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Paper 45
Dated: March 11, 2026

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FLUIDMASTER, INC.,
Petitioner,

v.

DANCO, INC.,
Patent Owner.

IPR2024-00635
Patent 10,934,698 B1

Before MEREDITH C. PETRAVICK, JAMES A. TARTAL, and ROBERT J. SILVERMAN, *Administrative Patent Judges*.

Opinion for the Board filed by *Administrative Patent Judge*, MEREDITH C. PETRAVICK.

Opinion Dissenting in Part filed by *Administrative Patent Judge* ROBERT J. SILVERMAN.

PETRAVICK, *Administrative Patent Judge*

JUDGMENT

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

I. INTRODUCTION

Fluidmaster, Inc. ("Petitioner") filed a Petition requesting *inter partes* review of claims 1–14 of US 10,934,698 B1 (Ex. 1001, "the '698 patent"). Paper 1 ("Pet."). On September 12, 2024, the Board instituted this *inter partes* review as to all challenged claims and the sole ground presented in the Petition. Paper 20.

After institution, Danco, Inc. ("Patent Owner") filed a Patent Owner's Response (Paper 26, "PO Resp."), Petitioner filed a Reply (Paper 30, "Pet. Reply"), and Patent Owner filed a Sur-reply (Paper 36, "PO Sur-reply"). An oral hearing was held on June 10, 2025, and a transcript appears in the record. Paper 41.

The Acting Chief Administrative Patent Judge extended the one-year period for issuing a final written decision under 35 U.S.C. § 316(a)(11) and 37 C.F.R. § 42.100(c). *See* Papers 42, 43.

The Board has jurisdiction for this proceeding under 35 U.S.C. § 6(b). This is a Final Written Decision under 35 U.S.C. § 318(a) as to the patentability of claims 1–14 of the '698 patent. For the reasons discussed below, we determine Petitioner establishes by a preponderance of the evidence that claims 1–14 are unpatentable,

A. Real-Parties-in-Interest

Petitioner identifies Fluidmaster, Inc. as the real party-in-interest. Pet. 14. Patent Owner identifies Danco, Inc., Hardware Holding, Inc., PPG, Inc. and NCH Corporation as the real parties-in-interest. Paper 4, 1.

B. Related Matters

The '698 patent is a subject of a district court action, *Danco, Inc. v. Fluidmaster, Inc. et al*, Civil Action No. 8:23-cv-01156-AB-DFM in the Central District of California ("the related litigation"). Pet. 1; Paper 7.[1]

The parties also identify the following related *inter partes* reviews: IPR2024-00633 and IPR2024-00634. Paper 4, 1; Paper 7.

C. The '698 Patent

The '698 patent, which is titled "Toilet Valve," issued on March 2, 2021, from U.S. Application No. 16/686,328 (filed November 18, 2019). Ex. 1001, codes (21), (22), (45), (54). On its face, the application of the '698 patent states that it claims priority to several related earlier-filed applications. *Id.* at code (63), 1:6–24.

The '698 patent states:

> A toilet fill valve in a toilet typically includes a water outlet that provides water for refilling a toilet bowl during a flush cycle. Unfortunately, the water flowing out of such conventional water outlets to fill a toilet bowl provide much more water than is necessary to fill the average toilet bowl. Consequently, much of the water that flows into a toilet bowl during the average flush cycle is lost down the drain. This translates into a loss of millions of gallons of water each year.

Ex. 1001, 1:28–36.

[1] The parties are reminded to update the Board regarding any material events occurring in the related litigation. *See* 37 C.F.R. § 42.8(a)(3).

Figure 1 of the ’698 patent is reproduced below.

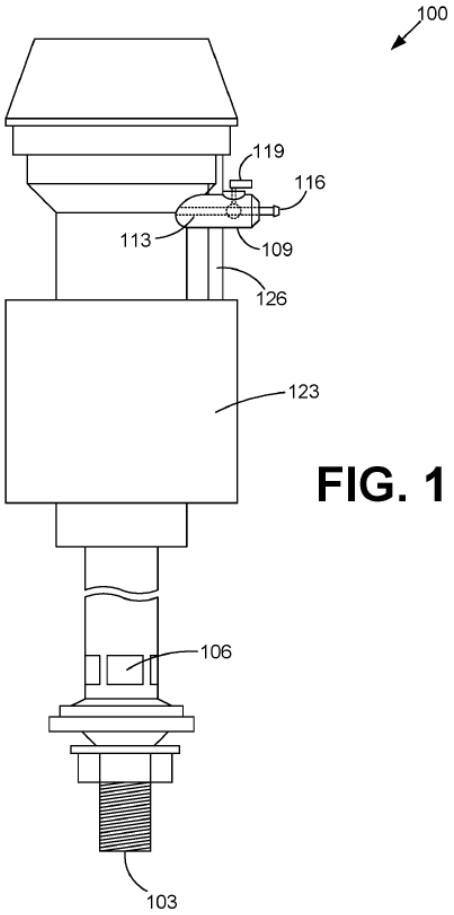

FIG. 1

Figure 1 of the ’698 patent depicts a perspective side view of an embodiment of a toilet fill valve, identified with reference number 100. Ex. 1001, 1:46–47.

The ’698 patent states:

> The toilet fill valve 100 includes a water inlet 103 at the bottom of the toilet fill valve 100 that is configured to be coupled to a water source outside of a toilet tank within which the toilet fill valve 100 is installed. The toilet fill valve 100 includes one or more water outlets 106 that are configured to supply water into a toilet tank within which the toilet fill valve 100 is installed. . . . The toilet fill valve 100 also includes a bowl fill valve 109 according to an embodiment of the present invention. The bowl

> fill valve 109 includes a bowl fill valve inlet 113 and a bowl fill valve outlet 116. In addition, the bowl fill valve 109 includes a handle 119 that facilitates a manual adjustment of the bowl fill valve 109.

Id. at 2:9–24. Additionally,

> the bowl fill valve inlet 113 is operatively coupled to the water inlet 103. In this respect, when the toilet fill valve 100 is open and water flows from the water inlet 103 to the water outlets 106 and into a toilet tank, an amount of water is also supplied to the bowl fill valve inlet 113 that flows through the bowl fill valve 109 and out the bowl fill valve outlet 116. By virtue of the manual setting of the handle 119 of the bowl fill valve 109, the flow of water through the bowl fill valve 109 is regulated. In this manner, the flow of water is regulated so that enough water flows out of the bowl fill valve 109 to fill a toilet bowl without wasting any water down a drain.

Id. at 2:35–46.

The '698 patent states that the disclosed embodiments provide additional beneficial features. For example, "[b]y virtue of the fact that the bowl fill valve 109 is integrated within the toilet fill valve 100, a pressure head is prevented from being created due to any potential pinching of the tube 146 or other similar adjustment mechanism." Ex. 1001, 4:63–67.

D. The Challenged Claims

Petitioner alleges that all claims of the '698 patent (claims 1–14) are unpatentable. Pet. 7. Of these challenged claims, claims 1, 8, 10, and 12 are independent claims. Claims 2–7 and 14 depend directly or indirectly from

claim 1. Claim 9 depends from claim 8. Claim 11 depends from claim 10. Claim 13 depends from claim 12.

Independent claims 1, 8, 10, and 12, reproduced below, including Petitioner's added sub-numbering (*see* Pet. vii–ix), illustrate the subject matter at issue:

1[Pre] 1. A toilet system, comprising:

1[A1] a toilet fill valve that comprises:

a body comprising an extended portion that forms a bowl fill outlet port;

1[A2] a water inlet configured to couple to a water source; and

1[A3] a tank water outlet configured to output water to a toilet tank;

1[B1] a bowl fill valve configured to attach directly to the body of the toilet fill valve, the bowl fill valve comprising:

1[B2] a bowl fill valve inlet port configured to mate directly to the bowl fill outlet port of the body of the toilet fill valve;

1[B3] a bowl fill valve outlet port;

1[B4] a protrusion configured to insert into a recess of the toilet fill valve and retain the bowl fill valve to the toilet fill valve, the protrusion being configured to snap fit into the recess;

1[B5] a water flow adjustment handle; and

1[B6] a slot configured to receive an extension of the toilet fill valve and prevent rotation of the bowl fill valve relative to the toilet fill valve; and

1[C] a tube configured to attach directly to the bowl fill valve outlet port of the bowl fill valve.

See Ex. 1001, 10:15–39.

8[Pre] 8. A bowl fill valve, comprising:

8[A] a bowl fill valve inlet port configured to mate directly to a bowl fill outlet port of a body of a toilet fill valve;

8[B] a bowl fill valve outlet port configured to attach directly to a tube that provides water from the bowl fill valve outlet port to an overflow tube;

8[C] a protrusion configured to insert into a recess of the toilet fill valve and retain the bowl fill valve to the toilet fill valve, the protrusion being configured to snap fit into the recess;

8[D] a slot configured to receive an extension of the toilet fill valve and prevent rotation of the bowl fill valve relative to the toilet fill valve; and

8[E] a water flow adjustment handle being configured to adjust water flow from the bowl fill valve inlet port to the bowl fill valve outlet port.

Id. at 10:65–11:13.

10[Pre] 10. A method, comprising:

10[A] coupling a water inlet of a toilet fill valve to a water source;

10[B1] attaching a bowl fill valve directly to a body of the toilet fill valve by at least:

10[B2] mating a bowl fill valve inlet port of the bowl fill valve directly to a bowl fill outlet port that extends from the body of the toilet fill valve;

10[B3] snap fitting a protrusion of the bowl fill valve into a recess of the toilet fill valve; and

10[B4] inserting an extension of the toilet fill valve into a slot of the bowl fill valve, wherein the slot is configured to prevent rotation of the bowl fill valve relative to the toilet fill valve; and

10[C] attaching a tube directly to a bowl fill valve outlet port of the bowl fill valve.

Id. at 11:17–12:6.

12[Pre] 12. A bowl fill valve, comprising:

12[A] a bowl fill valve inlet port configured to mate directly to a bowl fill outlet port of a body of a toilet fill valve;

12[B] a bowl fill valve outlet port configured to attach directly to a tube that provides water from the bowl fill valve outlet port to an overflow tube;

12[C] a protrusion on the bowl fill valve configured to snap fit into a recess of the toilet fill valve and retain the bowl fill valve to the toilet fill valve;

12[D] a slot configured to receive an extension of the toilet fill valve and prevent rotation of the bowl fill valve relative to the toilet fill valve; and

12[E] means for adjusting water flow out of the bowl fill valve outlet port.

Id. at 12:9–21.

E. The Asserted Ground

Petitioner contends that claims 1–14 of the '698 patent are unpatentable based on the following ground (Pet. 7):

Claims Challenged	35 U.S.C. §	Basis
1–14	103	Guoxin,[2] Ho,[3] "Quick Connection Art"

[2] Registered Utility Model Publication Number CN2447417Y, published Sept. 12, 2001 (Ex. 1015). A certified English language translation is Exhibit 1016. Patent Owner's Exhibit 2007 is an annotated version (adding line numbering) of Ex. 1016.

[3] U.S. Patent No. 5,862,538, issued June 26, 1999 (Ex. 1022).

"Quick Connection Art" refers Calmettes,[4] Hall,[5] and Kimber.[6] *See* Pet. 6.

Petitioner relies upon the Declaration of Kimberly Cameron (Ex. 1004). Patent Owner relies on the Declaration of Michael Jobin (Ex 2013).

II. ANALYSIS

A. Legal Standards

"In an IPR, 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")); *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in inter partes review). Although we may indicate in this Decision that certain Patent Owner arguments are not persuasive; in doing so we do not shift the ultimate burden from Petitioner.

A claim is unpatentable under § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a

[4] U.S. Patent No. 5,249,830, issued Oct. 5, 1993 (Ex. 1018).

[5] U.S. Patent No. 989,251, issued Apr. 11, 1911 (Ex. 1019).

[6] Canadian Patent No. 1,320,235, published July 13, 1993 (Ex. 1020).

person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) when in evidence, objective indicia of non-obviousness (i.e., secondary considerations).[7] *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

The Supreme Court explained in *KSR International Co. v. Teleflex Inc.* that:

> Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.

