

By: Jason M. Perilla (j.perilla@pkhip.com)
Kenneth A. Knox (k.knox@pkhip.com)
Eric G. Maurer (e.maurer@pkhip.com)
Thomas F. Finch (t.finch@pkhip.com)
PERILLA KNOX & HILDEBRANDT LLP
5871 Glenridge Drive
Suite 350
Atlanta, Georgia 30328-5376
Tel: (770) 927-7802
Fax: (877) 389-6779

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FLUIDMASTER, INC.,
Petitioner,

v.

DANCO, INC.
Patent Owner.

Case No. IPR2024-00633
U.S. Patent No. 9,139,993 B1

PATENT OWNER'S SURREPLY TO PETITIONER'S REPLY

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	GROUND 1 AND 2.....	1
A.	Guoxin does not disclose the claimed overflow tube configuration....	1
1.	Petitioner misrepresents the Challenged Claims.	2
2.	The Petition lacks <i>any</i> evidence Guoxin discloses the claimed overflow tube configuration.	3
3.	Petitioner does not prove the claimed overflow tube configuration is conventional.....	4
B.	Guoxin/Ho do not disclose the Integrally Molded Limitations.	6
1.	Ho.....	6
a)	Ho does not disclose a “molded” fill valve.	6
b)	Ho does not disclose the body and extended portion are “a single structure.”	9
2.	Guoxin.....	13
C.	The Petition lacks motivation to reverse Guoxin’s fluid flow connectors.....	14
D.	The Petition lacks motivation to combine Guoxin/Ho with the QCA.....	16
E.	Claim 5	17
F.	Claims 7, 9.....	18
G.	Claims 10-11	18
H.	Claims 19-20	19
III.	GROUND 3 AND 4.....	21

A.	Petitioner’s Motivation to Combine Brown and Ho is deficient.	21
B.	A POSITA would not have a reasonable expectation of success in combining Brown and Ho.	23
C.	The Petition does not identify “a tube that is configured to attach directly to the water flow regulator.”	24
D.	Petitioner has not shown it would be obvious to integrally mold Brown’s extended portion in view of unidentified “developments in molding techniques.”.....	27
E.	Petitioner does not articulate a motivation to further combine Brown/Ho with the QCA.....	27
F.	Claims 2, 13.....	27
G.	Claim 5	27
H.	Claims 7, 9.....	27
I.	Claims 19-20	27
IV.	GROUND 5.....	28
A.	Schuster does not anticipate.	31
V.	CONCLUSION	31

TABLE OF AUTHORITIES

CASES

<i>Abbott Labs. v. Sandoz, Inc.</i> , 544 F.3d 1341 (Fed. Cir. 2008).....	24
<i>ActiveVideo Networks, Inc. v. Verizon Communs., Inc.</i> , 694 F.3d 1312 (Fed. Cir. 2012).....	15, 22
<i>Arendi S.A.R.L. v. Apple Inc.</i> , 832 F.3d 1355 (Fed. Cir. 2016).....	4
<i>Ariosa Diagnostics v. Verinata Health, Inc.</i> , 805 F.3d 1359 (Fed. Cir. 2015).....	5, 6, 31
<i>Aspex Eyewear, Inc. v. Marchon Eyewear, Inc.</i> , 672 F.3d 1335 (Fed. Cir. 2012).....	3
<i>BASF Plant Sci., LP v. Commonwealth Sci. & Indus. Research Organisation</i> , 28 F.4th 1247 (Fed. Cir. 2022)	29
<i>Bilstad v. Wakalopulos</i> , 386 F.3d 1116 (Fed. Cir. 2004).....	30
<i>Capon v. Eshhar</i> , 418 F.3d 1349 (Fed. Cir. 2005).....	29
<i>In re Curtis</i> , 354 F.3d 1347 (Fed. Cir. 2004).....	30
<i>In re Magnum Oil Tools Int’l, Ltd.</i> , 829 F.3d 1364 (Fed. Cir. 2016).....	12, 15, 16
<i>In re Nordt Dev. Co., LLC</i> , 881 F.3d 1371 (Fed. Cir. 2018).....	9
<i>In re Smythe</i> , 480 F.2d 1376 (C.C.P.A. 1973)	29, 30
<i>Innogenetics, N.V. v. Abbott Labs.</i> , 512 F.3d 1363 (Fed. Cir. 2008).....	16, 23
<i>Intelligent Bio-Systems, Inc. v. Illumina Cambridge, Ltd.</i> , 821 F.3d 1359 (Fed. Cir. 2016).....	passim
<i>KSR Int’l Co. v. Teleflex Inc.</i> , 550 U.S. 398 (2007).....	16

<i>Lampi Corp. v. Am. Power Prods.,</i> 228 F. 3d 1365 (Fed.Cir. 2000).....	30
<i>Leo Pharm. Prods. v. Rea,</i> 726 F.3d 1346 (Fed. Cir. 2013).....	24
<i>Medtronic, Inc. v. Teleflex Innovations S.A.R.L.,</i> 70 F.4th 1331 (Fed. Cir. 2023)	2, 8, 13
<i>Netflix, Inc. v. DivX, LLC,</i> 84 F.4th 1371 (Fed. Cir. 2023)	19, 21, 24
<i>Perfect Web Techs., Inc. v. InfoUSA, Inc.,</i> 587 F.3d 1324 (Fed. Cir. 2009).....	4
<i>Persion Pharm. LLC v. Alvogen Malta Operations LTD.,</i> 945 F.3d 1184 (Fed. Cir. 2019).....	18
<i>Regents of Univ. of Cal. v. Eli Lilly & Co.,</i> 119 F.3d 1559 (Fed. Cir. 1997).....	30
<i>Salazar v. Procter & Gamble Co.,</i> 414 F.3d 1342 (Fed. Cir. 2005).....	7
<i>Wapp Tech Ltd. P’ship v. Seattle SpinCo, Inc.,</i> No. 4:18-CV-519, 2020 U.S. Dist. LEXIS 73089 (E.D. Tex. Apr. 27, 2020)	3

OTHER AUTHORITIES

United States Patent and Trademark Office, MANUEL OF PATENT EXAMINING PROCEDURE §608.02 (6th ed., rev. July 1997)	8
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RULES

37 C.F.R. § 42.104	19
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TABLE OF EXHIBITS

Exhibit	Description
EX2001	Declaration of Eric G. Maurer in Support of Motion for Admission <i>Pro Hac Vice</i>
EX2002	Definition of Pressure Head
EX2003	Definition of Valve
EX2004	Intentionally Left Blank
EX2005	Annotations to U.S. Patent Pub. No. 2024/0026990 A1 (“Cao”) Fig. 6B
EX2006	Annotations to U.S. Patent No. 8,028,719 (“Johnson”) Fig. 1
EX2007	Annotations to Petitioner’s EX1016 (“Guoxin”)
EX2008	Deposition Transcript of Dr. Kimberly Cameron, Dated Nov. 19-20, 2024
EX2009	Flowmatic Valves (https://www.flomatic.com/assets/pdf_files/literature/Flo-Trol-Literature.pdf) (last accessed Dec. 4, 2024)
EX2010	“What is a Flow Restrictor, and How Does It Work?” (https://www.theleeco.com/insights/what-is-a-flow-restrictor-and-how-does-it-work/) (last accessed Dec. 4, 2024).
EX2011	U.S. Patent Pub. No. 2024/0026990 A1 (“Cao”)
EX2012	U.S. Patent No. 8,028,719 (“Johnson”)
EX2013	Declaration of Michael Jobin
EX2014	Curriculum Vitae of Michael Jobin
EX2015	Deposition Transcript of Dr. Kimberly Cameron, Dated Apr. 23, 2025

GLOSSARY

Abbreviation	Term
'606 Application	U.S. Patent App. No. 10/798,606
'698 Patent	U.S. Patent No. 10,934,698
'904 Application	U.S. Patent App. No. 12/786,904
'993 Patent	U.S. Patent No. 9,139,993
Board	USPTO Patent Trial and Appeal Board
Challenged Claims	Claims 1-20 of the '993 Patent
Danco or PO	Patent Owner Danco, Inc.
Fluidmaster or Petitioner	Fluidmaster, Inc.
Institution Decision	IPR2024-00633 Paper 19
Integrally Molded Limitations	“wherein the extended portion is integrally molded with the body” (Claims 1 and 14) / “wherein the extended portion is integrally molded with the toilet fill valve” (Claim 8)
Parties	Danco and Fluidmaster, Collectively
Petition	IPR2024-00633 Paper 1
POPR	IPR 2024-00633 Paper 12 (Patent Owner Preliminary Response)
POR	IPR2024-00633 Paper 26 (Patent Owner’s Response)
POSITA	Person of Ordinary Skill in the Art
QCA	Quick Connection Art as defined in Petitioner’s Reply (Paper 30, i)
Reply	IPR2024-00633 Paper 30 (Petitioner’s Reply)

Abbreviation	Term
USPTO	United States Patent and Trademark Office

I. INTRODUCTION

PO identified deficiencies in the Petition which preclude a finding of invalidity. Paper 26. In Reply, Petitioner resorted to new arguments and evidence, which justifies wholesale exclusion of the Reply. *Intelligent Bio-Systems, Inc. v. Illumina Cambridge, Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016).

