Trials@uspto.gov
571-272-7822

Paper 53
Entered: February 23, 2026

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BIOFRONTERA INC., BIOFRONTERA BIOSCIENCE GMBH, BIOFRONTERA PHARMA GMBH, and BIOFRONTERA AG,
Petitioner,

v.

SUN PHARMACEUTICAL INDUSTRIES, INC.,
Patent Owner.

IPR2024-01312
Patent 11,697,028 B2

Before MITCHELL G. WEATHERLY, ZHENYU YANG, and MARY C. HOFFMAN, *Administrative Patent Judges*.

HOFFMAN, *Administrative Patent Judge*.

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

I. INTRODUCTION

Biofrontera Inc., Biofrontera Bioscience GmbH, Biofrontera Pharma GmbH, and Biofrontera AG ("Petitioner") filed a Petition requesting an *inter partes* review of claims 1, 2, 4–6, 16, 17, and 19–21 of U.S. Patent No. 11,697,028 B2 (Ex. 1001, "the '028 patent"). Paper 3 ("Pet."). Sun Pharmaceuticals Industries, Inc. ("Patent Owner") filed a Preliminary Response to the Petition. Paper 7 ("Prelim. Resp."). Applying the standard set forth in 35 U.S.C. § 314(a), the Board instituted an *inter partes* review as to all claims and grounds set forth in the Petition. Paper 9 ("Inst. Dec.").[1]

After Institution, Patent Owner filed a Patent Owner Response (Paper 14, "PO Resp."), Petitioner filed a Reply (Paper 29, "Reply"), and Patent Owner filed a Sur-reply (Paper 35, "Sur-reply").

Patent Owner also filed a Motion to Exclude Evidence (Paper 40, "Motion" or "Mot."), Petitioner filed an Opposition to the Motion to Exclude Evidence (Paper 41, "Opposition" or "Opp."), and Patent Owner filed a Reply to Petitioner's Opposition to the Motion (Paper 44, "Mot. Reply").

We then held an oral hearing on December 3, 2025, and the transcript is of record. Paper 51 ("Tr.").

---

[1] Additionally, Petitioner filed a Notice Regarding Parallel Petitions, as it had previously filed a petition challenging the same patent in IPR2024-00874. Paper 2 ("Notice"); *see* IPR2024-00874, Paper 3. In the Notice, Petitioner ranked the petition in IPR2024-01312 higher. Paper 2, 1. Patent Owner filed a response to Petitioner's Notice Regarding Parallel Petitions. Paper 8. The Board determined that the issue of whether the Board should exercise its discretion to institute more than one petition by Petitioner challenging the same patent was moot, as the Board denied the first petition on the merits. Inst. Dec. 2; *see* IPR2024-00874, Paper 9.

We have jurisdiction pursuant to 35 U.S.C. § 6. This Decision is a Final Written Decision under 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73 as to the patentability of the challenged claims. Petitioner bears the burden of proving unpatentability of the challenged claims. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). To prevail, Petitioner must prove unpatentability by a preponderance of the evidence. *See* 35 U.S.C. § 316(e) (2018); 37 C.F.R. § 42.1(d) (2021). Having reviewed the arguments and the supporting evidence, we determine Petitioner has shown, by a preponderance of the evidence, that claims 1, 2, 4–6, 16, 17, and 19–21 are unpatentable.

We additionally deny Patent Owner's Motion to Exclude Evidence.

A. Real Parties in Interest

Petitioner identifies Biofrontera Inc., Biofrontera Bioscience GmbH, Biofrontera Pharma GmbH, Biofrontera AG, Biofrontera Neuroscience GmbH, and Biofrontera Development GmbH, as real parties-in-interest. Pet. 5. Patent Owner identifies itself, Sun Pharmaceuticals Industries, Inc., as a real party-in-interest. Paper 5, 1.

B. Related Proceedings

The parties identify IPR2024-00874 as related. Pet. 6; Paper 5, 1.

The parties also relay that the following proceedings are related, both filed on June 24, 2024: *In re Certain Photodynamic Therapy Systems, Components Thereof, And Pharmaceutical Products Used In Combination With The Same*, Investigation No. 337-TA-1411 (U.S.I.T.C.); and *Sun Pharmaceutical Industries, Inc. v. Biofrontera Bioscience GmbH, Biofrontera Pharma GmbH, Biofrontera AG, and Biofrontera Inc.*, Civil Action No. 1:24-cv-11637 (D. Mass). Pet. 6; Paper 5, 1.

On September 16, 2025, a memorandum was issued explaining that the Board will consider prior findings of fact and conclusions of law when patent claims being challenged before the Board have already been adjudicated at the Office or in another forum, such as the U.S. International Trade Commission ("ITC"). *See* Memorandum, "PTAB Consideration of Prior Findings of Fact and Conclusions of Law" (Sept. 16, 2025).[2]

Patent Owner and Petitioner each filed briefing explaining the similarities and differences between issues addressed in the Initial Determination ("ID") in the related ITC proceeding and those presented in this proceeding. Papers 42 and 43. In the ID, the ITC determined that the asserted claims—also challenged in this IPR—were not invalid over the same prior art references and combinations that Petitioner asserts in this IPR. *See* Ex. 2090, 103–116, 118–121. The ID, however, is not final—the Commissioner has determined to review the ID as it relates to whether the asserted claims of the '028 patent are invalid under 35 U.S.C. § 103 for obviousness. *See* Exs. 3001, 1034, 1035.

As an initial matter, we note that the record before us includes critical declaration and deposition testimony not before the ITC (*see*, *e.g.*, Tr. 10:11–14:2; Exs. 1026 and 1027). Moreover, the ITC's initial determination requires clear and convincing evidence to establish invalidity, whereas here, we need only determine whether Petitioner has established unpatentability by a preponderance of the evidence. Where our findings of fact or conclusions of law differ from those expressed in the ID (Ex. 2090,

[2] https://www.uspto.gov/sites/default/files/documents/Memo_re_prior_findings_of_fact_and_conclusions_of_law_9_16_25.pdf.

17, 103–116, 118–122), we explain why those differences are warranted in our analysis below.

II. BACKGROUND

A. The ’028 Patent (Ex. 1001)

The ’028 patent relates to “an adjustable illuminator that provides a uniform distribution of visible light in a number of configurations and is suitable for use in photodynamic therapy and diagnosis.” Ex. 1001, 1:19–22. A perspective view of the illuminator attached to a stand, shown below, is in Figure 4.

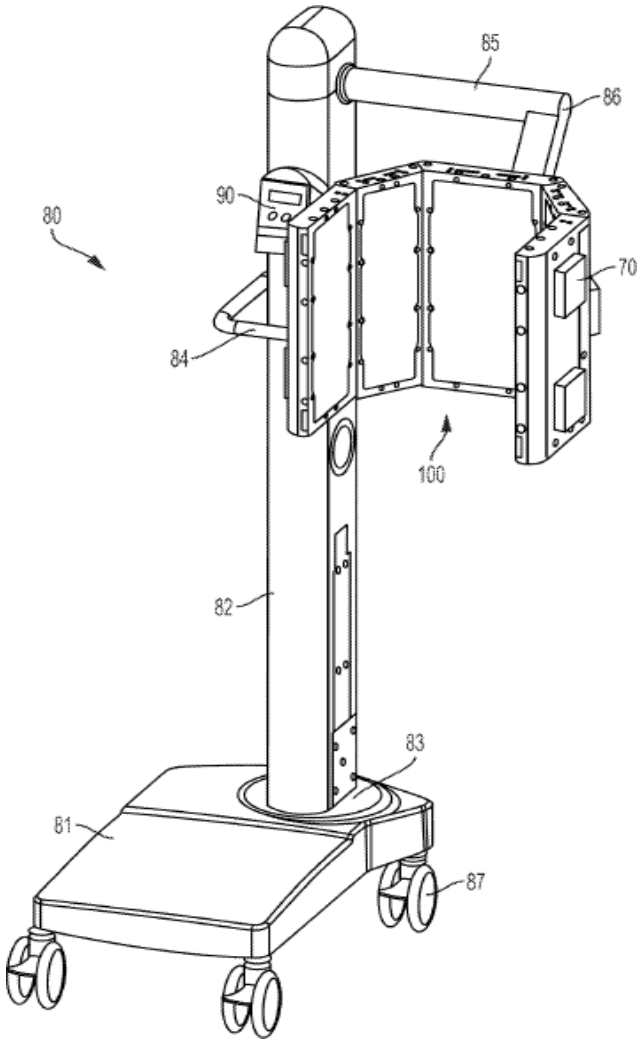


Figure 4 shows main body 100 of the illuminator mounted by a connecting arm 85 to a movable stand 80, which includes a base 81 with wheels 87. *Id.* at 5:16–33.

The Specification describes that main body 100 "preferably has five individual panels l0a–l0e, each of which are connected in a rotatable manner via nested hinges 50." *Id.* at 3:54–56. Further, "[e]ach panel contains an array of light emitting diodes (LED) 60, which may be configured in an evenly spaced pattern across the face of the panel." *Id.* at 3:56–59. The patent explains that the "LED arrays 60 emit light at an appropriate wavelength according to the intended treatment or to activate the particular photoactivatable agent used in treatment or diagnosis." *Id.* at 4:1–4. The main body 100 is shown below in perspective view in Figure 2b.

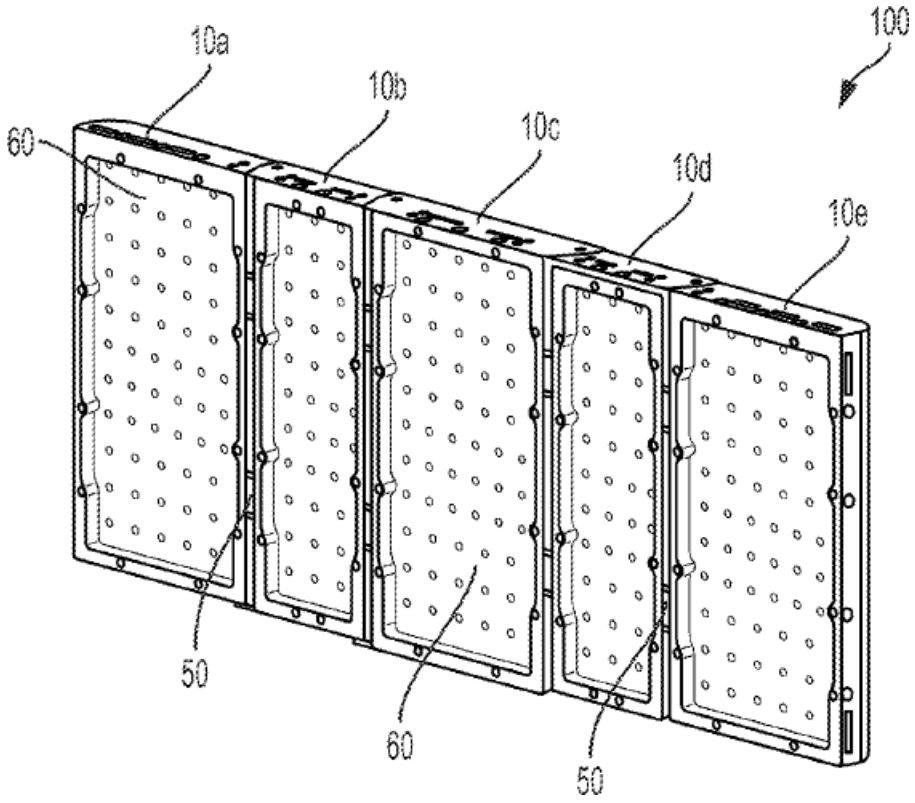


Figure 2b shows main body 100, comprising LED arrays 60, hinges 50, and panels 10a–10e. *Id.* at 3:52–59. The patent describes that "the five

panels 10a–10e are of different widths relative to one another," and connected to each other by hinges 50. *Id.* at 4:25–26, 4:47–48. The hinges "may take the form of nested hinges, which may include hinges that substantially reduce or eliminate optical dead spaces." *Id.* at 4:48–50.

