

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

KOHLER CO.,
Petitioner,

v.

DELTA FAUCET CO.,
Patent Owner.

IPR2024-00700
Patent 10,393,363 B2

Before GRACE KARAFFA OBERMANN, JANE E. INGLESE, and
BRIAN P. MURPHY, *Administrative Patent Judges*.

INGLESE, *Administrative Patent Judge*.

JUDGMENT

Final Written Decision
Determining Some Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

This is a Final Written Decision in an *inter partes* review of claims 1–24 of U.S. Patent No. 10,393,363 B2 (Ex. 1001, “the ’363 patent”). We have jurisdiction under 35 U.S.C. § 6 and enter this Decision pursuant to 35 U.S.C. § 318(a). For reasons that follow, we determine that Petitioner establishes that claims 1, 2, and 9 are unpatentable, but does not establish that claims 3–8 and 10–24 are unpatentable.

A. *Procedural History*

Kohler Co. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) for *inter partes* review of claims 1–24 (the “challenged claims”) of the ’363 patent. We entered an Institution Decision (Paper 9, “Dec.”) instituting review of the challenged claims based on all grounds of unpatentability asserted in the Petition. Thereafter, Delta Faucet Co. (“Patent Owner”) filed a Response (Paper 17, “Resp.”), Petitioner filed a Reply (Paper 22, “Reply”), and Patent Owner filed a Sur-reply (Paper 26, “Sur-reply”). Petitioner relies on a declaration provided by J. Chris Cook (Ex. 1003). Patent Owner cross-examined Mr. Cook and filed a transcript of his deposition testimony. Ex. 2005. Patent Owner relies on a declaration provided by Richard W. Klopp, Ph.D. (Ex. 2003). Petitioner cross-examined Dr. Klopp and filed a transcript of his deposition testimony. Ex. 1015. The Board heard oral arguments at a hearing conducted on July 10, 2025. Paper 29 (“Tr.”).

B. *Asserted Grounds of Unpatentability*

Petitioner asserts that the challenged claims are unpatentable on the following grounds (Pet. 6–7):

Ground	Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1	1–5, 10, 12–16	103	Tseng ¹
2	9, 11	103	Tseng, Mizuno ²
3	17, 18	103	Tseng, Schneider ³
4	1, 6–9, 19–23	103	Tse ⁴
5	1, 6–9, 19–23	103	Tse, Carter ⁵
6	24	103	Tse, Spangler ⁶
7	24	103	Tse, Carter, Spangler

C. Real Parties-in-Interest

Petitioner identifies itself, Kohler Co., as the real party-in-interest. Pet. 5. Patent Owner identifies itself and Masco Corporation as the real parties-in-interest. Paper 3, 2.

D. Related Matters

Petitioner indicates that the '363 patent is not at issue in any other action. Pet. 5. Patent Owner indicates that it is unaware of any other judicial or administrative matter that would affect, or be affected by, a decision in this proceeding. Paper 4, 2.

II. BACKGROUND

A. The '363 Patent (Ex. 1001)

The '363 patent is directed to an illumination device for a spray head or a pendant showerhead. Ex. 1001, code (54), 1:16–18, 1:60–61. Figures 1 and 3 below illustrate exemplary spray head 100:

¹ US 2015/0354186 A1, published December 10, 2015 (Ex. 1004).

² JP 2003-27537 A, published January 29, 2003 (Ex. 1008).

³ US 2015/0221206 A1, published August 6, 2015 (Ex. 1009).

⁴ WO 2009/000109 A1, published December 31, 2008 (Ex. 1005).

⁵ US 2010/0046199 A1, published February 25, 2010 (Ex. 1006).

⁶ US 2013/0299608 A1, published November 14, 2013 (Ex. 1014).

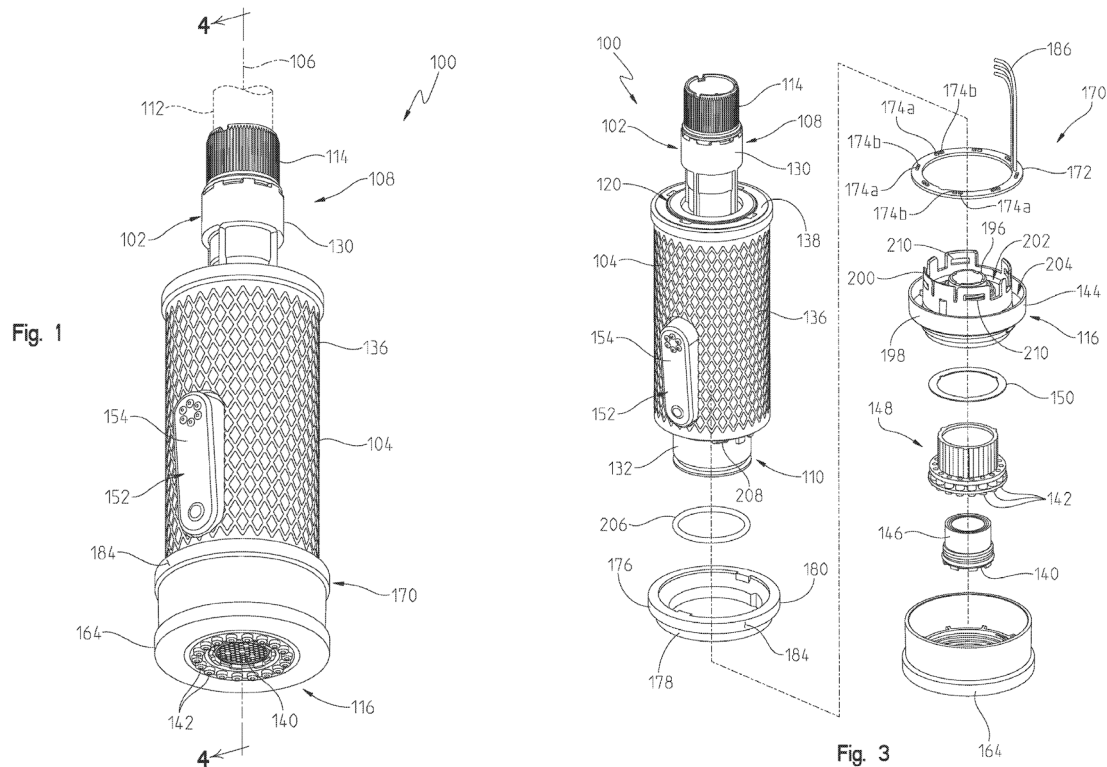


Figure 1 provides a perspective view of spray head 100, and Figure 3 shows a bottom exploded perspective view of spray head 100 of Figure 1. *Id.* at 2:14–25, 2:18–19.

Spray head 100 includes housing 104, waterway 102 disposed within housing 104 and extending along longitudinal axis 106, and spray face 116 fluidly coupled to outlet end 110 of waterway 102. *Id.* at 2:53–62. Housing 104 supports illumination device 170, which includes substrate 172 supporting a plurality of light emitters 174, and annular light pipe 176. *Id.* at 3:52–58. Annular light pipe 176 is formed of a translucent material and defines a closed loop to diffuse light radially outwardly from light emitters 174 towards outer illumination surface 184 of light pipe 176. *Id.* at 3:56–4:7. Outer illumination surface 184 defines a closed loop. *Id.* at 4:7–8.

Figures 8 and 9 below illustrate exemplary pendant showerhead 306:

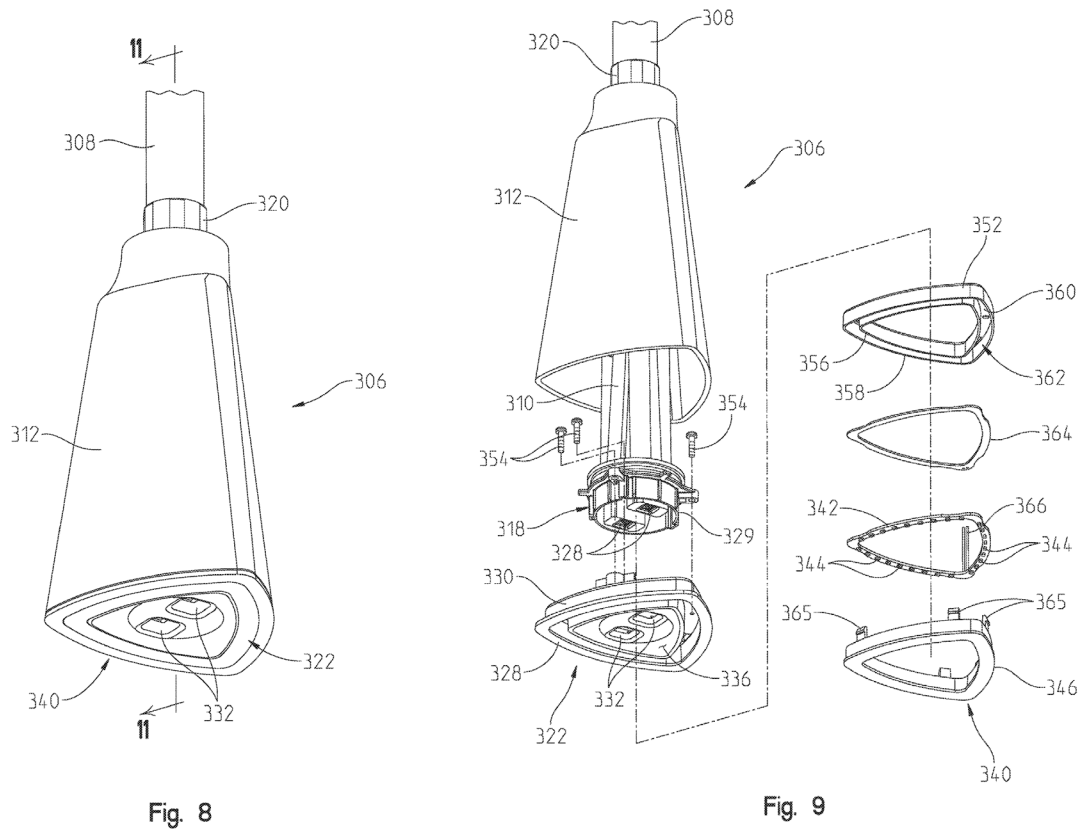


Figure 8 provides a perspective view of pendant showerhead 306, and Figure 9 shows a bottom exploded perspective view of pendant showerhead 306 of Figure 8. *Id.* at 2:28–31.

Pendant showerhead 306 includes waterway 310 disposed within housing 312 and extending along longitudinal axis 314, and spray face 322 fluidly coupled to outlet end 318 of waterway 310 and including water outlet openings 332. *Id.* at 5:35–42, 5:48–50. Spray face 322 supports illumination device 340, which includes substrate 342 supporting light emitters 344, and translucent light pipe 346, which defines a closed loop laterally surrounding water outlet openings 332. *Id.* at 5:65–6:5. Light pipe 346 transmits light outwardly in a direction parallel to axis 314 of shower head 306 toward outer illumination surface 350 of light pipe 346. *Id.* at

6:9–11. Outer illumination surface 350 defines a closed loop positioned laterally outside water outlets 332. *Id.* at 6:11–13.

B. Challenged Claims

Petitioner challenges claims 1–24 of the '363 patent. Pet. 6. Claims 1, 10, and 19 are independent, claims 2–9 depend from claim 1, claims 11–18 depend from claim 10, and claims 20–24 depend from claim 19. Ex. 1001, 7:6–9:3.

Claims 1 and 19 are representative of the claimed subject matter and read as follows:

1. A sprayhead comprising:
 - a housing defining a longitudinal axis;
 - a waterway received within the housing;
 - a sprayface fluidly coupled to the waterway and supporting a water outlet; and
 - an illumination device supported by the housing, the illumination device including a substrate, a plurality of light emitters supported by the substrate, and a translucent light pipe defining a closed loop to diffuse light from the light emitters outwardly away from the housing.

19. A pendant showerhead comprising:
 - a housing defining a longitudinal axis;
 - a waterway received within the housing;
 - a sprayface fluidly coupled to the waterway and including a water outlet; and
 - an illumination device supported by the sprayface, the illumination device including a substrate, a plurality of light emitters supported by the substrate, and a translucent light pipe defining a closed loop surrounding the water outlet to diffuse light from the light emitters outwardly in a direction parallel to the longitudinal axes.

Ex. 1001, 7:6–17, 8:40–51.

III. ANALYSIS

A. *Principles of Law*

“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”)); *see also* 37 C.F.R. § 42.104(b) (requiring a petition for *inter partes* review to identify how the challenged claim is to be construed and where each element of the claim is found in the prior art patents or printed publications relied upon).

B. *Level of Ordinary Skill in the Art*

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

Petitioner asserts that a person of ordinary skill in the art (“POSITA”) would have had a degree in industrial design or an equivalent field, and two years of professional experience working with kitchen, bath, or other plumbing fixtures (or similar products), or an equivalent level of skill, knowledge, and experience. Pet. 14. Petitioner asserts that a POSITA also would have been aware of, and generally knowledgeable about, the standard features and functionality of kitchen, bath, or other plumbing fixtures (or similar products). *Id.*

Patent Owner disagrees with Patent Owner’s definition of a POSITA. Resp. 7–8. Patent Owner asserts “that a POSITA would have had (1) a

degree in mechanical engineering, industrial design, or an equivalent field, including education in the field of optics, (2) at least two years of professional experience designing or analyzing kitchen, bath, or other similar plumbing fixtures or consumer products, and (3) at least two years of professional experience designing or analyzing optical apparatus.” *Id.* at 8. Patent Owner asserts that “additional education could compensate for professional experience or vice versa.” *Id.* (citing Ex. 2003 ¶¶50–51).

For purposes of this Decision, we adopt Petitioner’s definition of a POSITA. Petitioner’s witness (Mr. Cook) qualifies as a POSITA under this definition, and, therefore, is qualified to opine from the perspective of a POSITA on technical matters included within the areas of expertise prescribed by the definition. As indicated above, Petitioner’s definition of a POSITA does not require education in the field of optics and professional experience designing or analyzing optical apparatus, unlike Patent Owner’s definition. We are aware, however, that Patent Owner’s witness (Dr. Klopp) has more extensive experience with optical systems and methods than Petitioner’s witness (Mr. Cook). *Compare* Ex 1003 ¶¶ 8–14, Ex. 2005, 39:21–59:17, *with* Ex. 2003 ¶¶ 3–20, Ex. 2004, 1–2, Ex. 1015, 10:22–13:25. Although Mr. Cook possesses excellent credentials in the field of mechanical engineering, his experience in the design and analysis of optical systems and methods is sparse and insubstantial compared to that of Dr. Klopp. *Id.* Due to this difference in experience levels, in instances where the witnesses express differing views on factual issues related to optical systems and methods, we will accord more weight to Dr. Klopp’s testimony than to Mr. Cook’s.

