

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

EDEN PARK ILLUMINATION, INC.,
LARSON ELECTRONICS LLC, FAR UV TECHNOLOGIES, INC., and
USHIO AMERICA, INC.,
Petitioner,

v.

S. EDWARD NEISTER,
Patent Owner.

IPR2023-00695
Patent 11,246,951 B2

Before JEFFREY W. ABRAHAM, ELIZABETH M. ROESEL, and
JULIA HEANEY, *Administrative Patent Judges*.

HEANEY, *Administrative Patent Judge*.

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

I. INTRODUCTION

Eden Park Illumination, Inc., Larson Electronics LLC, Far UV Technologies, Inc., and Ushio America, Inc. (collectively “Petitioner”) filed a Petition to institute an *inter partes* review of claims 1–5 and 7–18 of U.S. Patent No. 11,246,951 B2 (Ex. 1001, “the ’951 patent”). Paper 5 (“Petition” or “Pet.”). S. Edward Neister (“Patent Owner”) filed a Preliminary Response. Paper 10. With our authorization, Patent Owner also filed a Corrected Preliminary Response. Paper 11 (“Prelim. Resp.”).¹ With our authorization, Petitioner filed a Reply (Paper 12, “Reply”). We denied Patent Owner’s Motion for Leave to Submit a Sur-reply Out of Time. Paper 15.

Institution of an *inter partes* review is authorized by statute when “the information presented in the petition . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a) (2018). Upon consideration of the Petition, the Preliminary Response, and the evidence of record, we determine that Petitioner has established a reasonable likelihood that it would prevail in showing the unpatentability of at least one claim challenged in the Petition. Accordingly, we institute an *inter partes* review of all claims and all grounds asserted in the Petition.²

¹ All citations for Patent Owner’s Preliminary Response (“Prelim. Resp.”) are to the Corrected Preliminary Response, unless stated otherwise.

² *Guidance on the Impact of SAS on AIA Trial Proceedings* (Apr. 26, 2018), <https://www.uspto.gov/patents-application-process/patent-trial-and-appeal-board/trials/guidance-impact-sas-aia-trial>; *see also SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018).

A. Related Proceedings

The parties identify the following litigation involving the '951 patent: *High Energy Ozone LLC et al. v. Larson Electronics LLC*, Case No. 3:21-cv-01166 (N.D. Tex.); *High Energy Ozone LLC et al. v. Eden Park Illumination, Inc.*, Case No. 3:22-cv-00425 (N.D. Tex.); and *High Energy Ozone LLC et al. v. Far UV Technologies*, No. 3:22-cv-00280 (N.D. Tex.). Pet. 64; Paper 7, 1.

The parties also identify the following petitions as related matters: IPR2022-00381 against U.S. Patent No. 9,700,642 and IPR2022-00682 against U.S. Patent No. 8,975,605. Pet. 64–65; Paper 7, 1–2. Patent Owner also identifies *Healthe, Inc. v. High Energy Ozone LLC et al.*, No. 6:20-cv-02233 (M.D. Fla.) as a related matter. Paper 7, 1.

B. The '951 patent

The '951 patent, titled “Method and Apparatus for Sterilizing and Disinfecting Air and Surfaces and Protecting a Zone from External Microbial Contamination,” describes using ultra-violet (UV) lamps for the destruction of virus, bacteria, spores, and pathogens (microorganisms or VSP). Ex. 1001, code (54), 1:24–31. The '951 patent explains that the broad ultraviolet spectrum has been divided into three regions, depending on its different effects on human skin: UV-A as having a band of wavelengths between 320 nm and 400 nm, UV-B as having a band of wavelengths between 280 nm and 320 nm, and UV-C as having a band of wavelengths between 235 nm and 280 nm. *Id.* at 1:57–67. Further, another band called “Far UV” is defined as having a band of wavelengths between 185 nm and 235 nm. *Id.* at 1:67–2:2. According to the '951 patent, “[c]laims have been made that UV-C radiation is used to alter the DNA” but “[n]one of these

claims make reference to any shorter wavelengths and to the absorption band that peaks at 200 nm,” due to the high absorption of molecular water. *Id.* at 2:7–18. The ’951 patent further explains that new ultra-violet (NUV) emitting lamps are becoming commercially available, which have emitters that produce a single line or a narrow spectral emission at a particular wavelength. *Id.* at 2:26–29. Still, “[i]f the treatment lamp’s wavelength is chosen to match closely to the peak of protein absorption of the microorganism’s DNA, then a lethal dosage can be delivered to the VSPs in a shorter time.” *Id.* at 2:30–33.

The ’951 patent discloses that destruction of pathogens is significantly improved by targeting its DNA or RNA with the proper wavelength. Ex. 1001, 2:57–60. This targeting can be accomplished by using a “NUV source at 222 nm” which targets proteins and their peptide bonds. *Id.* at 3:1–2. The ’951 patent discloses that the wavelengths it contemplates do not damage the epidermis “and therefore can quickly and effectively disinfect human or animal skin without skin cell damage.” *Id.* at 8:66–9:2, 9:20–24.

The ’951 patent further discloses that the energy of the emitted photon is determined by its wavelength and different bonds in DNA are affected with photons of different energy. Ex. 1001, 4:24–27. According to the ’951 patent, 540 kJ/mole photon energy from NUV lamps exceeds the bond energies of many of the peptide bonds and “should cause physical damage to the microorganism.” *Id.* at 4:28–30.

C. The Challenged Claims

Petitioner challenges claims 1–5 and 7–18 of the ’951 patent. Pet. 1. Claims 2–5 and 7–18 depend from claim 1. Claim 1, reproduced below with

Petitioner’s bracketing and labels, is illustrative of the subject matter of the challenged claims:

[1pre] 1. A process for destroying a DNA or RNA of a microorganism on a substance or on a surface comprising the steps of:

[1A] generating photons of a wavelength corresponding to a peak absorption wavelength of proteins, or DNA, or RNA, the wavelength being 222 nm;

[1B] directing the photons to a substance or surface to be disinfected, whereby the photons are generated to destroy a plurality of chemical bonds within the proteins, DNA, or RNA of the microorganism; and

[1C] wherein the substance or surface to be disinfected is human or animal tissue.

Ex. 1001, 19:52–20:9.

D. Asserted Ground of Unpatentability

Petitioner asserts the following ground of unpatentability:

Challenged Claim(s)	35 U.S.C. §³	Reference(s)/Basis
1–5, 7–18	103(a)	Eckhardt, ⁴ Sosnin ⁵

Pet. 3.

