

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

QUASAR SCIENCE LLC,
Petitioner,

v.

COLT INTERNATIONAL CLOTHING, INC. d/b/a COLT LED,
Patent Owner.

IPR2023-00614
Patent 10,566,895 B1

Before CHRISTOPHER L. CRUMBLEY, ZHENYU YANG, and
ROBERT J. WEINSCHENK, *Administrative Patent Judges*.

YANG, *Administrative Patent Judge*.

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

I. INTRODUCTION

Quasar Science LLC (“Petitioner”) filed a Petition (Paper 2, “Pet.”), seeking an *inter partes* review of claims 1–3, 6–18, 21–24, and 27–29 of U.S. Patent No. 10,566,895 B1 (Ex. 1001, “the ’895 patent”). Colt International Clothing, Inc. d/b/a Colt LED (“Patent Owner”) filed a Patent Owner Preliminary Response. Paper 6 (“Prelim. Resp.”).

We have authority under 35 U.S.C. § 314, which provides that an *inter partes* review may not be instituted “unless . . . 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).

For the reasons provided below, we determine Petitioner has satisfied the threshold requirement set forth in 35 U.S.C. § 314(a). Patent Owner has not persuaded us to exercise our discretion to deny institution. Accordingly, we institute an *inter partes* review of all challenged claims based on all grounds raised in the Petition. *See SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018).

A. Real Parties in Interest

Petitioner states that, in addition to itself, Videndum Production Solutions, Inc., Videndum US Holdings Inc., Videndum Holdings, Ltd., Videndum Investments Limited, Videndum Group Holdings, Ltd., and Videndum plc are also real parties in interest. Pet. 4. Patent Owner identifies itself as the only real party in interest. Paper 3, 2.

B. Related Matters

According to the parties, the ’895 patent is the subject of *Colt International Clothing, Inc. d/b/a Colt LED v. Quasar Science LLC*, No. 22-cv-00213 (D. Del.). Pet. 5; Paper 3, 2.

Petitioner also filed IPR2023-00611 and IPR2023-00614, challenging patents related to the '895 patent.

C. The '895 Patent and Related Background

The '895 patent relates to “a lighting system comprising a tube light with an improved LED array capable of producing light within at least two predetermined color temperature ranges.” Ex. 1001, 1:20–23.

According to the '895 patent, the two most frequently used and desired color temperature ranges in the lighting industry for stage and set lighting have been found to be 3050 to 3300 K for tungsten (warm white), and 5400 to 5600 K for daylight white. *Id.* at 2:3–7. The '895 patent states that when “accurate and suitable lighting color temperature is vital, lighting ‘gels’ are often used in conjunction with fluorescent lamps to produce the desired color temperature.” *Id.* at 2:10–13. Otherwise, “a lighting crew must continually change the fluorescent lamps between daylight white (or day white) colored lamps and tungsten (or warm white) colored lamps, or if desired, other types of white/light colored lamps.” *Id.* at 2:31–35.

According to the '895 patent, “[w]hat is desired is a lighting solution suitable for the lighting industry implementing the advantages of LED lights which allows for evenly dispersed light controllable within specific color temperature parameters without the need to physically switch out colored gels or lamp modules.” *Id.* at 3:6–10. To achieve this, the '895 patent describes “LED lighting systems configured to produce at least two different ranges of color temperature light, utilizing a first type of LED bulbs configured to provide a first color temperature range light and a second type of LED bulbs configured to provide a second color temperature range light.”

Id. at 4:66–5:5. The light system also may include circuitry configured such that only one group of LEDs can be turned on at a time. *Id.* at 5:58–60.

D. Illustrative Claim

Of the challenged claims, claims 1, 16, and 23 are independent.

Claim 1 is illustrative of the claimed subject matter and is reproduced below.

1. An LED light system configured for providing broad-spectrum white light suitable for a commercial image recording, in a form factor of a fluorescent light tube lamp, the LED light system comprising:
 - a. a housing having ends and including a support structure in a form of an elongated and narrow surface having a top side and a bottom side;
 - b. a plurality of first LEDs mounted on the top side of the support structure and configured to emit broad-spectrum white light in a first predetermined Kelvin temperature range of cool white light;
 - c. a plurality of second LEDs mounted on the top side of the support structure and configured to emit broad-spectrum white light in a second predetermined Kelvin temperature range of warm white light;
 - d. circuitry mounted to the support structure including an LED driver circuit configured for driving (i) the first LEDs, to provide light in the first predetermined Kelvin temperature range; or (ii) the second LEDs, to provide light in the second predetermined Kelvin temperature range, wherein the first and second predetermined Kelvin temperature ranges are nonoverlapping, and including a printed circuit board mounted to the support structure for carrying electrical power from a connection to the LED driver circuit and then to the first and second LEDs;
 - e. an elongate cover extending substantially a length of the support structure and covering the top side of the support structure for diffusing light emitted by the first and second LEDs; and