C. Claim Interpretation

We interpret claims “using the same claim construction standard that would be used to construe the claim[s] in a civil action [held] under 35 U.S.C. 282(b).” 37 C.F.R. § 42.100(b). Under that standard, claim terms generally are given their plain and ordinary meaning as would have been understood by the ordinarily skilled artisan at the time of the invention when read in the context of the specification and prosecution history. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc). We construe terms in controversy only to the extent necessary to resolve the controversy. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

Petitioner asserts that the claim terms do not require construction and should be afforded their plain and ordinary meaning. Pet. 13. Patent Owner contends that it applies the plain and ordinary meaning of the claim terms. Resp. 7. Taking into consideration the information presented, we determine that none of the claim terms requires express construction for purposes of resolving the dispute before us.

D. The Patentability Challenges

1. Ground 1: Asserted Obviousness over Tseng

Petitioner asserts that claims 1–5, 10, and 12–16 would have been obvious over Tseng. Pet. 23–43. Patent Owner disagrees. Resp. 17–46. To resolve the parties’ dispute, we begin with an overview of Tseng.

a) Tseng (Ex. 1004)

Tseng discloses a pull-out faucet including a spray head mounted on a body. Ex. 1004 ¶¶ 1, 9, 10. The spray head includes an external sleeve that houses a circuit board, a plurality of LED elements, and a light conductor.

Id. ¶¶ 10, 11, 21. The light conductor has at least one input face for inputting light emitted from the LED elements, at least one light transmission portion for transmitting the light, and at least one output face for outputting the light. *Id.* ¶ 11. The circuit board includes a C-shaped ring joined to a longitudinal sheet. *Id.* ¶ 12. Each of the LED elements is electrically connected to the C-shaped ring and faces an input face of the light conductor. *Id.* ¶ 12.

Tseng discloses three embodiments of its pull-out faucet in which the light conductors and circuit boards differ structurally. Figure 5, reproduced below, illustrates the pull-out faucet of Tseng's first embodiment:

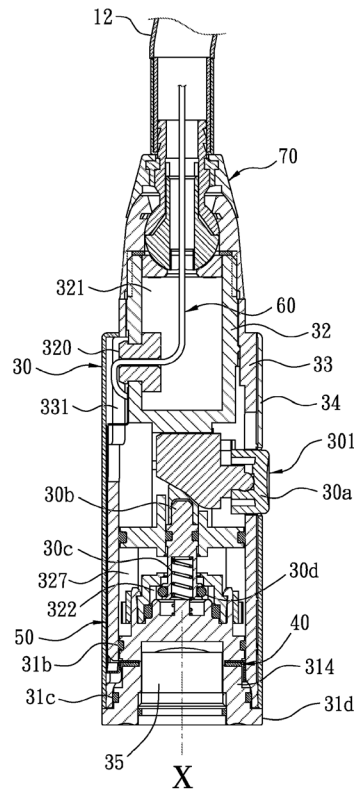


FIG. 5

Figure 5 shows a cross-sectional view of the pull-out faucet of Tseng's first embodiment. *Id.* ¶ 35. Figures 9 and 11–13, reproduced below, illustrate

the light conductor and circuit board of the pull-out faucet of Tseng's first embodiment:

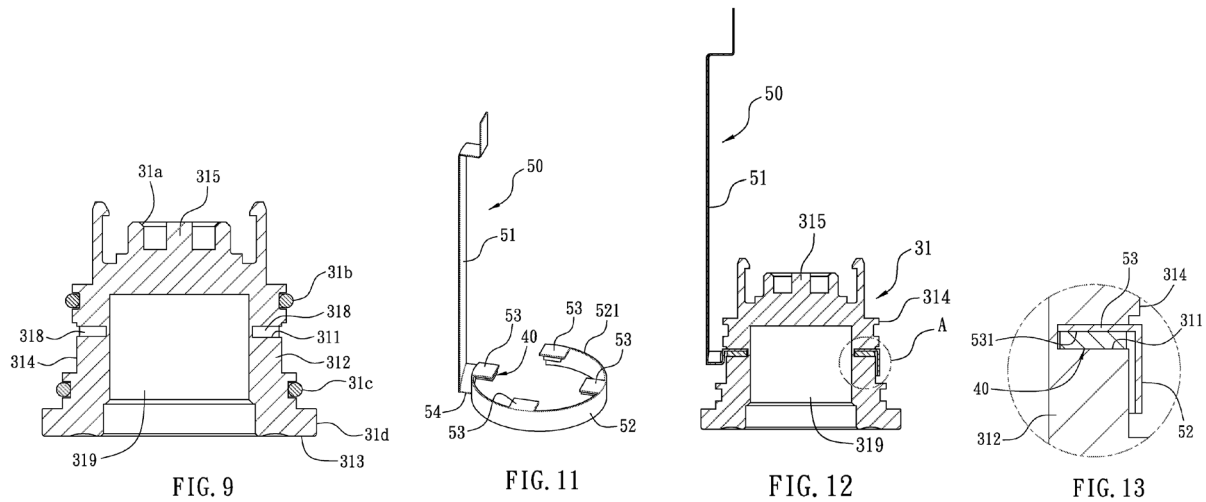


Figure 9 shows a cross-sectional view of light conductor 31 according to Tseng's first embodiment. *Id.* ¶¶ 38, 39. Figure 11 is a perspective view of circuit board 50 and LED elements 40 of Tseng's first embodiment. *Id.* ¶ 41. Figure 12 is a cross-sectional view of light conductor 31, circuit board 50, and LED elements 40 of Tseng's first embodiment. *Id.* ¶ 42. Figure 13 is an amplified cross-sectional view of Figure 12's LED element 40 positioned in light conductor 31 (identified as portion A in Figure 12). *Id.* ¶ 43.

Figures 9, 12, and 13 illustrate light conductor 31, which is “made of translucent material to guide lights” and includes plural slots 318. *Id.* ¶¶ 70, 72. Figure 11 illustrates circuit board 50 that includes longitudinal sheet 51 and C-shaped ring 52 having extensions 53 with bottom faces 531 that each electrically connect to an LED element 40. *Id.* ¶ 71. As shown in Figures 12 and 13, C-shaped ring 52 surrounds the outer wall of light conductor 31 and each extension 53 on C-shaped ring 52 fits into a slot 318. *Id.* ¶ 71, 72.

The bottom surfaces of slots 318 form input faces 311, and each LED element 40 is located above and faces a respective input face 311 of light conductor 31. *Id.* Light emitted from each LED element 40 is input into each respective input face 311 of light conductor 31. *Id.* ¶¶ 70, 72. Light transmission portion 312 of light conductor 31 transmits the input light, and output face 313 at “a bottom end of light conductor 31” outputs the transmitted light. *Id.* ¶¶ 70, 72.

As shown in Figure 5 (reproduced again below for ease of reference), “light conductor 31 further has a circular rib 31d extending outwardly from a lower side of an outer wall of the second stopping portion 31c opposite to the internal sleeve 33 and the external sleeve 34, such that the circular rib 31d exposes outside to enhance illumination effect.” *Id.* ¶ 79; Fig. 5.

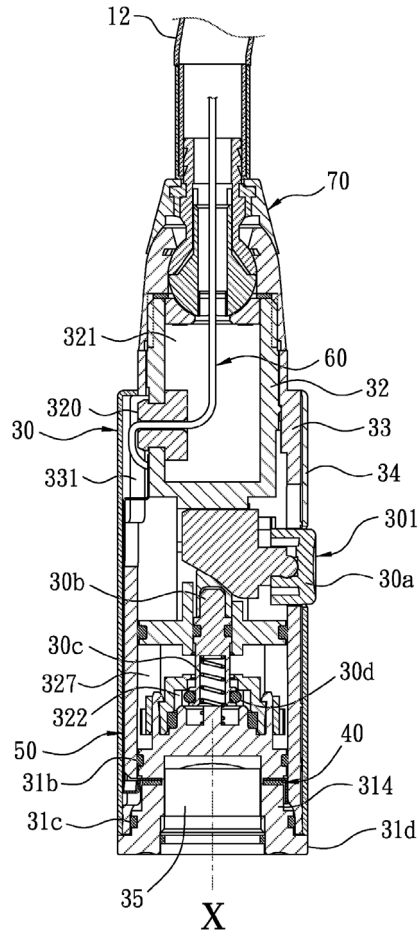


FIG. 5

Figure 5 shows a cross-sectional view of the pull-out faucet of Tseng's first embodiment. *Id.* ¶ 35.

Figures 27, 30, and 31, reproduced below, illustrate the light conductor and circuit board of Tseng's second embodiment:

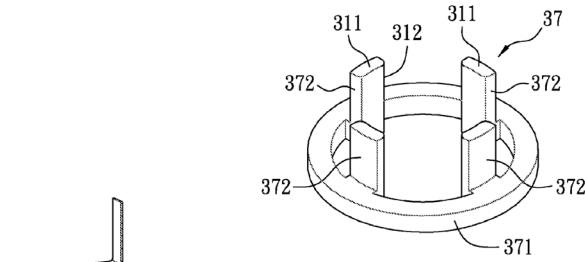


FIG. 30

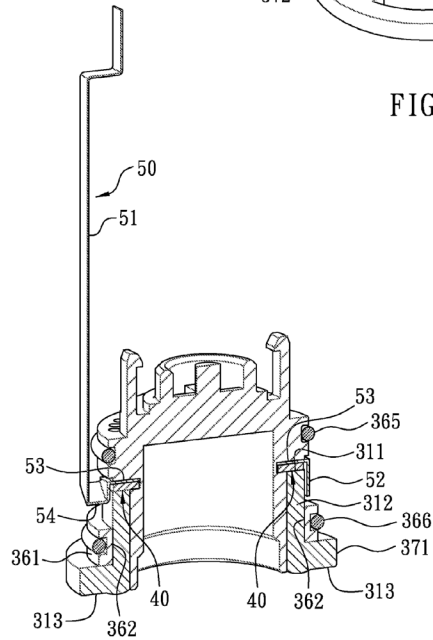


FIG. 31

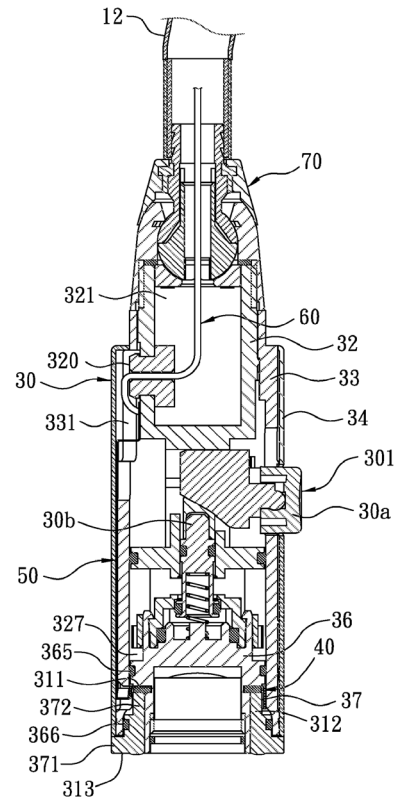


FIG. 27

Figure 30 shows light conductor 37 of Tseng's second embodiment. *Id.* ¶ 60. Figure 31 is a cross-sectional perspective view of light conductor 37, circuit board 50, and LED elements 40 of Tseng's second embodiment. *Id.* ¶ 61. Figure 27 is a cross-sectional view of elements of the pull-out faucet of Tseng's second embodiment. *Id.* ¶ 57.

As shown in Figure 30, light conductor 37 includes circular rib 371 and light columns 372 that extend upwardly from an inner wall of circular rib 371. *Id.* ¶ 91. Each light column 372 has an input face 311 formed on a top end. *Id.* Light columns 372 form light transmission portions 312, and bottom ends of light columns 372, along with the bottom end of circular rib 371, define output face 313. *Id.* As shown in Figure 31, C-shaped ring of circuit board 50 is fixed around light columns 372, and LED elements 40 on extensions 53 of circuit board 50 face input face 311 of each light

column 372. *Id.* ¶ 92. “A top end of the circular rib 371 of the light conductor 37 is opposite to a bottom end of the second stopping portion 366, a bottom end of the internal sleeve 33, and a bottom end of an external sleeve 34, such that exposes outside to enhance light transmission and illumination.” *Id.* ¶ 94, Figs. 27, 31.

Figure 32, reproduced below, illustrates the pull-out faucet of Tseng’s third embodiment:

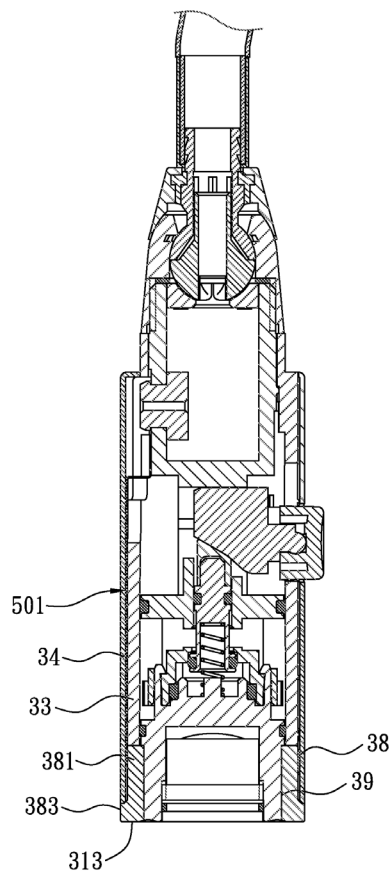


FIG. 32

Figure 32 is a cross-sectional view showing the pull-out faucet of Tseng’s third embodiment. *Id.* ¶ 62. Figures 35–37, reproduced below, illustrate the light conductor and circuit board of the pull-out faucet of Tseng’s third embodiment:

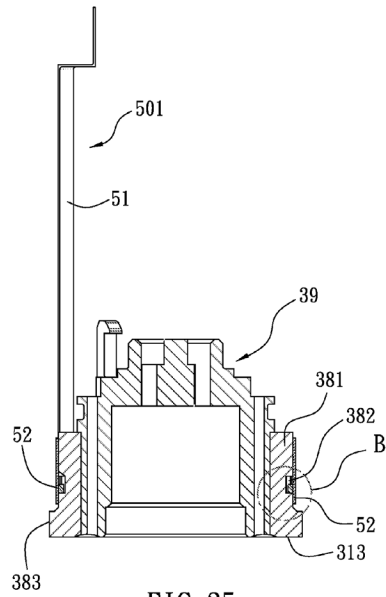


FIG. 35

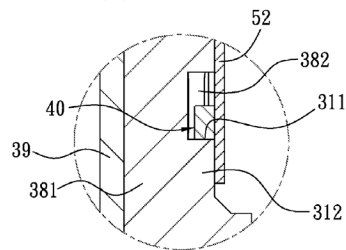


FIG. 36

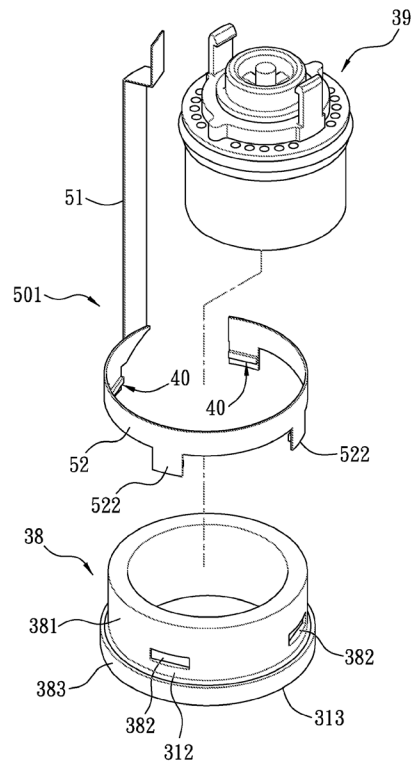


FIG. 37

Figure 35 shows a cross-sectional view of light conductor 38, circuit board 501, and LED elements 40 of Tseng's third embodiment. *Id.* ¶¶ 63–65. Figure 36 is an amplified cross-sectional view of portion B of Figure 35. *Id.* ¶ 66. Figure 37 is a perspective, exploded view of light conductor 38 and circuit board 501 of Tseng's third embodiment. *Id.* ¶ 67.

