile, the second profile, and the light panel." Petitioner contends that ILP Retrofit discloses this limitation in describing that the channel housing and lens kit provide an end cap which connects to the first and second profiles and the light panel. Pet. 61–62 (citing Ex. 1011, 4:12, 6:27, 5:40, 6:37; Ex. 1010, 19, 28–29; Ex. 1009, 5, 7, 8; Ex. 1003 ¶¶ 235–236).

Patent Owner relies on its contentions presented in Patent Owner's analysis of claim 1. PO Resp. 46 (citing Ex. 2076 ¶ 554). We disagree with Patent Owner for the reasons given in our analysis of claim 1. We find that Petitioner has demonstrated that ILP Retrofit teaches this limitation of claim 11.

Having considered all the evidence and arguments of record, we conclude that Petitioner has demonstrated, by a preponderance of the evidence, that ILP Retrofit and the knowledge of a person of ordinary skill, would have taught or suggested the limitations of claims 2–5, 8, 9, and 11 to a person of ordinary skill and that claims 2–5, 8, 9, and 11 would have been obvious to a person of ordinary skill.

Independent Claim 12

The preamble of claim 12 recites a "method for retrofitting a ceiling fixture, comprising the steps of." Petitioner contends that ILP Retrofit discloses the preamble for the reasons given in its analysis of claim 1. Pet. 62 (citing Ex. 1003 ¶¶ 237–238). To the extent the preamble is limiting, we find that ILP Retrofit teaches the preamble.

Claim 12 recites "1) identifying a ceiling fixture having a pre-installed base with a first longitudinal side and a second longitudinal side." Petitioner contends that ILP Retrofit discloses this limitation for the reasons given in its analysis of claim 1. Pet. 62 (citing Ex. 1003 ¶¶ 239–240). We find that Petitioner has demonstrated that ILP Retrofit teaches this limitation of claim 12.

Patent Owner contends that the claimed base is the base of a preexisting fluorescent fixture, not the base of a newly installed fixture. PO Resp. 47. Patent Owner, relying on the testimony of Dr. Bretschneider, contends that the channel housing embodiment of ILP Retrofit relied on by Petitioner is a new fixture, not a preexisting fixture as required by claim 12. *Id.* (citing Ex. 2076 ¶¶ 555–560). We disagree with Patent Owner and Dr. Bretschneider. As we discussed in our analysis of claim 1, we agree with Dr. Ducharme that the channel housing does include a base of a preexisting fixture because this testimony is supported by the explicit disclosure of ILP Retrofit, which describes that "the perfect LED retrofit kit easily installs into an existing channel housing." Ex. 1036 ¶¶ 88–91; Ex. 1009, 8; *see* Ex. 1032, 0:13 ("this is a . . . retrofit."), 1:01–1:08 ("this product is appropriate for . . . retrofitting."), 1:12–1:20, 4:13–4:28, 6:09–6:51, 8:40.

Patent Owner, relying on the testimony of Dr. Bretschneider, contends that a person of ordinary skill would not use the channel housing embodiment of ILP Retrofit because this embodiment has not been submitted for safety certification and efficiency testing. PO Resp. 47 (citing Ex. 2076 ¶¶ 203–225, 561). We disagree with Patent Owner. As we discussed in our analysis of claim 5, the '041 patent does not disclose techniques to address safety issues or efficiency testing. *See* Ex. 1036 ¶ 92. Therefore, we find that such techniques were within the level of ordinary

skill. *In re Epstein*, 32 F.3d at 1568; *In re Fox*, 471 F.2d at 1407. We find that Petitioner has demonstrated that ILP Retrofit teaches this limitation of claim 12.

Claim 12 recites "2) providing a ceiling light LED retrofit kit adapted to conceal the pre-installed base, the ceiling light LED retrofit kit comprising: a first profile, an opposing second profile, a light panel disposed between the first profile and the opposing second profile, a light emitting diode, and a lens." Petitioner contends that ILP Retrofit discloses this limitation in describing a retrofit kit that attaches to a pre-installed base to conceal the base, where the retrofit kit includes first and second opposing profiles, a light panel between the profiles, and a lens. Pet. 63 (citing Ex. 1011, 4:12; Ex. 1010, 19; Ex. 1009, 5; Ex. 1003 ¶¶ 241–242).

Patent Owner contends that a person of ordinary skill would not use the frosted lens disclosed by ILP Retrofit, because the lens would reduce efficiency, create safety issues, reduce light output, and add to operating cost. PO Resp. 48 (citing Ex. 2076 ¶¶ 568–570). We disagree with Patent Owner for the reasons given in our analysis of claim 5. We find that Petitioner has demonstrated that ILP Retrofit teaches this limitation of claim 12.

Claim 12 recites "3) connecting the first profile to the first longitudinal side, and the second profile to the second longitudinal side of the pre-installed base." Petitioner contends that ILP Retrofit discloses this limitation for the reasons given in its analysis of claims 2 and 3. Pet. 64 (citing Ex. 1003 ¶¶ 243–244). We find that Petitioner has demonstrated that ILP Retrofit teaches this limitation of claim 12.

Claim 12 recites "4) connecting the light emitting diode to the light panel." Petitioner contends that ILP Retrofit discloses this limitation for the

reasons given in its analysis of claim 1. Pet. 64–65 (citing Ex. 1011, 2:16; Ex. 1010, 13; Ex. 1009, 4; Ex. 1003 ¶¶ 245–246). We find that Petitioner has demonstrated that ILP Retrofit teaches this limitation of claim 12.

Claim 12 recites "5) covering the light panel with the lens." Petitioner contends that ILP Retrofit discloses this limitation for the reasons given in its analysis of claim 1. Pet. 65 (citing Ex. 1003 ¶¶ 247–248); *see* Ex. 1011, 4:12; Ex. 1010, 19, Ex. 1019, 5. Patent Owner contends that ILP Retrofit does not teach this limitation for the reasons given in Patent Owner's analysis of claim 5. PO Resp. 49 (citing Ex. 2076 ¶¶ 575–578). We find that Petitioner has demonstrated that ILP Retrofit teaches this limitation of claim 12.

Having considered all the evidence and arguments of record, we conclude that Petitioner has demonstrated, by a preponderance of the evidence, that ILP Retrofit and the knowledge of a person of ordinary skill, would have taught or suggested the limitations of claim 12 to a person of ordinary skill and that claim 12 would have been obvious to a person of ordinary skill.

E. Asserted Obviousness over Plunk, Sun, and Chan

Petitioner contends that claims 1–14 would have been obvious over Plunk, Sun, and Chan. Pet. 65–91.

Given that we find claims 1–14 unpatentable for the reasons given in our analysis of grounds 1 and 2, we do not reach the issue of whether claims 1–14 are also unpatentable for the reasons given in ground 3.