550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." (alteration in original)). A petitioner cannot prove obviousness with "mere conclusory statements." *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016). Rather, a petitioner must articulate a sufficient reason why a person of ordinary skill in the art would

[7] No evidence of secondary considerations has been presented at this stage of the proceeding.

have combined the prior art references. *In re Nuvasive, Inc.*, 842 F.3d 1376, 1382 (Fed. Cir. 2016).

"Whether an ordinarily skilled artisan would have been motivated to modify the teachings of a reference is a question of fact." *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1327 (Fed. Cir. 2016). "[W]here a party argues a skilled artisan would have been motivated to combine references, it must show the artisan 'would have had a reasonable expectation of success from doing so.'" *Arctic Cat Inc. v. Bombardier Recreational Prods. Inc.*, 876 F.3d 1350, 1360–61 (Fed. Cir. 2017) (quoting *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.*, 676 F.3d 1063, 1068–69 (Fed. Cir. 2012)).

B. Level of Ordinary Skill in the Art

In order to determine whether an invention would have been obvious at the time the application was filed, we consider the level of ordinary skill in the pertinent art at critical time. *Graham*, 383 U.S. at 17. The resolution of this question is important because it allows us to "maintain[] objectivity in the obviousness inquiry." *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991). In assessing the level of ordinary skill in the art, various factors may be considered, including the "type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field." *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (quoting *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962–63 (Fed. Cir. 1986)). Generally, it is

easier to establish obviousness under a higher level of ordinary skill in the art. *Innovention Toys, LLC v. MGA Entm't, Inc*., 637 F.3d 1314, 1323 (Fed. Cir. 2011) ("A less sophisticated level of skill generally favors a determination of nonobviousness . . . while a higher level of skill favors the reverse.").

The Declaration of Dr. Cameron, provided with the Petition, characterizes the level of ordinary skill in the art, as follows:

> A person of ordinary skill in the art ("POSITA") with respect to the subject matter of the '698 patent at the time of the priority date, March 11, 2004, would have had an undergraduate degree in mechanical engineering, or other technical training in product design or equivalent work experience. This person would also possess at least one year of experience in developing and/or evaluating mechanical aspects of fluid systems. I consider myself a person of ordinary skill in the art under this definition.

Ex. 1004 ¶ 28.

Patent Owner argues:

> A POSITA in the field to which the '698 Patent is directed would have had at least a Bachelor of Science degree in mechanical engineering or a related field or, as a substitute, at least two years of work or research experience in the design or development of toilet products, parts, and accessories.

PO Resp. 6.

We adopt Patent Owner's proposed definition of a POSITA, as it is consistent with the '698 patent and the asserted prior art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). However, we see no material difference between the level of skill proposed by Patent Owner and that proposed by Petitioner and Dr. Cameron such that our determinations would be the same under either proposed level of skill.

C. Claim Construction

In an *inter partes* review proceeding, a patent claim shall be construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b). 37 C.F.R. § 42.100(b) (as amended Oct. 11, 2018). Our rule adopts the same claim construction standard used by Article III federal courts, which follow *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc), and its progeny.

Under this standard, the words of a claim are generally given their "ordinary and customary meaning," which is the meaning the term would have to a person of ordinary skill at the time of the invention. *See Phillips*, 415 F.3d at 1312–13. In construing claims in accordance with their ordinary and customary meaning, we take into account the specification and prosecution history. *Id.* at 1315–17.

1. "Flow Limitations"

Petitioner collectively refers to the following limitations as the "Flow Limitations":

"a water flow adjustment handle" (Limitation 1B5);

"a water flow adjustment handle being configured to adjust water from the bowl fill valve inlet port to the bowl fill valve outlet port" (Limitation 8E);

"adjusting a flow of water out of the bowl fill valve" (Claim 11);

"means for adjusting water flow out of the bowl fill valve outlet port" (Limitation 12E); and

"the means for adjusting water flow out of the bowl fill valve outlet port comprises an adjustment handle" (Claim 13).

Pet. 15–16. Both Petitioner and Patent Owner agree that Limitation 12E is a means-plus-function limitation under 35 U.S.C. § 112 and the required structure encompasses at least an adjustment handle and equivalents. Pet. 7–8; PO Resp. 6–7.

Patent Owner asserts that, because each of the Flow Limitations relate to water flow through the bowl fill valve, these limitations require adjusting the flow *rate* of water exiting the flow valve. PO Resp. 15–17 (citing Ex. 2013 ¶ 97); *See also* PO Sur-Reply 7.

Petitioner responds that "the claim language of the '698 Patent discusses adjusting the water flow, not specifically the 'flow rate.'" Pet. Reply 13.

We are not persuaded by Patent Owner, and the conclusory testimony of Mr. Jobin (Ex. 2013 ¶ 97), that because the Flow Limitations "relate" to water flow through the bowl fill valve, that this necessarily means that the flow rate must be adjusted. As Petitioner points out, neither the term "flowrate" nor any similar term appears in any of the Flow Limitations. Thus, the plain language of the Flow Limitations requires that, contrary to Patent Owner's position, the claim limitation should not be restricted to adjustments to "flow *rate*."

Further, the '698 patent specification does not support Patent Owner's proposed construction. Although one passage of the '698 patent's specification states that "[b]ased on the setting of the handle 119, the bowl fill valve 109 determines the precise *flow rate* of the water that flows out the bowl fill valve outlet 116." (Ex. 1001, 3:26–28 (emphasis added)), other

passages reflect a broader scope of the term "flow adjustment" to reflect conveying an appropriate (but not excessive) volume of water to the toilet bowl, by using the disclosed adjustment techniques, as follows:

> By virtue of the manual setting of the handle 119 of the bowl fill valve 109, the flow of water through the bowl fill valve 109 is regulated. In this manner, the flow of water is regulated so that enough water flows out of the bowl fill valve 109 to fill a toilet bowl without wasting any water down a drain.
>
> Thus, the bowl fill valve 109 is configured to supply an adjustable flow of water out of the bowl fill outlet 116 that is directed to a toilet bowl during a flush cycle of a toilet to fill the toilet bowl. The flow of water is adjusted so that just enough flows out of bowl fill valve 109 so as to fill the toilet bowl without wasting any water.

Ex. 1001, 2:41–52; *see also* Pet. Reply 13; Ex. 1036 ¶¶ 30–31 (citing Ex. 1001, 4:53–63, 3:19–32). We will not import a flow rate adjustment limitation based on one passage of the '698 patent's specification into claim language that is not so limited. *See SuperGuide Corp. v. DirecTV Enterprises, Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004) (care should be taken "not to import into a claim limitations that are not part of the claim"); *see also In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993) ("limitations are not to be read into the claims from the specification").

In view of the plain language of the Flow Limitations and the intrinsic evidence of the '698 patent's specification, we do not construe the Flow Limitations to require adjustment of a flow rate.

2. Overflow Tube Limitations

Claims 8 and 12 are directed to a "bowl fill valve." More particularly, Limitation 8B further recites "a bowl fill valve outlet port configured to

attach directly to a tube that provides water from the bowl fill valve outlet port to an overflow tube." Limitation 12B recites "a bowl fill valve outlet port configured to attach directly to a tube that provides water from the bowl fill valve outlet port to an overflow tube."

Petitioner argues that Limitations 8B and 12B are directed to the configuration or structure of the bowl fill valve outlet port. Pet. Reply 2–4. According to Petitioner, because Limitations 8B and 12B do recite an overflow tube, the overflow tube is not separately claimed and is recited solely to define the function of the outlet port on the bowl fill valve. *Id.* at 3. Petitioner, thus, argues that an overflow tube is not separately claimed as a structural element, and that, to meet Limitations 8B and 12B, it is sufficient to show that the prior art discloses a bowl fill valve with an outlet port *that is configured to* attach directly to a tube that provides water from the outlet port to an overflow tube. *Id.* at 4.

In contrast, Patent Owner argues that Limitations 8B and 12B separately claim the overflow tube, and that Petitioner must show that the prior art discloses a tube that transfers water from the bowl fill valve outlet port to the toilet tank overflow tube. PO Resp. 10–11; PO Sur-reply 2–3. We disagree with Patent Owner, because claims 8 and 12, on their face, require "bowl fill valve outlet port," but do not require or recite an "overflow tube" as an element of the claimed "bowl fill valve."

When a structure is claimed as "configured to" perform a particular function, it generally requires a structure that is designed to perform the particular function claimed, i.e., it requires more than the mere capability of performing that function. *See Aspex Eyewear, Inc. v. Marchon Eyewear, Inc.*, 672 F.3d 1335, 1349 (Fed. Cir. 2012) (claim language including the

phrase "adapted to" is to be construed consistent with "configured to" language and requires that the structure must be "designed or configured to accomplish the specified objective, not simply that [it] can be made to serve that purpose."); *see also In re Giannelli*, 739 F.3d 1375, 1379 (Fed. Cir. 2014).

The plain language of Limitations 8B and 12B is clearly directed to the configuration of the bowl fill valve outlet port, in that these limitations recite "a bowl fill valve outlet port ***configured to***."[8] The recited function is "attach directly to a tube that provides water from the bowl fill valve outlet port to an overflow tube." The overflow tube is recited as part of the function in a clause identifying the tube to which the bowl fill valve outlet port is configured to attached — "***that*** provides water from the bowl fill valve outlet port to an overflow tube." The overflow tube, thus, is recited as part of the function defining the required structure of the bowl fill outlet port and is not separately claimed.

[8] The dissent considers the claim term "overflow tube" in isolation and not in the context of the clause in which it appears in Limitations 8B and 12B, which is in a function defining the structure of the configuration of the bowl fill valve outlet port. In related proceedings IPR2024-00634 and IPR2024-00633, we analyzed limitations that also recited the "overflow tube" but in different contexts — as part of a step of a method or the function defining the configuration of, not the bowl fill outlet port, but a tube. *See* IPR2024-00633, Paper 45, 16–17; IPR2024-00634, Paper 47, 14–15. The dissent does not properly account for the differences in the plain language of the claims in this proceeding and the related proceedings and how the term "overflow tube" is used in the claims at issue in the related proceeding. Contrary to the dissent, we find these differences are significant and must properly be taken into account.

Patent Owner points to nothing, and we see nothing in the '693 patent's specification that sufficiently suggests that Limitations 8B and 12B should be construed to require anything more than the structure of the bowl fill valve outlet port. *See* PO Resp. 10–11; PO Sur-reply 2–3.

Given the plain language of Limitations 8B and 12B, we are persuaded by Petitioner that these limitations require a bowl fill valve outlet port that is configured to or designed to perform the function of attaching directly to a tube that provides water from the bowl fill valve outlet port to an overflow tube and does not separately claim an overflow tube.

3. Remaining Terms

We do not need to construe explicitly any other claim terms to reach our decision. *See Realtime Data LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) ("The Board is required to construe 'only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.'" (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

D. The Prior Art Relied Upon

1. Guoxin

Guoxin is a Chinese Utility Model Patent Specification titled "Toilet Water Tank Water Supply Switching Device." Ex. 1016, code (54).

Guoxin's Figures 3–5 are reproduced below.

