

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.

Case IPR2023-00614
Patent 10,566,895

PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE

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1005	U.S. Patent No. 7,350,936 to Ducharme et al. (“Ducharme”)
1006	U.S. Publication No. 2010/0102729 to Katzir <i>et al.</i> (“Katzir”)
1007	WO 2009/063520 to Ianiro (“Ianiro”)
1008	U.S. Patent No. 8,668,361 to Hasnain <i>et al.</i> (“Hasnain”)
1009	U.S. Publication No. 2010/0102960 to Ivey <i>et al.</i> (“Ivey”)
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I. Introduction

Patent Owner's Response only argues that a single claim limitation is not present in the cited combinations of prior art. Patent Owner Response (Paper 29, "POR"), 13-22. Specifically, Patent Owner alleges that the claim 1[j] limitation, reciting that the "*emitted light*"¹ is "*at least 1000 lumens,*" is not sufficiently taught by the prior art relied upon by Petitioner. *Id.* Accordingly, Patent Owner concedes that the Petition sufficiently establishes the remaining limitations of the Challenged Claims.² Given its limited arguments regarding the obviousness of the Challenged Claims, Patent Owner expends significant energy alleging that secondary considerations overcome Petitioner's strong showing of obviousness of the Challenged Claims. POR, 42-59. However, Patent Owner fails to provide objective evidence with a sufficient nexus to the claims, as "there must be a legally and factually sufficient connection between the evidence and the patented invention." *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366 at 1373 (Fed.Cir. 2019). The products identified by Patent Owner include multiple unclaimed features while all the claimed features were all well-known and common in the

¹ Quoted and italicized text herein provides claim language.

² Petitioner requests cancellation of Claims 1–3, 6–18, 21–24, and 27–29 ("the Challenged Claims") of U.S. Patent No. 10,566,895 (Ex-1001, "'895 Patent").

prior art. Thus, the alleged indicia of non-obviousness fail to overcome the showing of obviousness by Petitioner.

II. Petitioner Established the Obviousness of The Challenged Claims Including Claim Limitations Regarding 1000 Lumens

Claim 1[j] of the '895 patent recites “*wherein the light emitted from the LED light system is said 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.*” Patent Owner argues that Petitioner failed to meet its burden to show this limitation is obvious in view of the proposed combinations. POR, 13. However, LED lighting devices capable of emitting light that is at least 1000 lumens were well known in the art, as exemplified by the prior art relied upon by Petitioner, including Kit, Katzir, and Hasnain. Ex-1003, ¶¶140-146, 346-353; Ex-1004, 4:63–5:4, 12:21–32; Ex-1006, ¶29; Ex-1008, 4:2-3.

A. Ducharme in View of Ianiro, Katzir, and Hasnain (Ground 2) Obviates The “*At Least 1000 Lumens*” Limitation

Patent Owner argues that Petitioner's lumens calculations are not sufficient to support a 1000 lumen minimum in a bicolor LED light system because Petitioner fails to account for “**known losses**³ from LED LPW in determining the ‘light system’ lumen output.” POR, 18. Patent Owner concedes, these were

³ Emphasis has been added to quoted text in bold font unless otherwise noted.

“**known losses**” to those of skill in the art (*Id.*), and Patent Owner’s declarant, Dr. Allen, testifies that these “lumen reducing penalties” were “**well known.**” Ex-2080, ¶¶18, 19. Thus, Patent Owner does not allege that the cited prior art fails to teach 1000 lumens, just that the outputs would need to be adjusted in view of known losses.

Dr. Allen testifies that a POSITA “would typically consider these luminaire factors as significant but they are not considered in the Holmes declaration.” Ex-2080, ¶22. Yet, they are similarly not addressed in the ’895 patent. Patent Owner also provides a long list of possible lumen losses that would need to be considered, including “Diffusion losses,” “CRI losses,” “Green index rating losses,” “Color temperature losses,” “Thermal droop losses,” “Current droop losses,” and “Driver/circuitry losses,” yet these losses are also not addressed or accounted for in the ’895 patent. POR, 16. These lumen reducing penalties were not mentioned in the ’895 patent because a POSITA would have accounted for such “**known losses**” in its LED light design. Ex-1049-Holmes, ¶¶22-27. Indeed, as Dr. Allen testified, these lumen losses are “inherent” to LED lighting design. Ex-2080, ¶21; Ex-1049-Holmes, ¶23. Patent Owner concedes that these known losses depend on the LED’s specifications, amount of power to driver current per LED, the LED p-n junction temperature, and other factors. *Id.* at 17. Thus, Patent Owner concedes that these are design specific considerations that a POSITA would need to consider

in designing each particular LED light. *Id.*; Ex-1049-Holmes, ¶¶22-27.