III. ANALYSIS OF THE CONTINGENT MOTION TO AMEND

In *Aqua Products, Inc. v. Matal*, 872 F.3d 1290 (Fed. Cir. 2017), the Federal Circuit addressed the burden of persuasion that the Board applies when considering the patentability of substitute claims presented in a motion

to amend filed under 35 U.S.C. § 316(d) in an *inter partes* review. The lead opinion concludes with the following:

> The only legal conclusions that support and define the judgment of the court are: (1) the PTO has not adopted a rule placing the burden of persuasion with respect to the patentability of amended claims on the patent owner that is entitled to deference; and (2) in the absence of anything that might be entitled to deference, the PTO may not place that burden on the patentee.

Aqua Prods., 872 F.3d at 1327.

In accordance with *Aqua Products*, Patent Owner does not bear the burden of persuasion to demonstrate the patentability of substitute claims presented in a motion to amend. Rather, the burden of persuasion ordinarily will lie with Petitioner to show that any proposed substitute claims are unpatentable by a preponderance of the evidence. The Board itself also may justify any finding of unpatentability by reference to evidence of record in the proceeding under limited circumstances, for example, when a Petitioner ceases to participate. *Hunting Titan, Inc. v. DyanEnergetics Europe GmbH*, IPR2018-00600, Paper 67, 25–26 (PTAB July 6, 2020) (precedential) (explaining that the Board may raise grounds of unpatentability not raised, or insufficiently developed by, a petitioner "for example, where the petitioner ceased to participate in the proceeding"). Ultimately, the Board determines whether substitute claims are unpatentable by a preponderance of the evidence based on the entirety of the record, including any opposition made by the Petitioner. *See Lectrosonics, Inc. v. Zaxcom, Inc.*, Case IPR2018-01129, -01130, Paper 15 at 4 (PTAB Feb. 25, 2019) (precedential).

Patent Owner proposes cancelling challenged claims 1–14 and substituting claims 15–28. Mot. 1. Substitute claim 15 is reproduced below.

15. A combination for illuminating the interior of a building, comprising:

a fixture having a base attached to a building ceiling, the fixture having a first tombstone and a second tombstone, wherein the first and second tombstones are adapted to receive between them a linear fluorescent light tube, and wherein the base includes a first longitudinal side and an opposite second longitudinal side;

a retrofit kit connected to the base, the retrofit kit including a light panel, a first profile and a second profile, the light panel including a first side facing the fixture and an opposite second side, wherein the light panel, the first profile, and the second profile extend longitudinally from the first tombstone to the second tombstone and parallel one-to-another;

the fixture, including the first and second tombstones, residing above the light panel and residing between the first profile and the second profile;

a light emitting diode disposed on the second side of the light panel; and

wiring in electrical communication with the light emitting diode,

wherein the wiring of the retrofit kit is adapted for series electrical connection to a second retrofit kit.

A. Whether the Substitute Claims Contain New Matter

Petitioner contends that substitute claims 23 and 28 contain new subject matter. Opp. 3–5; *see* 35 U.S.C. § 316(d)(3); 37 C.F.R. § 42.121(a)(2)(ii).

Proposed substitute claim 23 recites the "wiring is so adapted for making said electrical connection without the required assistance of a licensed electrician," and proposed substitute claim 28 recites that a step of method claim 26 "does not require the assistance of a licensed electrician." Mot. 5, App'x A-6–A-7. Patent Owner cites to paragraphs 5 and 6 of the '295 application, in addition to paragraph 37. *See id.* at 7. Paragraphs 5 and

6 disclose that known methods of converting fluorescent lighting to LED lighting "require intensive use of skilled electricians" to wire the device and that it would be desirable to "reduce the need for skilled electrician efforts." Ex. 1004 ¶¶ 5–6. Patent Owner also cites to paragraphs 6 and 7 of the '447 application that include the same disclosure. *See* Mot. 7; Ex. 1002, 25 ¶¶ 6–7.

Petitioner argues that the original application refers to a "skilled electriciaan" and not a "licensed electrician." Opp. 3–4 (citing Ex. 1002, 25 ¶¶ 6–7, 32 ¶¶ 46, 48). Instead, Petitioner argues that "the disclosure lacks the term 'licensed electrician,' lacks a definition of 'licensed electrician,' and lacks an explanation of what type of electrical connection would be allowed without the assistance of a licensed electrician." *Id.*; Ex. 1035 ¶¶ 76–79) (emphasis omitted). Accordingly, Petitioner argues that the original application does not support proposed substitute claims 23 and 28. *See id.*

We are persuaded by Petitioner's argument. The '295 and '447 applications describe a "skilled" electrician, not a "licensed" electrician. Patent Owner does not show that one of ordinary skill in the art would interpret these to be equivalent. Accordingly, we find that proposed substitute claims 23 and 28 adds new matter. Proposed substitute claim 24 depends from claim 23 and thus includes the same new matter.

B. Whether the Substitute Claims are Indefinite

Petitioner asserts that "substitute claims 23 and 28 fail to inform, with reasonable certainty, what it means for the referenced wiring to be 'so adapted for making said electrical connection without the required assistance of a licensed electrician' (substitute claim 23) or such that it 'does not require the assistance of a licensed electrician' (substitute claim 28)." Opp. 5 (emphasis omitted). Petitioner asserts that the original applications do not

disclose or provide insight as to a licensed electrician as opposed to a skilled electrician. *See id.* (citing Ex. 1002, 25 ¶¶ 6–7). Petitioner's declarant, Dr. Ducharme, attests that a "licensed electrician is an individual who has obtained a license from a regulatory authority such as a state or local government." Ex. 1035 ¶ 85. The licensing standards set forth "differ depending upon a given industry" and "change over time." *Id.* Accordingly, Petitioner asserts that "one skilled in the art is left to speculate as to what type of electrical wirings require a licensed electrician and which do not — there is no reasonable certainty of the scope of the claimed invention, as the standard requires." Opp. 5–6 (citing *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014)).

We are persuaded by Petitioner's argument that proposed substitute claims 23 and 28 are indefinite. Specifically, we agree that there is no reasonable certainty as to the definition of a licensed electrician, nor how to adapt wiring for series connection without the required assistance of a licensed electrician. Accordingly, we find that proposed substitute claims 23 and 28 are indefinite. Proposed substitute claim 24 depends from claim 23 and thus includes the same indefinite limitation.

C. Whether the Substitute Claims Would Have Been Obvious

Petitioner contends that the proposed substitute claims are unpatentable under the following grounds:

(1) Dowling, Burrow, and McCane[4] as to claims 15–24 and 26–28[5]; and

[4] U.S. Patent Application Publication No. 2015/0362132 A1, published December 17, 2015 (Ex. 1033, "McCane").

[5] Although the heading on page 15 states that claims 16-22, 24, and 27 are obvious in view of Dowling and McCane, the substantive analysis states that

(2) Dowling, Burrow, McCane and Carney[6] as to claim 25.

Opp. 8–19.