The Specification also describes that "[a]t least one control unit is also connected to the panels to regulate power to the lights to achieve the required uniformity and intensity for the target treatment," and that "each panel may have a dedicated control unit to regulate power to the individual LED array on a given panel." *Id.* at 5:52–62. A schematic view illustrating an exemplary configuration of LEDs mounted on the main body of the illuminator is shown below in Figure 5.

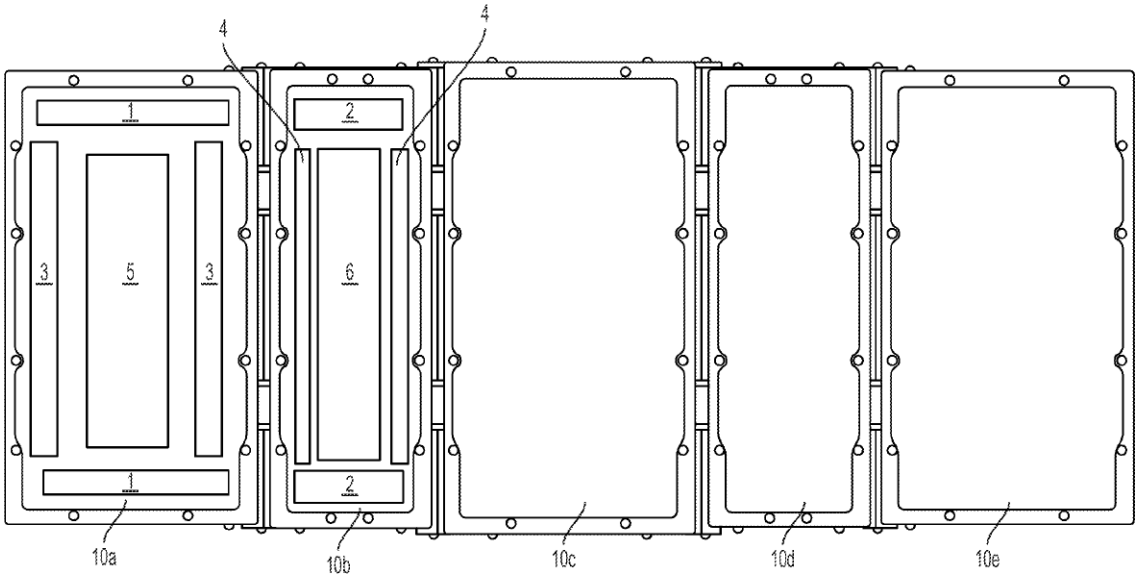


Figure 5 shows LED arrays 60 divided into three general areas, areas 1, 3, and 5 on the wider panels 10a, 10c, and 10e, and areas 2, 4, and 6 on the narrower panels 10b and 10d. *Id.* at 6:24–31. The Specification explains, "to increase the uniformity of light exposure to the treatment area while maintaining a practical size of the illuminator, the LED arrays 60 may be

individually configured to increase the intensity of light emitting from certain diodes," which may allow for a reduction of any "fall off" of light exposure that tend to occur at the edges of a curved surface. *Id.* at 6:7–8, 6:18–22. For example, "a higher current may be supplied to areas 1 and 2 than the current supplied to areas 3 and 4 such that areas 1 and 2 emit a higher intensity of light than areas 3 and 4." *Id.* at 6:33–36.

B. Illustrative Claims

Petitioner challenges claims 1, 2, 4–6, 16, 17, and 19–21 of the '028 patent. Independent claims 1 and 16, set forth below, are illustrative of the claimed subject matter.

> 1. A system for photodynamically diagnosing or treating a patient, comprising:
>
> an illuminator comprising five panels connected by hinged structures on inner side surfaces of adjacent panels; and
>
> light sources disposed on surfaces of the five panels, the illuminator being configured to uniformly illuminate a treatment surface of the patient via the light sources, one of the five panels being positioned as a center panel configured to face the treatment surface, and two or more of the five panels being configured to be angled relative to the center panel,
>
> wherein the five panels are positioned to allow treatment within approximately four inches of the treatment surface, and
>
> wherein each of the five panels has two first edges and two second edges shorter than the two first edges, and the light sources are arranged such that a higher intensity of light is emitted proximate the second edges compared to the intensity of light emitted not proximate the second edges.

16. A system for photodynamically diagnosing or treating a patient, comprising:
a mobile base supported by at least four wheels;
a pillar perpendicular to the base;
a controller disposed to be supported by the pillar;
an arm mounted to a top portion of the pillar; and
an illuminator connected at an end of the arm, the arm being hinged to allow adjustment of a position of the illuminator relative to the base, the illuminator comprising:
five panels connected by hinged structures to allow continuous illumination across the five panels, wherein the five panels are individually configurable to control illumination from each of the five panels,
light sources disposed on surfaces of the five panels, the illuminator being configured to uniformly illuminate a treatment surface of the patient via the light sources, the light sources being configured to output light uniformly during at least part of a time when the treatment surface is illuminated, each of the five panels having two first edges and two second edges shorter than the two first edges, the light sources arranged such that a higher intensity of light is emitted proximate the second edges compared to the intensity of light emitted not proximate the second edges, and
one or more fans mounted to at least one of the five panels.

Ex. 1001, 10:24–44; 11:45–12:7.

Independent claim 5 recites a method of photodynamically treating a patient, comprising administering 5-aminolevulinic acid (ALA) to the patient and positioning an illuminator proximate to the patient. Independent claims 20 and 21 also recite systems for photodynamically diagnosing or treating a patient.

Dependent claim 2 recites a red light dosage. Dependent claim 4 recites wavelength ranges. Dependent claim 6 recites a minimum duration

for outputting red light. Dependent claim 8 recites changing intensities of the light sources based on curvature of a treatment surface. Dependent claims 10, 11, 13, and 14 recite adjusting dose based on size or shape of a treatment surface. Dependent claim 17 recites panel positioning. Dependent claims 18 and 19 recite outputting blue light and red light, respectively

C. Asserted Grounds of Unpatentability

Petitioner asserts that claims 1, 2, 4–6, 16, 17, and 19–21 are unpatentable on the following two grounds:

Ground	Claims Challenged	35 U.S.C. §[3]	References
1	1, 2, 4–6, 16, 17, 19–21	103	Lundahl,[4] Larsen[5]
2	1, 2, 4–6, 16, 17, 19–21	103	Lundahl, Larsen, Bansal[6]

Petitioner supports its challenges with declarations of Robert E. Grove, Ph.D. (Exs. 1015 and 1026) and Michael Ehrenreich, M.D. (Ex. 1016). Patent Owner relies upon declarations of Jose Sasian, Ph.D. (Ex. 2001), Dr. Heather J. Roberts (Ex. 2015), Dr. Nan Marie Jokerst (Ex. 2050), Dr. Eric Bretnschneider (Ex. 2082), and Dr. Thomas D. Vander Veen (Ex. 2048).

[3] The Leahy-Smith America Invents Act, Pub. L. No. 112–29, 125 Stat. 284 (2011) ("AIA"), amended 35 U.S.C. § 103, effective March 16, 2013. The earliest claimed priority date for the '028 patent is after the effective date of the applicable AIA amendment. *See* Ex. 1001, code (60). Accordingly, we apply the AIA version of §103.

[4] Scott Lundahl, U.S. 6,223,071 B1, issued Apr. 24, 2001 (Ex. 1014, "Lundahl").

[5] Eric Larsen, U.S. 20042005/0075703 A1, published Apr. 7, 2005 (Ex. 1004, "Larsen").

[6] Vineet Bansal et al., U.S. 2004/0068305 A1, published Apr. 8, 2004 (Ex. 1005, "Bansal").

III. ANALYSIS

A. Level of Ordinary Skill in the Art

The level of ordinary skill in the art at the time of the invention is a factual determination that provides a primary guarantee of objectivity in an obviousness analysis. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 1324 (Fed. Cir. 1999) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991)).

Petitioner asserts that a person of ordinary skill in the art ("POSITA" or "POSA") at the time of the earliest effective filing date of the application for the '028 patent:

> would have been an individual or member of a multi-disciplinary team with education of (1) at least a Bachelor of Science degree in one or more fields of electrical engineering, physics, biomedical engineering, computer engineering, chemical engineering or material science, in fields relating to optics, optoelectronics, radiometry, photometry, photodynamic diagnosis (PD), photodynamic therapy (PDT), phototherapy (PT), and related technologies; and (2) a medical degree in fields relating to the diagnosis and treatment of skin conditions and related disease states.

Pet. 23–24. Additionally, Petitioner asserts,

> Alternatively, [ ] individually or members of the multi-disciplinary team would have had at least four years of experience in one or more fields of optics, optoelectronics, radiometry, photometry, photodynamic diagnosis (PD), photodynamic therapy (PDT), or phototherapy (PT), and at least four years of experience in one or more fields of medical treatment of skin conditions and related disease states.

Id. at 24.

According to Petitioner, Dr. Ehrenreich "provides testimony about the background knowledge of a POSITA for medical treatments involving PDT

and explains the teachings of medical treatments in the cited prior art." Pet. 24. (citing Ex. 1016 ¶¶ 28–37).

According to Patent Owner, a person of ordinary skill in the art at the time of invention "would have had a M.D. and/or a Ph.D. in an electrical engineering, physics, optical sciences, optical engineering, or a related scientific or engineering field, and at least one to two years of work or research experience in optical engineering, optics, optoelectronics, phototherapy ('PT'), PDT, or a related field." Prelim. Resp. 22. In the alternative, Patent Owner asserts that, "a POSITA could have a Bachelor's degree in one of the above areas and at least three to four years of work or research experience in that area." *Id.* (citing Ex. 2001 ¶¶ 29–30); *see also* PO Resp. 17 (citing Ex. 2050 ¶¶ 30–36).

Patent Owner asserts that Petitioner has not provided a valid justification for requiring a POSITA to have both an engineering degree and a medical degree. Prelim. Resp. 22. We agree, insofar as Petitioner has not clearly set out any particular explanation or evidence in support of its dual-degree requirement.