As shown in Figures 36 and 37, light conductor 38 includes outer cliff 381 having plural indentations 382. *Id.* ¶ 97. Input faces 311 are formed on a bottom end of each indentation 382 and output face 313 is formed on a bottom end of outer cliff 381. *Id.* Light transmission portion 312 is formed in outer cliff 381 between input faces 311 and output face 313. *Id.*

Circuit board 501 includes longitudinal sheet 51 and C-shaped ring 52, and LED elements 40 are arranged on an inner wall of C-shaped ring 52.

Id. ¶ 101. C-shaped ring 52 directly contacts outer cliff 381 of light conductor 38 to dispose LED elements 40 in indentations 382. *Id.* LED elements emit light to illuminate input faces 311 of light conductor 38. *Id.* “To enhance light transmission, the outer cliff 381 of the light conductor 38 has an annular protrusion 383 extending outwardly adjacent to the bottom end thereof to contact with a bottom end of an external sleeve 34.” *Id.* Figs. 32, 35, ¶ 98.

As shown in Figures 5, 27, and 32 (reproduced below again for ease of reference) rib 31d, rib 371, and annular protrusion 383 of Tseng’s first, second, and third embodiments, respectively, are structurally similar and are disposed in the faucets’ spray heads at similar locations relative to the spray heads’ respective internal 33 and external 34 sleeves.

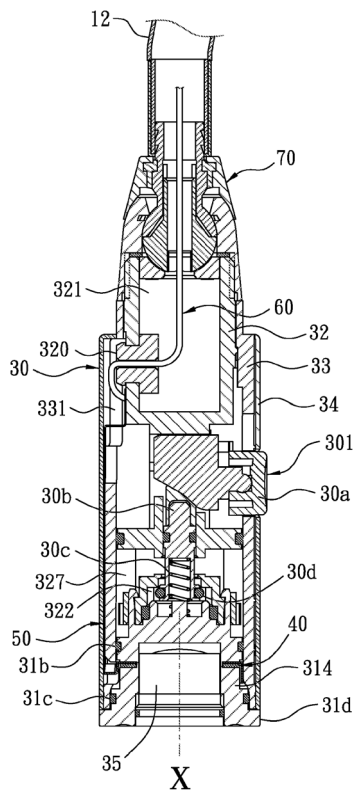


FIG. 5

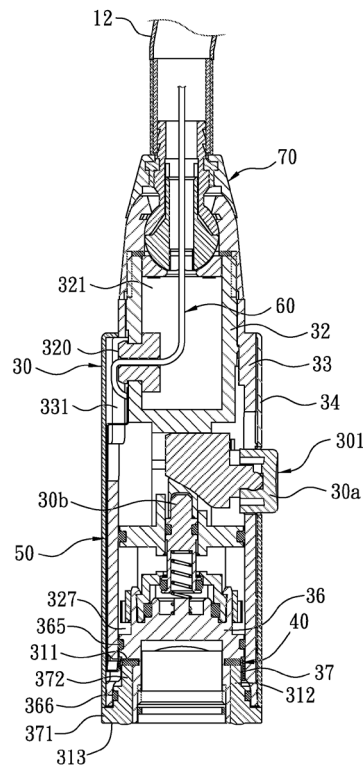


FIG. 27

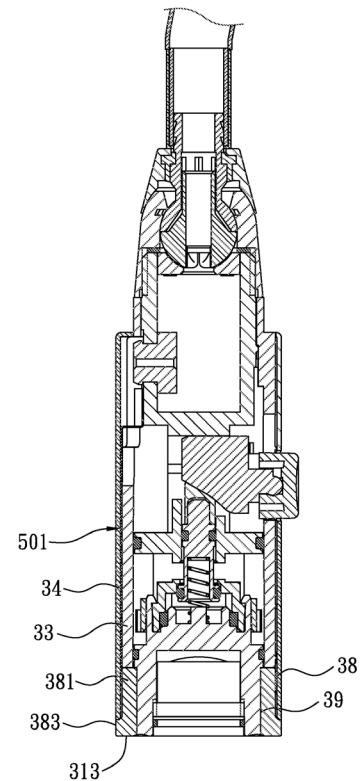


FIG. 32

b) Claim 1

The spray head of claim 1 includes a housing that supports an illumination device including a substrate, a plurality of light emitters supported by the substrate, and a *translucent* light pipe defining a closed loop *to diffuse light* from the light emitters outwardly away from the housing. Ex. 1001, 7:7–17. The parties dispute whether Tseng discloses (1) a translucent light pipe (2) to diffuse light from the light emitters outwardly away from the housing. *Compare* Pet. 29–32, *with* Resp. 17–46. We focus our analysis on these disputed limitations of claim 1, but first address whether Petitioner meets its burden of showing that Tseng discloses or would have suggested the remaining elements of claim 1.

The preamble of claim 1 recites a spray head. Ex. 1001, 7:7. To the extent that the preamble is limiting, Tseng discloses a spray head. Pet. 23; Ex. 1004 ¶ 68 (describing spray head 30 of pull-out faucet 1), Fig. 1. Patent Owner does not contest this point. Resp. 17–46.

The spray head of claim 1 includes a housing defining a longitudinal axis. Ex. 1001, 7:8. Tseng discloses such a housing. Tseng’s spray head 30 includes internal sleeve 33 and external sleeve 34 that surround and contain the remaining components of spray head 30; sleeves 33, 34 thus form a housing. Pet. 24; Ex. 1004 ¶ 73, Figs. 5, 27, 32. Tseng’s spray head 30 includes longitudinal central axis X within sleeves 33, 34, corresponding to a housing defining a longitudinal axis. Pet. 24; Ex. 1004 ¶¶ 13, 17, 71, Fig. 5. Patent Owner does not contest this point. Resp. 17–46.

The spray head of claim 1 includes a waterway received within the housing. Tseng discloses such a waterway. Tseng’s spray head 30 includes conduit member 32 disposed within sleeves 33, 34, and water flows out of spray head 30 via conduit member 32; conduit member 32 thus corresponds

to a waterway. Pet. 25; Ex. 1004 ¶¶ 68, 76, 77, Fig. 5. Patent Owner does not contest this point. Resp. 17–46.

The spray head of claim 1 includes a spray face fluidly coupled to the waterway and supporting a water outlet. Tseng’s spray head includes such a spray face. In particular, Tseng’s spray head 30 includes central 316 and peripheral 317 channels fluidly connected to internal conduit 32 (waterway). During operation, water flows through internal conduit 32 (waterway) to and through channels 316, 317 (water outlets) and water exits channels 316, 317 (water outlets) at the lower surface of spray head 30 (spray face). Pet. 26–27; Ex. 1004 ¶¶ 76, Figs. 8, 10, 32. Patent Owner does not contest this point. Resp. 17–46.

The spray head of claim 1 includes an illumination device supported by the housing that includes a plurality of light emitters supported by a substrate and a translucent light pipe defining a closed loop to diffuse light from the light emitters outwardly away from the housing. As discussed above, the parties dispute whether Tseng discloses or would have suggested that its spray head includes such an illumination device. For reasons discussed below, Petitioner establishes by a preponderance of the evidence that Tseng’s spray head includes an illumination device having the features recited in claim 1. Patent Owner’s assertions to the contrary are inconsistent with Tseng’s disclosures and the evidence of record.

As discussed above, Tseng discloses three embodiments of its pull-out faucet. Spray head 30 of each of the three embodiments includes circuit board 50 (“substrate”) that supports multiple LED elements 40 (“plurality of light emitters”) and a circular-shaped light conductor (“light pipe that defines a closed loop”), which together form an illumination device supported by Tseng’s internal 33 and external 34 sleeves (housing). Pet.

28–34; Ex. 1004 ¶¶ 10–11, 24, 26, 68, 70–72, 91, 94, 96–101, Figs. 11, 24, 30, 31, 32–37. Patent Owner does not contest this point. Resp. 17–46.

But Patent Owner does contest Petitioner’s contention that Tseng discloses a translucent light pipe that diffuses light from light emitters outwardly away from a housing, as recited in claim 1. *Id.* A preponderance of the evidence, however, supports Petitioner’s position that Tseng would have suggested a circular light conductor formed of a translucent material that diffuses and transmits light from Tseng’s LED elements to the exterior of Tseng’s spray head through the output face, corresponding to a translucent light pipe as recited in claim 1. Pet. 30–32, 34–35. As discussed more fully below, Petitioner’s showing is based on disclosures from Tseng’s “Summary of the Invention” section, from Tseng’s description of advantages of the pull-out faucet of Tseng’s invention, and from Tseng’s “Detailed Description of the Preferred Embodiments” section describing each of Tseng’s three embodiments. Pet. 30–32, 34–35 (citing Ex. 1004 ¶¶ 11, 24, 70, 94, 97, 98, 102, Figs. 30, 32, 35–37).

Petitioner explicitly addresses its reliance on aspects of the light conductors of each of Tseng’s three embodiments, explaining that “[t]his petition focuses on the second and third embodiments,” but “because Tseng’s three embodiments are overlapping and have numerous common structural features—many of which are discussed only in the context of the first embodiment—this petition also cites to certain first embodiment passages.” Pet. 15. Consistent with this approach, Petitioner’s witness, Mr. Cook, indicates that although his declaration focuses Tseng’s second and third embodiments, “a POSITA would understand Tseng’s discussion of the features in the first embodiment to apply equally to the same or

analogous features when present in the second and third embodiments.” Ex. 1003 ¶ 92.

Mr. Cook’s opinion as to the understanding of a POSITA is consistent with Tseng’s description and illustration of the embodiments of its inventive faucet, when this description is considered as a whole. In particular, Tseng’s “Detailed Description of the Preferred Embodiments” section spans paragraphs 68 to 101 of the reference and describes the first, second, and third embodiments of Tseng’s faucet. Ex. 1004 ¶¶ 68–101. Paragraphs 68 to 89 describe in detail, and Figures 1 to 26 illustrate, aspects and features of the faucet of Tseng’s first embodiment. Paragraph 90 references Figures 27 to 29 and describes specific differences between the faucet of Tseng’s second embodiment and that of Tseng’s first embodiment. Paragraphs 91 to 95 describe in further detail aspects and features of the second embodiment that differ from those of the first embodiment, and Figures 30 and 31 illustrate such features of the second embodiment. Similarly, paragraphs 96 and 97 reference figures 32 to 37 and describe specific differences between the faucet of Tseng’s third embodiment and that of Tseng’s second embodiment. Paragraphs 98 to 101 describe in further detail aspects and features of the third embodiment that differ from those of the second embodiment.

Tseng’s “Detailed Description of the Preferred Embodiments” section thus describes the first embodiment of Tseng’s faucet in great detail, describes the second embodiment by pointing out the differences between the second embodiment and the first embodiment, and describes the third embodiment by pointing out the differences between the third embodiment and the second embodiment. Due to this approach for describing the second and third embodiments by pointing out the differences between these

embodiments and the first and second embodiments, respectively, we credit Mr. Cook's opinion that "a POSITA would understand Tseng's discussion of the features in the first embodiment to apply equally to the same or analogous features when present in the second and third embodiments." In other words, a POSITA would understand that the features of Tseng's first embodiment that Tseng does not discuss as being different in the second and third embodiments would be the same in all three embodiments, due to the nature of how Tseng describes the second and third embodiments. *In re Preda*, 401 F.2d 825, 826 (CCPA 1968) (In assessing the content of the applied prior art, "it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom." (citation omitted)).

We turn now to the particular disclosures of Tseng. Petitioner relies on to support its position that Tseng would have suggested a closed loop light pipe formed of a translucent material that transmits and diffuses light from Tseng's LED elements away from the housing of Tseng's spray head, in accordance with claim 1. Pet. 30–32, 34–35 (citing Ex. 1004 ¶¶ 11, 24, 70, 94, 97, 98, 102, Figs. 30, 32, 35–37).

First, the "Summary of the Invention" section of Tseng discloses that Tseng's spray head includes a light conductor having at least one input face for inputting lights, at least one light transmission portion for transmitting the lights, and at least one output face for outputting the lights. Ex. 1004 ¶¶ 10, 11.

Second, Tseng includes a listing of eight advantages of "the pull-out faucet of the present invention," the first of which is that "spray head 30 has brilliant illumination." *Id.* ¶ 103. This disclosure describes general features and advantages of the faucet of Tseng's invention, and, therefore, is not

directed to features and advantages of any particular embodiment of the faucet; consequently, this disclosure relates to all the embodiments of Tseng's inventive faucet.

Third, in the “Detailed Description of the Preferred Embodiments” section, Tseng discloses that light conductor 31 of its first embodiment is “made of translucent material to guide lights,” and includes input faces 311 for inputting the lights, light transmission portion 312 for transmitting the lights, output face 313 for outputting the lights, and circular rib 31d that “exposes outside to enhance illumination effect.” Pet. 29–31; Ex. 1004 ¶¶ 70, 79, Figs. 5, 9, 12, 13. Tseng discloses that light conductor 37 of Tseng's second embodiment includes input faces 311, light transmission portions 312, output face 313, and circular rib 317 that “exposes outside to enhance light transmission and illumination.” Pet. 31; Ex. 1004 ¶¶ 91, 94, Figs. 27, 30, 31. Tseng discloses that light conductor 38 of Tseng's third embodiment includes input faces 311, light transmission portion 312, output face 313 defined on the bottom end of the light transmission portion (bottom end of outer cliff 381), and annular protrusion 383 “to enhance light transmission.” Pet. 31–32, 34–35; Ex. 1004 ¶¶ 97, 98, Figs. 32, 35, 36.

