

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, DONNA M. PRAISS, and
JANE E. INGLESE, *Administrative Patent Judges*.

INGLESE, *Administrative Patent Judge*.

DECISION

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

I. INTRODUCTION

A. Overview

Kohler Co. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) for *inter partes* review of claims 1–24 (the “challenged claims”) of U.S. Patent No. 10,393,363 B2 (Ex. 1001, “the ’363 patent”). Delta Faucet Co. (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim Resp.”).

We have authority to determine whether to institute *inter partes* review. See 35 U.S.C. § 314 (2018); 37 C.F.R. § 42.4(a) (2023) (“The Board institutes the trial on behalf of the Director.”). *Inter partes* review may not be instituted “unless . . . the information presented in the petition . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a).

After considering the information presented in the Petition and the Preliminary Response, we determine that Petitioner has provided sufficient information to demonstrate a reasonable likelihood of prevailing with respect to at least one of the challenged claims. We therefore grant institution of *inter partes* review. We provide our preliminary findings and conclusions of law in this Decision for the sole purpose of explaining our reasons for instituting an *inter partes* review, and any final determinations will be based on the full trial record.

B. 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.

C. 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 3, 2.

II. BACKGROUND

A. The '363 Patent (Ex. 1001)

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

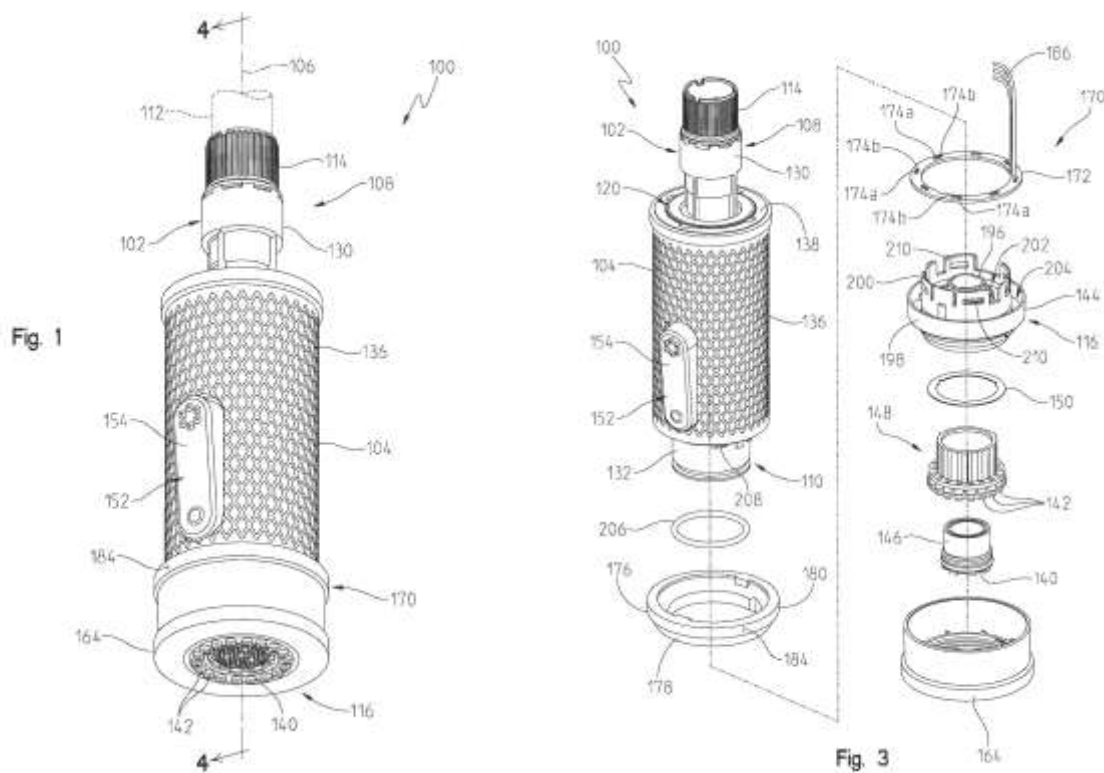


Figure 1 provides a perspective view of sprayhead 100, and Figure 3 shows a bottom exploded perspective view of sprayhead 100 of Figure 1. *Id.* at 2:14–25, 2:18–19.

Sprayhead 100 includes housing 104, waterway 102 disposed within housing 104 and extending along longitudinal axis 106, and sprayface 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:

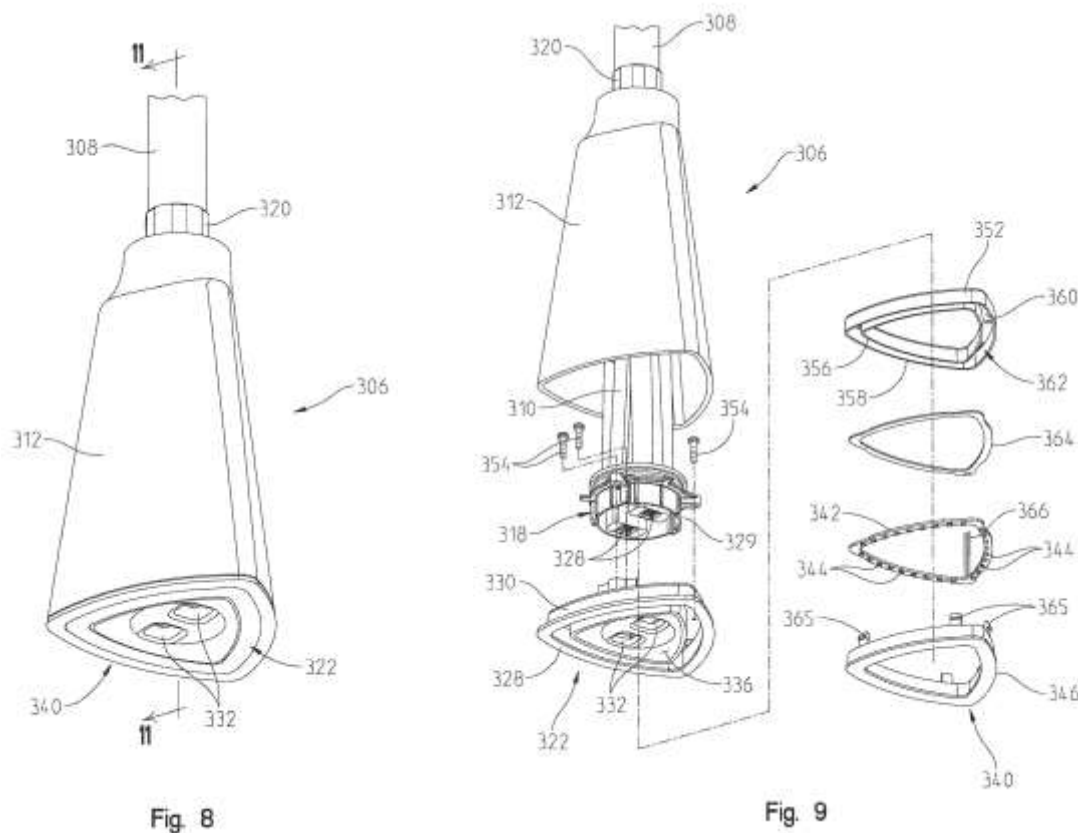


Figure 8 provides a perspective view of pendant showerhead 306, and Figure 9 shows a bottom exploded perspective view of pendant showerhead 306 of Figure 8. *Id.* at 2:28–31.

Pendant showerhead 306 includes waterway 310 disposed within housing 312 and extending along longitudinal axis 314, and sprayface 322 fluidly coupled to outlet end 318 of waterway 310 and including water outlet openings 332. *Id.* at 5:35–42, 5:48–50. Sprayface 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.

C. 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

The Petition is supported by the Declaration of J. Chris Cook
(Ex. 1003, the “Cook Declaration”).

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).

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 neither adopts nor disputes Petitioner’s proposed level of ordinary skill in the art. Prelim. Resp. 10.

For purposes of this Decision, we apply Petitioner’s definition of a POSITA, which is undisputed on this record, and is consistent with the level of ordinary skill in the art at the time of the invention as reflected in the asserted prior art.

C. Claim Interpretation

We interpret claims “using the same claim construction standard that would be used to construe the claims 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 “has applied the plain and ordinary meaning of the claim terms.” Prelim. Resp. 10. Taking into consideration the information presented, we determine that none of the claim terms requires express construction for purposes of deciding whether to institute review.⁷

⁷ If either party intends to further argue claim construction at trial, including what is the plain and ordinary meaning of a term, they should do so in a clearly designated section of their briefing so as to expressly identify such arguments. *See, e.g.*, 37 C.F.R. § 42.104(b)(3) (content of petition); *see also* Patent Trial and Appeal Board Consolidated Trial Practice Guide, 84 Fed. Reg. 64,280, at 46, 48–45 (Nov. 2019) (available at

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. Prelim. Resp. 21–32. We focus our analysis on the disputed limitations of claim 1, and begin with an overview of Tseng.

a) Tseng (Ex. 1004)

Tseng discloses a pull-out faucet including a sprayhead mounted on a body. Ex. 1004 ¶¶ 1, 9, 10. The sprayhead 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 in which the light conductors and circuit boards differ structurally. Figures 9 and 11–13, reproduced below, illustrate the light conductor and circuit board of the first embodiment:

<https://www.uspto.gov/TrialPracticeGuideConsolidated>). Claim construction arguments should not be relegated to patentability arguments on the facts.

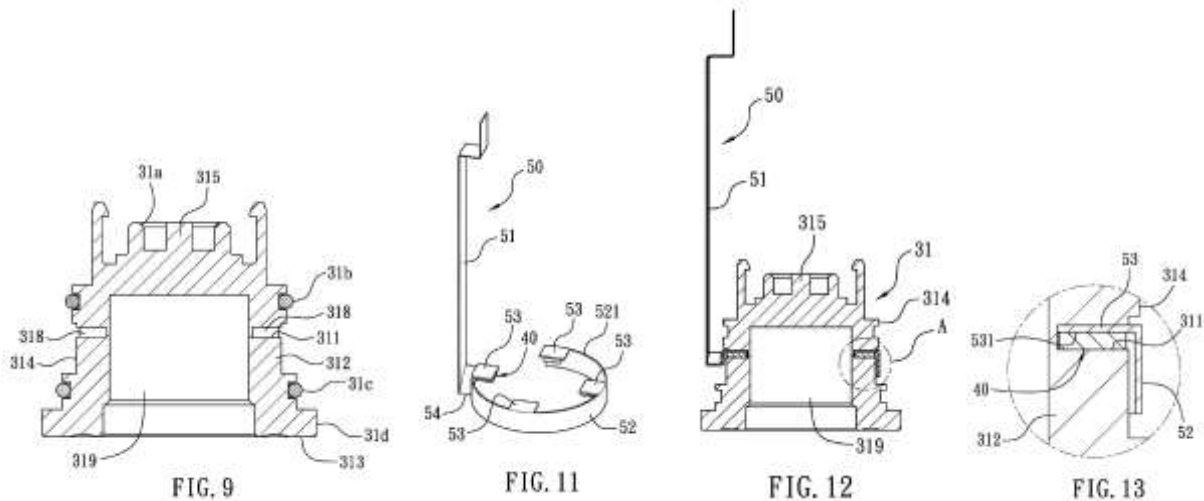
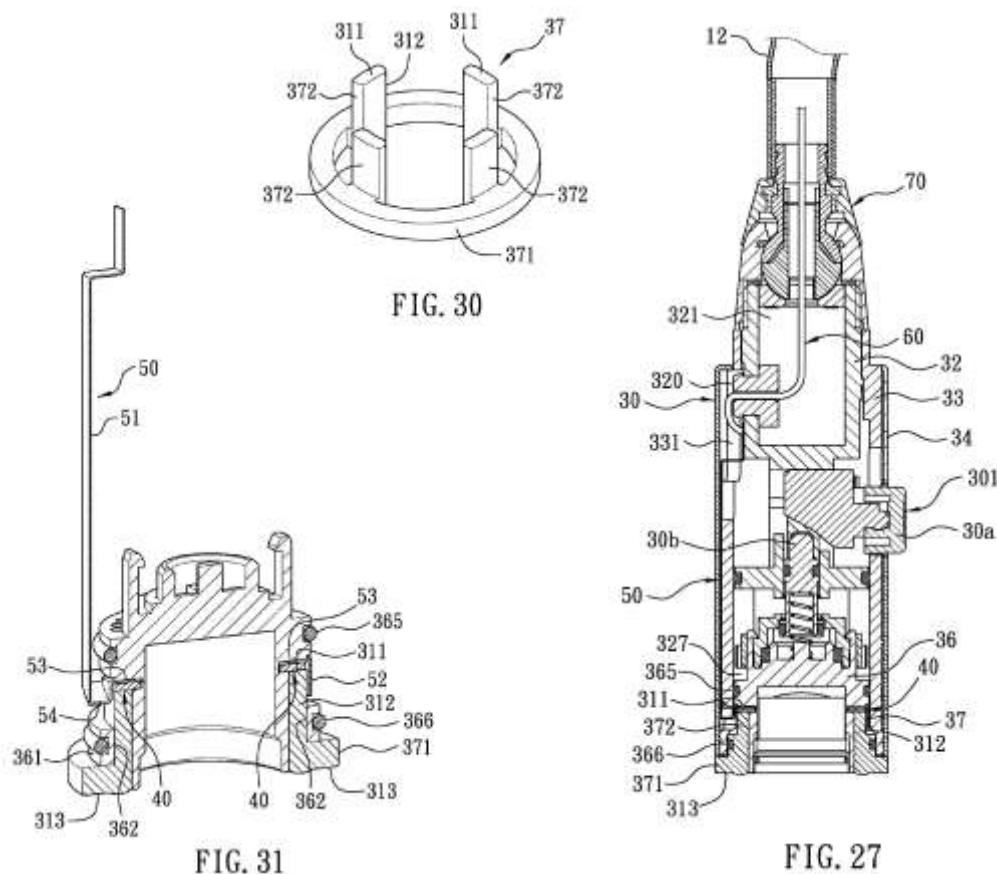