In all other respects, we note that the parties' proposed definitions are largely similar. Because we determine that Patent Owner's proposed definition is reasonable and consistent with the '028 patent and the cited art, we adopt Patent Owner's definition. In any event, our Decision does not turn on this level of skill determination.

B. Claim Construction

In an *inter partes* review, the Board construes the terms of a patent claim "in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution

history pertaining to the patent." 37 C.F.R. § 42.100(b); *see Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc); *see also* Pet. 12; Prelim Resp. 24.

We determine that no express claim construction is necessary for our Decision, apart from that discussed in our analysis below.[7] *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (holding that only terms in controversy must be construed "and only to the extent necessary to resolve the controversy") (citing *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

C. Overview of Asserted Prior Art

1. Lundahl (Ex. 1014)

Lundahl is "directed to an apparatus and method for photodynamic treatment (PDT) or diagnosis (PD) of actinic keratosis of the scalp or facial areas of a patient," as well as other areas of the patient, such as the arms and legs. Ex. 1014 ¶ 1. The photodynamic therapy uses an illuminator to provide a uniform distribution of visible light. *Id.* The Specification explains,

> The inverse square law of optics states that the intensity of light from a point source received by an object is inversely proportional to the square of the distance from the source.

[7] A claim construction order was issued in the related ITC proceeding, expressly construing several claim terms including adopting the parties' agreed-to construction of the term "uniformly illuminate/illuminating a treatment surface" (i.e., to require "irradiating light over the active emitting area such that the measured irradiance at a treatment surface of the patient is at least within 60% of the measured maximum"). PO Resp. 18 (citing Ex. 2033, 13–23, 35–40); Ex. 2090, 17. Although we decline to expressly construe claim terms, we note that our Decision is not inconsistent with the claim constructions set forth in the ID.

> Because of this behavior, distance from the source is an important variable in all optical systems. Thus, in order to achieve uniform facial or scalp irradiation, variations in output irradiance with distance must be minimized.

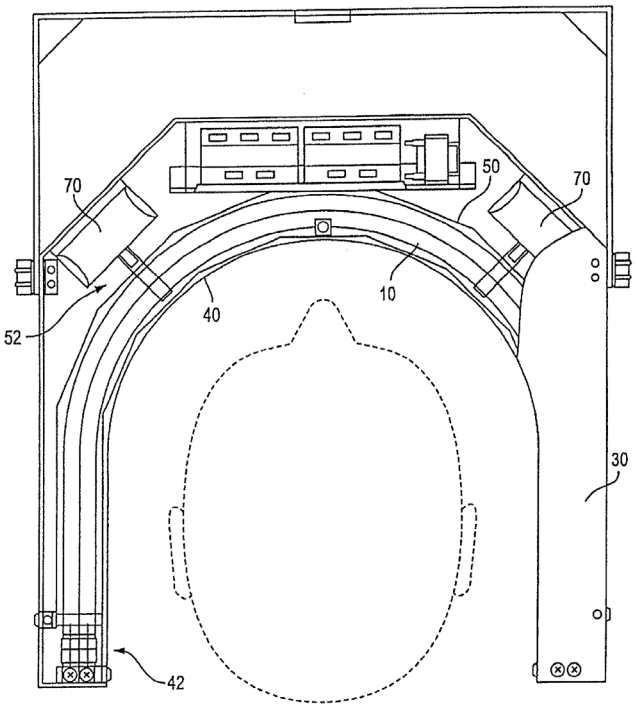
Id. at 4:22–28.

Lundahl teaches that "[a] flat emitting surface would not deliver a uniform light dose to all contours of the face simultaneously because the non-planar facial and scalp surfaces could not be placed at a constant distance from the emitting surface." *Id.* at 4:28–32.

Lundahl explains, "[t]o ameliorate this problem, the present invention uses a U-shaped emitting surface that more closely follows the contours of the human face and scalp, and minimizes lamp to target distance variations which in turn minimizes irradiance variations at the target." *Id.* at 4:32–37.

A partial cross-section, front elevation view of an illuminator according to the present invention is shown below, in Figure 1.

FIG. 1



Lundahl Figure 1 shows an embodiment of its device, along with the position of a patient's head and nose. *Id.* at 5:22, 33–34. The illuminator has seven U-shaped fluorescent tubes 10 that are supported by a housing 30 and are covered by a polycarbonate shield 40. *Id.* at 5:22–27. An aluminum reflector 50 increases both the output irradiance and the uniformity of the output distribution. *Id.* at 5:29–31. Lundahl explains that "[t]he U-shape minimizes the variations in distance between the emitter and the target, providing a uniform visible light distribution to the face or scalp of the patient." *Id.* at 6:30–32. The U-shape also "provides the desired irradiance and irradiance uniformity for scalp and facial irradiation, and thus ensures that the proper visible light dosage is applied to all target areas during PDT." *Id.* at 6:38–41.

Figure 4A of Lundahl is reproduced below.

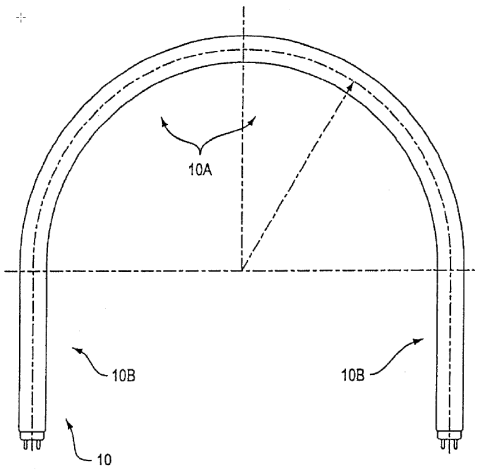
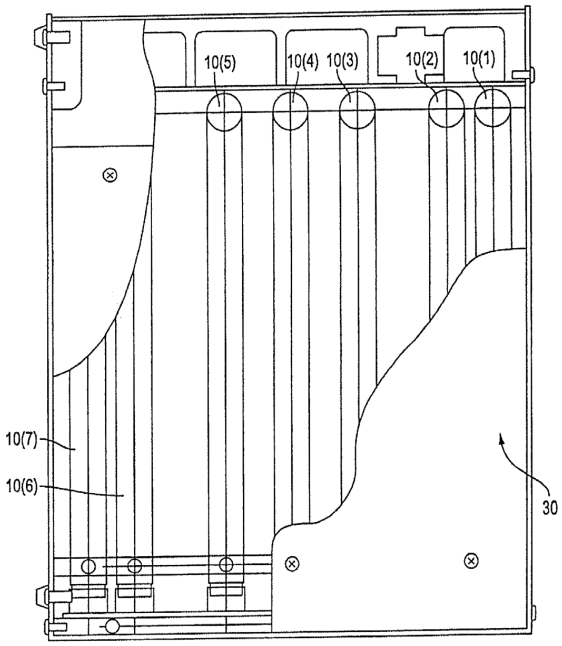


FIG. 4A

Figure 4A is a detail view of the fluorescent tube light source shown in Figure 1. *Id.* at 4:66–67.

A partial cross-section, side elevation view of the illuminator of Figure 1 is shown below, in Figure 2.

FIG. 2



Lundahl Figure 2 shows the lateral spacing of the seven U-shaped tubes 10(1)–10(7). *Id.* at 6:17–25. The partial tubes shown in Figure 2 are rotated 90° as compared to Figure 4A and the patient's perspective in Figure 1. The Specification explains that "[v]arying the lateral spacing of the tubes creates the same effect as folding the edges of a larger illuminator in on itself, thus emulating an infinite plane emitter with a compact unit." *Id.* at 6:27–30.

Lundahl states, "[t]he present invention provides a highly uniform output irradiance without the use of an additional diffusing element." *Id.* at 6:55–57.

2. Larsen (Ex. 1004)

Larsen describes a "treatment device which uses a light radiation of multiple wavelengths and pulse-shaped electromagnetic fields for the photodynamic stimulation of cells, especially cells of human tissue, and also

for the activation and stimulation of light sensitive substances (PTD)." Ex. 1004, code (57). Larsen's device produces energy radiation through the use of "semiconductor and/or laser diodes, which emit light in several separate wavelengths." *Id.* The device comprises a stand, a jointed arm, "machine applicators," wheels, and a control mechanism. *Id.* A diagram of Larsen's device is shown in Figure 1, below.

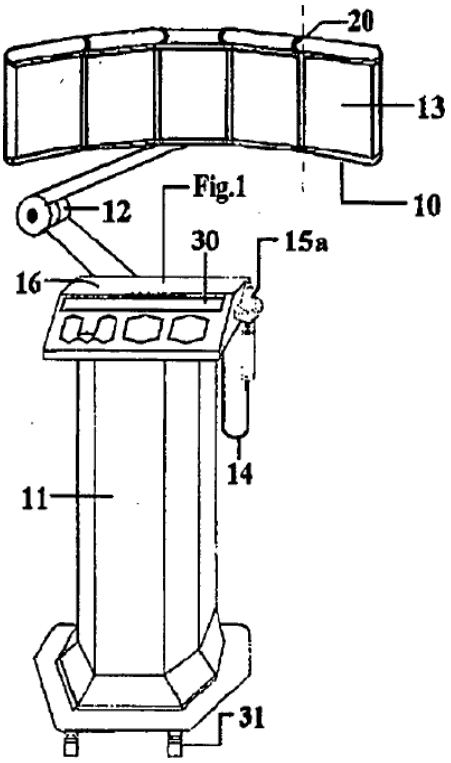


Figure 1 shows device 10, with stand 11, jointed arm 12, machine applicators 13, electric circuit 14, hand applicator 15, control mechanism 16, control panel 30, and wheels 31. *Id.* ¶ 69. Larsen describes that "applicators 13 are flexibly connected to each other through hinges 10, respectively connecting one edge with the other." *Id.* ¶ 72.

3. Bansal (Ex. 1005)

Bansal describes a phototherapy device including an array of light sources, arranged so as to achieve substantially uniform distribution of light

on a subject. Ex. 1005, code (57). The light sources can be arranged in a number of configurations, including distributions in which the density of lights sources is greater at the periphery than in the center. *Id.*

D. Ground 1: Obviousness over Lundahl and Larsen

As Ground 1, Petitioner contends that claims 1, 2, 4–6, 16, 17, and 19–21 are unpatentable under § 103(a) as obvious over Lundahl and Larsen. Pet. 25–73.

1. Legal Principles

A claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). "An obviousness determination requires finding both 'that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.'" *CRFD Research, Inc. v. Matal*, 876 F.3d 1330, 1340 (Fed. Cir. 2017) (quoting *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367–68 (Fed. Cir. 2016)). We base our obviousness inquiry on factual considerations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) any objective indicia of obviousness or non-obviousness that may be in evidence. *See Graham*, 383 U.S. at 17–18.

2. Claim 1

We begin our analysis with independent claim 1. For the reasons explained below, we determine that Petitioner has shown by a preponderance of the evidence that claim 1 is unpatentable as obvious over Lundahl and Larsen.