Furthermore, Mr. Holmes testified that a POSITA would have readily expected to achieve an output of at least 1000 lumens for commercial image recording applications, as exemplified by the disclosure in the '895 patent of a prior art device called Durosite™ that was disclosed as achieving an output of “1500 Lumens of Natural White light, using 17 Watts” and the disclosure in the provisional application of additional prior art Durosite™ devices, all of which have a lumen output of at least 1450 lumens, as set forth in the figure from the provisional application reproduced below:

Warm White:	3700 Kelvin; ~ 1450 lumens	- Yellowish Light
Natural White:	4500 Kelvin; ~ 1500 lumens	- Natural White Light
Daylight White:	5500 Kelvin; ~ 1550 lumens	- Pure White
Cool White:	7000 Kelvin; ~ 1600 lumens	- Bluish Light

Ex-1049-Holmes, ¶¶24-25 (citing Ex-1001 2:44-53; Ex-2123, 5).

Patent Owner also argues that “Holmes and Hasnain ‘[fail] to consider lumen reducing penalties.” POR, 21. However, the Petition explained “Hasnain discloses that ‘white light sources based on GaN blue emitting LEDs generate 70 to 100 lumens per watt.’” Pet., 62 (citing Ex-1008, 4:2–3). Furthermore, Mr. Holmes testified that “POSITA armed with the teachings of Hasnain would know that even assuming using LEDs capable of emitting 70 lumens per watt, an LED-based lamp having an elongated forty-four inch long and one-inch-wide circuit

board would be able to produce 1,540 lumens from just 22 watts, and up to 3,080 lumens at 44 watts.” Ex-1003, ¶351. Accordingly, Petitioner’s proposed combination could generate 1,540 lumens at 22 watts, 54% greater than the claimed amount of 1000 lumens, and could generate 3,080 lumens at 44 watts, 208% greater than the claimed amount of 1000 lumens. *Id.*; Pet., 62-63.

Significantly, Patent Owner chose not to cross-examine Mr. Holmes, and Patent Owner does not allege that his calculations are inaccurate, just that they fail to account for certain known losses, losses which are not recited in the Challenged Claims or the '895 patent. POR, 14-22. Additionally, neither Patent Owner nor its declarants offer any rebuttal to these calculations by Mr. Holmes in view of the cited prior art. POR, 18-22. Patent Owner and Dr. Allen simply argue that certain considerations may result in lumen penalties. Ex-2080, ¶¶27, 29, 30. Dr. Allen offers no specific rebuttal calculations in reference to the combination of Ducharme in view of Ianiro, Katzir, and Hasnain proposed by Petitioner. Dr. Allen only offers a general unsupported conclusion that “a further correction factor of at least 35% must be included to correct for green and CRI in the demanding applications of Commercial Image Recording as recited in the Claim 1j(ii)-(iii) requirements of the G/M 5 Point Limit and $CRI > 90$.” Ex-2080, ¶24. As Mr. Holmes shows, Dr. Allen’s lumen penalty analysis is incorrect for several reasons, including the '895 patent states that “[t]he LEDs are tested to provide the desired

light,” (Ex-1001, 11:39-44) not the device, and Dr. Allen incorporates lumen penalties that are inappropriate for the situation. Ex-1049-Holmes, ¶¶50-54. Even assuming Dr. Allen’s 35% reduction is accurate (it is not), the lumen output of the prior art combination proposed by Petitioner is well above 1000 lumens. Ex-1003, ¶¶347-353; Ex-1049-Holmes, ¶¶56-58.

Dr. Allen testified that diffusion covers also penalized lumen output up to 20%. Ex-1039, 51:4-11. However, the ’895 patent allows for clear diffusion covers (Ex-1001, 6:61-33) which would not have any material penalty, and even with Dr. Allen’s proposed 20% penalty the prior art combination would still be expected to achieve more than 1000 lumens. Ex-1049-Holmes, ¶¶53, 59.

B. Kit in View of Ducharme, Ianiro, and Katzir, (Ground 1) Obviates The “*At Least 1000 Lumens*” Limitation

As with Ground 2, Patent Owner argues that Petitioner’s lumens calculations in Ground 1 are insufficient to support a 1000 lumen minimum. Yet, the Petition explained “Kit discloses LEDs can achieve at least 1,200 lumens, and gives an example of a four-foot LED device that outputs 1,040 lumens.” Pet., 33 (citing Ex-1004, 4:63-5:4 (“4-foot LED lamp model should produce 1040 (20x52) lumens”)). Mr. Holmes concluded that “**even discounting the lumen yield for high CRI**, the output would have been well over 1000 lumens and capable of well over 42 watts while maintaining a greater than 90 CRI.” Ex-1003, ¶142. As Mr.