Figure 9 shows a cross sectional view of light conductor 31 according to Tseng's first embodiment. *Id.* ¶¶ 38, 39. Figure 11 is a perspective view of circuit board 50 and LED elements 40 of Tseng's first embodiment. *Id.* ¶ 41. Figure 12 is a cross sectional view of light conductor 31, circuit board 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 light” 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 of light conductor 31 outputs the transmitted light. *Id.* ¶¶ 70, 72. As shown in Figure 9, light conductor 31 also includes circular rib 31d that extends outwardly beyond the remaining structural portions of light conductor 31 so as to “expose[] outside to enhance illumination effect” of the output light. *Id.* ¶ 70, 79.

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



¶ 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. Circular rib 371 of light conductor 37 is adjacent to the bottom end of external sleeve 34 (housing) and extends outwardly beyond the remaining structural portions of light conductor 37 to “expose[] outside to enhance light transmission and illumination.” *Id.* ¶ 94, Figs. 27, 31.

Figures 35–37, reproduced below, illustrate the light conductor and circuit board of Tseng's third embodiment:

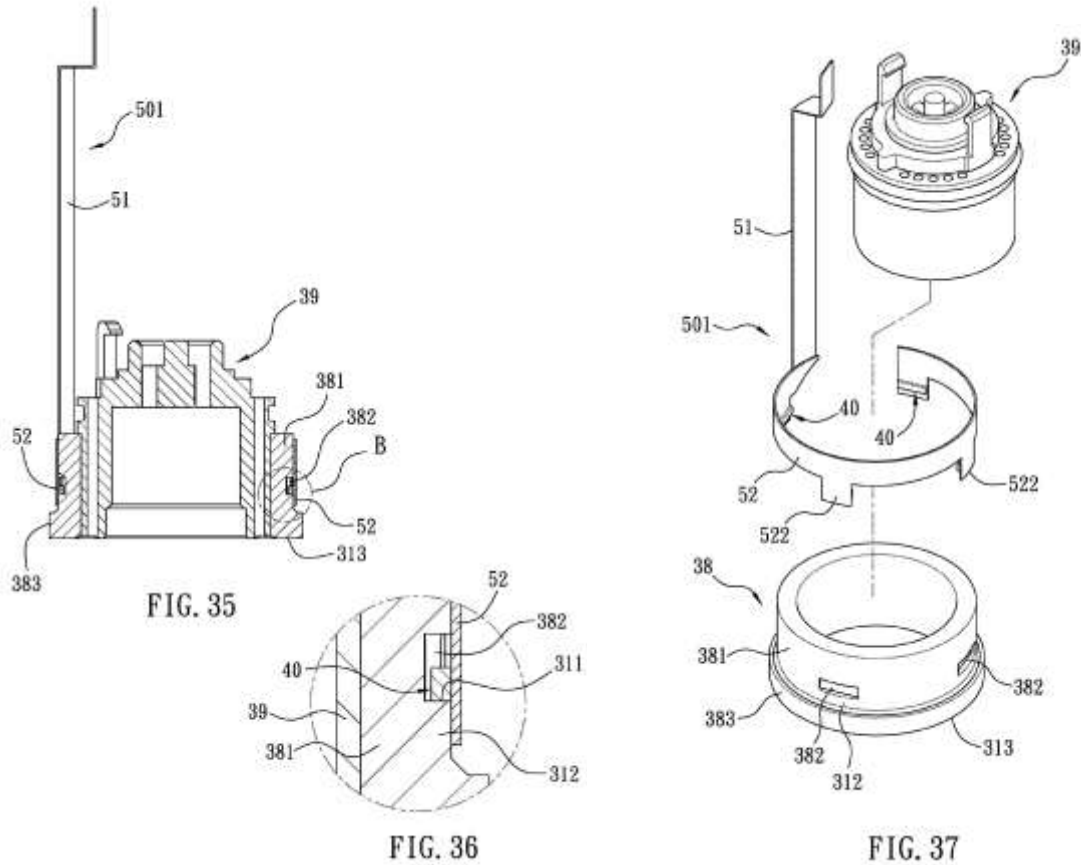


Figure 35 shows a cross-sectional view of light conductor 38, circuit board 501, and LED elements 40 of Tseng's third embodiment. *Id.* ¶¶ 63–65.

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 312. *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.* Outer cliff 381 of light conductor 38 includes annular protrusion 383 adjacent to a bottom end of external sleeve 34 (housing) and extends outwardly beyond the remaining structural portions of light conductor 38 to “enhance light transmission.” *Id.* Figs. 32, 35, ¶ 98.

b) Disputed limitation of claim 1

The sprayhead 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*. The parties dispute whether Tseng discloses a light pipe defining a closed loop to diffuse light from light emitters. *Compare* Pet. 29–32, with Prelim. Resp. 22–28.

