

By: Jason M. Perilla (j.perilla@pkhip.com)
Kenneth A. Knox (k.knox@pkhip.com)
Eric G. Maurer (*pro hac vice*) (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. IPR2024-00635
U.S. Patent No. 10,934,698 B1

PATENT OWNER'S RESPONSE

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	BACKGROUND	1
III.	OVERVIEW OF THE '698 PATENT	2
	A. Subject Matter	2
	B. Prosecution History of the '698 Patent	5
IV.	PERSON OF ORDINARY SKILL IN THE ART (“POSITA”).....	6
V.	CLAIM CONSTRUCTION.....	6
	A. “means for adjusting water flow ”.....	6
VI.	THE PRIOR ART.....	7
	A. Guoxin	7
	B. Ho	8
	C. Fluid Flow Connection References	8
VII.	THE CHALLENGED CLAIMS ARE NOT INVALID.....	9
	A. Ground 1: Guoxin in view of Ho, in further view of Calmettes, Hall, and/or Kimber.....	9
	1. The Petition is deficient with respect to certain claim limitations.....	10
	a) “overflow tube”	10
	b) The Flow Limitations	15
	2. The Petition does not articulate a motivation to combine the teachings of the prior art.	19
	a) The Petition does not articulate a motivation to reverse the configuration of Guoxin’s male and female fluid flow connectors based on the teachings of Ho.	19

- b) The Petition does not articulate any motivation to combine the Quick Connection Art with Guoxin and/or Ho, nor any reasonable expectation of success in doing so.....23

VIII. CONCLUSION 25

TABLE OF AUTHORITIES

CASES

Novartis Pharm. Corp. v. W.-Ward Pharm. Int’l Ltd.,
923 F.3d 1051 (Fed. Cir. 2019).....19

Sci. Plastic Prods. v. Biotage AB,
766 F.3d 1355 (Fed. Cir. 2014).....22

W.L. Gore & Associates, Inc. v. Garlock, Inc.,
721 F.2d 1540 (Fed. Cir. 1983).....21

RULES

37 C.F.R. § 42.104 13, 17

37 C.F.R. § 42.120 1

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	Definition of Overflow Tube
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

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
Board	USPTO Patent Trial and Appeal Board
Challenged Claims	Claims 1-14 of the '698 Patent
Danco or Patent Owner	Danco, Inc.
Fluidmaster or Petitioner	Fluidmaster, Inc.
Institution Decision	IPR2024-00635 Paper 20
Parties	Danco and Fluidmaster, Collectively
Petition	IPR2024-00635 Paper 1
POPR	IPR 2024-00635 Paper 13 (Patent Owner Preliminary Response)
POSITA	Person of Ordinary Skill in the Art
USPTO	United States Patent and Trademark Office
'606 Application	U.S. Patent App. No. 10/798,606

I. INTRODUCTION

Pursuant to 37 C.F.R. § 42.120, Danco, Inc. submits this Response to the Petition for *inter partes* review IPR2024-00635 of U.S. Patent No. 10,934,698 filed by Fluidmaster, Inc.

Petitioner asserts one ground of invalidity against Claims 1-14 of the '698 Patent.

Ground	Claims	Basis	Primary Reference	Secondary Reference(s)
1	1-14	103	Guoxin	Ho Calmettes Hall Kimber ¹

The Petition must be denied because Ground 1 is fatally flawed.

II. BACKGROUND

Excessive water usage in toilets is a significant issue with various implications, both on a micro and macro scale. Traditional toilet fill valves often dispense more water than necessary to refill the toilet bowl after flushing. EX1001, 1:28-36. The '698 Patent describes a toilet fill valve that restricts or regulates the

¹ The Petition refers to Calmettes, Hall, and Kimber collectively as the “Quick Connection Art.”

flow of water into the toilet bowl during a flush cycle to prevent any unnecessary wastage. EX1001, 2:35-46. EX2013, ¶¶55-57.

III. OVERVIEW OF THE '698 PATENT

The '698 Patent family is identified below.

