

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

EVERSTAR MERCHANDISE CO., LTD.,
Petitioner,

v.

WILLIS ELECTRIC CO., LTD.,
Patent Owner.

PGR2019-00056
Patent 10,222,037 B2

Before DEBRA K. STEPHENS, STACEY G. WHITE, and
JEFFREY W. ABRAHAM, *Administrative Patent Judges*.

ABRAHAM, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining No Challenged Claims Unpatentable
35 U.S.C. § 328(a)

Dismissing Patent Owner's Motion to Exclude
37 C.F.R. § 42.64(c)

Granting Joint Motion to Seal
37 C.F.R. § 42.54

I. INTRODUCTION

A. Background and Summary

Everstar Merchandise Co., Ltd. (“Petitioner”) filed a petition for post-grant review (Paper 1, “Pet.”) of claims 1–33 (the “challenged claims”) of U.S. Patent 10,222,037 B2 (Ex. 1001, “the ’037 patent”). Willis Electric Co., Ltd. (“Patent Owner”) timely filed a Preliminary Response (Paper 6, “Prelim. Resp.”). Pursuant to 35 U.S.C. § 324, the Board instituted trial on February 20, 2020, after determining, based on the information presented in the papers and evidence before us at that time, it was more likely than not that at least one challenged claim was unpatentable over the cited art. Paper 7 (“Institution Decision” or “Inst. Dec.”).

After institution, Patent Owner filed a Response to the Petition (Paper 15, “PO Resp.”), Petitioner filed a Reply to Patent Owner’s Response (Paper 21, “Reply”), and Patent Owner filed a Sur-reply (Paper 25, “Sur-reply”).

Patent Owner also filed a Motion to Exclude (Paper 31, “Mot.”), Petitioner filed an Opposition to Patent Owner’s Motion to Exclude (Paper 32, “Mot. Opp.”), and Patent Owner filed a Reply in Support of its Motion to Exclude (Paper 36, “Mot. Reply”).

The parties also filed a Joint Motion to Seal Exhibit 1026. Paper 37.

On December 16, 2020, the parties presented arguments at an oral hearing for this proceeding and for IPR2019-01485. The transcripts of the hearings have been entered into the record. Paper 38 (“PGR Tr.”); Paper 39 (“IPR Tr.”).

We have jurisdiction under 35 U.S.C. § 6. We issue this Final Written Decision pursuant to 35 U.S.C. § 328(a) and 37 C.F.R. § 42.73. Based on the record before us, we conclude that Petitioner has not shown, by a

preponderance of the evidence, that claims 1–33 of the '037 patent are unpatentable.

B. Related Matters

Petitioner states that there are no other judicial or administrative matters that would affect, or be affected by, a decision in this proceeding. Pet. 1.

Patent Owner indicates that U.S. Patents 9,140,438 B2, 9,157,588 B2, 9,243,788 B2, and 9,671,097 B2 are related to the '037 patent. PO Resp. 4; Paper 4, 1. In particular, those patents and the '037 patent claim priority to U.S. Provisional Patent Application 61/877,854. PO Resp. 4; Paper 4, 1. Patent Owner also indicates that U.S. Patent 9,157,588 B2 is the subject of IPR2019-01485 (institution granted on Feb. 20, 2020) and U.S. Patent 9,671,097 B2 is the subject of IPR2019-01484 (institution denied on Feb. 20, 2020). Paper 4, 2; IPR2019-01484, Paper 7; IPR2019-01485, Paper 7.

C. The '037 Patent (Ex. 1001)

The '037 patent, titled “Decorative Lighting With Reinforced Wiring,” issued March 5, 2019. Ex. 1001, codes (45), (54). The '037 patent states that decorative lighting, such as seasonal holiday lighting, “often comprises one or more strings of lights constructed of multiple wires, lamp assemblies and an electrical connector or power plug.” Ex. 1001, 1:34–36. According to the '037 patent, a typical light string may be constructed of wire that includes copper strands twisted together and covered with an insulating polymer. Ex. 1001, 1:40–44. The '037 patent explains that a decorative light string needs to be able to “withstand physical abuse with limited risk of breakage,” because breakage of the wiring “could result in

“reinforcing strands 102 and conductor strands 104 may be arranged in a variety of manners, and in a variety of quantities, dependent upon a number of factors, including desired wire properties, including, but not limited to, tensile strength, resistivity and conductivity.” Ex. 1001, 6:36–41.

The '037 patent discloses the use of reinforced wiring in “net light” configurations, wherein a patterned array of lamp elements and reinforced wire form a two dimensional lighting structure. Ex, 1001, 36:29–33. The '037 patent states that “[k]nown net lights typically require some kind of reinforcing strands wrapped about the various wiring segments . . . to provide additional strength,” but the use of its reinforced wire reduces or eliminates the need for such reinforcing strands to be wrapped around the net wires. Ex. 1001, 36:33–43.

One embodiment of the reinforced-wire net light of the '037 patent is depicted in Figure 38, reproduced below.

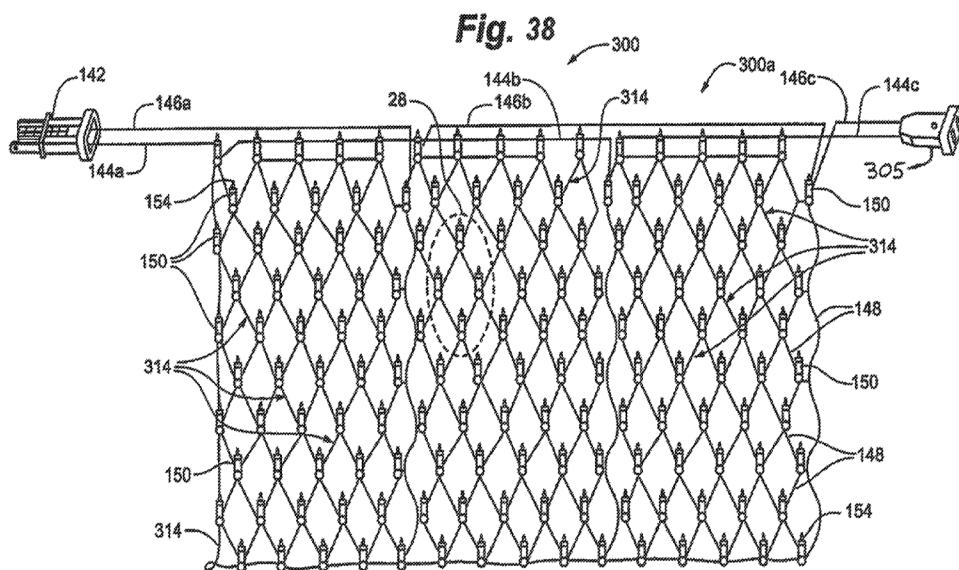


Figure 38 is a front view of a reinforced-wire net light, having power plug 142, power-terminal wires 144 and 146, lamp assemblies 150, lamp elements 154, power-connecting reinforced wires 148, and pattern-support cords 314. Ex. 1001, 5:36–37, 36:51–37:29. In Figure 38, lamp assemblies 150 are arranged in a matrix pattern with the lamp assemblies aligned horizontally and vertically to form a two-dimensional rectangular shape, and every other lamp assembly staggered to create a diamond pattern. Ex. 1001, 37:12–20.

D. Illustrative Claims

Of the challenged claims, claims 1, 21, and 33 are independent claims. Claims 2–20 depend directly or indirectly from claim 1 and claims 22–32 depend directly or indirectly from claim 21. Claim 1 is illustrative, and reproduced below.

1. A strength-enhanced, net-like decorative lighting structure, comprising:

- a power plug configured to connect to an external source of power;
- a first power wire and a second power wire, each of the first and second power wires connected to the power plug; and
- a plurality of light sets in electrical connection with the power plug via the first power wire and the second power wire, each light set defining an electrical circuit, the plurality of light sets including a first light set defining a first electrical circuit and a second light set defining a second electrical circuit, each of the plurality of light sets including:
 - a plurality of lamp assemblies, each lamp assembly including a lamp element; and
 - a plurality of internally-reinforced intermediate wires electrically connecting the lamp assemblies, each of the plurality of internally-reinforced intermediate wires

including a plurality of conductors, one or more reinforcing strands, and an outer insulating layer surrounding the plurality of conductors and the one or more reinforcing strands; and

one or more non-wire support cords mechanically connected to the first light set,

wherein the plurality of light sets in combination with the one or more non-wire support cords define a rectangular-shaped, net-like decorative lighting structure.