³ The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. § 103 that became effective on March 16, 2013. Because the ’591 patent claims priority to applications filed before March 16, 2013, we apply the pre-AIA versions of the statutory bases for unpatentability.

⁴ US Patent Pub. No. 2003/0031586 A1 to Eckhardt et al., published Feb. 13, 2003 (Ex. 1004).

⁵ Sosnin et al., *New bactericidal UV light sources: excilamps*, Proc. SPIE 5483, Atomic and Molecular Pulsed Lasers V, May 3, 2004 (Ex. 1005).

II. ANALYSIS

A. *Claim Construction*

Petitioner states that its ground for the challenged claims “addresses the interpretation of certain claim terms with reference to the specific prior art references advanced in this Petition” but “[b]eyond these arguments, the challenged claims require no express construction to evaluate their patentability.” Pet. 16–17. Patent Owner does not propose that the Board explicitly construe any claim terms. *See* Prelim. Resp.

We determine we need not explicitly construe any claim terms at this stage of the proceeding. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“we need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

B. *Level of Ordinary Skill in the Art*

Factors pertinent to a determination of the level of ordinary skill in the art include “(1) educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of workers active in the field.” *Envtl. Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 696–697 (Fed. Cir. 1983) (citing *Orthopedic Equip. Co. v. All Orthopedic Appliances, Inc.*, 707 F.2d 1376, 1381–82 (Fed. Cir. 1983)). Not all such factors may be present in every case, and one or more of these or other factors may predominate in a particular case. *Id.*

Petitioner argues a person of ordinary skill in the art at the time of the invention “would have had at least a bachelor’s degree in an engineering

discipline such as biological, chemical, environmental, electrical, mechanical, and/or systems engineering, or an equivalent degree such as one in physics or similar subject matter.” Pet. 16 (citing Ex. 1003 ¶ 21).

Petitioner further argues that “[s]uch a person would also have two to three years of work or research experience with UV disinfection technology and/or systems and would be familiar with the fundamentals of UV excimer lamps” but, “less education could be compensated by more experience and vice versa.” *Id.*

Patent Owner does not dispute the level of ordinary skill in the art. Prelim. Resp. 15. For purposes of this decision, we adopt Petitioner’s definition of the level of ordinary skill in the art because it is consistent with the ’951 patent and the asserted prior art.

C. Principles of Law

A claim is unpatentable under 35 U.S.C. § 103 if “the differences between the subject matter sought to be patented 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 said subject matter pertains.” *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when available, evidence such as commercial success, long felt but unsolved needs, and failure of others.

Graham v. John Deere Co., 383 U.S. 1, 17–18 (1966); *see KSR*, 550 U.S. at 407 (“While the sequence of these questions might be reordered in any

particular case, the [Graham] factors continue to define the inquiry that controls.”).

The Supreme Court made clear that we apply “an expansive and flexible approach” to the question of obviousness. *KSR*, 550 U.S. at 415. Whether a patent claiming the combination of prior art elements would have been obvious is determined by whether the improvement is more than the predictable use of prior art elements according to their established functions. *Id.* at 417. Reaching this conclusion, however, requires more than merely showing that the prior art includes separate references covering each separate limitation in a challenged claim. *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011). Rather, obviousness additionally requires that a person of ordinary skill at the time of the invention “would have selected and combined those prior art elements in the normal course of research and development to yield the claimed invention.” *Id.*

D. Effective Filing Date

The application (Application No. 15/645,480 (the ’480 application)) that issued as the ’951 patent was filed on July 10, 2017. Ex. 1001, code (21), (22). The ’480 application is a continuation-in-part that claims the benefit of Application No. 14/254,957, filed April 17, 2014, which is a continuation-in-part that claims the benefit of application 11/831,667, filed on July 31, 2007 (“the ’667 application,” issued as U.S. Patent No. 8,753,575), which is a continuation-in-part of PCT App. No. PCT/US2006/003393, filed on January 31, 2006, which claims the benefit of U.S. Provisional App. No. 60/593,626, filed on January 31, 2005. *Id.* at

codes (60), (63). Petitioner contends that the challenged claims are not entitled to claim priority back to the earlier applications. Pet. 3–10.

Patent Owner responds that the '626 provisional application includes many disclosures relating to the use of 222 nm wavelengths “in the presence of humans” which demonstrate that Mr. Neister possessed the claimed invention as of the '626 provisional application filing date. Prelim. Resp. 16–17 (citing Ex. 1008 ¶¶ 1, 4, 28–31, 38, claims 11, 12).

Having reviewed the disclosures of the '626 provisional application relied upon by Patent Owner, we do not agree that they would convey to a person of ordinary skill in the art that Mr. Neister had possession of using 222 nm wavelength to disinfect human or animal tissue. While they refer to human activity such as travel, surgery, and food preparation, the disclosures do not refer to disinfecting tissue. Rather, they refer to sterilizing things such as surfaces and air in the presence of humans, but not human or animal tissue itself. Therefore, we determine that Petitioner has satisfied its initial burden of production on the effective-filing-date issue by identifying the absence of specific supporting disclosure for claim 1 from the '626 provisional application. *See Dynamic Drinkware, LLC v. National Graphics, Inc.*, 800 F.3d 1375, 1379–80 (Fed. Cir. 2015) (discussing burden framework in *inter partes* review). Based on this record, we find that Petitioner has demonstrated a reasonable likelihood that it will prevail in establishing that the challenged claims are not entitled to an effective filing date earlier than the filing date of the PCT application. The parties will have an opportunity to develop their positions on the issue of the effective filing date further during trial.

E. Alleged Obviousness Based on Eckhardt and Sosnin

Petitioner argues claims 1–5 and 7–18 are rendered obvious by Eckhardt in view of Sosnin. Pet. 17–50. Petitioner relies on the Declaration of Oliver R. Lawal (Ex. 1003). Petitioner and Mr. Lawal describe where each limitation of the challenged claims is disclosed in the references, and the reasons a person of ordinary skill would have been motivated to combine the disclosures of the references. *See, e.g., id.* at 25–60; Ex. 1003 ¶¶ 88–169.