(a) Motivation to Combine[8]

Petitioner proposes to combine the PDT devices of Lundahl and Larsen. Petitioner explains that its proposed combination of Lundahl and Larsen "incorporate[s] the hinged panel LED displays of Larsen into the PDT device of Lundahl." Pet. 25 (citing Ex. 1015 ¶ 118). Petitioner refers to Lundahl's teaching that, for its U-shaped PDT device, "the tube dimensions were chosen based on the average dimensions of the adult human head." *Id.* at 27 (quoting Ex. 1014, 6:31–42). According to Petitioner, a POSITA would have "envision[ed] many scenarios where the shape and dimensions of the patient would not allow for the required 2-4["] distance required by the FDA approved indication." *Id.* at 29 (citing Ex. 1015 ¶ 124; Ex. 1016 ¶¶ 44–44). Additionally, Petitioner asserts that a "POSITA would have understood that there are other bodily anatomies that could use treatment for AK lesions, such as the arms, back and other body parts." *Id.* (citing Ex. 1016 ¶¶ 42–43).

Thus, Petitioner contends, a "POSITA would have been motivated to change the design of the system of Lundahl to allow for adjustment of the light panels to ensure a 2-4["] distance from the face and from other varying anatomies." *Id.* at 30 (citing Ex. 1016 ¶¶ 70–74, 87). According to Petitioner, the "POSITA would have understood that the easiest way to

[8] Petitioner proposes the same motivation for all claims.

modify the fixed, curved U-shape of Lundahl would be to incorporate hinged panels that could be individually adjusted to account for variations in head shape/size or other anatomy selected for treatment." *Id.* (citing Ex. 1015 ¶ 126).

To that end, Petitioner turns to Larsen's disclosure of a PDT device "[f]or the treatment of large-area tissues," such as the backs of human patients, wherein several applicators 13 are "flexibly connected to each other through hinges." *Id.* (quoting Ex. 1004 ¶ 72). Petitioner asserts that a POSITA would have been motivated "to incorporate Larsen's solution of connecting light applicators by hinges, to allow for adjustability of Lundahl's device to provide the desired irradiance and irradiance uniformity to all target areas during PDT." *Id.* (citing Ex. 1015 ¶ 127). According to Petitioner, a "POSITA would have had a reasonable expectation of success in combining Lundahl with Larsen, because both references describe similar illuminators for using light to treat conditions on a patient's skin." *Id.* at 31 (citing Ex. 1015 ¶ 128).

Petitioner's proposed modification of Lundahl also involves using LEDs as a light source instead of Lundahl's fluorescent tubes. *Id.* According to Petitioner, a POSITA would have been motivated to make this change because: (1) LEDs had a lower cost and a longer lifetime than fluorescent tubes; (2) fluorescent tubes were known to have inconsistent light output within the tube itself; and (3) "the use of LEDs would be more practical to reduce spacing between light sources and the edges of the panels, as opposed to the bulky metal couplings at the end of fluorescent tubes, to reduce optical dead space across the light surface." *Id.* (citing Ex. 1014, 4:41–42, 6:31–42; Ex. 1015 ¶ 129). Petitioner asserts that a POSITA would have had a reasonable expectation of success with this modification because Lundahl

and Larsen "describe similar illuminators and the conversion from fluorescent tubes to LEDs was a routine practice prior to 2015." *Id.* at 32 (citing Ex. 1015 ¶ 131).

Patent Owner does not meaningfully dispute the Petitioner's proposed reasons to combine Lundahl and Larsen. *See generally* PO Resp. To the extent Patent Owner argues that a POSITA would not have been motivated to make the combination because it would negatively affecting uniform illumination (PO Resp. 24), the motivating benefit here—using adjustable LED panels instead of monolith fluorescent tubes—outweighs the alleged disadvantages for the many reasons given by Petitioner, including greater adjustability and improved LED performance. *See Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) ("[t]he fact that the motivating benefit comes at the expense of another benefit, however, should not nullify its use as a basis to modify."); Reply 14. We are persuaded that a POSITA would have been motivated to combine Lundahl and Larsen for the reasons advanced by Petitioner.

Next, we address Petitioner's contentions that its proposed combination of Lundahl and Larsen teaches or suggests each limitation of challenged claim 1, along with Patent Owner's arguments and our analysis.

> (b) "A system for photodynamically diagnosing or treating a patient, comprising"

Petitioner begins by contending that Lundahl and Larsen each disclose a device and methods for photodynamically diagnosing or treating a patient. *Id.* at 35 (citing Ex. 1014, 1:9–14; Ex. 1004 ¶¶ 1, 37).

Patent Owner does not contest this, and we determine that Petitioner's contention is supported by a preponderance of the evidence.

> (c) "an illuminator comprising five panels connected by hinged structures on inner side surfaces of adjacent panels"

Petitioner contends that Larsen teaches or suggests a PDT device comprising an illuminator having five panels connected by "hinged structures on the inner side surfaces" of adjacent panels, wherein light sources are disposed on the surfaces of the panels. *See id.* at 35–39 (citing Ex. 1004, Fig. 1 (element 20); Ex. 1015 ¶¶ 152–154). According to Petitioner's declarant, Dr. Grove, the hinges are indicated as element 10 in Larsen's specification but shown as element 20 in Larsen's Figure 1. Ex. 1015 ¶ 154.

Petitioner also contends that, if the Board determines that Larsen's hinges are not on inner side surfaces, placing the hinges in that location would have been a predictable means within the skill in the art for flexibly connecting the panels. *See* Pet. 37–38 (citing Ex. 1015 ¶¶ 154–156). Specifically, Petitioner states that a "POSITA would have found it obvious and would have been motivated with a reasonable expectation of success to locate Larsen's hinges on the inner side surfaces of adjacent panels." Pet. 35; Ex. 1015 ¶ 155. Petitioner explains this "involve[s] nothing more than the use of a known prior art element according to known methods to yield predictable results." *Id.* at 37–38. Petitioner also explains that "there were finite number of known, predictable solutions for Larsen's panels to be 'flexibly connected to each other through hinges,' and POSITA would have found it obvious to try placing the hinges on the inner side surfaces of the panels." *Id.* at 38.

Petitioner explains that a POSITA would have had a reasonable expectation of success, "since POSITA would have known that hinges located on the inside surfaces of the applicator would allow them to be positioned in a nearly flush arrangement as shown in Figure 1." *Id.*

Patent Owner contends that Larsen does not teach or suggest hinged structures on inner side surfaces of adjacent panels. PO Resp. 48–56; Sur-reply 2–5. According to Patent Owner, Larsen depicts hinges at bottom side surfaces of the panels, not on inner side surfaces. *Id.* at 32–36; Ex. 1004, Figure 1 (element 10); Ex. 1004 ¶ 72).

We agree with Patent Owner that Larsen is ambiguous as to the structure and location of the hinges—it is not clear whether the hinges are depicted by element 20 on inner side surfaces, as asserted by Petitioner, or element 10 on bottom side surfaces, as asserted by Patent Owner. As Patent Owner's declarant, Dr. Jokerst correctly states, "a POSITA reading Larsen would have understood that the hinges are ***not necessarily*** on inner side surfaces." Ex. 2050 ¶ 171. Thus, we do not find that Larsen expressly teaches hinges on the inner side surfaces.

However, Larsen's high-level teaching of hinges and lack of detail regarding their structure and location is not fatal to Petitioner's obviousness theory, i.e., that it would have been obvious to relocate Larsen's hinges in a nearly flush arrangement on the inner side surfaces of the panel. Even Dr. Jokerst testifies that "a POSITA [ ] would have understood that the hinges are ***not necessarily*** on inner side surfaces," which implies that a POSITA would have understood Larsen as at least suggesting that hinges could be on inner side surfaces. Ex. 2050 ¶ 171. As pointed out by the Petitioner, this is how the Examiner originally

understood Larsen. Pet. 34 (citing Ex. 1009 ¶ 4 (Examiner finding Larsen teaches hinges on inner side surfaces)).

Patent Owner further argues that Petitioner's reasoning (i.e., that it would have been obvious to try placing the hinges on the inner side surfaces) is unsupported and conclusory. PO Reps. 53–54. Patent Owner argues that Petitioner fails to identify a single prior art reference showing hinged structures on inner side surfaces. *Id.* This argument ignores that Larsen expressly identifies hinges on at least bottom side surfaces, and Petitioner merely proposes modifying their location from the bottom sides to inner sides. We find credible Dr. Grove's testimony that relocating hinges would have been within the level of ordinary skill in the art. Ex. 1015 ¶ 155.

Dr. Jokerst testifies that a POSITA would have been discouraged from placing hinges between Larsen's adjustable applicators, because the hinges would create gaps that interfere with uniform illumination as well as the panels' wiring, and create issues with the use and alignment of the panels. Ex. 2050 ¶ 175. However, a system with discrete panels connected by hinges (like in Larsen) will already have wiring, use and alignment technical challenges, regardless of the location of the hinges—the expected consequence of connecting multiple movable electronic panels. Moreover, the '028 patent acknowledges in its discussion of conventional illuminators that placing hinges between panels was already known. Ex. 1001, 2:7–15.

With respect to Dr. Jokerst's opinion that the hinges would create gaps negatively affecting uniform illumination, we are persuaded that it would have been within the skill of a POSITA to locate the hinges on the

inside surfaces "in a nearly flush arrangement," such that the gaps would be minimized. *Id.*; Ex. 1015 ¶ 155. We also credit Dr. Grove's supplemental testimony on this issue, directly refuting Dr. Jokerst's testimony regarding gaps and uniform illumination (and therefore within the proper scope of reply, contrary to Patent Owner's argument otherwise (Mot. 9). *See* Ex. 1026 ¶¶ 17–20 (explaining LED light divergence and that the physical space caused by hinges "is easily addressed" to maintain uniform illumination).[9]

We further point out that the '028 patent also suggests that gaps do not necessarily negatively affect uniform illumination in all instances. Ex. 1001, 2:17–22 (describing conventional illuminators as having gaps "can" cause optical dead space in certain portions of the target treatment area while other areas receive optimal amount of light).

We also agree with Petitioner that there was a "finite number of known, predictable solutions" for placing hinges to connect three-dimensional rectangular panels, that by definition have six surfaces. Ex. 1015 ¶ 155. Patent Owner's argument implicitly acknowledges this to be true. PO Resp. 55 (contemplating other locations for the hinges: "on the bottom, top, or back of the panels," "on the front of the panels," "or between the panels"). In its Reply, Petitioner confirms that there are only three reasonable options for placing hinges—on the top/bottom, back, or between panels. Reply 25; Ex. 1031, 592:2–8 (which is in the proper scope of reply

[9] This testimony was not presented in the related ITC proceeding and directly relates to the ID's divergent determination that "introducing gaps would destroy Lundahl's goal of uniform illumination, undermining any motivation for flexibility." Ex. 2090, 120.

because it responds to Patent Owner's argument (Mot. 12–13) that there was not a finite number of locations/sides to place a hinge on a three-dimensional rectangular panel)). Even if we did not accept Petitioner's argument that there are only "three" locations (sides) on which to place a hinge, common sense limits the number of possible locations to six sides (top, bottom, front, back, and two sides) on a three-dimensional rectangular panel, and six is a reasonable finite number. We are, therefore, persuaded by Petitioner's argument that "[t]he choice of whether to place hinges between panels, on the top or bottom, or on the back is not an act of invention." Reply 25.