Ex. 1001, 42:47–43:7.

E. Reviewed Challenges to Patentability

Claim(s) Challenged	35 U.S.C. §	References
1–16, 33	103	Kumada, ¹ Debladis '120, ² Liu, ³ Lawrence ⁴
17–20	103	Kumada, Debladis '120, Debladis '614, ⁵ Huang ⁶
21–29	103	Kumada, Debladis '120, Lin, ⁷ Liu, Lawrence
30–32	103	Kumada, Debladis '120, Lin, Debladis '614, Huang
1, 12, 21	103	Lin, Debladis '120
33	103	Lin, Debladis '120, Liu, Kumada
1, 4, 5, 10–14, 16, 21, 22, 25, 27	103	Sylvania, ⁸ Debladis '120, 2002 UL 588 Standards ⁹ (optionally)

Pet. 5.

Petitioner submits declarations from Stephen D. Fantone, Ph.D., (Ex. 1010 (“Dr. Fantone’s First Declaration”), Ex. 1020 (“Dr. Fantone’s Supplemental Declaration”)), Bruce R. Proper (Ex. 1021), and Wai Lung (“Patrick”) Wong (Exs. 1022, 1032). Patent Owner submits declarations from Stuart Brown (Exs. 2001, 2011, 2041) and Michael Sugar (Ex. 2045).

¹ US 6,367,951 B1, issued Apr. 9, 2002 (Ex. 1003).

² US 8,692,120 B2, issued Apr. 8, 2014 (Ex. 1007).

³ CN 2644876 Y, published Sept. 29, 2004 (Ex. 1006).

⁴ US 5,601,361, issued Feb. 11, 1997 (Ex. 1005).

⁵ US 2010/0089614 A1, published Apr. 15, 2010 (Ex. 1009).

⁶ US 2013/0062095 A1, published Mar. 14, 2013 (Ex. 1008).

⁷ CA 2,238,113 A1, published Nov. 20, 1999 (Ex. 1004).

⁸ Sylvania LED Micro Net-Style Lights, 2008 (sale/purchase) (Ex. 1013).

⁹ Underwriters Laboratories Inc., UL Standard for Safety for Seasonal and Holiday Decorative Products, UL 588 (2000) (Ex. 1011).

II. ANALYSIS

A. *Level of Ordinary Skill in the Art*

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

Petitioner asserts that “a person of ordinary skill in the art (‘POSITA’) would have had at least a Bachelor of Science degree (or equivalent) in Electrical Engineering, or a comparable field, and five (5) or more years of experience in the fields of designing electrical wiring or decorative lighting.” Pet. 8 (citing Ex. 1010 ¶ 19).

In its Preliminary Response, Patent Owner disagreed with Petitioner’s definition, asserting “the subject matter of the ’037 Patent does not require the level of experience for a POSITA that Petitioner proposes.” Prelim. Resp. 22. Instead, Patent Owner submitted

a POSITA during the relevant timeframe would have been (1) a technician with at least two years of experience in the design of electrical wiring and/or decorative lighting, or (2) a person with at least a bachelor’s degree in mechanical engineering, electrical engineering, or an equivalent field, and a basic familiarity with circuits used in decorative lighting.

Prelim. Resp. 22 (citing Ex. 2001 ¶¶ 14–15).

In the Institution Decision, we adopted Patent Owner’s proposed definition, noting that “[b]ased on our review of the ’037 patent and the prior art of record, we determine that the definition offered by Patent Owner comports with the qualifications a person would have needed to understand

and implement the teachings of the '037 patent and the prior art.” Inst. Dec. 9–11.

In its Patent Owner Response, Patent Owner offered a modified definition, contending that a person of ordinary skill in the art “would have (1) at least two years of experience in the design of decorative lighting, or (2) at least a bachelor’s degree in mechanical engineering, electrical engineering, or an equivalent field, and a basic familiarity with circuits used in decorative lighting.” PO Resp. 18. In this modified definition, Patent Owner removes the requirement that a person of ordinary skill in the art is “a technician” and removes the reference to “electrical wiring” from the first part of its originally-proposed definition. PO Resp. 18; *see* Reply 4. According to Patent Owner, “experience only in electrical wiring [would not] provide a familiarity with the particularities of decorative lighting.” PO Resp. 18. Patent Owner also contends that the subject matter of the '037 patent does not require five years of decorative lighting experience (per Petitioner’s definition) to understand. PO Resp. 18.

Petitioner argues Patent Owner is attempting to lower the level of skill in the art to include one of its declarants, Mr. Sugar, as a person of ordinary skill in the art. Reply 5. Our determination of the appropriate level of skill in the art, however, does not depend on whether Mr. Sugar qualifies as a person of ordinary skill in the art under a particular definition. To testify as an expert under Federal Rule of Evidence 702, a person need not be a person of ordinary skill in the art, but rather must be “qualified in the pertinent art.” *Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356, 1363–64 (Fed. Cir. 2008); *see SEB S.A. v. Montgomery Ward & Co.*, 594 F.3d 1360, 1372–73 (Fed. Cir. 2010) (upholding a district court’s ruling to allow an expert to

provide testimony at trial because the expert “had sufficient relevant technical expertise” and the expert’s “knowledge, skill, experience, training [and] education . . . [wa]s likely to assist the trier of fact to understand the evidence”); *Mytee Prods., Inc. v. Harris Research, Inc.*, 439 F. App’x 882, 886–87 (Fed. Cir. 2011) (non-precedential) (upholding admission of the testimony of an expert who “had experience relevant to the field of the invention,” despite admission that he was not a person of ordinary skill in the art).

Petitioner also argues that Patent Owner eliminated the reference to electrical wiring in its modified definition because it “suddenly realized it could not have a [person of ordinary skill in the art] who had knowledge and experience in electrical wiring outside of the decorative lighting space, as that contradicted the non-analogous art positions it is taking.” Reply 5. Dr. Brown, however, testified (1) that he did not consider the change removing the express reference to electrical wiring to be significant, (2) that “if you’re designing decorative lighting, you have to be designing electrical wiring,” and (3) that he considers the term “decorative lighting” in his description of a person of ordinary skill in the art to incorporate electrical wiring. Ex. 1016, 25:16–26:2, 28:5–8; *see* Ex. 2041 (“Dr. Brown’s Third Declaration”) ¶ 14. In view of this, we do not consider the definition Patent Owner proposes in its Response to be substantively different from the definition it proposed in its Preliminary Response, which we adopted in the Institution Decision.

We note that there is at least some overlap in the parties’ proposed definitions of a person of ordinary skill in the art, namely that a person of ordinary skill in the art would have at least a bachelor’s degree in electrical

engineering or an equivalent field. Although Petitioner adds a requirement of five or more years of experience, we agree with Patent Owner that five years of decorative lighting experience *in addition to* a degree in electrical engineering or an equivalent subject would not be required to understand the subject matter of the '037 patent. PO Resp. 18.

Thus, after considering the '037 patent, the asserted prior art, and the parties' arguments, we adopt Patent Owner's proposed definition and determine that a person of ordinary skill in the art "would have (1) at least two years of experience in the design of decorative lighting, or (2) at least a bachelor's degree in mechanical engineering, electrical engineering, or an equivalent field, and a basic familiarity with circuits used in decorative lighting." PO Resp. 18. For the reasons discussed above, we understand "decorative lighting" to include "electrical wiring." Ex. 1016, 25:16–26:2, 28:5–8. Furthermore, despite the fact that Patent Owner offers two "prongs" in its definition, we understand that these prongs ultimately define the same level of skill in the art. Ex. 1016, 29:16–30:8 (Dr. Brown testifying that someone with experience can have "a level of familiarity with a product and its design which is equivalent" to someone with a formal education and college degree), 30:20–31:6 (Dr. Brown generally agreeing that a person of ordinary skill in the art could have less education but more specialized experience, or more education and more generalized experience). Further, Dr. Fantone states that his opinions would not change if we adopt Patent Owner's definition of the level of ordinary skill in the art. Ex. 1020, ¶ 13; *see also* PGR Tr. 9:24–10:1 (counsel for Petitioner stating that "as long as the level of skill is not being used as a bludgeon to try to eliminate the Debladis and Huang's internally reinforced wires as analogous art," then

adopting Patent Owner’s level of skill in the art “wouldn’t have any impact”).