- f. wherein the housing and cover together have an elongate linear form factor,
- g. wherein the LED light system is configured for receiving input power to be provided to the LED driver circuit to selectively light the first or second LEDs,
- h. wherein the first and second LEDs are disposed in a plurality of rows distributed along the length of the top side of the support structure to emit light, when selectively lit by the LED driver circuit, along the length of the top side of the support structure,
- i. wherein the light is diffused by the cover and is suitable for the commercial image recording both when the emitted light from the LED light system is in the first temperature range of cool white light and when the emitted light from the LED light system is in the second temperature range of warm white light, and
- j. wherein the light emitted from the LED light system is suitable for the commercial image recording when said emitted light: (i) is at least 1000 lumens when the first LEDs are lit and is also at least 1000 lumens when the second LEDs are lit; (ii) is broad-spectrum white light having a color deviation corresponding to less than five points of green and less than five points of magenta (5M, 5G) of color compensation (CC), and (iii) has a color rendering index of light emitted from each of the first LEDs or each of the second LEDs, whichever respective plurality of first or second LEDs is lit, that is greater than 90.

Ex. 1001, 12:5–62.

E. Asserted Challenges to Patentability

Petitioner asserts the following challenges to patentability:

Claims Challenged	35 U.S.C. §	References
1–3, 6–18, 21–24, 27–29	103	Kit, ¹ Ianiro, ² Ducharme, ³ Katzir ⁴
1–3, 6–18, 21–24, 27–29	103	Ducharme, Ianiro, Katzir, Hasnain ⁵

Petitioner also relies on the declaration of Fred Holmes as support for its Petition. Ex. 1003.

II. DISCRETIONARY DENIAL UNDER § 325(D)

Institution of an *inter partes* review is discretionary. *See Cuozzo Speed Techs., LLC v. Lee*, 579 U.S. 261, 273 (2016) (explaining that because § 314 includes no mandate to institute review, “the agency’s decision to deny a petition is a matter committed to the Patent Office’s discretion”); *see also Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (stating that under § 314(a), “the PTO is permitted, but never compelled, to institute an IPR proceeding”).

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.” Our § 325(d) analysis employs a two-prong framework: (1) whether the arguments presented in the petition

¹ US 7,507,001 B2, issued Mar. 24, 2009 (Ex. 1004, “Kit”).

² WO 2009/063520 A1, published May 22, 2009 (Ex. 1007, “Ianiro”).

³ US 7,350,936 B2, issued Apr. 1, 2008 (Ex. 1005, “Ducharme”).

⁴ US 2010/0102729 A1, published Apr. 29, 2010 (Ex. 1006, “Katzir”).

⁵ US 8,668,361 B2, issued Mar. 11, 2014 (Ex. 1008, “Hasnain”).

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 arguments. *Advanced Bionics, LLC v. MED-EL Electromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 (“*Advanced Bionics*”), 8 (PTAB Feb. 13, 2020) (precedential).

Patent Owner asks us to deny the Petition under § 325(d). Prelim. Resp. 38–66. According to Patent Owner, prior art asserted and arguments presented in the Petition are the same as, or cumulative of, art and arguments previously presented the Office. *Id.* at 39–63. Patent Owner also argues that Petitioner has not shown the Office erred in a manner material to patentability of challenged claims. *Id.* at 63–66. We are not persuaded that we should deny institution under § 325(d) because, even if the first prong of the *Advanced Bionics* framework is satisfied, we find material error under the second prong of the framework.

Under the second prong of the *Advanced Bionics* framework, we consider “whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.” *Advanced Bionics*, 8. We focus our analysis on Ducharme, one of the primary references asserted in the Petition. Although Ducharme was “not before the Office during examination of the [’]895 Patent,” Patent Owner asserts that it is cumulative to a reference that “was presented to the Office during examination by IDS.” Prelim. Resp. 42–43. Patent Owner does not point to, and we have not found, any evidence showing discussion or application of the previously presented reference by the Examiner during prosecution of the ’895 patent or its related patents.