> (d) "light sources disposed on surfaces of the five panels, the illuminator being configured to uniformly illuminate a treatment surface of the patient via the light sources"

Petitioner contends that the combined teachings of Lundahl and Larsen disclose illuminators with light sources on panels "configured to uniformly illuminate a treatment surface." Pet. 39–42; Ex. 1015 ¶¶ 160–165. Petitioner contends that both Lundahl and Larsen teach uniformly illumination. *Id.* (citing Ex. 1014, 1:9–11 ("uniform distribution of visible light"); Ex. 1004 ¶¶ 28 ("even and gap-free radiation of the surface"), 79). Petitioner further points to Lundahl's teaching of varying the vertical spacing of the light sources to achieve uniformity, specifically, by having a higher density of light sources at the top and bottom portions of a panel. Pet. 40–41 (citing Ex. 1014, 6:16–30, 43–57, Fig. 2); Ex. 1015 ¶¶ 160–162.

Patent Owner argues that Petitioner only addresses Lundahl and Larsen separately and therefore has not shown that Lundahl and Larsen, *as combined*, teach the "uniformly illuminate" limitation. PO Resp. 19–33. Patent Owner also argues that Petitioner has not provided evidence or analysis to show that the combination would achieve measured irradiance

within 60% of the measured radiance. *Id.* at 19, 21 ("Dr. Grove does not identify what the measured maximum is for the ***combination*** of Lundahl and Larsen, nor does he explain how a POSITA would have achieved the same measured results as Lundahl after combining Lundahl with Larsen.").

As an initial matter, we note that "configured to uniformly illuminate a treatment surface" is a functional limitation, and we need only determine that the combination is "capable of" uniformly illuminating a treatment area. Furthermore, the recited "treatment area" is unspecified, and therefore includes very small and/or flat areas of a patient's body (for example, the forehead or back of the hand) selected by, e.g., a dermatologist. Ex. 1001, 1:26–50; *see In re Blue Buffalo Enters., Inc.*, No. 2024-1611, 2026 WL 100470 (Fed. Cir. Jan. 14, 2026).

We are persuaded that Petitioner has met its burden to show that the combination teaches or suggests the "uniformly illuminate" limitation. It is not in dispute that, separately, Lundahl is configured to provide uniform illumination (including at the 60% measured radiance). We also find that Larsen is configured to provide uniform illumination, including for small treatment areas sufficiently far from any potential lower irradiance regions at Larsen's panel junctions.[10] Ex. 2018 ¶¶ 151, 154; Ex. 1004 ¶ 72. As Petitioner explains, uniform illumination is emphasized in both Lundahl and Larsen. Pet. 39, 41. We agree with Petitioner that a POSITA would have used their knowledge to retain the essential, functional teachings of the references–in this case, maintaining light uniformity–while converting

[10] In contrast with the ITC's finding that Larsen does not disclose "uniform illumination" under a clear and convincing standard, we find Larsen, by a preponderance of the evidence, discloses this element. Ex. 2090, 103.

Lundahl's U-shaped fluorescent tube arrangement and accompanying structure into LEDs on adjustable panels in view of Larsen. *See* Reply 6 (citing Ex. 1014, 15:22–27; 6:16–30); Ex. 1015 ¶¶ 160–165; Ex. 1026 ¶¶ 15-16). Naturally, some adaptation of the Lundahl-Larsen combination would be required to maintain Lundahl's uniform illumination, but "[a] person of ordinary skill is also a person of ordinary creativity, not an automaton." *See KSR*, 550 U.S. at 421.

In our view, regardless of the different characteristic of LEDS and fluorescent tubes, upgrading fluorescent systems in a PDT to an LED system while maintaining uniform illumination, particularly for a small and/or flat treatment area, is akin to routine optimization and well within the level of ordinary skill. Even if achieving uniform illumination for larger treatment areas, across several panels, was "one of the more difficult challenges" and required "numerous tests,"[11] this is not sufficient evidence that achieving uniform illumination would have been beyond ordinary skill, particularly for a small, flat treatment area covered by a single panel (which is all the claim requires). PO Resp. 33 (citing Ex. 2052, 73:20–74:14). Although Patent Owner argues that Petitioner's own expert argued that achieving uniform illumination was not routine, Dr. Grove's testimony only referred to achieving uniform illumination over large or non-flat treatment areas (e.g., torso and extremities). *See* PO Resp. 32 (citing Ex. 2034 ¶¶ 186, 191–192; Ex. 2084, 66:1–67:14); Reply 13. Furthermore, as Patent Owner's witness explains, light uniformity is affected by a variety of factors, including "density, power, angle, diffuser, the LED itself," none of which is laid out

[11] The record includes no information regarding an approximate number of the "numerous tests" conducted. Ex. 2053, 89:8–15.

with specificity in the '028 patent claims, suggesting that achieving uniformity was routine optimization within the level of ordinary skill. Ex. 2052, 74:2–14, 88:15–89:8; Ex. 1026 ¶ 16.

With respect to Patent Owner's remaining arguments that the combination fails to teach uniform illumination, and that a POSITA would not have had a reasonable expectation of success, because of the "numerous modifications" of "carefully selected and engineered components" needed to modify Lundahl as proposed (PO Resp. 22–28), it is well accepted that "it is not necessary that a device shown in one reference . . . be physically inserted into the device of the other. The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference." *In re Keller*, 642 F.2d 413, 425 (CCPA 1981) (internal citations omitted); *see also In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983) ("[I]t is not necessary that the inventions of the references be physically combinable to render obvious the invention under review."); *In re Nievelt*, 482 F.2d 965, 968 (CCPA 1973) ("Combining the teachings of references does not involve an ability to combine their specific structures."). Moreover, the artisan is not compelled to blindly follow the teaching of one prior art reference over the other without the exercise of independent judgment. *See Lear Siegler, Inc. v. Aeroquip Corp.*, 733 F.2d 881, 889 (Fed. Cir. 1984). The evidence here suggests that there was a reasonable expectation of success in updating a fluorescent system like Lundahl's with LED technology. Ex. 1015 ¶ 131; Ex. 1027; Ex. 2011 (explaining that LEDs have replaced incandescent and fluorescent bulbs and are were used in a myriad of applications by the relevant time).

> (e) "one of the five panels being positioned as a center panel configured to face the treatment surface, and two or more of the five panels being configured to be angled relative to the center panel"

Petitioner contends that Larsen's device has one of its five panels positioned as a center panel which is configured to face the treatment surface, while two or more of the five panels are configured to be angled relative to the center panel. *Id.* at 42–43 (citing Ex. 1004, Fig. 1; Ex. 1015 ¶ 166). We agree that Figure 1 of Larsen shows a center and angled panels. Patent Owner does not contest this, and we determine that Petitioner's contention is supported by a preponderance of evidence.[12]

> (f) "wherein the five panels are positioned to allow treatment within approximately four inches of the treatment surface"

Petitioner asserts that Lundahl teaches or suggests positioning its device at a distance of between two and four inches of the treatment surface. *Id.* at 44–45 (citing Ex. 1014, 15:22–27). Patent Owner does not contest this, and we determine that Petitioner's contention is supported by a preponderance of evidence.

[12] Our determination differs from the ITC's ID, which agreed with Patent Owner's argument that Larsen does not teach a center panel configured to face the treatment surface under the clear and convincing evidence standard. Ex. 2090, 115–116.

> (g) "wherein each of the five panels has two first edges and two second edges shorter than the two first edges, and the light sources are arranged such that a higher intensity of light is emitted proximate the second edges compared to the intensity of light emitted not proximate the second edges"

Petitioner contends that Larsen's panels each have two first edges (vertical side edges) and two shorter second edges (horizontal top edges). Pet. at 45–46 (citing Ex. 1004, Fig. 1). According to Petitioner, Lundahl teaches the concept of arranging light sources such that a "higher intensity of light is emitted proximate the second edges." *Id.* at 46–48 (citing Ex. 1004, Fig. 2, 6:54–57). Petitioner argues that its combination "maintain[s] the same light distribution pattern Lundahl utilized for the fluorescent bulbs." Ex. 1015 ¶ 179.

Patent Owner argues that Lundahl and Larsen do not render obvious the recited higher intensity of light emitted proximate the shorter second edges. PO Resp. 33–48. First, Patent Owner argues that Petitioner's combination ignores Lundahl's teachings of areas of reduced emission along Lundahl's "shorter" edges (due to the metal couplings at the end of the fluorescent tubes outside of the active emitting area). PO Resp. 34; Ex. 1015 ¶ 129. Patent Owner argues that these reduced emission areas are missing from Petitioner's proposed combination. PO Resp. 34–38. Patent Owner's argument, however, is illogical and ignores that the reduced emission areas are simply a consequence of using tubular fluorescent light sources. *See* Reply 16; Ex. 1026 ¶¶ 22–26.[13] We agree with Petitioner that a POSITA would not incorporate Lundahl's

[13] This testimony was not presented in the related ITC proceeding.

shortcomings into a combination using LEDs as light sources. Reply 16 (citing Ex. 1032, 768:10–13); Ex. 1026 ¶¶ 22–26.

Patent Owner also argues that, due to the presence of Larsen's scan engines, the higher intensity of light is not emitted proximate to the second edges. PO Resp. 38–41. However, we agree with Petitioner that Larsen's scan engine is not required in the combination, which modifies Lundahl with the concept of Larsen's five adjustable, hinged LED panels. Reply 21–22. Moreover, Dr. Jokerst confirmed that Larsen's scan engine, seen in Larsen's Figure 3, moves linearly side to side, which would not affect light intensity at the second edges. Ex. 1032, 769:1–8; *see* Reply 22–23 (citing Ex. 1032, 741:22–742:14).

In general, Patent Owner's argument that neither Lundahl nor Larsen teach emitting light at a higher intensity close to shorter edges does not consider what the references teach as a whole. PO Resp. 42–48. As Petitioner correctly points out, Patent Owner ignores that the *longer* top and bottom edges of Lundahl's fluorescent tubes (which indisputably teach emitting higher intensity light due to the uneven spacing), when modified in view of Larsen, correspond to the *shorter* top and bottom edges of panels.[14] Reply 19–21; *see In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (Nonobviousness cannot be established by attacking the references individually when the rejection is based upon a

[14] We disagree with the ITC's finding that "[a]pplying Lundahl's light distribution to Larsen's five panels yields a higher intensity of light on the longer edges of each panel," as seen in the annotated figure CDX-0018C.77. Ex. 2090, 109. Petitioner provides several illustrations clarifying that when combined as proposed, Lundahl and Larsen teach emitting light at a higher intensity close to shorter edges. Pet. 25, 35; Reply 20.

combination of prior art, and each reference "must be read, not in isolation, but for what it fairly teaches in combination with the prior art as a whole.").