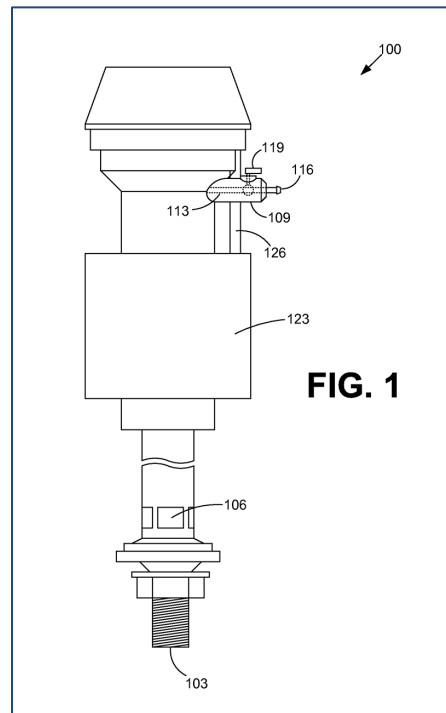
Patent App. No.	Filing Date	Status	Patent No.	Priority
10/798,606	03/11/2004	Patented	6,823,889	
10/958,797	10/05/2004	Patented	7,743,436	CIP of '889
12/786,904	05/25/2010	Patented	8,104,105	Continuation of '436
13/346,355	07/09/2012	Patented	8,650,671	Continuation of '105
14/164,424	01/27/2014	Patented	9,139,993	Continuation of '671
14/457,697	08/12/2014	Patented	9,103,105	Continuation of '993
14/856,901	09/17/2015	Patented	10,519,639	Continuation of '105
16/686,328	11/18/2019	Patented	10,934,698	Continuation of '639

The '698 Patent includes four independent claims. *Id.*, Cls. 1, 8, 10, 12.

A. Subject Matter

The '698 Patent is entitled “Toilet Fill Valve,” and describes a toilet fill valve system designed to efficiently manage water flow during the flush cycle of a toilet. *Id.*, 1:28-36; and 2:35-46. The system includes a toilet fill valve with a body that has an extended portion integrally molded with it, forming a bowl fill outlet port. *Id.*, 2:21-46. The valve is equipped with a water inlet to receive water from a supply source and a tank water outlet to provide a portion of the water to the toilet tank. *Id.*,

2:35-46. Additionally, the system features bowl fill valve 109 that attaches directly to the extended portion of the valve body. *Id.*, 2:25-34. This valve is designed to regulate the flow rate of a second portion of water during the flush cycle. *Id.*



EX1001, Fig. 1

The bowl fill valve can be locked onto the integrally molded, extended portion of the toilet fill valve body using a protrusion that inserts into a recess in the valve. *Id.*, 7:4-13. This direct attachment method is intended to prevent the formation of a pressure head within the connecting tube. *Id.*, 4:3-21. Such pressure heads can cause a tube, also part of the system, to become loose, disconnect, or leak over time. *Id.* The tube is designed to attach directly to the bowl fill valve and direct the constricted flow of water to the toilet tank's overflow tube. *Id.*, 3:29-32. A slot and a rib can be

provided that prevents the rotation of the bowl fill valve with respect to the bowl fill outlet port a when the bowl fill valve inlet port is inserted into the bowl fill outlet port. *Id.*, 6:54-7:3.

The '698 Patent also outlines a method of operation for the toilet fill valve system. *See generally id.* It involves coupling a water inlet of a toilet fill valve to a water source, attaching a bowl fill valve directly to a body of the toilet fill valve by at least: mating a bowl fill valve inlet port of the bowl fill valve directly to a bowl fill outlet port that extends from the body of the toilet fill valve; snap fitting a protrusion of the bowl fill valve into a recess of the toilet fill valve; and, inserting an extension of the toilet fill valve into a slot of the bowl fill valve, where the slot is configured to prevent rotation of the bowl fill valve relative to the toilet fill valve. *Id.*

The bowl fill valve restricts the flow rate of this second portion of water, which is then provided to a tube that directs it to the toilet tank overflow tube. *Id.*, 2:35-46. The method ensures that the water level in the toilet bowl reaches a predefined level at the end of the flush cycle, minimizing water wastage. *Id.*, 4:40-46.