Holmes identifies, a POSITA would have accounted for “**lumen yield for high CRI,**” in addition to the numerous other design considerations known to a POSITA when designing an LED to meet certain specifications. *Id.*; Ex-1049-Holmes, ¶¶29-31. Mr. Holmes further identifies that in view of Katzir, a “POSITA would have known to fit hundreds of LEDs on a four-foot linear support structure,” and “Katzir discloses that, while 225 LEDs is preferred, upwards of 400 LEDs may be placed in a fluorescent tube form factor.” Ex-1003, ¶143 (citing Ex-1006, ¶29).

Again, Patent Owner chose not to cross-examine Mr. Holmes, and neither Patent Owner nor Dr. Allen offer any rebuttal Mr. Holmes's calculations. Dr. Allen incorrectly offers only a generalized conclusion that “a further correction factor of at least 35% must be included” (Ex-2080, ¶24; Ex-1049-Holmes, ¶¶50-54), and the lumen output of the Ground 1 prior art is above 1000 lumens. Ex-1003, ¶¶140-146.

III. The Alleged Thermal Issues Are Not Recited in the Challenged Claims and Not Discussed in the '895 Patent

Patent Owner argues that “[b]oth Holmes’ declaration and Hasnain fail to show obviousness or that a POSITA would have any reasonable likelihood of success in a luminaire design due to failure to properly take into account **thermal management considerations** that are critical to a successful luminaire design.” POR, 24. While Patent Owner dedicates a significant portion of its brief (over 16

pages) to alleged thermal issues “critical” to LED light design, the Challenged Claims do not contain a single limitation regarding thermal considerations.

Further, the '895 patent specification does not include any reference to or discussion of the alleged thermal issues. In fact, the terms “thermal” and “heat” are not present in the '895 patent. Patent Owner's declarant, Mr. Fisher, dedicated 25 pages of his declaration to the discussion of alleged thermal issues for LED lighting designs, but conceded on cross-examination that there is no discussion in the '895 patent about thermal issues or how to overcome them:

“Q: So you would agree that the '895 patent does not provide any disclosure about overcoming thermal issues?

A: I would agree. And I was wrong.” Ex-1043, 195:13-16.

Because the alleged “thermal issues” are not recited in the Challenged Claims or even the '895 patent, they are of no moment to the patentability of the Challenged Claims.

A. Petitioner Does Not Propose Combining Hasnain's Open Tube into Ducharme's LED Light System

Regarding Ground 2, Patent Owner argues that Hasnain's structure does not include a cover and Ducharme includes a cover; thus, it would not have been obvious to combine them. POR, 31. However, Petitioner's proposed combination in Ground 2 does not rely upon Hasnain for its teaching of an uncovered LED light

system, but merely cites to Hasnain to show an expected lumens per watt output for a typical T12 LED device. Pet., 62. Specifically, Petitioner's proposed combination in Ground 2 relies upon Hasnain's teachings regarding "white light sources based on GaN blue emitting LEDs generate 70 to 100 lumens per watt" and teachings regarding an "additional heat-dissipating surface on the backside of the light source can be utilized to dissipate more heat if required." Pet. 67 (citing Ex-1008, 4:2-3, 4:41-43). Conversely, Claim 1[e] requires an "*elongate cover*" for "*diffusing light*," and Petitioner's Ground 2 relies upon Ducharme's disclosure of a "top portion (1111) will generally be comprised of a translucent, transparent, or similar material allowing light transmission" as rendering obvious claim 1[e]. Pet., 57-58 (citing Ex-1005, 29:27-30, 12:3-15). Accordingly, Petitioner's proposed combination in Ground 2 does not propose combining Hasnain's open tube into Ducharme's design. As set forth in the Petition, a "POSITA would have been motivated to utilize the teachings of Katzir, Ianiro, and Hasnain to create the LED lighting device disclosed in Ducharme capable of selectively electronically switching between two predetermined color temperatures of broad-spectrum white light with a high (greater than 90) CRI and less than five points of deviation of green and magenta of color compensation, with each predetermined color temperature emitting greater than 1000 lumens." Pet., 50 (citing Ex-1003, ¶¶313-315); Ex-1049-Holmes, ¶¶7-27 (confirming conventionality of claimed features per

original declaration). Accordingly, a POSITA would have found it obvious to use the teachings from Hasnain to improve the features of the Ducharme LED light system, not to reduce its features. *Id.*

B. The Alleged “Substantial Thermal Concerns” Were Well Known to a POSITA Engaged in LED Lighting Design

The thermal concerns raised by Patent Owner were known to those of skill in the art, as confirmed by Patent Owner's declarants. For example, Dr. Allen testified that thermal issues were well known in 2010 to 2013. Ex-1039, 75:4-14.⁴ And while Dr. Allen complains about heat issues (Ex-2080, ¶¶35-62), Dr. Allen failed to apply Hasnain's heat dissipation techniques cited by Mr. Holmes, rendering his analysis faulty. Ex-1039, 93:25-104:25; Ex-1003, ¶490; Ex-1049-Holmes, ¶¶41-49.