Petitioner asserts that Tseng discloses a sprayhead (“illumination device”) that includes a circuit board (“substrate”) supporting multiple LED elements (“plurality of light emitters”) and a translucent light conductor (“translucent light pipe”). Pet. 28–31 (citing Ex. 1004 ¶¶ 10–11, 68, 70–72, Figs. 11, 24, 30, 31, 37, 70, 91, 94, 97–98; Ex. 1003 ¶¶ 154–166). According to Petitioner, Tseng’s Figures 30 and 37 (reproduced below) provide two examples of how Tseng’s translucent light conductor can be constructed. Pet. 30.

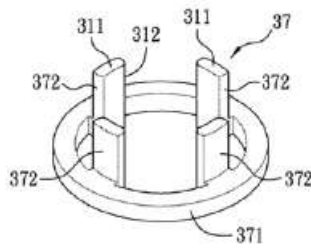


FIG. 30

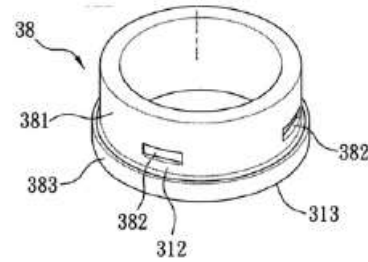


FIG. 37

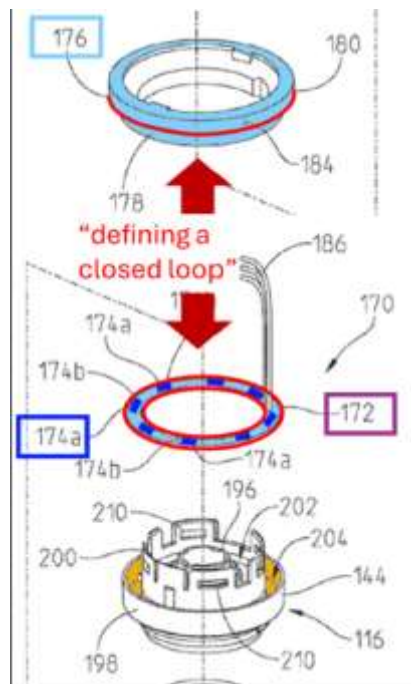
Tseng's Figure 30 is a perspective view of light conductor 37 of the pull-out faucet of Tseng's second embodiment, and Tseng's excerpted Figure 37 is a perspective view of light conductor 38 of the pull-out faucet of Tseng's third embodiment. Ex. 1003 ¶¶ 60, 67.

Petitioner asserts that Tseng's light conductors 37, 38 ("translucent light pipes") each define a closed loop because rib 371 shown in Figure 30 is structured as an unbroken circle, and because transmission portion 312 and protrusion 383 shown in Figure 37 are structured as unbroken circles.

Pet. 32 (citing Ex. 1004 ¶¶ 24, 26; Ex. 1003 ¶¶ 181–182). Petitioner asserts that Tseng's light conductor "operates to transmit and uniformly diffuse light from Tseng's four internal LED elements to the exterior of sprayhead 30." *Id.* at 31 (citing Ex. 1004 ¶¶ 11, 24, 79, 94; Ex. 1003 ¶¶ 167–172). In particular, according to Petitioner, light emitted from Tseng's LED elements enters light conductor 38 (shown in Figure 37), is transmitted through transmission portion 312, which substantially diffuses the light, and the light is then emitted through output face 313 and annular protrusion 383 ("diffuses light from the light emitters outwardly away from the housing"). Pet. 34–37 (citing Ex. 1004 ¶¶ 97, 98, 102; Ex. 1003 ¶¶ 190–202).

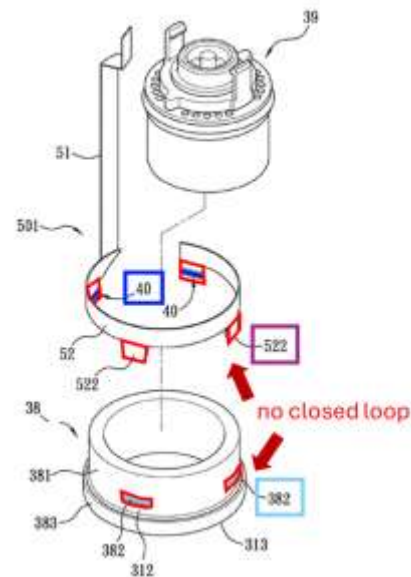
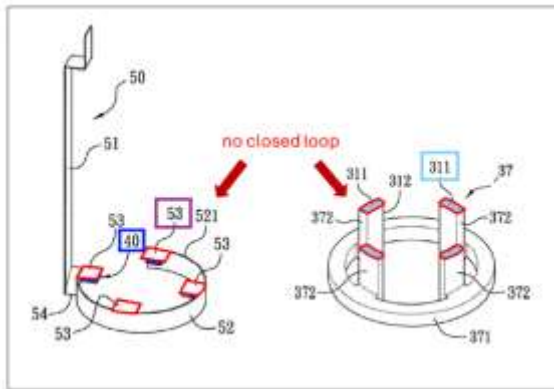
Patent Owner counters that Tseng's light conductor does not define a closed loop to diffuse light from light emitters. Prelim. Resp. 22. Patent Owner contends that the light pipe recited in the claims is structured so that

a closed loop is defined where light from the light emitters enters the light pipe. *Id.* at 23 (citing Ex. 1001, Fig. 3). Patent Owner indicates that, as shown in Figure 3 of the '363 patent (annotated, excerpted version reproduced below), light pipe 176 defines a closed loop by having a continuous closed-loop surface where it meets light emitters 174, and the closed loop is also defined by the continuous closed-loop surface of substrate 172. *Id.* at 23–24. According to Patent Owner, locating light emitters 174 between these two closed-loop surfaces traps the light between the surfaces, and the trapped light diffuses along light pipe 176, “defining a closed loop.” *Id.* at 24 (referring to annotated Figure 3 of the '363 patent shown below).



Patent Owner’s annotated excerpt of Figure 3 of the '363 patent shows an exploded view of elements of sprayhead 100, including substrate 172 supporting a plurality of light emitters 174 and annular light pipe 176. Ex. 1001, 2:18–19, 3:52–58.