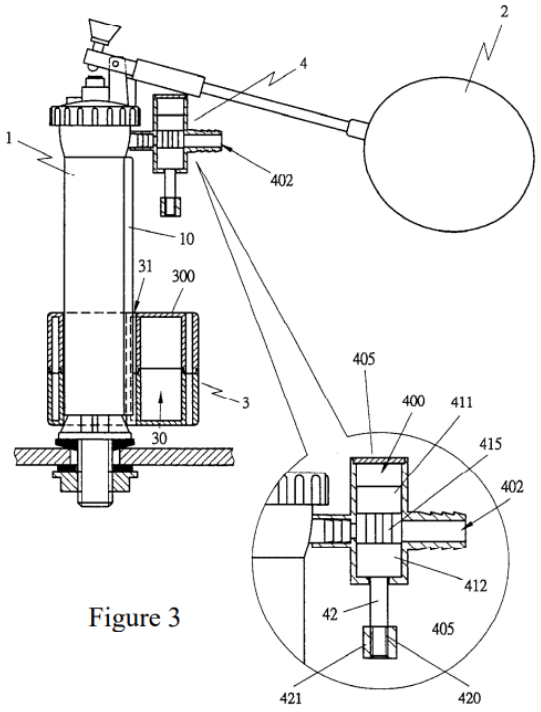

Figure 3

Figure 4

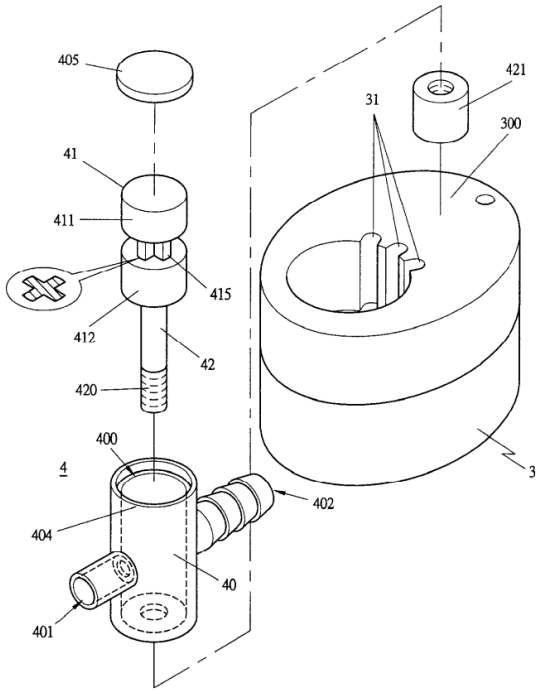

Figure 5

Figure 3 shows an embodiment of the disclosed device, Figure 4 is an enlarged view of Figure 3, and Figure 5 is an exploded view of the same embodiment. Ex. 1016, 5. Figures 3–5 depict switching mechanism 4, which Guoxin describes as follows:

> The switching mechanism 4 is equipped with a valve seat 40. This valve seat 40 has a slot 400 to accommodate a switching valve 41. The valve seat 40 has water inlet and outlet 401 and 402, where the water outlet 402 can be connected to the water supply pipeline 403, and the water supply line 403 is

> directed to the toilet to directly provide water supply to the toilet. . . .
>
> The switching valve 41 is equipped with upper and lower annular surrounds 411 and 412, and between these two annular surrounds 411 and 412, there is a smaller annular surround 415, which the smaller annular surround 415 can be cross-shaped or another shape. This facilitates a state as shown in Figures 3 and 4, where the water inlet and outlet can be aligned in a straight line, allowing water to flow into the toilet. However, when the water in the toilet water tank gradually reaches a set level of height (as shown in Figure 2), the lower annular surround 412 will block between the water inlet and outlet 401 and 402, thus discontinuing the water supply to the toilet through this switching mechanism. Furthermore, the valve stem 42 is equipped with external threads 420, which are combined with a T-shaped nut 421. This T-shaped nut has an appropriate weight, such that when the water level in the water tank decreases, the weight of the nut will automatically lower the switching valve. By simply turning the T-shaped nut, the length of the valve stem can be altered, thus changing the position at which the switching valve's stem is driven by the secondary ball float.

Id. at 5.

2. Ho

Ho is a U.S. patent titled "Toilet Flushing Device." Ex. 1022, code (54). Figure 3 of Ho is reproduced below.

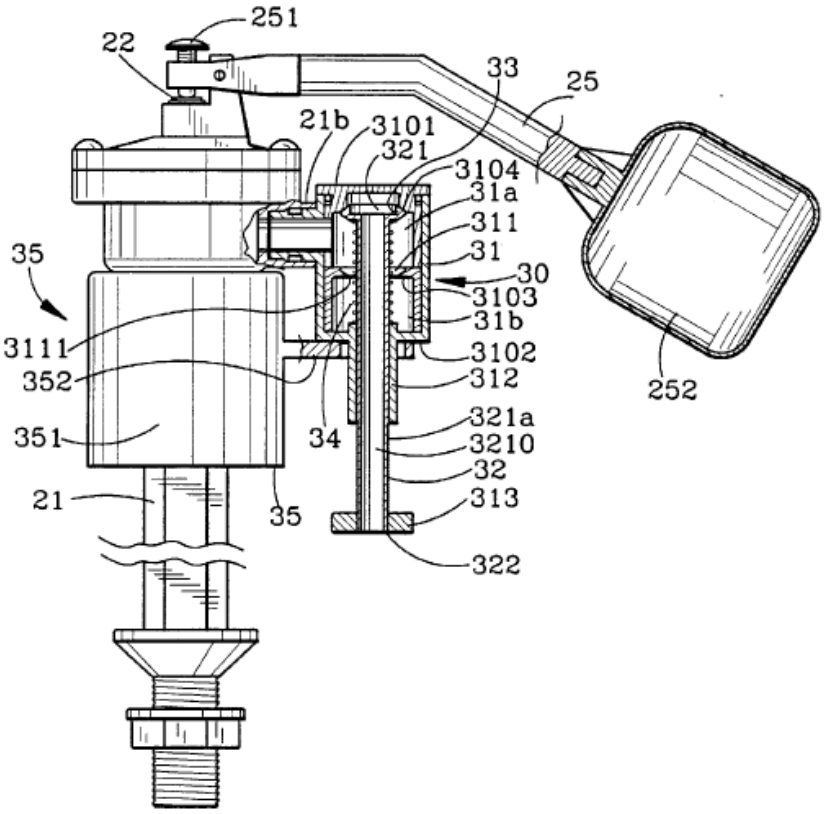

FIG.3

Figure 3 depicts a partial sectional view of Ho's toilet flushing device. *Id.* at 2:24–26. Ho states: "the diverter valve means 30 of the present invention includes . . . a transverse inlet pipe (21*b*) which receives water from the water supplying pipe 21." *Id.* at 3:12–17.

3. Calmettes

Calmettes is a U.S. Patent entitled "Device for Locking Two Coaxial Tubes," which discloses coupling devices for connecting the ends of coaxial tubes, such as those found in motor vehicle cooling circuits or other industrial applications. Ex. 1018, code (54), 1:4–10. A disclosed embodiment includes a locking mechanism having an outer tube with a longitudinal groove and an inner tube with radially projecting guides. *Id*. at 2:10–24, 3:30–63, Figs. 1a–4. A flexible locking tab, attached to the outer tube and positioned adjacent to a groove, contains apertures to receive the bosses. *Id*. at 3:59–4:21.

4. Hall

Hall is a U.S. Patent titled "Hose Coupling," which relates to hose-coupling techniques that that enable connection of adjacent hose sections, without using coupling threads. Ex. 1019, 1:8–14. A disclosed embodiment includes one section having bayonet slots and the other section having corresponding lugs that fit into the bayonet slots. *Id.* at 1:66–85. A feature of this coupling is a spring-biased sleeve or collar that slides over one of the hose sections and is equipped with locking plates that close the entrance to the bayonet slots once the lugs are inserted, thereby locking the hose sections together. *Id.* at 1:100–2:7. The embodiment also includes a gasket to prevent leakage at the junction of the hose sections. *Id.* at 1:86–99.

5. Kimber

Kimber is a Canadian patent document titled "Quick Connect Pipe Coupling," which discloses coupling techniques for creating a sealed

connection between two conduits, such as hoses and radiators in automobiles. Ex. 1020, code (54), 1. The coupling technique employs a tubular male fitting with an external conical portion and a tubular female fitting that snugly fits over the male fitting, featuring a complementary internal conical portion. *Id.* at 2. An embodiment includes axially oriented guide means (in the form of keying members on one fitting and guide slots on the other fitting) for proper angular alignment and relative axial movement of the fittings, as well as locking means (in the form of detent projections, on one fitting, that are received within apertures, on the other fitting) that secure the fittings axially upon assembly. *Id.* at 3, 6–7.

E. Analysis

1. Petitioner's Contentions

Petitioner contends that the combination of Guoxin, Ho, and the Quick Connection Art teaches all of the limitations of claims 1–14 and provides a mapping showing where each claim limitation is found in the prior art. Pet. 21–59. We have reviewed the Petition's mapping and determine that the Petition sufficiently shows that each limitation of claims 1–14 is disclosed by the combination of Guoxin, Ho, and the Quick Connection Art. Further, we have reviewed Petitioner's rationale for combining the prior art and determine that the Petition sufficiently shows that it would have been obvious to a POSITA to combine Guoxin, Ho, and the Quick Connection Art.

2. Patent Owner's Arguments

We have considered all of Patent Owner's argument but find them unpersuasive. We address each of Patent Owner's arguments below by topics as presented in the Patent Owner's Response.

a. Patent Owner's Arguments Concerning the Overflow Tube

Limitation 8B recites: "a bowl fill valve outlet port configured to attach directly to a tube that provides water from the bowl fill valve outlet port to an overflow tube." Limitation 12B is similar to Limitation 8B.

Petitioner maps the bowl fill valve outlet port to Guoxin's outlet port 402 of switching mechanism 4. Pet. 46 (referencing *id.* at 35 (mapping of Limitation 1B3), 44 (mapping of Limitation 1C)).

Patent Owner argues that Guoxin does not disclose Limitations 8B and 12B because neither Guoxin nor Ho teaches a tube that provides water from the bowl fill valve outlet port to an overflow tube, as purportedly required by Limitations 8B and 12B. PO Resp. 10–15; PO Sur-reply 1–7.

Patent Owner's argument is misplaced. Claims 8 and 12 are directed to a "bowl fill valve," not to a system or to a method. Above, we construed Limitations 8B and 12B to require a bowl fill valve outlet port that is configured to or designed to perform the function of attaching directly to a tube that provides water from the bowl fill valve outlet port to an overflow tube and determined that Limitations 8B and 12B do not require or separately claim an overflow tube. Patent Owner makes no argument that the structure of Guoxin's outlet port 402 is not configured to or designed to attach directly to a tube that provides water from the bowl fill valve outlet port to an overflow tube. *See* PO Resp. 10–15; PO Sur-reply 1–7. We note that the structure of Guoxin's outlet port 402 is quite similar to the structure

of the '698 patent's bowl fill valve outlet 116. *See e.g.,* Ex. 1001, 4:3–8, Fig. 1; Ex. 1016, Figs. 2, 4, 5.

Having considered all of the arguments of Petitioner and Patent Owner, as well as all of the cited evidence, we determine that Petitioner has sufficiently established that the cited references teach or suggest Limitations 8B and 12B.

b. Patent Owner's Arguments Concerning the Flow Limitations

Petitioner maps the water flow adjustment handle of the Flow Limitations to Guoxin's T-shaped nut. Pet. 42 (citing Ex. 1004 ¶ 137; Ex. 1016, 2:25–33). Turning Guoxin's T-shaped nut adjusts the volume of the water flow out of the switching valve. Ex. 1016, 5 ("By simply turning the T-shaped nut, the length of the valve stem can be altered, thus changing the position at which the switching valve's stem is driven by the secondary ball float."). Patent Owner argues that Guoxin's T-shaped nut does not meet the Flow Limitations because Guoxin's T-shaped nut does not adjust the flow rate. *See* PO Resp. 15–18; PO Sur-reply 7–9. Patent Owner's arguments are misplaced because we do not construe the Flow Limitation to require adjusting a flow rate.

Having considered all of the arguments of Petitioner and Patent Owner, as well as all of the cited evidence, we determine that Petitioner has sufficiently established that the cited references teach or suggest the Flow Limitations.

c. Patent Owner's Arguments Concerning the Motivation to Reverse the Configuration of Guoxin's Male and Female Fluid Flow Connectors Based on Ho.

Limitation 1B4 recites: "a protrusion configured to insert into a recess of the toilet fill valve and retain the bowl fill valve to the toilet fill valve, the protrusion being configured to snap fit into the recess." Ex. 1001, 10:29–32. Limitations 8C, 10B3, and12C are similar to Limitation 1B4, which we discuss as representative of these limitations.

Petitioner argues that both Guoxin and Ho disclose a "bowl fill valve configured to attach directly to the body of the toilet fill valve" (*see e.g.,* Pet. 33–34), but Petitioner acknowledges that "[t]he bowl fill outlet port of Guoxin is a male connector that inserts into the female connector of the bowl fill valve inlet port." *Id.* at 36–37. That is, where limitation 1B4 requires a "protrusion" to fit into a "recess of the toilet fill valve," Guoxin has the reverse arrangement — i.e., a projecting element on the structure that Petitioner maps to the "bowl fill outlet port" that fits into a conduit of the structure that Petitioner maps to the "toilet fill valve." *See id.*

In contrast to Guoxin, Petitioner argues that "Ho discloses an extended portion on a toilet fill valve with a recess (female connector) into which a bowl fill valve inlet port (male connector) of a bowl fill valve is inserted and locked into place." Pet. 22 (citing Ex. 1022, Figs. 3, 5). Such an arrangement of male and female connectors allegedly corresponds to what is recited in limitation 1[B4]. *See id.* at 37 (citing Ex. 1004 ¶ 129).