The claims of the patent focus on the system's components, including the toilet fill valve that is configured to attach directly to the body of the toilet fill valve, the bowl fill valve with its locking mechanism, and a water flow adjustment handle.

See generally id. The system is designed to prevent water wastage by ensuring that the water level in the toilet bowl is adequately refilled without excess during the flush cycle, which can save consumers money on water bills or provide additional environmental benefits through decreased water usage. *Id.*, 4:40-46. The direct attachment of the bowl fill valve to the valve body and the prevention of pressure head formation in the tube are various advantages. *Id.*, 4:4-21; EX2013, ¶60.

B. Prosecution History of the '698 Patent

The '698 Patent was filed as 16/686,328 (the "'328 Application") on November 18, 2019. EX1001, p. 1.

Originally-filed claims 1-3, 5-7, 11-14, 17-19, and 22-25 were rejected under 35 U.S.C. § 102 as allegedly being anticipated by DeMarco. *Id.*, 98-102. Moreover, originally-filed Claims 4, 9, 10, 15, 16, 20, and 21 were obvious under 35 U.S.C. § 103 in view of DeMarco and Robinson. *Id.*, 102-103. Finally, the claims were rejected on the grounds of non-statutory double patenting. *Id.*, 103. Patent Owner filed a response on April 15, 2020. *Id.*, 73. Patent Owner included features relating to a snap connection in the independent claims and argued that such features were not shown in the cited art. *Id.*, 85-91.

The Office then rejected pending Claims 1-7, 12-14, 17-19, 22, 23, and 25 as allegedly being obvious over DeMarco in view of Bjerke. *Id.*, 63-67. Patent Owner submitted amendments and arguments in reply on October 8, 2020 in which Patent

Owner generally amended the claims to include recitations regarding a slot configured to receive an extension of the toilet fill valve, and prevent rotation of the bowl fill valve relative to the toilet fill valve, arguing that each and every element of the claims was not shown by the cited art. *See id.*, 55. Patent Owner’s amendments and arguments were persuasive, and, after the filing of a terminal disclaimer by Patent Owner, a Notice of Allowance was issued on November 3, 2020. *Id.*, 10.

IV. PERSON OF ORDINARY SKILL IN THE ART (“POSITA”)

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

For purposes of its Institution Decision, the Board “adopt[ed] Patent Owner’s proposed definition of a POSITA, as it is consistent with the ’993 [P]atent and the asserted prior art.” Paper 20, 16. The Board further explained that it “see[s] no material difference between the level of skill proposed by Patent Owner and that proposed by Dr. Cameron.” *Id.*

V. CLAIM CONSTRUCTION

A. “means for adjusting water flow ”

Patent Owner agrees with Petitioner that the term “means for adjusting water flow” recited in Claim 12 is a means-plus-function limitation under 35 U.S.C. § 112.

Pet., 7. Patent Owner asserts that for purposes of this petition, “means for adjusting water flow” should cover an adjustment handle and equivalents thereof (structure) for adjusting or regulating water flow (function). Paper 13 (POPR), 14-15.

VI. THE PRIOR ART

A. Guoxin

Guoxin discloses a water supply switching device for one-piece toilets with insufficient water storage capacity. EX1016, p. 004; EX2007, 1:1-5. Unlike the '698 Patent, which is directed to reducing the amount of water flowing into the toilet bowl, Guoxin aims to *increase the amount* of water flowing to the toilet bowl during the flush cycle to address the issue of *insufficient water* volume for a flush. EX1016, p. 004; EX2007, 1:5-7. The device directs water directly into the toilet, thereby ensuring a thorough flush. *Id.* EX2013, ¶¶64-65.