In other words, “the record of the Office’s previous consideration of the art is not well developed or silent.” *Advanced Bionics*, 10. In such situations, “a petitioner may show the Office erred by overlooking something persuasive.” *Id.*; *see also id.* at 8 n.9 (“An example of a material error may include misapprehending or overlooking specific teachings of the relevant prior art where those teachings impact patentability of the challenged claims.”).

On this record, Petitioner has shown sufficiently that the Examiner overlooked Ducharme’s teachings of the limitations that were the basis for allowing the challenged claims. Indeed, the Examiner allowed the challenged claims, stating that the closest prior art references

lack the teachings of the emitted light being suitable for the commercial image recording when the emitted light is simultaneously at least 1000 lumens when either the first or the second LEDs are lit, is broad-spectrum white light having a color deviation corresponding to less than 5 points of both green and magenta of color compensation, and has a color rendering index of light emitted from each of the first or the second LEDs (whichever is lit) that is greater than 90.

Ex. 1002, 150.

Petitioner’s evidence indicates that Ducharme teaches an LED light suitable for commercial image recording that includes a plurality of first white LEDs having a first spectrum and a plurality of second white LEDs having a second spectrum. *See, e.g.*, Ex. 1005, 4:1–7. Petitioner’s evidence also indicates that a person of ordinary skill in the art would have had reason to select first white LEDs with a daylight spectrum and second white LEDs with a tungsten spectrum. *See, e.g.*, Ex. 1003 ¶ 449; Ex. 1006 ¶ 53. Further, Petitioner’s evidence indicates that LEDs satisfying the light quality parameters recited in the challenged claims were known to those of ordinary

skill in the art. *See, e.g.*, Ex. 1003 ¶ 480; Ex. 1005, 25:36–43; Ex. 1007, 7:11–15; Ex. 1008, 4:1–3.

Thus, the evidence cited in the Petition demonstrates that the Office overlooked the prior art’s teachings of the limitations that were the basis for allowing the challenged claims. As a result, we decline to exercise our discretion under § 325(d) to deny the Petition.

III. ANALYSIS

A. Claim Construction

In an *inter partes* review, we construe a claim term “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. [§] 282(b).” 37 C.F.R. § 42.100(b) (2020). Under that standard, the words of a claim “are generally given their ordinary and customary meaning,” which is “the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc).

The parties agree that, for purposes of this Decision, no claim term needs specific construction beyond its plain and ordinary meaning. Pet. 14; Prelim. Resp. 14.

Claim terms need only be construed to the extent necessary to resolve the controversy. *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011). On this record and for purposes of this Decision, we see no need to address the construction of any claim term.

B. Level of Ordinary Skill in the Art

Petitioner argues that a person of ordinary skill in the art would have had “at least a Bachelor of Science degree in electrical engineering, or a

closely related field, along with at least two years of experience in the design of entertaining lighting systems, and the design and use of LEDs.” Pet. 14 (citing Ex. 1003 ¶ 32). Patent Owner does not dispute Petitioner’s definition of the skill level at this stage of the proceeding. Prelim. Resp. 13. For purposes of this Decision, we adopt Petitioner’s definition of the skill level because it is consistent with the prior art’s demonstration of the skill level at the time of the invention.

C. Prior Art Disclosures

Ducharme is directed to “LED-based light bulbs having one or more white LEDs, for replacing/retrofitting conventional light bulbs.” Ex. 1005, Abstract. It teaches that “the color temperature and/or CRI of light is critical to creators of images, such as photographers, film and television producers, painters.” *Id.* at 4:1–3. Ducharme teaches a LED-based light bulb, comprising at least one first white LED to generate first radiation having a first spectrum, and at least one second LED to generate second radiation having a second spectrum different than the first spectrum. *Id.* at 33:62–67. According to Ducharme, when “CRIs measure in the high 90s,” the light “may be characterized as high-quality.” *Id.* at 25:42–43.

Ianiro teaches “[a]n optimization technique of the balancing of the color temperature parameters in a lighting body formed by the assembly of selected LEDs.” Ex. 1007, Abstract. It teaches a “mixture” of LEDs that “produces balancing suitable for the Red - Blue correction at a color temperature of 5500° K, a chromatic color correction for the remaining excess Blue and a compensation for the Green - Magenta ratio for obtaining a measure deviation not greater than 5 CC degrees.” *Id.* at 7:11–15.

Hasnain is directed to an LED-based replacement for fluorescent light source. Ex. 1008, code (54). According to Hasnain, such “an LED replacement light source needs to generate 70 to 100 lumens per inch of light source.” *Id.* at 7:65–66. At the time of Hasnain’s invention, “white light sources based on GaN blue emitting LEDs generate 70 to 100 lumens per watt.” *Id.* at 8:1–3.