Petitioner argues that "[u]sing Ho's connection instead of Guoxin's would have been obvious to a POSITA as a matter of design preference, as they are well-known substitute structures for performing the same function

in their known and expected manner." Pet. 24 (citing Ex. 1004 ¶ 100; *KSR*, 550 U.S. at 416); *see also id.* ("One of ordinary skill in the art would understand that male and female fluid flow connectors are generally interchangeable and the decision to make one component a male connector and the other a female connector is a matter of design preference.") (citing Ex. 1004 ¶ 101).

In addition, Petitioner argues that the Quick Connection Art (specifically the Hall and Kimber references) supports the argument that "swapping the mating surfaces such that a protrusion is located on the bowl fill valve and inserts into a recess in the toilet fill valve would have been obvious to a POSITA as a matter of design preference." Pet. 37 (citing Ex. 1004 ¶ 129); *see also id.* at 37–41. Petitioner states:

> The connections between the two fluid channels recited by the claims are well-known fluid flow connections disclosed by numerous documents such as Hall and Kimber. EX1004, ¶ 133. As such, using the mating engagements of Hall or Kimber to attach the extended portion of Guoxin's toilet fill valve to switching mechanism 4 would have been obvious to a POSITA as a matter of design preference, as they are well-known simple substitute structures for performing the same function (i.e., coupling and retaining fluid flow components together) in their known and expected manner to obtain predictable results. EX1004, ¶ 133.

Id. at 41; *see also id.* at 42 ("[T]he combination of Guoxin and the Quick Connection Art renders obvious a protrusion on a bowl fill restriction that snaps into a recess in the toilet fill valve, thereby satisfying this element.") (citing Ex. 1004 ¶ 135).

Petitioner also cites the Bjerke[9] patent as further evidence that one of ordinary skill in the art would have known that male and female connectors are interchangeable. *See* Pet. 24–25, 39–40 (citing Ex. 1004 ¶¶ 101, 132; Ex. 1017, 7:15–24, Figs. 4–6).

In addition, Petitioner states that the '698 patent's specification characterizes male and female connector elements as being reversible. *See* Pet. 41–42 (citing Ex. 1004 ¶ 134; Ex. 1002, 80–81 (referring to ¶¶ 33, 42 of the originally filed specification)). Petitioner argues, "[i]t is clear from the '698 patent specification and intrinsic evidence that [Patent Owner] placed no criticality on which portion of the coupling was the male portion and which portion was the female portion—and consequently, no criticality on whether the protrusion is on the bowl fill valve or on the toilet fill valve bowl fill outlet port." *Id.* at 42 (citing Ex 1004 ¶ 134).

Patent Owner disputes the sufficiency of Petitioner's reasons for "reversing the configuration of Guoxin's male and female fluid flow connectors — based on the alleged teachings of Ho — for each of limitations 1[B4], 8[C], 10[B4], and 12[C]." PO Resp. 19 (citing Pet., 36–41, 46, 48; Ex. 2013 ¶ 106).

Patent Owner argues that the Petition fails to articulate a proper reason to combine Guoxin's teaching (i.e., its disclosure of an arrangement of male and female connectors) with those of any other referenced teachings, or otherwise to modify Guoxin's teaching (i.e., reverse the identified male and female elements) to achieve Limitation 1B4's recitation of a

[9] U.S. Patent No. 5,926,868, issued July 27, 1999 (Ex. 1017).

"protrusion" of the "bowl fill valve" that fits into a "recess of the toilet fill valve." *See* PO Resp. 19–23.

Patent Owner contends that Petitioner's argument, that combining the connection techniques of Hall or Kimber with Guoxin's device "would have been obvious to a POSITA as a matter of design preference," is simply a "conclusory allegation." PO Resp. 23–24 (quoting Pet. 41).

Further, Patent Owner argues that Bjerke — although though it discloses the reversibility of male and female mating connectors — nevertheless "provide[s] a POSITA with guidance regarding when to use a particular fluid flow connector configuration." PO Resp. 20 (citing Ex. 1017, 7:24–29; Ex. 2013 ¶ 111); *see also id.* at 23 ("Petitioner ignores the design considerations plainly disclosed by Bjerke and fails to provide any analysis supporting how those considerations would — or would not — motivate a POSITA to make the suggested changes.")

However, Patent Owner's discussion of the Bjerke patent (*see* PO Resp. 20, 23) does not bear upon the analysis of Limitation 1B4. Patent Owner states that Bjerke "provide[s] *design preferences* which provide a POSITA with guidance regarding when to use a particular fluid flow connector configuration." *Id.* at 20 (citing Ex. 1017, 7:24–29; Ex. 2013 ¶ 111). Patent Owner cites a portion of Bjerke indicating that it is preferable, in Bjerke's disclosed detachable bathtub shower head hose coupling, for the bathtub faucet to be equipped with the female receptacle, e.g., in order to "prevent[ ] upward spray at the connection" of the shower head hose. Ex. 1017, 7:25–27; *see also* Ex. 2013 ¶ 113. Yet, Patent Owner does not indicate how Bjerke's preference might apply to the context of Limitation 1B4 — i.e., whether Bjerke would favor a particular arrangement

of male and female connectors, in a toilet valve system — the subject matter of the '698 patent.

Moreover, Petitioner's argument constitutes a proper application of the so-called "design choice" basis for combining referenced teachings. A design choice analysis requires a factual determination that there are only a finite number of known techniques for accomplishing a particular purpose. *See Uber Techs., Inc. v. X One, Inc.*, 957 F.3d 1334, 1340 (Fed. Cir. 2020) ("Okubo's terminal-side plotting and Konishi's server-side plotting were both well known in the art, and were the only two identified, predictable solutions for transmitting a map and plotting locations, it would have been obvious to substitute server-side plotting for terminal-side plotting in a combination of Okubo and Konishi."). The Federal Circuit, in *Uber*, 957 F.3d at 1338–39, regards the design-choice approach as an example of the type of reasoning, expressed by the Supreme Court in *KSR*, 550 U.S. at 421, of resolving obviousness issues "[w]hen there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp."

Regarding the use of male and female connectors to attach the "bowl fill valve inlet port" to the "bowl fill outlet port," there are only two possible arrangements concerning which element has the recited "recess" — it must be one of the two "port[s]." In the context of the subject matter of Limitation 1B4, Petitioner arguments and cited evidence, discussed above, sufficiently establish that both alternatives are viable and that a person of ordinary skill in the art would have accomplished either arrangement with a reasonable expectation of success.

Patent Owner also argues that Petitioner "ignored evidence against the proffered combination." PO Resp. 23–24 (citing Ex. 2013 ¶ 118). Patent Owner contends that the use of metal and plastic, in certain prior art references, confounds Petitioner's proposed combination — a position allegedly supported by Petitioner's expert witness (Dr. Cameron):

> Dr. Cameron testified that a POSITA would have typically used either metal or plastic in a fluid system (but not both), and that certain connection mechanisms are better suited for plastic fluid systems (as opposed to metal systems) because of (1) the pressure inside, and (2) because plastic is more easily deformed. EX2008, 57:14–58:13, 56:2–57:13. However, neither Dr. Cameron nor Petitioner provide any analysis regarding how (or why) each specific connection mechanism disclosed by Bjerke, Calmettes, Hall, or Kimber would have been adapted by a POSITA for molded plastic toilet systems. EX2013, ¶ 119.

PO Resp. 24; *see also* PO Sur-reply 10–11 (citing Ex. 2008, 57:14–58:13, 56:2–57:13; Ex. 2015, 137:20–138:20, 184:19–185:11).

Petitioner contends that Patent Owner's argument — regarding a potential combination of plastic and metal prior art elements — is inapposite, because "[n]one of the claims of the '698 Patent require a 'molded' component, and the claims (and specification) are otherwise silent as to material composition or method of manufacture of the structures recited by the claims." Pet. Reply 16 n.7 (citing Ex. 1037, 18:5–18:16, 18:24–19:10). Indeed — notwithstanding the disclosures of plastic construction in Bjerke (Ex. 1017, 3:22), Calmettes (Ex. 1018, 5:2–3), and Kimber (Ex. 1020, 6) — Petitioner's argument relates to the combination of particular prior art teachings; Petitioner's argument for Limitation 1B4 does not involve the bodily incorporation of elements made of particular

materials. *See In re Etter*, 756 F.2d 852, 859 (Fed.Cir.1985) (en banc) ("Etter's assertions that Azure cannot be incorporated in Ambrosio are basically irrelevant, the criterion being not whether the references could be physically combined but whether the claimed inventions are rendered obvious by the teachings of the prior art as a whole.")

Additionally, Patent Owner contends that Petitioner's argument for Limitation 1B4 is based on hindsight: "The *only* support for the proposed modification is the '698 Patent itself, consideration of which is impermissible hindsight." PO Resp. 23 (citing Ex 2013 ¶ 116; *KSR*, 500 U.S. at 421).

Contrary to Patent Owner's "hindsight" assertion (*see* PO Resp. 21–23), Petitioner's arguments are not based on impermissible hindsight and are not based "*only*" on "the '698 Patent itself." *Id.* at 23. Indeed, Patent Owner acknowledges that Petitioner's argument for Limitation 1B4 involves the Guoxin and Ho references (*see id.* at 19), Dr. Cameron's testimony (*see id.* at 20–22), as well as the Bjerke patent's indication of the understanding of a person of ordinary skill in the art (*see id.* at 20, 22, 23). Moreover, Petitioner also cites the Hall and Kimber references to support the interchangeability of male and female connectors. *See* Pet. 36–41.

Notably, with respect to Petitioner's citations to the '698 patent's disclosure on the reversibility of male and female connectors, Petitioner's citations are not relied upon for any purported prior art teachings, but only to show that Patent Owner, in the context of the '698 patent specification and prosecution history, "placed no criticality on which portion of the coupling was the male portion and which portion was the female portion — and consequently, no criticality on whether the protrusion is on the bowl fill

valve or on the toilet fill valve bowl fill outlet port." Pet. 42 (citing Ex. 1004 ¶ 134).

Having considered all of the arguments of Petitioner and Patent Owner, as well as all of the cited evidence, we determine that Petitioner has sufficiently established that the cited references teach or suggest Limitations 1B4, 8C, 10B3, and12C.

d. Patent Owner's Arguments Concerning the Motivation to Combine Quick Connection Art with Guoxin and Ho

Limitation 1B6 recites: "a slot configured to receive an extension of the toilet fill valve and prevent rotation of the bowl fill valve relative to the toilet fill valve." Ex. 1001, 10:34–36. Limitations 8D, 10B4, and 12D are similar to Limitation 1B6, which we discuss as representative of these limitations.

Petitioner relies upon the disclosure in the Kimber reference (Ex. 1020) of a coupling arrangement having axial grooves (on one fitting) that mate with ribs (on the opposing fitting), in view of the supporting explanatory testimony of Dr. Cameron (Ex. 1004 ¶¶ 139–141), for teaching the recited "slot configured to receive an extension and prevent rotation" of the respective elements. *See e.g.,* Pet. 43–44. The Petition states:

> Kimber (EX1020) discloses a snap fit pipe coupling that comprises a male fitting and a tubular female fitting where the male fitting has *slots* configured to receive an *extension* of the toilet fill valve and *prevent rotation* of the bowl fill valve relative to the toilet fill valve. Annotated Figure 2 below illustrates the coupling arrangement between male fitting 22 and tubular female fitting 24 where tabs can snap into apertures and axial grooves 62 mate with ribs 80 to prevent axial movement and rotation.

Id. (italics added) (citing Ex. 1004 ¶ 140). Petitioner's annotated version of Kimber's Figure 2, appearing on page 44 of the Petition, is reproduced below.