B. Claim Construction

We construe claim terms according to the standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–17 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.200(b). Under *Phillips*, claim terms are afforded “their ordinary and customary meaning.” *Phillips*, 415 F.3d at 1312. “[T]he ordinary and customary meaning of a claim term 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.” *Id.* at 1313. “Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Id.*

The parties agree that we do not need to construe any claim terms. Pet. 8–9; PO Resp. 16–17. We likewise agree. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.”)).

C. Asserted Obviousness over Kumada, Debladis ’120, and Liu or Lawrence

Petitioner contends claims 1–16 and 33 would have been unpatentable as obvious in view of the combined teachings of Kumada, Debladis ’120, and Liu or Lawrence. Pet. 19–55.

1. Overview of References

a) Kumada (Ex. 1003)

Kumada discloses “[a]n economical method of making a net or mesh light,” wherein the net light includes a plurality of series-connected light strings, each light string including a plurality of lamp sockets and a plurality of intermediate lengths of wire connecting the lamp sockets, and at least one non-electrical rope physically fastened to the lamp sockets, thereby forming a net or mesh. Ex. 1003, code (57). One embodiment of Kumada’s net light is depicted in Figure 6B, reproduced below.

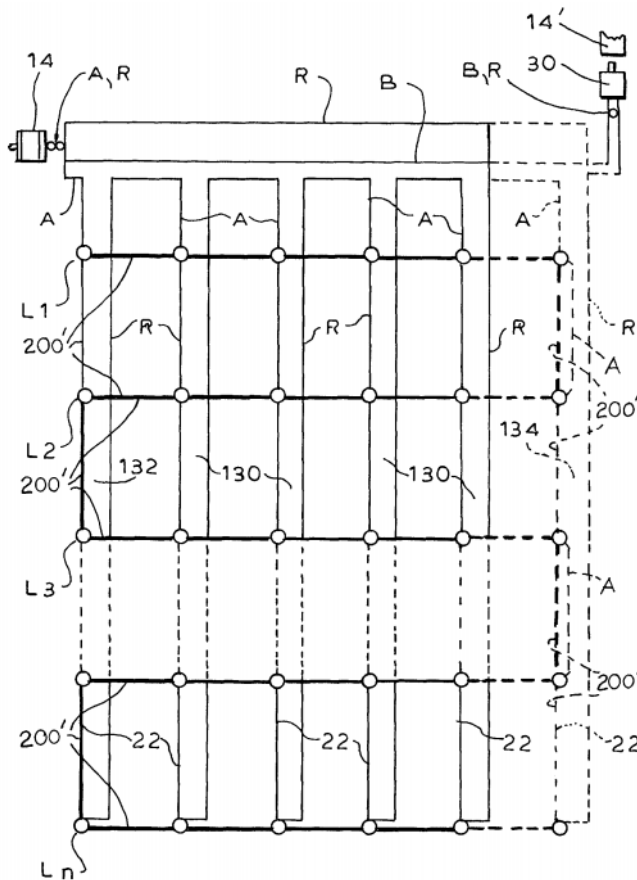


Figure 6B is a circuit diagram and physical layout of a net light having light strings 130, wires 22 connecting the individual lamps sockets (L1, L2,

L3, . . . Ln) in the light strings, and rope 200' which joins all of the lamp sockets of all light strings 130. Ex. 1003, 6:23–25, 6:53–64, 11:7–12.

b) Debladis '120 (Ex. 1007)

Debladis '120 discloses “electrical control cables, or power cables, used for delivering electricity.” Ex. 1007, 1:11–12. Debladis '120 explains that such cables are used in various fields, and need to be “as lightweight as possible, and to be compact, while retaining good mechanical strength.” Ex. 1007, 1:16–22. Debladis '120 depicts one embodiment of its cable in Figure 3, which is reproduced below.

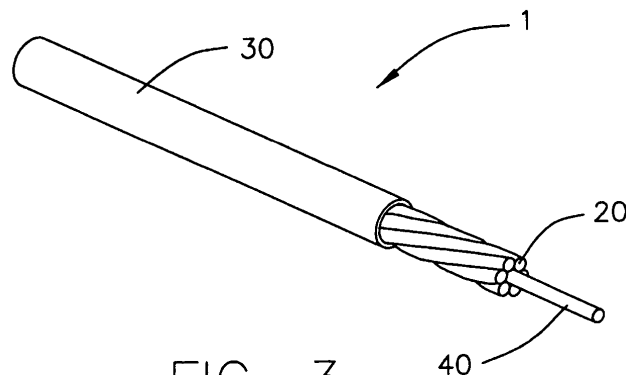


Figure 3 of Debladis '120 shows the structure of a cable, wherein strands 20, made of conductive material such as copper, extend in the longitudinal direction of, and surround, central core 40 made of a multifilament polymer. Ex. 1007, 3:15–26. The cable also contains outer sheath 30 made of insulating material. Ex. 1007, 3:18.

2. Analysis

a) Claim 1

Petitioner contends that Kumada and Debladis '120 teach or suggest all of the limitations in claim 1. Pet. 19–33. Relying on Figures 4A and 6B of Kumada, Petitioner argues that Kumada discloses a power plug configured to connect to an external power source (plug 14), first and second power wires connected to the plug (active wire A and return wire B), a plurality of light sets defining an electrical circuit (32D) and including a plurality of lamp assemblies and lamp elements (L1 . . . Ln), and non-wire support cords connected to the first light set (rope 200'), wherein the plurality of light sets and non-wire support cords define a rectangular-shaped, net-like decorative lighting structure. Pet. 19–33 (citing Ex. 1003, Figs. 4A and 6B, 1:20–23, 2:57–59, 3:44–46, 6:61–64, 7:39–43, 7:46–47, 7:55–58, 8:6–12, 10:13, 10:24–35, 10:48–50, 11:9–11, 11:41–44). Petitioner also directs us to portions of Debladis '120 purportedly disclosing internally-reinforced intermediate wires including a plurality of conductors (strands 20 in Figure 3), one or more reinforcing strands (strand 40 in Figure 3), and an outer insulating layer (outer sheath 30 in Figure 3), as recited in claim 1. Pet. 26–29 (citing Ex. 1007, Fig. 3, 3:15–18, 3:46–51).

Patent Owner does not dispute that the combined teachings of Kumada and Debladis '120 disclose each limitation of claim 1. Patent Owner, however, does dispute Petitioner's proposed reasons for combining Kumada and Debladis '120, and argues that Debladis '120 is not analogous art. PO Resp. 36–61.

1. Whether Debladis '120 is analogous art

“A reference qualifies as prior art for an obviousness determination under § 103 only when it is analogous to the claimed invention.” *In re Klein*, 647 F.3d 1343, 1348 (Fed. Cir. 2011). “Two separate tests define the scope of analogous prior art: (1) whether the art is from the same field of endeavor, regardless of the problem addressed and, (2) if the reference is not within the field of the inventor’s endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved.” *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004).

Petitioner contends that Kumada and Debladis '120 are analogous art to the '037 patent, arguing that the references are in the same field of endeavor because they all disclose a conductive wire that connects various resistive elements used in products that require electricity. Pet. 29–30. Petitioner also argues that Kumada, Debladis '120, and the '037 patent have overlapping U.S. and International patent classifications—H01B, relating to “CABLES; CONDUCTORS; INSULATORS.” Reply 7. Petitioner also directs us to the file history of the '037 patent, noting that Patent Owner cited at least one prior art reference in an IDS “relating to electrical wiring outside of decorative lighting,” and that Patent Owner did not raise a non-analogous art argument when the examiner applied a non-decorative lighting reference in an office action rejecting the claims. Reply 7.

Patent Owner contends that Debladis '120 is from a different field of endeavor as compared to Kumada and the '037 patent. According to Patent Owner, Kumada and the '037 patent are both directed to the field of decorative lighting, and more specifically, net lights. PO Resp. 59. On the other hand, Patent Owner argues that Debladis '120 is directed to an entirely

different field of endeavor because it discloses a “lightweight, reduced-copper control cable,” and the only explicit use of the cable is in the automotive industry. PO Resp. 59. Patent Owner argues Debladis ’120 “do[es] not relate to decorative lighting, mention lights, or even mention connecting *a series of* resistive elements.” Sur-reply 6. Patent Owner further argues that Petitioner’s proposed field of endeavor is “unclear and devoid of lighting.” Sur-reply 7.