II. GROUNDS 1 AND 2

A. Guoxin does not disclose the claimed overflow tube configuration.

Guoxin teaches water supply line 403 “(1) ‘is directed to the toilet’ and (2) ‘*directly* provide[s] water supply to the toilet.’” POR, 18 (citing EX1016, p. 005; EX2007, 2:18-21; EX2013, ¶¶114-115). Guoxin also depicts line 403 *below* the water line. POR, 18-20 (citing EX2013, ¶¶116-118). A POSITA would have understood supply line 403 is *not* configured to direct water to an overflow tube, which must be *above* the water line. *Id.*; EX2015, 176:5-177:6.¹

Petitioner ignores Guoxin. Reply, 5-6 (alleging “Guoxin’s description of line 403 ‘directly’ suppling water to the bowl does not preclude connecting it to an overflow tube”); EX1036, ¶34 (Dr. Cameron “do[es] not attach *any weight* to the

¹ Dr. Cameron also testified a tube directed to an overflow tube would likely include either anti-siphoning means or a clip to hold it above the water line. EX2015, 75:9-79:19, 81:5-15. Guoxin depicts no such features.

depiction of water supply line 403”).² Rather, Petitioner believes Guoxin discloses the claimed overflow tube “even though there’s no indication that [Guoxin’s line 403] goes to an overflow tube.” EX2015, 157:13-158:17. Dr. Cameron expressly *assumes* Guoxin’s line 403 is directed to an overflow tube solely because (she believes) Guoxin doesn’t explicitly depict an alternative configuration. EX2015, 178:17-179:18. But Petitioner has “the burden of proving a proposition of unpatentability by a preponderance of the evidence. The absence of a finding that [a reference] does not have [claimed features] therefore cannot establish [the reference] in fact has those features.” *Medtronic, Inc. v. Teleflex Innovations S.A.R.L.*, 70 F.4th 1331, 1338 (Fed. Cir. 2023).

1. Petitioner misrepresents the Challenged Claims.

The Challenged Claims require more than “a tube ‘configured to attach directly to the water flow regulator.’” Reply, 2. Rather, Claim 1[E] states the tube “direct[s] the second portion of the water from the water flow regulator directly to a toilet tank overflow tube.” EX1001, Limitations 1[E], 8[E], 14[B]. Petitioner does not explain how Guoxin’s line 403 is “configured to” direct water to an overflow tube absent disclosure of said overflow tube. *Wapp Tech Ltd. P’ship v. Seattle SpinCo, Inc.*, No. 4:18-CV-519, 2020 U.S. Dist. LEXIS 73089, at *55 (E.D. Tex.

² All emphasis added unless otherwise noted.

Apr. 27, 2020) (“‘configured to’ has a narrower meaning than merely ‘capable of’”) (citing *Aspex Eyewear, Inc. v. Marchon Eyewear, Inc.*, 672 F.3d 1335, 1349 (Fed. Cir. 2012)). Although Petitioner argues the claimed overflow tube is merely a “reference point,” this argument (1) is not in the Petition,³ (2) completely reads out Limitation 8[F], as well as the wherein clauses of Limitations 1[E] and 14[B], and (3) incorrectly implies *any* tube which is “configured to attach directly to the water flow regulator” invalidates the Challenged Claims.

2. The Petition lacks *any* evidence Guoxin discloses the claimed overflow tube configuration.

Because Guoxin *does not disclose* an overflow tube, Petitioner’s Reply lacks citations to Guoxin itself. Reply, 2-3 (citing EX1004, ¶¶120, 148-49). Instead, Petitioner references irrelevant portions of Dr. Cameron’s declaration. EX1004, ¶120 (discussing the connection between Guoxin’s line 403 and the alleged water flow regulator, but providing no evidence that the *other end* of line 403 is “direct[ed] ... to a toilet tank overflow tube.”); ¶¶148-49 (repeating claim language, and stating it “is conventional in the art” without additional support).

Paragraph 149 is instructive. Dr. Cameron states “Guoxin discloses tube 403 (Fig. 2), that is configured to provide water supply to the toilet bowl.” EX1004, ¶149

³ Petitioner’s argument is waived. *Intelligent Bio-Systems*, 821 F.3d at 1369.

(citing Guoxin, 2:17-18). Petitioner’s annotated Figure 2 *does not depict* an overflow tube, and the fact that tube 403 provides water to the bowl is insufficient.

3. Petitioner does not prove the claimed overflow tube configuration is conventional.

Petitioner’s invalidity challenges rest on the tenuous premises that (1) overflow tubes are conventional in toilet design, and (2) a single reference (Brown) discloses the claimed overflow tube configuration. Reply, 3-4.

Ultimately, the alleged prevalence of overflow tubes among residential toilets does not mean the claimed configuration (a separate tube which directs water from a specific regulator to an overflow tube) is conventional. In fact, Ho provides an example of a tube (supply line 40) which directs water from a regulator to the bowl *without* first passing through an overflow tube, yet nevertheless discloses a stand-alone overflow tube. EX1022, Figs. 1-2; EX2015, 145:14-20, 156:14-157:9. Petitioner’s circular recitation that a “POSITA would understand that Guoxin’s line 403 is conventionally connected to an overflow tube” because “[o]verflow tubes are undisputedly conventional in toilet design” (Reply, 3-4) does not prove obviousness because it lacks “a reasoned explanation that avoids conclusory generalizations.” *Perfect Web Techs., Inc. v. InfoUSA, Inc.*, 587 F.3d 1324, 1328-29 (Fed. Cir. 2009); *see also Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361-62 (Fed. Cir. 2016) (“references to common sense ... cannot be used as a wholesale substitute for

reasoned analysis and evidentiary support, especially when dealing with a limitation missing from the prior art references specified”).⁴

Finally, the fact that a single reference (Brown) discloses an overflow tube is irrelevant. Petitioner did not rely on Brown in its Petition, allege obviousness in view of Brown, or identify any motivation to combine Guoxin/Ho with Brown. It cannot do so now. *Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1367 (Fed. Cir. 2015).

Petitioner points to instances where Guoxin is silent and (in Petitioner’s view) not inconsistent with the claimed configuration. But, Petitioner has failed to show Guoxin *actually discloses* a tube configured to direct water “directly to a toilet tank

⁴ Petitioner erroneously cites Dr. Cameron’s deposition to prove overflow tubes are conventional. Reply, 3-4. Dr. Cameron, however, did not reference an *overflow* tube. Immediately after Petitioner’s excerpt, Dr. Cameron was asked “what tube” she was referring to and responded: “I don’t know what you mean by that” and “I don’t know how to answer that.” EX2008, 85:9-20. Mr. Jobin, meanwhile, testified that “toilet systems may use an overflow tube,” but the claimed regulator, first tube, overflow tube configuration is not conventional. EX2013, ¶¶107-110. Even if overflow tubes are conventional, there is no evidence Guoxin’s line 403 directs water to an overflow tube.

overflow tube.” Petitioner’s conclusory, unsupported reference to the alleged conventionality of overflow tubes generally does not render the Challenged Claims obvious, and its belated reliance on Brown underscores the Petition’s deficiencies. *Ariosa Diagnostics*, 805 F.3d at 1367.