1. Overview of Eckhardt (Ex. 1004)

Eckhardt is titled “Method and Apparatus for Sterilizing or Disinfecting a Region Through a Bandage” and “relates generally to the field of sterilization or disinfection systems and methods.” Ex. 1004, code (54), ¶ 2. Eckhardt discloses that a region of tissue to be sterilized or disinfected may include unbreached or bare skin. *Id.* ¶¶ 29, 69. The sterilization or disinfection may occur via killing microorganisms or via inactivating microorganisms by rendering the microorganisms unable to reproduce. *Id.* ¶ 29. Sterilizing or disinfecting light is emitted by a light source. *Id.* ¶ 31. Eckhardt discloses that the light source “may be any light source that emits light capable of sterilization or disinfection,” such as a xenon flash lamp. *Id.* ¶¶ 31, 43. For example, a lamp may be used to “emit narrow spectrum light (e.g., a line spectrum) or broad spectrum light” and the broad spectrum light “may include, e.g., UVA, UVB, and UVC light, or UV light accompanied by light from another portion of the electromagnetic spectrum.” *Id.* ¶ 31. Eckhardt further discloses that the energy from the light source of a single flash of greater than 10 mJ/cm² of UVC may be sufficient to deliver a sterilizing or disinfecting dosage. *Id.* ¶ 32. A material

can be used to transmit sterilizing light “from a xenon flash having a wavelength in the range of 220 to 310 nm.” *Id.* ¶ 70.

2. Overview of *Sosnin* (Ex. 1005)

Sosnin is titled “New bactericidal UV light sources – excilamps.” Ex. 1005, 317. *Sosnin* describes the use of various excilamps, such as a krypton-chlorine (KrCl) lamp and that such lamps can emit wavelengths like 308, 222, and 282 nm. *Id.* at 319. *Sosnin* further describes irradiation of *E. coli* by the excilamps. *Id.* According to *Sosnin*, “KrCl-excilamp irradiation leads to inactivation 99.9 % of *E. coli* during 8 seconds of exposure at primary irradiation and during 6 seconds at the secondary irradiation” and that such a KrCl excilamp emits radiation at a 222 nm wavelength. *Id.* at 320.

3. Claim 1

Petitioner contends that Eckhardt teaches a process for destroying DNA or RNA of a microorganism on a substance or surface, as recited in the preamble⁶ of claim 1, because it discloses using a light source to disinfect human or animal skin. Pet. 26 (citing Ex. 1003 ¶ 112; Ex. 1004 ¶¶ 29, 31–32). Petitioner relies on Eckhardt’s disclosure that sterilization or disinfection may occur by “rendering the microorganisms unable to reproduce” (Ex. 1004 ¶ 30) as teaching “destroying” DNA or RNA of the microorganisms. *Id.* at 25–27 (also citing Ex. 1003 ¶ 113; Ex. 1001, 4:11–23, 8:13–17; Ex. 1018, 7:36–50).

⁶ Neither party argues whether the preamble limits claim 1. Although we find that the evidence supports that the prior art teaches the preamble, we make no determination at this stage of the proceeding whether the preamble of claim 1 is limiting.

Petitioner contends that Eckhardt teaches “generating photons of a wavelength corresponding to a peak absorption wavelength of proteins, or DNA, or RNA, the wavelength being 222 nm,” as recited in limitation [1A], because Eckhardt’s light source 7 may include a lamp emitting narrow or broad spectrum light, including UVA, UVB, and UVC light, and “sterilizing light from a xenon flash having a wavelength in the range of 220 to 310 nm.” *Id.* at 27 (citing Ex. 1003 ¶ 115; Ex. 1004 ¶¶ 31, 43, 70). Petitioner contends a person of ordinary skill would have recognized that the range of wavelengths produced by Eckhardt’s light source 7 would include generating a wavelength of 222 nm and that 222 nm could correspond to a peak absorption wavelength of proteins, DNA, or RNA. *Id.* at 27–29 (citing Ex. 1003 ¶¶ 116–118; Ex. 1004 ¶¶ 43, 70; Ex. 1038, 580; Ex. 1018, 2:49–52, 3:1–7, 3:38–4:7, 7:38–50; Ex. 1005, 317; Ex. 1001, 2:64–3:2, 3:62–4:5, 6:51–64, Figs. 9, 10). Petitioner further contends that Sosnin expressly discloses sterilizing through irradiation using KrCl excimer lamps, which generate a wavelength of 222 nm. *Id.* (citing Ex. 1005, 319–321; Ex. 1003 ¶ 116).

Petitioner contends Eckhardt teaches “directing the photons to a substance or surface to be disinfected,” as recited in limitation [1B], because Eckhardt discloses directing light towards wound 1 and surrounding skin 3. *Id.* at 30 (citing Ex. 1003 ¶ 120; Ex. 1004 ¶¶ 31–32). Petitioner contends Sosnin teaches the photons destroy a plurality of chemical bonds within the DNA or RNA of the microorganism because it discloses using 222 nm radiation, “which intrinsically destroys proteins and the chemical bonds in the proteins associated with the DNA or RNA of the microorganism.” *Id.* (citing Ex. 1003 ¶ 121; Ex. 1005, 319–321).

Petitioner contends Eckhardt teaches disinfection of human or animal tissue (e.g., skin) with light source 7, as recited in limitation [1C]. *Id.* at 30–31 (citing Ex. 1004, Fig. 1, ¶¶ 29–32; Ex. 1003 ¶ 122). Petitioner presents further arguments regarding the degree of safety and efficacy required for claim 1’s process. *Id.* at 31–34.

Petitioner contends a person of ordinary skill in the art would have been motivated to combine the teachings of Eckhardt and Sosnin for several reasons: (1) Eckhardt’s teaching of using any light source capable of sterilization or disinfection, and specifically “narrow spectrum light (e.g., a line spectrum)” would have suggested to a person of ordinary skill in the art to incorporate other well-known germicidal UV light sources like Sosnin’s, and both references teach that their light sources kill bacteria; (2) a person of ordinary skill would have implemented Eckhardt’s disclosure of using UV-C light to disinfect skin with Sosnin’s 222 nm excimer lamp because Sosnin’s lamp’s wavelength is within the range of 220 to 310 nm suggested by Eckhardt; and (3) the effectiveness and relative safety of directing UV-C light of 222 nm onto bare skin for disinfection was already understood by persons of ordinary skill in the art, even though there was general caution against exposing skin to excessive UV radiation. Pet. 21–25 (citing Ex. 1003 ¶¶ 8, 40, 89–109; Ex. 1004 ¶¶ 5, 29–31, 69, 70; Ex. 1005, 318–321; Ex. 1006, 5; Ex. 1007, 8, 11; Ex. 1011 ¶¶ 28, 40; Ex. 1012, 1; Ex. 1013 ¶ 8; Ex. 1014, 3–9; Ex. 1015, 2:22–67; Ex. 1016, 2:23–26; Ex. 1017, 16, 58; Ex. 1001, 3:42–48, 4:7–10).