We determine that Petitioner's foregoing contentions are supported by the combined teachings and suggestions of Lundahl and Larsen, as well as the testimony of Petitioner's declarants, which we find credible. We determine that Petitioner has shown by a preponderance of the evidence that the proposed combination of Larson and Lundahl teaches or suggests each element of challenged claim 1.

(h) Secondary Considerations or Objective Indicia of Non-Obviousness

Patent Owner argues that secondary considerations of nonobviousness, including commercial success and praise, should be accorded substantial weight, and demonstrate that the challenged claims are nonobvious. PO Resp. 72–78.

When presented, secondary considerations "must always . . . be considered in the overall obviousness analysis." *Adapt Pharma Operations Ltd. v. Teva Pharms. USA, Inc.*, 25 F.4th 1354, 1372 (Fed. Cir. 2022). However, "a strong showing of obviousness may stand even in the face of considerable evidence of [secondary considerations]." *Id.* Based on the evidence of record and findings discussed above, we determine that any evidence of secondary considerations would need to be given substantial weight in order to determine that the claims have not been shown to be unpatentable by a preponderance of the evidence.

"In order to accord substantial weight to secondary considerations in an obviousness analysis, 'the evidence of secondary considerations must have a 'nexus' to the claims, i.e., there must be 'a legally and factually

sufficient connection' between the evidence and the patented invention.'" *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019), *cert. denied*, 141 S. Ct. 373 (2020). Applying *Fox Factory*, the Board uses a two-step analysis in evaluating nexus between the claimed invention and objective evidence of nonobviousness. *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 33 at 33 (PTAB Jan. 24, 2020) (precedential). We first consider whether the patent owner has demonstrated "that its products are coextensive (or nearly coextensive) with the challenged claims," resulting in a rebuttable presumption of nexus. *Id.* If not, that does not end the inquiry; "the patent owner is still afforded an opportunity to prove nexus by showing that the evidence of secondary considerations is the 'direct result of the unique characteristics of the claimed invention.'" *Id.* (quoting *Fox Factory*, 944 F.3d at 1373–75). Ultimately, "[t]he patentee bears the burden of showing that a nexus exists." *WMS Gaming, Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1359 (Fed. Cir. 1999).

(1) Patent Owner's Product: (BLU-U®4170E)

Patent Owner presents evidence that its product, BLU-U®4170, embodies the challenged claims and has been praised by the dermatology industry as "a step forward in photodynamic therapy." PO Resp. 77 (citing Ex. 2014 (ITC claim chart); Ex. 2085, 3 (Dermatology Times article); Ex. 2050 ¶ 252). The extent of Patent Owner's evidence is a single article in Dermatology Times announcing the U.S. Food and Drug Administration's (FDA) approval of the BLU-U®4170 product—which we do not find to be praise from industry participants. The evidence here is not sufficient to overcome the strong case of obviousness in view of Lundahl and Larsen.

(2) Petitioner's Product: RhodoLED®XL

As we explain below, Patent Owner has not established a presumption of nexus or actual nexus, and the weight of Patent Owner's evidence is insufficient to overcome the strong case of obviousness in view of Lundahl and Larsen.

(a) Presumption of Nexus/Nexus

Patent Owner argues that a presumption of nexus applies because Petitioner's product, RhodoLED®XL, embodies and is coextensive with the challenged claims. PO Resp. 73 (citing Ex. 2050 ¶¶ 226–232, Appendix B; Ex. 2038, 127–132; Ex. 2043; Ex. 2056, 2; Ex. 2058, 1; Ex. 2059; Ex. 2060, 1; Ex. 1019 (claim chart)); Sur-reply 27 (citing Ex. 1029, 38:15–39:14, 46:22–52:17; Ex. 2048 ¶ 27; Ex. 1033, 295:30–297:24); Tr. 74:7–78:18. Notably, for the coextensiveness requirement, Patent Owner cites (but does not analyze) numerous exhibits including the declarations of Dr. Vander Veen and Dr. Jokerst. PO Resp. 73. However, Dr. Vander Veen expressly states that he does not opine on coextensiveness, and Dr. Jokerst's testimony on coextensiveness is conclusory and does not address whether the RhodoLED®XL includes additional unclaimed features. Ex. 1029, 23:5–7; Ex. 2050 ¶ 229. Additionally, Patent Owner argues that actual nexus exists by tying the RhodoLED®XL's commercial success and praise to the claimed combination of features of the '028 patent, i.e., the RhodoLED®XL's "larger illumination area," "uniform light," and adjustable "five panels with [the] particular LED arrangement." PO Resp. 78 (citing 2050 ¶¶ 225–254; Ex. 2048 ¶¶ 26–46).

In its Reply, Petitioner argues that Patent Owner has not met its burden in establishing 1) that the RhodoLED®XL is entitled to the

presumption of nexus, or 2) actual nexus. Reply 29–30 (arguing that Patent Owner's analysis is conclusory, improperly incorporates by reference numerous exhibits, and ignores certain features of the RhodoLED®XL, e.g., its sleek construction, intuitive user interface, maneuverability, and distance sensors) (citing Ex. 2045, 1).

We are not persuaded that Patent Owner is entitled to the presumption of nexus. Even assuming the proffered claim chart (Exhibit 1019) is sufficient to establish that the RhodoLED®XL embodies the challenged claims, Patent Owner provides only conclusory analysis for the coextensiveness requirement. Moreover, during oral argument, Patent Owner expressly acknowledged that the RhodoLED®XL embodies another patented invention, U.S. Patent No. 11,235,169. Tr. 75:12–22; Ex. 2059 ("the RhodoLED®XL" patent); *see Therasense, Inc. v. Becton, Dickinson & Co.*, 593 F.3d 1289, 1299 (Fed. Cir. 2010), *vacated on other grounds*, 374 F. App'x 35 (2010) (finding that the patentee was not entitled to a presumption of nexus because the product embodied at least two patented inventions). The RhodoLED®XL patent includes claims reciting "distance sensors" that allow an "automatically switched" function—features presumably in the RhodoLED®XL product. Ex. 2059, 33:1–30; Ex. 2043, 17–18. We see nothing in this record demonstrating that the RhodoLED®XL's distance sensors and automatic switching function are non-critical features. *See Fox Factory*, 944 F.3d at 1375 ("A patent claim is not coextensive with a product that includes a 'critical' unclaimed feature that is claimed by a different patent and that materially impacts the product's functionality"). Rather, the fact that these sensors were touted by Petitioner in its marketing material provides evidence to the contrary. Ex. 2045, 1 ("the RhodoLED XL offers

. . . additional features such as positioning sensors to ensure the patient receives the optimal energy delivery from the LED array").

Based on the forgoing, Patent Owner has not shown that it is entitled to the presumption of nexus. The burden remains on the Patent Owner to show actual nexus—that the RhodoLED®XL's praise and commercial success was due to the combination of the claimed features of the '028 patent. Patent Owner falls short of its burden to show actual nexus, for reasons discussed below.

Regarding its evidence of industry praise of the RhodoLED®XL, Patent Owner identifies praise, some of which is tied to features claimed in the '028 patent, in particular, the RhodoLED®XL's larger illumination area and adjustable/flexible panel configuration. Sur-reply 29; *see* PO Resp. 77 (citing Ex. 2050 ¶¶ 247–252; Ex. 2045, 1; Ex. 2054, 1; Ex. 2046, 1; Ex. 2042, 4; Ex. 2039, 44:9–45:11, 58:15–59:6). These two features, however, are both taught in the Larsen prior art. We agree with Petitioner that the remaining praise identified by Patent Owner, such as "[the] particular LED arrangement," "elegant design" "maneuverability," "adjustability," and "advanced features," is not tied sufficiently to the '028 patent claims, and we are not persuaded of an actual nexus here. Reply 31–32 (citing PO Resp. 77).

Regarding commercial success, we are also not persuaded of an actual nexus. As Petitioner persuasively points out, many claimed features that drove the success of the RhodoLED®XL were already known, at least separately, in the prior art. Reply 30. That is, Larsen teaches using a larger illumination area with adjustable five LED panels, and each of Lundahl and

Larsen teach using uniform light.[15] The '028 patent also recognizes that using uniform light was known. Ex. 1001, 1:50–57. Petitioner also points out that Patent Owner ignores the contribution of the RhodoLED®XL's unclaimed features ("sleek" aesthetics, intuitive user interface, simple maneuverability, and distance/positioning sensors). Reply 30 (citing Ex. 2045, 1).

Although Patent Owner cites testimony from Dr. Vander Veen to show that the unclaimed features do not drive customer purchasing decisions, Patent Owner does not provide analysis of that testimony. Sur-reply 28 (citing Ex. 1029, 38:15–39:14, 46:22–52:17; Ex. 2048 ¶ 27). Based on his testimony, we cannot determine if Dr. Vander Veen meaningfully considered whether and to what extent the RhodoLED®XL's unclaimed features (aesthetics, user interface, maneuverability, and sensors) or other factors (Biofrontera's marketing strategies, advertising budget, and customer service) drove customer purchasing decisions. For instance, Dr. Vander Veen notes that original RhodoLED® sales doubled from 2022 (66 units sold) to 2023 (123 units) but does not explain why sales of Petitioner's PDT products would not similarly keep increasing into 2024. Ex. 2048 ¶ 32. It is also not clear whether and to what extent Dr. Vander Veen factored into his analysis that certain claimed features—a larger illumination area with adjustable five LED panels and using uniform light—were previously known (at least separately) in the prior art.

[15] Bansal provides further evidence that the prior art recognized the importance of uniform light distribution when using LED panels on a subject. Ex. 1005, Abstract, code (57).

Looking at the evidence before us, we are not persuaded that the increased sales for Biofrontera's RhodoLED®XL were a result of the claimed features. PO Resp. 72 (citing Ex. 2048 ¶¶ 19–33, 43), 75 (citing Ex. 2045, 1; Ex. 2046, 1). Rather, it appears that Biofrontera's increased sales were due to, at least in part, the FDA's October 2024 approval involving the drug Ameluz®, which is used in conjunction with the RhodoLED® and RhodoLED®XL. Ex. 2078, 1. According to a sales and earnings report for Biofrontera, the October FDA approval of larger doses (three tubes) of Ameluz® allows for expanding the treatment's utility to treating larger surface areas at one time. The sales and earnings report states:

> The [] approval also dovetails nicely with the larger treatment lamp that [Biofrontera] launched in 2Q24, the RhodoLED XL lamp . . . . In reality, dermatologists have been spreading Ameluz more thinly than they should over a broader area than is recommended on the Ameluz label in order to cover more AK lesions at once. The new approval should help them apply the correct amount which, given the markup they pass through to insurance on the tubes of Ameluz they buy, should increase both procedure profitability and effectiveness. Furthermore, the more liberal Ameluz approval also helps BFRI better compete against the competing Levulan Kerastick photodynamic therapy, given that the Kerastick procedure covers a greater surface area per treatment than the original BF-RhodoLED lamp used with one Ameluz tube.