The light conductors of all three of Tseng's embodiments thus include input faces, a light transmission portion, an output face , and a rib or protrusion. Tseng's description of the second and third embodiments does not indicate that the material used to form the light conductors of these embodiments differs from the translucent material used to form the light conductor of Tseng's first embodiment. Thus, when considering the entirety of Tseng's “Detailed Description of the Preferred Embodiments” section, a POSITA reasonably would have understood that the light conductor of all three of Tseng's embodiments is formed of a translucent material, consistent

with Mr. Cook’s interpretation of Tseng’s description of its three embodiments. Ex. 1003 ¶ 92.

As Petitioner persuasively explains, because Tseng’s light conductor is formed of a translucent material, “a POSITA would have understood that Tseng’s light conductor engages in internal light diffusion and reflection to transmit the light emitted from the LEDs through (and eventually out of) the conductor.” Pet. 32 (citing Ex. 1003 ¶¶ 173–175); *see also id.* at 37 (“a POSITA would understand that—given the path it must travel—light entering Tseng’s light conductor will be substantially diffused as it is transmitted towards protrusion 383 and [output] face 313”) (citing Ex. 1003 ¶ 102).

Petitioner, therefore, persuasively shows that the relied-upon disclosures of Tseng would have suggested a closed loop, translucent light conductor that transmits and diffuses light from Tseng’s LED elements, and outputs diffused light through the light transmission portion and bottom output face to the exterior of Tseng’s spray head away from the housing, corresponding to a translucent light pipe having the features recited in claim 1.

Patent Owner argues that Tseng only uses the word “translucent” in connection with the light conductor of its first embodiment, and Tseng is silent as to the material used for the light conductors of its second and third embodiments, which Petitioner relies on for disclosure of “other features” of claim 1. Resp. 17–20 (citing Pet. 15, 29–30; Ex. 1004 ¶¶ 70, 91, 97; Ex. 2003 ¶¶ 82–87).

Regardless of whether Tseng explicitly discloses that the light conductors of Tseng’s second and third embodiments are formed of a translucent material, a POSITA reasonably would have understood this to be

the case—based on Tseng’s disclosures as a whole—for reasons discussed above. Patent Owner’s argument, and Dr. Klopp’s corresponding opinion, do not take into consideration the entirety of Tseng’s disclosures as they would be interpreted by a POSITA. *In re Mercier*, 515 F.2d 1161, 1165 (CCPA 1975) (“[A]ll of the relevant teachings of the cited references must be considered in determining what they fairly teach to one having ordinary skill in the art.”); *In re Meinhardt*, 392 F.2d 273, 276, 55 CCPA 1000, 1004 (1968); *see also In re Wesslau*, 353 F.2d 238, 241 (1965) (“It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art.”).

Because Dr. Klopp’s opinion on this particular issue is inconsistent with Tseng’s disclosures as a whole, we accord little weight to the opinion. *Velandier v. Garner*, 348 F.3d 1359, 1371 (Fed. Cir. 2003) (“In giving more weight to prior publications than to subsequent conclusory statements by experts, the Board acted well within [its] discretion.”); *Yorkey v. Diab*, 601 F.3d 1279, 1284 (Fed. Cir. 2010) (The Board has discretion to give more weight to one item of evidence over another “unless no reasonable trier of fact could have done so”).

Patent Owner argues, and Dr. Klopp opines, that the light conductors of Tseng’s three embodiments have different objectives: the light conductor of the first embodiment enhances illumination, the light conductor of the second embodiment enhances light transmission and illumination, and the light conductor of the third embodiment enhances light transmission. Resp. 23 (citing Ex. 1004 ¶¶ 79, 980, 94, 95, 98; Ex. 2003 ¶¶ 88–90). Patent Owner argues that a POSITA, therefore, would have recognized that the

light conductors of Tseng's second and third embodiments "focus more on light 'transmission.'" Resp. 23. Consistent with this position, Dr. Klopp opines that a "POSITA would recognize that translucence is antithetical to enhanced transmission due to the light scattering associated with translucence" and "using translucent material would be a suboptimal choice for the second and third embodiments due to scattering" and "would go against the stated 'advantage' in Tseng, namely 'brilliant illumination.'" Ex. 2003 ¶ 90 (citing Ex. 1004 ¶¶ 102–103); *see also* Ex. 1015, 19:4–12, 21:19–22:8.

Patent Owner's arguments and Dr. Klopp's opinions and testimony are inconsistent with Tseng's disclosures as a whole, however. In particular, as discussed above, Tseng explicitly discloses that the light conductor of its first embodiment functions to "enhance illumination," is formed of translucent material, and like the light conductors of Tseng's second and third embodiments, includes a transmission portion, an output face, and a rib (or protrusion). Tseng further explicitly discloses that the faucet of its invention—which includes all embodiments of the faucet, including the first embodiment—provides "brilliant illumination." *Id.* ¶ 103.

Tseng's disclosures as a whole, consequently, reasonably would have suggested that all embodiments of Tseng's faucet, including the first embodiment having a translucent light conductor, provide brilliant illumination. Dr. Klopp's opinion that using a translucent material to form the light conductor of Tseng's second and third embodiments "would be a suboptimal choice" "due to scattering," and "would go against the stated 'advantage' in Tseng, namely 'brilliant illumination'" is, therefore, inconsistent with Tseng's disclosures as a whole. We, therefore, accord

little weight to Dr. Klopp's opinion on this particular issue. *Velandar*, 348 F.3d at 1371; *Yorkey*, 601 F.3d at 1284.

Patent Owner argues that Petitioner does not provide any reason why a POSITA "would have been motivated to use the same translucent material from Tseng's first embodiment to modify its second and third embodiments." Resp. 21 (citing *Intelligent Bio-Systems, Inc. v. Illumina Cambridge, Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016)). According to Patent Owner, "Petitioner cannot mix and match different embodiments within a reference without presenting evidence that a POSITA would have been motivated to combine them." *Id.* at 22 (citing *In re Stepan Co.*, 868 F.3d 1343, 1346 n.1 (Fed. Cir. 2017); *Virtek Vision Int'l ULC v. Assembly Guidance Sys., Inc.*, 97 F.4th 882, 887 (Fed. Cir. 2024); Ex. 2003, ¶¶ 84–85).

As discussed above, however, Petitioner's showing is not based on modifying the light conductor of Tseng's second and third embodiments, or on combining the light conductors of Tseng's embodiments. Rather, Petitioner's showing is based on Tseng's disclosures as a whole as they reasonably would have been interpreted by a POSITA. To repeat, Petitioner persuasively shows that a POSITA reasonably would have understood the entirety of Tseng's disclosures to have suggested a closed loop, translucent light conductor that transmits and diffuses light from LED elements, and outputs diffused light through the light transmission portion and bottom output face to provide brilliant illumination, corresponding to a translucent light pipe defining a closed loop to diffuse light from light emitters outwardly away from a housing, as recited in claim 1.

Patent Owner argues that the Petition fails to demonstrate that Tseng discloses or would have suggested a translucent light pipe defining a closed

loop to *diffuse light* from the light emitters outwardly away from the housing. Resp. 39. Patent Owner argues that “Tseng does not say anything about diffusing light,” and instead states that the light conductors of its second and third embodiments enhance light transmission and illumination. Resp. 39–40 (citing Ex. 1004 ¶¶ 94, 98). According to Patent Owner, a “POSITA would have understood that Tseng’s light conductors 37 and 38 are structured to further Tseng’s objective to enhance and transmit light, which suggests not to diffuse light.” Resp. 41 (citing Ex. 1004 ¶¶ 94, 98, 103); *see also id.* at 28 (“there is no disclosure in Tseng that light conductor 38 engages in internal light diffusion and reflection”); *id.* at 33 (“there is no evidence in Tseng that the light conductor 38 in this embodiment diffuses light.”).

Contrary to Patent Owner’s arguments, a preponderance of the evidence on the present record supports Petitioner’s position that Tseng would have suggested a translucent light pipe defining a closed loop to diffuse light from light emitters *outwardly away from the housing* as recited in claim 1, for reasons that follow.

First, as discussed above, Petitioner persuasively shows that Tseng’s disclosures as a whole would have suggested a closed loop, translucent light conductor that transmits and diffuses light from LED elements, and outputs diffused light through the light transmission portion and bottom output face to the exterior of a spray head. In particular, as Petitioner persuasively explains, a POSITA would have understood that because Tseng’s light conductor is formed of translucent material, the light conductor would diffuse—to at least some extent—light transmitted through the light transmission portion and bottom output face, and, as a consequence, would

output at least some diffused light through the output face away from the housing. Pet 32, 37.

Second, Patent Owner's assertion that a POSITA would have understood that the light conductors of Tseng's second and third embodiments are structured to enhance and transmit light, "which suggests not to diffuse light," is contrary to Tseng's disclosures. As discussed above, Tseng explicitly discloses that the light conductor of its first embodiment is formed of translucent material and functions to "enhance illumination," and additional evidence of record indicates that the translucent material would diffuse (or scatter) light, to at least some extent (as discussed above). Tseng's explicit disclosure of providing enhanced illumination with a translucent light conductor, therefore, would have suggested that diffuse light emitted from the translucent light conductor provides enhanced illumination, contrary to Patent Owner's argument that enhanced transmission and illumination suggest "not to diffuse light."

Although Patent Owner also argues that the Petition fails to sufficiently explain what motivation a POSITA would have had to modify Tseng's light conductor 37 or 38 to diffuse light outwardly away from the housing (Resp. 40–41), Petitioner's showing is not based on modifying the light conductors of Tseng's second and third embodiments (as discussed above). Reply 12; *see also* Tr. 62:17–24.

And although Patent Owner also argues that a POSITA would have understood that the light conductors of Tseng's second and third embodiments would create hot spots, the plain language of claim 1 does not exclude formation of hot spots, requiring only diffusion of light from the light emitters outwardly away from the housing. Resp. 42–43; *In re Self*, 671 F.2d 1344, 1348 (CCPA 1982) ("[A]ppellant's arguments fail from the

outset because . . . they are not based on limitations appearing in the claims.”).

Finally, Patent Owner argues that “despite conceding that Tseng does not anticipate,” the Petition does identify any motivation that a POSITA would have had to modify any portion of Tseng to arrive at the claimed features, and fails to identify any reasonable expectation of success in a proposed modification. Resp. 44–45. Again, however, Petitioner’s showing is not based on modifying any of Tseng’s explicit disclosures, and instead is based on what Tseng’s disclosures as a whole reasonably would have suggested to a POSITA.

Considering the totality of the evidence presented in the record before us, a preponderance of the evidence supports Petitioner’s position that the subject matter of claim 1 would have been *prima facie* obvious over Tseng.

c) Claim 2

Claim 2 depends from claim 1. Petitioner identifies disclosures in Tseng that teach or would have suggested each limitation of claim 2, and Patent Owner does not challenge Petitioner’s showing for this claim. *Compare* Pet. 38–39 (citing Ex. 1003 ¶¶ 207–214; Ex. 1004 ¶¶ 1, 68, 82, Figs. 2, 4, 5), *with* Resp. 17–46. For the reasons discussed above for independent claim 1, along with Petitioner’s arguments and evidence for claim 2, Petitioner shows by a preponderance of the evidence that claim 2 would have been *prima facie* obvious over Tseng. *Incept LLC v. Palette Life Sciences, Inc.*, 77 F.4th 1366, 1375 (Fed. Cir. 2023) (“Where a party ‘does not raise any arguments with respect to any other claim limitation, nor does it separately argue [the] dependent claim,’ ‘[the] dependent claim . . . stands or falls together with [the] independent claim.’”) (quoting *Genentech, Inc. v. Hospira, Inc.*, 946 F.3d 1333, 1340 (Fed. Cir. 2020)).

d) *Claim 10*

Independent claim 10 is similar to claim 1, and is reproduced below with differences from claim 1 italicized:

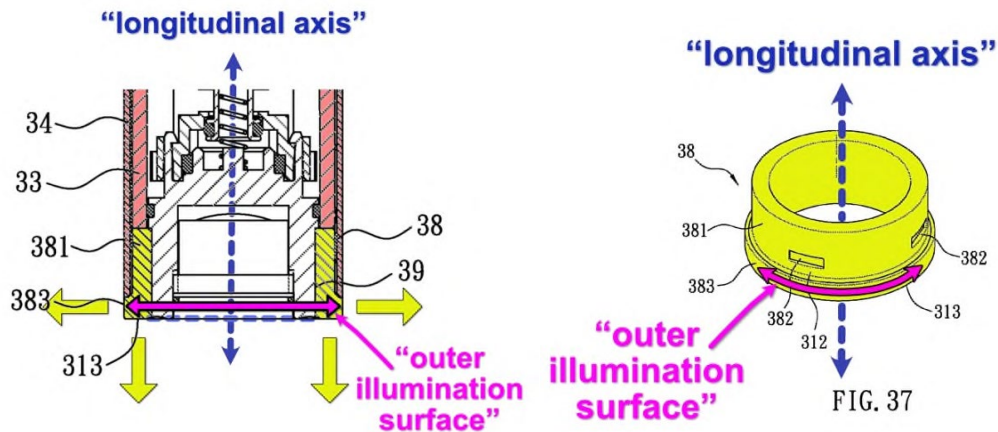
10. A *pull-down* sprayhead for a faucet, the sprayhead comprising:
a housing defining a longitudinal axis *extending between a proximal end and a distal end*;
a waterway received within the housing;
a sprayface fluidly coupled to the waterway and *defining a water outlet*; and
an illumination device supported by the housing, the illumination device including a substrate, a plurality of light emitters supported by the substrate, and a translucent light pipe *including an outer illumination surface extending perpendicular to the longitudinal axis of the housing*, the translucent light pipe defining a closed loop to diffuse light from the light emitters *outwardly to the outer illumination surface*.

Ex. 1001, 7:47–61.

The parties dispute whether Tseng discloses a translucent light pipe including an *outer illumination surface extending perpendicular to the longitudinal axis of the housing*, as required by claim 10. Compare Pet. 35–38, with Resp. 25–37. For reasons that follow, Petitioner does not establish by a preponderance of the evidence that Tseng discloses or would have suggested a light pipe having such an illumination surface.