Katzir is directed to a lighting assembly that “can replace a fluorescent tube light while providing a more comfortable and steady light source, consuming less power and with enhanced longevity.” Ex. 1006, Abstract. It teaches “[t]he lighting assembly include a tube, a light emitting diode [LED] panel disposed within the tube, a circuit board disposed within the tube, and insulation disposed between the [LED] panel and the circuit board.” *Id.*

Kit is directed to “[a]n energy saving device for an LED lamp mounted to an existing fixture for a fluorescent lamp.” Ex. 1004, Abstract. It teaches replacing fluorescent lights with LEDs to achieve energy savings for “general lighting fixtures.” *Id.* at 13:34–38, 16:4–9.

D. Alleged Obviousness over Ducharme, Ianiro, Katzir, and Hasnain

Petitioner asserts that claims 1–3, 6–18, 21–24, and 27–29 would have been obvious over the combination of Ducharme, Ianiro, Katzir, and Hasnain. Pet. 47–75. Based on this record, and for at least the following reasons, we determine Petitioner has established a reasonable likelihood that it would prevail in this assertion.

We focus our analysis on claim 1. Petitioner provides detailed analysis, mapping each claim limitation to the teachings of the asserted prior art. *Id.* at 51–63. Petitioner also argues that an ordinarily skilled artisan

would have had reason to combine the cited teachings of the prior art, would have had a reasonable expectation of success in doing so. *Id.* at 47–51.

Patent Owner disagrees. Prelim. Resp. 22–37. Based on the current record, and as explained below, we find Petitioner’s analysis more persuasive.

Petitioner argues that Ducharme, together with other asserted prior art, teaches the preamble of claim 1,⁶ as well as limitations 1.a. and 1.d.–1.i. Pet. 51–53, 56–60 (citing Ex. 1005, 4:1–7, 5:7–33, 10:43–63, 12:3–15, 12:17–35, 12:49–53, 13:60–14:28, 14:30–32, 16:27–52, 18:51–64, 19:14–24, 19:62–65, 24:45–25:2, 26:5–28, 29:15–60, 30:23–34, 31:51–54, 32:11–13, 32:44–45, Figs. 5a, 5b, 18, 29; Ex. 1006 ¶¶ 11–13, 27–29, 33, 34, 53, 54, Figs. 5A, 5B). At this stage of the proceeding, Patent Owner does not dispute these assertions.⁷ On this record, we find Petitioner’s mapping of these limitations to Ducharme persuasive.

1. Limitations 1.b. and 1.c.

Petitioner also contends that Ducharme teaches limitations 1.b. and 1.c. Pet. 54–56. Specifically, Petitioner refers to Ducharme for teaching a plurality of first white LEDs and a plurality of second white LEDs. *Id.*

⁶ Because Petitioner presents evidence that the prior art teaches the recitations in the preamble of claim 1, at this stage of the proceeding, we need not decide whether the preamble is limiting.

⁷ Patent Owner’s argument related to limitation 1.d. is subsumed in its argument related to limitations 1.b. and 1.c. *See* Prelim. Resp. 25 (arguing the prior art does not “teach a tubular bicolor luminaire with cool white LEDs and warm light LEDs, and thus fail to satisfy claim 1 elements 1[b], 1[c] as well as 1[d], 1[j]”). Indeed, Patent Owner does not dispute Petitioner’s assertion that Ducharme discloses a circuitry “that is mounted on a support structure and can control color temperature and power to an LED.” *See* Pet. 56–57 (citing Ex. 1005, 29:47–51, 30:24–26, Fig. 29).

at 54–55 (citing Ex. 1005, 5:47–50, 13:60–64, 33:63–67). Petitioner argues that an ordinarily skilled artisan “would have known that daylight and tungsten color temperature ranges are used in the lighting industry for stage and set lighting,” and thus would have had reason to select first white LEDs with a daylight temperature and second white LEDs with a tungsten temperature. *Id.* at 55 (citing Ex. 1003 ¶¶ 330–335).