1. McCane

McCane discloses a retrofit kit for retrofitting an LED light engine into an existing light fixture housing. Ex. 1033, [57]. McCane discloses that the retrofit kit includes a hook bracket mounted in the housing in order to suspend an end of the engine in order to permit an installer to electrically connect the engine. *Id.* McCane discloses that the retrofit kit also includes a mounting bracket to secure the free end of the engine into the housing after the engine has been rotated into the housing. *Id.*

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the claims are unpatentable for reasons given in the Petition, and cite to the Petition's discussion of ground 1, which is based on Dowling and Burrow. Thus, we find that the heading on page 15 is harmless error. Similarly, we find the heading on page 16 is also harmless error.

[6] U.S. Patent Application Publication No. 2014/0177209 A1, published June 26, 2014 (Ex. 1034, "Carney").

Figure 11 of McCane is reproduced below.

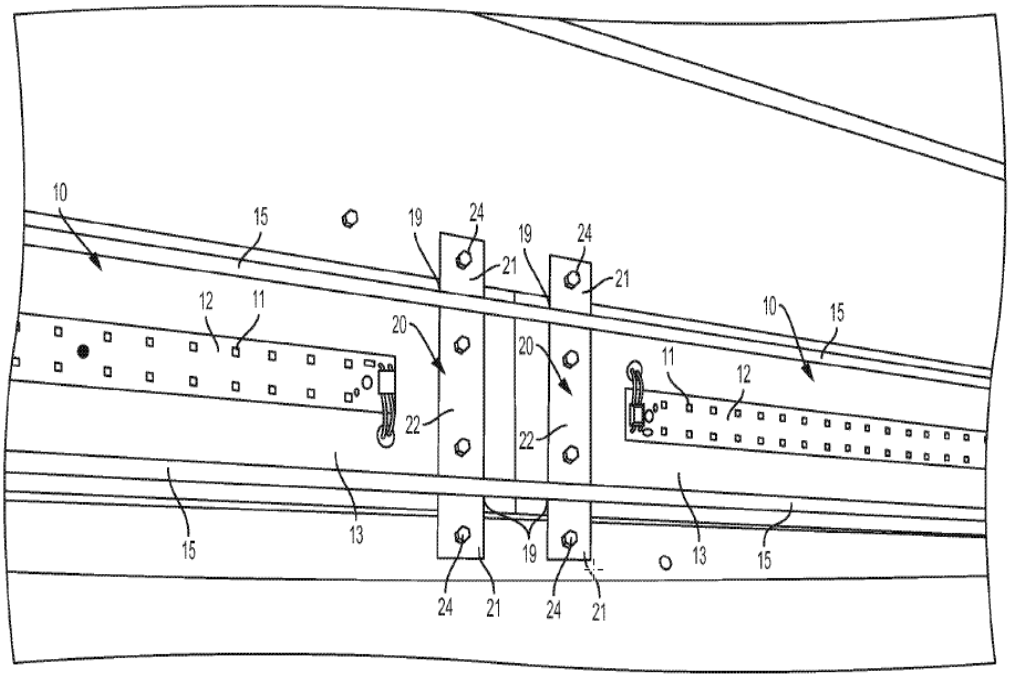


FIG. 11

Figure 11 above shows a bottom perspective view of multiple light engines installed in a light fixture housing. Ex. 1033 ¶ 22. Figure 11 shows printed circuit boards (PCBs) 12 populated with a plurality of LEDs 11. *Id.* ¶ 28. Each PCB can have wiring for connecting to a power supply, which can be shared between PCBs 12, or each PCB can have its own power supply. *Id.* McCane discloses that in certain embodiments, multiple retrofit kits may be necessary such that multiple light engines 10 are installed in a series arrangement (i.e., end-to-end) within the housing, such as shown in Figure 11. *Id.* ¶¶ 39, 47.

2. Obviousness of Substitute Claims 15–24 and 26–28

Independent Claims 15 and 26

Substitute claim 15 recites the limitations of original claim 1, and adds the limitation "wherein the wiring of the retrofit kit is adapted for series

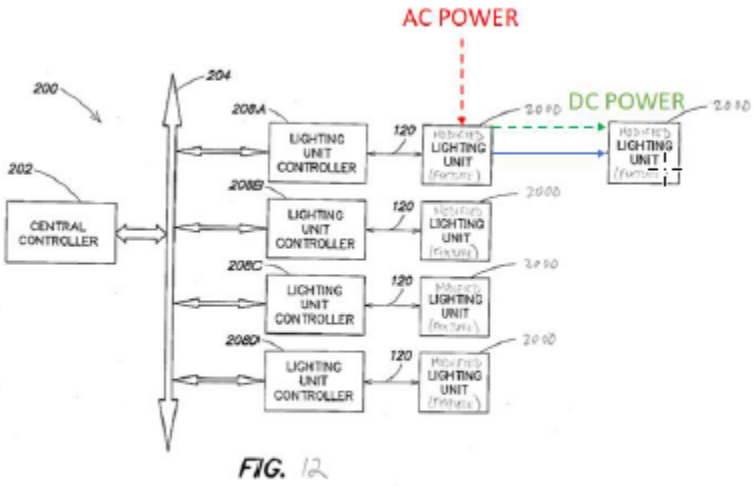
electrical communication." Petitioner contends that the limitations in proposed claim 15 found in original claim 1 are taught by the combination of Dowling and Burrow for the reasons given by Petitioner in its analysis of ground 1. Opp. 8 (citing Pet. 26–33; Ex. 1003 ¶¶ 125–146). We agree with Petitioner for the reasons given in our analysis of ground 1.

With respect to the language of proposed substitute claim 15 reciting "wherein the wiring of the retrofit kit is adapted for series electrical connection to a second retrofit kit," Petitioner asserts that Dowling teaches a serial connection between lighting units. Opp. 9 (citing Ex. 1035 ¶¶ 27–29). Petitioner asserts that even if this serial connection is for data communications, "Dowling's serial data communications require an electrical connection." *Id.* Petitioner asserts that "Dowling therefore renders the electrical-series limitations unpatentable as the claimed limitations are broadly written to include any form of serial electrical connection – including serial data electrical connections." *Id.* (citing Ex. 1035 ¶¶ 29–31). Petitioner further asserts that Dowling teaches connecting multiple LED retrofit kits to power, which, according to Petitioner, would be done in one of two ways—using an independent power supply for each kit or using a shared power supply for both kits. *Id.* at 10–11 (citing Ex. 1007 ¶ 114; Ex. 1035 ¶¶ 31–32). Petitioner asserts that "[a] POSITA would have underst[ood] and [would have] been motivated to use a shared power supply to both reduce cost and improve the overall control for [Dowling's] light fixture." *Id.* at 10 (citing Ex. 1035 ¶ 33). Likewise, Petitioner asserts that McCane discloses connecting two retrofit kits to a common power supply. *Id.* (citing Ex. 1035 ¶¶ 36–37; Ex. 1033 ¶¶ 28, 36).