With regard to Petitioner’s arguments about the citation of references during prosecution of the application leading to the ’037 patent, Patent Owner notes that Petitioner cites no authority in support of its arguments, asserts that there is no requirement that a patent applicant make every argument during prosecution, and argues that citation in an information disclosure statement is not an admission of relevance of the cited reference. Sur-reply 8–9 (citing MPEP § 2266.01 and 37 C.F.R. §1.97(h)).

We are persuaded by Petitioner’s argument that the references are in the same field of endeavor. The Federal Circuit in *Bigio* held that the field of endeavor test for analogous art “requires the PTO to determine the appropriate field of endeavor by reference to explanations of the invention’s subject matter in the patent application, including the embodiments, function, and structure of the claimed invention.” *Bigio*, 381 F.3d at 1325. Despite quoting this portion of *Bigio* in its Sur-reply, Patent Owner focuses only on the end-use of the subject matter described in the ’037 patent, namely decorative lighting, in defining the field of endeavor. Sur-reply 6. The “explanations of the invention’s subject matter” in the ’037 patent, however, extend beyond decorative lighting. *Bigio*, 381 F.3d at 1325.

For example, the title, Abstract, and Field of Invention in the '037 patent each refer to wiring. Ex. 1001, codes (54) and (57), 1:20–27. The '037 patent states that “[w]ires used in decorative lighting typically include an electrical conductor surrounded by an insulating material. The electrical conductor usually comprises multiple, individual strands of copper conductors.” Ex. 1001, 1:37–40. Additionally, the '037 patent contains several figures depicting the structure of its wires, and describes several embodiments of its reinforced wires. *E.g.*, Ex. 1001, Figs. 3–6 and 9–13, 2:34–59, 6:29–15:28, 16:50–19:23. Although the '037 patent describes the use of this reinforced wiring in decorative lighting applications, it is clear that at least some of “the embodiments, function, and structure of the claimed invention” focus on the wiring itself.

Consistent with the holding in *Bigio*, Petitioner’s characterization of the field of endeavor is not limited by, or based on, the end-use of the wire. The wires/cables of Kumada, Debladis '120, and the '037 patent all share common fundamental features associated with electric wiring, namely an electrical conductor, often comprised of multiple, individual strands of copper, surrounded by an insulating material. *See* Ex. 1001, 1:37–40; Ex. 1007, 1:11–32 (describing conventional cables made of copper strands surrounded by an insulating sheath); Ex. 1003, 6:53–55 (referring to “common wire means 40” used in decorative net light products). Furthermore, despite Patent Owner’s characterization of Debladis '120 as being limited to automotive applications, Debladis '120 states that its invention “relates to electrical control cables, or power cables, used for delivering electricity,” and that “[s]uch cables are used in various fields in

industry.” Ex. 1007, 1:11–17. Accordingly, we determine that Kumada, Debladis ’120, and the ’037 patent are all from the same field of endeavor.

Even if we were to agree with Patent Owner that the appropriate field of endeavor is “decorative lighting,” the outcome here would not change. Dr. Brown testified that “if you’re designing decorative lighting, you have to be designing electrical wiring,” and that decorative lighting “incorporates . . . electrical wiring.” Ex. 1016, 25:16–18, 28:5–8. Dr. Fantone agreed, testifying in his Supplemental Declaration that “[d]ecorative lighting design necessarily involves design of electrical wiring.” Ex. 1020 ¶ 16. Thus, declarants from both parties agree that decorative lighting and electrical wiring are inexorably intertwined, which undermines Patent Owner’s arguments that Debladis ’120, a reference addressing electrical wiring, is from a different field of endeavor than decorative lighting.

For all of the foregoing reasons, we determine that Debladis ’120, Kumada, and the ’037 patent are analogous art.

2. Whether Petitioner presented evidence sufficient to demonstrate a reason to combine Kumada and Debladis ’120

To show obviousness, it is not enough to merely show 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, “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.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). According to the Supreme Court in *KSR*, “[t]his is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of

necessity will be combinations of what, in some sense, is already known.” *Id.* at 418–19. As a result, Petitioner must articulate a reason why a person of ordinary skill in the art would have combined or modified the prior art references. *In re NuVasive, Inc.*, 842 F.3d 1376, 1382 (Fed. Cir. 2016); *see also Metalcraft of Mayville, Inc. v. The Toro Co.*, 848 F.3d 1358, 1366 (Fed. Cir. 2017) (“In determining whether there would have been a motivation to combine prior art references to arrive at the claimed invention, it is insufficient to simply conclude the combination would have been obvious without identifying any reason why a person of skill in the art would have made the combination.”); *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) (“[O]bviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention.”) (citing *InTouch Techs., Inc. v. VGO Commc’ns, Inc.*, 751 F.3d 1327, 1352 (Fed. Cir. 2014)). Furthermore, in performing an obviousness analysis, it is important to be aware of “the distortion caused by hindsight bias,” and also to “be cautious of arguments reliant upon *ex post* reasoning.” *KSR*, 550 U.S. at 421.

i. The Parties’ Arguments

Petitioner first argues that “a person skilled in the art would have looked to combine Kumada with Debladis ’120 if she were looking for known methods that could be used to increase the strength and durability of the decorative lighting products.” Pet. 30 (citing Ex. 1010 ¶ 65). Petitioner contends a person of ordinary skill in the art “would have had a reasonable expectation of success incorporating the reinforced wires of Debladis ’120 into the decorative light assembly of Kumada according to known principles

in the art to achieve a more durable wire.” Pet. 30. Additionally, Petitioner asserts that as far back as 2002, the UL 588 standards “contemplated the use of reinforced wiring in decorative lighting products.” Pet. 30 (citing. Ex. 1011; Ex. 1010 ¶ 66).

Petitioner next argues that “it would have been obvious to modify Kumada to incorporate the reinforced wires of Debladis ’120 because it involves a simple substitution of one known element for another to obtain the predictable and desirable result of a more durable wire.” Pet. 30 (citing Ex. 1010 ¶ 67).

In its Patent Owner Response, Patent Owner contends that Petitioner’s arguments are flawed because Debladis ’120 teaches reduction of copper “while **conserving** very good mechanical strength” and “**retaining** good mechanical strength,” and, therefore, “teaches replacement of a wire with a lower copper-content wire that has equivalent, **and not greater**, strength and durability.” PO Resp. 37 (quoting Ex. 1007, 1:52–54, 1:62–66, 2:41–46, 3:14–22). Based on this, Patent Owner argues that a person of ordinary skill in the art “would understand that Debladis ’120 simply does not teach increasing the strength or durability of the wires it replaces.” PO Resp. 37; Ex. 2041 ¶ 65. Patent Owner thus asserts that a person of ordinary skill in the art would not have been motivated to use Debladis ’120 to increase the strength or durability of a wire. PO Resp. 37; Ex. 2041 ¶ 65.

Additionally, according to Patent Owner, Petitioner’s argument that a person of ordinary skill in the art would have looked to Debladis ’120 “*if* she were looking for known methods that could be used to increase the strength and durability of the decorative lighting products,” is flawed because it does not establish why a person of ordinary skill in the art would be looking for

known methods to increase strength and durability. PO Resp. 42. Patent Owner states that “[o]bviousness is not determined by what a person of skill in the art *could* do, but rather what the skilled person *would* do.” PO Resp. 42 (citing *Personal Web Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 993 (Fed. Cir. 2017)).

Further, Patent Owner asserts that Kumada emphasizes the importance of compliance with UL standards, which indicates the wires of Kumada would have had sufficient strength for decorative lighting. PO Resp. 40. In view of this, Patent Owner argues Petitioner fails to provide sufficient evidence establishing that a person of ordinary skill in the art *would be looking* for methods to increase the strength and durability of decorative lighting. PO Resp. 42. Patent Owner also argues that “[w]iring need not be internally reinforced to be reinforced, and therefore Petitioner fails to state a valid motivation for combining Kumada and Debladis ’120.” PO Resp. 45.

With regard to Petitioner’s simple substitution argument, Patent Owner notes that Petitioner cites to paragraph 67 of Dr. Fantone’s First Declaration, wherein he discusses “the importance of durability” in connection with Kumada’s use of “reinforcing ropes 200/200’.” PO Resp. 52–53; Ex. 1010 ¶ 67. Patent Owner argues that Kumada does not refer to ropes 200/200’ as “reinforcing ropes,” and does not indicate that these ropes are used for durability or strength. PO Resp. 53. Instead, according to Patent Owner, Kumada’s ropes are used to form a net or mesh, and Kumada uses wires in twisted pairs to ensure adequate strength. PO Resp. 53 (citing Ex. 1003, 2:52–56, 4:18–21, 5:9–12, 5:43–47, 6:53–57, 9:17–30, 10:26–30, 11:2–3).