Despite its voluminous allegations about thermal concerns, Patent Owner fails to provide any examples of bi-color LED light tubes that exhibited thermal issues. For example, Mr. Baxter testified that he is unaware of any thermal issues for bi-color LED light tubes:

“Q. Are you aware of a thermal failure for a bi-color light tube?

⁴ Dr. Allen does not qualify as a POSITA under Patent Owner's POSITA definition. Ex-1039, 44:22-45:17.

A. No, not at all.” Ex-1042, 99:12-14.

Similarly, Mr. Wonderlick, a 20 year veteran of Paramount's lighting department, recalled MacTech LED tubes being used prior to the invention and without any heat issues. Ex-1046, 60:15-19 (“Q: Do you recall any heat issues with the MacTech LED tubes? . . . THE WITNESS: No.”).

IV. A POSITA Would Have Been Motivated to Make the Proposed Combination and Have a Reasonable Expectation of Success in Doing So

Patent Owner argues that “in view of a web of design issues faced by a POSITA, it would not have been obvious to combine the references in Grounds I or II.” POR, 32. However, the “web of design issues” identified by Patent Owner all relate to alleged thermal concerns, which are not recited in the Challenged Claims or even identified in the '895 patent specification. As established in the Petition and further confirmed by Patent Owner's declarants on cross-examination, each limitation in the Challenged Claims was known in the prior art and the “thermal concerns” were well known to those of skill in lighting design.

A. Patent Owner's Own Declarants Acknowledge That All Components of the Claimed Invention Were Known

The Petition clearly established each of the limitations of the Challenged Claims were known in the prior art, including Kit, Ducharme, Ianiro, Katzir, and Hasnain. Pet., 14-75. Furthermore, Patent Owner's declarant, Mr. Baxter,

concedes that every component of the claimed invention was known at the time of the invention. Ex-2048, ¶25. Specifically, Mr. Baxter testified that before the time of the invention, he “had the technical capability to build . . . two-color models, e.g., single tubes containing both 5600K cool white and 3200K warm white LEDs (collectively “Bi-Color”).” Ex-2047, ¶25. On cross-examination, Mr. Baxter confirmed that, before the time of the invention, the bi-color LED tube was known:

“Q. You go on to say that: ‘Litepanels had the technical capability to build, No. 2, two colored models, e.g. single tubes containing both 5600 cool white and 3200 K warm white LEDs, collectively, bi-color.’”

A. Yes.

Q. In view of that statement --

A. Yes. We perfected bi-color, and we certainly had the ability to make the tube. . .” Ex-1042, 86:6-7.⁵

The prior art relied upon in the Petition discloses each of the limitations of the Challenged Claims of the '895 patent. Pet., 14-75. Patent Owner also acknowledges additional prior art LED tubes, including MacTech LED tubes, were available prior to the invention. POR, 50 (citing Ex-2066, ¶8).

⁵ Notably, Patent Owner does not argue, and therefore concedes, that the prior art relied upon in Grounds 1-2, such as Ducharme, teaches bi-color LED tubes.



Ex-2016, 1. As of 2011, the MacTech LED lighting tube provided the following features:

- “Consistent color temperatures at both daylight and tungsten and almost zero percent green at 93 CRI”
- “Utilizes specially developed 50K hour, high output LED chips”
- “30% to 70% less power than equivalent conventional lighting”
- “Low heat output”
- “The fixtures are assembled in Sun Valley from 100% recyclable aluminum”

Ex-1023, 4. It is undisputed that the MacTech LED tubes predate the '895 patent.

Ex-1045-Silva, 88:19-24; Ex-1046, 56:2-7; Ex-2041-Csernecky, ¶12; Ex-1025,

93:12-25. Even the alleged inventor, Mr. Macias, conceded that the MacTech

LED tubes were already known. Ex-1047 (“Q. Before you went to Paramount with

your brother were you aware of MacTech? A. Yes, I'd seen it. Q. Were you

aware of it beforehand? A. Yes.”). Mr. Fisher further testified that these MacTech LED tubes were operable in view of the thermal issues identified. Ex-1043, 113:18-21 (“Q. You would agree that the Mac Tech LED tube was operable in view of the thermal issues that you have identified? A. Okay. Again, I think I was very specific there. So the Mac Tech worked in the horizontal orientation.”).