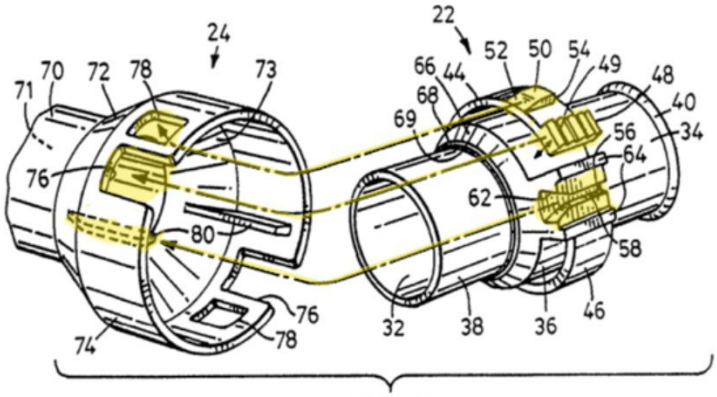

FIG.2

Petitioner's annotated version of Kimber's Figure 2 is a perspective view of male fitting 22 (having slots 58, 62 defined in an outer surface thereof) and female fitting 24 (having keying members 80 in the form of extensions from an inner surface thereof), wherein arrows show the manner of moving fittings 22 and 24 toward each other, such that keying members 80 would be received within slots 58, 62. *See* Ex. 1020 at 5, 8–9.

In addition, Petitioner argues that the Calmettes reference (Ex. 1018) and Dr. Cameron's testimony provide a sufficient reason for combining Kimber's teachings with those of the other referenced teachings relied upon in the analysis of claim 1:

> [A] POSITA would . . . be motivated to select a connection that prevented relative rotation of the bowl fill valve with respect to the toilet fill valve. [Ex. 1004 ¶ 139]. For example, Calmettes teaches that "the immobilization of two coaxial tubes may be sought after, both with regard to a relative rotation and to a translation, whenever it is desired to obtain an efficient mechanical connection between the two tubes." EX1018, 1:17–22, 1:58-64.

Pet. 43.

Patent Owner first argues that Petitioner's "motivation to combine analysis" concerning the Quick Connection Art "relies on the conclusory allegation that the art discloses 'well-known fluid flow connections.'" PO Resp. 23 (quoting Pet. 24[10]). Patent Owner contends that "the mere fact that the fluid flow connections were allegedly well known" does not address "whether a POSITA would have been motivated to combine the known Quick Connection Art with Guoxin and/or Ho." *Id.* (citing Ex. 2013 ¶ 117).

We determine that Petitioner articulates a sufficient reason to combine the identified teachings of Guoxin and Kimber, with a reasonable expectation of success, in view of Dr. Cameron's testimony and the evidence in Calmettes to the effect that prohibiting "relative rotation" of coupling elements helps to "obtain an efficient mechanical connection between the two tubes." Pet. 43 (quoting Ex. 1018, 1:17–22); *see also* Ex. 1004 ¶¶ 138–141; Ex. 1018, 1:58–64; Ex. 1020, 3, 8–9, Fig. 2. This reasoning is consistent with the Supreme Court's acknowledgment that "any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *KSR*, 550 U.S. at 420; *see also WMS Gaming Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1355 (Fed. Cir. 1999) ("The suggestion to combine may be found in explicit or implicit teachings within the references

[10] In context, the phrase quoted from the Petition states: "[T]he snap fit and slot/rib (or slot/extension) connections between the two fluid channels recited by the claims are well-known fluid flow connections disclosed by numerous documents such as Calmettes, Hall, and Kimber — the Quick Connection Art." Pet. 24 (citing Ex. 1004 ¶ 100).

themselves, from the ordinary knowledge of those skilled in the art, or from the nature of the problem to be solved.")

Having considered all of the arguments of Petitioner and Patent Owner, as well as all of the cited evidence, we determine that Petitioner has sufficiently established that the cited references teach or suggest Limitations 1B6, 8D, 10B4, and 12D.

III. CONCLUSION

After considering the evidence and arguments presented in the current record, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1–14 of the '698 patent are unpatentable.

In summary:

Claim(s)	35 U.S.C. §	Reference(s)/Basis	Claim(s) Shown Unpatentable	Claim(s) Not Shown Unpatentable
1–14	103	Guoxin, Ho, Quick Connection Art	1–14	

IV. ORDER

Accordingly, it is:

ORDERED that Petitioner has proven by a preponderance of the evidence that claims 1–14 of U.S. Patent No. 10,934,698 B1 are unpatentable;

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

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571-272-7822

Paper 45
Dated: March 11, 2026

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FLUIDMASTER, INC.,
Petitioner,

v.

DANCO, INC.,
Patent Owner.

IPR2024-00635
Patent 10,934,698 B1

Before MEREDITH C. PETRAVICK, JAMES A. TARTAL, and ROBERT J. SILVERMAN, *Administrative Patent Judges*.

SILVERMAN, *Administrative Patent Judge*, Dissenting in Part.

I join the panel majority's opinion, with regard to the determination that Petitioner has sufficiently established the unpatentability of claims 1–7, 10, 11, and 14. I respectfully dissent, with regard to the panel majority's claim construction of the claim limitations reciting the "overflow tube," in § II.C.2, and the related patentability analysis of claims 8, 9, 12, and 13, in § III.E.2.a.

Although I agree with and endorse nearly every aspect of the panel majority's opinion, I respectfully part ways, regarding the proper construction of certain limitations of independent claims 8 and 12 of the '698 patent[11] (reciting an "overflow tube") and, consequently, whether Petitioner has adequately established that the cited prior art satisfies these limitations. For the reasons that follow, and in view of all of the parties' arguments and evidence presented, Petitioner has not adequately shown the unpatentability of independent claims 8 and 12, along with respective dependent claims 9 and 13, by a preponderance of the evidence.

I. Background

Claims 8 and 12 recite an "overflow tube" in what Petitioner identifies as Limitations 8[B] and 12[B].

The associated disclosed structure is shown, e.g., in Figure 3 of the '698 patent specification (reproduced below), which depicts an embodiment of the disclosed apparatus having overflow tube 149.

[11] This separate opinion adopts of all of the abbreviations and other descriptors or nomenclature provided in the associated panel majority opinion.

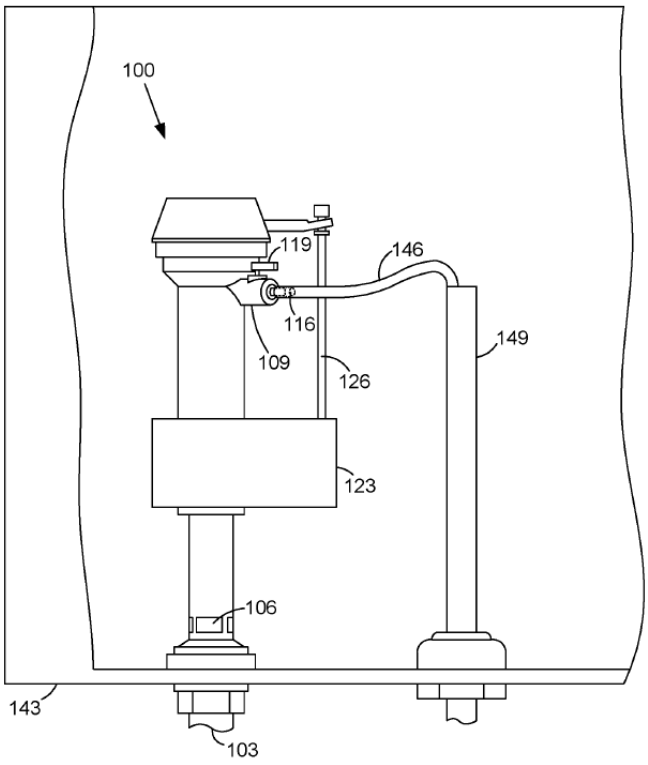

FIG. 3

Figure 3 is a cutaway drawing of a toilet tank 143 that is equipped with toilet fill valve 100, bowl fill valve 109, valve outlet 116, tube 146, and overflow tube 149. Ex. 1001, 1:50–52, 3:57–4:21. The '698 patent specification explains the operation of these elements:

> A tube 146 is coupled to the bowl fill valve outlet 116 and is directed into the overflow tube 149 of the toilet tank 143. The tube 146 directs water that flows out of the bowl fill valve outlet 116 into the overflow tube 149 and refills the toilet bowl associated with the toilet tank 143 as can be appreciated by those with ordinary skill in the art. The bowl fill valve 109 is configured to supply the adjustable flow of water out the bowl fill valve outlet through the tube 146 and into the overflow tube 149 for filling the toilet bowl during the flush cycle of the toilet.

Id. at 4:3–12.

The Petition states that each of Guoxin and Ho satisfies Limitation 8[B] (as well as the identically phrased Limitation 12[B]), "[f]or the reasons discussed [elsewhere in the Petition] with respect to 1[B3][12] and 1[C].[13]" Pet. 46 (citing Ex. 1004 ¶ 149) (emphasis omitted).

Petitioner's analyses of the referenced Limitations 1[B3] and 1[C] discuss, in relevant part, Guoxin's water supply pipeline 403 and Ho's supply line 40, each of which Petitioner maps to the "tube" of Limitation 1[C]. *See* Pet. 35–36 (citing Ex. 1004 ¶¶ 124–26; Ex. 1016, 2, Fig. 2; Ex. 1022, 3:6–17, 4:5–7), 44 (citing Ex. 1004 ¶ 143; Ex. 1016, Fig. 2; Ex. 1022, 3:6–17, 4:5–7).

Patent Owner's Response argues that Petitioner fails to meet its burden, with regard to Limitation 8[B][14] (as well as identically Limitation 12[B]) because neither of the cited prior art Guoxin and Ho references accounts for the recited "overflow tube." PO Resp. 10–15.[15]

[12] Limitation 1[B3] recites "a bowl fill valve outlet port." Pet. vii; Ex. 1001, 10:28.

[13] Limitation 1[C] recites "a tube configured to attach directly to the bowl fill valve outlet port of the bowl fill valve." Pet. vii; Ex. 1001, 10:37.

[14] Patent Owner's Response (e.g., page 10) mistakenly refers to Limitation "8[C]" as the limitation that recites the "overflow tube," rather than Limitation 8[B]. *See* Pet. Reply 1 n.1.

[15] Patent Owner argues Limitation 8[B] together with Limitation 12[B]. *See* PO Resp. 10–15; *see also* PO Sur-reply 1–7. In responding to Patent Owner, Petitioner also argues Limitations 8[B] and 12[B] together. *See* Pet. Reply 1–11.

Petitioner's Reply (pages 1–11) and Patent Owner's Sur-reply (pages 1–7) further address the disputed issues concerning the "overflow tube" recitations of Limitations 8[B] and 12[B].

There is no dispute that the intervening "tube" of Limitations 8[B] and 12[B] (i.e., "a bowl fill valve outlet port configured to attach directly to a *tube* . . .") (emphasis added) limits the scope of the claims. *See* Pet. 44, 45; PO Resp. 10. However, the parties dispute whether the recited "overflow tube" is also limiting.

II. The "Overflow Tube" Constitutes Limiting Claim Language

A. Petitioner's Arguments

Petitioner argues that the "overflow tube" language of Limitations 8[B] and 12[B] is non-limiting. *See* Pet. Reply 2–4.

In one aspect, Petitioner argues that the preambles of claims 8 and 12 (Limitations 8[Pre] and 12[Pre]), each reciting "[a] bowl fill valve, comprising," narrowly restrict the scope of claims 8 and 12 to the "bowl fill valve" — in contrast to claim 1, which has a preamble reciting "[a] toilet system, comprising" (Limitation 1[Pre]). Pet. Reply 2.

The Petitioner further contends that the '698 patent specification shows that "the overflow tube is a generic component of the ***toilet tank system***, and not a feature of the claimed bowl fill valve." Pet. Reply 3 (citing Ex. 1001, 4:3–4, 6:41–43). According to Petitioner, "[o]ne of ordinary skill in the art would thus understand that the overflow tube is a generic component of the toilet, and not recited as a feature of the claimed bowl fill valve of Claims 8 and 12." *Id.* (citing Ex. 1004 ¶ 145; Ex. 1036 ¶¶ 28–29).