B. Guoxin/Ho do not disclose the Integrally Molded Limitations.

Guoxin and Ho are *silent* regarding the structure of the extended portion. Because both references are unclear, the Challenged Claims are not obvious.

1. Ho

Neither party contests the Board’s construction of “integrally molded with,” which requires the fill valve and extended portion be (1) molded, and (2) a single structure. Paper 19 at 14-15. Petitioner did not prove either requirement.

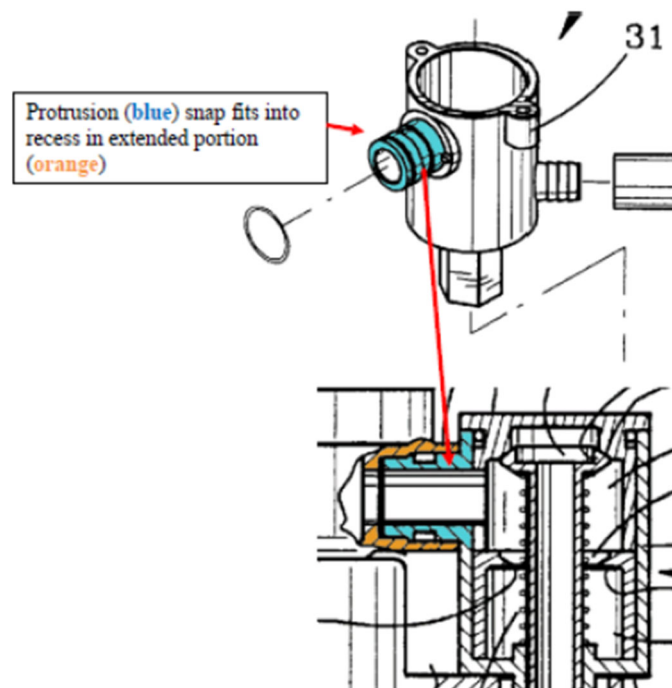
a) Ho does not disclose a “molded” fill valve.

“Neither the Petition nor Dr. Cameron (1) include any analysis that Ho allegedly discloses a ‘molded’ structure, (2) rely on any evidence from the Ho specification, or (3) explain which portion(s) of the cited Ho figure(s) allegedly show integral molding.” POR, 25. By focusing on the “single structure” portion of the Board’s construction, Petitioner effectively reads the term “molded” out of “integrally molded with.”

PO maintains “molded” denotes plastic structures. POR, 24-25. That PO did not argue this during prosecution is irrelevant. *Salazar v. Procter & Gamble Co.*,

414 F.3d 1342, 1345 (Fed. Cir. 2005). Moreover, Petitioner’s argument that “plastic parts can be ‘molded’ or ‘machined’” is beside the point. Reply, 9. PO does not argue molding is the *only* way to make plastic, merely that *only* plastic structures are “molded.” POR, 24-25. Petitioner’s “supplemental” expert declaration emphasizes Dr. Cameron did not previously address structure. Reply, 9 (citing EX1036, ¶¶16-24).

Ultimately, resolution of whether “molded” denotes plastic structure is unnecessary because Petitioner never identifies *any evidence* Ho discloses a “molded” fill valve. Tellingly, the Petition contains only a single conclusory sentence and annotated Figure (reproduced below). Petition, 33 (“Ho most clearly discloses an integrally molded extended portion on a toilet fill valve”).



Dr. Cameron concedes Ho is silent regarding the material composition of its fill valve (EX2015, 121:13-122:8), and Ho’s specification does not teach the fill valve is a “molded” structure. EX1022; EX2015, 104:2-9. Moreover, Dr. Cameron concedes Ho’s figures would be identical if the structure were (1) made of metal (EX2015, 138:12-140:21) and (2) welded together. *Id.*, 184:2-186:2. Consistent with Dr. Cameron’s testimony, the MPEP suggests an applicant would use cross-hatching such as Ho’s to indicate a metal structure. MPEP §608.02.

Thus, Petitioner’s sole remaining argument is Dr. Cameron’s personal, unsupported belief that molded plastic toilet fill valves were typical in 1997,⁵ coupled with the fact that “there’s nothing in [Ho] to indicate that this is anything other than normal.” EX2015, 104:10-105:1. But silence alone does not support invalidity. *Medtronic, Inc. v. Teleflex Innovations S.A.R.L.*, 70 F.4th 1331, 1338 (Fed. Cir. 2023).

To cover for its oversight, Petitioner now argues “[t]he ’993 Patent is not directed to the composition ... of its claimed structure. The claims and specification are silent as to material composition.” Reply, 8.⁶ In fact, Dr. Cameron’s

⁵ This argument was first raised in Reply and is waived. *Intelligent Bio-Systems, Inc. v. Illumina Cambridge, Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016).

⁶ Same as FN 5.

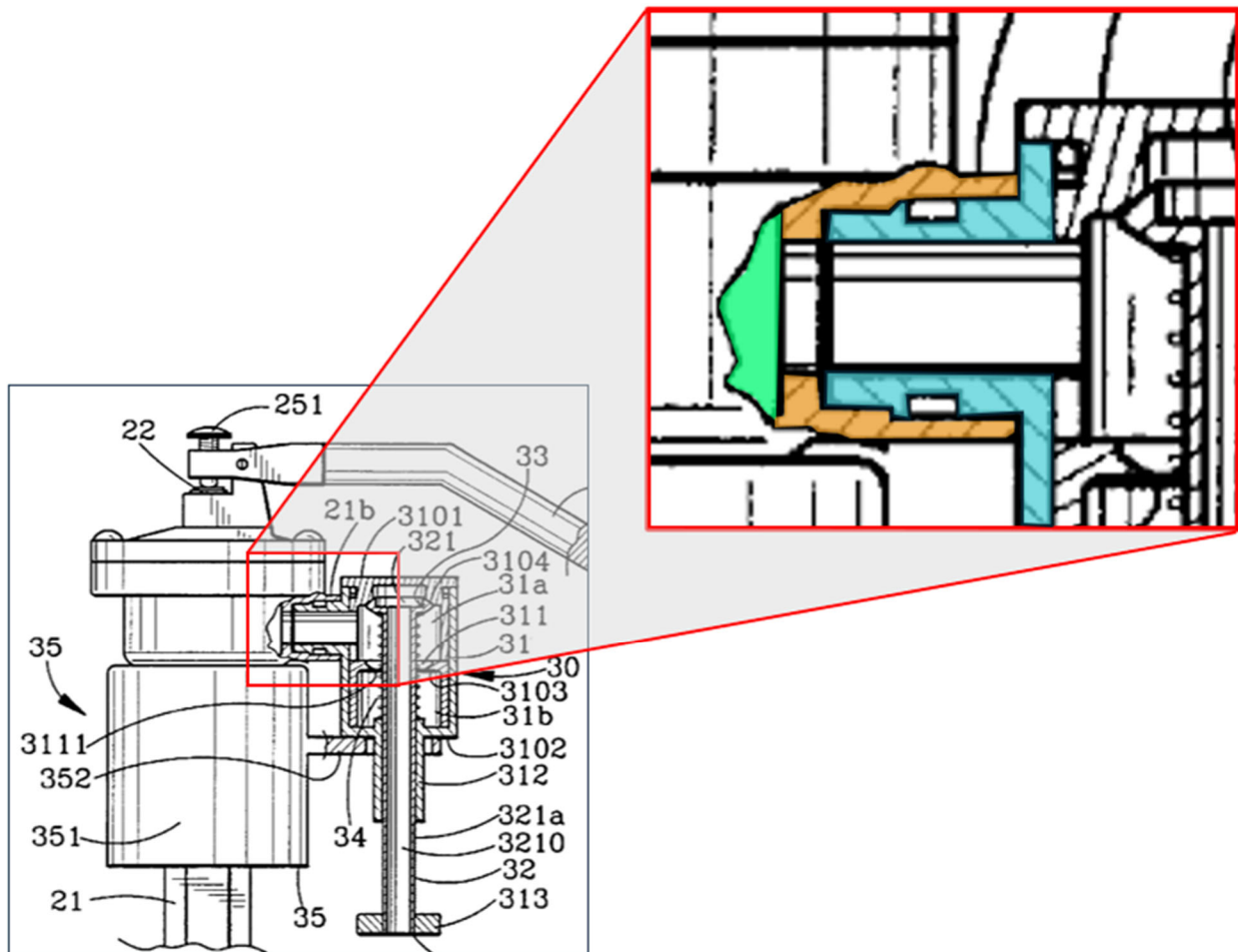
interpretation reads out “molded” entirely. *See, e.g.*, EX2015, 95:2-96:2 (testifying that in her view, the Challenged Claims cover “a fill valve and an extended portion” that were “chiseled ... out of a block of wood”). But, the Challenged Claims explicitly recite “molded” structures, and “words of limitation that can connote with equal force a structural characteristic of the product or a process of manufacture are commonly and *by default interpreted in their structural sense.*” *In re Nordt Dev. Co., LLC*, 881 F.3d 1371, 1375-76 (Fed. Cir. 2018) (“the specification itself convey[s] a structural meaning to ‘injection molded.’”). Petitioner has not shown Ho discloses a *molded* structure, precluding a finding of obviousness.

b) Ho does not disclose the body and extended portion are “a single structure.”