When questioned during cross-examination as to which claim limitations were not taught by the prior art LED tubes, Patent Owner's declarants only rebuttal was that they were not bi-color LED tubes, i.e. a single tube providing both tungsten light and daylight. Ex-1043-Fisher, 115:14-16 (“So Mac Tech was monochromatic so their tube was either daylight or tungsten, they did not do bi-color.”); Ex-1045-Silva, 88:11-12 (“they were just only one Daylight or Tungsten”); Ex-2041-Csernecky, ¶12 (“It was not bicolor, even though bicolor had existed for years in a panel light.”); Ex-1025, 89:4-91:11 (confirming pre-existing bi-color functionality); Ex-1049-Holmes, ¶¶12-13.. Yet, as exhibited in the prior art relied upon in Grounds 1-2, including Kit, Ducharme, and Katzir, bi-color LED tubes were known. Pet. 24, 54 (citing Ex-1004 at 3:20–38, 22:9–35; Ex-1005 at 29:16–60, 5:7–33, Figs. 29, 5B; Ex-1006, ¶¶53-56). For example, as set forth in the Petition, “Ducharme discloses a plurality of LEDs (1155) mounted on a fluorescent tube-like support structure (1153) configured to emit cool white light and warm white light.” Pet., 54 (citing Ex-1005 at 29:16–60, 5:7–33 (“The

lighting fixture may produce white light within a range of color temperatures such as, but not limited to, the range 500K to 10,000K and the range 2300K to 4500K”). Indeed, as the ’895 patent admits, it is simply a matter of selecting the correct LEDs:

“To create the LED lamps, in each of the above examples, LEDs in the desired color ranges are selected which provide at least about 1000 lumens. The LEDs are tested to provide the desired light, e.g., with CRI of at least about 90 percent or more, flux of at least about 1000 lumens or more, and purity of color.” (Ex-1001, 11:39-44.)

See also Ex-1049-Holmes, ¶¶28-31. Mr. Macias confirmed this was the approach he took. Ex-1047, 238:24-242:9 (explaining he would keep asking for batches of LEDs until they met the standard commercial image recording specifications).)

B. Petitioner Sufficiently Established the Motivation to Combine and a Reasonable Expectation of Success

Patent Owner argues that claim 1 would not have been obvious because “POSITA would consider the claimed invention a very bad idea.” POR, 33. More particularly, Patent Owner argues that Mr. Macias “went the wrong way” and “the more he went the wrong way, the worse the idea seemed according to conventional wisdom.” POR, 33. Patent Owner identifies four reasons why Mr. Macias went the wrong way and each of them relate to thermal concerns. POR, 33-35 ((1) “Contrary to Thermal Management,” (2) “Contrary to Thermal Management

Needs,” (3) “contrary to thermal concerns,” (4) “Thermal design issues”). Yet, as confirmed by Patent Owner’s declarants (see below) and Mr. Holmes, these thermal concerns were well known by a POSITA. Ex-1049-Holmes, ¶¶33-40. Mr. Holmes testifies that “heat generation would have been nothing more than a trivial concern or a routine design consideration to a POSITA at the time of the ’895 patent.” *Id.*, ¶33. Furthermore, these alleged “thermal concerns” are not required by the Challenged Claims and they are not addressed in the specification of the ’895 patent.

Patent Owner also argues that the “four thorny trade-offs” identified above “would result in a POSITA lacking a reasonable expectation of success.” POR, 36. Yet, contrary to Patent Owner’s argument, Dr. Allen testified that a POSITA would have had a high confidence of achieving success:

“Q. So aside from an aluminum housing, is there anything else in the '582 patent that teaches a POSITA how to overcome all the thermal management issues described in your declaration? . . .

A. Most significantly the results of especially example two in my opinion and the statement of 40,000 hour life and the guidance of an aluminum housing give a POSITA high confidence that without undue experimentation these results can be reproduced.”