Petitioner also argues that each of "overflow tube" recitations, in claims 8 and 12,

> simply require[ ] that the claimed bowl fill valve have an outlet port that is "***configured to***" attach directly to a tube that provides water from the bowl fill valve outlet port to an overflow tube. This confirms that the "overflow tube" is not recited as a separate structure — rather, is recited solely to define the function of the outlet port on the bowl fill valve. Thus, the overflow tube is not separately claimed but rather serves as a "reference point" to define the "purpose and structure" of the bowl fill valve outlet port.

Pet. Reply 3 (quoting *Eko Brands, LLC v. Adrian Rivera Maynez Enters., Inc.*, 946 F.3d 1367, 1377 (Fed. Cir. 2020)).

B. Patent Owner's Arguments

Patent Owner maintains that the "overflow tube" language of Limitations 8[B] and 12[B] limits the scope of the respective claims. *See* PO Resp. 10–12; PO Sur-reply 2–3. According to Patent Owner, Petitioner's interpretation of claims 8 and 12 reads the "overflow tube" language out of the claims. Sur-reply 3.

Patent Owner's position emphasizes the distinction between independent claims 8 and 12 — which recite "a tube that provides water from the bowl fill valve outlet port to an overflow tube" — and independent claims 1 and 10 — each of which recites the "tube" that attaches to the "bowl fill valve outlet port," but omit the "overflow tube." *See* Sur-reply 2–3 (referring to Limitations 1[C] and 10[C]).

C. Analysis

"Claim construction 'begins and ends in all cases with the actual words of the claim.'" *Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010) (quoting *Renishaw PLC v. Marposs S.p.A.*, 158 F.3d 1243, 1248 (Fed. Cir. 1998)). "The purpose of a patent claim is to define the precise scope of a claimed invention, thereby 'giv[ing] notice both to the examiner at the U.S. Patent and Trademark Office during prosecution, and to the public at large, including potential competitors, after the patent has issued.'" *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 950 (Fed. Cir. 2006) (quoting *Johnson & Johnston Assocs., Inc. v. R.E. Serv. Co.*, 285 F.3d 1046, 1052 (Fed. Cir. 2002) (en banc)). In view of this goal, "claims are interpreted with an eye toward giving effect to all terms in the claim," because

> [a]llowing a patentee to argue that physical structures and characteristics specifically described in a claim are merely superfluous would render the scope of the patent ambiguous, leaving examiners and the public to guess about which claim language the drafter deems necessary to his claimed invention and which language is merely superfluous, nonlimiting elaboration.

Id.; *see also Apple Inc. v. Ameranth, Inc.*, 842 F.3d 1229, 1237 (Fed. Cir. 2016) ("Ideally, claim constructions give meaning to all of a claim's terms.")

Petitioner's construction of the "overflow tube" of claims 8 and 12, whereby Petitioner argues that this claim language is non-limiting, is at odds with the principle that it is preferable to ascribe meaning to each word in a claim. In addition, Petitioner's construction is contrary to the intrinsic evidence provided by the other claims of the '698 patent and its related patents.

The claim construction doctrine of claim differentiation — which, in its "strongest" form, concerns differences between a claim and its dependent claim (*see Seachange Int'l, Inc. v. C-Cor Inc.*, 413 F.3d 1361, 1368 (Fed. Cir. 2005)) — "is not hard and fast rule of construction." *Kraft Foods, Inc. v. Int'l Trading Co.*, 203 F.3d 1362, 1368 (Fed.Cir.2000). Even so, "[d]ifferences among claims can . . . be a useful guide in understanding the meaning of particular claim terms." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (en banc).

In contrast to independent claims 8 and 12 of the '698 patent, neither of independent claims 1 and 10, nor any of their dependent claims, recites an "overflow tube." For example, comparing the relevant portions of claims 1 and 8[16] of the '698 patent — and with the understanding that these are not the only differences between these claims — the presence of the "overflow tube" in claim 8 is a manifest distinction (emphasis added):

> **Limitation 1[C]**: "a tube configured to attach directly to the bowl fill valve outlet port of the bowl fill valve."
>
> **Limitation 8[B]**: "a bowl fill valve outlet port configured to attach directly to a tube that provides water from the bowl fill valve outlet port to an *overflow tube*."

This distinction suggests that the inclusion of the "overflow tube" in Limitation 8[B] — and the omission of such a recitation in Limitation 1[C] — is meaningful and should have a limiting effect in claim 8. As Patent

[16] Because Limitations 8[B] and 12[B] are identical, this opinion may refer to the analysis of only Limitation 8[B] as exemplary in certain instances, but such determinations apply equally to Limitation 12[B].

Owner argues, this distinction reflects a claim drafting choice of whether or not a claim requires an "overflow tube." *See* PO Sur-reply 2–3 (comparing Limitations 8[B] and 12[B] with Limitation 1[C]); *see also Kara Tech. Inc. v. Stamps.com, Inc.*, 582 F.3d 1341, 1347 (Fed. Cir. 2009) ("[W]hen the inventor wanted to restrict the claims to require the use of a key, he did so explicitly. None of the claims at issue on appeal recite the term 'key.' By contrast, all of the other independent claims require either an 'encryption key' or 'key data.'").

In contrast, Petitioner's construction of Limitations 8[B] and 12[B] amounts to ignoring the phrase "to an overflow tube."

Petitioner argues, in part, that the "overflow tube" of claims 8 and 12 "is not recited as a separate structure," but "rather, is recited solely to define the function of the outlet port on the bowl fill valve." Pet. Resp. 3.

In so arguing, Petitioner appears to place particular emphasis on the word "configured" in Limitations 8[B] and 12[B]. *See* Pet. Resp. 3.

Yet, the word "configured," appearing in Limitations 8[B] and 12[B], does not dictate the meaning of the recited "overflow tube." Limitations 8[B] and 12[B] recite that the "bowl fill valve outlet port" is "configured to attach directly to" the intervening "tube." However, the "configur[ation]" of the "bowl fill valve outlet port" — or the manner in which it "attach[es]" to the intervening "tube" — does not reflect on the interpretation of either the intervening "tube" or the "overflow tube."

Insofar as Petitioner's construction relies upon the phrase "overflow tube" being introduced in a paragraph, in each of claims 8 and 12,that begins by reciting "a bowl fill valve outlet port," Petitioner does not explain why a

structure (e.g., the "overflow tube") recited later in the paragraph would not have limiting effect.

Indeed, Limitations 8[B] and 12[B] also introduce the intervening "tube," in addition to the "overflow tube," later in the paragraph. Yet, the parties do not dispute that the recitations of the "tube," in each of Limitations 8[B] and 12[B], do limit the scope of these claims. *See* Pet. 44, 45; PO Resp. 10. The opinion of the panel majority endorses this construction. In order to be consistent with the construction of the "tube," the "overflow tube" should also be limiting.

As noted above, Petitioner also argues that the "overflow tube" should be non-limiting, because it "is recited to define the function of the outlet port on the bowl fill valve." Pet. Reply 3. Arguably, the intervening "tube" has a function recited in Limitations 8[B] and 12[B] — "provid[ing] water" — which might be regarded as a non-limiting intended use of the "tube." *See In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997). However, by contrast, the "overflow tube" does not describe any function whatsoever — it is an entirely *structural* feature.

In addition to other claims of the '698 patent, the claims of related patents[17] can illuminate the meaning of the "overflow tube" in Limitations 8[B] and 12[B]. *See Kara Tech.*, 582 F.3d at 1347; *Epcon Gas Systems, Inc. v. Bauer Compressors, Inc.*, 279 F.3d 1022, 1030–31 (Fed. Cir. 2002); *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 980 (Fed. Cir. 1999). For example, an "overflow tube" is recited in all of the claims of certain other

[17] The relationships among the patents and applications of the '698 patent family are identified in the Petition (pages 2–3), Patent Owner's Response (page 2), and on the face of the '698 patent (Ex. 1001, code (63)).

related patents (each having a specification identical to that of the '698 patent) — such as U.S. Patent No. 9,139,993 B1 (Ex. 1007) ("the '993 patent") (the subject of IPR2024-00633) and U.S. Patent No. 9,103,105 B1 (Ex. 1005) ("the '105 patent") (the subject of IPR2024-00634). Notably, the present panel has determined that the "overflow tube" recitations of the '993 and '105 patents are limiting. *See* IPR2024–00633, Paper 45, 16–20 (PTAB Dec. 15, 2025) ('993 patent); IPR2024-00634, Paper 47, 14–18 (PTAB March 5, 2026) ('105 patent).

Of course, the particular words and phrases employed in claims are critical to any determination of whether the "overflow tube" language — even if recited in a claim — actually limit the scope of a particular claim. In this regard, independent claim 1 of the '993 patent and independent claims 1 and 24 of the '105 patent contain limitations helpful to the interpretation of the "overflow tube" language in the '698 patent. Like claims 8 and 12 of the '698 patent, claim of the '993 patent and claims 1 and 23 of the '105 patent are apparatus claims, as opposed to method claims. Relevant limitations of these claims are reproduced below, along with Limitation 8[B] of the '698 patent (emphasis added):

'993 patent (clm. 1):	"a tube that is configured to attach directly to the water flow regulator, wherein the tube is configured to direct the second portion of the water from the water flow regulator directly to a toilet tank *overflow tube*." (Ex. 1007, 10:16–19).
'105 patent (clm. 1):	"a tube that is configured to attach directly to the bowl fill restriction, wherein the tube is configured to direct the second portion of the water

	from the bowl fill restriction directly to a toilet tank *overflow tube*." (Ex. 1005, 10:17–20).
'105 patent (clm. 24):	"a tube configured to attach directly to the bowl fill restriction, wherein the tube is configured to direct the second portion of the water from the bowl fill restriction to a toilet tank *overflow tube*." (Ex. 1005, 12:36–39).
Limitation 8[B]:	"a bowl fill valve outlet port configured to attach directly to a tube that provides water from the bowl fill valve outlet port to an *overflow tube*."

There are some differences in terminology among these claims, e.g., the use of the terms "water flow regulator" ('993 patent) and "bowl fill restriction" ('105 patent) —rather than the '698 patent's "bowl fill valve outlet port" — as well as the modifier of "toilet tank" applied to the "overflow tube" in the '993 and '105 patents. However, these differences in terminology, relating to similar elements, do not affect whether the "overflow tube" limitations should be construed to limit claim scope. Neither party argues to the contrary.

Notably, the above claims of the '993 and '105 patents recite the intervening "tube" being "configured" to attach to the "water flow regulator"/"bowl fill restriction" and to convey "water" — whereas, in Limitation 8[B] of the '698 patent, it is the other structure involved in the recited "attach[ment]" relationship (i.e., the "bowl fill outlet port") that is recited as being "configured to attach directly to a tube." Consequently, Limitation 8[B] of the '698 patent further recites that the intervening "tube" "provides water from the bowl fill valve outlet port to an overflow tube" —

without reciting that it is "configured" to do so. Yet, whether it is the "bowl fill valve outlet port" (or the "water flow regulator" or the "bowl fill restriction," as in the '993 and '105 patents) that is said to be "configured" — as opposed to the intervening "tube" — does not bear upon the meaning of the "overflow tube." The "overflow tube" is recited in essentially the same way in all of these claims — as a *structural* feature. Therefore, in order to be consistent with this panel's claim constructions in IPR2024–00633 and IPR2024-00634, the "overflow tube" of the '698 patent's Limitations 8[B] and 12[B] should be construed as limiting claim scope.

In another aspect of its claim construction argument, Petitioner contends that the "overflow tube" recitations of claims 8 and 12 have no limiting effect, because they are allegedly "generic." *See* Pet. Reply 2–3. Yet, Petitioner does not explain why the purported generic quality of the "overflow tube" would render this language non-limiting. Moreover, reciting old or generic features in a patent claim is not only permissible, it is often unavoidable. Indeed, "inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418–19 (2007).

Petitioner also argues that the claim preambles in the '698 patent require the "overflow tube" of Limitations 8[B] and 12[B] to be construed as non-limiting. *See* Pet. Reply 2. Petitioner contends that, because the preambles, 8[pre] and 12[pre], recite "[a] bowl fill valve comprising," the claims must be limited in scope to features of the "bowl fill valve" component only — excluding the "overflow tube" recited in the body of each claim. *See id.*

Claim preambles are frequently used to express an overall purpose or an intended use for claimed subject matter; such preambles typically do not limit claim scope:

> Generally, a preamble is not limiting. *Symantec Corp. v. Computer Assocs. Int'l, Inc.*, 522 F.3d 1279, 1288 (Fed. Cir. 2008). For example, "[p]reamble language that merely states the purpose or intended use of an invention is generally not treated as limiting the scope of the claim." *Pacing Techs., LLC v. Garmin Int'l, Inc.*, 778 F.3d 1021, 1023–24 (Fed. Cir. 2015) (quoting *Bicon*[, 441 F.3d at 952]).