Petitioner did not prove Ho’s fill valve and extended portion are “molded together as a single structure.” The Petition relies on largely-irrelevant evidence. For example, the fact that Ho’s extended portion is separate from its water flow regulator (Reply, 10-11) is irrelevant for determining whether it is integrally molded with the body.

Petitioner makes three novel arguments in Reply, each of which is waived. *Intelligent Bio-Systems*, 821 F.3d at 1369 (Fed. Cir. 2016) (rejecting arguments raised for the first time in Reply because “[i]t is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify ‘with particularity’ the ‘evidence that supports the grounds for the challenge

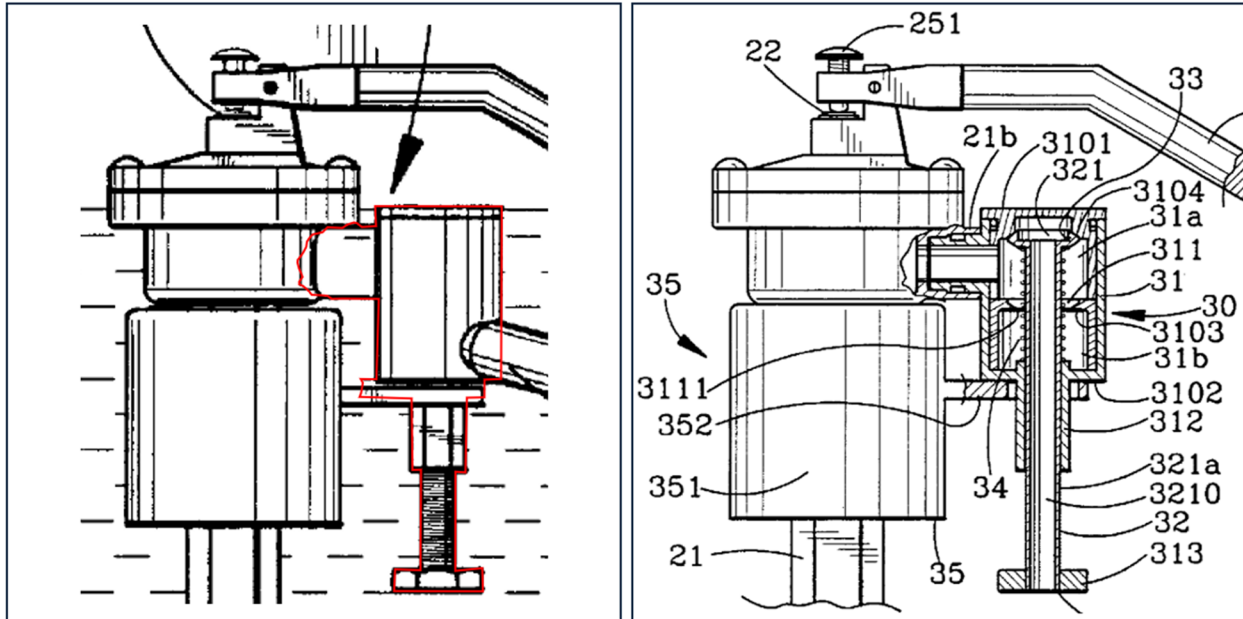
to each claim.”). First, Petitioner argues “the cross-hatching and border for the extended portion (orange) extends into the body of the fill valve.” Reply, 11. Not so. The orange cross-hatching confirms that the extended portion itself is a single structure. It *does not* extend into the body. Rather, a solid line separates it from portions of the figure which *are not* cross-hatched (green).



EX1022 (Ho), Fig. 3 (annotated)

When the section cut from Figure 3 (below, right) is overlaid over Figure 2 (below, left; overlay in red), the green portion from the previous annotations

overlaps directly with the body of the fill valve, whereas the orange and blue cross-hatched sections overlap with the extended portion. Notably, the extended portion is depicted as a separate structure in Figure 2 (as indicated by the different line patterns used on the extended portion and body of the fill valve).



At most, Ho's cross-hatching shows the extended portion itself is a single structure, but provides no guidance as to whether it is "integrally molded with" the body.⁷

⁷ Petitioner alleges previously uncited figures "also confirm this." Reply, 11; *id.* n. 7.

Petitioner's reliance on previously uncited figures is impermissible. The Petition *did not even reference cross-hatching*. Rather, the Board raised the issue *sua sponte*. Paper 19 at 20, 29; *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1381 (Fed.

Second, Petitioner argues “[i]f the extended portion (unlabeled in Fig. 2) were not integral to the fill valve, a POSITA would expect to see it shown separately, as with Fig. 5.” Reply, 11-12. But, Figure 5 depicts “an exploded view of the diverter valve” and as previously established, whether the extended portion is part of the diverter valve is immaterial. EX1022, 2:30-31. Similarly, Ho does not separately depict water supplying pipe 21, ball-cock valve 22, rod 25, or main float 252, yet they are not “integrally molded with” the body.

Third, Petitioner argues “attaching the extended portion separately would render it superfluous, because Ho’s valve *could instead be* directly connected to the fill valve via a screw connection.” Reply, 12. But how Ho’s fill valve *could be* constructed is irrelevant considering what the reference *actually discloses* to a POSITA. Additionally, the ’993 Patent discusses snapping or clamping a structure into place as an alternative to integral molding. EX1001, 2:17-26.

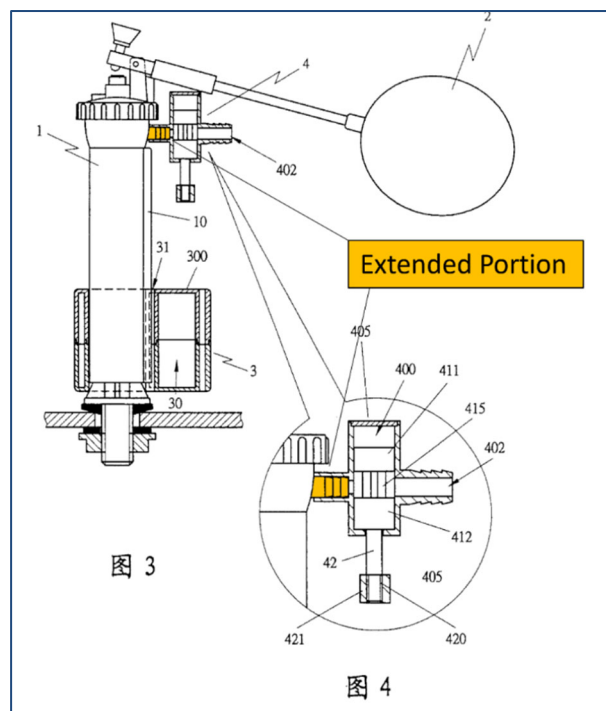
In sum, Petitioner reiterates Mr. Jobin had “no way to know for sure” as if that admission represents a fatal flaw in PO’s arguments. Reply, 12. Not so. Rather, it

Cir. 2016) (the Board may not “adopt arguments on behalf of petitioners that could have been, but were not, raised by the petitioner during an IPR.”). Petitioner cannot now point to “additional testimony” regarding arguments it *did not make* in the first place. *Intelligent Bio-Systems*, 821 F.3d at 1369.

represents a realistic analysis of Ho's disclosure. After reviewing Ho's figures and specification, a POSITA would have had "no way to know" whether Ho discloses a *molded* fill valve where the body and extended portion are *a single structure*. *Medtronic, Inc. v. Teleflex Innovations S.A.R.L.*, 70 F.4th 1331, 1338 (Fed. Cir. 2023).⁸ The Challenged Claims are not obvious.