Ex-1039, 89:10-21. Dr. Allen further testified that by “selecting high performance LEDs” and “providing an aluminum housing,” a “POSITA would have a high confidence that I could reproduce that result.” Ex-1039, 90:19-22. Accordingly, Dr. Allen contends that a POSITA aware of the use of aluminum housing to address thermal issues and the use high performance LEDs would have a high confidence in successfully creating the claimed LED light system. *Id.* The Petition establishes that Ducharme teaches aluminum housing. Pet., 65 (citing Ex-1005, 11:54-12:2 (“enclosure plate (378) are preferably made from a material that conducts heat, such as aluminum.”)). Furthermore, the selection of high performance LEDs is not recited in the Challenged Claims. Mr. Macias confirmed on cross examination that he simply ordered the LEDs from a manufacturer:

“Q. What process did you use to get LEDs that met specifications sufficient to produce sufficient light?

A. We would test them . . . one by one . . .

Q. So did you get LEDs by ordering them from the manufacturer?

A. Yes.”

Ex-1047, 321:7-16. Accordingly, as confirmed by Patent Owner's declarants, a POSITA would have been motivated to combine the prior art as proposed in Grounds 1-2 and would have had reasonable expectation of success in doing so. Pet., 14-20, 47-51.

V. Patent Owner's Secondary Considerations Arguments are Insufficient and Unpersuasive

Secondary indicia arguments require a nexus between the evidence and the claimed invention. *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995). The evidence “must be tied to the novel elements of the claim at issue” and “reasonably commensurate with the scope of the claims.” *Institut Pasteur & Universite Pierre Et Marie Curie v. Focarino*, 738 F.3d 1337, 1347 (Fed. Cir. 2013). “The Patent Owner bears the burden of showing that a nexus exists.” *WMS Gaming Inc. v. Int’l Game Tech.*, 184 F.3d 1339, 1359 (Fed. Cir. 1999). Here, Patent Owner failed to discharge that burden.

A. Nexus Cannot Be Presumed as Patent Owner's Cited Products are Not Coextensive with the Claims

To be accorded substantial weight, there must be a nexus between the merits of the claimed invention and the evidence of secondary considerations. *In re GPAC Inc.*, 57 F.3d at 1580. The burden of showing that there is a nexus lies with the Patent Owner. *Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1392 (Fed. Cir. 1988); *In re Paulsen*, 30 F.3d 1475, 1482 (Fed. Cir. 1994).

“[P]resuming nexus is appropriate ‘when the Patent Owner shows that the asserted objective evidence is tied to a specific product and that product ‘embodies the claimed features, and is coextensive with them.’” *Fox Factory*, 944 F.3d at 1373.

“‘[W]hen the thing that is commercially successful is not coextensive with the

patented invention . . . the Patent Owner is not entitled to a presumption of nexus.”

Id. Here, Patent Owner failed to sufficiently establish that the “product is essentially the claimed invention.” *Fox Factory* at 1374.

In *Fox Factory, Inc.*, the Federal Circuit held that the Board erroneously presumed a nexus when “there are one or more features not claimed by the [] patent that materially impact the functionality of the [commercial] products.” *Id.* at 1376. Similarly here, the products identified by Colt include many unclaimed features; thus, nexus cannot be presumed. For example, Patent Owner advertises its Colt Bi-Color LED tube as having: (1) “no pulse width modulation,” (2) “power run[ing] through a semi-conductor controlled rectifier (SCR),” (3) “constant voltage,” and (4) “Dimmable to 1%.” Ex-1061, 1. None of these four features are covered by the Challenged Claims. Wamco summarizes the “**Colt LED Tube Benefits**” as follows: “Dimmable to 1% Flicker Free, Constant Voltage | No Pulse Width Modulation . . . No Complicated Electrical | Grounding on Board.” Ex-1062, 1. Mr. Holmes testifies that the unclaimed features of (1) “no pulse width modulation,” (2) “power run[ing] through a semi-conductor controlled rectifier (SCR),” (3) “constant voltage,” and (4) “Dimmable to 1%” would be seen by a POSITA as features materially impacting the functionality of the Colt Bi-Color LED tube because, as the Wamco webpage describes, these are the “**Benefits**” of the Colt LED Tube. Ex-1049-Holmes, ¶¶60-62. In view of Colt’s marketing, it is

clear that the unclaimed features listed in Colt's marketing materially impact the functionality of Colt's Bi-Color LED tube and "no reasonable fact finder could conclude that these features are insignificant." *Fox Factory* 944 F.3d 1366, at 1375. Accordingly, a nexus cannot be presumed.