Patent Owner disputes that a person of ordinary skill in the art would have had a reason to combine Eckhardt and Sosnin with a reasonable expectation of success. Prelim. Resp. 27–38. Patent Owner submits the

Declaration of Mark T. Hernandez, Ph.D. (Ex. 2001) in support of its arguments. Patent Owner argues that Eckhardt does not teach or suggest using a 222 nm source for any purpose and “Eckhardt teaches the very opposite of the claimed invention” because “Eckhardt teaches methods of *preventing* UV light of knowingly harmful 254 nm and other wavelengths from reaching the skin by applying a bandage, using a light filter, or reducing the dose—either by reducing the intensity of the light or reducing the exposure time.” *Id.* at 27–29, 31–32 (citing Ex. 1004 ¶¶ 43, 55; Ex. 2001 ¶¶ 31–32, 34, 36, 44–66; Ex. 1011 ¶ 40; Ex. 1012 ¶ 2; Ex. 1013 ¶ 8). Patent Owner argues that Eckhardt and Mr. Lawal acknowledge the danger that UV light poses to skin, because Eckhardt teaches the use of bandages to “block and/or significantly reduce penetration of the skin by the tested UV wavelengths.” *Id.* at 30–31 (citing Ex. 1003 ¶¶ 38, 46, 49, 56, code (54); Ex. 2001 ¶¶ 31–32, 37, 58). According to Patent Owner, Eckhardt focuses on the use of the 254 nm wavelength but this wavelength is known to damage skin and other tissues, and Eckhardt repeatedly cautions against using this UV light on skin. *Id.* (citing Ex. 1004 ¶¶ 5, 28, 55; Ex. 2001 ¶ 38).

Patent Owner contends that Sosnin is directed toward disinfecting glassware, not human or animal tissue, and Sosnin teaches that the best results are obtained with a XeBr excilamp. Prelim. Resp. 28 (citing Ex. 1005, 317; Ex. 2001 ¶¶ 51–52). Patent Owner contends that one of ordinary skill in the art “would not believe that the ‘instantaneous sterilization or disinfection unit’ could be used with a 222 nm light source instead of its xenon flash lamp” because “[a] 222 nm light source, namely the Krypton-Chloride (KrCl) lamp, was quite rare and expensive, so the POSITA would not have thought to use it.” *Id.* at 10. According to Patent

Owner, “even today, 222 nm light sources are not designed to deliver these energy levels (*i.e.*, greater than 10 Joules or even 20 Joules), nor are they configured to be used in pulses or flashes.” *Id.* at 10–11 (citing Ex. 2001 ¶ 35).

Having considered the evidence and arguments presented by both parties on the present record, we find sufficient support for Petitioner’s contentions that Eckhardt and Sosnin teach or suggest all of the limitations in claim 1, and that a person of ordinary skill in the art would have combined Eckhardt’s teaching of narrow spectrum light in the range of 220 to 310 nm to disinfect skin, with Sosnin’s implementation of excimer lasers including 222 nm to kill bacteria, to arrive at the method of claim 1 with a reasonable expectation of success. Petitioner relies on Eckhardt’s teachings, as follows. Eckhardt teaches that “[a] region of tissue to be sterilized or disinfected may include unbreached skin.” Ex. 1004 ¶ 29. Eckhardt describes its Figure 1 as illustrating “a method for sterilizing or disinfecting a region of skin or tissue of a patient using sterilizing or disinfecting light” and that the light may be UV light, such as UVA, UVB, and UVC light. *Id.* ¶ 31. Eckhardt also teaches that the light may be generated in one or more flashes and that the energy of a single flash might be sufficient to deliver a sterilizing or disinfecting dosage. *Id.* ¶ 32. On the present record, we disagree with Patent Owner’s argument that Eckhardt’s bandages teach away from the use of UV light on skin. Eckhardt does not teach bandages as a way to block all UV light, but rather, uses bandages to control the intensity of UV light reaching the skin. Indeed, Eckhardt’s embodiment that Petitioner relies upon is titled “UV-Transmissive Bandage” and explains

how to choose bandage materials that transmit UV-C light. *See id.* ¶¶ 69–72.

Although Dr. Hernandez opines that one of ordinary skill in the art would have avoided direct UV-C skin and eye exposures, he also acknowledges that one of ordinary skill in the art, as Eckhardt cautions, would have recognized that shining Xe flash bulb or mercury (Hg) light sources directly on living tissue “was a special consideration even for wounded skin.” Ex. 2001 ¶ 38. This testimony indicates some allowance for treating living tissue.

We also disagree with Patent Owner’s argument that Sosnin teaches away by disclosing that best results were obtained with a XeBr excilamp. *See* Prelim. Resp. 28. “A reference does not teach away . . . if it merely expresses a general preference for an alternative invention but does not ‘criticize, discredit, or otherwise discourage’ investigation into the invention claimed.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1327 (Fed. Cir. 2009) (quoting *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004)). To the extent Sosnin teaches that a XeBr excilamp provides the best results, Sosnin also teaches that a KrCl excilamp is useful for disinfection. Ex. 1005, 319–321. In view of these teachings, as well as Eckhardt’s disclosure of a wavelength range of 220 to 310 nm, at this stage there is sufficient support for Petitioner’s arguments that one of ordinary skill in the art would have combined Eckhardt and Sosnin and arrived at claim 1’s invention. Ex. 1004 ¶¶ 32, 70. With regard to the availability of a KrCl lamp, Sosnin teaches its use for disinfection. Ex. 1005, 319–321. With regard to cost, the fact that a combination may increase costs does not necessarily mean that a person of ordinary skill in the art would not have

made the asserted combination. *See Orthopedic Equipment Co. et al. v. United States*, 702 F.2d 1005, 1013 (Fed. Cir. 1983); *In re Farrenkopf*, 713 F.2d 714, 718 (Fed. Cir. 1983).

In addition, Patent Owner’s assertion that researchers are still debating the safety and efficacy of UVC on skin does not mean Petitioner is unable to show a reasonable expectation of success. Prelim. Resp. 35–38 (citing Ex. 2001 ¶¶ 38, 46, 83–85); *see Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1364 (Fed. Cir. 2007) (“[T]he expectation of success need only be reasonable, not absolute.”). As discussed above, Petitioner relies on Eckhardt, which teaches that skin can be disinfected by UV light, including UVC light. Ex. 1004 ¶¶ 29, 31–32.

