

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FLUIDMASTER, INC.,
Petitioner,

v.

DANCO, INC.,
Patent Owner.

IPR2024-00634
Patent 9,103,105 B1

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

PETRAVICK, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. Background and Summary

Fluidmaster, Inc. (“Petitioner”) filed a Petition requesting *inter partes* review of claims 1–24 of U.S. Patent No. 9,103,105 B2 (Ex. 1001, “the ’105 patent”). Paper 1 (“Pet.”). Danco, Inc. (“Patent Owner”) filed a Preliminary Response. Paper 13 (“Prelim. Resp.”). With our prior authorization (Paper

17), Petitioner filed a Reply (Paper 18, “Reply”) and Patent Owner filed a Sur-reply (Paper 20, “Sur-reply”).

Under 35 U.S.C. § 314(a), an *inter partes* review may not be instituted unless the information presented in the petition “shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.”

After considering the Petition, the Preliminary Response, the Reply, the Sur-reply, and the evidence of record, we determine the information presented shows a reasonable likelihood that Petitioner would prevail in establishing the unpatentability of at least one of the challenged claims of the ’105 patent. Accordingly, we institute an *inter partes* review of claims 1–24 of the ’105 patent on the grounds asserted in the Petition.

B. Real Parties in Interest

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

C. Related Matters

The parties identify *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”) as a related proceeding. Pet. 4; Paper 4, 1.

Patent Owner also identifies the following related *inter partes* reviews: IPR2024-00633 and IPR2024-00635. Paper 4, 1; *see also* Pet. 4 (discussing two additionally filed petitions).

D. The '105 Patent

The '105 patent is titled “Toilet Fill Valve” and issued from a U.S. patent application filed on November 18, 2019. Ex. 1001, code (22), (54). On its face, the '105 patent claims priority to an application filed on March 11, 2004, which issued as U.S. Pat. No. 6,823,889. *Id.* at code (63).

Figure 4 of the '105 patent is reproduced below, with some labels added.

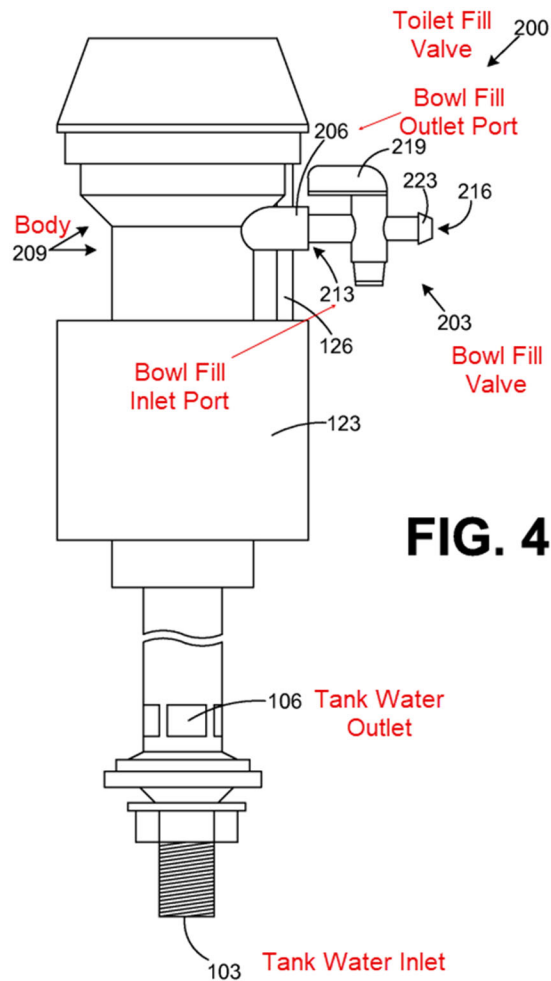


Figure 4 depicts an embodiment of the toilet fill valve. *Id.* at 1:52–53, 5:1–2. Toilet fill valve 200 includes body 209, having tank water inlet 103 and tank water outlet 106. *Id.* at 5:3–4.

Toilet fill valve 200 also has bowl fill outlet port 206 that radially extends from body 209. *Id.* at 5:15–17. The ’105 patent explains:

The toilet fill valve 200 provides an advantage in that the body 209 of the toilet fill valve 200 may be constructed with the bowl fill outlet port 206 using a molding process that is much less complex than attempting to mold the entire bowl fill valve 203 within the structure of the body 209 as a single molded construction as was described with reference to one embodiment of the toilet fill valve 100. In this regard, the bowl fill valve 203 may be constructed as a separate component to the body 209 of the toilet fill valve 200 and assembled for distribution to end users.

Id. at 6:22–31; *see also id.* at 2:23–26 (describing that bowl fill valve 109 can be molded as a portion of toilet fill valve 100 or “snapped or clamped into place”), *id.* at 5:9–14.

Bowl fill valve 203 includes bowl fill valve inlet port 213 that couples to bowl fill outlet port 206. *Id.* at 5:14–13. Bowl fill valve 203 also includes a handle for adjusting the flow of water to the toilet bowl, bowl fill valve outlet port 215, and nipple 223 that mates with tube 146 extending from overflow tube 149. *Id.* at 5:27–30, 38–43.

After the toilet is flushed, toilet fill valve 200 opens to allow water to flow from water inlet 103 to water outlets 106 into the toilet tank. *Id.* at 3:10–14. At the same time, water flows to bowl fill valve 209 and tube 146 directs the water flowing out bowl fill valve 209 to an overflow tube in the tank so as to refill the bowl. *Id.* at 3:14–23.

Bowl fill valves 203’s handle is set to “ensure that the water level in the toilet bowl reaches the full level at about the same time that the flush cycle ends. . . . This prevents any water from being lost down the drain associated with the toilet.” *Id.* at 4:30–36.

E. Illustrative Claims

Petitioner challenges claims 1–24 of the '105 patent. Claims 1, 9, 15, and 24 are independent. Claims 2–8 and 21 depend directly or indirectly from claim 1. Claims 10–14 depend directly or indirectly from claim 9. Claims 16–20 and 22 depend directly or indirectly from claim 14.

Claim 1 is illustrative and reproduced below with element labels added.