B. Patent Owner Failed to Establish That Sales Were a Direct Result of The Unique Characteristics of the Claimed Invention

To show how commercial success supports nonobviousness, Patent Owner must prove that sales were a direct result of the unique characteristics of the invention, and not a result of economic and commercial factors unrelated to the quality of the patented subject matter. *Seagate Tech. (US) Holdings, Inc. v. Enova Technology Corp.*, IPR2014-01178, Paper 49 (PTAB Dec. 18, 2015). "[I]f the commercial success is due to an unclaimed feature of the device," or "if the feature that creates the commercial success was known in the prior art, the success is not pertinent." *Ormco*, 463 F.3d at 1312. Commercial success must be due to the merits of the claimed invention beyond what was readily available in the prior art. *Hamilton Beach Brands, Inc. v. Courtesy Prods., LLC*, IPR2014-01257, Paper 49 (PTAB Feb. 24, 2016).

Patent Owner also fails to establish that its alleged evidence of secondary considerations is the result of the "unique characteristics" of the claimed invention, nor can it. Indeed, while Patent Owner's declarant, Dr. Allen, complains the prior

art would not be combined due to improper thermal and lumen penalties, Dr. Allen also cannot point to anything other than an aluminum housing as facilitating the alleged invention. Of course, aluminum housings were well-known in the LED lighting space (Ex-1049-Holmes, ¶¶34-35), so there cannot be any nexus based on the use of an aluminum housing.

Patent Owner alleges that the bi-color tubes, including Colt's bi-color LED tube and Quasar's S-Swtich, "have a large/substantial market share." POR, 59. However, Patent Owner fails to provide any objective evidence to support this statement. *Id.* Patent Owner only offers Todd Csernecky's testimony that "[m]ore than half of all productions that I have worked on or seen over the past seven to eight years or so have used Colt's Bicolor T12 Tubes." POR, 59 (citing Ex-2041, ¶18). Colt failed to offer any evidence as to the size of the total market or Colts percentage of market share. "[E]vidence related solely to the number of units sold provides a very weak showing of commercial success, if any." *In re Huang*, 100 F.3d 135, 140 (Fed. Cir. 1996). Thus, Patent Owner's allegations of commercial success are not persuasive.

C. Patent Owner's Allegations of Copying Are Unsupported by Objective Evidence

Patent Owner argues that Petitioner's predecessor company obtained some of Colt's Bi-Color LED tubes from Paramount and asked Mr. Zhang from the

manufacturer Laysion to copy them. POR, 51-52. Specifically, Patent Owner offers the testimony of Mr. Zhang in the form of a Declaration allegedly signed in August 2018 in which Mr. Zhang alleges that he “met a man I know as Ray Gonzalez” and “Mr. Gonzalez asked me if I could duplicate tube”. Ex-2039 (“Zhang Declaration”), ¶¶2, 4. Mr. Zhang’s testimony is entirely unreliable as it is directly contradicted by sworn testimony two months later by Mr. Zhang, which was submitted by Patent Owner, that he has never met Mr. Ray Gonzales. Ex-2079, 32:22-33:1. More particularly, two months after signing the Zhang Declaration, Mr. Zhang was in the United States and was subject to sworn testimony in a deposition involving these same parties, and Mr. Zhang testified that he has never even communicated with Ray Gonzales, much less met him. Ex-2079, 32:22-33:1 (“Q. Have you ever communicated with a gentleman by the name of Ray Gonzalez? A. No.”).⁶ Ray Gonzales also confirmed that he has never

⁶ Mr. Macias could not explain the falsehoods in the Zhang Declaration. (Ex-1047, 278:1-282:8). The Zhang Deposition is also impermissible hearsay under the Federal Rules of Evidence and Mr. Zhang’s testimony cannot be used against Petitioner given the different subject matter at issue in this proceeding and the current posture between the parties.

communicated with Mr. Zhang and never asked him or anyone else to duplicate a Colt Bi-Color tube. Ex-1059, ¶3.

Petitioner sought to cross-examine Mr. Zhang in these proceedings and Patent Owner failed to make Mr. Zhang available for cross-examination. This is apparently because Mr. Zhang and Mr. Macias are embroiled in a legal dispute in California over Mr. Macias' alleged failure to pay Mr. Zhang for product provided by Mr. Zhang to Mr. Macias. *See* Ex-1038, *Laysion, LLC v. Macias*, No. B319551, California Court of Appeals, Second District, Third Division, Jul 28, 2023 at 1 (“Laysion sued defendants [Colt LED] for breach of contract, fraud, and other claims stemming from defendants’ alleged agreement to purchase stage lighting equipment from Laysion.”). In that proceeding, Mr. Zhang submitted a Declaration stating that Mr. Macias special ordered lighting equipment, and verbally promised to pay cash in full against invoice upon delivery.⁷ *Id.* at 2. Mr. Macias disagreed and specifically argued that **“Zhang’s Declaration was false.”** *Id.* at 3. While it is unclear who is telling the truth between Mr. Zhang and Mr.