Patent Owner also presents arguments in response to Petitioner’s contention that various references show that UVC was acceptable for general occupational exposure at low levels. Pet. 23–25; Prelim. Resp. 32–38 (citing Ex. 2001 ¶¶ 55–82, 84–85). At this preliminary stage, Petitioner has provided a sufficient reason to combine Eckhardt and Sosnin without reliance on these additional references. Specifically, Petitioner asserts that one of ordinary skill in the art would have looked to other references based on Eckhardt’s teachings and would have combined known prior art elements (i.e., Sosnin’s 222 nm KrCl excilamp)⁷ according to known methods to yield a predictable result (i.e., using the excilamp to disinfect a surface). Pet. 21–22. As a result, we need not address the parties’ dispute about Petitioner’s

⁷ As discussed above, Eckhardt teaches disinfection of skin and that wavelengths in the range of 220 to 310 nm may be used. Ex. 1004 ¶¶ 32, 70.

other references for purposes of this Decision. Nevertheless, we invite the parties to further develop this issue during trial.

Accordingly, we determine that Petitioner has shown a reasonable likelihood of prevailing on its obviousness challenge to claim 1.

4. Claims 7 and 9

Petitioner identifies where the limitations of challenged claims 7 and 9 are found in the combination of Eckhardt and Sosnin. Pet. 42–43. Patent Owner does not present separate arguments as to these dependent claims. *See generally* Prelim. Resp. We have reviewed Petitioner’s evidence and argument, including the relevant portions of the Lawal Declaration, and are persuaded, based on the current record, that Petitioner has shown a reasonable likelihood of prevailing on its obviousness challenge to claims 7 and 9.

5. Claim 2

Claim 2 depends from claim 1 and additionally recites “the human or animal tissue is one of blood, an organ, or a wound.” Ex. 1001, 20:9–10. Petitioner argues that the combination of Eckhardt and Sosnin teaches the limitations of claim 2 because “Eckhardt discloses disinfecting a human or animal’s wound by directing light emitted by light source 7 towards wound 1.” Pet. 34 (citing Ex. 1003 ¶ 130; Ex. 1004 ¶¶ 29–32, 34, Fig. 1).

Referring to its arguments for claim 1, Patent Owner contends that “neither Eckhardt nor Sosnin teach, disclose or suggest disinfecting ‘human or animal tissue’” and, because “‘blood, and organ, or a wound’ is a subset of ‘tissue,’ neither reference teaches, discloses or suggests disinfecting any of these items either.” Prelim. Resp. 39.

As discussed above with regard to claim 1, we find sufficient support for Petitioner’s contention that Eckhardt teaches disinfecting human or animal tissue, including a human wound. Ex. 1004 ¶¶ 31, 34.

6. *Claim 3*

Claim 3 depends from claim 1 and additionally recites “the microorganism is at least one of a bacteria, a virus, a fungus, an amoeba, and a protozoa.” Ex. 1001, 20:11–13. Petitioner contends that claim 3 is unpatentable over the combination of Eckhardt and Sosnin because Eckhardt teaches sterilization to address the problem of bacteria and “refers to ‘microorganisms’ as including ‘bacteria and viruses.’” Pet. 35 (citing Ex. 1004 ¶¶ 3, 91; Ex. 1003 ¶ 132). Petitioner also argues that Sosnin describes testing the inactivation of *E. coli* and *S. aureus*. *Id.* (citing Ex. 1005, 320–321; Ex. 1003 ¶ 133).

Patent Owner contends that “[w]hile Eckhardt and Sosnin disclose disinfection of microorganisms, neither provides any disclosure of doing so using 222 nm light, particularly on human or animal tissue.” Prelim. Resp. 39 (citing Ex. 2001 ¶ 89).

We do not agree with Patent Owner’s position because “the test for combining references is not what the individual references themselves suggest but rather what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art.” *In re McLaughlin*, 443 F.2d 1392, 1395 (CCPA 1971). On the present record, we find sufficient support for Petitioner’s contention that Eckhardt and Sosnin teach the limitations of claim 3 in view of Sosnin’s teaching of the use of a KrCl excilamp that emits radiation at 222 nm and Eckhardt’s teaching regarding the use of UV radiation on a patient’s skin or wound, as discussed above.

7. *Claim 4*

Claim 4 depends from claim 1 and additionally recites “the step of directing is performed for approximately two seconds.” Ex. 1001, 20:14–15. Petitioner argues that claim 4 is unpatentable over the combination of Eckhardt and Sosnin because Eckhardt teaches using sterilizing light for “less than a few minutes or seconds.” Pet. 36 (citing Ex. 1004 ¶ 32; Ex. 1003 ¶ 135).

Patent Owner asserts that “[n]either Eckhardt nor Sosnin teach, disclose or suggest that the generated photons are directed to a substance or surface to be disinfected for approximately two seconds, much less involving 222 nm light on skin.” Prelim. Resp. 39. More specifically, Patent Owner argues that Eckhardt only discloses a broad range of exposure durations not anything close to “approximately two seconds,” especially with regard to a 222 nm source. *Id.* at 40 (citing Ex. 1004 ¶¶ 32, 43)

An overlap between ranges establishes a *prima facie* case of obviousness. *In re Peterson*, 315 F.3d 1325, 1329 (Fed. Cir. 2003). Here, Eckhardt teaches sterilization for “less than a few minutes or seconds.” Ex. 1004 ¶ 32. This range overlaps with claim 4’s range. Therefore, on the present record, we find sufficient support for Petitioner’s contention that Eckhardt and Sosnin teach the limitations of claim 4.

8. *Claim 5*

Claim 5 depends from claim 1 and additionally recites “a lamp within a wand” in connection with the steps of generating photons and directing the photons. Ex. 1001, 20:17–19. Petitioner contends that Eckhardt teaches the use of a hand-held lamp as a source for generating photons. Pet. 40–41 (citing Ex. 1004 ¶¶ 45, 51; Ex. 1003 ¶ 145). Petitioner asserts that

“Eckhardt also teaches that the hand-held UV source includes a ‘light directing component,’ which can be ‘movable’ so as ‘to reflect light from light source 7 to partially shadowed area[s]’ and allows hand-held operation without the need for an attachment mechanism.” *Id.* at 41 (citing Ex. 1004 ¶¶ 51, 64–66; Ex. 1003 ¶ 147) (alteration in original).

Patent Owner argues that Petitioner is incorrect because “Eckhardt only discloses the lamp itself,” and “[t]here is no disclosure of a ‘wand’ with a ‘lamp positioned within’ the same.” Prelim. Resp. 41 (citing Ex. 2001 ¶ 95).

On the present record, we find sufficient support for Petitioner’s contention that Eckhardt teaches a sterilization/disinfection unit that can be hand-held and includes a housing. *See* Ex. 1004 ¶¶ 45, 51. On this record, we find that Eckhardt suggests positioning a light source within a wand (e.g., a housing) that is hand-held. Therefore, Petitioner sufficiently shows that Eckhardt and Sosnin teach the limitations of claim 5.