1. [1 Pre] A system, comprising:

[1A] a toilet fill valve that comprises:

[1B] a body comprising an extended portion, wherein the extended portion is integrally molded with the body, wherein the extended portion forms a bowl fill outlet port;

[1C] a water inlet configured to receive water from a water source; and a tank water outlet configured to provide a first portion of the water to a toilet tank during at least a portion of a flush cycle:

[1D1] a bowl fill restriction configured to attach directly to the extended portion of the body, [1D2] wherein the bowl fill restriction comprises a protrusion that is configured to insert into a recess in the toilet fill valve to lock the bowl fill restriction to the extended portion of the body, [1D3] wherein the bowl fill restriction is configured to receive a second portion of the water from the bowl fill outlet port during at least a portion of the flush cycle, [1D4] wherein the restriction is configured to constrict a flow rate of the second portion of the water that flows through the bowl fill restriction; and

[1E] 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. 1001, 9:62–10:20.

F. Asserted Grounds

Petitioner asserts that claims 1–24 would have been unpatentable on the following grounds:

Ground	Claim(s) Challenged	35 U.S.C. §	Basis
1	1–3, 6, 8–15, 20–24	103	Guoxin ¹ and Ho ²
2	4, 5, 7, 6–19	103	Guoxin, Ho, and “Quick Connection Art”
3	1–3, 6, 8–15, 20–24	103	Brown ³ and Ho
4	4, 5, 7, 16–19	103	Brown, Ho, and “Quick Connection Art”
5	1–24	103	Schuster ⁴

“Quick Connection Art” refers to Bjerke⁵, Calmettes⁶, Hall⁷, and Kimber⁸, collectively. Pet. 7.

Petitioner relies on the Declaration of Dr. Kimberly Cameron. Ex. 1004.

II. ANALYSIS

A. 35 U.S.C. § 312

Patent Owner argues that we should deny the Petition because it “is ambiguous, fails to identify evidence with particularity, and fails to account

¹ Registered Utility Model Publication Number CN2447417Y, published Sept. 12, 2001 (Ex. 1015). A certified English language translation is at Exhibit 1016.

² U.S. Patent No. 5,862,538, issued Jan. 26, 1999 (Ex. 1022).

³ U.S. Patent No. 3,086,546, issued Apr. 23, 1963 (Ex. 1021).

⁴ U.S. Patent No. 8,104,105, issued Jan. 31, 2012 (Ex. 1029).

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

⁶ U.S. Patent No. 5,249,830, issued Oct. 5, 1993 (Ex. 1018).

⁷ U.S. Patent No. 989,251, issued Apr. 11, 1911 (Ex. 1019).

⁸ Canadian Patent No. 1,320,235, published July 13, 1993 (Ex. 1020).

for how each claim is unpatentable.” Prelim. Resp. 26–31 (citing 35 U.S.C. § 312(a)(3), 37 C.F.R. §§ 42.104(b)(4), (b)(5)). For example, Patent Owner argues that annotations and labels are missing from prior art figures reproduced in the Petition and that these annotations and labels are necessary for Petitioner to meet its burden. Prelim. Resp. 26–31; *see also* Sur-reply 1–3.

Petitioner responds that “[t]he Petition as a whole and the discussion of the references within it are complete and unambiguous standing alone.” Reply 5–8. Petitioner notes that the Declaration of Dr. Cameron contains the same images with the missing annotations and that most images in the Petition are followed by direct citations to the portions of Dr. Cameron’s testimony containing the same image. *Id.* at 7.

Patent Owner’s argument is unpersuasive. We have considered the information presented in the Petition and the cited testimony of Dr. Cameron. As can be seen from our discussion of Petitioner’s challenge in the analysis below, we determine that the information in the Petition is sufficient to show a reasonable likelihood that at least claim 1 is unpatentable over the asserted combination of Brown and Ho. We, thus, decline to deny the Petition for alleged lack of particularity (*see* 35 U.S.C. § 312(a)(3)) and for allegedly failing to account for how each claim is unpatentable (*see* 37 C.F.R. 42.104(b)(4), (b)(5)).

B. 35 U.S.C. § 325(d)

Patent Owner requests that we discretionarily deny the Petition under 35 U.S.C. § 325(d), “because the Petition is based on patents or publications that are either the same or substantially the same as those previously

presented to the Office.” Prelim. Resp. 31– 36. In determining whether to deny institution under § 325(d) we use a two-part framework, as follows:

- (1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and (2) if either condition of [the] first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.

Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential). The *Becton, Dickinson* factors provide useful insight into how to apply the framework under 35 U.S.C. § 325(d). *Id.* at 9 (referencing *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 at 17–18 (PTAB Dec. 15, 2017) (precedential as to § III.C.5, first paragraph)).

Under § 325(d), the art and arguments must have been previously presented to the Office during proceedings, such as examination of the underlying patent application, pertaining to the challenged patent. *Advanced Bionics*, Paper 6 at 7.

Turning to the first part of the *Advanced Bionics* framework, we consider “whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office.” *Id.* at 8. We evaluate *Becton, Dickinson* factors (a), (b), and (d) to determine whether Petitioner has demonstrated material error. *Id.* at 10. Those factors are:

- (a) the similarities and material differences between the asserted art and the prior art involved during examination;
- (b) the cumulative nature of the asserted art and the prior art evaluated during examination; and

(d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art.

Becton, Dickinson, Paper 8 at 17–18.

Previously presented art includes art made of record by the Examiner, and art provided to the Office by an applicant, such as on an Information Disclosure Statement (“IDS”), in the prosecution history of the challenged patent. *Id.* at 7–8. Here, it is not disputed that Brown and Bjerke were listed on an IDS and, thus, were previously presented to the Office. Pet. 12, n.4; Prelim. Resp. 33. It is also not disputed that Guoxin, Ho, Calmettes, Hall, Kimber, and Schuster were not previously presented to the Office. *See* Prelim. Resp. 33.

Patent Owner argues that Guoxin, Brown, and Ho are cumulative of a reference, DeMarco⁹, that was previously presented to the Office and relied upon to reject the claims. Prelim. Resp. 33 Patent Owner argues that Guoxin, Brown, and Ho are cumulative to DeMarco because all of the “references are completely silent as to whether the purported ‘extended portion’ is integrally molded with the purported body of the toiled fill valve.” *Id.* at 33–36.

Patent Owner’s arguments are unpersuasive. As can be seen from our discussion of Ho in our analysis below, on this record, we are persuaded that Petitioner has sufficiently shown for purposes of institution how Ho allegedly teaches the claimed integrally molded extended portion. We, thus, are not persuaded that at least Ho is cumulative of DeMarco.

Grounds 1–4 rely upon combinations of prior art that include Ho. Ground 5 is based upon Schuster, which was not previously presented to the

⁹ U.S. Patent No. 5,708,991 (Ex. 1024).

Office. Accordingly, we determine that discretionary denial is not warranted. Because we determine that part one of the framework is not satisfied, we need not turn to part two to determine whether Petitioner demonstrates that the Office erred in a manner material to the patentability of the challenged claims. For the reasons discussed above, we decline to exercise our discretion under § 325(d) to deny the Petition.