Patent Owner contends that, in contrast, “Tseng’s light conductors do not define a closed loop *where the light from the LED elements enters the light conductor.*” Prelim. Resp. 25. According to Patent Owner, “[a]lthough a portion of Tseng’s light conductors may eventually form a closed loop,” Patent Owner’s annotated versions of Tseng’s Figures 11, 30, and 37 (reproduced below) show that the surfaces where light first enters Tseng’s light conductors are separated into distinct pieces that each focus a separated LED element into a separate spot, which limits any potential diffusion of the light. *Id.* at 25–27.



Patent Owner’s annotated version of Tseng’s Figure 11 (left) shows a perspective view of circuit board 50 and LED elements 40 of the pull-out faucet of Tseng’s first embodiment. Ex. 1004 ¶ 41. Patent Owner’s annotated version of Tseng’s Figure 30 (middle) shows a perspective view of light conductor 37 of the pull-out faucet of Tseng’s second embodiment. *Id.* ¶ 60. Patent Owner’s annotated version of Tseng’s Figure 37 (right) shows a perspective view of exploded components of guiding member 39,

light conductor 38, and circuit board 501 of the pull-out faucet of Tseng's third embodiment. *Id.* ¶ 67.

Petitioner provides sufficient information for purposes of institution to show that Tseng discloses or would have suggested a translucent light pipe defining a closed loop to diffuse light from light emitters outwardly away from a housing. Tseng's Figures 30 and 37 show that rib 371 and protrusion 383 of translucent light conductors 37, 38 (light pipes), respectively, are both shaped as unbroken circles. Ex. 1004, Figs. 37, 38; *see also id.* ¶ 24 (describing "circular" rib), ¶ 26 (indicating that the "light conductor is formed in a sleeve shape"). Tseng discloses that light from LED elements 40 enters input face 311 of Tseng's light conductors 37, 38, travels through transmission portion 312, and is emitted through downward facing output face 313. Ex. 1004 ¶¶ 91, 94, 97, 98, Figs. 30, 31, 35, 36, 37. Light is also emitted from outwardly extending annular rib 371 and protrusion 383 of light conductors 37, 38, respectively, which "enhance[s] light transmission." *Id.*

Petitioner, therefore, provides sufficient information to show that Tseng's translucent light conductors 37, 38 (light pipes) define a closed loop to diffuse light from LED elements 40 (light emitters) outwardly away from external sleeve 34 (housing).

Patent Owner's assertion that Tseng's light conductors do not define a closed loop *where light from the LED elements enters the light conductors* appears to be based on unclaimed subject matter. *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."). As discussed above, Patent Owner does not provide an explicit construction of any of the language of claim 1, indicating only that it "has applied the plain

and ordinary meaning of the claim terms.” Prelim. Resp. 10. The disputed limitation of claim 1 does not recite that the light pipe defines a closed loop *where light from the light emitters enters the light pipe*. Rather, the limitation recites “a translucent light pipe defining a closed loop to diffuse light from the light emitters outwardly away from the housing.”

Patent Owner’s implicit interpretation of claim 1 as requiring the light pipe to define a closed loop where light from the light emitters enters the light pipe is not supported by the plain language of claim 1, or any disclosure in the ’363 patent or information its prosecution history identified on the present record.

At this juncture, Patent Owner directs us to disclosures of embodiments in the specification of the ’363 patent that may result in a closed loop where light from the light emitters enters the light pipe. Prelim. Resp. 25–27. On this preliminary record, we determine that importing that limitation from the specification into claim 1, as advanced by Patent Owner, would blur the distinction between the claim and the disclosure, and violate the well-settled principle that “the name of the game is the claim.” *In re Hiniker Co.*, 150 F.3d 1362, 1369 (Fed. Cir. 1998). “[I]f we once begin to include elements not mentioned in the claim, in order to limit such claim . . . , we should never know where to stop.” *McCarty v. Lehigh Valley R.R. Co.*, 160 U.S. 110, 116 (1895). We invite Patent Owner to address that principle to the extent it preserves this argument in a timely-filed response to the Petition during the trial phase.

Patent Owner’s further assertion that the surfaces where light first enters Tseng’s light conductors are separated into distinct pieces, and each surface focuses a separated LED element into a separate spot, which limits any potential diffusion of the light, also appears to be based on unclaimed

subject matter. The plain language of the disputed limitation does not place any requirement on the extent of diffusion, and, consequently, encompasses *any* level of diffusion. The plain language also does not exclude the recited light pipe from focusing light from separated LED elements into separate spots. Rather, the plain language indicates that the light pipe alone defines a closed loop—independent of the light emitters—to diffuse light from the light emitters outwardly away from the housing.

Patent Owner also contends that “[b]ecause the ’363 patent’s light pipe defines a closed loop using two closed-loop surfaces—light pipe 176 and substrate 172—on each side of the light emitters, it diffuses light through the light pipe without hot spots,” which “is not possible with Tseng.” Prelim. Resp. 27–28. According to Patent Owner, in Tseng, light is focused through columns into discrete spots, and the light “does not diffuse through a closed-loop surface defined by the closed-loop surfaces of the substrate and light pipe like the ’363 patent does; rather, it forms hot spots first, and then (i.e., ‘in turn’) diffuses.” *Id.* at 28.

Similar to Patent Owner’s arguments discussed above, these arguments appear to be based on unclaimed subject matter. The plain language of the disputed limitation does not recite that the closed loop is defined using two closed-loop surfaces. Instead, the plain language requires the closed loop to be defined by only the light pipe. The plain language of the disputed limitation also does not exclude formation of hot spots before diffusion of light, but requires only that light from the light emitters is diffused outwardly away from the housing.

We have considered Patent Owner’s further argument that Tseng’s light conductor does not *uniformly* diffuse light (Prelim. Resp. 22–23), and Patent Owner’s contention that Tseng’s “light columns” have a bulky and

less flexible design than the light pipe of the '363 patent (*id.* at 29–32). Claim 1, however, does not recite any degree of uniformity of diffusion. Nor does claim 1 recite any requirement for the size or flexibility of the recited light pipe.