Guoxin is silent on whether the purported “extended portion” of the water inlet device 1 referenced in the Petition is integrally molded with the body of the water inlet device. Guoxin only states that to one side of the water inlet device, there is a switching mechanism 4 that is equipped with a valve seat with a slot to accommodate a switching valve. EX1016, p. 005; EX2007, 2:17-23. The switching valve has upper and lower annular surrounds with a smaller annular surround therebetween. EX1016, p. 005; EX2007, 2:24-31. When the water in the toilet tank reaches a set level of height, the lower annular surround blocks between the water

inlet and outlet, discontinuing the water supply to the toilet through the switching mechanism. EX1016, p. 005; EX2007, 2:31-41; EX2013, ¶66.

B. Ho

Ho describes a toilet flushing device designed to be installed in a water supply tank, featuring a diverter valve that directs high-pressure water to the rim flushing conduit of a toilet bowl during flushing. EX1022, Abstract. Like Guoxin, Ho aims to *increase* the amount of water directed to the toilet bowl, in stark contrast to the '698 Patent. The diverter valve includes a valve housing and a valve rod that moves in response to changes in water level in a water supply tank. *Id.*, Abstract; EX2013, ¶67-68.

The diverter valve has a hollow housing, an inlet pipe, a supply line to the rim flushing conduit, and a float member that moves the valve rod in response to water level changes, ensuring proper water flow during flushing and tank refilling. *Id.*, 3:12-17, 3:53-61. Like Guoxin, Ho is also silent on whether the purported “extended portion” of the water supplying pipe referenced in the Petition is integrally molded with the body of the water supplying pipe. EX2013, ¶69.

C. Fluid Flow Connection References

Bjerke outlines a detachable bathtub shower system that can be swiftly connected to a bathtub faucet via a screw-threaded fitting. EX1017, 3:23-48. This

system incorporates a backflow preventer with a quick connect/disconnect feature, allowing for easy attachment or removal. *Id.*, 3:5-22; EX2013, ¶70.

Calmettes describes a coupling device designed to securely connect the ends of two coaxial tubes, such as those found in motor vehicle cooling circuits or other industrial applications. EX1018, 1:21; *see also id.*, 10:23; 3-30-47, 3:67-68; 4:1-2; 10:10-20; EX2013, ¶72.

Hall pertains to a hose-coupling device that enables the quick and secure connection of adjacent hose sections without the use of traditional coupling threads. EX1019, 1:8-14, *see also id.*, 1:66-85, 1:86-89, 1:100-112; EX2013, ¶73.

Kimber describes a coupling designed to create a sealed connection between two conduits, such as hoses and radiators in automobiles. EX1020, 1, *see also id.*, 2-3, 8; EX2013, ¶74.

VII. THE CHALLENGED CLAIMS ARE NOT INVALID

A. Ground 1: Guoxin in view of Ho, in further view of Calmettes, Hall, and/or Kimber

Petitioner has not met its burden to show that the Challenged Claims are invalid.

1. The Petition is deficient with respect to certain claim limitations.

a) “overflow tube”

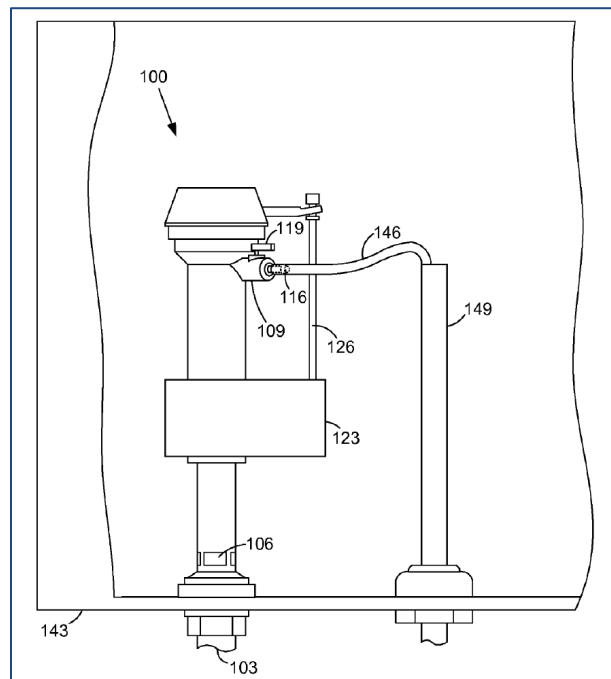
Independent claims 8 and 12 require a first tube that transfers water from the bowl fill valve outlet port to a second toilet tank “overflow tube.” *See, e.g.,* limitations 8[C], 12[B] (“a bowl fill valve outlet port configured to attach directly to a tube that provides water from the bowl fill valve outlet port to an overflow tube”); Pet., 46 (citing EX1004, ¶149). EX2013, ¶77.