SUMMIT 6, LLC v. Samsung Elecs. Co., Ltd., 802 F. 3d 1283, 1292 (Fed. Cir. 2015).

Rather than arguing that words appearing in the preambles of claims 8 and 12 should (or should not) be treated as claim limitations, Petitioner argues that the preambles of claims 8 and 12 curtail the scope of each claim, so as to ascribe no limiting effect to the "overflow tube" language of Limitations 8[B] and 12[B] — terms recited in the *bodies* of these claims. *See* Pet. Reply 2–3.

The limiting effect of language in a claim preamble depends on the particular circumstances of the claim language at issue. *See Catalina Marketing Int'l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808–809 (Fed. Cir. 2002). However, the limiting or non-limiting effect of preamble language, in claims 8 and 12, would not affect the meaning of the "overflow tube" claim language at issue. In the'698 patent, the preambles of claims 8 and 12 recite "[a] bowl fill valve," which is then repeated and further described in the body of each claim. *See* Ex. 1001, 10:65, 11:5, 12:9, 12:15. There is no dispute, in this proceeding, that claims 8 and 12 require a "bowl fill valve." After the term "bowl fill valve," the preambles of claims 8

and 12 go on to recite the transition word, "comprising" (*id.* at 10:65, 12:9), which has a well-established meaning in patent law:

> When a patent claim uses the word "comprising" as its transitional phrase, the use of "comprising" creates a presumption that the body of the claim is open. In the parlance of patent law, the transition "comprising" creates a presumption that the recited elements are only a part of the device, that the claim does not exclude additional, unrecited elements.

Crystal Semiconductor Corp. v. TriTech Microelecs. Int'l, Inc., 246 F.3d 1336, 1347 (Fed. Cir. 2001) (citing *KCJ Corp. v. Kinetic Concepts, Inc.*, 223 F.3d 1351, 1356, (Fed. Cir. 2000)); *see also Innovad Inc. v. Microsoft Corp.*, 260 F.3d 1326, 1333 (Fed. Cir. 2001) ("Indeed, by using the transition term 'comprising' at the outset of the claim, the claim drafter signaled that an accused device could have additional elements — such as switches — beyond those expressly recited and still literally fall within the claim terms.") (citing *AFG Indus. v. Cardinal IG Co.*, 239 F.3d 1239, 1244–45 (Fed. Cir. 2001)).

In view of the "open" transition word "comprising" — and contrary to Petitioner's argument — the preambles of claims 8 and 12 should not be understood to deprive the "overflow tube" terms, recited in the body of each claim, of limiting effect. Thus, even though the preamble of each claim recites "[a] bowl fill valve," the claim scope may include limitations beyond the particular elements of the "bowl fill valve" component disclosed in the '698 patent's specification.

Further, Petitioner's proposed construction of claims 8 and 12 as being limited to features of the "bowl fill valve," on account of the claim preambles, would conflict with the parties' undisputed constructions of the

intervening "tube" of Limitations 8[B] and 12[B]. Under Petitioner's proposed approach, the recitation of this "tube" should have not limiting effect, because it is not part of the "bowl fill valve" recited in the preamble of each claim. Yet, the parties agree to the contrary — the intervening "tube" introduced in Limitations 8[B] and 12[B] has limiting effect. *See* Pet. 44, 45; PO Resp. 10.

Petitioner's characterization (*see* Pet. Reply 3) of the "overflow tube" as something that merely provides "a 'reference point' to define the 'purpose and structure' of the bowl fill valve outlet port" — in the manner of the cited *Eko Brands* case — is also misplaced.

The Federal Circuit articulated the notion of a non-limiting claim feature, which merely establishes a "reference point" for other recited elements, in *Vaupel Textilmaschinen KG v. Meccanica Euro Italia S.p.A.*, 944 F.2d 870, 879–80 (Fed. Cir. 1991), and applied it again in *C.R. Bard, Inc. v. M3 Sys.*, 157 F.3d 1340, 1350 (Fed. Cir. 1998) (citing *Vaupel*), as well as *Eko Brands*, 946 F.3d at 1377 (citing *C.R. Bard*). All three of these cases involved claim terms introduced in the preambles of the respective claims and, in each case, the Federal Circuit determined that the claim language at issue did not limit the scope of the claims.

The claims in *Vaupel* related to textile-weaving technology and recited certain parts of a loom — a "breast beam" or a "breast plate" — in the preambles. *Vaupel*, 944 F.2d at 879–80. Although the "breast beam" or "breast plate" also appeared in the bodies of the claims, the Federal Circuit held that these terms "are not structural limitations" of the claims, because "they indicate a reference point to fix the direction of movement of the woven fabric from the loom." *Id.* at 880. Notably, the Federal Circuit

explained, the "breast beam" and "breast plate" "are not illustrated in any of the figures of the . . . patent or otherwise described in the specification." *Id.*

C.R. Bard related to "devices for taking samples of body tissue for biopsy purposes, wherein a biopsy needle firing device or 'gun' mechanically injects a biopsy needle assembly into the core body tissue." *C.R. Bard*, 157 F.3d at 1346. The preamble of the relevant independent claim recited a "housing" (and associated parts) of such a biopsy gun (i.e., a "tissue sampling device"):

> A biopsy needle for use with a tissue sampling device having a housing with a forward end, a first slide mounted for longitudinal motion within said housing, and a second slide mounted for longitudinal motion within said housing, said biopsy needle comprising: . . . .

C.R. Bard, 157 F.3d at 1348–49. The body of the claim describes how the "biopsy needle," interacts with the "housing," including, for example, a portion of the "biopsy needle" "coupling . . . to said first slide for longitudinal motion both toward and away from said forward end of said housing." *Id.* at 1349.

A dispute in the *C.R. Bard* case concerned whether the preamble's recitation of the "housing," along with its various parts, meant that the claim required, as limitations, certain features of the biopsy gun. *See id.* at 1350. Referring to the "reference point" concept of *Vaupel*, the Federal Circuit explained that the scope of the claim is not limited in such a way:

> [T]he preamble . . . recites the portion and structure of the gun housing into which the needles fit, and provides reference points in the gun that aid in defining the needles as set forth in the body of the claim. [The defendant] is incorrect in stating that the preamble must contain details of the integrated mechanical cocking structure, for the gun structure is not part of

> the separate claims to the needles. The question of anticipation of the . . . claims [i.e., their scope] relates to the needles, not the gun.

Id.

Eko Brands, the case that Petitioner relies upon (*see* Pet. Reply 3), concerns a patent that "describes a reusable filter cartridge device for use with single-serve beverage brewing machines," e.g., for making coffee. *Eko Brands*, 946 F.3d at 1372. At issue was whether the recitations describing a single-serve beverage brewing machine were limiting, where the claim preamble recited the machine ("a single serve beverage brewer"), along with its various parts ("a brewing holster," "an inlet probe," and "an outlet probe"), and the body of the claim recited the interactions of such parts with the filter cartridge (called a "beverage brewing device" in the claim). *Id.* at 1376–77. The claim preamble recited:

> A beverage brewing device [i.e., the cartridge] for use with a single serve beverage brewer having a brewing holster, an inlet probe for dispensing water, the inlet probe moveable between a non-brewing position and a brewing position, and an outlet probe extending upwardly into the brewing holster for outleting a brewed beverage, the beverage brewing device comprising: . . . .

Id. at 1376 (emphasis omitted). The body of the claim recited that the "beverage brewing device" includes "a body removably receivable within a brewing holster of a single serve beverage brewer," an "outlet probe receptacle" "configured to receive an outlet probe of the single serve beverage brewer," and a "lid" defining "an inlet probe opening" that is "configured to receive an inlet probe of the single serve beverage brewer in a

brewing position for placing the inlet probe into fluid communication with the brew chamber." *Id.* at 1376 n.3 (emphasis omitted).

The Federal Circuit determined that the claim "on its face does not require a beverage brewer, even if the preamble is limiting" and "[t]o the extent that [the claim] mentions a beverage brewer, it is only as a 'reference point' to define the purpose and structure of the brewing device." *Eko Brands*, 946 F.3d at 1377 (citing *C.R. Bard*, 157 F.3d at 1350). In addition, the Federal Circuit pointed out, "there is nothing in the prosecution history suggesting that the beverage brewer itself is part of the claim." *Id.*

Even leaving aside the circumstances that the relevant claim language in *Vaupel*, *C.R. Bard*, and *Eko Brands* was introduced in the claims' preambles, the "reference point" concept of these cases does not apply to the "overflow tube" recitations of the '698 patent.

In one aspect, *Vaupel*, *C.R. Bard*, and *Eko Brands* all involve non-limiting claim language that described interactions with and relative movements of other recited structures. *See Vaupel*, 944 F.2d at 880 (explaining that the "breast beam" and "breast plate" "indicate a reference point to fix the direction of movement of the woven fabric from the loom."); *C.R. Bard*, 157 F.3d at 1349 (referring to the "biopsy needle" "coupling . . . to said first slide for longitudinal motion both toward and away from said forward end of said housing."); *Eko Brands*, 946 F.3d at 1376 n.3 (describing the filter cartridge being "removably receivable within" and "configured to receive an outlet probe" and an "inlet probe" of the single-serve beverage brewing machine). In this sense, the non-limiting claim features are used to describe structural features of other elements recited in the claims.

By contrast, the connection and interaction between the intervening "tube" and the "overflow tube," in Limitations 8[B] and 12[B], are unspecified — stating only that the "tube . . . provides water from the bowl fill valve outlet port to an overflow tube." The relationship between the intervening "tube" and the "overflow tube," in the '698 patent, is stated even more generally than it is the above-identified claims of the related '993 and '105 patents, wherein the intervening "tube" is "configured to direct the second portion of the water . . . *directly* to a toilet tank overflow tube." Ex. 1005, 10:18–20 (claim 1), 12:38–40 (claim 24) (emphasis added); Ex. 1007, 10:18–20 (claim 1) (emphasis added). Notably, with regard to the '993 and '105 patents, the present panel was not persuaded by Petitioner's arguments — *see* IPR2024–00633, Paper 30, 1–2 (PTAB March 19, 2025); IPR2024-00634, Paper 32, 1–2 (PTAB March 19, 2025) — that the "overflow tube" limitations, of their respective claims, should be regarded as non-limiting "reference points." *See* IPR2024–00633, Paper 45, 16–20 (PTAB Dec, 15, 2025); IPR2024-00634, Paper 47, 14–18 (PTAB March 5, 2026). Thus, the "overflow tube" recitations in Limitations 8[B] and 12[B] — unlike the recited features of the single-serve brewer in *Eko Brands*, 946 F.3d at 1377 — do not "define the purpose and structure of" other features in the respective claims.

Moreover, unlike the claims in *Vaupel*, *C.R. Bard*, and *Eko Brands*, the "overflow tube" is not needed to understand the other features recited in the claims of the '698 patent; indeed, independent claims 1 and 10 of the '698 patent do not recite an "overflow tube."

Still further, and perhaps most fundamentally, the non-limiting claim terms of *Vaupel*, *C.R. Bard*, and *Eko Brands* referred to framework

structures (a loom, a biopsy gun, and a beverage brewing machine, respectively) that physically supported distinct removable, reusable, and replaceable elements — textile weaving/cutting elements, a biopsy needle, and a beverage cartridge, respectively. Notably, the claims in *C.R. Bard* and *Eko Brands* distinguish the framework structures, from the removable elements, with the expression "for use with," thereby signaling their separateness. *See C.R. Bard*, 157 F.3d at 1348 (reciting "[a] biopsy needle for use with a tissue sampling device . . . ."); *Eko Brands*, 946 F.3d at 1376 (reciting "[a] beverage brewing device for use with a single serve beverage brewer having a brewing holster, an inlet probe . . . , and an outlet probe . . . .") (emphasis omitted). As the Federal Circuit remarked, in *Eko Brands*, 946 F.3d at 1377, the claim "on its face does not require a beverage brewer." Such separateness is also reflected, for example, in the Federal Circuit's observation, in *Vaupel*, 944 F.2d at 880, that the "breast beam" and "breast plate" "are not illustrated in any of the figures of the . . . patent or otherwise described in the specification."