On the present record, Petitioner has shown sufficiently that Tseng teaches or would have suggested the disputed limitation of claim 1.

c) Currently Undisputed Limitations of Claim 1

Petitioner contends that the remaining limitations of claim 1 (beyond the disputed limitation discussed in the preceding section) would have been obvious over Tseng. Pet. 23–35. Patent Owner does not dispute Petitioner's contentions. *See generally* Prelim. Resp. After considering the arguments and evidence Petitioner provides for the remaining limitations of claim 1, including the Cook Declaration, we determine that Petitioner sufficiently demonstrates, for purposes of this Decision, that these limitations would have been obvious to one ordinary skill in the art in view of Tseng.

d) Conclusion for Claim 1

Considering the totality of the information presented in the record before us, we determine that Petitioner establishes a reasonable likelihood of prevailing in its challenge to the patentability of claim 1. We, accordingly, institute *inter partes* review for all claims and all grounds of unpatentability asserted in the Petition. *SAS Institute, Inc. v. Iancu*, 138 S. Ct. 1348 (2018); 37 C.F.R. § 42.108(a) (“When instituting . . . review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.”).

e) Claims 2–5, 10, 12–16

Because we institute *inter partes* review based on Petitioner's showing for claim 1, it is not necessary, at this stage, for us to analyze every

challenge Petitioner presents, particularly Petitioner's undisputed challenge to the patentability of claims 2–5, 10, and 12–16 as obvious over Tseng. Analysis of these claims on this ground is best left for trial after full development of the record.

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

Petitioner asserts that dependent claims 9 and 11 would have been obvious over Tseng and Mizuno. Pet. 43–46. Patent Owner disagrees. Prelim. Resp. 32–38. Claims 9 and 11 depend from claims 1 and 10, respectively, and require the recited sprayhead to further comprise a hydrogenator fluidly coupled to the waterway and in electrical communication with the illumination device.

Mizuno discloses a faucet including an LED illumination lamp powered by a hydroelectric generator that generates power from the flow of water through the faucet. Ex. 1008 ¶¶ 1, 6.

Petitioner asserts that Tseng provides power to the LED elements in its sprayhead by routing an electric wire connected to an external power supply through the shower head. Pet. 44 (citing Ex. 1004 ¶ 68, Figs. 1–5). Petitioner asserts that because Tseng's shower head is designed to be pulled out, the wire is subject to stress and strain, which could lead to failure over time. *Id.* (citing Ex. 1003 ¶¶ 251–253). According to Petitioner, incorporating Mizuno's hydroelectric generator into Tseng's shower head would obviate the need for an external power supply or battery, which would reduce installation and operation costs, prevent a potential wiring failure, and eliminate periodic battery replacement. *Id.* at 45 (citing Ex. 1003 ¶¶ 257–260). Petitioner asserts that a person of ordinary skill in the art, therefore, would have been motivated to incorporate Mizuno's hydroelectric generator into Tseng's shower head, 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 a person of ordinary skill in the art would not have had any reason to modify Tseng in view of Mizuno. Prelim. Resp. 32. Patent Owner contends that Tseng expressly set out to develop a design that includes electrical wiring, and did so successfully by improving the integration of electrical wiring into its shower head design. *Id.* at 33–34 (citing Ex. 1004 ¶¶ 9, 102–110). Patent Owner further contends that a person of ordinary skill in the art would not have been motivated to completely redesign Tseng’s shower head to change the power source entirely to eliminate wiring. *Id.*

Patent Owner contends that a person of ordinary skill in the art also would not have had a reasonable expectation of success in incorporating Mizuno’s hydroelectric generator into Tseng’s shower head because Tseng explicitly discloses that the space in its shower head is narrow. *Id.* at 36 (citing Ex. 1004 ¶¶ 7, 108). According to Patent Owner, Mizuno’s hydroelectric generator requires room for additional components beyond the hydrogenator, including a voltage stabilizer, cooling components, and a relief valve, which Patent Owner contends would have discouraged the ordinarily skilled artisan from a major redesign of Tseng’s faucet necessary to incorporate these elements. *Id.* at 37.

We have considered Petitioner and Patent Owner’s assertions for ground 2. Because Petitioner demonstrates a reasonable likelihood of prevailing in its challenge to the patentability of claim 1 for ground 1, resolution of the disputed factual issues raised by Petitioner and Patent Owner in ground 2 is best left for trial after full development of the record.

3. *Ground 3: Asserted Obviousness over Tseng and Schneider*

Petitioner asserts that dependent claims 17 and 18 would have been obvious over Tseng and Schneider. Pet. 46–52. Patent Owner disagrees. Prelim. Resp. 38–42.

Claim 17 depends from independent claim 10 and requires the claimed pull-down sprayhead to include a temperature sensor configured to detect the temperature of water within the sprayhead's waterway, and a controller configured to change the color of light emitted by the light emitters in response to the temperature detected by the temperature sensor.

Claim 18 depends from claim 17 and requires the plurality of light emitters to include a first light emitter configured to generate light of a first color when the signal from the temperature sensor detects a first water temperature, and a second light emitter configured to generate light of a second color when the signal from the temperature sensor detects a second water temperature greater than the first water temperature. Claim 18 further requires the first and second light emitters to blend the light of the first and second colors to generate light of a third color when the signal from the temperature sensor detects a third water temperature between the first and second water temperatures.

Schneider discloses a fluid delivery device, such as a kitchen or lavatory faucet, that includes a temperature sensor, a controller electrically coupled to the temperature sensor, and a display unit electrically coupled to the controller. Ex. 1009 ¶¶ 6, 26, 29, 32. The display unit has a display screen and includes first and second light sources, which may be blue and red LEDs, respectively. *Id.* at Abstr., ¶¶ 36, 40. When the faucet is on, the temperature sensor measures the water temperature and sends a signal to the

controller, which sends a signal to the light sources to adjust the color of the backlight of the display unit's display screen. *Id.* ¶ 40. When a user adjusts the fluid delivery device to deliver cold water, the controller sends a signal to the display unit to activate only the first light source (blue LED) so that the backlighting of the display unit will be blue. *Id.* When a user adjusts the fluid delivery device to output hot water, the controller sends a signal to the display unit to activate only the second light source (red LED) so that the backlighting of the display unit will be red. *Id.* ¶ 42. And when a user adjusts the fluid delivery device to deliver warm water, the controller sends a signal to the display unit to activate both the first and second light sources (blue and red LEDs) so that the backlighting of the display unit will be a combination of blue and red colors, such as purple or magenta. *Id.*

Petitioner asserts that a person of ordinary skill in the art would have been motivated to apply Schneider's teachings to Tseng's pull-out faucet to allow the modified faucet to convey water temperature information to a user. Pet. 51 (citing Ex. 1003 ¶ 300). Petitioner asserts that Tseng's modified faucet could alert a user when the water is hot so that the user could exercise care, and could also notify a user when the water reaches a desired temperature. *Id.* (citing Ex. 1003 ¶ 302).