Id.

Dr. Vander Veen opines that, because the drug Ameluz® can be used with either the RhodoLED® or the RhodoLED®XL, the increase in sales of the RhodoLED®XL compared to its predecessor cannot be the result of the FDA approval. Ex. 2048 ¶ 33. This ignores the fact that the FDA's approval of larger doses of Ameluz® (three tubes) is directly linked to the

profitability and effectiveness of the larger RhodoLED®XL, not the RhodoLED®. As seen in the excerpt above, the smaller RhodoLED® only requires one tube to be profitable and effective, and one-tube applications of Ameluz® were already FDA-approved. Thus, the evidence suggests that the FDA's approval of larger doses of the drug Ameluz®, used in conjunction with the larger RhodoLED®XL, impacted RhodoLED®XL sales.

Patent Owner also points to Biofrontera's marketing materials and the RhodoLED®XL's premium price to show a nexus between the evidence of commercial success and the'028 patent. PO Resp. 75–76 (Ex. 2048 ¶¶ 34–45). We are not persuaded.

Patent Owner's arguments and evidence again ignore that RhodoLED®XL has unclaimed features (e.g., updated aesthetics, user interface, and maneuverability as well as distance sensors). These unclaimed features were touted in Biofrontera's marketing materials alongside of the claimed features. *See*, *e.g.*, Ex. 2045, 1. Improved aesthetics, user interface, maneuverability, and sensors would likely command a higher price. Furthermore, the RhodoLED®XL is larger than the RhodoLED® (having five adjustable panels instead of one), and it logically follows that a larger, more complex device would cost more to manufacture, ship, etc., resulting in a higher sticker price. Simply put, Patent Owner does not provide evidence that the price premium is actually due to the claimed features (as opposed to the unclaimed features or some other reason—scarcity, advertising, production costs, etc.).

For the above reasons, we determine that Patent Owner has not established a nexus between its evidence of commercial success and the

challenged claims. For completeness, we now weigh Patent Owner's evidence of praise and commercial success relating to Petitioner's product.

(b) Industry Praise

Patent Owner's evidence of praise of the RhodoLED®XL includes Biofrontera's self-referential praise and quotes from self-serving press release articles and advertising material. PO Resp. 77; Exs. 2039, 2042, 2045, 2046, 2054; *see Bayer Healthcare Pharms., Inc. v. Watson Pharms., Inc.*, 713 F.3d 1369, 1377 (Fed. Cir. 2013) (discussing how "self-referential commendation fall[s] well short of demonstrative true industry praise"); *In re Cree, Inc.*, 818 F.3d 694, 702 (Fed. Cir. 2016) (rejecting patentee's reliance on "self-serving statements from researchers about their own work" as alleged evidence of praise). Because the praise is not from *industry*, we afford this evidence little weight.

(c) Commercial Success

Regarding Patent Owner's proffered evidence of increased sales of Biofrontera's more expensive RhodoLED®XL, Petitioner argues that Patent Owner fails to show that the sales volume of RhodoLED®XL is significant. PO Resp. 72 (citing Ex. 2048 ¶¶ 19–33, 43), 75 (citing Ex. 2045, 1; Ex. 2046, 1), 76; Reply 30.

Although Patent Owner demonstrates that the RhodoLED®XL sales and revenue are higher in comparison to its predecessor, the RhodoLED®, without a full comparison of the relevant PDT market (which in this case, appears to be a comparison to Patent Owner's own PDT sales[16]), it is unclear

[16] According to Dr. Vander Veen, Petitioner and Patent Owner were the only FDA-approved sellers of PDT devices on the market at the relevant time. Ex. 2048 ¶ 31.

if Biofrontera's increased sales and higher revenue were truly significant. *See J.T. Eaton & Co. v. Atl Paste & Glue Co.*, 106 F.3d 1563, 1571 (Fed. Cir. 1997) ("a patentee can demonstrate commercial success . . . by significant sales in a relevant market"). Because the lack of overall market share data cuts against the sales data, we afford this evidence of commercial success moderate weight. S*ee also, e.g.*, *In re Applied Materials, Inc.*, 692 F.3d 1289, 1300 (Fed. Cir. 2012) ("An important component of the commercial success inquiry in the present case is determining whether [Patent Owner] had a significant market share relative to all competing [products] based on the merits of the claimed invention."); *In re Huang*, 100 F.3d 135, 140 (Fed. Cir. 1996) (noting that "evidence related solely to the number of units sold provides a very weak showing of commercial success, if any").

Regarding the higher price point of the RhodoLED®XL over the RhodoLED®, we afford this little weight because a more expensive product could indicate commercial success but, as discussed above, we are not persuaded that the higher price is actually a result of the claimed features rather than something else.

To the extent Patent Owner relies on Biofrontera's marketing documentation, press releases, public announcements, and other public information to evidence commercial success (PO Resp. 72–75; Ex. 2048 ¶¶ 45), this evidence is not sufficient to show commercial success and we give it little weight, if any.

(3) Conclusion on Secondary Considerations

We have considered the evidence in this proceeding regarding secondary considerations. We determine that the evidence is not entitled to

substantial weight in our obviousness analysis because the evidence does not establish either a presumption of nexus or actual nexus. Even assuming we determined a presumption of nexus or actual nexus existed, we find Patent Owner's weak to moderate evidence of commercial success and praise does not overcome the strong showing of obviousness established by Petitioner.

(i) Conclusion as to Claim 1

We find that the combination of Lundahl and Larsen teaches all the limitations of claim 1, that one of ordinary skill in the art would have had reasons to combine Lundahl and Larsen, a reasonable expectation of success in doing so, and that Patent Owner fails to show entitlement to a presumption of nexus or establish an actual nexus, and even assuming the existence of a nexus, Patent Owner still presents only weak to moderate evidence of secondary considerations. We, therefore, determine that Petitioner has shown, by a preponderance of the evidence, that claim 1 is unpatentable as obvious over the combination of Lundahl and Larsen.

3. Claim 16

Petitioner alleges motivation to modify Lundahl in view of Larsen (Pet. 25–34) and alleges that the proposed combination teaches or suggests each limitation of challenged claim 16. We first turn to the limitations in dispute.

(a) Claim 16: Disputed Limitations

Claim 16 recites "uniformly illuminate a treatment surface of a patient" and "higher intensity of light is emitted proximate the second edges," which are both limitations in dispute. We previously addressed Petitioner's contentions and Patent Owner's arguments with respect to these limitations in our analysis for claim 1 above, which is similarly

applicable to claim 16. Thus, the only remaining claim 16 limitation in dispute reads as follow:

> (b) "five panels connected by hinged structures to allow continuous illumination across the five panels, wherein the five panels are individually configurable to control illumination from each of the five panels"

Petitioner relies on Larsen's five panels connected by hinged structures to allow "continuous illumination" across the five panels. Pet. 63.

Patent Owner argues that Larsen does not teach hinged structures on inner side surfaces, and any such hinges would create gaps (and thus not allow continuous illumination). PO Resp. 63–64. Claim 16, however, does not require hinged structures on inner side surfaces. Additionally, even if we accept Patent Owner's argument that Larsen's hinges would create gaps between panels creating "lower irradiance regions" (PO Resp. 64), we are persuaded by Petitioner that lower irradiance regions still allow for some irradiance, therefore, continuous illumination of those regions. Reply 28 (citing Ex. 1026 ¶¶ 9–17; Ex. 2050, 178–182); *see* Tr. 31:23–32:7 ("It just means it needs to be continuously illuminated. So even if there's an area of lower radiance, as long as that area is still irradiated by the light, it's our position that that claim term is met by the prior art."); Ex. 1001, 2:18–22 (disclosing that gaps can create areas with lower and higher irradiance). Dr. Jokerst's conclusory testimony that "[a] POSITA would understand that with 'lower irradiance regions at the junction' of Larsen's panels, Larsen does not provide continuous illumination across its five panels" is not persuasive. Ex. 2050 ¶ 193. In our view, illumination is continuous regardless of whether the illumination is lower or higher. Continuous illumination does not mean uniform illumination.

Petitioner also relies on Larsen to show that the five panels are "individually configurable to control illumination from each of the five panels." Pet. 64–65 (citing Ex. 1015 ¶¶ 229–231; Ex. 1004 ¶¶ 70, 74, 79–80, Figs. 1, 2a–2c). Petitioner identifies Larsen's teaching of adjustable applicators 13, with various configurations of light sources, as seen in Figures 2a–2c, each applicator connected to controller 16. Pet. 64 (citing Ex. 1004 ¶ 70; Figures 1, 2a–2c).[17]

Patent Owner argues Larsen teaches only controller 16 for the entire device, not a controller dedicated to each applicator 13. PO Resp. 60 (citing Ex. 2050 ¶ 185), 61. Patent Owner's argument is not commensurate with the scope of the claim because, here, there is no requirement for each panel to have a dedicated control unit. We also agree with Petitioner that a POSITA would have understood that a single controller can control multiple applicators and/or LEDs. *See* Reply 27 (citing Ex. 2011, 2 ("controls are usually interfaced to the driver circuitry to allow the brightness of the individual LEDs to be set")); Tr. 34:3–9.

Patent Owner further disputes that Larsen's controller can individually control each applicator, arguing that Larsen's various applicator configurations in Figures 2a–2c are "3 different use cases." We do not agree that the various applicators taught in Larsen (Figures 2a–2c and paragraph 70) are separate use cases that cannot be used together in a single system. Larsen suggests that applicators having different light source configurations (as seen in Figures 2a–2c) can be used together. *See* Ex. 1004, claim 15 (requiring that *at least one* of the applicators have a fluorescent light),

[17] The ID in the related ITC proceeding does not discuss Petitioner's reliance on Larsen's Figures 2a–2c. Ex. 2090, 114–115.

Fig. 17b (using different upper and lower applicators). A system that uses different types of applicators suggests individual control of those applicators. *See* Ex. 1002, 328 (The Examiner finding the corresponding disclosure in Larsen, U.S. 7,033,381, Exhibit 1008, to teach "individually configurable" panels).

Petitioner also identifies Larsen's teaching that one or more panels may include a sensor. Pet. 65 (citing Ex. 1004 ¶¶ 79–80, Figs. 2a–2c); Ex. 1015 ¶ 230. Patent Owner argues that Larsen does not teach each applicator 13 being adjusted individually based on the feedback received at sensors 32. PO Resp. 62. We are persuaded by Petitioner's declarant that, where each panel includes its own sensor, Larsen at least suggests that applicators are individually adjusted by the controller based on feedback from their respective sensors. Ex. 1015 ¶ 230.[18]

Petitioner further contends that a POSITA would have understood Larsen's teachings of "the invented device is adjustable" and "switch select system" as teaching that the individual applicators are adjustable. Pet. 64 (citing Ex. 1004 ¶ 74). Patent Owner argues that Larsen only refers to adjustability/switching across all applicators, not adjustability of individual applicators. PO Resp. 59–60. We agree with Petitioner's broader reading of Larsen, particularly in light of the teaching of Larsen's claim 5. *See* Reply 26–27; Tr. 34:10–37:16. Larsen's claim 5 depends from claim 1, which recites, "the light source consists of at least one semiconductor diode and/or at least one laser diode." Ex. 1004 ¶ 125. Larsen's claim 5 relates to the switch select system and recites that light sources, such as laser diodes, "are

[18] The ID in the related ITC proceeding does not address Larsen's sensors or testimony related to the sensors. Ex. 2090, 114–115.

individually selected—switched ON or OFF." *Id.* Claim 5's teaching that laser diodes are individually switched supports Petitioner's position that Larsen's teachings go beyond simply adjustability/switching across all applicators.