Petitioner asserts a POSITA would have understood that there would have been two design choices to share a common power supply between

electrically connected retrofit kits: (1) series or (2) parallel. Opp. 11. "Given the limited design choices for providing an electrical connection, a POSITA would have understood and been motivated to try either or both choices." *Id.* (citing Ex. 1035 ¶¶ 34–35, 38–39). For example, Petitioner asserts that McCane "discloses multiple retrofit kits may be connected end-to-end in series." *Id.* at 6–7 (citing Ex. 1033 ¶¶ 39, 47). Specifically, McCane teaches that "multiple retrofit kits may be necessary such that multiple light engines 10 are installed in a series arrangement (i.e., end-to-end) within the housing 50." Ex. 1033 ¶ 39.

Petitioner further illustrates the series D/C power connection between two lighting fixtures in Dowling Figure 12, reproduced as modified below.



Ex. 1007, Fig. 12 (modified)

Opp. 13. Dowling Figure 12 shows a diagram of a networked lighting system including multiple modified lighting fixtures having LED-based retrofit subassemblies. Ex. 1007 ¶ 79. Lighting system 200 includes a central controller 202 connected via a generic connection, shown as up and down arrow 204, to multiple lighting unit controllers 208A–208D. *See id.*

¶¶ 122–123. Each lighting unit control 208 is connected to modified light fixtures 2000 via communication ports 120. *See id.*

Petitioner modified Figure 12 by adding second modified light fixture 2000 "attached" by a blue line to first modified light fixture 2000. *See* Opp. 12–13. Petitioner also modified Figure 12 by adding a first arrow for AC power directed to the first modified light fixture and a second arrow labeled DC power from the first to the second modified light fixture. *See id.* at 13–14 (citing Ex. 1035 ¶¶ 46–47). According to Petitioner, "given there are only two design choices (parallel or series) for electrical connection between two retrofit LED kits, a POSITA would have understood how and been capable of using either known method." *Id.* at 14.

Patent Owner contends that Dowling does not disclose multiple retrofitted fixtures connected in series. Mot. 10–11 (citing Ex. 2006 ¶¶ 232–236). We disagree with Patent Owner. We agree with Dr. Ducharme, that a person of ordinary skill would have understood that Figure 12 and its corresponding description in the specification teaches multiple retrofitted fixtures connected in series. Ex. 1035 ¶¶ 40–45. Dowling discloses that the disclosure of Figure 12 is not limited to one lighting fixture coupled to one lighting unit controller (LUC), "as different numbers of lighting fixtures may be coupled to a given LUC in a variety of different configurations," including serial connections. Ex. 1007 ¶ 122; Ex. 1035 ¶ 42. Further, we agree with Dr. Ducharme, that a person of ordinary skill would have understood that first and second lighting fixtures could be powered in either parallel or series. Ex. 1035 ¶ 43. Dr. Ducharme persuasively testifies that when providing AC power to one of the lighting fixtures that includes an AC-to-DC power supply, it would have been obvious to connect to the second lighting fixture in electrical series. *Id.* ¶ 44.

Patent Owner, relying on testimony of Dr. Bretschneider, argues that Dowling's serial connection refers "to the nature of data transfer for control and communication from Dowling's [lighting unit controllers] to each fixture, not with respect to its electrical wiring between fixtures." Mot. 11 (citing Ex. 2006 ¶¶ 236–253; Ex. 2011; Ex. 1007, Fig. 12) (emphasis omitted); Reply to Opp. 2 (citing Ex. 2111 ¶¶ 76–89). According to Patent Owner, the claim requires an electrical connection between a first and second retrofit where the first provides operating power to the second. Reply to Opp. 6 (citing Ex. 2111 ¶¶ 94–95). Petitioner responds that, even if Dowling refers to serial data communications connections, Dowling's data connections would still teach an electrical connection within the scope of the claim. Opp. 9 (citing Ex. 1035 ¶¶ 27–29; Ex. 2006 ¶ 251). We agree with Dr. Ducharme that the scope of wiring that is "adapted for series electrical connection to a second retrofit kit" is not limited to carrying electricity sufficient to power an LED retrofit, but instead, encompasses a connection that provides electricity in series. Ex. 1035 ¶¶ 29–31. We agree with Dr. Ducharme that Dowling's disclosure teaches an electrical connection because data communications involve electrical voltage and current between the retrofit kits. *Id.* ¶ 31; *see* Ex. 2006 ¶ 251. We also agree with Dr. Ducharme, that it would have been obvious to power the retrofit kits using a series connection because Dowling discloses powering multiple retrofit kits from one LUC, and using series connections with a shared power supply would have been one of two finite options. Ex. 1035 ¶¶ 32–45.

Patent Owner argues that a person of ordinary skill "would understand that modifying the fixture of Dowling to be physically or electrically connected in series to a second fixture would require significant physical and electrical modifications" and the resulting modified fixtures "would not

operate if they were connected in series." Mot. 11–12 (citing Ex. 2006 ¶¶ 249–253). Patent Owner argues that a person of ordinary skill "would not be motivated to modify the independent circuitry disclosed in Dowling to a series connection because of various shortcomings of series connections." *Id.* at 12 (citing Ex. 2006 ¶¶ 250–256). Patent Owner lists these shortcomings as: (1) failure of one fixture affects the subsequent fixtures, (2) other failure modes can occur, and (3) adding fixtures in series could decrease the brightness of each individual fixture. *Id.*; *see* Reply to Opp. 3–4 (citing Ex. 2111 ¶¶ 39–43, 59–75). According to Patent Owner, connecting a lighting fixture that includes a power supply in electrical series to a second lighting fixture would create safety hazards and unpredictable output. Reply to Opp. 6 (citing Ex. 2111 ¶¶ 96–99).

Petitioner, relying on the testimony of Dr. Ducharme, contends that a "POSITA would have understood that LED drivers could be — and were — designed to provide proper current and voltage to multiple LED devices," thereby avoiding reduced brightness. Opp. 14 (citing Ex. 1035 ¶¶ 47–48). Petitioner asserts that series connection was one of two well-known design choices to provide D/C power between light fixtures. *See id.* at 13.

We agree with Petitioner. The '041 patent does not disclose such shortcomings, complications, and safety hazards, nor does the '041 patent disclose any techniques for addressing these problems. In the absence of a specific description of such techniques in the '041 patent, we find that addressing problems when disposing light panels end to end in electrical series was within the knowledge of a person of ordinary skill. *In re Epstein*, 32 F.3d at 1568; *In re Fox*, 471 F.2d at 1407. We agree with Dr. Ducharme, that providing electrical data or power using a series connection between two retrofit kits was within the level of ordinary skill. Ex. 1035 ¶¶ 33, 47–

51. Further, we find that the advantages of using a single power supply to power multiple separate LED retrofit kits, such as reduced cost and increased control over the fixture, outweigh the disadvantages identified by Patent Owner. *See id.* ¶¶ 38, 47–48; *Medichem*, 437 F.3d at 1165 ("[A] given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.").