Patent Owner counters that a person of ordinary skill in the art would not have been motivated to combine Tseng and Schneider, and the only reasons Petitioner provides for the combination are "conclusory statements from the Cook Declaration" that "do not cite to anywhere in Tseng or Schneider," and, therefore, "should be given no weight." Prelim. Resp. 38–39 (citing *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624 (PTAB Aug. 24, 2022) (precedential), Paper 9, 15; *Nichia Corp. v. Lighting Sci. Grp.*, IPR2019-01261 (PTAB Jan. 10, 2020), Paper 23, 20; *Securus Techs. Inc. v.*

*Glob. Tel*Link Corp.*, 701 F. App'x 971, 974-76 (Fed. Cir. 2017); 37 C.F.R. § 42.65(a)). To the contrary, however, Petitioner identifies multiple disclosures in Tseng and Schneider that, in Petitioner's view, convey a "similarity of subject matter and application" that would have suggested the proposed combination, which yields no more than an arrangement of old elements performing their known functions. Pet. 51–52 (and citations therein). That is sufficient to support institution of review.

Patent Owner also contends that "Tseng deals with solving the electric wiring and limited spacing problems inside the faucet," and "[t]o apply Schneider to Tseng," a person of ordinary skill in the art would have had to redesign Tseng's flexible circuit board and electric wire, and would have had to squeeze a temperature sensor and a controller into the limited space of Tseng's sprayhead 30. Prelim Resp. 38, 40–41 (citing Ex. 1004 ¶¶ 7, 108, Fig. 27). According to Patent Owner, the ordinarily skilled artisan also would have had to connect the sensor and controller with the electric wire, "exposing the wire to greater risk of damage." *Id.* at 41. Patent Owner contends that a person of ordinary skill in the art "would not go through this major change against Tseng's stated problem—wiring and spacing." *Id.*

Petitioner asserts to the contrary that because Schneider's temperature sensor and controller are specifically designed for use with a faucet to control LEDs within the faucet, and because Tseng's faucet uses LEDs for illumination, a person of ordinary skill in the art would have expected that "Schneider could (and would) be successfully integrated into Tseng." Pet. 51–52 (citing Ex. 1009 ¶¶ 2–3, 36, Fig. 4; Ex. 1004 ¶ 68; Ex. 1003 ¶¶ 309–313).

Petitioner identifies disclosures in Schneider and Tseng sufficient to show that a person of ordinary skill in the art reasonably would have

expected that a temperature sensor and controller as disclosed in Schneider could be incorporated successfully into Tseng's faucet. Pet. 51–52.

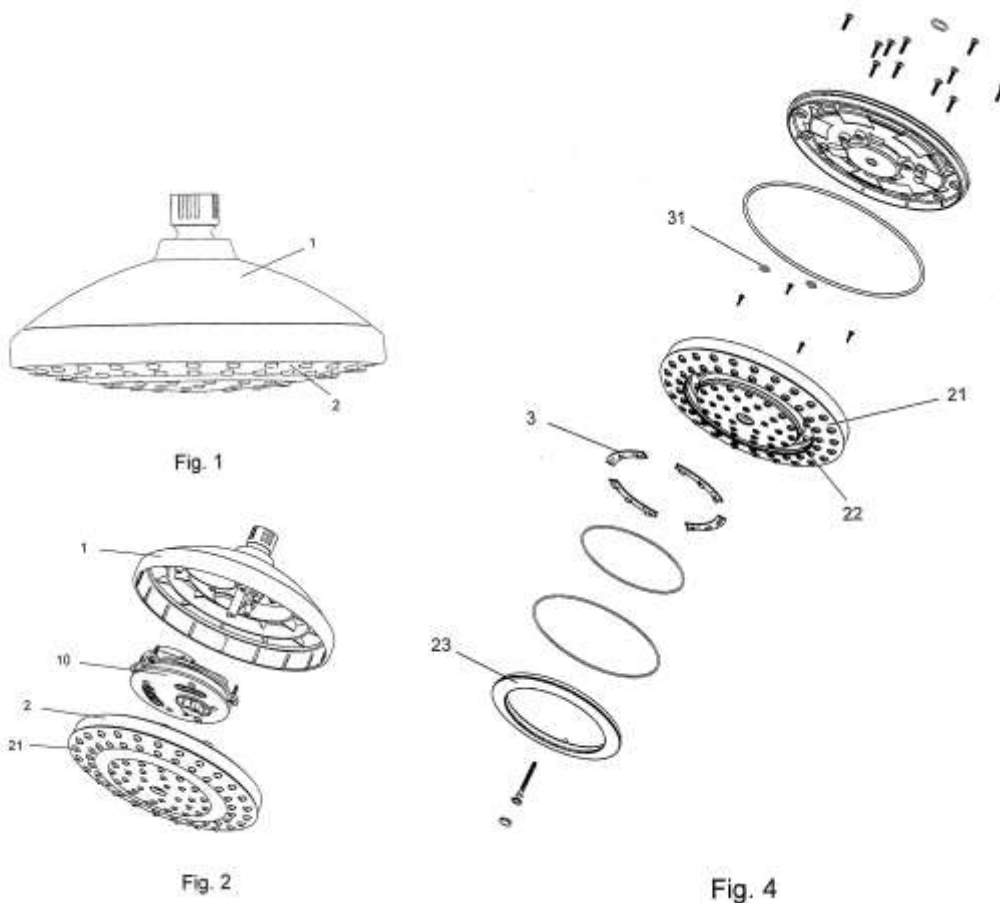
Petitioner, therefore, makes a sufficient showing for purposes of institution to establish a reasonable likelihood of prevailing in its challenge to the patentability of claims 17 and 18.

4. *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. Prelim. Resp. 42–48. We focus our analysis on the disputed limitations of independent claims 1 and 19, and we begin with an overview of Tse.

a) *Tse (Ex. 1005)*

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.

b) Disputed limitation shared by claims 1 and 19

Claims 1 and 19 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.