C. 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 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).¹⁰ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

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

[o]ften, 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)).

“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) (citations omitted). “[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)).

¹⁰ No evidence of secondary considerations has been presented at this stage of the proceeding.

D. 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) (quotation omitted). Generally, it is easier to establish obviousness under a higher level of ordinary skill in the art. *Innovation 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.”).

Patent Owner proposes that:

A [person of ordinary skill in the art (“POSITA”)] in the field to which the ’105 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.

Prelim. Resp. 17.

Petitioner’s declarant Dr. Cameron asserts that:

A [POSITA] with respect to the subject matter of the ’105 patent at the time of the priority date, January 27, 2014, 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.

Ex. 1004 ¶ 29.

For purposes of this Decision, we adopt Patent Owner’s proposed definition of a POSITA, as it is consistent with the ’105 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 Dr. Cameron.

E. 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.

However, a patentee may act as their own lexicographer by giving the term a particular meaning in the specification with “reasonable clarity, deliberateness, and precision.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

1. “*integrally molded with*”

The ’105 patent sets forth a definition of the term “integral,” as follows:

The bowl fill valve 109 is integral with the toilet fill valve 100. In this respect, the term “integral refers to the fact that the bowl fill valve 109 and the toilet fill valve 100 comprise a single structure. In this respect, the bowl fill valve 109 may be included within the body of the toilet fill valve 100 as a portion of the toilet fill valve 100 in a single piece construction. Specifically, the bowl fill valve 109 may be molded as a portion of the toilet fill valve 100 or it may be snapped or clamped into place, or it may be attached to the toilet fill valve 100 in some other manner, etc.

Ex. 1001, 2:17–26; *see also id.* at 4:65–5:3. Based on this definition in the ’105 patent, Petitioner contends that “integrally molded” should be “construed to mean molded together as a single structure or molded separately and subsequently attached to one another to form a single structure.” Pet. 9–10; *see also* Ex. 1004 ¶¶ 46–47.

Patent Owner disagrees that “integrally molded” includes “items created as separate pieces and attached together later.” Prelim. Resp. 17. Patent Owner points out that the claims recite “integrally molded *with*” and Petitioner’s interpretation would read the word “with” out of the claims. *Id.* at 17–19.

On this record, we are persuaded by Patent Owner that the claim phrase “integrally molded with” should be construed to mean “molded together as a single structure” and to exclude items created as separate pieces and attached together later. Patent Owner’s construction is consistent with the plain language of the claims, which requires the extended portion be “integrally molded with” the body and not just the extended portion be integral with the body.

Further, we determine that Patent Owner’s construction is consistent with the ’105 patent, which discloses that “*the bowl fill valve 109 may be molded as a portion of the toilet fill valve 100* or it may be snapped or clamped into place, or it may be attached to the toilet fill valve 100 in some other manner, etc.” *Id.* at 2:23–26 (emphasis added).

At this stage of the proceeding, we construe “integrally molded with” to mean molded together as a single structure.

2. *remaining terms*

We do not need to construe explicitly any other claim terms to reach our decision on whether to institute *inter partes* review. *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))).

F. *Ground 1 – Guoxin in view of Ho*

Petitioner contends that claims 1–3, 6, 8–15, and 20–24 are unpatentable over Guoxin and Ho. Pet. 22–52.

1. *Summary of Guoxin*

Guoxin is a Chinese Utility Model Patent Specification titled “Toilet Water Tank Water Supply Switching Device” and published on September 12, 2001. Ex. 1016, codes [12], [45], [54].

Guoxin's Figures 3–5 are reproduced below, side-by-side.

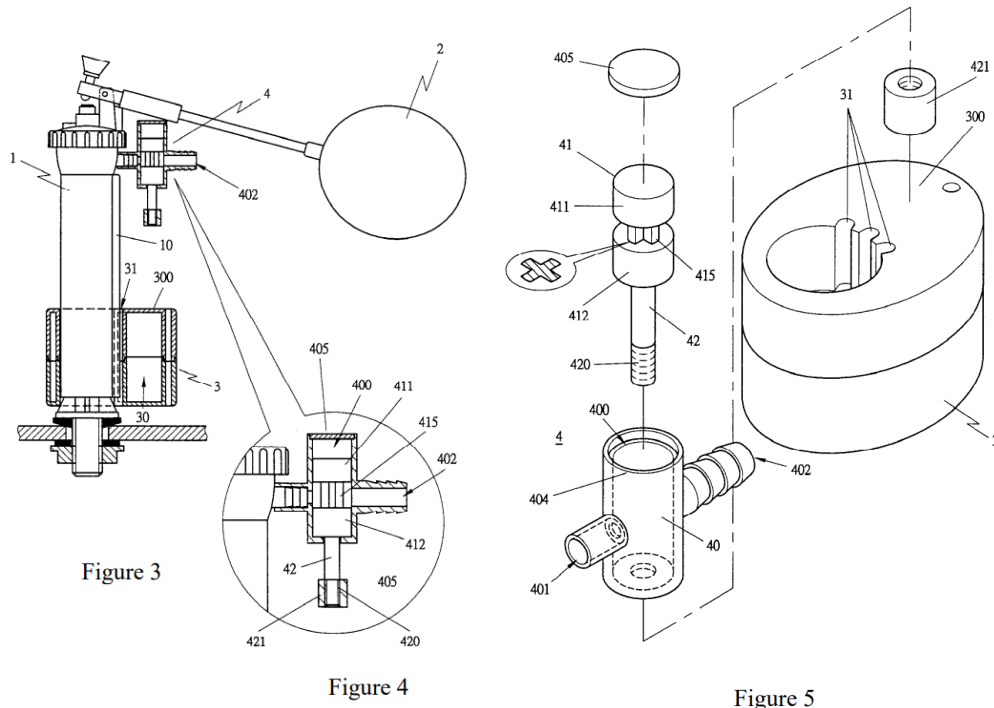


Figure 3 shows the invention after flushing, and Figure 4 is an enlarged view of Figure 4, and Figure 5 is an exploded view. Ex. 1016, 5:7–8. Figures 3–5 depicts switching mechanism 4. Guoxin discloses switching mechanism 4 as follows:

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 5:7–15.

2. Summary of Ho

Ho is a U.S. patent titled “Toilet Flushing Device” and issued of January 26, 1999 from an application filed on November 20, 1997.

Ex. 1022, code [22], [45], [54].

Figure 3 of Ho is reproduced below.