As an initial matter, the Petition’s analysis with respect to limitations 8[C] and 12[B] merely incorporates prior analysis of limitations 1[B3] and 1[C]. Pet., 46. But, limitations 1[B3] and 1[C] *do not recite the claimed overflow tube*. Likewise, Petitioner’s analysis of limitations 1[B3] and 1[C] does not analyze or otherwise reference the claimed overflow tube in any capacity. EX2013, ¶78.

Notably, limitations 8[C] and 12[B] require a first tube attached directly to the bowl fill valve, which in turn is connected to a second, separate toilet tank overflow (or overfill) tube. EX1001, Cls., 8, 12, *see also* 3:60-65. This is consistent with the purpose of the ’698 Patent, which is to minimize wasted water. EX1001, 6:33-38. The overflow tube prevents the tank from overflowing in the case of failure of the fill valve in an open state. Meanwhile, the break between the tubes prevents

siphoning of the toilet water into the water supply in the case of negative pressure on the water supply line. EX2013, ¶79

This configuration is depicted (for example) in Figure 3 of the '698 Patent, which depicts tube 146 and overflow tube 149.² EX2013, ¶80-81.



EX1001, Fig. 3

- (1) The Petition does not identify any evidence that Guoxin’s water supply line 403 directs water to the claimed overflow tube.**

The Petition identifies Guoxin’s “water supply line 403” and Ho’s “supply line 40” as the claimed tube attached directly to the bowl fill valve. Pet., 35-36, 44. The

Petition does not at any point identify the separate toilet tank overflow tube, as required by limitations 8[B] and 12[B]. A toilet tank overflow tube is not depicted in any of Petitioner's annotated figures, nor do any cited or uncited portions of Guoxin or Ho reference an overflow. Moreover, Neither Guoxin nor Ho reference the claimed configuration—namely, a tube that provides water from the bowl fill valve outlet port to an overflow tube.

(1) The claimed configuration is not disclosed or otherwise “conventional in the art.”

When questioned on the operation of a conventional residential toilet, Dr. Cameron testified that she was only aware of two mechanisms by which water enters a toilet bowl: (1) a tube that transfers water directly from the fill valve to the bowl, and (2) water entering the bowl through the flush valve. EX2008, 87:14-21; *see also id.*, 79:19-87:21. Dr. Cameron *did not* reference overflow tubes in any capacity. EX2013, ¶¶83-86.

Moreover, the claimed configuration—a tube which directs water from a bowl fill valve to a separate overflow tube—is not conventional in the art. Bowl fill valves perform multiple functions in toilet systems. The specific function impacts where the water exiting the valve is directed. Some, like the valve disclosed and claimed by the '698 Patent, regulate the flow of water from the fill valve to the overflow tube. Others, like Ho's diverter valve direct water from the fill valve to a conduit

encircling the rim of the toilet bowl. EX1022, 4:7-9; EX2013, ¶87. Still others, like switching mechanism 4 disclosed by Guoxin, provide a mechanism whereby water “*is directly supplied to the toilet bowl* to compensate for the lack of water in the tank.” EX1016, p. 004; EX2007, 1:2-7; *see also* EX2013, ¶88.³

Numerous other, different configurations of tubes, bowl fill valves, and overflow tubes also exist. Petitioner has not identified any evidence which even suggests that Guoxin discloses the claimed configuration. Likewise, Petitioner has not alleged (or provided any evidence to support) that the claimed configuration is an obvious modification of Guoxin in view of the knowledge of a POSITA. EX2013, ¶89.