Patent Owner disagrees. Prelim. Resp. 23–28. According to Patent Owner, Ducharme does not teach “a bicolor luminaire using daylight white and tungsten white,” but instead teaches a luminaire having a first white LED with a “first spectrum” and a second LED with a “different spectrum.” *Id.* at 25–26 (citing Ex. 1005, 13:60–14:3, 33:63–67). Patent Owner argues that spectrum is referring to “wavelength which would determine color, not color temperature.” *Id.* at 26 (emphasis omitted). “Since the first LED is white and since the second LED has a different spectrum,” Patent Owner concludes “the second LED is a different color.” *Id.*

On this record, we find Petitioner’s argument more persuasive. Ducharme teaches “at least one first white LED . . . having a first spectrum,” and “at least one second LED . . . having a second spectrum different than the first spectrum.” Ex. 1005, 33:63–67. The evidence of record indicates that two white LEDs may have different spectrums. For example, white LEDs may be “daylight spectrum LEDs” or “tungsten spectrum LEDs.” Ex. 1006 ¶ 53. Thus, we disagree with Patent Owner that Ducharme is limited to first white LEDs and second non-white LEDs. Instead, on this record, Ducharme’s teaching includes first white LEDs having a daylight spectrum and second white LEDs having a tungsten spectrum.

In sum, on this record and for purposes of institution, we find Petitioner has shown sufficiently that Ducharme teaches limitations 1.b. and 1.c.

2. Limitation 1.j.

Petitioner further argues that the parameters recited in limitation 1.j., including outputting 1000 lumens, a CRI greater than 90, and less than five points of green and magenta of color compensation are merely “optimum or workable color or temperature ranges of known LED devices.” Pet. 61 (citing Ex. 1003 ¶¶ 346–347). Moreover, Petitioner contends that the asserted prior art combination teaches these recited parameters. *Id.* at 61–63. Specifically, Petitioner asserts that Ducharme teaches embodiments where the color rendering index (“CRI”) is greater than 90. *Id.* at 61–62 (citing Ex. 1005, 4:1–5, 25:36–43). Petitioner also argues that Hasnain teaches LEDs generating at least 1000 lumens. *Id.* at 62–63 (citing Ex. 1003 ¶¶ 350–351; Ex. 1008, 4:2–3, 4:37–43). Petitioner further refers to Ducharme for teaching that, in theatrical lighting design, strong green light on the human body is undesirable. *Id.* at 63 (citing Ex. 1005, 4:14–18). In addition, Petitioner argues that Ianiro teaches a broad-spectrum white light with a color deviation corresponding to less than five points of green and less than five points of magenta of color compensation. *Id.* (citing Ex. 1007, 7:11–15).

Patent Owner disagrees. Specifically, Patent Owner argues that because Ducharme teaches use of “three different colored LEDs” or “even more narrow spectrum LEDs” to get high quality light, it “teaches away from broad-spectrum when seeking high CRI.” Prelim. Resp. 24 (citing Ex. 1005, 24:9–50, 25:16–20, Figs. 14, 16) (emphasis omitted).

Patent Owner contends that Hasnain does not teach LEDs that are suitable for generating at least 1000 lumens and also satisfy the claimed “parameters of the CRI, the green-magenta deviations, or the color temperature.” *Id.* at 36 (citing Ex. 1008, 4:1–3); *see also id.* at 36–37 (arguing Hasnain “might cause a POSITA to investigate higher output LEDs, but there is no basis to say” that such LEDs would meet limitation 1.j.). In addition, Patent Owner argues that Hasnain teaches the LEDs suitable for generating at least 1000 lumens are spaced “one to two inches apart in a line” and thus “would lack the multiple rows of LEDs” recited in limitation 1.h. *Id.* at 37 (citing Ex. 1008, 6:38–43).

On this record, we find Petitioner’s argument more persuasive. Even though Ducharme uses different colored LEDs to achieve CRI greater than 90, we are not persuaded that this would discourage an ordinarily skilled artisan from using broad-spectrum white light to achieve CRI greater than 90. Indeed, Ducharme states “CRI of light is critical to creators of images, such as photographers, film and television producers, painters.” Ex. 1005, 4:1–5. In making this statement, Ducharme does not distinguish broad-spectrum white light from narrow-spectrum colored lights.

Patent Owner also cannot attack Hasnain individually because Petitioner’s obviousness challenge here is based on the combination Ducharme, Ianiro, Katzir, and Hasnain. *In re Keller*, 642 F.2d 413, 426 (CCPA 1981). Indeed, Petitioner relies on Hasnain only for teaching LEDs with output of at least 1000 lumens. Pet. 62–63 (citing Ex. 1008, 4:2–3, 4:37–43). Petitioner relies on Ducharme and Ianiro for teaching the other parameters recited in limitation 1.j. *Id.* at 61–63 (citing Ex. 1005, 4:1–5, 4:14–18, 25:36–43; Ex. 1007, 7:11–15); *see also In re Mouttet*,

686 F.3d 1322, 1333 (Fed. Cir. 2012) (explaining that “the test for obviousness is what the combined teachings of the references would have suggested to those having ordinary skill in the art”).