Patent Owner argues that a person of ordinary skill "would know that as of [Dowling's] filing date, LEDs were, in fact, less energy efficient than fluorescent lighting sources." Mot. 12 (citing Ex. 2006 ¶¶ 259–265; Ex. 2017, 9, 15; Ex. 2016, 15). Patent Owner argues that "[a] POSA would, therefore, not rely on Dowling given that the reference proposes a more expensive and less energy efficient lighting system." *Id.* Patent Owner contends that McCane discloses a series arrangement (i.e., end-to-end), which refers to the physical orientation of the retrofit kits, but does not disclose series electrical connections between devices. Reply to Opp. 6–7 (citing Ex. 2111 ¶ 108). As discussed above in the section addressing Petitioner's challenge to claim 1 based on Dowling and Burrow, we find that Dowling is analogous art and, therefore, is properly considered for obviousness.

We rely on the testimony of Dr. Ducharme in finding that both Dowling and McCane teach or suggest connecting LED light fixtures in electrical series. *See* Ex. 1007 ¶ 122; Ex. 1033 ¶¶ 39, 47; Ex. 1035 ¶¶ 10–11, 34–45). We also agree with Dr. Ducharme that both series and parallel electrical connections were well-known design options available to those of ordinary skill in the art at the time. *See* Ex. 1035 ¶¶ 34–35, 38, 43. In particular, we agree that there are two ways to connect devices to a common power source – in parallel and in series. *See Uber Technologies, Inc. v. X*

One, Inc., 957 F.3d 1334, 1341 (Fed. Cir. 2020) ("Even if the two proposed solutions would have required different implementation, that does not negate the fact that server-side and terminal-side plotting are two known, finite, predictable solutions for solving the same problem which, consistent with precedent, renders obvious the challenged limitation").

We find that a person of ordinary skill in the art would have adapted the electrical conductor of Dowling for series electrical connection to a second retrofit kit as taught by both Dowling and McCane to yield the predictable benefits of reduced cost and improved control of the lighting fixture. Ex. 1035 ¶ 33. We find that connecting one power supply in series to multiple LED retrofit kits as taught by Dowling and McCane is "the combination of familiar elements according to known methods" that "does no more than yield [the] predictable result[]" of providing power to multiple retrofit kits. *KSR*, 550 U.S. at 416; Ex. 1035 ¶ 33. We find that Petitioner has shown that the prior art teaches the limitations of substitute claim 15.

Patent Owner and Petitioner present similar contentions regarding independent substitute claim 26. *See* Mot. 9–13; Opp. 8–9. We agree with Petitioner and Dr. Ducharme, that the limitations of substitute claim 26 are taught by the prior art for the reasons given in our analysis for substitute claim 15, and for the reasons given in our analysis of claim 12. *See* Opp. 8–9 (citing Pet. 41, 43–46; Ex. 1003 ¶¶ 172–173, 177–189; Ex. 1035 ¶¶ 18–20, 27–28).

Dependent Claims 16–24, 27, and 28

Petitioner contends that the limitations recited in substitute claims 16–22, 24, and 27 which correspond to original claims 2–8, 10, and 13, are taught by the prior art for the reasons given in Petitioner's analysis of claims 2–8, 10, and 13. Opp. 15 (citing Pet. 33–43, 46; Ex. 1003 ¶¶ 147–172, 190–

193; Ex. 1035 ¶¶ 55–57). We agree with Petitioner for the reasons given in our analysis of claims 2–8, 10, and 14. We find that Petitioner has shown that the prior art teaches the limitations of substitute claims 16–22, 24, and 27.

Petitioner, relying on testimony of Dr. Ducharme, contends that substitute claim 23 which recites "without the required assistance of a licensed electrician," and substitute claim 28, which recites a similar limitation, are unpatentable because a person of ordinary skill, who is not a licensed electrician, would have been knowledgeable and capable of making the electrical connection as claimed. Opp. 16 (citing Ex. 1035 ¶¶ 59–60). We agree with Dr. Ducharme. We find that Petitioner has shown that the prior art teaches the limitations of substitute claims 23 and 28.

Patent Owner contends that commercial success and copying are two objective indicia of non-obviousness. Mot. 24–25. Patent Owner's arguments and evidence here are substantially the same as the its arguments in the Response, which we address above in the discussion of the challenges based on Dowling. *See* PO Resp. 64–65. For the reasons discussed above, Patent Owner has not demonstrated nexus.

We find that Petitioner has shown that the prior art teaches the limitations of substitute claims 16–24, 27, and 28. Having considered all the evidence and arguments of record, we conclude that Petitioner has demonstrated, by a preponderance of the evidence, that Dowling and Carney would have taught or suggested the limitations of substitute claims 16–24, 27, and 28 to a person of ordinary skill and that claims 16–24, 27, and 28 would have been obvious to a person of ordinary skill.

3. Carney

Petitioner contends that proposed claim 25 is obvious over Dowling, Burrow, McCane, and Carney. Opp. 16–19. Carney discloses a linkable linear light emitting diode system that has a splice connector for connecting two LED linear lighting modules. Ex. 1034, [54], ¶¶ 96–97, Figs. 18 and 20. Carney's Figure 18 is reproduced below.

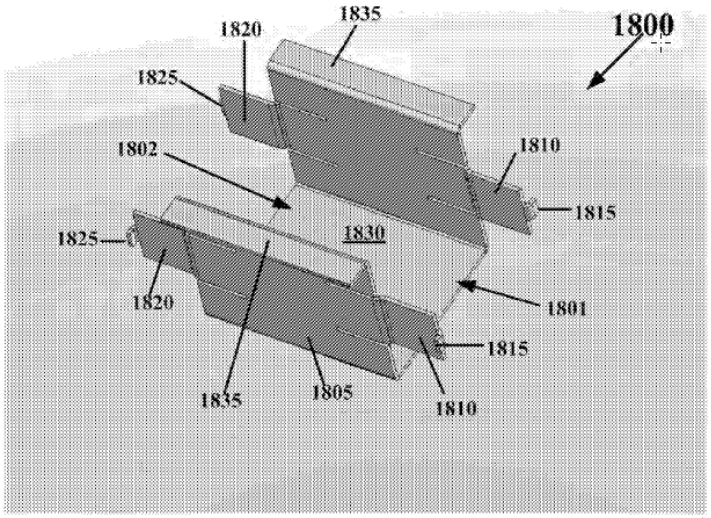


Fig. 18

Carney's Figure 18 illustrates splice connector 1800 for connecting two LED linear lighting modules. *Id.* ¶ 96. Splice connector 1800 includes cap 1830 with a pair of walls 1805 extending from cap 1830 in a generally orthogonal manner. *Id.* The opposing end of each wall 1805 includes flange 1835 extending from the end of the wall and positioned adjacent to and applying a force against the top surface of the ceiling tile. *Id.*

Carney's Figure 20 is reproduced below.