The '698 patent does not exhibit any such separateness for the "overflow tube," as seen, for example, in Figure 3 (above) and the accompanying description in the specification, wherein the "overflow tube" (element 149) is identified in the same manner as the other components of the disclosed embodiments. *See* Ex. 1001, 3:57–4:21.

Finally, *Eko Brands*, 946 F.3d at 1377, also remarked that "there is nothing in the prosecution history suggesting that the beverage brewer itself is part of the claim." It is worth noting that, by contrast, during prosecution of the application that issued as the '698 patent, the Examiner mapped the "overflow tube" to the prior art DeMarco reference (Ex. 1024) — a

determination that the applicant did not dispute. *See* Ex. 1002, 65–66, 100–101. The applicant's silence, in this context, does *not* establish a disavowal or disclaimer of claim scope. *See Salazar v. Procter & Gamble Co.*, 414 F.3d 1342, 1345 (Fed. Cir. 2005). Yet, the Federal Circuit has stated that such unchallenged determinations by the Examiner may shed some light on the meaning of claim language:

> Although unilateral statements by an examiner do not give rise to a clear disavowal of claim scope by an applicant, it does not necessarily follow that such statements are not pertinent to construing claim terms. Statements about a claim term made by an examiner during prosecution of an application may be evidence of how one of skill in the art understood the term at the time the application was filed.

Id. at 1347. Such a view is consistent with the notion that the prosecution history is part of the public record of a patent, upon which the public may rely, in order to understand the scope of the patent rights. *See Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583 (Fed. Cir. 1996). Thus, although it is by no means dispositive, the Examiner's mapping of the "overflow tube" (recited in claims that would issue as claims 8 and 12) to a prior art reference, further indicates that these recitations should be regarded as limitations on the scope of the claims.

In view of the foregoing, the "overflow tube" of Limitations 8[B] and 12[B] should be construed as having limiting effect on the scope of the claims, as Patent Owner contends.

III. Petitioner Does Not Sufficiently Demonstrates that the Prior Art Teaches or Suggests the "Overflow Tube" Limitation

Petitioner argues that — if the "overflow tube" is construed to be limiting — Guoxin satisfies Limitations 8[B] and 12[B]. *See* Pet. Reply 4–7.

Patent Owner argues that — even if Petitioner has not waived the argument that Guoxin alone teaches Limitations 8[B] and 12[B] — Petitioner, nevertheless, fails to establish that Guoxin satisfies these limitations and, therefore, fails to establish the unpatentability of independent claims 8 and 12 and their dependent claims 9 and 13. *See* PO Sur-reply 3 (citing, *inter alia*, *Intelligent Bio-Systems, Inc. v. Illumina Cambridge, Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016)).

For the reasons that follow, Petitioner's arguments (if not waived) fail to establish the unpatentability of claims 8, 9, 12, and 13, by a preponderance of the evidence.

In contrast to the Petition (*see* Pet. 46), Petitioner's Reply omits any argument that the Ho reference might teach or suggest Limitations 8[B] or 12[B]. Indeed, as Patent Owner points out, Ho fails to teach these limitations, instead disclosing "an example of a tube (supply line 40) which provides water from a valve to the bowl *without* first passing through an overflow tube, yet nevertheless discloses a stand-alone overflow tube." PO Sur-reply 5 (citing Ex. 1022, Figs. 1–2; Ex. 2015, 145:14–20, 156:14–157:9).

Petitioner argues that Guoxin satisfies Limitations 8[B] and 12[B], because

> one of ordinary skill in the art would understand that Guoxin's water supply line 403 would conventionally be connected to an overflow tube, and that the water supply line 403 supplies water from the bowl fill valve outlet port to the overflow tube because such a connection is conventional in the prior art.

Pet. Reply 4; *see also id.* at 4–5 ("Based on these conventional connections, a POSITA would understand that Guoxin discloses a tube (water supply line 403) that is conventionally connected to an overflow tube, and which provides water from the bowl fill valve outlet port to the overflow tube.") (citing Ex. 1036 ¶¶ 11–23); 7 ("In sum, Guoxin discloses a line 403 that is configured to provide water to an overflow tube, and a POSITA would understand that it is connected to an overflow tube, as is conventional.")

Patent Owner argues that Guoxin lacks an "overflow tube." *See* PO Resp. 13–15 (citing Ex. 1016, 5, Fig. 2; Ex. 2007, 2:6, 2:18–21, Fig. 2; Ex. 2013 ¶¶ 90–93).

Notably, Guoxin discloses that its switching mechanism 4 has water outlet 402 connected to water supply line 403 (Ex. 1016, 5) — these are the elements that Petitioner maps, respectively, to the recited "bowl fill valve," "bowl fill valve outlet port," and "tube" of claims 8 and 12. *See* Pet. 33, 35–36, 45–46 (citing Ex. 1004 ¶¶ 116, 121, 124, 147, 149; Ex. 1016, 2, Figs. 2–5). Rather than disclosing a "tube that provides water from the bowl fill valve outlet port to an overflow tube," per Limitations 8[B] and 12[B], Guoxin states that water supply line 403 "is directed to the toilet to directly provide water supply to the toilet":

> The switching mechanism 4 is equipped with a valve seat 40. This valve seat 40 has a slot 400 to accommodate a switching valve 41. The valve seat 40 has water inlet and outlet 401 and 402, where the water outlet 402 can be connected to the water supply pipeline 403, and the water supply line 403 is *directed to the toilet to directly provide water supply to the toilet*.

Ex. 1016, 5 (emphasis added).

Figure 2 of Guoxin (reproduced below) shows one end of water supply line 403 connected to switching mechanism 4, but does not show where the other end terminates.

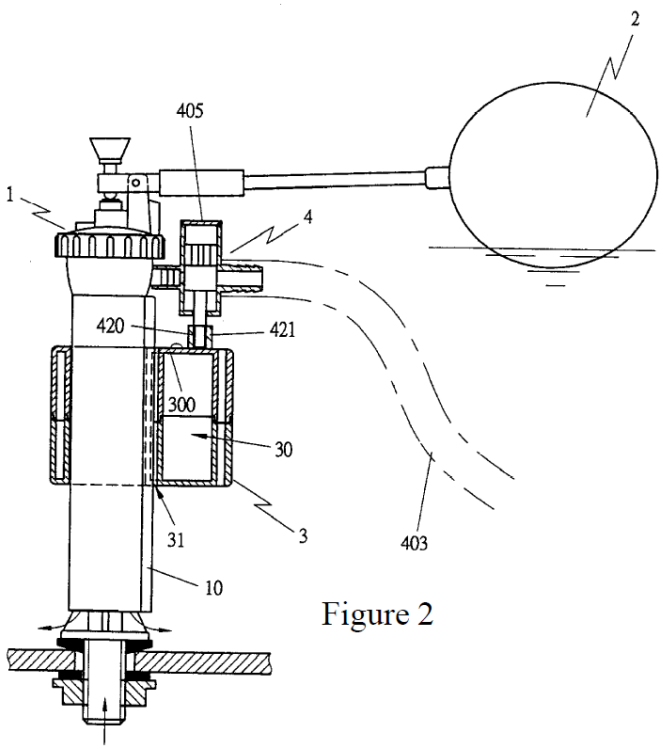

Figure 2

Guoxin's Figure 2 shows an embodiment of the disclosed device having switching mechanism 4 and water supply line 403. *See* Ex. 1016, 5.

Patent Owner argues that the descending appearance of water supply line 403 in Figure 2, and its location below the depicted water level, "is consistent with its stated purpose of supplying water directly to the bowl in

order to increase flush volume." PO Resp. 15. Patent Owner argues that, if water supply line 403 "were directed to an overflow tube, then it would need to *ascend* from the point of attachment." *Id.* (citing Ex 2013 ¶ 93).

Petitioner argues that the descending appearance of water supply line 403, by itself, would not necessarily preclude the possibility of leading to an overflow tube, because "both the specification of the '698 Patent and the prior art confirms such tubes may ascend or descend (or both) before connecting to the overflow tube." Pet. Reply 6–7 (citing Ex. 1014, Fig. 1; Ex. 1021, Fig. 4; Ex. 1036 ¶¶ 24–25; Ex. 1037, 28:17–29:7; 30:18–31:2; 32:9–33:19; 36:12–16). Even so, there is, nevertheless, nothing in Guoxin's disclosure indicating the implementation of an overflow tube, such as Limitations 8[B] and12[B] require.

Furthermore, Patent Owner argues that "the claimed configuration — a tube which directs water from a bowl fill valve to a separate overflow tube — is not conventional in the art." PO Resp. 12. Patent Owner argues:

> Bowl fill valves perform multiple functions in toilet systems. The specific function impacts where the water exiting the valve is directed. Some, like the valve disclosed and claimed by the '698 Patent, regulate the flow of water from the fill valve to the overflow tube. Others, like Ho's diverter valve direct water from the fill valve to a conduit encircling the rim of the toilet bowl. EX1022, 4:7–9; EX2013, ¶ 87. Still others, like switching mechanism 4 disclosed by Guoxin, provide a mechanism whereby water "*is directly supplied to the toilet bowl* to compensate for the lack of water in the tank." EX1016, p. 004; EX2007, 1:2–7; *see also* EX2013, ¶ 88.

Id. at 12–13.

In response, Petitioner argues that Patent Owner's "heavy reliance on the word 'directly' in Guoxin's disclosure is unavailing." Pet. Reply 7. Petitioner states that, "[e]lsewhere" in the reference,

> Guoxin teaches "a portion of the water from the inlet device is ***directly*** supplied to the toilet bowl" ([Ex. 2007], 2:5–7); but this does not mean that the water inlet device terminates at the bowl. Indeed, Guoxin discloses several intermediating connections between the water inlet device and the bowl. *Cf.* EX1037, 52:1–21. Applying that same logic, Guoxin's description of line 403 "directly" supplying water to the bowl does not preclude an intermediating connection via an overflow tube, especially since that is conventional. EX1036, ¶¶ 26–27.

Id.

But, Petitioner's argument that Guoxin "does not preclude an intermediating connection via an overflow tube" (Pet. Reply 7) also does not establish that Guoxin teaches an "overflow tube."

Moreover, Petitioner's repeated assertion, to the effect that overflow tubes are "conventional" structures, is unpersuasive. Regardless of whether a particular claim limitation might constitute conventional technology, a Petitioner in an IPR proceeding "must specify where each element of the claim is found in the prior art patents or printed publications relied upon." 37 C.F.R. § 42.104(b)(4); *see also* 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify "with particularity . . . the grounds on which the challenge to each claim is based").

Patent Owner fairly characterizes aspects of Petitioner's argument, regarding the "overflow tube," as "circular," because Petitioner assumes that Guoxin employs an "overflow tube," because this element is "conventional" — notwithstanding the lack of evidence for an "overflow tube" in Guoxin.

PO Sur-reply 5–6 (citing Pet. Reply 4–6); *see also id.* at 2 (citing Ex. 2015, 157:13–158:17, 178:17–179:18).

Petitioner does not show that Guoxin teaches the "overflow tube." In addition, Petitioner makes no argument that it might be obvious to modify Guoxin, or combine it with other prior art teachings, to achieve the claimed subject matter of Limitations 8[B] and 12[B].

Accordingly, Petitioner does not show, by a preponderance of evidence, that the cited prior art teaches or suggests Limitations 8[B] and 12[B]. Therefore, Petitioner does fails to demonstrate that claims 8 and 12 are unpatentable.

Because Petitioner fails to meet its burden to show, by a preponderance of the evidence, that independent claims 8 and 12 are unpatentable, over the cited prior art in the ground (Guoxin, Ho, and the Quick Connection Art), Petitioner likewise fails to satisfy such burden as to dependent claims 9 and 13. *See In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992).

IV. Conclusion

For the reasons herein, in view of all of the evidence presented by the parties, Petitioner has not established, by a preponderance of the evidence, the unpatentability of claims 8, 9, 12, and 13 of the '698 patent.

Accordingly, I respectfully dissent from the identified aspects of the panel majority's opinion.

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