Similarly, Petitioner asserts, and Patent Owner does not dispute, that Ducharme or the combination of Ducharme and Katzir teaches a plurality of rows of LEDs, as required in limitation 1.h. Pet. 59 (citing Ex. 1005, 12:17–35, 16:27–52, 24:45–25:2, 29:15–55, Fig. 29; Ex. 1006 ¶ 54, Figs. 5A, 5B). Thus, whether the LEDs in Hasnain would, as Patent Owner contends, “lack the multiple rows of LEDs” (Prelim. Resp. 37) matters not, because, as we understand it, Petitioner proposes implementing Ducharme’s light, which includes a plurality of rows of LEDs, with the lumen output as taught in Hasnain (Pet. 49–50).

In sum, on this record and for purposes of institution, we find Petitioner has shown sufficiently that the combination of the asserted prior art teaches limitation 1.j.

3. Reason to Combine and Reasonable Expectation of Success

Finding that Petitioner, on this record and for purposes of institution, has shown sufficiently that the asserted prior art teaches all limitations of claim 1, however, does not end our obviousness inquiry. An invention is not obvious just because all of the elements that comprise the invention were known in the prior art. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (“[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.”). Rather, “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.” *Id.*

Petitioner argues that an ordinarily skilled artisan would have had reason to combine the teachings of asserted prior art and would have had a reasonable expectation of success in doing so. Pet. 47–51 (citing Ex. 1003 ¶¶ 307–320). According to Petitioner, “based on the teachings of Ducharme, a POSITA would have known that it was of critical importance to have lighting systems capable of emitting light with a high CRI, minimal deviation from green and magenta (preferably 0), and a high lumen output.” *Id.* at 49 (citing Ex. 1003 ¶¶ 307–310). Petitioner argues that, “to achieve an LED lighting system suitable for use in image recording,” an ordinarily skilled artisan would have had a reason to implement Ducharme’s LED light using LEDs with high lumen output, as taught by Hasnain, and a specific green and magenta color compensation, as taught by Ianiro. *Id.* at 49–50 (citing Ex. 1003 ¶¶ 307–320).

Petitioner also argues that Ducharme and Katzir both teach LEDs in a fluorescent tube form factor. *Id.* at 47–48, 50–51 (citing Ex. 1005, 28:53–65, Figs. 5a, 29; Ex. 1006 ¶ 27, Fig. 1C). Thus, according to Petitioner, an ordinarily skilled artisan would have had a reason “to modify the elongated tube form factor disclosed in Ducharme based on the teachings of Katzir.” *Id.* at 50–51 (citing Ex. 1003 ¶¶ 316–319).

Patent Owner contends that there would have been no reason to combine Ducharme and Katzir. Prelim. Resp. 28–31. Patent Owner argues that the teachings of Ducharme and Katzir are “in conflict” because Ducharme uses “three or more different colored LEDs with narrow bandwidth,” whereas Katzir uses “disparate color temperature white LEDs and blend[s] them.” *Id.* at 30. Patent Owner also argues that “Ducharme teaches the need for an accurate color temperature output,” and thus an

ordinarily skilled artisan “would forego Katzir’s disparate color blending luminaire, as Katzir’s device would make accurate color temperature rendition difficult.” *Id.* at 30–31.

Patent Owner also contends that there would have been no reason to combine Ducharme and Ianiro. *Id.* at 22–23. According to Patent Owner, “Ianiro mentions CRI and use of a luminaire in the film industry, but says that CRI is not so important.” *Id.* at 22 (citing Ex. 1007, 7:6–15). An ordinarily skilled artisan consulting Ianiro, Patent Owner concludes, “would be satisfied with a lower CRI and not seek one over . . . 90.” *Id.* at 23.

Patent Owner further argues that an ordinarily skilled artisan would not have had a reasonable expectation of success in combining the prior art teachings to arrive at the claimed invention. *Id.* at 31–35. Patent Owner argues that it would have been a “challenge” to design a light that generates at least 1000 lumens when only the cool white LEDs are on and when only the warm white LEDs are on. *Id.* at 32–33; *see also id.* at 35 (“[A] POSITA would know it would be difficult to make a bicolor LED luminaire to emit 1000+ lumens out of only one half of the LEDs on.”). Patent Owner also asserts that “there is a lumen penalty (reduction in output) for warm white LEDs,” for “reducing green tones in LED output,” and for “higher CRI.” *Id.* at 33–34. Thus, according to Patent Owner, an ordinarily skilled artisan would not have a reasonable expectation of success for “a bicolor LED luminaire using broads-spectrum white LEDs in the cool white and warm white color temperatures, especially if trying to minimize green-magenta color deviation, trying to maximize CRI and trying to get 1000 lumens out when only half of the LEDs are on at a time.” *Id.* at 34.