In its Reply, Petitioner maintains that a person of ordinary skill in the art would have been motivated to use internal polymer strands to increase the durability of the net light and light strings. Reply 16–17 (citing Pet. 30). Citing testimony from Dr. Fantone’s Supplemental Declaration, Petitioner states that a person of ordinary skill in the art “would immediately appreciate that ‘polymer reinforced fibers increase chemical resistance, tensile, bending, abrasion properties, etc., and therefore will increase the durability of the wire.’” Reply 17 (citing Ex. 1020 ¶¶ 33–37; Ex. 1024, 2).

Petitioner also argues in its Reply that a person of ordinary skill in the art would have been motivated to combine Kumada and Debladis ’120 in order to reduce costs. Reply 17. According to Petitioner, incorporating the wire from Debladis ’120 into Kumada would reduce the amount of total copper used in Kumada’s system, and, therefore, reduce the overall cost of the system while maintaining its strength. Reply 17.

Patent Owner argues Petitioner’s cost argument is new, as it was not presented in the Petition. Sur-reply 18. Patent Owner also argues that Exhibit 1024, which Petitioner cites in support of its argument that a person of ordinary skill in the art would have appreciated that including a polymer fiber in a wire would increase the durability of the wire, never mentions wiring, and is not prior art. Sur-reply 20; Paper 31, 14.

ii. Analysis

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the

grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. See *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review). To prevail, Petitioner cannot rely on conclusory statements, and must provide “some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F. 3d 977, 988 (Fed. Cir. 2006), *cited* in *KSR*, 550 U.S. 398 at 418. After reviewing the parties’ arguments and evidence, we find Petitioner has failed to provide sufficient argument and evidence to establish that a person of ordinary skill in the art would have had reason to combine the teachings of Kumada and Debladis ’120 to arrive at the claimed invention.

Petitioner first argues that “a person skilled in the art would have looked to combine Kumada with Debladis ’120 if she were looking for known methods that could be used to increase the strength and durability of the decorative lighting products.” Pet. 30 (citing Ex. 1010 ¶ 65). We, however, are not persuaded by this argument, as Petitioner fails to provide evidence of “known methods” for increasing the strength and durability of decorative lighting products. Petitioner does not direct us to any portion of Kumada relating to increasing the strength or durability of decorative lighting products. Nor does Petitioner direct us to any portion of Debladis ’120 discussing *increasing* strength or durability of a wire. As Patent Owner points out, Debladis ’120 discloses only “retaining” or “conserving” mechanical strength in its wires. Ex. 1007, 1:16–21, 1:62–66. Thus, the cited references at best teach or suggest methods for retaining or conserving the mechanical strength of wires, not known methods that could be used to increase the strength and durability of decorative lighting products. This

undermines Petitioner's reasoning as to why a person of ordinary skill in the art would have looked to combine Debladis '120 with Kumada.

Petitioner cites to paragraph 65 in Dr. Fantone's First Declaration to support its assertion about known methods that increase the strength and durability of decorative lighting products. Pet. 30 (citing Ex. 1010 ¶ 65). In paragraph 65 of his First Declaration, Dr. Fantone repeats the language in the Petition regarding a person of skill in the art looking for known methods to increase the strength and durability of decorative lighting products, without citation. Dr. Fantone also states that a person of ordinary skill in the art would have known how to connect the conductors in Debladis '120 to Kumada's conductive contacts to power Kumada's bulbs. Ex. 1010 ¶ 65. Nothing in this paragraph provides sufficient evidence of known methods to increase strength or durability of decorative lighting products.

We turn next to Petitioner's and Dr. Fantone's statement that "the UL [588] standards governing decorative lighting products as far back as at least 2002 have contemplated the use of reinforced wiring in decorative lighting products." Pet. 30; Ex. 1010 ¶ 66; Ex. 1011. Although it appeared from the Petition that Petitioner was relying on this statement to support its argument that a person of ordinary skill in the art would have "looked to combine Kumada and Debladis '120," in its Reply Petitioner states that "the UL 588 Standards are not a reference necessary to establish the unpatentability of any challenged claim" and "the UL 588 Standards would have had limited influence on a [person of ordinary skill in the art] designing net light products." Reply 8; *see also* PGR Tr. 37:17–24. Accordingly, we do not consider this statement, on its own, as providing evidence of a reason for combining Kumada and Debladis '120.

To the extent the 2002 UL 588 Standards cited by Petitioner and Dr. Fantone even encompass the type of wire disclosed in Debladis '120, neither Petitioner nor Dr. Fantone address Debladis '120 disclosing only “retaining” or “conserving” mechanical strength, not increasing it. *See* Pet. 30; Ex. 1010 ¶ 66. Notably, in its Reply, Petitioner acknowledges that a person of ordinary skill in the art “would understand that the intent of Section 13.2.4 [of the 2002 UL 588 Standards] would allow for the replacement of copper with cheaper polymeric rope, while also *retaining* sufficient strength,” and that Debladis '120 “has the same intent.” Reply 15. The statement is consistent with the discussion of retaining and conserving strength in Debladis '120, and indicates that Petitioner’s and Dr. Fantone’s comments regarding the 2002 UL 588 Standards do not support the assertion that “a person skilled in the art would have looked to combine Kumada with Debladis '120 if she were looking for known methods that could be used to *increase* the strength and durability of the decorative lighting products.” Pet. 30 (emphasis added).

Petitioner’s argument that “it would have been obvious to modify Kumada to incorporate the reinforced wires of Debladis '120 because it involves a simple substitution of one known element for another to obtain the predictable and desirable result of a more durable wire” (Pet. 30) suffers from the same deficiency as its other arguments. In particular, Petitioner fails to offer sufficient evidence regarding durability to establish that modifying Kumada to incorporate the wires of Debladis '120 would lead to “the predictable and desirable result of a *more durable wire*.” Pet. 30 (emphasis added).

Petitioner cites to paragraph 67 of Dr. Fantone's First Declaration to support its argument in the Petition. Pet. 30. In paragraph 67 of his First Declaration, Dr. Fantone first repeats the statement in the Petition that modifying Kumada to incorporate the reinforced wires of Debladis '120 "involves a simple substitution of one known element for another to obtain the predictable and desirable result of a more durable wire." Ex. 1010 ¶ 67. Dr. Fantone then states that the wires in Debladis '120 "include[] the requisite flexibility for use in Kumada's net light," and "[t]his substitution would increase the durability of Kumada's structure, e.g., prolonging the suitable use life thereof." Ex. 1010 ¶ 67. Dr. Fantone, however, does not provide a basis for these statements. For example, Dr. Fantone does not direct us to any information regarding the flexibility of the Debladis '120 wires or their ability to "prolong the suitable use life" of Kumada's net light structure. As such, Dr. Fantone's statements regarding increased durability are entitled to little or no weight. *See* 37 C.F.R. § 42.65(a).

Dr. Fantone also states that "[t]he importance of durability is recognized by Kumada, as Kumada uses reinforcing ropes 200/200' in its construction, and replacing Kumada's intermediate wires with the reinforced wires of Debladis '120 would further this goal of increased durability." Ex. 1010 ¶ 67. As Patent Owner correctly points out, however, Kumada never refers to ropes 200/200' as "reinforcing ropes." PO Resp. 53; *see, e.g.*, Ex. 1003, 10:45–11:33. Even if we did agree with Petitioner that Kumada's disclosure of ropes 200/200' is an indication of the importance of durability, it is not evident how replacing Kumada's electrical wires, which are a different component than ropes 200/200', with the wires of Debladis '120 would "further the goal of increased durability" of Kumada's structure. Ex.

1010 ¶ 67. As noted above, the record is devoid of any evidence demonstrating that the wires of Debladis '120 provide increased strength or durability.

In the Reply, in response to Patent Owner's challenges to the combination of Kumada and Debladis '120, Petitioner contends that a person of ordinary skill in the art "would have been motivated to use internal polymer, fiber reinforcing strands [of Debladis '120 in Kumada] to increase the durability of the net light and strings." Reply 16–17 (citing Pet. 30; Ex. 1010 ¶ 67). Petitioner again relies on paragraph 67 of Dr. Fantone's First Declaration to support this increased durability argument. As discussed above, however, Dr. Fantone's testimony suffers from various flaws.