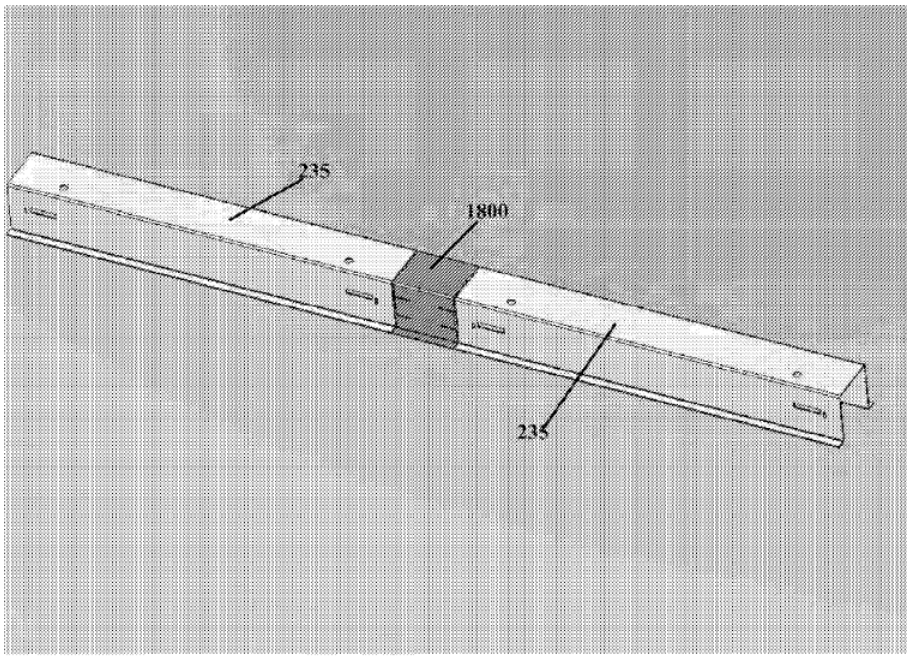


Fig. 20

Carney's Figure 20 illustrates two linear lighting modules each including "housing 235 configured in a generally U-shaped manner having a generally horizontal cap and walls extending downward in a generally orthogonal manner from two opposing sides of the cap to create a cavity." Ex. 1034 ¶ 49. The two main bodies are coupled together end-to-end with splice 1800 covering the coupled ends of the main bodies. *Id.* ¶ 96.

4. Obviousness of Substitute Claim 25

Substitute claim 25 depends from substitute claim 11 and recites "a splice joining the first and second retrofit kit." Petitioner contends that Carney discloses a mechanical splice for connecting two LED linear lighting modules together, and that the shape, design, and construction of differently shaped mechanical splices were known and within the skill of a person of ordinary skill. Opp. 18 (citing Ex. 1034 ¶¶ 96–97, Figs. 18 and 20; Ex. 1035 ¶¶ 67–68). Petitioner contends that a person of ordinary skill would have

understood that retrofitting longer fluorescent fixtures may require using two of Dowling's retrofit kits linearly arranged in series, resulting in a gap between the two retrofit kits. *Id.* at 17 (citing Ex. 1035 ¶¶ 61–65). Petitioner contends that a person of ordinary skill would have concealed the gap using a splice as taught by Carney. *Id.* at 18–19 (citing Ex. 1035 ¶¶ 69–71). Petitioner contends that concealing the gap between two serially aligned retrofit kits of Dowling using the splice of Carney does no more than yield the predictable result of providing the appearance of a single unified body as taught by Carney. *Id.* at 19.

Patent Owner contends that Carney is in a different field than that of the '041 patent, because Carney does not disclose a retrofit kit. Reply to Opp. 7 (citing Ex. 1034 ¶ 2; Ex. 2111 ¶¶ 109–110). The proper inquiry for analogous art is whether Carney is "within the field of the inventor's endeavor" or "reasonably pertinent to the particular problem with which the inventor was involved." *In re Wood*, 599 F.2d 1032, 1036 (CCPA 1979); *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004). "If a reference disclosure has the same purpose as the claimed invention, the reference relates to the same problem, and that fact supports the use of that reference in an obviousness rejection." *In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992). The purpose of the splice in the claimed invention is to cover the juncture of two abutting light panels. Ex. 1001, 5:12–16, 5:24–32, Figs. 6 and 8. Similarly, the purpose of the splice in Carney is to cover the juncture of two abutting light panels. Ex. 1034 ¶ 96, Figs. 18 and 20; Ex. 1035 ¶¶ 67–68. A person having ordinary skill in the art would have reasonably expected to solve the problem of covering the juncture of two abutting light panels by considering a reference that does so using a splice. Therefore, Carney is analogous art to the invention.

Patent Owner contends that Carney uses the term end-to-end with reference to physical arrangement, not electrical connections. Reply to Opp. 7 (citing Ex. 1034 ¶ 87; Ex. 2111 ¶ 111). However, Dowling teaches connecting electrical conductors in electrical series as required by base claim 15, for the reasons given in our analysis of claim 15.

Patent Owner contends that Carney discloses that modifying splices is within the knowledge and skill of those of ordinary skill in the art of lighting manufacturing, but does not mention lighting developing. Reply to Opp. 7–8 (citing Ex. 1034 ¶ 97). According to Patent Owner, a person of ordinary skill in this proceeding would have had experience in developing, not manufacturing, lighting fixtures, and there are material differences between developing and manufacturing. *Id.* at 8 (citing Ex. 2111 ¶¶ 112–113). However, neither Patent Owner nor Dr. Bretschneider identify what the material differences are. In particular, neither Patent Owner nor Dr. Bretschneider explain why a person of ordinary skill with experience in developing lighting fixtures would be unable to develop modified splices after reading the disclosure of Carney. Dr. Ducharme testifies that Carney is in the field of LED lighting design. Ex. 1035 ¶ 70. We rely on the testimony of Dr. Ducharme in finding that a person of ordinary skill with experience in lighting design would have applied Carney's known splice to Dowling's known retrofit kits to yield the predictable result of providing the appearance of a unified body as taught by Carney. *Id.* ¶¶ 69–70.

Patent Owner contends that a person of ordinary skill would not be motivated to combine the splice of Carney with Dowling. Reply to Opp. 9 (citing Ex. 2111 ¶¶ 114, 126). We rely on the testimony of Dr. Ducharme in finding that a person of ordinary skill would have been motivated to apply the splice of Carney to the retrofit kits of Dowling to yield the predictable

result of providing the appearance of a unified body. Ex. 1035 ¶¶ 65–71. We disagree with Dr. Bretschneider, that a person of ordinary skill would have been unable to address any heat related problems arising from covering a gap between retrofit kits with a splice. As we discussed previously, in the absence of a specific description of thermal management techniques arising from using a splice in the '041 patent, we find that addressing thermal problems arising from using a splice was within the knowledge of a person of ordinary skill. *In re Epstein*, 32 F.3d at 1568; *In re Fox*, 471 F.2d at 1407.