On this record, we again find Petitioner’s argument more persuasive. On the reason to combine Ducharme and Katzir, as discussed above, we are not persuaded that Ducharme is limited to different colored narrow bandwidth LEDs. In addition, Patent Owner misinterprets Petitioner’s proposed combination. Petitioner does not propose modifying Ducharme to include Katzir’s blending of two LEDs with different color temperatures. Rather, Petitioner only proposes implementing Ducharme’s LED light using Katzir’s fluorescent tube form factor. Pet. 47–48, 50–51 (citing Ex. 1003 ¶¶ 316–319; Ex. 1005, 28:53–65, Figs. 5a, 29; Ex. 1006 ¶ 27, Fig. 1C). Thus, on this record and purposes of institution, we find that Petitioner has shown sufficiently that an ordinarily skilled artisan would have combined the teachings of Ducharme and Katzir.

We do not need to address Patent Owner’s argument that Petitioner has not shown sufficiently reason to combine Ducharme and Ianiro to reach high CRI. This is because Petitioner cites Ianiro when discussing not only CRI (*see* Pet. 62), but also color deviation of no more than five points of green and magenta (*see id.* at 63). On the latter, Petitioner argues that in view of the teachings of Ducharme, “[a] POSITA would have been motivated to use LEDs that achieve low points of green and magenta color compensation.” *Id.* (citing Ex. 1003 ¶ 352; Ex. 1005, 4:14–18). And Ianiro, Petitioner continues, teaches such LEDs. *Id.* (citing Ex. 1003 ¶¶ 352–353; Ex. 1007, 7:11–15). Patent Owner does not appear to dispute these assertions. Thus, on this record and purposes of institution, we find that Petitioner has shown sufficiently that an ordinarily skilled artisan would have combined the teachings of Ducharme and Ianiro.

We acknowledge Patent Owner's argument that there would be no reasonable expectation of success because "LED luminaire design, especially for the film industry is fraught with many tradeoffs," and thus "is not simply routine optimization and routine experimentation." Prelim. Resp. 32, 34. On this record, however, Patent Owner does not point to sufficient evidence to support or adequately explain its assertions.

For example, when contending that it "would be a challenge to a POSITA" to design the luminaire as claimed, Patent Owner cites a reference for stating that "[n]ow LEDs are bright enough to be used to light performers and to be used as a white light source, color consistency will become a major concern, if not a headache." *Id.* at 32 (citing Ex. 1014, 5) (emphasis omitted). Patent Owner does not explain, and it is not immediately apparent to us, how this statement supports Patent Owner's contention that it is difficult to design LEDs with the lumen output as claimed. Similarly, even if we accept Patent Owner's assertions of various lumen penalties, Patent Owner does not argue, let alone point to sufficient evidence to show, that the tradeoffs would have been so significant that an ordinarily skilled artisan would not have expected to successfully arrive at the claimed LED light system. Thus, on this record and for purposes of institution, we find Petitioner has shown sufficiently that an ordinarily skilled artisan would have had a reasonable expectation of success in combining the teachings of asserted prior art to arrive at the claimed invention.

4. Summary

In sum, based on this record, we determine Petitioner has established a reasonable likelihood that it would prevail in its assertion that claim 1

would have been obvious over the combination of Ducharme, Ianiro, Katzir, and Hasnain.

Petitioner also asserts that claims 2, 3, 6–18, 21–24, and 27–29 would have been obvious over the combination of Ducharme, Ianiro, Katzir, and Hasnain. Pet. 65–75. Patent Owner does not address these claims separately. After reviewing the record, we determine that, Petitioner has made a sufficient showing regarding these claims too.

Thus, we institute an *inter partes* review as to all challenges raised in the Petition. *See* Patent Trial and Appeal Board Consolidated Trial Practice Guide 64 (Nov. 2019)⁸ (“The Board will not institute on fewer than all claims or all challenges in a petition.”); *see also PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018) (interpreting the statute to require “a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition”).