Petitioner also argues that a person of ordinary skill in the art "would immediately appreciate that 'polymer reinforced fibers increase chemical resistance, tensile, bending, abrasion properties, etc., and therefore will increase the durability of the wire.'" Reply 17 (citing Ex. 1020 ¶¶ 33–37; Ex. 1024, 2). Petitioner cites to paragraphs 33–37 of Dr. Fantone's Supplemental Declaration to support this statement. Paragraphs 33 and 34 of the Supplemental Declaration effectively repeat the testimony in paragraph 67 of Dr. Fantone's First Declaration, which we have addressed above.

Paragraph 35 of Dr. Fantone's Supplemental Declaration repeats testimony from Dr. Brown regarding Debladis '120's discussion of retaining or conserving mechanical strength, wherein Dr. Brown concludes that a person of ordinary skill in the art "would understand that Debladis '120 simply does not teach increasing the strength or durability of the wires it replaces, and would not have been motivated to use Debladis '120 to

increase strength or durability of a wire.” Ex. 1020 ¶ 35 (quoting Ex. 2041 ¶ 65).

In paragraph 36 of Dr. Fantone’s Supplemental Declaration, he expresses his opinion that Dr. Brown is incorrect, then repeats verbatim the statement in the Petition regarding what a person of ordinary skill in the art would “immediately appreciate” about polymer reinforced fibers. Ex. 1020 ¶ 36. Dr. Fantone next states that “[i]t was very well known that polymers typically have increased durability in comparison to metals,” and cites to page 2 of Exhibit 1024 to support that statement. Ex. 1020 ¶ 36. As Patent Owner points out, however, Exhibit 1024 does not discuss the use of polymer fibers in wires, either in general or more specifically as a way to increase the durability of a wire. Sur-reply 20.

Furthermore, Exhibit 1024 appears to be an article posted on December 16, 2014, which is more than one year after the filing date of the earliest application to which the ’037 patent claims priority. Ex. 1024, 1; Ex. 1001, code (60) (noting the September 13, 2013 filing date of a provisional application). Thus, even if we were to agree with Petitioner that Exhibit 1024 demonstrates that it was well-known that polymers generally have increased durability in comparison to metals, Exhibit 1024 only establishes this general knowledge as of December 16, 2014. There is no evidence demonstrating that this information would have been well known to a person of ordinary skill in the art at any time before that date, including the September 2013 priority date. Thus, the evidence of record fails to establish sufficiently that it was well known that polymers typically have increased durability in comparison to metals to a person of ordinary skill in the art as of the earliest effective filing date of the ’037 patent. *See* 35

U.S.C. § 103 (stating that a patent claim is unpatentable as obvious “if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains”).

In paragraph 37 of Dr. Fantone’s Supplemental Declaration, he refers to Exhibit 1025 to support the statement that “[i]t was also well understood in the decorative lighting field that polymers would improve the durability of a decorative lighting structure.” Ex. 1020 ¶ 37. Exhibit 1025 has a publication date of January 2017. Ex. 1025, code (45). Similar to Exhibit 1024, Petitioner does not direct us to evidence demonstrating that this information would have been well known to a person of ordinary skill in the art at any time before that date, including the September 2013 priority date.

For all of the foregoing reasons, we determine Petitioner’s arguments suffer from a lack of supporting evidence, constitute mere conclusory statements lacking articulated reasoning with some rational underpinning, and are based on impermissible hindsight. Accordingly, we find Petitioner has failed to establish sufficiently that “a person skilled in the art would have looked to combine Kumada with Debladis ’120 if she were looking for known methods that could be used to increase the strength and durability of the decorative lighting products” or that “it would have been obvious to modify Kumada to incorporate the reinforced wires of Debladis ’120 because it involves a simple substitution of one known element for another to obtain the predictable and desirable result of a more durable wire.” Pet. 30.

In addition to its increased strength and durability arguments, Petitioner states in the Reply that a person of ordinary skill in the art “would have been motivated to reduce costs by incorporating the internally reinforced wire of Debladis ’120 into the net light system of Kumada.”

Reply 17. We agree with Patent Owner that Petitioner’s arguments regarding reduced cost as a reason to combine Kumada and Debladis ’120 are new arguments not present in the Petition. PO Resp. 18, 21; Paper 24, 1.

In the Petition, Petitioner provided three paragraphs addressing the reasons a person of ordinary skill in the art would have had to combine Kumada and Debladis ’120. Pet. 29–30. Nowhere in those paragraphs does Petitioner raise the concept of cost reduction. At the hearing, counsel for Petitioner agreed that Petitioner did not raise this specific argument in the Petition. PGR Tr. 14:16–21.

Our Trial Practice Guide states that Petitioner “may not submit new . . . argument in reply that it could have presented earlier, e.g., to make out a prima facie case of unpatentability.” Patent Trial and Appeal Board Consolidated Trial Practice Guide, 73 (Nov. 2019), *available at* <https://www.uspto.gov/TrialPracticeGuideConsolidated>. Additionally, our reviewing court has explained that

[i]t is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify “with particularity” the “evidence that supports the grounds for the challenge to each claim.” 35 U.S.C. § 312(a)(3). “All arguments for the relief requested in a motion must be made in the motion. A reply may only respond to arguments raised in the corresponding opposition or patent owner response.” 37 C.F.R. § 42.23(b). Once the Board identifies new issues presented for the first time in reply, neither this court nor the Board must parse the reply brief to determine which, if any, parts

of that brief are responsive and which are improper. As the Board noted, “it will not attempt to sort proper from improper portions of the reply.” Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,767 (Aug. 14, 2012).

Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd., 821 F.3d 1359, 1369 (Fed. Cir. 2016); *see also Acceleration Bay, LLC v. Activision Blizzard Inc.*, 908 F.3d 765, 775 (Fed. Cir. 2018) (quoting same). Based on those standards, the Federal Circuit found the Board properly refused to consider a new theory raised for the first time in a reply brief:

Unlike district court litigation—where parties have greater freedom to revise and develop their arguments over time and in response to newly discovered material—the expedited nature of IPRs bring with it an obligation for petitioners to make their case in their petition to institute. While the Board’s requirements are strict ones, they are requirements of which petitioners are aware when they seek to institute an IPR.

....

... In these circumstances, we find that the Board did not err in refusing the reply brief as improper under 37 C.F.R. § 42.23(b) because [the petitioner] relied on an entirely new rationale to explain why one of skill in the art would have been motivated to combine Tsien or Ju with a modification of Zavgorodny.

Intelligent Bio-Sys., 821 F.3d at 1369–70.

Because Petitioner did not argue in the Petition that a person of ordinary skill in the art “would have been motivated to reduce costs by incorporating the internally reinforced wire of Debladis ’120 into the net light system of Kumada,” we determine this is a new theory and do not consider it.

Furthermore, we observe that Petitioner argues “the Petition sets forth that a [person of ordinary skill in the art] would be motivated to incorporate

the polymer reinforced wire of Debladis '120 in order to improve durability *and* reduce cost.” Reply 16 (emphasis added). We, therefore, consider Petitioner to present cost reduction as an additional reason to combine Debladis '120 and Kumada, not as an alternative reason meant to stand alone. For the reasons discussed above, Petitioner has failed to demonstrate sufficiently that a person of ordinary skill in the art would have incorporated the wires of Debladis '120 into Kumada's net lighting to increase durability. As a result of this deficiency, Petitioner fails to establish a sufficient basis for its argument that a person of ordinary skill in the art would have incorporated the wires of Debladis '120 into Kumada's net lighting to increase durability *and* reduce costs. Thus, even if we were to consider Petitioner's cost reduction arguments, the outcome here would not change.

iii. Conclusion

After reviewing the parties' arguments and evidence, we find Petitioner has failed to establish sufficiently that a person of ordinary skill in the art would have had reason to combine the teachings of Kumada and Debladis '120 to arrive at the claimed invention. Accordingly, we find Petitioner has failed to demonstrate, by a preponderance of evidence, that claim 1 is unpatentable as obvious in view of Kumada and Debladis '120.

b) Claims 2–16 and 33

Petitioner's unpatentability challenges for claims 2–16 and 33 rely on the combination of Kumada and Debladis '120. Pet. 33–55. For these claims, Petitioner offers no evidence or arguments that cure the deficiency discussed above regarding the failure to demonstrate adequately a reason to combine the teachings of Kumada and Debladis '120 to arrive at the claimed invention. As a result, we reach at the same conclusion here as we did for

claim 1, and determine that Petitioner has failed to establish by a preponderance of evidence that claims 2–16 and 33 are unpatentable as obvious in view of Kumada, Debladis '120, and Liu or Lawrence.