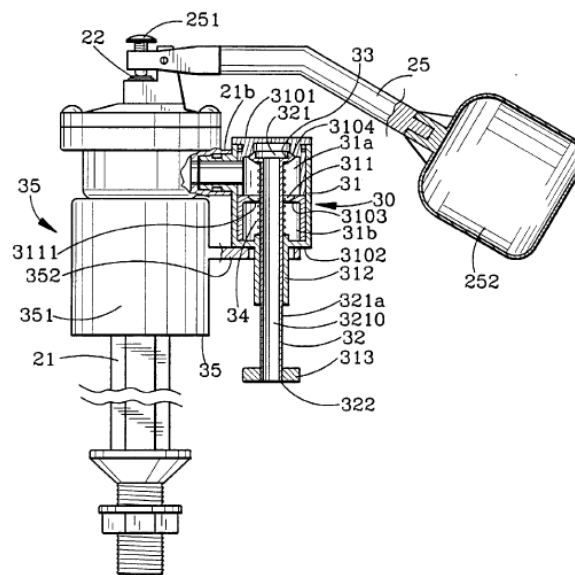


FIG.3

Figure 3 depicts a sectional view of Ho's toilet flushing device. *Id.* at 2:24–26. Ho states: “the diverter valve means 30 of the present invention

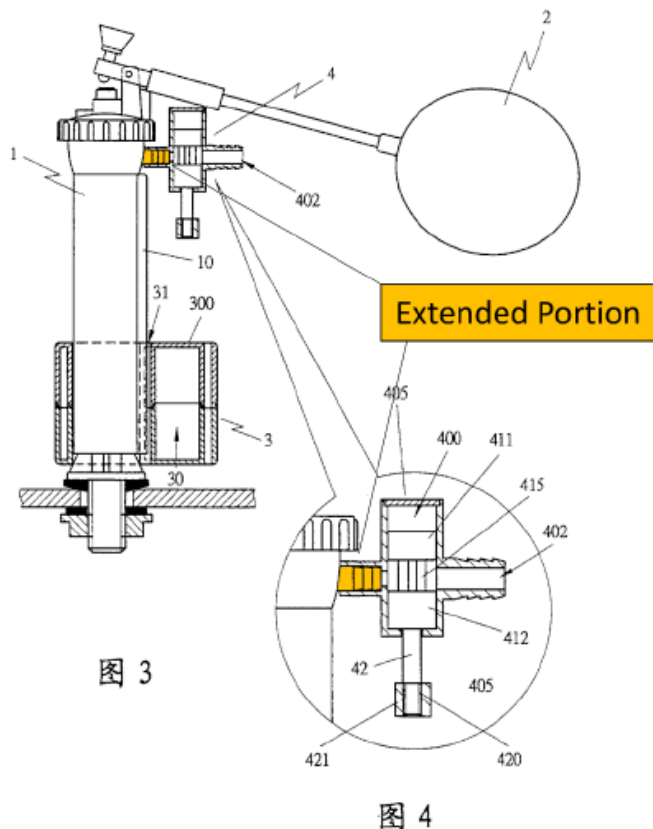
includes . . . a transverse inlet pipe (21*b*) which receives water from the water supplying pipe 21.” *Id.* at 3:12–17.

3. Analysis of Claim 1

Petitioner contends that claim 1 is unpatentable over Guoxin and Ho. Pet. 25–41. Patent Owner disputes that elements 1B and 1D2 are taught by Guoxin and Ho. Prelim. Resp. 36–47.

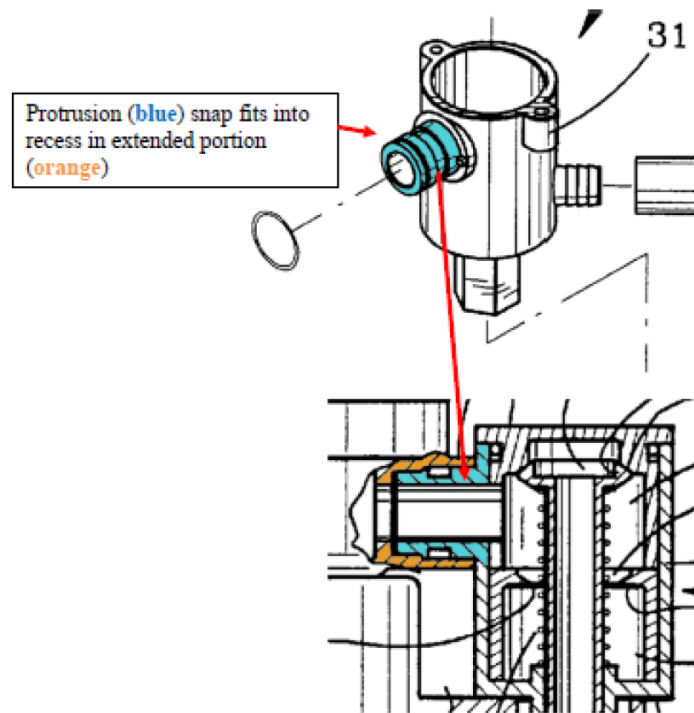
- a) *Element 1B – “a body comprising an extended portion, wherein the extended portion is integrally molded with the body, wherein the extended portion forms a bowl fill outlet port”*

Petitioner first contends that Guoxin discloses a toilet fill valve with an extended portion that is integrally molded with the water inlet device 1. Pet. 28 (citing Ex. 1004 ¶ 132). Reproduced below is Guoxin’s Figures 3 and 4, annotated by Petitioner. Pet. 33.



Petitioner's annotated Figures 3 and 4 of Guoxin by coloring an "extended portion" orange. *Id.*

Alternatively, Petitioner contends that, to the extent that it is argued that Guoxin's extended portion is not integrally molded, Ho discloses an integrally molded extended portion on a toilet fill valve. *Id.* at 28 (citing Ex. 1022, Figs. 3, 5; Ex. 1004 ¶ 124). Petitioner annotated portions of Figures 3 and 5 to show the extended portion. Pet. 29. Petitioner's annotated Figures 3 and 5 are reproduced below.



Petitioner annotated Ho's Figure 3 by coloring the extended portion orange. *Id.* Petitioner argues that it would have been obvious to integrally mold the extended portion of Guoxin with the inlet device as taught by Ho in order to achieve the benefits of improved strength and integrity of connection. *Id.* at 29 (citing Ex. 1004 ¶ 125).

Patent Owner first disputes that the combination of Guoxin and Ho teaches an extended portion integrally molded with the valve body. Prelim.