The parties dispute whether Tse discloses a translucent light pipe. Pet. 58–61; Prelim. Resp. 44–48.

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 light emitted by 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).

Patent Owner counters that Tse’s cover 23 is transparent—not translucent—and, therefore, cannot diffuse light. Prelim. Resp. 47. Patent Owner contends that transparent and translucent materials are fundamentally different, and Tse’s transparent cover 23 is not translucent. *Id.* at 46–47 (citing Ex. 2001, 1; Ex. 2002).

Tse, however, discloses that cover 23 “is made of transparent or *semi-transparent* material.” Ex. 1005, 6:23–29 (emphasis added). As discussed above, neither Petitioner nor Patent Owner provides an explicit construction of any of the limitations of claims 1 and 19. Pet. 13; Prelim. Resp. 10. Instead, Petitioner asserts that the claim terms do not require construction and should be afforded their plain and ordinary meaning, while Patent Owner indicates that it “has applied the plain and ordinary meaning of the claim terms.” *Id.* Although Patent Owner provides evidence showing that differences exist between transparent and translucent materials, the evidence does not address “semi-transparent” materials, and, therefore, does not demonstrate any difference between translucent and “semi-transparent” materials. Exs. 2001, 2002.

Insufficient information thus exists in the present record to determine that Tse’s “semi-transparent” material neither discloses nor would have suggested a “translucent” light pipe as recited in claims 1 and 19. *See*

Pet. 59; Ex. 1003 ¶¶ 355–356; *see also* Prelim. Resp. 46–47. In our view, analysis of the patentability of claims 1 and 19 on this ground, therefore, is best left for trial after full development of the record.

c) *Claims 6–9 and 20–23*

We decline to provide a detailed analysis of the sufficiency of Petitioner’s showing as to claims 6–9 and 20–23 because these claims depend from either claim 1 or claim 19, and Patent Owner does not present any arguments directed to these claims for this ground. Analysis of the patentability of claims 6–9 and 20–23 on this ground is best left for trial after full development of the record.

5. *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. 70–74. Patent Owner disagrees. Prelim. Resp. 48–49. We focus our analysis on the disputed limitation shared by independent claims 1 and 19, and we begin with an overview of Carter.

a) *Carter (Ex. 1006)*

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 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.

b) *Disputed limitation shared by claims 1 and 19*

Claims 1 and 19 both recite a *translucent* light pipe.

Petitioner asserts that Carter’s molded-in-place integrated light pipe is “transparent.” Pet. 70 (citing Ex. 1006, Abstr., ¶¶ 8, 9, 26). Petitioner asserts that applying Carter’s light pipe to Tse “results in the claimed subject matter: [Tse’s] 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). Petitioner asserts that a person of ordinary skill would have been motivated to so modify Tse’s shower head to improve its durability. *Id.* at 71–72 (citing Ex. 1006 ¶¶ 6, 7; Ex. 1003 ¶¶ 432–436).

Patent Owner contends that “just like Tse, Carter teaches a **transparent** ‘light pipe,’ not a **translucent** light pipe’ that can ‘diffuse light,’ as the claims require.” Prelim. Resp. 48–49 (citing Ex. 1006 Abstr., ¶ 26). Patent Owner contends that for at least this reason, Carter does not cure Patent Owner’s asserted deficiencies of Tse’s cover (discussed above for ground 4). *Id.* at 49.

Carter, however, discloses that integrated light pipe 3 is made of “clear/clear tinted/clear colored/semi-clear thermoplastics.” Ex. 1006 ¶ 26. As discussed above, neither Petitioner nor Patent Owner provides an explicit construction of any of the limitations of claims 1 and 19. Pet. 13; Prelim. Resp. 10. Although Patent Owner provides evidence showing that differences exist between transparent and translucent materials, the evidence does not address “clear tinted/clear colored/semi-clear thermoplastics,” and, therefore, does not demonstrate any difference between these materials and “semi-transparent” materials. Ex. 2001. Insufficient information exists in the present record to determine that Carter’s “clear tinted/clear colored/semi-clear thermoplastics” neither discloses nor would have suggested a “translucent” light pipe as recited in claims 1 and 19. *See* Pet. 70; Ex. 1003

¶ 418; *see also* Prelim. Resp. 49. Accordingly, analysis of the patentability of claims 1 and 19 on this ground is best left for trial after full development of the record.

c) Claims 6–9 and 21–23

We decline to provide a detailed analysis of the sufficiency of Petitioner’s showing as to claims 6–9 and 21–23 because these claims depend from either claim 1 or claim 19, and Patent Owner does not present any arguments directed to these claims for this ground. Analysis of the patentability of claims 6–9 and 21–23 on this ground is best left for trial after full development of the record.

6. Ground 6: Asserted Obviousness over Tse and Spangler and Ground 7: Asserted Obviousness over Tse, Carter, and Spangler

Petitioner asserts that claim 24, which depends from claim 19, would have been obvious over Tse and Spangler (ground 6) and over Tse, Carter, and Spangler (ground 7). Pet. 74–76. Patent Owner disagrees, contending only that these grounds fail “because Spangler does not cure the deficiencies in Tse and Carter.” Prelim. Resp. 49.

As discussed above, insufficient information exists in the present record to determine that Tse’s “semi-transparent” material and Carter’s “clear tinted/clear colored/semi-clear thermoplastics” neither disclose nor would have suggested a “translucent” light pipe as recited in claim 19. In our view, therefore, analysis of this ground is best left for trial after full development of the record.

IV. CONCLUSION

For the reasons discussed above, the Petitioner has demonstrated a reasonable likelihood of prevailing in establishing that at least one claim of

the '363 patent is unpatentable. We, therefore, institute an *inter partes* review of all challenged claims based on all asserted grounds of unpatentability set forth in the Petition. 35 U.S.C. § 314(a)(1).

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that *inter partes* review of the '363 patent is hereby instituted as to claims 1–24 on all grounds set forth in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial on the grounds of unpatentability authorized above; the trial commences on the entry date of this decision.

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FOR PETITIONER:

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

FOR PATENT OWNER:

Scott Bertulli
David L. Cavanaugh
Jungyeon Kim
WILMER CUTLER PICKERING HALE AND DORR, LLP
scott.bertulli@wilmerhale.com
david.cavanaugh@wilmerhale.com
john.kim@wilmerhale.com