We find that Petitioner has shown that the prior art teaches the limitations of substitute claims 25. Having considered all the evidence and arguments of record, we conclude that Petitioner has demonstrated, by a preponderance of the evidence, that Dowling and Carney would have taught or suggested the limitations of substitute claim 25 to a person of ordinary skill and that claim 25 would have been obvious to a person of ordinary skill.

IV. MOTION TO EXCLUDE

Patent Owner filed a Motion to Exclude (Paper 34) Exhibits 1009, 1010, and 1011 as unauthenticated under Fed. R. Evid. 901. Paper 34, 1.

Patent Owner contends that Petitioner has not shown that Exhibit 1009 is a true and accurate copy of the slide show that contains slides from the "ILP Low Profile Webinar" as published in 2013. Paper 34, 3. Patent Owner contends that in Exhibit 1028, which is a declaration of Daniel Kroencke, the Vice President of Engineering for Industrial Lighting Products, Inc., Mr. Kroencke testifies that ILP uploaded and published a slide show on its website in 2013 and attached the slide show as Exhibit B, but that Exhibit B does not exist. *Id.* at 4. Patent Owner contends that even

if Exhibit 1009 is Exhibit B to Exhibit 1028, Mr. Kroencke does not testify that he uploaded the slide show or that he reviewed the slide show at the time that it was uploaded. *Id.*

Patent Owner contends that Petitioner has not shown that Exhibit 1010 is in fact ILP Low Profile Video Screenshots of Exhibit 1011 as published in 2013. Paper 34, 4. Patent Owner contends that Petitioner does not explain when the screenshots were taken, when they were archived, or whether they had been manipulated. *Id.* at 5.

Patent Owner contends that Petitioner has not shown that Exhibit 1011 is a true and accurate copy of a video recording of the "ILP Low Profile Webinar" published in 2013. Paper 34, 6. Patent Owner contends that the authentication of electronically stored information in this case requires a webmaster or person with personal knowledge of the website to confirm that Exhibit 1011 is the same as it appeared on the website in 2013, and that Petitioner has not provided this evidence. *Id.* Patent Owner contends that Exhibit 1028 does not authenticate Exhibit 1011, because Mr. Kroencke testifies that Exhibit A to Exhibit 1028 is a true and accurate copy, but that Exhibit A does not exist. *Id.* at 7. Patent Owner contends that Mr. Kroencke does not testify that Exhibit 1011 is Exhibit A to Exhibit 1028. *Id.*

Petitioner, in an Opposition to the Motion to Exclude (Paper 40), contends that Mr. Kroencke testified, based on his personal knowledge from working at ILP, that the video at the link "https://www.youtube.com/watch?v=6LWsvuFLOUQ" is a true and accurate copy of the one ILP uploaded and published on January 16, 2013. Paper 40, 1. Petitioner contends that the video at the link identified by Mr. Kroencke is the same as the video submitted as Exhibit 1011. *Id.* Petitioner contends that a certificate from a YouTube custodian is not required because

Petitioner submitted a declaration from a person having personal knowledge demonstrating that the video was placed on YouTube by ILP during the relevant time period. *Id.* at 2.

Petitioner contends that the screenshots in Exhibit 1010 and the Webinar video of Exhibit 1011 show that they are identical. Paper 40, 2. Petitioner contends that, although some of the screenshots in Exhibit 1010 appear to be part of a webpage, that is because they were captured from an embedded version of the Webinar located at ILP's YouTube channel before the video was expanded, and that they are the same video. *Id.* at 3.

Petitioner contends that Mr. Kroencke authenticated Exhibit 1009 by testifying, based on his personal knowledge, that "by April 2013, ILP uploaded and published a slide show (in PDF format) on its website." Paper 40, 3. Petitioner contends that the slides from Exhibit 1009 can be found at Archive.org for the April 2013 timeframe. *Id.*

Patent Owner, in a Reply in Support of the Motion to Exclude (Paper 48), contends that Petitioner has not established that the video that was uploaded in 2013 is identical to the video submitted as Exhibit 1011. Paper 48, 1. Patent Owner contends that Mr. Kroencke does not testify that he viewed the video that was available in 2013 or that it is identical to the one downloaded and attached as Exhibit A or to Exhibit 1011. *Id.* Patent Owner contends that Mr. Kroencke does not testify that his reference to Exhibit A was an error. *Id.* Patent Owner contends that Petitioner must provide a certificate from a YouTube custodian because personal knowledge falls short of authenticating the video. *Id.*

Patent Owner contends that Mr. Kroencke's testimony does not authenticate Exhibit 1010, and the significant differences in appearance between Exhibit 1010 and Exhibit 1011 call into question the identity of

Exhibit 1010. Paper 48, 2–3. Patent Owner contends that Petitioner's statements are contradictory because Petitioner stated that "counsel captured the Ex. 1010 screenshots directly from the video" identical to Exhibit 1011, except that the video was an embedded version (Paper 40, 2–3), then stated that the screenshots of Exhibit 1010 came from ILP's YouTube channel, rather than from the link identified by Mr. Kroencke. Paper 48, 2–3. Patent Owner contends that Mr. Kroencke does not testify that he verified the content of ILP's YouTube channel or that the video attached to his declaration as Exhibit A is identical to that in Exhibit 1011 or the screenshots in Exhibit 1010. *Id.* at 3.

Patent Owner contends that Petitioner's contention that Exhibit 1009 can be authenticated as uploaded in 2013 based on availability at archive.org is untimely. Paper 48, 4. Patent Owner contends that this claim of corroboration was not substantiated by any sworn testimony. *Id.* Patent Owner contends that Petitioner does not provide an accurate and specific web address of the source webpage for the slides. *Id.*

We are not persuaded by Petitioner's argument that the challenged Exhibits are not authenticated. Federal Rule of Evidence 901 sets a relatively low bar for authentication. Rule 901(a) states: "To satisfy the requirement of authenticating or identifying an item of evidence, the proponent must produce evidence sufficient to support a finding that the item is what the proponent claims it is." Fed. R. Evid. 901(a). By way of example, Rule 901(b)(1) states that a witness with knowledge can provide authenticating testimony that an item is what it is claimed to be. Fed. R. 901(b)(1).

Mr. Kroencke testifies that in January 2013, ILP held a webinar entitled "ILP Low Profile Webinar," which was recorded as a video. Ex. 1028 ¶ 4. Mr. Kroencke testifies that ILP uploaded and published the "ILP

Low Profile Webinar" video to ILP's YouTube channel home page and that the Webinar video still resides on ILP's YouTube channel, and that a copy of the video is attached as Exhibit A. *Id.* ¶ 5. Mr. Kroencke testifies that a link to the "ILP Low Profile Webinar" video on YouTube was embedded in ILP's website in January 2013. *Id.* ¶ 6. Mr. Kroencke testifies that by April 2013 ILP uploaded and published a slide show that includes most of the slides from the "ILP Low Profile Webinar," and that a copy of the slide show is attached as Exhibit B. *Id.* ¶ 7.