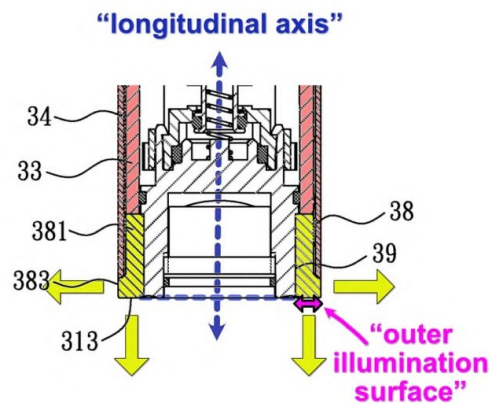
Petitioner asserts that Tseng’s spray head includes two illumination surfaces as recited in claim 10. Pet. 35–36. First, according to Petitioner, protrusion 383 of light conductor 38 “forms an outer surface that proceeds circumferentially around the spray head like a belt,” and “[t]his surface’s direction of “exten[sion]” (around the housing) is “perpendicular” to the

housing's "longitudinal axis," as shown in Petitioner's excerpted and annotated versions of Tseng's Figures 32 and 37, reproduced below:



Pet. 35 (citing Ex. 1004, Figs. 32, 27). Figure 32 is a cross-sectional view of the spray head of the faucet of Tseng's third embodiment, and Figure 37 is a perspective view of the light conductor of the faucet of Tseng's third embodiment. Ex. 1004 ¶¶ 62, 67.

Second, according to Petitioner, "light conductor 38 also has a lower surface 313 with a direction of 'extension' (a width) that is similarly 'perpendicular' to the housing's 'longitudinal axis,'" as shown in Petitioner's excerpted and annotated version of Tseng's Figure 32, reproduced below:



Pet. 36. (citing Ex. 1004, Fig. 32). Figure 32 is a cross-sectional view of the spray head of the faucet of Tseng's third embodiment. Ex. 1004 ¶ 62.

Petitioner argues that “[b]oth of these faces receive and emit light from the LEDs 40.” *Id.* (citing Ex. 1004 ¶¶ 97–98; Ex. 1003 ¶¶ 195–198). Mr. Cook merely repeats Petitioner’s statements, without further explanation or elaboration. Ex. 1003 ¶¶ 195–198.

Patent Owner addresses Petitioner’s first asserted illumination surface, arguing that “Tseng only describes the *bottom face* of the annular protrusion [383]—not the entire protrusion—as the output face 313,” and Tseng makes clear that light from each LED element enters light conductor 38 through input face 311 and exits through output face 313. Resp. 28–29 (citing Ex. 1004 ¶ 97). Patent Owner argues that “nowhere does Tseng describe or suggest that light emanates from the side of the annular portion 383, or that the side of annular protrusion 383 is another output face 313.” Resp. 33–34 (citing Ex. 2003 ¶¶ 101–102). Consistent with Patent Owner’s argument, Dr. Klopp opines that a “POSITA would understand from Tseng’s third embodiment that light from the LED would bypass the annular protrusion 383 of outer cliff 381, while transmitting downwardly toward the output face 313.” Ex. 2003 ¶ 101; *see also* Ex 1015, 37:25–38:1 (“no meaningful light would reach 383”). According to Patent Owner and Dr. Klopp, a POSITA would understand the purpose of annular protrusion 383 to be to enlarge the bottom illumination surface—output face 313—to make the illumination effect brighter. Resp. 33, 36 (citing Ex. 1004 ¶¶ 98, 103); Ex. 2003 ¶¶ 102, 105.

Petitioner does not establish by a preponderance of the evidence that the side surface of Tseng’s annular protrusion 383 is an “outer illumination surface extending perpendicular to the longitudinal axis of the housing” as recited in claim 10, for reasons that follow.

First, as discussed above, Tseng discloses that light is transmitted through the light transmission portion and bottom output face 313 of light conductor 38, which teaches transmitting light in parallel with the longitudinal axis of the housing. Tseng does not disclose or teach that light is emitted through the side surface of annular protrusion 383 in a direction perpendicular to the longitudinal axis of the housing. Ex. 1004 ¶ 97. Petitioner's assertions that this would be the case consist solely of conclusory statements, supported only by citations to Mr. Cook's declaration. Mr. Cook, however, simply repeats Petitioner's conclusory statements, without providing sound technical reasoning supported by objective evidence to explain and support his opinions. Ex. 2003 ¶¶ 101–102, 105, 195–198, 202. We, therefore, accord little weight to Mr. Cook's opinion on this particular matter because it “merely repeats, verbatim, the conclusory assertion for which it is offered to support,” and “does not cite to any additional supporting evidence or provide any technical reasoning [in] support.” *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 15 (PTAB Aug. 24, 2022) (precedential).

Furthermore, Mr. Cook's opinion conflicts with that of Patent Owner's witness, Dr. Klopp, who opines that a “POSITA would understand from Tseng's third embodiment that light from the LED would bypass the annular protrusion 383 of outer cliff 381, while transmitting downwardly toward the output face 313.” *Compare* Ex. 1003 ¶¶ 174–175, 190–194, *with* Ex. 2003 ¶¶ 101–102, 105. As discussed above, Mr. Cook is qualified to opine from the perspective of a POSITA on technical matters included within the expertise of a person meeting Petitioner's definition of a POSITA, which do not include optics and optical apparatus. We, therefore, credit Dr. Klopp's opinion over that of Mr. Cook on this particular factual issue of how

and where light would be emitted from Tseng's light conductor 38, because it is directly related to optical systems and methods about which Mr. Cook possesses limited relevant experience. *See* Ex. 1003 ¶¶ 6–15 (experience in communication systems and electronics); Ex. 2005, 55:16–58:19 (design experience with electronics that use indicator lights or fiber-optic communications; no professional experience with light pipes, diffusers, or plumbing fixtures). Dr. Klopp possesses substantial research and professional experience with optical methods, fiber optic light pipes, light guides, diffusers, prisms, and analysis of faucets, spray heads, and plumbing fixtures. *See* Ex. 2003 ¶¶ 6–10 *Supra* 8 (discussing weight accorded to conflicting witness testimony); *see also* Resp. 2–3 (arguing that “Petitioner's expert, Mr. Cook, is a mechanical engineer with substantial professional experience in electronics for high-voltage power systems and communications, but he has limited experience with the claimed subject matter.”).

Second, in response to Patent Owner's arguments, Petitioner again provides nothing more than conclusory statements in the Reply to support its position that a POSITA would understand that light would be emitted from the side of protrusion 383 of Tseng's light conductor 38, and Petitioner again cites the same conclusory opinions in the Cook declaration to support its statements. Reply 5–8 (citing Ex. 1003 ¶¶ 174–175).

Petitioner also argues in the Reply that Patent Owner's position that a POSITA would have understood the function of Tseng's protrusion 383 to be to provide a larger bottom output face 313 “finds no support in Tseng.” Reply 6 (citing Resp. 34). Petitioner argues that “protrusion 383 would not meaningfully ‘enhance’ light transmission if it simply outputs light in the exact same way as ‘output face 313,’” and Petitioner argues that there would

be no reason for annular protrusion 383 to extend outwardly if it were not intended to transmit light radially outwardly. *Id.*

Petitioner and Patent Owner—and their respective witnesses—offer differing explanations for why annular protrusion 383 would enhance light transmission from Tseng’s light conductor 38, neither of which is explicitly disclosed or suggested in Tseng. *Compare* Reply 5–8 (citing Ex. 1003 ¶¶ 174–175, *with* Resp. 33–34 (citing Ex. 2003 ¶¶ 101–102)). Because Patent Owner’s witness (Dr. Klopp) has greater experience with the technology at issue—optical systems and methods—we accord more weight to Dr. Klopp’s opinion on the purpose and effect of annular protrusion 383 than we accord to Mr. Cook’s opinion on this matter.

Third, Petitioner also presents arguments directed to Gautschi (Ex. 2009, also referred to as the ’874 patent) in the Reply, but Petitioner’s reliance on Gautschi does not meaningfully support its position that light would be emitted from the side of annular protrusion 383 of Tseng’s light conductor 38. To place Petitioner’s reliance on Gauschi in context, the “Background of the Invention” section of Tseng states that “A conventional illuminative faucet is disclosed in U.S. Pat. No. 7,467,874 B2 [Gauschi] and contains a shower head, wherein the shower head has an outlet pipe to flow water and guide lights, the shower head also has plural LED elements to illuminate the lights via the outlet pipe.” Ex. 1004 ¶ 3. Tseng goes on to state that “[t]he conventional illuminative faucet also contains an electric wire electrically connected with a power supply,” and Tseng explains that the electric wire results in “complicated assembly” and “is broken easily as rotating the shower head and [the] rotation angle of the shower head is limited.” *Id.* ¶ 4.

In the Response, in the context of addressing Petitioner’s assertion of the unpatentability of claims 9 and 11 in Ground 2, Patent Owner relies on asserted benefits of an external power supply disclosed in Gauschi to support its argument that a POSITA would not have been motivated to replace Tseng’s external electrical power source with a hydro-generator as disclosed in Mizuno. Resp. 46–48 (citing Ex 2009, 4:24–26, 8:25–29, 8:30–31, 8:40–42).

In the Reply, Petitioner argues that Dr. Klopp testified that a “POSITA would have reviewed” Gauschi “to further understand” Tseng, and Petitioner contends that Gauschi “discloses an illuminated plumbing fixture almost indistinguishable from Tseng.” Reply 8 (citing Ex. 2003 ¶ 120; Ex. 2009 1:6–7). According to Petitioner, Gauschi discloses that its plumbing fixture includes lightguide outflow pipe 50 at its end, and light from LEDs 74 enters lightguide outflow pipe 50 via “input face 56,” proceeds through “transmission region 52,” and “rather than exiting only via ‘end face 58,’ the ’874 patent [Gauschi] explains that ‘light may also be output from . . . the exposed outer surface area 72.’” *Id.* (citing Ex. 2009, 318–27, 3:51–62, Fig. 2). Petitioner then cites Dr. Klopp’s deposition testimony and states that “[t]his directly contradicts how Patent Owner interprets Tseng.” *Id.* at 9 (citing Ex. 1015, 47:14–48:1, 50:1–52:4, 53:3–54:1, 54:23–55:8).

Contrary to Petitioner’s argument, Dr. Klopp’s deposition testimony directed to Gauschi’s light guide outflow pipe 50 simply confirmed that Petitioner’s counsel had correctly read certain of Gauschi’s disclosures. Ex. 1015, 47:3–57:6 (discussing Ex. 2009, 3:52–60, 4:2–3, 6:29–33, Figs. 2 and 3). Dr. Klopp did not draw any parallels between Tseng’s light conductor and Gauschi’s light guide outflow pipe 50, except to say that Gauschi’s

light guide outflow pipe 50 is largely analogous to Tseng's light conductor "at a very high level." Ex. 1015 48:21–49:1 (discussing Ex. 2009, 3:18–30). Nor did Dr. Klopp provide any testimony explaining how Gautschi's light guide outflow pipe 50 operates, other than to confirm explicit language of certain of Gautschi's disclosures, as discussed above. Dr. Klopp, consequently, did not testify that any of Gautschi's disclosures demonstrate that light would be emitted from the side of annular protrusion 383 of Tseng's light conductor 38.

Petitioner's witness, Mr. Cook, offered no testimony related to Gautschi. As a consequence, the record is devoid of any expert testimony explaining how Gautschi's light guide outflow pipe 50 operates, and explaining how and why the disclosures of Gautschi Petitioner relies upon support Petitioner's position that light would be emitted from the side of annular protrusion 383 of Tseng's light conductor 38. Petitioner's conclusory assertions to that effect carry little weight in the absence of any corroborating evidence.

Nonetheless, Petitioner's counsel asserted at the hearing that Gautschi's disclosures undermine Dr. Klopp's credibility, referring to statements in paragraph 120 of Dr. Klopp's declaration. Tr. 58:7–61:6; *see also* Ex. 1016, slide 19. Dr. Klopp states in this paragraph of his declaration that "[a] POSITA would have reviewed the '874 patent to further understand the problems Tseng addresses, and while doing so, would have also recognized several benefits highlighted in the '874 patent regarding powering the faucet with a wired power source." Ex. 2003 ¶ 120 (citing Ex. 2009 4:24–31, 8:25–29, 8:30–31, 8:32–40). Dr. Klopp's deposition testimony directed to Gautschi's light guide outflow pipe 50 does not contradict these statements in paragraph 120 of Dr. Klopp's declaration.

Petitioner, therefore, does not show that Dr. Klopp's testimony directed to Gautschi's light guide outflow pipe 50 undermines Dr. Klopp's credibility. Ex. 1015, 47:3–57:6

As for the second outer illumination surface Petitioner asserts Tseng discloses, Petitioner does not provide a sufficient showing to establish that output face 313 of Tseng's light conductor 38 constitutes an outer illumination surface extending perpendicular to the longitudinal axis of Tseng's housing (internal 33 and external 34 sleeves). In particular, Petitioner is required to identify—in the Petition—how the challenged claims are to be construed. 37 C.F.R. § 42.104(b)(3). Petitioner, however, does not provide a proposed construction of “an outer illumination surface extending perpendicular to the longitudinal axis of the housing” as recited in claim 10. Due to lack of a proposed construction of this phrase, or a persuasive explanation by Mr. Cook of why Tseng would teach the recited limitation, the record is devoid of any explanation for why a POSITA would understand Tseng's output face 313 to constitute an outer illumination surface extending perpendicular to the longitudinal axis of Tseng's housing (internal 33 and external 34 sleeves).

Furthermore, Petitioner and Mr. Cook's position that output face 313 extends perpendicular to the longitudinal axis of Tseng's housing (internal 33 and external 34 sleeves) is inconsistent with their initial position that the side surface of annular protrusion 383 extends perpendicular to the longitudinal axis of the housing. Neither Petitioner nor Mr. Cook provides any explanation, beyond their conclusory assertions, for why a POSITA would understand output face 313 to extend perpendicularly to the longitudinal axis of Tseng's housing. Petitioner, therefore, does not provide a sufficient showing to establish that output face 313 of Tseng's light

conductor 38 constitutes an outer illumination surface extending perpendicular to the longitudinal axis of Tseng's housing (internal 33 and external 34 sleeves). "In an *inter partes* review, the burden of persuasion is on the petitioner to prove 'unpatentability by a preponderance of the evidence,' 35 U.S.C. § 316(e), and that burden never shifts to the patentee." *In re Magnum Oil Tools Int'l Ltd.*, 829 F.3d 1364, 1375 (Fed. Cir. 2016) (quoting *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015)); see also *Aqua Products, Inc. v. Matal*, 872 F.3d 1290, 1306 (Fed. Cir. 2017 (en banc (quoting *Magnum Oil*))).