2. Guoxin

Petitioner's annotations of Guoxin's figures do not provide *any* information regarding the structure of Guoxin's "water inlet device 1." POR, 21-23.



Petition, 32

⁸ PO's arguments apply with equal force to Guoxin. *See* §II.B.2, *infra*.

In Reply, Petitioner (1) restates Dr. Cameron’s conclusory testimony, (2) mischaracterizes Mr. Jobin’s testimony, and (3) offers new arguments based on Guoxin’s Figure 5. Each argument fails:

- Dr. Cameron’s testimony has no support in the figures or specifications. POR, 21-23.
- Mr. Jobin testified “*this feature is not integrally molded because one cannot determine whether it is or not...* It’s been identified as such by Dr. Cameron, but I disagree with that analysis.” EX1037, 78:8-18.
- Guoxin’s Figure 5 does not depict the body of the fill valve, and is therefore irrelevant for determining whether the extended portion is “integrally molded with” the body.

The Petition’s “analysis” is limited to the annotated figure, above. Petition, 32. Under Petitioner’s theory, any reference which depicts the extended portion *next to* the body would be sufficient. Petitioner is incorrect.

C. The Petition lacks motivation to reverse Guoxin’s fluid flow connectors.

Petitioner’s only non-hindsight motivation to reverse Guoxin’s fluid flow connector is its unsupported assertion that reversal “is merely a matter of design preference.” POR, 35 (citing Petition, 42-43). In Reply, Petitioner *still* fails to identify *any* design preferences, instead referencing “the common goal of accurately controlling water flowing into the bowl.” Reply, 13. But, *every* component in a toilet

system shares that goal—that is the entire point of the system. Petitioner’s argument is “generic and bears no relation to any specific combination of prior art elements.” *ActiveVideo Networks, Inc. v. Verizon Communs., Inc.*, 694 F.3d 1312, 1328 (Fed. Cir. 2012).

In fact, the only record evidence instructs a POSITA to use male-to-female connectors in certain circumstances, and female-to-male connectors in others. POR, 35-36 (citing EX1017, 7:24-29; EX2013, ¶¶162-165). There is no evidence both configurations “do substantially the same thing.” Petitioner ignores this in Reply.⁹

Petitioner’s alleged motivation is conclusory language supported by explicit hindsight. POR, 34-39. Petitioner excuses the hindsight as “additional illustrative examples.” Reply, 14. But absent hindsight, Petitioner is left with conclusory recitations of generic legal standards, which is insufficient. *In re Magnum Oil Tools Intl, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016) (“[P]etitioner cannot employ mere

⁹ Petitioner’s argument that *integrally molding* Guoxin’s extended portion “would additionally achieve the benefit of improved strength and integrity of connection” is irrelevant because Petitioner does not explain how reversing the fluid flow connection would impact—much less improve—strength or integrity of connection. Reply, 13

conclusory statements. [It] must instead articulate specific reasoning, based on evidence of record.”).

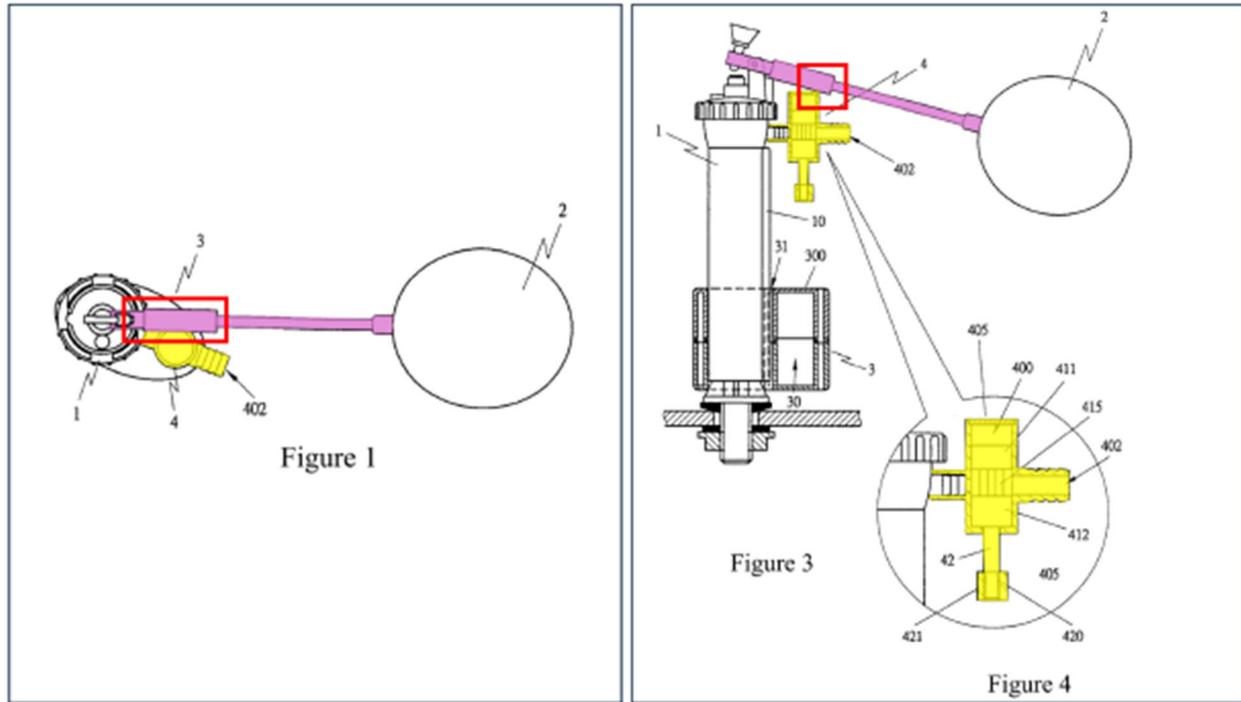
D. The Petition lacks motivation to combine Guoxin/Ho with the QCA.

Petitioner argues “any known method of connecting two fluid channels” would be appropriate, and no further analysis is needed. Reply, 14-15; Petition, 57-61. This is incorrect. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (“[I]t can be important to identify a reason that would have prompted a [POSITA] to combine the elements in the way the claimed new invention does” and “this analysis should be made explicit.”); *Innogenetics, N.V. v. Abbott Labs.*, 512 F.3d 1363, 1373 (Fed. Cir. 2008) (“[K]nowledge of a problem and motivation to solve it are entirely different from motivation to combine *particular references*...”).