Petitioner contends that the slides in Exhibit 1009 are the same as the slides on the website www.ilp-inc.com, which Mr. Kroencke declares were uploaded and published on the website by April 2013. Paper 40, 3; Ex. 1028 ¶ 7. Petitioner contends that the video of Exhibit 1011 is the same as the video on ILP's YouTube channel, which Mr. Kroencke declares was uploaded and published on the YouTube channel on January 16, 2013. Paper 40, 2; Ex. 1028 ¶ 5. Petitioner contends that the screenshots of Exhibit 1010 were captured from an embedded version of the Webinar video found on the YouTube channel identified by Mr. Kroencke. Paper 40, 3.

As the Vice President of Engineering for Industrial Lighting Products, Inc., Mr. Kroencke qualifies as a person with knowledge, under Rule 901, that the slides on the website identified by Mr. Kroencke, as well as the Webinar video on the YouTube channel identified by Mr. Kroencke, were uploaded and published in 2013. Mr. Kroencke's declaration unfortunately does not include Exhibit A, which he testifies is a true and accurate copy of the video, nor does the declaration include Exhibit B, which he testifies is a true and accurate copy of the slideshow. *See* Ex. 1028 ¶¶ 5, 7. However, Mr. Kroencke testifies that the video at the following link is the Webinar that was uploaded on January 16, 2013:

https://www.youtube.com/watch?v=6LWsvuFLOUQ. Ex. 1028 ¶ 5. We have compared that video to the video in Exhibit 1011, and we agree with Petitioner that they are the same. *See* Paper 40, 1–2. Thus, we determine that Exhibit 1011 is authentic based on our comparison of Exhibit 1011 to the video about which Mr. Kroencke testified. *See* Fed. R. Evid. 901(b)(3) (providing, as an example of "evidence that satisfies the requirement" of authentication, "[a] comparison with an authenticated specimen by an expert witness or the trier of fact.").

We also determine, based on a comparison, that Exhibit 1010 contains screenshots from the video in Exhibit 1011 and linked in Mr. Kroencke's declaration. The timestamped content of the screenshots of Exhibit 1010 matches the timestamped content of the video. We disagree with Patent Owner that "symbols for liking and disliking, sharing, subscribing, and a view count of '3,038,'" in Exhibit 1010 are "significant differences." *See* Paper 48, 2. These symbols appear to be part of a webpage in which the video was embedded when the screenshots were taken, but the symbols are not part of the video screenshots themselves. The screenshots in Exhibit 1010 are from the video in Exhibit 1011, notwithstanding minor presentation differences. *See Valve Corp. v. Ironburg Inventions Ltd.*, 8 F.4th 1364, 1371–72 (Fed. Cir. 2021) (authenticating by comparison despite differences).

We also determine, based on a comparison, that the content of the slides in Exhibit 1009 is found in the video in Exhibit 1011 and the screenshots in Exhibit 1010, as follows:

Exhibit 1009	Exhibit 1010
Page 1	Page 1
Page 2	Page 5
Page 3	Page 11
Page 4	Pages 13–14
Page 5	Page 19
Page 6	Pages 23–24
Page 7	Page 26
Page 8	Page 28
Page 9	Pages 30–32 (minor image differences)
Page 10	Page 34
Page 11	Page 36
Page 12	Page 38
Page 13	Page 40

Based on the comparison of Exhibit 1009 with Exhibits 1010 and 1011 and based on Mr. Kroencke's testimony that a slideshow was uploaded shortly after the video was published, we determine that Exhibit 1009 is the slide show that Petitioner claims it is.

Therefore, based on Mr. Kroencke's testimony and our comparisons of the exhibits and the video, we conclude that Petitioner has met the standard set forth in Rule 901 to authenticate the challenged Exhibits. Patent Owner's Motion to Exclude the challenged Exhibits is consequently denied.

V. CONCLUSION[7]

Claims 1–14 are unpatentable over the prior art. We deny Patent Owner's Motion to Amend because proposed claims 15–28 are unpatentable over the prior art and proposed claims 23, 24, and 28 are unpatentable under 35 U.S.C. § 112.

Claim(s)	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not shown Unpatentable
1–10, 12–14	103	Dowling and Burrow	1–10, 12–14	
1–5, 8, 9, 11, 12	103	ILP Retrofit	1–5, 8, 9, 11, 12	
1–14[8]	103	Plunk, Sun, Chan		
Overall Outcome			1–14	

[7] 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).

[8] Given that we find claims 1–14 unpatentable for the reasons given in our analysis of grounds 1 and 2, we do not reach the issue of whether claims 1–14 are also unpatentable for the reasons given in ground 3.

Motion to Amend Outcome	Claim(s)
Original Claims Cancelled by Amendment	
Substitute Claims Proposed in the Amendment	15–28
Substitute Claims: Motion to Amend Granted	
Substitute Claims: Motion to Amend Denied	15–28
Substitute Claims: Not Reached	

VI. ORDER

It is hereby:

ORDERED claims 1–14 are unpatentable;

FURTHER ORDERED that Patent Owner's Motion to Amend is *denied*;

FURTHER ORDERED that Patent Owner's Motion to Exclude is *denied*;

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

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

WALMART INC. and CURRENT LIGHTING SOLUTIONS, LLC,
Petitioner,

v.

POWER CONCEPTS, LLC,
Patent Owner.

IPR2022-00534
Patent 10,837,628 B2

Before KEVIN F. TURNER, JEFFREY S. SMITH, and DANIEL J. GALLIGAN, *Administrative Patent Judges.*

GALLIGAN, *Administrative Patent Judge*, concurring.

I agree with the majority that Petitioner has proven that the challenged claims and the proposed substitute claims are unpatentable. Thus, I concur in the result. I do not join the majority's opinion, however, because I do not agree with all of the reasoning therein.

As one example, in response to Patent Owner's assertion that a person of ordinary skill in the art would not have been "motivated to modify Dowling by inversion" (PO Resp. 10), the majority sets forth a discussion at pages 17–20 of heat dissipation that ultimately indicates that a person of ordinary skill in the art would have included a fan in the light fixture. But

the premise of Patent Owner's argument is false because Dowling discloses a light mounted to a ceiling, as correctly stated in the majority's decision at page 14. *See* Ex. 1007 ¶¶ 7, 9 (Dowling's disclosure of "retrofitting conventional lighting fixtures," which include "recessed fixtures (e.g., wherein the housing is concealed behind a ceiling or wall)"). In my view, this is dispositive and ends the discussion. Indeed, Patent Owner's argument stems from its misrepresentation of Dowling's teachings, including the use of an ellipsis to omit "ceiling" from a discussion of how Dowling's fixture can be mounted, as pointed out by the majority at pages 14–15. *See* PO Sur-reply 2–3. Because there is no modification, Petitioner is not required to prove that a person of ordinary skill in the art would have been motivated to make a modification, and we need not resolve whether a person of ordinary skill in the art would have included a fan in the light.

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