Resp. 36–45. Patent Owner first argues that Guoxin does not explicitly use the terms “molded” or “integrally molded” and thus fails to teach element 1B. Prelim. Resp. 36–37. Patent Owner also argues that Ho is silent as to any extended portion that is integrally molded with a body. *Id.* at 37–40.

But, Patent Owner’s argument does not sufficiently account for what a POSITA would have known from Ho as a whole, including Ho’s drawings. *See* Ex. 1022, Figs. 2–5. Based on Ho’s figures, Dr. Cameron testifies that “Ho clearly discloses an integrally molded extended portion on a toilet fill valve with a recess into which a bowl fill restriction device with a protrusion is instead and locked into place. Ex. 1004 ¶ 124 (annotating Ho’s Figs. 3 and 5). We note that Annotated Figure 3 shows no line or other break in the orange-colored cross-hatching that would indicate separate parts.

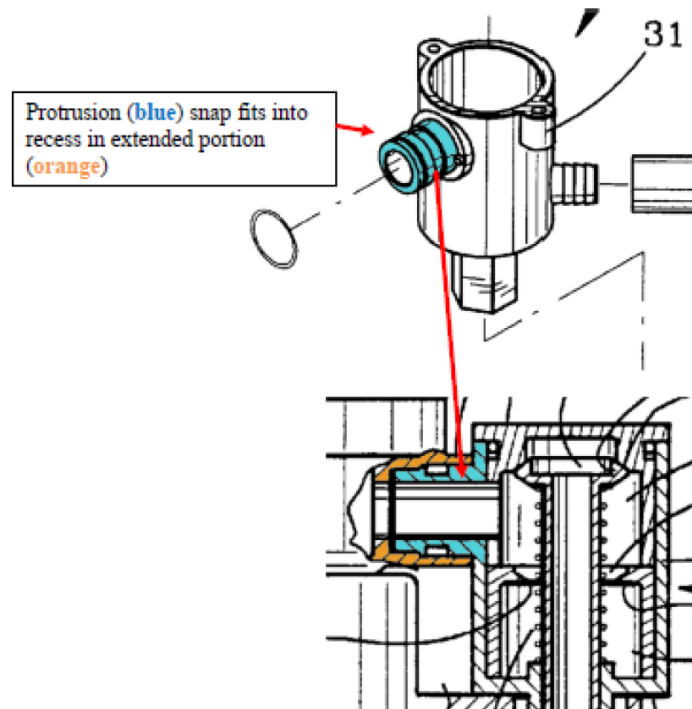
Patent Owner next disputes that a POSITA would have combined Guoxin and Ho and argues that Petitioner’s alleged rationale to combine Guoxin and Ho as conclusory and lacks sufficient support. Prelim. Resp. 40–42. We determine that Petitioner has sufficiently articulated a motivation to combine Guoxin and Ho to support institution. Petitioner asserted motivation to combine — improved strength and integrity of connection — is supported by the testimony of Dr. Cameron. Dr. Cameron testifies: “Integrally molding the extended portion of Guoxin with the inlet device as taught by Ho would be advantageous in improving the strength and integrity of the connection, and to make it easier to manufacture and assemble.” Ex. 1004 ¶ 125.

Based on the record at this stage of the proceeding, we determine that Petitioner has sufficiently shown that the combination of Guoxin and Ho teaches element 1B.

- b) *Element 1D2: “wherein the bowl fill restriction comprises a protrusion that is configured to insert into a recess in the toilet fill valve to lock the bowl fill restriction to the extended portion of the body”*

Petitioner contends that Guoxin discloses a protrusion that is configured to insert into a recess in inlet 401 of the water flow regulator. Pet. 32 (citing Ex. 1004 ¶ 140; Ex. 1016, Figs. 3, 4). Petitioner, however, acknowledges that Guoxin discloses the opposite of the arrangement claimed. Pet. 22. “Guoxin discloses the reverse coupling arrangement between the water flow regulator and the toilet fill valve (i.e., regulator has a recess, and the extended portion of toilet fill valve has a protrusion. *Id.* (citing Ex. 1016, Fig. 4).

Petitioner relies upon Ho to teach that it would have been obvious to reverse Guoxin’s coupling arrangement, so that the extended portion is on Guoxin’s switching mechanism. Pet. 33–34; *see also* Pet. 23–24. Ho’s Figures 3 and 5, as annotated by Petitioner, are reproduced below.

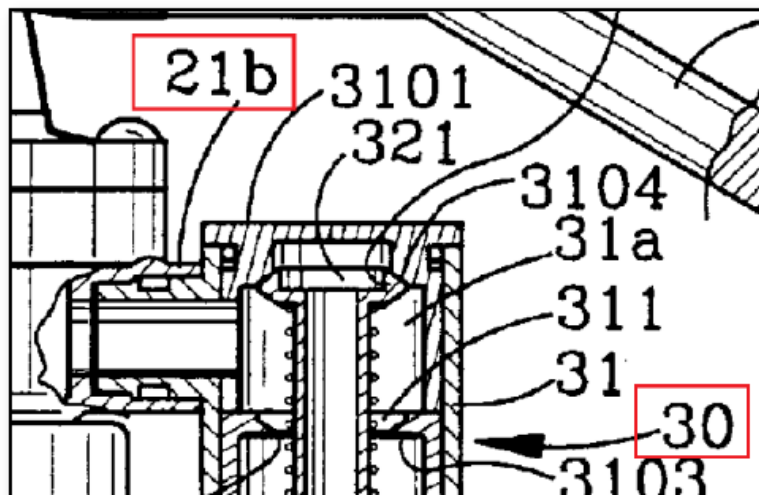


Petitioner’s annotated Figures 3 and 5 of Ho to color the extended portion orange and color the protrusion blue. *Id.* at 33–34. Petitioner contends that

it would have been obvious to use the mating engagement of Ho to attach the extended portion of Guoxin’s toilet fill valve with switching mechanism 4 of Guoxin, as a simple substitution of one known coupling arrangement for another to obtain predictable results.

Id. at 38 (citing Ex. 1004 ¶¶ 142–144); *see also* Pet. 24–25 (“A POSITA would understand that male and female fluid flow connectors are generally interchangeable and the selection of which is a matter of design preference.” (citing Ex. 1004 ¶¶ 114–118; Ex. 1017, 7:15–24, Figs. 5–6; Ex. 1006, 80–81)).

Patent Owner first takes issue with Petitioner’s annotation of Ho’s Figures 3 and 5 and argues that the orange-colored portion “is not an extended portion of a purported toilet fill valve, but is instead a portion of diverter valve means 30.” Prelim. Resp. 45–47 (citing Ex. 1022, 3:12–17, Fig. 3). Patent Owner’s argument is based on where a leader line end for the label “21b,” in an annotated version of Ho’s Figure 3, which is reproduced below). *See* Prelim. Resp. 46–47.