E. Alleged Obviousness over Kit, Ianiro, Ducharme, and Katzir

As discussed above, because Petitioner has met its burden in its challenge based on the combination of Ducharme, Ianiro, Katzir, and Hasnain, we institute trial as to all challenges raised in the Petition. We nevertheless offer the following observations on the obviousness challenge based on combination of Kit, Ianiro, Ducharme, and Katzir. *See* Pet. 14–47.

Petitioner argues that Kit teaches a plurality of LED arrays “configured to emit broad-spectrum white light in various predetermined Kelvin temperature ranges, including cool and warm white light.” *Id.* at 24 (citing Ex. 1004, 3:20–38, 22:9–35). Patent Owner counters that “Kit lacks

⁸ Available at <https://www.uspto.gov/sites/default/files/documents/tpgnovpdf>.

any disclosure of a bicolor luminaire with cool white and warm white LEDs.” Prelim. Resp. 18. According to Patent Owner, Kit teaches “matching LEDs of a given color temperature to get consistent color temperature output,” and “not both warm white and cool white in one luminaire.” *Id.* at 18–19 (citing Ex. 1004, 3:28–31, 3:33–36, 3:53–56).

On this record, we find Patent Owner’s argument more persuasive.

Kit teaches that

[t]he solution to the wide manufacturing tolerances for achieving a consistent color temperature and intensity was to introduce color-matched white Luxeon Lamps, each containing multiple white Luxeon LEDs that are selected by advanced binning algorithms. By correctly combining an appropriate mix of LEDs, the Luxeon Lamps themselves have well-controlled and consistent color temperatures of 3200K (warm white), 4100K (commercial white) *or* 5500K (cool white).

Ex. 1004, 3:28–36 (emphasis added). We read this passage, which Petitioner relies on, as teaching a light with LEDs that produce a single, consistent temperature, and not, as Petitioner argues, a light having both cool white LEDs and warm white LEDs. *See* Pet. 24.

Petitioner cites another portion of Kit to support its argument that Kit teaches a light having both cool white LEDs and warm white LEDs. *See id.* (citing Ex. 1004, 22:9–35). There, however, Kit teaches a single warm white LED (Ex. 1004, 22:9–21) and an “alternate arrangement” using “white color LEDs with a combination of yellow or amber color LEDs” (*id.* at 22:21–25).

Petitioner also argues that “Katzir further discloses daylight and tungsten temperature ranges within the claimed temperature ranges.” Pet. 24 (citing Ex. 1006 ¶¶ 53, 54, Figs. 5A, 5B). According to Petitioner, Katzir teaches “various LED array layouts which a POSITA would have looked to when designing an LED tube lighting like that disclosed in Kit.” *Id.* at 19

(citing Ex. 1006 ¶ 54, Figs. 5A–5F). Patent Owner contends that Petitioner’s purported motivation to combine the teachings of Katzir and Kit “just because they both put LEDs into a retrofittable tubular format would be true of virtually all LED tubular luminaires, regardless of how opposite their purposes” is “conclusory and insufficient.” Prelim. Resp. 29.

On this record, we find Patent Owner’s argument more persuasive. Even if Petitioner is correct that Katzir teaches a light with both cool white LEDs and warm white LEDs, on this record, Petitioner does not show sufficiently that it would have been obvious to combine that specific teaching of Katzir with Kit. As discussed above, Kit appears to teach a light with LEDs that produce a single, consistent temperature of warm white, commercial white, or cool white. Ex. 1004, 3:28–36. Petitioner does not explain sufficiently why an ordinarily skilled artisan would have modified Kit to include Katzir’s particular layout that includes both cool white LEDs and warm white LEDs.

IV. CONCLUSION

Based on the current record, and for the reasons explained above, we find Petitioner has demonstrated a reasonable likelihood that it would prevail with respect to at least one claim challenged in the Petition. We therefore institute an *inter partes* review of all challenged claims on all asserted grounds.

At this stage of the proceeding, the Board has not made a final determination as to the construction of any claim term or the patentability of any challenged claim. We encourage the parties to further address all relevant issues of all challenges to fully develop the record during trial. Our

view with regard to any conclusion reached in the foregoing could change upon further development of the record during trial.

Any argument not raised in a timely Patent Owner Response to the Petition, or as permitted in another manner during trial, shall be deemed waived even if asserted in the Preliminary Response. In addition, nothing in this Decision authorizes Petitioner to supplement information advanced in the Petition in a manner not permitted by the Board's Rules.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review is hereby instituted on all challenged claims of the '895 patent based on all the asserted grounds set forth in the Petition; and

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

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