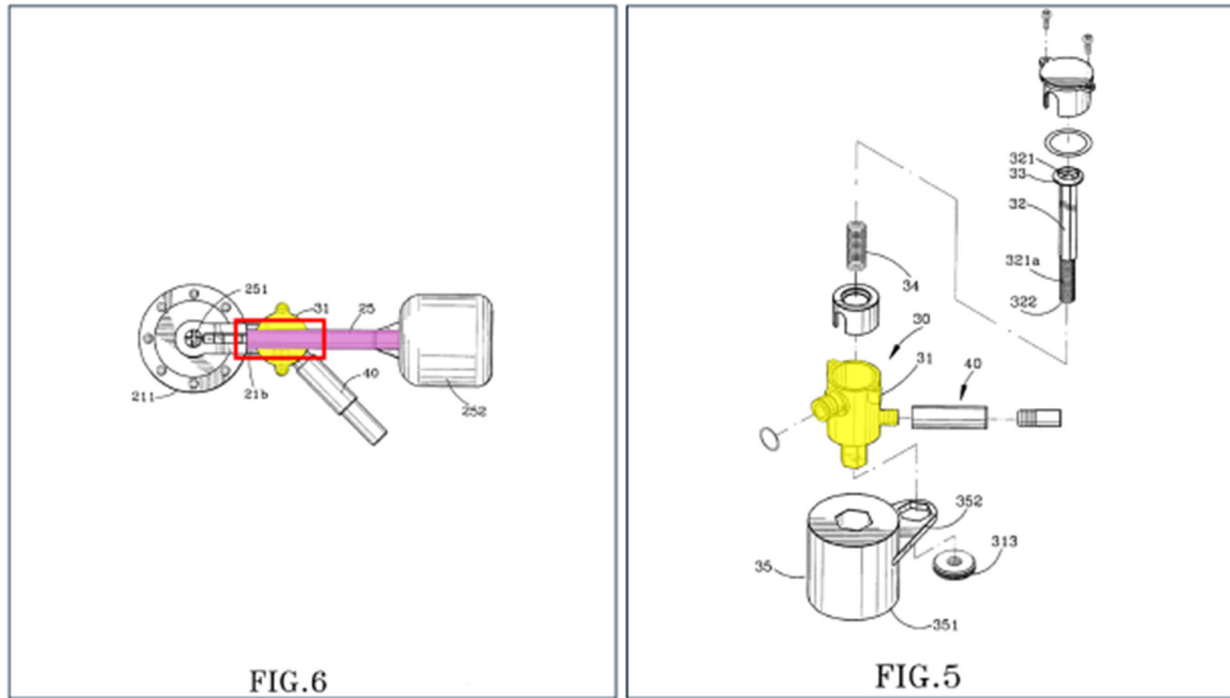
The Petition did not articulate a specific motivation to combine *any* of the “QCA” references with the alleged Guoxin/Ho combination. POR, 39-40. In Response, PO identified concerns which would caution against each proposed sub-combination, which Petitioner ignored on Reply. *Id.* (citing EX2013, ¶¶172-76). Petitioner side-stepped any reference-specific motivation to combine analysis with its statement that “any known method of connecting two fluid channels” would be appropriate. But it is Petitioner’s burden to identify a motivation to combine, and it cannot do so solely through conclusory statements. *Magnum Oil Tools*, 829 F.3d at 1380.

E. Claim 5

Guoxin's Figures depict angular alignment and interference. POR, 43.
Petitioner ignores the figures, and incorrectly claims interference does not exist.
Reply, 15; EX2015, 164:4-169:20.



does not interfere with the float arm is irrelevant, since the valve as a whole both interferes with and is angularly aligned with the float arm. POR, 44-45.



F. Claims 7, 9

Petitioner has not shown the claimed feature is “necessarily present.” POR, 45-46 (citing EX1008, 188:4-191:8); *see also Persion Pharm. LLC v. Alvogen Malta Operations LTD.*, 945 F.3d 1184, 1191 (Fed. Cir. 2019)

G. Claims 10-11

Petitioner objects to elevating “form over substance” but the Petition’s citations to Guoxin are incoherent. *See, e.g., Netflix, Inc. v. DivX, LLC*, 84 F.4th

1371, 1377 (Fed. Cir. 2023); 37 C.F.R. §42.104(b)(4)-(5); *see also* EX2015, 65:1-74:5.

H. Claims 19-20

Petitioner fundamentally misunderstands the '993 Patent's claimed flow rate. Claim 19 recites: "an adjustable water flow regulator that is configured to adjust **the flow rate** of the second portion of the water." "The flow rate" of Claim 19 has antecedent basis in Claim 1: "the water flow regulator is configured to constrict **a flow rate of the second portion of the water that flows through the water flow regulator**." A POSITA would have understood "flow rate" as the rate water flows *through* the regulator. EX2013, 196-97 (referencing "the flow rate of *water passing through the switching valve*").¹⁰

Guoxin discloses a mechanism to adjust *how long* water flows through the switching mechanism. Increasing the length of the valve stem (by loosening the T-shaped nut) causes the switching mechanism to open later and close earlier in the fill cycle. This reduces both the total *amount* of water entering the bowl and the total *time* water passes through the switching mechanism and, thus, has no impact on the *rate* water passes through the switching valve. The overall length of the fill cycle is irrelevant. EX2015, 88:5-89:1. Conversely, decreasing the length of the valve stem

¹⁰ PO's analysis applies to Claims 14 and 20.

(by tightening the T-shaped nut) causes the switching mechanism to open earlier and close later. This increases both the total *amount* of water entering the bowl and the total *time* water passes through the switching mechanism and, again, does not impact the *rate* water passes through the switching valve. POR, 49 (citing EX2013, ¶¶196-97).

Petitioner incorrectly refers to flow rate as “the amount of water that leaves the water flow regulator during refill divided by *the time it takes for the tank to refill.*” Reply, 18-19. This is incorrect. The flow rate (of the second portion of the water) is the amount of water that leaves the water flow regulator, divided by *the time the water is passing through the water flow regulator.* Water which does not pass through the regulator—either before it opens or after it closes—is irrelevant.

Petitioner’s expert seemingly agrees, testifying that (1) water pressure and (2) the diameter of the orifice were the only things she could think of which impact flow rate. EX2015, 84:6-85:22. If those variables are constant, flow rate will not change. *Id.*, 88:5-12. Unlike Brown’s set screw 26 (which alters the diameter of the opening), adjusting *when* Guoxin’s switching mechanism opens and closes has no impact on flow rate. *Id.*, 88:14-89:1.

III. GROUND 3 AND 4

A. Petitioner's Motivation to Combine Brown and Ho is deficient.

“A petitioner may not rely on a vague, generic, and/or meandering petition and later fault the Board for failing to understand what the petition really meant.” *Netflix, Inc. v. DivX, LLC*, 84 F.4th 1371, 1377 (Fed. Cir. 2023). Petitioner previously argued “using the bowl fill restriction of Ho *instead of* the bowl fill restriction shown in Brown, would have been obvious to a POSITA as a matter of design preference.” Petition at 65, 75-76.

PO's Response highlighted inconsistencies in Petitioner's identification of the claimed water flow regulator. POR, 57-62. In Reply, Petitioner now argues “Brown *alone* discloses Claim 1[D]” (the claimed water flow regulator) and “Brown discloses ... Claim 1[E].” Reply, 21.¹¹

Petitioner now relies on Ho solely for the Integrally Molded Limitations. Reply, 22-23. But Petitioner's sole “motivation” to integrally mold Brown's extended portion is conclusory references to “more recently developed molding techniques.” Petition, 68; Reply, 22-23. The Federal Circuit rejected a similar

¹¹ The Petition's motivation to combine argument was based on *replacing* Brown's set screw 26 with Ho's diverter valve. Petitioner's argument remains deficient. POR, 50-57. Moreover, it speaks to a combination Petitioner has now disclaimed.

“motivation” because it was “generic and bears no relation to any specific combination of prior art elements. It also fails to explain why a person of ordinary skill in the art would have combined elements from specific references *in the way the claimed invention does*.” *ActiveVideo Networks*, 694 F.3d at 1328 (criticizing the alleged motivation to “build something better ... by combining these two things you could do something new that [you] hadn’t been able to do before”); *see also* POR, 56-57.

Petitioner now argues no explicit motivation is needed because “Brown and Ho share a common function, to accurately control the amount of water that flows from the toilet fill valve into the toilet bowl.” Reply, 19-20. Not only is Petitioner’s premise fundamentally incorrect—Brown discloses means for *reducing* “the amount of water flowing through the overflow pipe into the toilet bowl” while Ho discloses means for *redirecting* “water from the water supplying pipe to the rim flushing conduit of a toilet bowl”—but it is again directed to “the use of Ho’s valve” which Petitioner has disavowed. Reply, 20; EX1021, 1:9-16; EX1022, 1:6-9.¹²

¹² If Petitioner reasserts at trial that the proposed combination includes Ho’s valve, the Petition does not adequately disclose at least limitations 1[D1], 1[D2], and 1[D4]. POR, 61-62.

As explained in PO's Response, the Petition's conclusory allegation that a POSITA would have been motivated to use Ho's (unidentified) molding techniques to modify Brown's toilet fill valve is deficient. POR, 56-57. In Reply, Petitioner did not identify any *evidence* addressing PO's critiques, but rather intimated a motivation to combine is unnecessary because both references—like all references in the residential plumbing industry—aim to control water flow into the toilet. Petitioner's approach is incorrect. *Innogenetics*, 512 F.3d at 1373 (Fed. Cir. 2008).