Patent Owner's Annotated Figure 3 of Ho shows with labels "21b" and "30" highlighted.

We acknowledge that Ho's Figure 3 appears to show a leader line starting from the "21b" label and ending in what would be the orange-colored portion in Petitioner's Annotated Figure 3. But, based upon Ho's disclosure as a whole and other figures, we find that label "21b" refers to the blue-colored portion and the leader line is intended to point to the blue-color portion, which is close to and immediately adjacent to the orange-colored portion. For example, Ho's Figure 5 "is an exploded view of the diverter valve means," which includes the blue colored-portion but not the orange-colored portion. *See* Ex. 1022, 2:30–31. This can be seen in Petitioner's Annotated Figure 5. As another example, Ho describes that "the diverter valve means 30 of the present invention includes . . . a transverse inlet pipe (21b) which receives water from water supplying pipe 21." *Id.* at 3:12–28. From this description and Figure 5, on this record, we determine that the orange-colored portion is part of water supplying pipe 21 and the blue-colored portion is transverse inlet pipe (21b) part of the diverter valve means 30 .

Patent Owner next argues that Petitioner's alleged motivation to combine Guoxin and Ho is conclusory and lacks sufficient support. Prelim. Resp. 43–45. At this stage of the proceeding, we determine that Petitioner's alleged motivation is sufficiently supported by the testimony of Dr. Cameron. Dr. Cameron testifies that:

it would have been obvious to use the mating engagement of Ho to attach the extended portion of Guoxin's toilet fill valve with switching mechanism 4 of Guoxin, as a simple substitution of one known coupling arrangement for another to obtain predictable results.

Ex. 1004 ¶ 142. Pointing to teachings from Bjerke, Dr. Cameron also testifies that “[a POSITA] would understanding that male and female fluid flow connectors are generally interchangeable and the selection of which is a matter of design preference.” Ex. 1004 ¶¶ 114–119 (citing Ex. 1017, 7:15–24, Figs. 5–6).

At this stage of the proceeding, Patent Owner provides no sufficient evidence to rebut Dr. Cameron’s testimony as to what a POSITA would have known from Guoxin and Ho’s drawings and as to the alleged motivations to combine Guoxin and Ho.

Based on Petitioner’s evidence and analysis, and taking into account the Preliminary Response, at this stage of the proceeding, we determine that the information in the Petition shows a reasonable likelihood that claim 1 is unpatentable over Guoxin and Ho.

4. *Remaining Claims of Ground 1*

“When instituting *inter partes* review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.” 37 C.F.R. § 42.108(a). We must “either (1) institute as to all claims challenged in the petition and on all grounds in the petition, or (2) institute on no claims and deny institution.” Patent Trial and Appeal Board Consolidated Trial Practice Guide (Nov. 2019),¹¹ 5–6, 64; *see also* 37 C.F.R. § 42.108(a), *PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1359–60 (Fed. Cir. 2018) (stating a decision to institute is “a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition”).

¹¹ Available at <https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf?MURL=TrialPracticeGuideConsolidated>

Because we have decided to institute *inter partes* review based on claim 1, we must do the same for the remaining claims of Ground 1 as well, as institution must include all challenged claims under all asserted grounds.

Patent Owner at this stage does not raise any other arguments specifically directed to the remaining claims of Ground 1.

G. Ground 3 – Brown in view of Ho

Petitioner contends that claims 1–3, 6, 8–15, and 20–24 are unpatentable over Brown and Ho. Pet. 60–75.

1. Summary of Brown

Brown is a U.S. patent titled “Water Silencing and Saving Means for Ball Cock Valve Assembly In Toilet Flush Tank” and issued on April 23, 1963, from an application filed on March 6, 1959. Ex. 1021, 1.

Figure 1 of Brown is reproduced below.

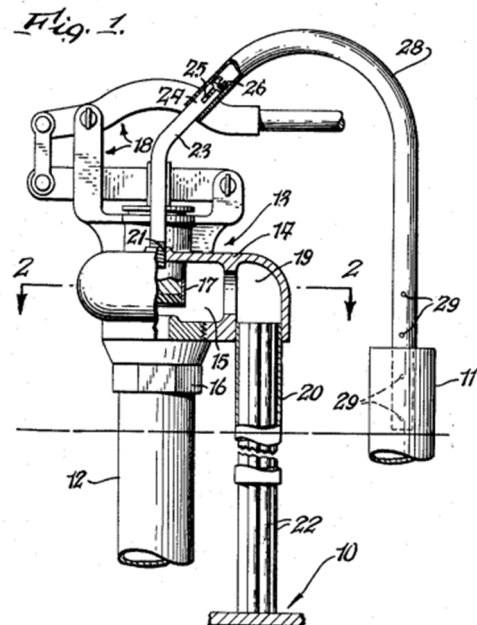


Figure 1 depicts a portion of the toilet flush tank, having a ball cock valve assembly. *Id.* at 2:25–31. Ball cock valve assembly 13 has main

chamber 15, auxiliary chamber 19, and opening 21. *Id.* at 2:53–58. When the toilet refills after flushing, water flows into main chamber 15 from intake pipe 12 and to auxiliary chamber 19 to refill the tank through pipe 20. *Id.* at 2:69–3:4. Water also flows through adapter tube 23, which is attached by external threads to opening 21. *Id.* at 2:4–6. Adapter tube 23 is connected to overflow pipe 11 by tube 28. *Id.* at 3:57–64.

Figure 3 of Brown is reproduced below.