(1) Guoxin’s tube 403 and Ho’s supply line 40 do not direct water from a bowl fill valve to an overflow tube.

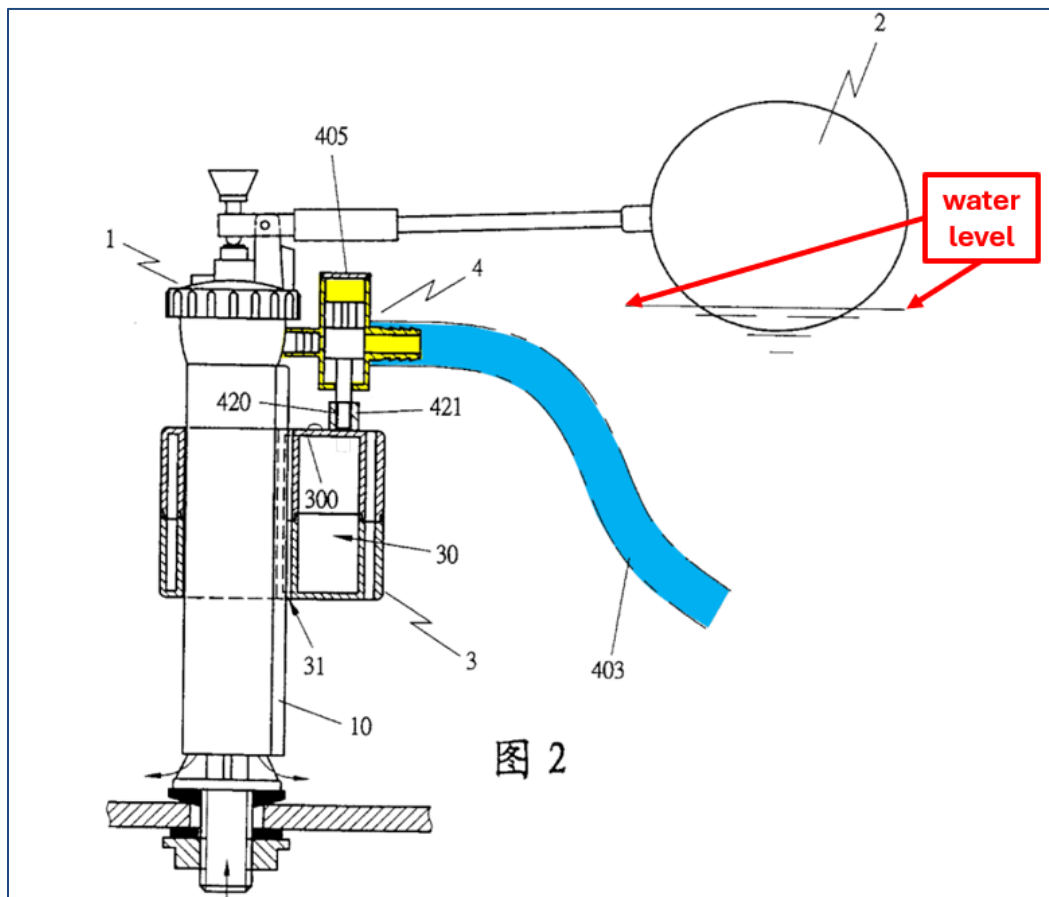
Petitioner’s citations and analysis of Guoxin are deficient, and that alone justifies a finding that the Challenged Claims are not invalid. 37 C.F.R. § 42.104(b)(5) (the Board may exclude evidence “where a party has failed to ... identify specific portions of the evidence that support the challenge.”).

However, Guoxin itself confirms that water supply line 403 is not directed to an overflow tube, but instead (1) “is directed to the toilet” and (2) “*directly* provide[s]

³ All emphasis is added unless otherwise noted.

water supply to the toilet.” EX1016, p. 005; EX2007, 2:18-21. Guoxin supplies water directly to the bowl in order to *increase* flush volume. EX2013, ¶¶90-91.