Considering the totality of the evidence presented in the record before us, a preponderance of the evidence does not support Petitioner's position that Tseng discloses or would have suggested a translucent light pipe including an outer illumination surface extending perpendicular to the longitudinal axis of a housing. Petitioner, therefore, does not carry its burden of proving that claim 10 would have been obvious over Tseng; consequently, Petitioner does not establish the unpatentability of this claim.

e) Claims 15 and 16

Claims 15 and 16 each depend from claim 10; consequently, our analysis for claim 10 also applies to these claims. It follows that Petitioner does not establish by a preponderance of the evidence that claims 15 and 16 are unpatentable as obvious over Tseng.

f) Claims 3–5 and 12–14

As discussed above, claim 1 recites that the claimed spray head comprises a housing defining a longitudinal axis. Claim 3 depends (indirectly) from claim 1 and recites that the light pipe includes an annular ring configured to transmit light radially outwardly from the longitudinal axis. Claims 4 and 5 depend from claim 3. Similar to claim 3, claim 12

depends from claim 10 and recites that the light pipe includes an annular ring configured to transmit light radially outwardly. Claims 13 and 14 depend from claim 12.

The parties dispute whether Tseng discloses a light pipe having an annular ring configured to transmit light radially outwardly, as recited in claims 3 and 12. *Compare* Pet. 39–40, *with* Resp. 37–39. For reasons that follow, Petitioner does not establish by a preponderance of the evidence that Tseng discloses or would have suggested such a light pipe.

Petitioner asserts, without elaboration, that Tseng’s light conductor includes an annular ring configured to transmit light radially outwardly because (1) light conductor 37 shown in Tseng’s Figure 30 “includes a ‘circular rib 371’ that ‘exposes outside’ the spray head’s housing ‘to enhance light transmission and illumination,’” and (2) light conductor 38 shown in Tseng’s Figure 37 “has a ‘sleeve shape’ with a ‘light transmission portion’ and an ‘annular protrusion 383’ that ‘enhance[s] light transmission.’” Pet. 39–40 (citing Ex. 1004 ¶¶ 94, 97–98; Ex. 1003 ¶¶ 215–219). Petitioner cites the Cook declaration to support this assertion, but the cited paragraphs of the declaration repeat Petitioner’s statements *verbatim*. Ex. 1003 ¶¶ 217–219. In particular, the opinion that Tseng’s light pipe includes “an annular ring configured to transmit light radially outwardly” (*id.* ¶ 217) is supported inadequately, if at all, by the objective support cited in the Cook declaration. *Id.* ¶¶ 218–219 (citing Ex. 1004 ¶¶ 94, 97–98).

Patent Owner counters that even if Tseng’s circular rib 371 and annular protrusion 383 extend outwardly, Tseng does not disclose, teach, or suggest that its light conductor is “configured to transmit light radially outwardly” from the sides of circular rib 371 or annular protrusion 383. Resp. 36–37. Patent Owner contends that Tseng instead consistently

explains that light is transmitted through output face 313 at the bottom side of circular rib 371 and annular protrusion 383. *Id.* at 37–39 (citing Ex. 2003 ¶¶ 107, 109).

Patent Owner is correct that Tseng does not disclose that light emits from the sides of circular rib 371 and annular protrusion 383, and Tseng discloses that light is transmitted through light transmission portion 312 and output face 313 of light conductors 37, 38, which is at the bottom surface of each of light conductor 37, 38. Tseng ¶ 91 (“a bottom end of the circular rib 371 define[s] at least one output face [of light conductor 37],” as shown in Figure 17); *id.* ¶ 97 (“outer cliff 381 [of light conductor 38] also has an output face 313 defined on a bottom end thereof,” and “outer cliff 381 among input faces 311 . . . and the output face 313 forms a light transmission portion 312,” as shown in Figures 30 and 32).

Neither Petitioner nor Mr. Cook provides sound technical reasoning supported by objective evidence that explains why a POSITA would have understood Tseng’s disclosure, that light is transmitted through light transmission portion 312 and bottom output face 313 of light conductors 37, 38, to have taught or suggested that light conductors 37, 38 are configured to transmit light radially outwardly from the longitudinal axis of the housing. Nor do Petitioner and Mr. Cook provide an explanation supported by objective evidence for why a POSITA would have understood Tseng’s disclosure that circular rib 371 and annular protrusion 383 enhance light transmission and illumination to disclose or suggest that light conductors 37, 38 are configured to transmit light radially outwardly. Petitioner’s and Mr. Cook’s conclusory assertions to that effect fall short of a showing necessary to establish that a POSITA would have understood Tseng’s light conductors 37, 38 to be configured in this manner.

Considering the totality of the evidence presented in the record before us, a preponderance of the evidence does not support Petitioner's position that Tseng discloses or would have suggested a light conductor including an annular ring configured to transmit light radially outwardly from the longitudinal axis of the housing. Petitioner, therefore, does not carry its burden of proving that claims 3–5 and 12–14 would have been obvious over Tseng by a preponderance of the evidence; consequently, Petitioner does not establish the unpatentability of these claims.

2. *Ground 2: Asserted Obviousness over Tseng and Mizuno*

a) *Claim 9*

Claim 9 depends from claim 1 and requires the recited spray head to further comprise a hydrogenator fluidly coupled to the waterway and in electrical communication with the illumination device. Ex. 1001, 7:44–46, 7:62–64. Petitioner asserts that claim 9 would have been obvious over Tseng and Mizuno. Pet. 43–46. Patent Owner disagrees. Resp. 46–55. We begin our analysis of the parties' dispute with an overview of Mizuno.

Mizuno discloses that illumination lamps included in faucets conventionally have been powered with an external power supply connected to the lamps using electrical wiring, or by a battery mounted in the faucet's spout. Ex. 1008 ¶¶ 3, 4. Mizuno explains, however, that incorporation of electrical wiring into a faucet requires "time and effort in the construction, and an illumination function cannot be easily provided to the faucet." *Id.* ¶ 5. Mizuno further explains that mounting a battery in a faucet's spout requires the spout to be large to accommodate the battery, and results in high running and maintenance costs due to the need to periodically replace the battery. *Id.*

Mizuno's invention addresses these problems and is directed to a faucet that includes LED illumination lamps 12 powered by generator unit 32 including generator 32A (hydroelectric generator) fitted within recess 30 of body 14 of the faucet's spout head 10 (spray head). *Id.* ¶¶ 1, 6, 18, 19, 22, Figs. 1–3. Generator unit 32 (hydroelectric generator) generates power from the flow of water through the faucet, advantageously eliminating the need to include wiring connected to an external power supply, or to include a battery, in spout head 10 (spray head) to power LED illumination lamps 12. *Id.* ¶ 6. Mizuno's generator unit 32 includes elements that “allow stable operation” “even when excessive power is generated in the generator 32A due to high feed-water pressure.” *Id.* ¶¶ 30–32.

Petitioner asserts that Tseng provides power to LED elements 40 in spray head 30 by routing electric wire 60 connected to an external power supply through spray head 30. Pet. 44 (citing Ex. 1004 ¶ 68, Figs. 1–5). Petitioner asserts that because Tseng's spray head 30 is designed to be pulled out, electrical wire 60 is subject to stress and strain, which could lead to failure over time. *Id.* (citing Ex. 1003 ¶¶ 251–253). According to Petitioner, a POSITA would have recognized that incorporating Mizuno's hydroelectric generator into Tseng's spray head 30 would obviate the need for an external power supply or battery to power Tseng's LEDs 40, which would reduce installation and operation costs, prevent a potential wiring failure, and eliminate periodic battery replacement. *Id.* at 44–45 (citing Ex. 1003 ¶¶ 254–260). Petitioner asserts that a POSITA, therefore, would have been motivated to incorporate Mizuno's hydroelectric generator into Tseng's spray head 30, and would have had a reasonable expectation of success in doing so, because Mizuno's hydroelectric generator is designed and intended

to be integrated into a faucet’s shower head to reliably power LEDs. *Id.* at 45–46 (citing Ex. 1008 ¶¶ 1, 2).

Patent Owner counters that Tseng “expressly states that its objective is to improve the ‘conventional illuminative faucet’” disclosed in Gautschi (Ex. 2009) while maintaining the benefits of Gautschi’s wired external power supply. Resp. 47–48 (citing Ex. 1004 ¶ 3; Ex. 2003 ¶ 120; Ex. 2005, 94:19–95:1). Patent Owner argues that Gautschi “describes multiple advantages of its faucet being powered by a wired power source,” and “Mizuno’s hydro-generator would have been unable to achieve the benefits of an external power supply explained in the ’874 patent [Gautschi] that Tseng sought to improve.” *Id.* at 48–50 (citing Ex. 2009, 4:24–26, 8:25–29, 8:30–31, 8:40–42). Patent Owner argues that “a POSITA reading Tseng would have had no reason to implement a major redesign of Tseng—changing the power source entirely from a wired external power source to a hydro-generator as in Mizuno—and lose the attendant benefits of Tseng’s external wired power source.” Resp. 51 (citing Ex. 2003 ¶ 126). According to Patent Owner, the benefits Petitioner relies on to support the proposed modification of Tseng merely address problems that would arise from the modification, and would not have provided motivation to combine Mizuno with Tseng in the first place. Resp. 51–52 (citing Ex. 2003 ¶ 127–129).

A preponderance of the evidence on the record before us weighs in favor of Petitioner’s position, for reasons that follow.

First, the evidence of record does not support Patent Owner’s assertion that Tseng’s express—and sole—objective is to improve Gautschi’s faucet *while maintaining the benefits of Gautschi’s wired external power supply*. Resp. 47–48 (citing Ex. 1004 ¶ 3; Ex. 2003 ¶ 120;

Ex. 2005, 94:19–95:1). The paragraph of Tseng that Patent Owner cites to support this assertion contains no such disclosure. Ex. 1004 ¶ 3. And the paragraph of the Klopp declaration Patent Owner cites to support Tseng’s asserted objective states that “a POSITA would have had no reason to eliminate the benefits of a wired power supply as the ’874 patent [Gautschi] describes. In other words, a POSITA would have preserved these benefits of a wired external power source.” Ex. 2003 ¶ 120. Dr. Klopp, however, does not provide any objective evidence to support this conclusory opinion, which carries little weight in the absence of such corroboration. *Velandar*, 348 F.3d at 1371 (“[W]hat the Board consistently did was accord little weight to broad conclusory statements that it determined were unsupported by corroborating references. It is within the discretion of the trier of fact to give each item of evidence such weight as it feels appropriate”). The portion of Mr. Cook’s deposition testimony Patent Owner cites states only that Mr. Cook agreed that Tseng discloses in paragraph 3 that its invention is aimed to improve the conventional illuminated faucet disclosed in Gautschi. Ex. 2005, 94:19–95:1.

Second, as Patent Owner acknowledges, “Tseng and Mizuno propose two divergent designs, each with different benefits.” Resp. 47 (citing Ex. 2003 ¶ 118). In particular, Tseng and Mizuno each disclose different approaches to addressing problems associated with powering LED elements in an illuminated spray head with an external power supply. Tseng couples its spray head with a flexible pipe and utilizes an electric wire inserted along the flexible pipe and electrically connected to a flexible circuit board to power LED elements connected to the circuit board. Ex. 1005 ¶ 10. Mizuno uses a hydrogenator to provide power to illumination lamps in a faucet, eliminating use of an external power supply. Ex. 1008 ¶ 6.

As Petitioner and Mr. Cook explain, a POSITA would have recognized that modifying Tseng’s spray head to incorporate a hydroelectric generator would obviate the need for an external power supply, reducing installation costs and preventing a potential wiring failure. Resp. 44–45; Ex. 1003 ¶¶ 254–260; *see also* Ex. 1004 ¶¶ 4, 7, 9. As Petitioner and Mr. Cook further persuasively explain, a POSITA, therefore, would have recognized that incorporating a hydroelectric generator into Tseng’s spray head would be an alternative to Tseng’s approach for addressing problems stemming from powering its LEDs with an external power source, providing motivation to so modify Tseng’s spray head. Resp. 44–45; Ex 1003 ¶¶ 247–260; *Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1380–81 (Fed. Cir. 2023) (“There is a motivation to combine when a known technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the ‘prior art elements according to their established functions.’”) (citations omitted) (internal quotation marks omitted); *see also In re Inland Steel Co.*, 265 F.3d 1354, 1362 (Fed. Cir. 2001) (“The motivation to combine particular references may come from the nature of the problem to be solved, leading inventors to look to the references relating to possible solutions to that problem.” (internal quotation marks and citation omitted)).

Furthermore, even if we were to accept Patent Owner’s assertion that Gautschi discloses numerous advantages of powering its faucet with a wired power source, Tseng nonetheless explicitly discloses numerous disadvantages of so powering LEDs in an illuminative faucet. Ex. 1004 ¶¶ 4, 6, 7. And Mizuno discloses a hydrogenator that advantageously eliminates the disadvantages Tseng seeks to avoid and allows stable

operation even with excessive power is generated due to high feed-water pressure. Ex. 1008 ¶¶ 6, 30–32.

Based on these disclosures, a POSITA would have recognized that replacing Tseng’s wired power source with a hydro-generator as disclosed in Mizuno would have both advantages and disadvantages. Any disadvantages, however, would not negate the advantages of using a hydro-generator, providing motivation for the replacement. *Winner Int’l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000) (“The fact that the motivating benefit comes at the expense of another benefit, however, should not nullify its use as a basis to modify the disclosure of one reference with the teachings of another. Instead, the benefits, both lost and gained, should be weighed against one another”); *Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016) (“Although modification of the movable blades may impede the quick change functionality disclosed by Caterpillar, ‘[a] given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.’” (quoting *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006))).

Nonetheless, Patent Owner asserts that a “POSITA would not have had a reasonable expectation of success implementing Mizuno in Tseng” because “the combination would have had to include multiple additional devices beyond the hydro-electric generator” and the “Petition incorrectly characterizes Tseng’s faucet as having sufficient space to add all Mizuno’s needed components.” Resp. 53–54 (citing Ex. 2003 ¶¶ 130–134).

Patent Owner’s arguments, and the portions of Dr. Klopp’s declaration Patent Owner cites, do not address Mizuno’s explicit disclosure that all of the components of Mizuno’s generator unit 32 are sized to fit

within recess 30 of body 14 of spout head 10 (spray head) of Mizuno's faucet. Ex. 1008 ¶¶ 22–32, Figs. 1–3. In view of this disclosure, as Petitioner and Mr. Cook persuasively explain, a POSITA reasonably would have expected that Tseng's spray head could accommodate Mizuno's hydro-generator. Reply 15 (“a POSITA would have understood that Mizuno's generator is more than capable of fitting in a spray-head like that taught by Tseng”) (citing Ex. 1003 ¶¶ 265–270; Ex. 1008 ¶22); Ex. 1003 ¶ 270 (“a POSITA would have recognized that the large internal ‘chamber 321’ within Tseng's shower head could be readily adapted to accommodate and fit Mizuno's hydro-generator without significantly impacting the spray head's water flow”).