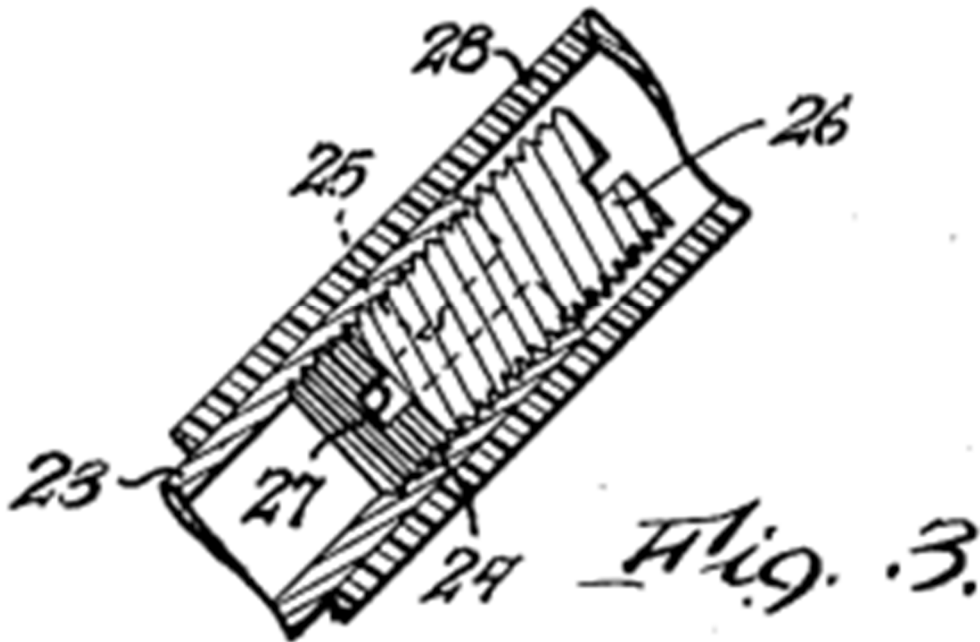
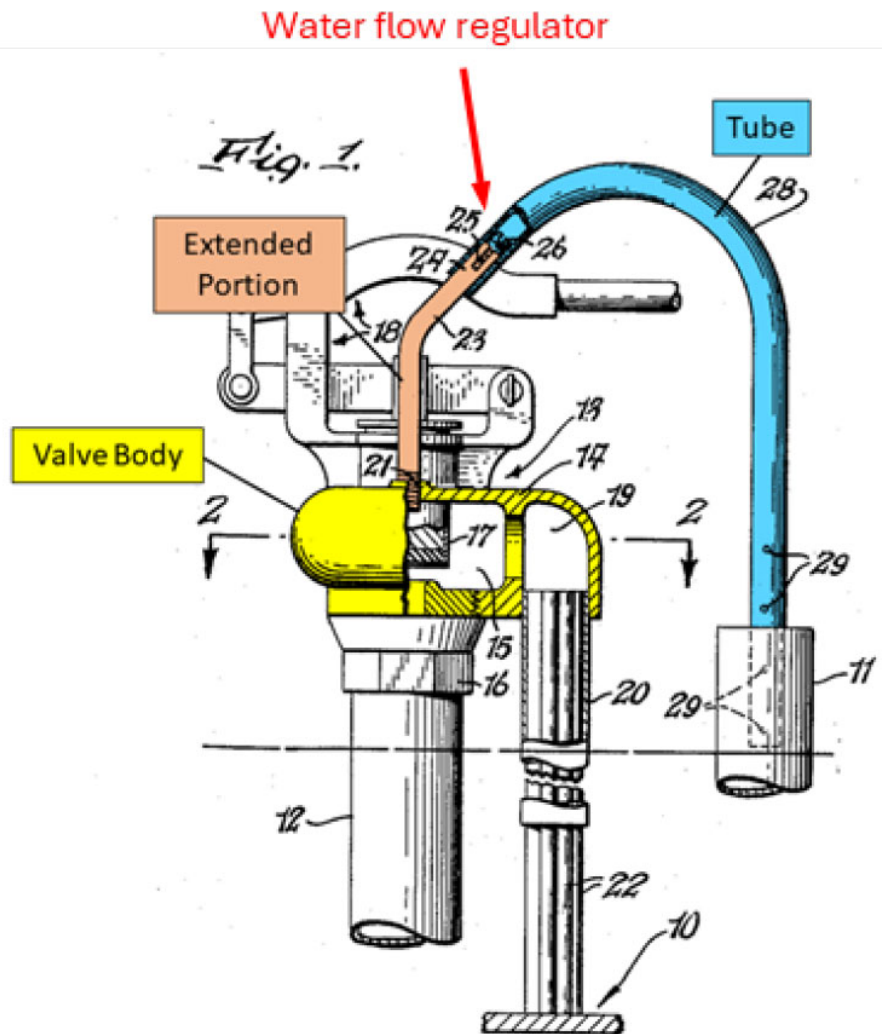


Figure 3 depicts the metering valve of Figure 1. *Id.* at 2:34–37. One end of adapter tube 23 has internally threaded portion 24 with a pair of diametrically opposed slots 25, and internally threaded portion 24 receives set screw 26. *Id.* at 3:45–51. “The slotted portion 24 of adapter tube 23 and the set screw 26 form an adjustable metering valve for confining the flow of water through the restricted opening 27 formed between the slots 25 of portion 24 and the end of set screw 26.” *Id.* at 3:52–56.

2. Analysis of Claim 1

Petitioner maps most of claim 1's elements to Brown, as illustrated by Petitioner's annotations to Brown's Figure 1. Pet. 61–70. Annotated Figure 1 is reproduced below. *Id.* at 61.



Annotated Figure 1 shows valve assembly 13 colored yellow and mapped to the claimed valve body; adapter tube 23 colored orange and mapped to the claimed extended portion; and tube 28 colored blue and mapped to the claimed tube. *See id.* Petitioner maps set-screw 26 to the claimed bowl fill restriction. *Id.* at 65–67 (citing Ex. 1021, 3:52–56, Figs. 1, 3; Ex. 1004 ¶¶ 264, 266, 267, 269).

Petitioner relies upon Ho to teach an extended portion integrally molded with a toilet fill valve. Pet. 63–64.

Patent Owner disputes that the combination of Brown and Ho teaches an extended portion integrally molded with the valve body, as required by element 1B. Prelim. Resp. 48–54¹²; *see also id.* at 40–42. Element 1B recites: “a body comprising an extended portion, wherein the extended portion is integrally molded with the body.” Ex. 1001, 9:64–67. Patent Owner first argues that Brown explicitly teaches that its adaptor tube is threaded or screwed into the flush valve and, thus, does not teach an extended portion that is integrally molded with the valve body. Prelim. Resp. 49 (citing Ex. 1021, 3:45–51). Patent Owner next asserts that Ho is silent as to any extended portion that is integrally molded with a body. Prelim. Resp. 52.

But, Patent Owner’s argument does not sufficiently account for Petitioner’s alternative¹³ obviousness argument or the testimony of Dr. Cameron, cited in the Petition.

¹² Patent Owner makes additional arguments that neither Petitioner nor Dr. Cameron provides a rationale as to why a POSITA would reverse the coupling arrangement or additionally rely on the Quick Connection Art. Prelim. Resp. 53–54. We, however, note that Ground 3 does not propose such a modification or rely upon the Quick Connection Art to show that claim 1 is unpatentable. *See* Pet. 61–70.