9. Claim 8

Petitioner contends the combination of Eckhardt and Sosnin teaches the limitations of claim 8 because Eckhardt describes a UV light source that is “‘optically protected by a UV transmissive window or screen,’ which ‘may be made from quartz, fused silica, a UV transmissive glass or screen, or a perforated sheet of metal or other material.’” Pet. 42 (citing Ex. 1004 ¶ 38; Ex. 1003 ¶ 152). Petitioner contends Eckhardt further teaches that Eckhardt’s window or screen “is a ‘cover’ because it protects the light source” and that a person of ordinary skill “would understand that the cover described in Eckhardt could be used with Sosnin’s 222 nm excimer lamp to

permit 222 nm light to disinfect skin.” *Id.* (citing Ex. 1001,⁸ 14:51–53; Ex. 1005, 319–321; Ex. 1003 ¶ 152).

Patent Owner contends that Petitioner is incorrect because, “[e]ven if Sosnin discloses a 222 nm lamp (which it does not), there is no suggestion in Sosnin to use (or not use) that lamp with a cover.” Prelim. Resp. 41. Patent Owner contends that “there is no description at all of any lamps used in Sosnin, or whether a ‘cover’ would be an appropriate, desirable or feasible feature” and Petitioner’s argument that one of ordinary skill in the art “would know to use Eckhardt’s ‘transmissive window or screen’ with Sosnin is speculative, at best.” *Id.* at 41–42 (citing Ex. 2001 ¶ 96).

On the present record, we find sufficient support for Petitioner’s contention that Eckhardt teaches “a UV transmissive window or screen” for its light source and that a filter can be incorporated in the window or light source “to absorb or block undesired wavelengths.” Ex. 1004 ¶ 38. Further, Petitioner relies on Sosnin, which describes excilamps, such as a KrCl excilamp that emits 222 nm radiation. Ex. 1005, 319–320. It is well-established that “[a] person of ordinary skill is also a person of ordinary creativity, not an automaton.” *KSR*, 550 U.S. at 421. So, “in many cases[,] a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle.” *Id.* at 420. Even though Eckhardt does not teach that its window can be for 222 nm radiation and Sosnin does not teach using a window with its KrCl excilamp, Petitioner contends that a person having ordinary skill in the art would be able to apply ordinary creativity based on the teachings of the references and adapt Eckhardt’s

⁸ The Petition cites Ex. 1011, which appears to be a typographical error.

window to Sosnin's 222 nm excimer lamp. Pet. 42. For purposes of institution, there is sufficient support for Petitioner's contention.

10. Claims 10 and 11

Claims 10 and 11 each depend from claim 1 and additionally recite "the step of directing the photons further comprises providing a radiant dose energy" of 40 mJ/cm² and 60 mJ/cm², respectively. Petitioner contends that Eckhardt "discloses 'deliver[ing] a sterilizing or disinfecting dosage, e.g., greater than 10 mJ/cm² of UVC, to all surfaces to be sterilized or disinfected.'" Pet. 43–44 (citing Ex. 1004 ¶ 32; Ex. 1003 ¶ 156) (alteration in original). Petitioner further argues that "Sosnin discloses using a range of radiant dose energies of photons of wavelength 222 nm between ~25 mJ/cm² and ~260 mJ/cm² to disinfect a surface by killing *E. coli*." *Id.* at 44 (citing Ex. 1005, 320–321; Ex. 1003 ¶ 156). Petitioner relies on its arguments for claim 10 in arguing unpatentability of claim 11. *Id.* at 47 (citing Ex. 1003 ¶¶ 155–167).

Patent Owner contends that Eckhardt describes two embodiments but neither uses 222 nm radiation, and that Eckhardt teaches the use of "rapid, transient UV exposures" of short durations, and energy intensities of "greater than 10 mJ/cm²" and "about 20 mJ/cm²." Prelim. Resp. 42–44 (citing Ex. 1004 ¶¶ 32, 37–61, 70, 104; Ex. 2001 ¶¶ 38, 46, 93–102). Patent Owner argues that Sosnin's teachings relate to sterilization of "glassware, not human or animal tissue," so one of ordinary skill in the art "would not be motivated to select a KrCl 222 nm light source to use with anything, much less human or animal tissue" but would have selected a XeBr 282 nm excilamp instead. *Id.* at 43 (citing Ex. 2001 ¶ 99). According to Patent Owner, "[a] 222 nm light source, namely the Krypton-Chloride (KrCl) lamp,

was quite rare and expensive, so the POSITA would not have thought to use it” and “even today, 222 nm light sources are not designed to deliver these energy levels . . . , nor are they configured to be used in pulses or flashes.” *Id.* (citing Ex. 2001 ¶¶ 50, 101).

On the present record, we find sufficient support for Petitioner’s contention that Eckhardt and Sosnin teach the limitations of claims 10 and 11. Eckhardt describes the generation of flashes with its light source and states that “[t]he energy of a single flash may be sufficient to deliver a sterilizing or disinfecting dosage, e.g., greater than 10 mJ/cm² of UVC, to all surfaces to be sterilized or disinfected.” Ex. 1004 ¶ 32. Further, Sosnin’s Figure 3 shows radiant doses of up to about 0.25 J/ cm² for a KrCl excilamp, which is equivalent to 250 mJ/cm². Ex. 1005, 320.

As noted above, an overlap between ranges establishes a *prima facie* case of obviousness. *In re Peterson*, 315 F.3d at 1329. Petitioner shows that each of Eckhardt and Sosnin teach ranges for radiant doses that overlap with the ranges of claims 10 and 11. Petitioner’s evidence is sufficient to shift the burden of production to Patent Owner to come forward with evidence of teaching away, unexpected results or criticality, or other pertinent objective indicia indicating that the overlapping range would not have been obvious in light of that prior art. *E.I. Dupont De Nemours & Company v. Synvina C.V.*, 904 F.3d 996, 1006 (Fed. Cir. 2018). At this stage, Patent Owner has not met its burden of production. Patent Owner has not explained why a 222 nm excilamp like Sosnin’s would not be capable of delivering the claimed radiant doses. Dr. Hernandez cites Eckhardt’s teachings regarding the incompatibility of commonly available Hg lamps with continuous operation but does not sufficiently explain how this pertains to Sosnin’s KrCl excilamp

or the non-continuous flashes Eckhardt describes for a lamp. Ex. 2001 ¶ 101; Ex. 1004 ¶ 32.