We find no evidence on the record before us establishing that modifying Tseng's spray head to accommodate a hydro-generator as disclosed in Mizuno would have been beyond the level of ordinary skill in the art. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 417–419 (2007) (“[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.”). Contrary to Patent Owner's arguments and Dr. Klopp's opinion, a POSITA, therefore, reasonably would have expected that Tseng's spray head could be modified successfully to incorporate a hydro-generator as disclosed in Mizuno. *In re Kubin*, 561 F.3d 1351, 1360 (Fed. Cir. 2009) (“Obviousness does not require absolute predictability of success . . . all that is required is a reasonable expectation of success.”) (emphasis omitted, citing *In re O'Farrell*, 853 F.2d 894, 903–04 (Fed. Cir. 1988)).

Considering the totality of the evidence presented in the record before us, a preponderance of the evidence supports Petitioner's position that the subject matter of claim 9 would have been *prima facie* obvious over Tseng and Mizuno.

b) Claim 11

Petitioner asserts that claim 11, which depends from claim 10, would have been obvious over Tseng and Mizuno. Pet. 43–46. Petitioner does not rely on any disclosure in Mizuno, or provide any other argument or evidence, that remedies the deficiencies of the Petitioner's showing for claim 10 in Ground 1. *Id.* Petitioner, therefore, does not establish by a preponderance of the evidence that claim 11 is unpatentable as obvious over Tseng and Mizuno.

3. Ground 3: Asserted Obviousness over Tseng and Schneider

Petitioner asserts that claims 17 and 18, which depend from claim 10, would have been obvious over Tseng and Schneider. Pet. 46–52. Petitioner does not rely on any disclosure in Schneider, or provide any other argument or evidence, that remedies the deficiencies of the Petitioner's showing for claim 10 in Ground 1. *Id.* Petitioner, therefore, does not establish by a preponderance of the evidence that claims 17 and 18 are unpatentable as obvious over Tseng and Schneider.

4. Objective Indicia of Nonobviousness

As discussed above, Petitioner shows that the asserted prior art teaches or would have suggested all the limitations of claims 1, 2, and 9, rendering these claims *prima facie* obvious. We, therefore, consider all objective indicia of nonobviousness on the record before us.

Patent Owner contends that there was a long-felt but unsolved need in the industry for a lighted faucet or showerhead, and hundreds praised Delta's

lighted kitchen faucet and pendant showerhead. Resp. 72–76. Petitioner counters that Patent Owner does not establish a nexus between the challenged claims and the asserted long-felt but unsolved need and praise by others. Reply 23–24. A preponderance of the evidence supports Petitioner’s position, for reasons that follow.

“[T]o accord substantial weight to secondary considerations in an obviousness analysis, ‘the evidence of secondary considerations must have a ‘nexus’ to the claims, i.e., there must be ‘a legally and factually sufficient connection’ between the evidence and the patented invention.’” *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (quoting *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324, 1332 (Fed. Cir. 2019)); see also *Lectrosonics, Inc. v. Zaxcom, Inc.*, Case IPR2018-01129, Paper 33 at 32 (PTAB Jan. 24, 2020) (precedential) (“For objective indicia of nonobviousness to be accorded substantial weight, its proponent must establish a nexus between the evidence and the merits of the claimed invention.”).

The patent owner bears the burden of showing this nexus. *Fox Factory*, 944 F.3d at 1373. A patent owner, however, is entitled to a presumption of nexus where it shows that the evidence supporting secondary considerations “is tied to a specific product and the product ‘is the invention disclosed and claimed’” or, put another way, the “product ‘embodies the claimed features, and is coextensive with them.’” *Id.* “A [patent owner] may establish nexus absent the presumption by showing that the objective indicia are the ‘direct result of the unique characteristics of the claimed invention,’ rather than a feature that was ‘known in the prior art.’” *Campbell Soup Co. v. Gamon Plus, Inc.*, 10 F.4th 1268, 1277 (Fed. Cir. 2021) (citation omitted).

Here, Patent Owner asserts, without elaboration, that Delta’s two product lines—the Allentown kitchen faucet and the Pendant Raincan showerhead—each embody the ’363 patent claims, implicitly asserting a presumptive nexus between the claimed subject matter and these two product lines. Resp. 73–75 (citing Ex. 2012; Ex. 2013; Ex. 2003 ¶¶ 172–173). Although Patent Owner cites Exhibits 2012 and 2013 and Dr. Klopp’s declaration to support this assertion, this evidence is insufficient to establish a presumptive nexus.

First, Exhibit 2012 is a description of the “Allentown Single-Handle Pull-Down Sprayer Kitchen Faucet” and appears to be taken from Delta’s website. Although this exhibit indicates that the faucet includes a TempSense® indicator having a display that changes color when the water temperature changes, the exhibit does not state that the indicator display is translucent. Nor does the exhibit indicate that the faucet includes any translucent component.

Second, Exhibit 2013 is a description of the “H₂Okinetic® Pendant Raincan Shower Head” and also appears to be taken from Delta’s website. Although the exhibit indicates that the shower head includes both LED lights and accent lights, the exhibit does not indicate that the shower head includes any translucent component.

Finally, the portion of Dr. Klopp’s declaration Patent Owner cites states, without any explanation or elaboration, that “the Allentown kitchen faucet has ‘a translucent light pipe’” and the “Pendant Raincan showerhead also has ‘a translucent light pipe.’” Ex. 2003 ¶ 173. Dr. Klopp, however, does not identify the particular component of either the Allentown kitchen faucet or the Pendant Raincan showerhead that constitutes a translucent light pipe.

Neither Patent Owner nor Dr. Klopp explains how or why either the Allentown faucet or the Pendant Raincan Shower Head includes a translucent light pipe. Dr. Klopp's conclusory assertion to that effect is not sufficient to establish that either product includes such a component. Patent Owner, therefore, does not provide sufficient evidence to demonstrate that either the Allentown faucet or the Pendant Raincan Shower Head corresponds to the spray head of claims 1, 2, 9–11, and 15–18 of the '363 patent. Nor does Patent Owner provide sufficient evidence to establish that either product embodies, and is coextensive with, the features of these claims.

Patent Owner, therefore, is not entitled to a presumption of nexus. Although Patent Owner may still establish a nexus absent a presumption, Patent Owner does not provide a sufficient showing to do so. In particular, under the heading of "Long-Felt But Unsolved Needs," Patent Owner argues that the length of time between when Mizuno and Tse were published and "the claimed invention supports nonobviousness." Resp. 76. In particular, Patent Owner asserts that Mizuno was published "14 years before the '363 patent's provisional application" and Tse was published "almost a decade before the '363 patent," and "the particular claimed combination was not in the prior art." *Id.*

As discussed above, however, Petitioner establishes that Tseng—rather than Tse—discloses or would have suggested all the limitations of claims 1 and 2, and Petitioner establishes that a combination of Tseng and Mizuno teaches or would have suggested all the limitations of claim 9. Tse's publication date, therefore, does not establish a long-felt but unsolved need in the art. And Mizuno's publication date alone also does not establish a long-felt but unsolved need in the art. *In re Gershon*, 372 F.2d 535,

538–39 (CCPA 1967) (Establishing long-felt need requires objective evidence showing existence of a persistent problem recognized by those of ordinary skill in the art for which a solution was not known.); *Newell Cos., Inc. v. Kenney Mfg. Co.*, 864 F.2d 757, 768 (Fed. Cir. 1988) (The long-felt need must not have been satisfied by another before the invention by applicant.).

Patent Owner, therefore, does not provide sufficient evidence to establish the existence of a long-felt but unsolved need in the art; consequently, Patent Owner does not establish that the unique characteristics of the spray head of claims 1, 2, and 9 satisfied such a need.

Nonetheless, under the heading “Praise by Others” Patent Owner also argues that “Delta’s products have received high ratings and excellent reviews from customers.” Resp. 76. Patent Owner argues that “major retailers—e.g., Home Depot, Amazon—collectively show hundreds of reviews in which customers identified and praised Delta’s products embodying the specific claimed features.” *Id.* (citing Ex. 2015, Ex. 2003 ¶ 177). Patent Owner cites Exhibit 1015 to support these assertions, which is from The Home Depot’s website and consists of customer reviews of the “Allentown Single-Handle Pull-Down Sprayer Kitchen Faucet with TempSense Indicator and Soap in SpotShield Stainless.” This exhibit, however, does not indicate that the subject faucet includes any translucent component.

Patent Owner also cites Dr. Klopp’s declaration to support its assertions. Dr. Klopp indicates that “I have reviewed the webpages of major home appliance retailers, such as Home Depot, for Delta’s products, including the Allentown kitchen faucet and Pendant Raincan showerheads,” and “[c]ustomers generally liked the claimed features and left good

reviews.” Ex. 2003 ¶ 177. Dr. Klopp further states that “on Home Depot’s webpage for the Allentown kitchen faucet, customers gave an overall rating of 4.5/5, with hundreds of reviews expressing their appreciation for the claimed features.” *Id.* (citing Ex. 2015). Dr. Klopp, however, does not elaborate on which “claimed features” garnered positive customer reviews. Dr. Klopp’s unsupported, conclusory assertions, therefore, are insufficient to establish that the customer praise of the Allentown Faucet was a direct result of characteristics of features of the spray head of claims 1, 2, and 9. Patent Owner, therefore, does not provide sufficient evidence to establish that the asserted praise by others was the direct result of the unique characteristics of the spray head of these claims.

Patent Owner does not provide a sufficient showing to establish a nexus between either the asserted satisfaction of a long-felt and unsolved need, or the asserted praise by others, and the spray head of claims 1, 2, and 9. Patent Owner’s asserted objective indicia of nonobviousness, therefore, carry little weight towards establishing the nonobviousness of claims 1, 2, and 9.

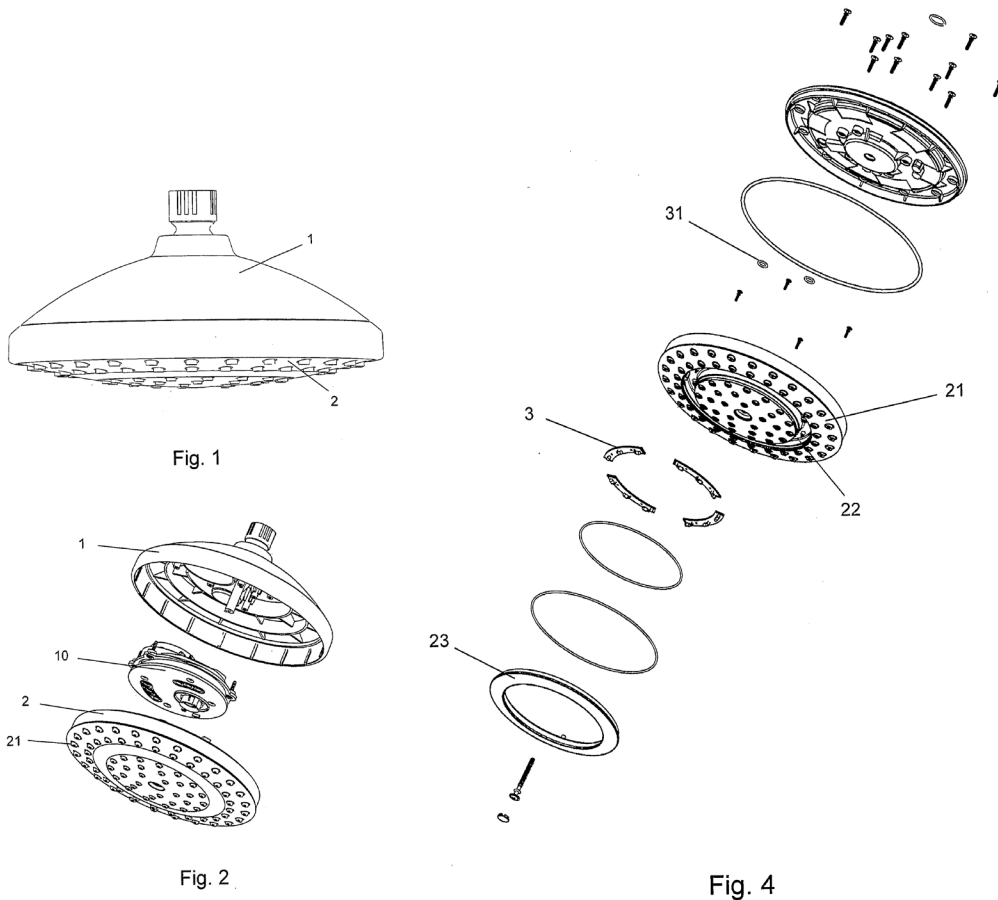
Considering the totality of the evidence on the present record, a preponderance of the evidence supports Petitioner’s position that claims 1, 2, and 9 would have been obvious. Petitioner, therefore, meets its burden of establishing the unpatentability of claims 1, 2, and 9 by a preponderance of the evidence.

5. *Ground 4: Asserted Obviousness over Tse*

Petitioner asserts that claims 1, 6–9, and 19–23 would have been obvious over Tse. Pet. 52–70. Patent Owner disagrees. Resp. 62–68. To resolve the parties’ dispute, we focus on independent claims 1 and 19, which

both recite an illumination device including a plurality of light emitters supported by a substrate and a *translucent light pipe* defining a closed loop to diffuse light from the light emitters outwardly. We begin our analysis with an overview of Tse.

Tse's Figures 1, 2, and 4 are reproduced below:



Tse's Figure 1 shows Tse's shower head. Ex. 1005, 4:27. Tse's Figure 2 shows an exploded view of Tse's shower head. *Id.* at 4:28. Tse's Figure 4 shows an exploded view of the front portion of Tse's shower head. *Id.* at 5:2–3.

As shown in the above Figures, Tse discloses a shower head that includes rear portion 1, front portion 2 having perforated member 21 adapted to discharge a spray of water, light emitting means 3, and a power source

including water turbine 4 and electrical generator 5 (hydroelectric generator). Ex. 1005, 5:14–18, 5:23–6:9, 7:28–8:20, Figs. 1, 2, 4. Light emitting means 3 is disposed in groove 22 of perforated member 21, and groove 22 is sealed by cover 23, which “is made of transparent or semi-transparent material” so that light emitted by light emitting means 3 “can be seen.” *Id.* at 6:23–29, Fig. 4. Light emitting diodes, light bulbs, or any other light emitting source powered by electricity may serve as light emitting means 3. *Id.* at 6:29–7:4. In one embodiment, light emitting means 3 comprises four sets of three light emitting diodes (LEDs). *Id.* at 6:29–7:2.