⁷ It appears to be more than a coincidence that the Zhang Declaration from August 2018 coincided with an alleged \$1 million order from Mr. Macias. (Ex-1038 at 2 (“According to Zhang, in ‘late 2018 [to] early 2019,’ Macias special ordered 500 units of lighting equipment, at a price of \$2,000 per unit....”).)

Macias, if anyone, what is clear is that the Board cannot reasonably rely on any evidence from Mr. Zhang in this proceeding, whether that be in the form of Mr. Zhang's August 2018 Declaration (Ex-2036) or his deposition testimony of October 2018 (Ex-2079).

Patent Owner attempted to support the testimony from Mr. Zhang with testimony from Fernando Silva, sales manager for the Set Lighting Department at Paramount Pictures, that he loaned Mr. Gonzalez some of Colt's Bi-Color LED tubes "but he never returned the tubes." POR, 52 (citing Ex-2066, ¶17). On cross-examination, Mr. Silva conceded, however, that he distributed around 60 samples of the Colt Bi-Color LED tube to potential customers, only two of which went to Mr. Gonzalez, and most of which were not returned. Ex-1045, 58:14-59:10, 85:9-. Accordingly, Patent Owner fails to offer any credible evidence of copying.

D. Patent Owner Fails to Establish a Long-Felt Need

Patent Owner alleges that it solved a long-felt need with the Colt Bi-Color LED tube. POR, 48. However, Patent Owner did not provide evidence that demonstrates both that a demand existed for the claimed invention, and that others tried but failed to satisfy that demand. *Amazon.com, Inc. v. Personalized Media Communications, LLC*, IPR2014-01531, Paper 55 (PTAB Apr. 1, 2016).

For example, Patent Owner alleges that the prior art "had only one color temperatures LEDs." POR, 47. Yet, Patent Owner and Mr. Baxter concede that

bi-color LED lights, such as the Litepanel bi-color LED light, were available for commercial image recording prior to the invention. POR, 48; Ex-1042, 38:11-14.

Patent Owner argues that “Colt’s Bicolor LED Tubes Were an Instant Success.”

POR, 67. Yet, Mr. Baxter testified on cross-examination that Colt’s LED Bi-Color tubes “**are not really used that much in the industry.**” Ex-1042, 98:9-92:2.

Accordingly, Patent Owner fails to sufficiently establish that there was a long-felt need for its claimed invention.

For the above reasons, Patent Owner has failed to establish any nexus. Even if Patent Owner had, it would still be insufficient to overcome the strong showing of obviousness presented in the Petition. *Tokai Corp. v. Easton Enters., Inc.*, 632 F.3d 1358, 1370 (Fed. Cir. 2011).

VI. Patent Owner’s Arguments Regarding Dependent Claims and Alleged Input Wattages are Unpersuasive

As to dependent claims 10-13, 16, and 22, 28-29, Patent Owner argues that additional limitations in the dependent claims regarding input wattage would result in more drive current and create “more thermal droop and more current droop,” and a POSTIA “would not go in this direction.” POR, 60. Yet, as discussed, these thermal concerns were well known to a POSITA. Ex-1049-Holmes, ¶¶33-40.

Furthermore, the Challenged Claims fail to recite any thermal dissipation features and they are not addressed in the specification of the ’895 patent.

Patent Owner also argues that the “alleged input wattages are conclusory.” POR, 61. For example, Patent Owner argues that “Kit appears to be guessing that it ‘should consume about 28 watts.’” *Id.* However, the cited statement from Kit is merely relying upon statements from LED manufacturer Cree. Ex-1004, 6:25-27 (“The new basic 4-foot LED retrofit lamp model should consume about 28-watts (20x1 .4) based on the published data from Cree Lighting.”). Patent Owner’s arguments that the disclosures in the references are unreliable are unsupported and fail to identify any basis to discredit the express disclosures of the prior art.

Dated: May 17, 2024

By: /Trenton A. Ward/
Trenton A. Ward, Lead Counsel
Reg No. 59,157
Counsel for Petitioner

CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), the undersigned hereby certifies that the foregoing PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE contains 5,476 words, excluding the parts exempted under 37 C.F.R. § 42.24(c), as measured by the word-processing system used to prepare this paper.

Dated: May 17, 2024

By: /Trenton A. Ward/
Trenton A. Ward, Lead Counsel
Reg No. 59,157
Counsel for Petitioner

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE was served electronically on May 17, 2024, on counsel of record for the Patent Owner as follows:

- David Hoffman: dhoffman@nolandheimann.com
- Robert Katz: rkatz@katzfirm.com

Dated: May 17, 2024

By: /s/ Trenton Ward