11. Claims 12–18

Claims 12–18 depend from claim 1 and recite limitations related to the human or animal tissue to be disinfected. Claim 12, for example, recites that the tissue is skin, and claims 15–18 each recite that the human or animal is living. Petitioner argues that claims 12–18 would be unpatentable over the asserted combination in view of its arguments for limitation [1C] of claim 1. Pet. 49–50 (citing Ex. 1003 ¶¶ 122–128, 168–169).

Patent Owner contends that a person of ordinary skill “would not read Eckhardt or Sosnin to teach, disclose, or suggest using 222 nm light to disinfect human or animal tissue, and including the tissue of a living human or animal.” Prelim. Resp. 44–45 (citing Ex. 2001 ¶ 103).

For the reasons discussed above with regard to claim 1, we find sufficient support for Petitioner’s contention that Eckhardt teaches the use of UV radiation to disinfect human or animal tissue, as recited in claims 12–18, and that Petitioner has sufficiently articulated a reason to combine Eckhardt and Sosnin for purposes of this Decision.

III. DISCRETIONARY DENIAL UNDER 35 U.S.C. § 325(d)

Patent Owner argues we should exercise discretion under § 325(d) and deny institution because Eckhardt was considered during examination, Sosnin is substantially the same as prior art considered during examination, and Petitioner presents arguments that are substantially the same as those before the Examiner. Prelim. Resp. 18–27. Petitioner opposes. Pet. 50–60; Reply 1–5. For the reasons discussed below, we do not invoke our discretion to deny institution under § 325(d).

A. *Principles of Law*

Under § 325(d), in determining whether to institute an *inter partes* review, “the Director may take into account whether, and reject the petition or request because, the same or substantially the same prior art or arguments previously were presented to the Office.”⁹ Our § 325(d) analysis employs a two-prong framework: (1) whether the prior art and arguments presented in the petition are the same or substantially the same as those previously presented to the Office; and (2) if so, whether the petitioner has demonstrated a material error by the Office in its prior consideration of those prior art and arguments. *Advanced Bionics, LLC v. Med-El Electromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 (“*Advanced Bionics*”), 8 (PTAB Feb. 13, 2020) (precedential).

We consider several non-exclusive factors as set forth in *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 (Dec. 15, 2017) (precedential as to § III.C.5, first paragraph) (“*Becton, Dickinson*”), which “provide useful insight into how to apply the framework” under § 325(d). *Advanced Bionics*, 9. These non-exclusive factors include:

- (a) the similarities and material differences between the asserted art and the prior art involved during examination;
- (b) the cumulative nature of the asserted art and the prior art evaluated during examination;
- (c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection;

⁹ The Board institutes trial on behalf of the Director. 37 C.F.R. § 42.4(a).

- (d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art;
- (e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and
- (f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments.

Becton, Dickinson, 17–18 (formatting added). “If, after review of factors (a), (b), and (d), it is determined that the same or substantially the same art or arguments previously were presented to the Office, then factors (c), (e), and (f) relate to whether the petitioner has demonstrated a material error by the Office.” *Advanced Bionics*, 10.

B. *Whether the Prior Art and Arguments are the Same or Substantially the Same*

Patent Owner argues that “the Examiner considered substantially the same art during examination.” Prelim. Resp. 19. Specifically, Patent Owner argues that the Examiner considered “the Patent that ultimately issued from Eckhardt.” *Id.* (U.S. Patent No. 6,730,113, “Eckhardt Patent”). Petitioner acknowledges that the Eckhardt Patent was listed on an IDS and was cited as a secondary reference in a rejection of dependent claims 5 and 8. Pet. 14–15 (citing Ex. 1002, 334–335, 294–295). Petitioner disagrees that Eckhardt is substantially the same as the Eckhardt Patent because the former is prior art under § 102(b) while the latter is prior art under § 102(e). *Id.* at 52–53. Petitioner further argues that Patent Owner misrepresents Eckhardt’s relevance to the issued independent claims. Reply 3–4.

The Examiner applied the Eckhardt Patent as a secondary reference to reject claims 5 and 8 during prosecution. Ex. 1002, 294. Office records show that the Eckhardt Patent issued from U.S. Application No. 10/173,129,

which is the same application as Eckhardt. Ex. 1004, code (21). Therefore, we find that Eckhardt and the Eckhardt Patent have substantially the same disclosures.

Patent Owner also argues that the Examiner considered “a publication from Sosnin^[10] describing the same 222 nm excimer lamp Petitioners rely upon here.” Prelim. Resp. 19. Petitioner asserts that the IDS including the Eckhardt Patent also included Sosnin and Sosnin IEEE but the Sosnin references were crossed off by the Examiner, which means they were not considered. Pet. 14–15, 52 (citing Ex. 1002, 331, 334–335, 308). Patent Owner asserts that another IDS was filed during prosecution that included invalidity contentions and charts based upon Sosnin IEEE (Ex. 1037). Prelim. Resp. 7 (citing Ex. 1002, 113; Ex. 1038, 117, 119;¹¹ Ex. 2007).¹² We find that the prosecution history supports both of these assertions, and therefore the Examiner considered Sosnin IEEE. *See* Ex. 1002, 117, 101, 308.

¹⁰ Sosnin et al., *The Effects of UV Irradiation and Gas Plasma Treatment on Living Mammalian Cells and Bacteria: A Comparative Approach*, 32 IEEE TRANSACTION ON PLASMA SCI. 1544, Aug. 2004 (“Sosnin IEEE,” Ex. 1037).

¹¹ Patent Owner’s citation to Ex. 1038 appears to be in error, because Ex. 1038 does not contain pages 117 and 119.

¹² Patent Owner also argues that Petitioner relied upon Sosnin IEEE in IPR2022-00381, which challenges claims of U.S. Patent No. 9,700,642. Prelim. Resp. 21–22. As discussed herein, we agree that the first prong of *Advanced Bionics* is satisfied because Eckhardt and Sosnin are substantially similar to prior art considered during prosecution. Patent Owner does not argue that the Board materially erred in the IPR2022-00381 proceeding, in which a final Decision has not yet been issued. IPR2022-00381, Paper 12 (PTAB Aug. 15, 2022); *see* Reply 4–5.

We next consider whether Sosnin is substantially the same as Sosnin IEEE. Petitioner argues that “Sosnin specifically discloses sterilizing through irradiation using a KrCl excimer lamp, which generates photons with wavelength 222 nm.” Pet. 27 (citing Ex. 1005, 319–321; Ex. 1003 ¶ 116). Petitioner also argues that Sosnin “discloses disinfection of ‘a bacteria, a virus, a fungus, an amoeba, and a protozoa’ because Sosnin discloses testing showing the inactivation of two strains of bacteria—*E. coli* and *S. aureus*.” *Id.* at 35 (citing Ex. 1005, 320–321; Ex. 1003 ¶ 133).