D. Asserted Obviousness over Kumada, Debladis '120, and Debladis '614 or Huang

Petitioner contends the subject matter of claims 17–20 would have been obvious in view of the combined teachings of Kumada, Debladis '120, and Debladis '614 or Huang. Pet. 56–62.

1. Debladis '614 (Ex. 1009)

Debladis '614 discloses electric control cables used in various fields, which need to be “as light-weight as possible, and to be compact, while nevertheless conserving good mechanical strength.” Ex. 1009 ¶ 2. Debladis '614 explains that conventional cables “make[] use of more copper than [they] really need[] in terms of the quantity of electric current that is to be conveyed by the cable,” and that copper is becoming more expensive, so it is “important to find novel cable structures that minimize the quantity of copper used.” Ex. 1009 ¶¶ 3–6. Debladis '614 depicts one embodiment of its cable in Figure 2, which is reproduced below.

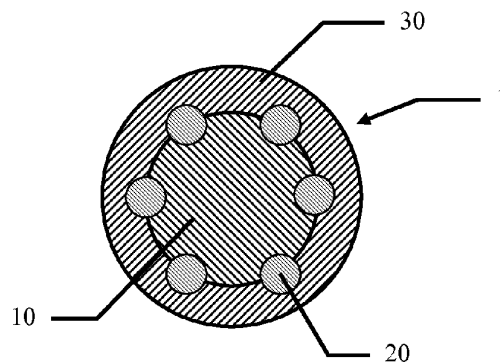


FIG. 2

Figure 2 of Debladis '614 shows a cross-sectional view of a cable, wherein strands 20, made of conductive material such as copper, extend in the longitudinal direction of, and are distributed around the periphery of central core 10, made of a polymer material. Ex. 1009 ¶ 22. The cable also contains outer insulating sheath 30 surrounding core 10 and copper strands 20. Ex. 1009 ¶ 23. Debladis '614 states that in comparison to conventional wires (as depicted in Debladis '614 Figure 1), the design of the wire shown in Figure 2 “leads to a considerable decrease in the cost and the weight of the cable.” Ex. 1009 ¶ 28.

2. Huang (Ex. 1008)

Huang discloses “a flat cable that is placed inside a body-worn device or a cloth attachment type device, a cable harness using the flat cable, and a method of making the flat cable.” Ex. 1008 ¶ 3. One embodiment of Huang’s wire is depicted in Figure 2, reproduced below.

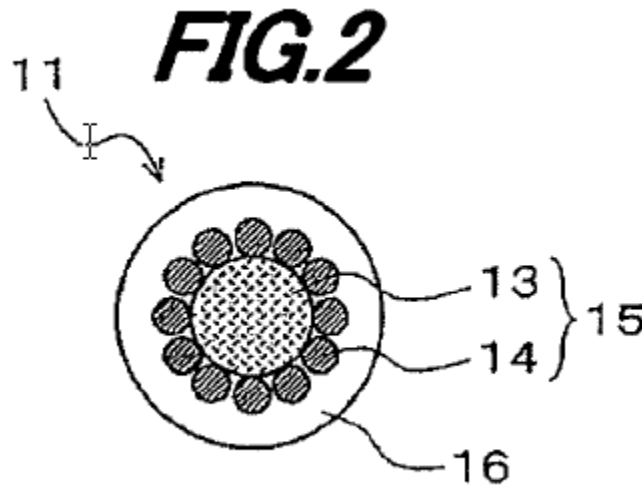


Figure 2 shows a cross sectional view of a wire with inner conductor 15 composed of filament 13, formed of a tensile fiber or a fiber having stretching properties, and conductors 14 spirally wound around an outer

periphery of filament 13. Ex. 1008 ¶¶ 34, 39. The “tensile fiber used for the filament 13 includes, e.g., a polyamide fiber such as aramid and a polyester fiber such as polyethylene terephthalate (PET), etc.” Ex. 1008 ¶ 40.

Further, “plural conductors 14, which are spirally wound, lengthwise disposed or braided on an outer periphery of the filament 13,” can be made of copper wire. Ex. 1008 ¶ 44.

3. *Analysis*

Claim 17

Claim 17 depends from claim 1 and recites a limitation requiring “the one or more reinforcing strands comprises a polymer material.” Ex. 1001, 44:7–8.

Petitioner first contends that Debladis ’120 discloses “a central core 40 of multifilament polymer,” and argues that claim 17 is obvious over Debladis ’120 in view of Kumada “[f]or at least the same reasons as discussed with respect to claim 1.” Pet. 56 (citing Ex. 1006, 3:17). Because claim 17 depends from claim 1, and Petitioner fails to offer any evidence to cure the deficiencies discussed above with regard to claim 1, we reach the same conclusion here as we did for claim 1. We, therefore, determine that Petitioner has failed to establish by a preponderance of evidence that claim 17 is unpatentable as obvious “over Kumada, Debladis ’120, and optionally in view of Debladis ’614 or Huang” as presented in the Petition. Pet. 60.

We note that Petitioner includes a parenthetical at the end of this section of the Petition, stating “(Claim 17 further is obvious over just Kumada in view of Debladis ’614 or just Kumada in view of Huang for at least the reasons discussed above.)” Pet. 60. Although it is not entirely clear because it is only recited in a parenthetical, it appears that Petitioner is

presenting challenges to claim 17 based on Kumada and Debladis '614 alone and based on Kumada and Huang alone, in addition to its challenge based on Kumada and Debladis '120. To the extent that Petitioner considers the Petition to include these additional challenges, we find them to be deficient for several reasons.

First, 37 C.F.R. § 42.22(a)(1) and (2) require the Petition to state the “precise relief requested” and include a “full statement of the reasons for the relief requested, including a detailed explanation of the significance of the evidence including material facts.” Similarly, 35 U.S.C. § 312(a)(3) requires the Petition “identifies, in writing and with particularity, each claim challenged, the grounds on which the challenge to each claim is based, and the evidence that supports the grounds for the challenge to each claim.” Petitioner’s parenthetical statement regarding these challenges is insufficient to satisfy these requirements.

Second, claim 17 depends from claim 1. Therefore, to succeed on a challenge to claim 17 based on Kumada and Debladis '614 alone or Kumada and Huang alone, Petitioner must demonstrate sufficiently that Kumada and Debladis '614 alone or Kumada and Huang alone teach or suggest every limitation of claim 1. Petitioner, however, only presents a detailed challenge against claim 1 based on the combined teachings of Kumada and Debladis '120. Pet. 5 (indicating the basis for its claim 1 challenge is that it is “Obvious under 35 U.S.C. §103 over Kumada in view of Debladis '120, further in view of Liu or Lawrence”), 19–33 (same). Thus, Petitioner fails to provide the requisite underlying basis for its argument that Kumada and Debladis '614 alone or Kumada and Huang alone teach or suggest every limitation of claim 17.

In view of the foregoing, we determine that Petitioner has failed to establish by a preponderance of evidence that claim 17 is unpatentable as obvious “over just Kumada in view of Debladis ’614 or just Kumada in view of Huang.” Pet. 60.

Petitioner’s arguments based on Debladis ’614 and Huang (either alone or in combination with Debladis ’120) suffer from an additional deficiency. Although Petitioner relies on new references, it relies on the same arguments regarding a reason to combine the teachings of Kumada with Debladis ’614 or Huang: (1) Debladis ’614 and Huang are analogous art to the ’037 patent, (2) “a person skilled in the art would have looked to combine Kumada with Debladis ’614 or Huang if she were looking for known methods that could be used to increase the strength and durability of the decorative lighting products,” and (3) “it would have been obvious to modify Kumada to incorporate the reinforced wires of Debladis ’614 or Huang because it involves a simple substitution of one known element for another to obtain the predictable and desirable result of a more durable wire.” Pet. 58–59 (citing Ex. 1010 ¶¶ 176–179).

As with its arguments for claim 1 and Debladis ’120, Petitioner fails to direct us to sufficient evidence in Kumada, Debladis ’614, or Huang that provide adequate support for its statements regarding increased strength and durability of decorative lighting products or “the predictable and desirable result of a more durable wire.” *See* Pet. 58–59. In paragraphs 176–179 of his First Declaration, Dr. Fantone repeats verbatim the sentences found in the Petition, without support. As a result, for the same reasons discussed above in connection with the proposed combination of Kumada and Debladis ’120, we find Petitioner’s arguments regarding a reason to combine

the teachings of Kumada with Debladis '614 or Huang suffer from a lack of supporting evidence, constitute mere conclusory statements lacking articulated reasoning with some rational underpinning, and are based on impermissible hindsight.