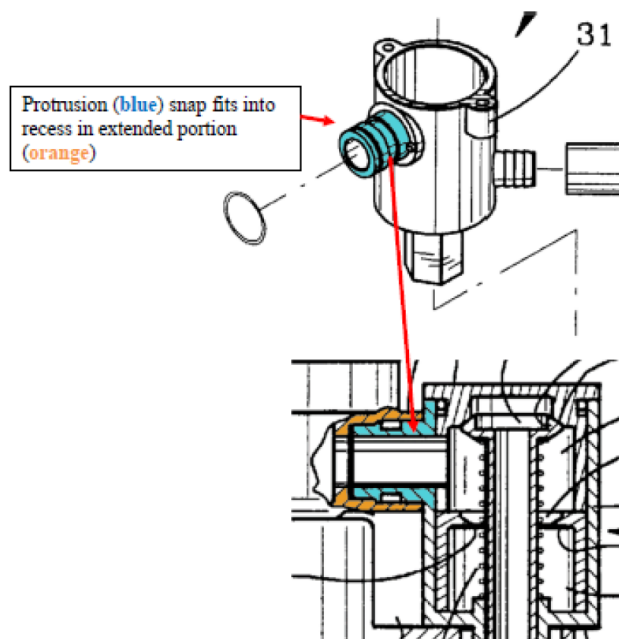
¹³ With respect to element 1B, Petitioner first argues that, under Petitioner’s construction of the claim term “integrally molded,” Brown discloses an integrally molded extended portion. However, as discussed above, we do not adopt Petitioner’s proposed construction for purposes of this Decision. We, thus, do not rely on Petitioner’s first argument that Brown alone teaches element 1B for purposes of this Decision.

Petitioner contends:

it would have been obvious to mold the toilet fill valve body of Brown together with the extended portion 23 in a single mold, given the more recently developed molding techniques that were not readily available in 1959 when Brown was filed. EX1004, ¶230. Moreover, Ho discloses integrally molded outlets on a toilet fill valve body that are attached to a bowl fill restriction, thereby rendering obvious integrally molding extended portion 23 with the toilet fill valve body of Brown. *Id.*

Pet. 63 (citing Ex. 1004 ¶ 253); *see also id.* at 62 (referencing the discussion of Ho in Section VII.A of the Petition), 70 (citing Ex. 1004 ¶¶ 280).

For support, Petitioner points to portions of Ho's Figures 2 and 5 as showing an extended portion that is integrally molded with a valve body. Pet. 62 (reproducing portions of Figures 2 and 5); *see also id.* at 27; Ex. 1004 ¶ 119. Petitioner also annotated portions of Figures 3 and 5 to show the extended portion. Pet. 29. The annotated portions of Figures 3 and 5 are reproduced below.



Pet. 28; *see also* Ex. 1004 ¶ 124. Annotated Figure 3 highlights Ho's extended portion with orange color. Based on Ho's figures, Dr. Cameron

testifies that “Ho discloses integrally molded outlets on a toilet fill valve body that are attached to a bowl fill restriction.” *Id.* ¶ 253; *see also id.* ¶ 124 (Dr. Cameron’s testimony that Ho “clearly discloses an integrally molded extended portion on a toilet fill valve with a recess into which a bowl fill restriction device with a protrusion is inserted and locked into place” and reproducing the annotated portions of Ho’s Figures 3 and 5). We note that Annotated Figure 3 shows no line or other break in the orange-colored cross-hatching that would indicate separate parts.

Dr. Cameron also testifies that: “[I]t would have been obvious to mold the toilet fill valve body of Brown together with the extended portion 23 in a single mold, given the more recently developed molding techniques that were not readily available in 1959 when Brown was filed.” Ex. 1004 ¶ 253; *see also* Ex. 1004 ¶ 125 (testifying, with respect to ground 1, that integrally molding the extended portion “would be advantageous in improving the strength and integrity of the connection, and to make it easier to manufacture and assemble.”)

At this stage of the proceeding, Patent Owner provides no sufficient evidence to rebut Dr. Cameron’s testimony as to what a POSITA would have known from Ho’s drawings and as to the rationale for combining Brown and Ho.

Based on Petitioner’s evidence and analysis, and taking into account the Preliminary Response, at this stage of the proceeding, we determine that the information in the Petition shows a reasonable likelihood that claim 1 is unpatentable over Brown and Ho.

3. *Remaining Claims of Ground 3*

Because we have decided to institute *inter partes* review based on claim 1, we must do the same for the remaining claims of Ground 3 as well, as institution must include all challenged claims under all asserted grounds.

Patent Owner at this stage does not raise any arguments specifically directed to the remaining claims of Ground 3.

H. *Grounds 2 and 4*

For Grounds 2 and 4, Petitioner has mapped the limitations of the challenged claims to the teachings of the prior art combinations and articulated reasons why one of ordinary skill in the art would have combined the references, supporting its contentions with citations to the Declaration of Dr. Cameron. Pet. 52–60, 75–79.

Because we have decided to institute *inter partes* review based on Grounds 1 and 3, we must do the same for Grounds 2 and 4 as well, as institution must include all challenged claims under all asserted grounds.

Patent Owner at this stage does not raise any other arguments specifically directed to the claims of Grounds 2 and 4. *See* Prelim. Resp. 47–48, 54–55.

I. *Ground 5*

For Ground 5, Petitioner has mapped the limitations of the challenged claims to the teachings of the prior art combinations and articulated reasons why one of ordinary skill in the art would have combined the references, supporting its contentions with citations to the Declaration of Dr. Cameron. Pet. 22–60, 79–98.

Because we have decided to institute *inter partes* review based on Grounds 1 and 3, we must do the same for Ground 5 as well, as institution must include all challenged claims under all asserted grounds.

Petitioner argues that the '105 patent is not entitled to its earliest priority date because the claim term “bowl fill restriction” is a genus that is not sufficiently supported by the disclosure of a single species in its parent applications. Pet. 7–8, 82–86; Pet. Reply 2–5. Petitioner, thus, asserts that Schuster (Ex. 1029) is available as prior art. *Id.* The question of whether a claim to the genus can find written description support in a single species disclosed in the parent application is best left for trial. *See* Prelim. Resp. 15–17; Sur-reply 3–6.

III. CONCLUSION

After considering the evidence and arguments presented in the Petition, Preliminary Response, Reply, and Sur-reply, we determine that the information presented shows a reasonable likelihood that Petitioner would prevail in establishing that at least claim 1 is unpatentable over Brown and Ho.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review is instituted for claims 1–24 of the '105 patent on the unpatentability grounds asserted in the Petition; and

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

IPR2024-00634
Patent 9,103,105 B1

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