B. A POSITA would not have a reasonable expectation of success in combining Brown and Ho.

PO explained the proposed combination is inoperable. POR, 54-56. In Reply, Petitioner argues the Board should ignore numerous technical challenges raised by the Brown/Ho combination because “a POSITA would understand that toilet components must be sized and oriented appropriately to account generally for toilet designs” and “[t]here are a finite number of known techniques to achieve that result.” Reply, 20-21.¹³

But, “*KSR* did not create a presumption that all experimentation in fields where there is already a background of useful knowledge is ‘obvious to try.’” *Abbott*

¹³ Petitioner's argument is at odds with its implication that a POSITA would also look to references outside of the residential plumbing industry—such as the QCA—for additional “known techniques.” Petitioner stretches the term “finite” to its limit.

Labs. v. Sandoz, Inc., 544 F.3d 1341, 1352 (Fed. Cir. 2008). The Federal Circuit “recognizes an important distinction between combining known options into a finite number of identified, predictable solutions, and merely throwing metaphorical darts at a board in hopes of arriving at a successful result.” *Leo Pharm. Prods. v. Rea*, 726 F.3d 1346, 1357 (Fed. Cir. 2013) (cleaned up). Petitioner’s proposal—that there are only a finite number of ways to arrange plumbing components—clearly falls into the latter, impermissible category.

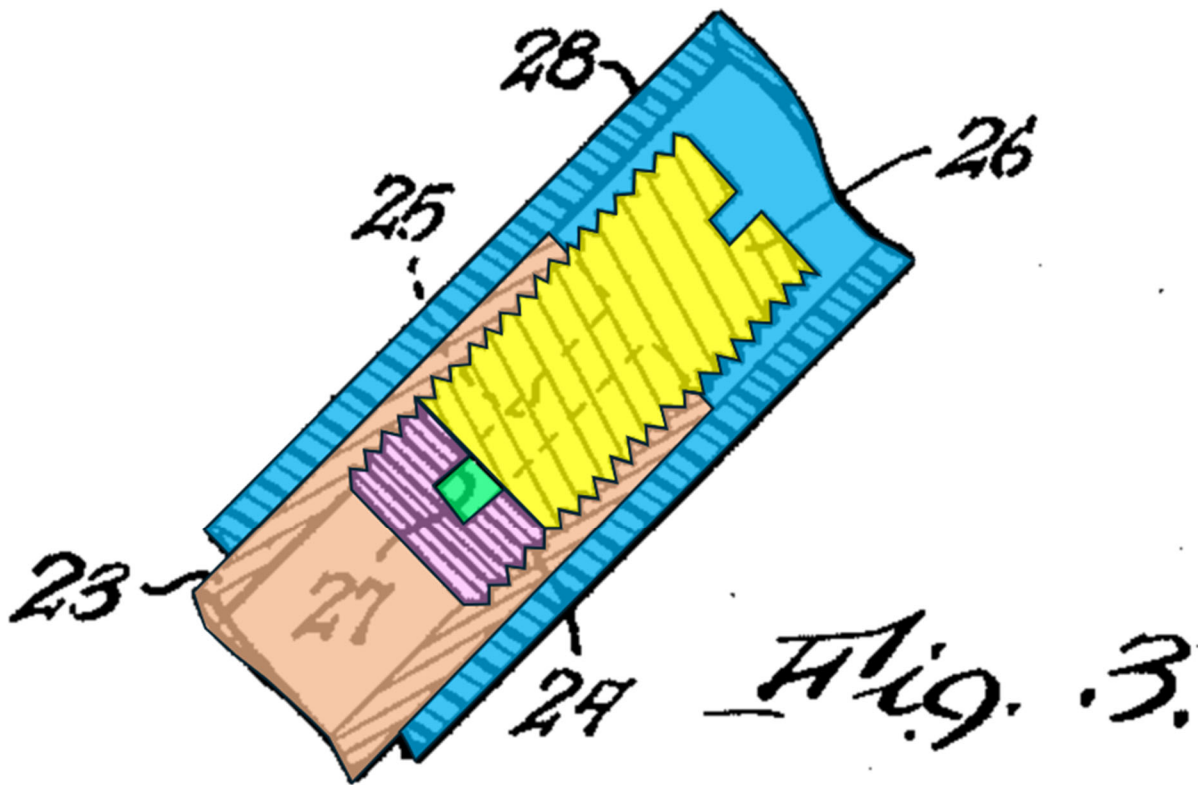
C. The Petition does not identify “a tube that is configured to attach directly to the water flow regulator.”

The Petition’s identification of the claimed “water flow regulator” was—perhaps intentionally—vague and confusing. Petition, 70-74. Brown does not disclose “a tube that is configured to attach directly to the water flow regulator” because the claimed “tube” attaches to the extended portion. POR, 57-62. Petitioner now argues PO misunderstood the Petition. But, “[a] petitioner may not rely on a vague, generic, and/or meandering petition and later fault the Board for failing to understand what the petition really meant.” *Netflix, Inc. v. DivX, LLC*, 84 F.4th 1371, 1377 (Fed. Cir. 2023).

Brown discloses:

- Adapter tube 23 (brown/peach);
- Internally threaded portion 24 (purple);
- Diametrically opposed slots 25 (located behind set screw 26);

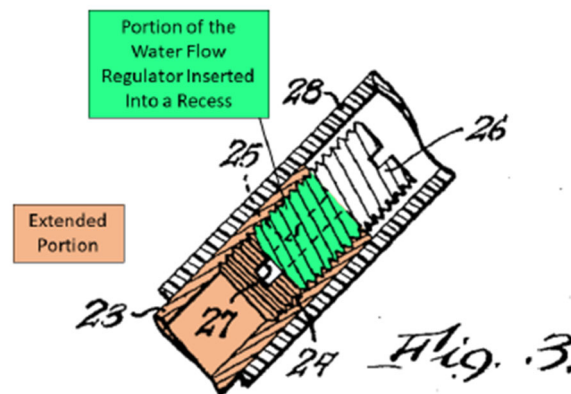
- Set screw 26 (yellow);
- Restricted opening 27 (green); and
- Flexible tube 28 (blue).



Regardless of how Petitioner defines the alleged “water flow regulator,” Brown does not disclose the claimed “tube” attaches “directly to the water flow regulator.”¹⁴ Flexible tube 28 is not attached to diametrically opposed slots 25 or

¹⁴ Petitioner’s Reply claims “Brown’s water flow regulator is the combination of the slotted portion of adapter tube 23 and set screw 26.” Reply, 21 (citing EX1004, ¶245).

restricted opening 27—those labels identify empty space water flows through, and a structure cannot *attach* to empty space. Nor is it attached to *internally* threaded portion 24. Rather, flexible tube 28 attaches to the *exterior* of adapter tube 23. But, Petitioner emphasized adapter tube 23 is the “extended portion” of the fill valve, and relied on this to show “a portion of the water flow regulator is configured to insert into, and come into contact with, the extended portion of the body.” Petition, 71-72.



The same structure cannot be part of both the water flow regulator, *and* the extended portion. Petitioner’s failure to consistently define the claimed water flow regulator results in a Petition that does not disclose “a tube that is configured to attach directly to the water flow regulator.”¹⁵

¹⁵ This argument similarly impacts Claims 8 (“a tube that is in contact with the water flow regulator”) and 14 (“attaching a tube directly to the water flow regulator”).

D. Petitioner has not shown it would be obvious to integrally mold Brown's extended portion in view of unidentified "developments in molding techniques."

Petitioner's apparent single-reference obviousness argument fails for the same reasons as its Brown/Ho combination. *See* §§II.B.1, III.A, *supra*; POR, 56-57.

E. Petitioner does not articulate a motivation to further combine Brown/Ho with the QCA.

See §II.D.

F. Claims 2, 13

Petitioner's allegation that a POSITA would modify Brown in view of Ho "to allow for a more compact design, including by molding the extended portion to extend radially from the longitudinal axis" is unsupported. *See* §§III.A-B, *supra*. In fact, a radially-extending extended portion is arguably *less compact* than the vertical structure disclosed by Brown.

G. Claim 5

Brown does not depict or describe the alleged float and actuating arm, much less the claimed configuration. POR, 64-66; §II.E.

H. Claims 7, 9

See §II.F.