(c) Claim 16: Remaining Limitations

Patent Owner does not dispute Petitioner's identification of teachings in Lundahl and Larsen for the remaining limitations of claim 16. PET. 58–67. We determine that Petitioner's following contentions, discussed below, are supported by a preponderance of evidence.

Petitioner relies on its same contentions as for claim 1, and additionally contends Larsen teaches a mobile base supported by at least four wheels (Ex. 1004, Fig. 1, ¶¶ 27, 69; Ex. 1015 ¶¶ 213–216); and a pillar perpendicular to the base (Ex. 1004, Fig. 1, ¶ 69; Ex. 1015 ¶¶ 217–218). For the controller, Petitioner cites Lundahl's teaching of an electronic control system 100 (Ex. 1014, 11:19–29; Ex. 1015 ¶ 219) and Larsen's controller 16 (Ex. 1004, Fig. 1, ¶ 74; Ex. 1015 ¶¶ 219–220). Petitioner cites Larsen's jointed arm 12, on which applicator 13 is hingedly connected. Ex. 1004, Fig. 3, ¶ 73; Ex. 1015 ¶¶ 222, 225. Petitioner also contends that Lundahl teaches a fan or that it would have been obvious to include a fan mounted on Larsen's applicator in light of Larsen's teaching of disadvantageous overheating. Ex. 1014, 9:14–18; Ex. 1004 ¶ 6; Ex. 1015 ¶¶ 239–242.

(d) Claim 16: Conclusion

We find that the combination of Lundahl and Larsen teaches all the limitations of claim 16, that one of ordinary skill in the art would have had reasons to combine Lundahl and Larsen with a reasonable expectation of

success, and that Patent Owner fails to show entitlement to a presumption of nexus or establish an actual nexus, and presents only weak to moderate evidence of secondary considerations. We, therefore, determine that Petitioner has shown, by a preponderance of the evidence, that claim 16 is unpatentable as obvious over the combination of Lundahl and Larsen.

4. Remaining Claims 2, 4, 5, 6, 17, 19, 20, and 21

Aside from its argument that the combination of Lundahl and Larsen does not teach or suggest claims 1 or 16, Patent Owner does not contest Petitioner's contentions with respect to claims 2, 4, 5, 6, 17, 19, 20, and 21. Pet. 49–57, 68–73. We determine Petitioner's contentions with respect to these claims, discussed below, to be supported by a preponderance of evidence.

Regarding claims 2 and 4, Petitioner contends the combination of Lundahl in view of Larsen renders obvious using red light at a dose of 30J/cm2 to 150J/cm2 and wavelength of 400nm to 700nm. According to Petitioner, Lundahl expressly incorporates all teachings of Kennedy[19], which teaches red light in the recited dose and wavelength ranges. Pet. 50 (citing Ex. 1017, 4:60–69, Examples 1–4); Ex. 1014, 1:38–48, 2:18–26, 15:55–6; Ex. 1015 ¶¶ 182–186, 189. Petitioner also contends Larsen teaches using red light and the recited wavelength. Pet. 51; Ex. 1004 ¶¶ 24, 25, 71–76, 83; Ex. 1015 ¶ 187.

Regarding claim 5, Petitioner relies on the same contentions as for claim 1 and additionally contends Lundahl and/or Larsen teach a method of photodynamically diagnosing or treating a patient (Ex. 1014, 1:9–17;

[19] Kennedy et al., U.S. 5,079,262, issued January 7, 1992 (Ex. 1017) ("Kennedy").

Ex. 1004 ¶ 1) including administering 5-aminolevulinic acid (ALA) to the patient (Ex. 1014, 2:18–26, 15:29–37), positioning an illuminator proximate to the patient (*id.* at 4:33–38, Fig. 1), the illuminator comprising five panels connected by hinged structures on inner side surfaces of adjacent panels (Ex. 1004 ¶¶ 70–72). Pet. 53–56; Ex. 1015 ¶¶ 191–205; Ex. 1016 ¶¶ 75–82.

Regarding claim 6, Petitioner relies on the same contentions as for claims 2 and 4. Pet. 56–57; Ex. 1015 ¶¶ 206–211. Regarding claim 17, Petitioner relies on the same contentions as for claim 1. Pet. 68; Ex. 1015 ¶ 243. Regarding claim 19, Petitioner relies on the same contentions as for claim 6. Pet. 68; Ex. 1015 ¶ 244. Regarding claim 20, Petitioner relies on the same contentions as for claim 1 and additionally contends that Larsen teaches illuminators (applicators) configured to output light at a variable irradiance density during treatment. Pet. 68; Ex. 1004 ¶¶ 25, 74, 79–80, Figs. 2a–2c; Ex. 1015 ¶¶ 245–255. Regarding claim 21, Petitioner relies on the same contentions as for claims 1 and 16. Pet. 71–73; Ex. 1015 ¶¶ 256–265.

E. Ground 2: Obvious over Lundahl, Larsen, and Bansal

Under Ground 2, Petitioner contends that claims 1, 2, 4–6, 16, 17, 19–21 are unpatentable under § 103(a) as obvious over Lundahl, Larsen, and Bansal. Pet. 73–77.

Ground 2 is similar to Ground 1 except that Petitioner additionally relies on the Bansal reference for the "higher intensity of light [] emitted proximate the second edges" limitation. *Id.*

Petitioner did not argue Ground 2 in its Reply or during oral argument. *See generally* Reply and Tr. Instead, Petitioner expressly indicated that it "no longer intends to pursue Ground 2 [based on] the

Board's findings in IPR2024-00874." Reply 2, fn. 2; IPR2024-00874, Paper 9, 17 (determining the Petition's argument and discussion of Bansal in Ground 2 to be deficient). We interpret Petitioner's statement to be a concession that it failed to meet its burden of proving unpatentability of the challenged claims under Ground 2.

IV. MOTION TO EXCLUDE

Under Federal Rule of Evidence 403, Patent Owner seeks to exclude portions of the Supplemental Declaration of Dr. Grove (Ex. 1026) and of the ITC Trial Transcript Day 3 (Ex. 1031) as being unduly prejudicial. Mot. 1, 10, 13. Specifically, Patent Owner moves to exclude Dr. Grove's testimony on uniform illumination (Ex. 1026 ¶¶ 12–17, 19) and hinges (Ex. 1031, 591:5–7, 592:2–8). Patent Owner argues that this evidence introduces new theories and opinions not included in the Petition. Mot. 1. For the following reasons, we deny Patent Owner's Motion.

Rule 403 provides that the court "may" exclude relevant evidence if its probative value is substantially outweighed by a danger of unfair prejudice. The rule is *permissive*. Additionally, it has been recognized that in a non-jury trial, such as in trial proceedings before the Board, the risk that a decision by the trier of fact will be unfairly affected by the admission of improper evidence is far less than in a jury trial. *See E.E.O.C. v. Farmer Bros. Co.*, 31 F.3d 891, 898 (9th Cir. 1994); *see also* Wright & Miller, 22A Fed. Prac. & Proc. Evid. § 5213 (2d ed.) ("In bench trials . . . appellate courts have said that exclusion of evidence on grounds of 'prejudice' makes little sense because the judge has to see the putatively prejudicial evidence in order to rule."); *see also Schultz v. Butcher*, 24 F.3d 626, 632 (4th Cir. 1994)

(court should not exclude evidence under Rule 403 in non-jury trial on grounds of unfair prejudice).

As the factfinders, the Board is able to consider the evidence offered here, in light of the parties' arguments, and give it the appropriate weight, without risk of unfair prejudice.

Furthermore, the Consolidated Trial Practice Guide[20] provides that "[a] motion to exclude must explain why the evidence is not admissible (e.g., relevance or hearsay)" but should not "address arguments or evidence that a party believes exceeds the proper scope of reply or sur-reply." CTPG 79. Further, the CTPG clearly distinguishes a motion to exclude evidence from a motion to strike evidence. The CTPG states that, "[i]f a party believes that a brief filed by the opposing party raises new issues, is accompanied by belatedly presented evidence, or otherwise exceeds the proper scope of reply or sur-reply, it may request authorization to file a motion to strike." *Id.* at 80. As an alternative to a motion to strike, "a party may request authorization for further merits briefing . . . to address the merits of newly-raised arguments or evidence." *Id.* A party must seek authorization to file a motion to strike "within one week of the allegedly improper submission." *Id.* at 81. As noted in the Consolidated Trial Practice Guide, motions to strike are intended to address, *inter alia*, whether a brief raises new issues or exceeds the proper scope of a sur-reply.

Here, Patent Owner could have challenged the evidence and arguments in question by requesting authorization to file a motion to strike,

[20] USPTO, Patent Trial and Appeal Board Consolidated Trial Practice Guide November 2019, https://www.uspto.gov/TrialPracticeGuideConsolidated ("CTPG").

which, as noted above, is intended for the purpose of addressing evidence and arguments that a party believes exceeds the proper scope of reply. CTPG 80. Patent Owner did not request such authorization, presumably because, as Patent Owner admits, "the Board is well-equipped to decipher which portions of the Reply contain new arguments and a Motion to Strike is rarely needed." Mot. Reply 5.

Based on the forgoing, we deny Patent Owner's Motion to Exclude Evidence.

V. CONCLUSION

We conclude that Petitioner has shown that claims 1, 2, 4–6, 16, 17, and 19–21 of the '028 patent are unpatentable by a preponderance of the evidence.

In summary:

Claims	35 U.S.C. §	Reference(s)	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 2, 4–6, 16, 17, 19–21	103	Lundahl, Larsen	1, 2, 4–6, 16, 17, 19–21	
1, 2, 4–6, 16, 17, 19–21	103	Lundahl, Larsen, Bansal		1, 2, 4–6, 16, 17, 19–21
Overall Outcome			1, 2, 4–6, 16, 17, 19–21	

VI. ORDER

It is

ORDERED that Petitioner has shown that claims 1, 2, 4–6, 16, 17, and 19–21 of the '028 patent are unpatentable;

ORDERED that Patent Owner's Motion to Exclude Evidence (Paper 40) is denied;

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

For PETITIONER:

James Murphy
Corey Casey
Megan Hart
POLSINELLI PC
jpmurphy@polsinelli.com
ccasey@polsinelli.com
mkhart@polsinelli.com

For PATENT OWNER:

Gabrielle Higgins
Yung-Hoon Ha
DESMARAIS LLP
ghiggins@desmaraisllp.com
yha@desmaraisllp.com