We find that Sosnin IEEE includes substantially the same disclosures as relied upon by Petitioner. Sosnin IEEE teaches the use of excilamps to provide UV irradiance for sterilization, including at a wavelength between 240 and 300 nm. Ex. 1037, 1545. Sosnin IEEE also describes a study in which *E. coli* bacteria were irradiated by a XeBr lamp and a KrCl lamp that produces an emission peak at about 222 nm, with the UV doses needed to deactivate *E. coli* bacteria being “much lower than the ones that cause necrosis in fibroblasts.” *Id.* at 1547, Figs. 8, 9. In view of this overlap between the teachings of Sosnin and Sosnin IEEE regarding the use of a 222 KrCl lamp for sterilization and UV radiation for inactivation of *E. coli*, we find that Sosnin is substantially the same as Sosnin IEEE, which the Examiner considered during prosecution.

For these reasons, we determine that Eckhardt and Sosnin are substantially the same as references previously presented to the Office. Because this satisfies the first prong of *Advanced Bionics*, we do not reach the parties’ positions regarding whether Petitioner’s arguments are the same or substantially the same as those previously presented to the Office.

C. *Whether Petitioner has Demonstrated Material Error*

We next analyze whether Petitioner has demonstrated a material error by the Office under the second prong of *Advanced Bionics*.

Petitioner contends that the Examiner erred in overlooking key teachings of Eckhardt. Pet. 59–60. Petitioner argues the Examiner used Eckhardt only as a secondary reference in an obviousness rejection to teach “‘provid[ing]/position[ing] a wand in a process for destroying a DNA or RNA of a microorganism’ and disinfecting a ‘wound,’” as recited by dependent claims. *Id.* at 59 (citing Ex. 1002, 294–295, 300–301) (alteration in original). According to Petitioner, the Examiner “materially erred by thereafter overlooking Eckhardt’s teachings of using particular UV light sources and ranges to disinfect skin.” *Id.* (citing Ex. 1004 ¶¶ 31, 43, 69–70). Petitioner acknowledges that the Examiner initially cited Eckhardt for “directing photons to a . . . surface to be disinfected being human or animal tissue . . . in the form of a wound,” but argues the Examiner subsequently allowed claims because a cited primary reference, Sizer, did “not specifically teach or suggest that the substance or surface to be disinfected is human or animal tissue.” *Id.* at 59–60 (citing Ex. 1002, 159–160) (alteration in original). In other words, “Eckhardt disclosed a key limitation the Examiner relied on to find the claims patentable over Sizer.” *Id.* at 60.

Patent Owner argues the Examiner acknowledged Eckhardt, and other references, in the reasons for allowance. Prelim. Resp. 26. Patent Owner relies on the Examiner’s statement that the references “do not ‘teach use of 222 nm to generate photons that will destroy a plurality of chemical bonds within proteins, DNA, or RNA of microorganisms.’” *Id.* (citing Ex. 1002, 160). Patent Owner argues that the reasons for allowance show the

Examiner concluded that a person of ordinary skill in the art would not have been motivated to combine the references to arrive at the claimed invention. *Id.* at 26–27 (citing Ex. 1002, 160). According to Patent Owner, “Petitioners do nothing to demonstrate that this conclusion is wrong” and “[i]n particular, Petitioners do nothing to show that a POSITA would have been motivated to combine Sizer and Eckhardt.” *Id.* at 27.

We find that Petitioner has demonstrated a material error by the Office in the prior consideration of the Eckhardt Patent and Sosnin IEEE. Under the second prong of *Advanced Bionics*, we consider “the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection.” *Becton, Dickinson*, 17. Here, we agree with Petitioner that, although the Eckhardt Patent was used in an obviousness rejection, the Eckhardt Patent was cited as a secondary reference to teach the additional limitations of dependent claims reciting that the tissue was a wound and reciting the use of a wand. Ex. 1002, 294–295, 388. To the extent the Examiner considered teachings of the Eckhardt Patent when making that rejection, including the Eckhardt Patent’s teaching of particular UV light sources and ranges to disinfect a skin wound, the Examiner overlooked those teachings in subsequent rejections and when providing reasons for allowance. *Id.* at 192–194, 159–160, 89–91, 13. In addition, Sosnin IEEE was presented in an IDS but not used in a rejection. In view of the Examiner’s statement in the reasons for allowance regarding the failure of the prior art references to teach the use of 222 nm, we determine the Examiner overlooked Sosnin IEEE’s teachings regarding the use of KrCl lamps to emit UV radiation at 222 nm, such as to inactivate *E.*

coli, and failed to consider whether Sosnin IEEE would have been combined with the Eckhardt Patent.

We are not persuaded by Patent Owner's argument that the Examiner correctly concluded there was a lack of motivation to combine the references and arrive at the claimed invention. As discussed above with regard to claim 1, Petitioner has directed us to portions of Eckhardt and Sosnin that support combining the teachings of the references. The Examiner overlooked those teachings as indicated in the reasons for allowance, and at this stage of the proceedings, Petitioner has persuaded us that was a material error. *See Becton, Dickinson* at 18 (requiring we consider "whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art").

Because we determine that Petitioner has demonstrated a material error by the Office in the consideration of Eckhardt and Sosnin IEEE, we need not reach Petitioner's arguments regarding material error relating to written description support of the challenged claims or consideration of a declaration under 37 C.F.R. § 1.131 during prosecution. Pet. 54–59.

D. *Conclusion*

For the foregoing reasons, we decline to exercise discretion to deny institution under § 325(d).

IV. CONCLUSION

Based on the arguments in the Petition and the evidence of record, we determine that Petitioner has established a reasonable likelihood of prevailing in showing that at least one of claims 1–5 and 7–18 of the '951 patent is unpatentable.

Our factual findings, conclusions of law, and determinations at this stage of the proceeding are preliminary, and based on the evidentiary record developed thus far. This is not a final decision as to the patentability of claims for which *inter partes* review is instituted. Our final decision will be based on the record as fully developed during trial.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that an *inter partes* review of all challenged claims of the '951 patent is instituted with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(a), *inter partes* review of the '951 patent is hereby instituted commencing on the entry date of this Decision, and pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial.

IPR2023-00695
Patent 11,246,951 B2

PETITIONER:

David Conrad
Lance Wyatt
FISH & RICHARDSON P.C.
conrad@fr.com
wyatt@fr.com

PATENT OWNER:

Brent P. Ray
Abby Parsons
KING & SPALDING LLP
bray@kslaw.com
aparsons@kslaw.com