Claims 18–20

Claims 18–20 depend from claim 17. Because Petitioner fails to offer any evidence to cure the deficiencies discussed above with regard to claims 1 and 17, we reach the same conclusion here as we did for claims 1 and 17, and determine that Petitioner has failed to establish by a preponderance of evidence that claims 18–20 are unpatentable as obvious in view of Kumada, Debladis '120, Debladis '614, and/or Huang.

E. Asserted Obviousness in view of Kumada, Debladis '120, Lin, Liu, or Lawrence

Petitioner contends the subject matter of claims 21–29 would have been obvious in view of Kumada, Debladis '120, Lin, and Liu or Lawrence. Pet. 63–79. For each of these claims, Petitioner relies on the same arguments regarding the combination of Kumada and Debladis '120 as it does for claim 1. Pet. 66–68. Because Petitioner fails to offer any evidence to cure the deficiencies discussed above with regard to claim 1, we reach the same conclusion here as we did for claim 1, and determine that Petitioner has failed to establish by a preponderance of evidence that claims 21–29 are unpatentable as obvious in view of Kumada, Debladis '120, Lin, and Liu or Lawrence.

F. Asserted Obviousness over Kumada, Debladis '120, Lin, and Huang or Debladis '614

Petitioner contends the subject matter of claims 30–32 would have been obvious over Kumada, Debladis '120, Lin, and Huang or Debladis

'614. Pet. 79–82. Claims 30–32 each depend from claim 21. Ex. 1001, 45:36–46:6. Petitioner relies on the same arguments regarding a reason to combine the asserted references for these claims as it does for claims 1, 17, and 21. Pet. 79–82. Because Petitioner fails to offer any evidence to cure the deficiencies discussed above with regard to claims 1, 17, and 21, we reach the same conclusion here as we did for claims 1, 17, and 21, and determine that Petitioner has failed to establish by a preponderance of evidence that claims 30–32 are unpatentable as obvious in view of Kumada, Debladis '120, Lin, and Huang or Debladis '614.

G. Obviousness Challenges based on Lin and Debladis '120

Petitioner contends the subject matter of claims 1, 12, and 21 would have been obvious in view of the combined teachings of Lin and Debladis '120 (Pet. 82–102), and the subject matter of claim 33 would have been obvious in view of the combined teachings of Lin, Debladis '120, Liu, and Kumada (Pet. 103–111). Petitioner argues that the asserted references teach or suggest the limitations in claims 1, 12, 21, and 33, and directs us to portions of the references in support of its arguments. Pet. 82–111. Petitioner argues that it would have been obvious to a person of ordinary skill in the art to replace or modify the wires of Lin to include the reinforcing strand and insulating layer of the wire in Debladis '120. Pet. 88–89, 108–109. Petitioner's arguments regarding the reasons to combine Lin and Debladis '120 are virtually identical to those presented for the combination of Kumada and Debladis '120. *Compare* Pet. 88–89, *with* Pet. 29–30. Accordingly, Petitioner's arguments here suffer from the same deficiencies discussed above with regard to the proposed combination of Kumada and Debladis '120. Because Petitioner fails to offer any evidence

to cure the evidentiary deficiencies identified above, we reach the same conclusion here as we did above, and determine that Petitioner has failed to establish by a preponderance of evidence that claims 1, 12, and 21 are unpatentable as obvious in view of Lin and Debladis '120, or that claim 33 is unpatentable as obvious in view of Lin, Debladis '120, Liu, and Kumada.

H. Asserted Obviousness over Sylvania, Debladis '120, and optionally the 2002 UL 588 Standards

Petitioner contends the subject matter of claims 1, 4, 5, 10–14, 16, 21, 22, 25, 27, and 33 would have been obvious in view of the combined teachings of Sylvania, Debladis '120, and, optionally, the 2002 UL 588 Standards. Pet. 112–149. Petitioner argues that the combined teachings of Sylvania and Debladis '120, and, optionally, the 2002 UL 588 Standards, teach or suggest the limitations in claims 1, 4, 5, 10–14, 16, 21, 22, 25, 27, and 33, and directs us primarily to portions of Sylvania and Debladis '120 in support of its arguments. Pet. 112–149. Petitioner argues that it would have been obvious to a person of ordinary skill in the art to replace or modify the wires of Sylvania in view of Debladis '120 to arrive at a wire having the features recited in the above-referenced claims. Pet. 123–124, 129–130, 140–141. Petitioner's arguments regarding the reasons to combine Sylvania and Debladis '120 are virtually identical to those presented for the combination of Kumada and Debladis '120. *Compare* Pet. 123–124, *with* Pet. 29–30.

Accordingly, Petitioner's arguments here suffer from the same deficiencies discussed above with regard to the proposed combination of Kumada and Debladis '120. Because Petitioner fails to offer any evidence to cure the evidentiary deficiencies identified above, we reach the same

conclusion here as we did above, and determine that Petitioner has failed to establish by a preponderance of evidence that claims 1, 4, 5, 10–14, 16, 21, 22, 25, 27, and 33 are unpatentable as obvious in view of the combined teachings of Sylvania, Debladis '120, and optionally the 2002 UL 588 Standards.

III. CONCLUSION

For the foregoing reasons, Petitioner has not demonstrated by a preponderance of evidence that claims 1–33 of the '037 are unpatentable.

In Summary:

Claim(s) Challenged	35 U.S.C. §	References	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–16, 33	103	Kumada, Debladis '120, Liu, Lawrence		1–16, 33
17–20	103	Kumada, Debladis '120, Debladis '614, Huang		17–20
21–29	103	Kumada, Debladis '120, Lin, Liu, Lawrence		21–29
30–32	103	Kumada, Debladis '120, Lin, Debladis '614, Huang		30–32
1, 12, 21	103	Lin, Debladis '120		1, 12, 21
33	103	Lin, Debladis '120, Liu, Kumada		33
1, 4, 5, 10– 14, 16, 21, 22, 25, 27	103	Sylvania, Debladis '120, 2002 UL 588 Standards (optionally)		1, 4, 5, 10–14, 16, 21, 22, 25, 27
Overall Outcome				1–33

IV. MOTION TO EXCLUDE

Patent Owner filed a Motion to Exclude certain evidence presented by Petitioner. Paper 15. Because we ultimately find for Patent Owner without excluding the documents listed in Patent Owner's Motion, we dismiss as moot Patent Owner's Motion to Exclude.

V. JOINT MOTION TO SEAL

The parties filed a Joint Motion to Seal selected portions of Exhibit 1026, which is the deposition transcript of Michael Sugar. Paper 37. The parties submitted a version of the transcript with redactions (Ex. 1018) and a proposed protective order reflecting the provisions set forth in the Board's default protective order (Ex. 1031). The parties indicate that good cause exists for sealing the redacted information because it concerns "non-public sensitive technical and financial information including sales and profit information, communications, and other highly sensitive nonpublic information" that "could result in harm and business losses if released to the public." Paper 37, 2.

The standard for granting a motion to seal is good cause. 37 C.F.R. § 42.54. That standard includes showing that the information addressed in the motion to seal is truly confidential, and that such confidentiality outweighs the strong public interest in having the record open to the public. *See Garmin Int'l Inc. v. Cuozzo Speed Techs., LLC*, IPR2012-00001, Paper 34 at 2-3 (PTAB Mar. 14, 2013).

After considering the redacted portions of the deposition transcript and the corresponding explanation of the confidential nature of the information, we determine that the parties have established sufficient good cause for sealing the portions of Exhibit 1026 identified in the Joint Motion

to Seal. Accordingly, we grant the Joint Motion to Seal Exhibit 1026 and the associated request to enter the protective order submitted as Exhibit 1031.

VI. ORDER

For the reasons given, it is:

ORDERED that Petitioner has not shown, by a preponderance of the evidence, that claims 1–33 of the '037 patent are unpatentable;

FURTHER ORDERED that Patent Owner's Motion to Exclude is *dismissed* as moot;

FURTHER ORDERED that the parties' Joint Motion to Seal is *granted*;

FURTHER ORDERED that the parties' proposed protective order (Ex. 1031) is entered; and

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

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