When the water supply to Tse’s shower head is turned on, water flows through water turbine 4 to generate mechanical energy, and electrical generator 5 converts the mechanical energy into electrical energy, which is transmitted to light emitting means 3. *Id.* at 7:28–8:20. As water flows out of perforated member 21, light emitting means 3 emits colored light, which makes the water appear to have the same color as the light, for a user’s “visual enjoyment.” *Id.* at 8:20–23.

Although Petitioner asserts that Tse discloses a translucent light pipe, Petitioner does not direct us to evidence sufficient to establish that Tse discloses or would have suggested such a light pipe, for reasons that follow.

Petitioner asserts that Tse’s cover 23, which is sealed over light emitting means 3, and “made of transparent or semi-transparent material so that the light emitted by the light emitting means 3 can be seen,” “is the claimed ‘**translucent light pipe**.’” Pet. 58–59 (citing Ex. 1005, 2:16–17, 3:3–5, 5:21–22, 6:23–24, 6:27–29); *see also id.* at 59 (referring to Tse’s “translucent cover 23”). Mr. Cook repeats Petitioner’s statements, without elaborating: “According to Tse, ‘the cover’ over the LEDs ‘is made of transparent or semi-transparent material so that the light emitted by the light

emitting means can be seen.’ In my opinion, this ‘cover’ is the claimed ‘translucent light pipe.’” Ex. 1003, 355–356 (citing Ex. 1005, 3:3–5, 6:27–29). Both Petitioner and Mr. Cook thus indicate that Tse’s semi-transparent cover is translucent, and both, therefore, implicitly take the position that a distinction does not exist between semi-transparent and translucent materials.

Consistent with this position, at the hearing, Petitioner’s counsel stated that “Patent Owner has not argued, in this proceeding, that Tse does not disclose a translucent light pipe. Its expert has not testified that Tse does not disclose a translucent light pipe, and there’s no evidence in the record that even remotely indicates that a semi-transparent material is any different from a translucent material.” Tr. 23:20–24:7; *see also id.* at 23:2–7, 63:25–63:2. These statements of Petitioner’s counsel at the hearing, however, do not bolster the weight of the Petitioner’s evidence and arguments, which are insufficient to support the factual proposition at hand. Petitioner bears the burden of persuasion to prove unpatentability by a preponderance of the evidence, and this burden never shifts to Patent Owner. *Dynamic Drinkware*, 800 F.3d at 1378; *Magnum Oil*, 829 F.3d at 1375.

Contrary to the statements of Petitioner’s counsel at the hearing, Patent Owner contends in the Response that a “POSITA would have understood that Tse’s thin, transparent/semi-transparent cover is unlike a light pipe and instead is more like a window. . . [and] would have showed ‘hot spots.’” Resp. 63 (citing Ex. 1005, 6:27–29, Fig. 4; Ex. 2003, ¶¶146, 147–148). Patent Owner cites Dr. Klopp’s declaration to support this assertion. *Id.* Dr. Klopp states in the cited paragraphs that “Tse teaches away from using translucency for its cover—it instead encourages the light emitting means to be visible by making the ‘cover of the groove . . . of

transparent or semi-transparent material so that the light emitted by the light emitting means can be seen.” Ex. 2003 ¶ 146 (citing Ex. 1005, 3:3–5, 6:27–29). Dr. Klopp further states that “[m]aking the cover of transparent or semi-transparent material would not have diffused light.” *Id.*; *see also id.* ¶ 147.

Petitioner’s position that Tse’s semi-transparent cover (Ex. 1005, 6:23–29) is translucent consists solely of a conclusory assertion to that effect, supported only by Mr. Cook’s declaration. Pet. 58–59. Mr. Cook, however, simply repeats Petitioner’s conclusory statements, without providing sound technical reasoning supported by objective evidence to explain and support his opinions. Ex. 2003 ¶¶ 355–356. We, therefore, accord little weight to Mr. Cook’s opinion on this particular matter because it “merely repeats, verbatim, the conclusory assertion for which it is offered to support,” and “does not cite to any additional supporting evidence or provide any technical reasoning [in] support.” *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 15 (PTAB Aug. 24, 2022) (precedential).

By contrast, Dr. Klopp’s testimony that Tse teaches away from using translucency for its cover, and instead makes the cover of transparent or semi-transparent material so that the light emitted by the light emitting means can be seen, indicates that, in Dr. Klopp’s view, translucent materials differ from semi-transparent materials. Dr. Klopp’s opinion thus contradicts Mr. Cook’s implicit position (discussed above) that translucent materials are not distinct from semi-transparent materials. We credit Dr. Klopp’s opinion over that of Mr. Cook on this particular factual issue, because it relates to optical systems and methods about which Mr. Cook possesses limited relevant experience, in comparison to Dr. Klopp’s substantial experience in optics, particularly regarding light pipes and diffusers, as discussed above.

Supra 8 (discussing weight accorded to conflicting witness testimony); *see also* Resp. 2–3.

In Reply, Petitioner asserts that “Patent Owner has effectively conceded that Tse satisfies the claims” because, according to Petitioner, Patent Owner does not dispute “Petitioner’s explanation of what constitutes a ‘light pipe’ (structures that diffuse light),” and Patent Owner represents that “all translucent materials diffuse at least some light.” Reply 18–19. As discussed above, however, Patent Owner does not concede that Tse’s semi-transparent cover is translucent; therefore, contrary to Petitioner’s argument, Patent Owner does not “effectively concede[]” that Tse discloses a translucent light pipe.

Considering the totality of the evidence on the record before us, a preponderance of the evidence does not support Petitioner’s position that a POSITA would have understood Tse’s semi-transparent cover to be translucent. As a consequence, Petitioner does not establish that Tse discloses or would have suggested a translucent light pipe. Petitioner, therefore, does not carry its burden of establishing the unpatentability of claims 1, 6–9, and 19–23 as obvious over Tse.

6. *Ground 5: Asserted Obviousness over Tse and Carter*

Petitioner asserts that claims 1, 6–9, and 19–23 would have been obvious over Tse and Carter. Pet. 52–70. Patent Owner disagrees. Resp. 62–68. To resolve the parties’ dispute, we focus on independent claims 1 and 19, which both recite an illumination device including a plurality of light emitters supported by a substrate and *a translucent light pipe* defining a closed loop to diffuse light from the light emitters outwardly. We begin our analysis with an overview of Carter.

Carter discloses a plumbing fixture disposed below the water line of a swimming pool. Ex. 1006, Abstr., ¶ 3. The plumbing fixture includes substrate 1 on which array 15 of lighting elements 6 is disposed, and integrated light pipe 3 is injection molded in place over lighting elements 6. *Id.* ¶¶ 7, 8, 19, Fig. 4A. Light 8 from lighting elements 6 is transmitted up and through molded-in place integrated light pipe 3, which functions to disperse light 8 across substrate 1 “either partially or completely.” *Id.* ¶¶ 8, 19, 25, Fig. 4B. “[V]arious types of clear/clear tinted/clear colored/semi-clear thermoplastics can be used for the integrated light pipe.” *Id.* ¶ 26.

Petitioner does not establish by a preponderance of the evidence that the combined disclosures of Tse and Carter disclose or would have suggested a translucent light pipe, as required by claims 1 and 19, for reasons that follow.

As an initial matter, Petitioner and Mr. Cook both indicate that Carter’s molded-in-place integrated light pipe is “transparent.” Pet. 70 (citing Ex. 1006, Abstr., ¶¶ 8, 9, 26); Ex. 1003 ¶ 418. Petitioner argues that a POSITA would have been motivated to apply Carter’s teachings to Tse to improve the durability of Tse’s shower head, resulting in cost savings. *Id.* at 71–72 (citing Ex. 1006 ¶¶ 6, 7; Ex. 1003 ¶¶ 413–436). According to Petitioner, applying Carter’s teachings to Tse would involve integrating and directly molding a light pipe into Tse’s groove. *Id.* at 72 (citing Ex. 1003 ¶ 433). Petitioner argues that “[t]his would be accomplished by first molding [Tse’s] perforated member [21] with the groove, inserting the light emitting means 3 into the groove, and then applying the light pipe via a second molding step.” *Id.* (citing Ex. 1003 ¶ 434.) Petitioner argues that so modifying Tse would “result[] in the claimed subject matter: cover 23 would be replaced with an integrated, molded light pipe that diffuses light from

Tse's LEDs out of the face of [Tse's] perforated member 21.” *Id.* at 71 (citing Ex. 1003 ¶¶ 413–422).

It is unclear, however, whether Petitioner proposes modifying Tse by integrally molding Tse's semi-transparent cover 23 into Tse's groove 22 over light emitting means 3, or by replacing Tse's semi-transparent cover 23 with Carter's light pipe 3, and integrally molding Carter's light pipe 3 into Tse's groove 22 over light emitting means 3.⁷ Regardless, however, Petitioner does not direct us to sufficient evidence to establish that either modification would result in a *translucent* light pipe, as required by claims 1 and 19.

As discussed above, a preponderance of the evidence does not support Petitioner's position that a POSITA would have understood Tse's semi-transparent cover material to be translucent. As for Carter, the reference discloses that integrated light pipe 3 is made of “clear/clear tinted/clear colored/semi-clear thermoplastics,” also characterized as “light pipe (transparent plastic).” Ex. 1006 ¶ 26. As discussed above, Petitioner explicitly states in the Petition that Carter's molded-in-place integrated light pipe is “transparent.” Pet. 70 (citing Ex. 1006, Abstr., ¶¶ 8, 9, 26). Mr. Cook concurs, indicating that “[a]ccording to Carder [*sic*], the light pipe is ‘transparent.’” Ex. 1003 ¶ 418 (citing Ex. 1006, Abstr., ¶ 26).

Patent Owner contends that “Carter's light pipe does not cure Tse's deficiencies” because “[t]he Petition and Mr. Cook explicitly state that

⁷ Petitioner's counsel indicated at the hearing that Petitioner's proposed modification of Tse does not involve changing the material of Tse's cover, and, instead, involves forming the cover differently. Tr. 27:3–25 (“in this particular combination, the only modification that we're proposing making is integrating a light pipe into the cover. We're not proposing changing the material used”).

Carter’s light pipe is ‘*transparent*’” and “the claim requires a ‘translucent’ light pipe.” Resp. 72 (citing Pet. 70; Ex. 1003 ¶ 418; Ex. 2003 ¶ 169). Consistent with Patent Owner’s position, Dr. Klopp testifies that “transparent and translucent materials are different.” Ex. 2003 ¶ 170.

In response to these arguments, Petitioner asserts in the Reply that Patent Owner “is wrong” because both Tse and Carter “explicitly reference translucent material,” and Petitioner cites Tse’s disclosure of semi-transparent material and Carter’s disclosure of semi-clear plastic to support this assertion. Reply 22–23 (citing Ex. 1005, 3:3–5 (“semi-transparent material”); Ex. 1006 ¶ 7 (“semi-clear plastic.”)). Petitioner thus indicates that Carter’s semi-clear plastic is translucent, and, therefore, implicitly takes the position that a distinction does not exist between semi-clear plastic and translucent materials. Petitioner, however, does not rebut Dr. Klopp’s testimony—“transparent and translucent materials are different”—with objective evidence. Ex. 2003 ¶ 170; *see* Reply 22–23 (citing Ex. 1005, 3:3–5 (“semi-transparent material”); Ex. 1006 ¶ 7 (“semi-clear plastic.”)). Petitioner’s unsupported, implicit assertion is insufficient to establish that there is no difference between semi-clear plastic and translucent materials, such that both would diffuse light from light emitters as recited in claims 1 and 19. Petitioner, consequently, does not provide sufficient evidence to establish that Carter discloses or would have suggested a translucent light pipe.

A preponderance of the evidence on the record before us, therefore, does not support Petitioner’s position that a POSITA would have understood Carter’s semi-clear plastic light pipe to be translucent. It follows that Petitioner does not establish that the combined disclosures of Tse and Carter disclose or would have suggested a translucent light pipe. Petitioner,

therefore, does not carry its burden of establishing the unpatentability of claims 1, 6–9, and 19–23 as obvious over Tse and Carter.

7. *Grounds 6 and 7: Asserted Obviousness over Tse (or Tse and Carter) and Spangler*

Petitioner asserts that claim 24, which depends from claim 19, would have been obvious over Tse and Spangler (Ground 6), and would have been obvious over Tse, Carter, and Spangler (Ground 7). Pet. 74–76. Petitioner does not rely on any disclosure in Spangler, or provide any other arguments or evidence, however, that remedies the deficiencies of the Petitioner’s showing for claim 19 (Grounds 4 and 5). *Id.* Petitioner, therefore, does not establish by a preponderance of the evidence that claim 24 is unpatentable as obvious over Tse and Spangler, and over Tse, Carter, and Spangler.

IV. CONCLUSION⁸

Petitioner establishes by a preponderance of the evidence that claims 1, 2, and 9 of the ’363 patent are unpatentable. Petitioner does not establish by a preponderance of the evidence that claims 3–8 and 10–24 of the ’363 patent are unpatentable. The following table summarizes our decision

⁸ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

Claim(s)	35 U.S.C. §	Reference(s)/ Basis	Claim(s) Shown Unpatentable	Claim(s) Not shown Unpatentable
1–5, 10, 12–16	103	Tseng	1, 2	3–5, 10, 12–16
9, 11	103	Tseng, Mizuno	9	11
17, 18	103	Tseng, Schneider		17, 18
1, 6–9, 19–23	103	Tse		1, 6–9, 19–23
1, 6–9, 19–23	103	Tse, Carter		1, 6–9, 19–23
24	103	Tse, Spangler		24
24		Tse, Carter, Spangler		24
Overall Outcome			1, 2, 9	3–8, 10–24

V. ORDER

It is

ORDERED that Petitioner has proved by a preponderance of the evidence that claims 1, 2, and 9 of the '363 patent are unpatentable; and

FURTHER ORDERED that Petitioner has not proved by a preponderance of the evidence that claims 3–8 and 10–24 of the '614 patent are unpatentable;

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

IPR2024-00700
Patent 10,393,363 B2

FOR PETITIONER:

K. Patrick Herman
Alyssa Caridis
ORRICK, HERRINGTON & SUTCLIFFE LLP
p52ptabdocket@orrick.com
a8cptabdocket@orrick.com

FOR PATENT OWNER:

David L. Cavanaugh
Scott Betulli
Jungyeon Kim
R. Gregory Israelsen
WILMER CUTLER PICKERING HALE AND DORR, LLP
david.cavanaugh@wilmerhale.com
scott.bertulli@wilmerhale.com
john.kim@wilmerhale.com
greg.israelsen@wilmerhal.com