I. Claims 19-20

If Petitioner asserts Grounds 3 and 4 rely on Ho's water flow regulator (as opposed to Brown's set screw 26), Claims 19-20 are not obvious. *See* §II.H.

IV. GROUND 5

Petitioner concedes “toilet fill valves with various mechanisms to control the flow of water to the toilet bowl during a flush cycle were well known in the art.” EX1004, ¶¶83-84. As early as 1959 Brown taught fixed restrictors “accomplish substantially the same results” as adjustable valves. EX1021, 4:20-44. When discussing the “technological background” of the ’993 Patent, Dr. Cameron identified “several examples” of flow restrictors with “varied decreased diameters” such as a “tube extended from the ... fill valve that has a smaller (restricted) diameter than conventional refill tubes but lacks the ‘feature of adjustability.’” EX1004, ¶¶84-88. Petitioner summarized Dr. Cameron’s analysis: “[a]s known in the art, once a bowl fill restrictor is inserted and in place, it is no longer adjustable.” Petition, 19.

Petitioner also recognizes the improvement from known fixed restrictors to adjustable valves was one of the “inventive feature[s]” of the ’606 Application. Reply, 25 (“the specification repeatedly identifies only adjustability as an *inventive feature* of the claimed bowl fill valve”). Dr. Cameron agrees, stating an inventive feature of the ’606 Application was “[u]sing a bowl fill valve, which is adjustable, as opposed to a device that is not adjustable.” EX2015, 92:5-93:10.

Despite alleging (1) fixed restrictors of “varied decreased diameters” were known mechanisms to reduce water flow, (2) adjustable valves were known to provide a benefit over fixed restrictors, and (3) this benefit (of using adjustable

valves instead of fixed restrictors) was one of the “inventive features” of the ’606 Application, Petitioner maintains that the inventors of the ’606 Application did not have possession of a fill valve implementing fixed flow restrictors. Reply, 25-26. This argument is meritless. *BASF Plant Sci., LP v. Commonwealth Sci. & Indus. Research Organisation*, 28 F.4th 1247, 1264 (Fed. Cir. 2022) (“A patentee may rely on information that is well-known in the art to the extent it informs how a relevant artisan would reasonably understand what is actually described in the specification.”) (cleaned up).

The genus in question contains two species: adjustable flow valves (recited in the ’606 Application), and fixed restrictors (which Petitioner asserts were known in the art). EX2015, 47:2-13; *see also Capon v. Eshhar*, 418 F.3d 1349, 1358 (Fed. Cir. 2005) (“The ‘written description’ requirement must be applied in the context of the particular invention and the state of the knowledge.... As each field evolves, the balance also evolves between what is known and what is added by each inventive contribution.”). Petitioner cannot dispute that fixed restrictors are “already stored in the minds of those skilled in the arts, ready for instant recall upon reading the descriptions of” adjustable bowl fill valves. *In re Smythe*, 480 F.2d 1376, 1384 (C.C.P.A. 1973).

Petitioner’s authority is inapposite. *See In re Curtis* 354 F.3d 1347, 1357 (Fed. Cir. 2004) (holding “a [POSITA] would be hard-pressed to instantly recall any other

species” based on the specification’s limited disclosure); *Regents of Univ. of Cal. v. Eli Lilly & Co.*, 119 F.3d 1559, 1568 (Fed. Cir. 1997) (“[o]ne skilled in the art therefore cannot,,, visualize or recognize the identity of the members of the genus”). Neither case applies here, where the record indicates the patentee both had knowledge of and specifically intended to improve upon fixed restrictors.¹⁶

Because the inventors of the ’606 Application had possession of both adjustable valves and fixed restrictors, the ’993 Patent is entitled to its earliest claimed priority date. Schuster is not prior art.¹⁷

¹⁶ Petitioner references *Bilstad*, *Smythe*, and *Lampi*, noting they do not hold *all* mechanical inventions allow a patentee to claim a genus based on disclosure of a single species. Reply, 26-27. But, PO never made that assertion, and as explained in the POR and herein, this case falls into the predicable, mechanical world where *Bilstad*’s teachings are applicable. *Bilstad v. Wakalopulos*, 386 F.3d 1116, 1126 (Fed. Cir. 2004).

¹⁷ Although Petitioner concedes Schuster is not prior art to Claims 19 and 20 (Reply, 28), Dr. Cameron maintains the ’606 Application lacks written description support for those claims. EX2015, 35:5-41:22. Curiously, Dr. Cameron previously alleged (1) “claims 19 and 20 recite ... an adjustable water flow regulator” (EX1004, ¶203) and (2) the priority applications “disclose[] ... a device that can control and adjust

A. Schuster does not anticipate.

Schuster's Figure 4 alone does not teach integral molding, and the Petition does not reference the specification. POR, 77-78. Petitioner cannot rely on portions of prior art not previously identified. *Ariosa Diagnostics*, 805 F.3d at 1367.

V. CONCLUSION

As explained herein and in PO's Response, the Challenged Claims are not invalid.

Dated: April 30, 2025

Respectfully submitted,

/Jason M. Perilla/

Jason M. Perilla (Reg. No. 65,731)
Kenneth A. Knox (Reg. No. 71,306)
Eric G. Maurer (*admitted pro hac vice*)
Thomas F. Finch (Reg. No. 82,341)

PERILLA KNOX & HILDEBRANDT LLP
5871 Glenridge Drive
Suite 350
Atlanta, GA 30328-5376
Telephone: (770) 927-7802
Facsimile: (877) 389-6779

the flow through the bowl refill tube.” *Id.* ¶327. This blatant contradiction calls Dr. Cameron's priority analysis into question.

CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that the foregoing Patent Owner's Sur-Reply to Petitioner's Reply contains 5,598 words according to Microsoft Word's word count feature.

Dated: April 30, 2025

Respectfully submitted,

/Thomas F. Finch/

Thomas F. Finch (Reg. No. 82,341)
Counsel for Patent Owner

CERTIFICATE OF SERVICE

In accordance with 37 C.F.R. § 42.6(e), the undersigned certifies that on the 30th day of April 2025, a complete and entire copy of the foregoing Patent Owner's Sur-Reply to the Petitioner's Reply including the exhibits relied upon, was served on counsel of record for Petitioners, as follows:

Lead Counsel	Back-up Counsel
Carolyn S. Toto (Reg. No. 56,817) carolyn.toto@pillsburylaw.com Postal & Hand-Delivery Address PILLSBURY WINTHROP SHAW PITTMAN LLP 725 South Figueroa Street, 36th Floor Los Angeles, CA 90017-5406 Telephone: (213) 488-7238 Facsimile: (213) 629-1033	Evan Finkel (Reg. No. 49,059) evan.finkel@pillsburylaw.com Postal & Hand-Delivery Address PILLSBURY WINTHROP SHAW PITTMAN LLP 725 South Figueroa Street, 36th Floor Los Angeles, CA 90017-5406 Telephone: (213) 488-7307 Facsimile: (213) 226-4058
	Ranjini Acharya (Pro Hac Vice Application Forthcoming) ranjini.acharya@pillsburylaw.com Postal & Hand-Delivery Address PILLSBURY WINTHROP SHAW PITTMAN LLP 2550 Hanover Street Palo Alto, CA 94304-1115 Telephone: (650) 233-4085 Facsimile: (650) 233-4545

electronically, via e-mail, at: carolyn.toto@pillsburylaw.com,
evan.finkel@pillsburylaw.com, and ranjini.acharya@pillsburylaw.com, by consent
of counsel of record for Petitioners electronically, via e-mail, at:
carolyn.toto@pillsburylaw.com, evan.finkel@pillsburylaw.com, and
ranjini.acharya@pillsburylaw.com, and docket_ip@pillsburylaw.com, by consent
of counsel of record for Petitioners.

Dated: April 30, 2025

Respectfully submitted,

/Jason M. Perilla/

Jason M. Perilla (Reg. No. 65,731)

Kenneth A. Knox (Reg. No. 71,306)

Eric G. Maurer (*admitted pro hac vice*)

Thomas F. Finch (Reg. No. 82,341)

PERILLA KNOX & HILDEBRANDT LLP

5871 Glenridge Drive

Suite 350

Atlanta, GA 30328-5376

Telephone: (770) 927-7802

Facsimile: (877) 389-6779