Petitioner’s annotations of Figure 2 support this conclusion. Pet., 49; EX1016, p. 005; EX2007, 2:6. Notably, the water level when full is above both the outlet port of switching mechanism 4, and the terminal end of water supply line 403. EX2013, ¶92.



Pet., 49 (citing EX1016, Fig. 2) (annotated)

However, in order to function properly, the opening of an overflow tube must be located *above* the water level. Figure 2 indicates that water supply line 403

descends from the point it attaches to switching mechanism 4, which is consistent with its stated purpose of supplying water directly to the bowl in order to increase flush volume. If it were directed to an overflow tube, then it would need to *ascend* from the point of attachment. EX2013, ¶93.

Additionally, Ho's diverter valve 30 "permits the supply of high pressure water to the rim flushing conduit of a toilet bowl when the toilet bowl is flushed." EX1022, Abstract. Rather than directing water to an overflow tube, Ho's diverter valve 30 directs water to a conduit encircling the rim of the toilet bowl. EX1022, 4:7-9 ("[h]igh pressure water thus enters the *rim flushing conduit 54*, thereby effectively rinsing the inner wall of the toilet bowl."). EX2013, ¶93.

As such, limitations 8[C] and 12[B] are not disclosed or otherwise rendered obvious by Guoxin, alone or in view of Ho. EX2013, ¶94.

b) The Flow Limitations

The '698 Patent contains several limitations related to water flow through the bowl fill valve (collectively, the "Flow Limitations"). Each of these limitations relates to adjusting the flow rate of water *through the bowl fill valve*. EX2013, ¶96.

- 1[B5]: "a water flow adjustment handle"
 - Pet., 42 ("Guoxin discloses an adjustable bowl fill valve that adjusts the *water flow rate* through the valve based on a setting of the bowl fill valve.").

- 8[E]: “a water flow adjustment handle being configured to adjust water flow from the bowl fill valve inlet port *to the bowl fill valve outlet port*”
 - Pet., 46-47 (“For the reasons discussed above with respect to 1[B5], Guoxin, alone or with Ho, and the Quick Connection Art render these elements obvious.”)
- 11: “adjusting a flow of water *out of the bowl fill valve*”
 - Pet., 58 (“Claims 11 and 13 are rendered obvious for the reasons discussed above with respect to elements 1[B5], 8[E], and 12[E].”)
- 12[E]: “means for adjusting water flow *out of the bowl fill valve outlet port*”
 - Pet., 46-47 (“For the reasons discussed above with respect to 1[B5], Guoxin, alone or with Ho, and the Quick Connection Art render these elements obvious.”)
- 13: “the means for adjusting water *flow out of the bowl fill valve outlet port* comprises an adjustment handle”
 - Pet., 58 (“Claims 11 and 13 are rendered obvious for the reasons discussed above with respect to elements 1[B5], 8[E], and 12[E].”)

Importantly, each of the Flow Limitations relates to water passing through the bowl fill valve, and ultimately out of the outlet port. Thus, in order to disclose one or more of the Flow Limitations, a reference must first disclose adjusting the flow

of water which *exits* the flow valve. Merely terminating the flow of water at the valve is insufficient. Petitioner only identifies Guoxin as allegedly disclosing limitation 1[B5]. Pet., 42. And, with respect to the remaining limitations, Petitioner only refers back to limitation 1[B5]. However, Guoxin *does not* disclose an adjustable flow rate. EX2013, ¶¶97-98.

As an initial matter, the sole evidence relied on with respect to this limitation consists of citations to Guoxin’s specification. However, Dr. Cameron’s citations are deficient and not informative, as the cited portions of Guoxin do not relate to the propositions for which they are cited. EX2013, ¶99; *see also* EX2008, 193:18-200:19. Regardless of (1) what Dr. Cameron intended to cite, or (2) whether or not Dr. Cameron thinks it is “that complicated,” the cited language does not reference adjusting the *rate* at which water passes through the bowl fill valve. EX2013, ¶100. 37 C.F.R. § 42.104(b)(5).

Moreover, the Petition does not actually allege that the prior art discloses an adjustable flow rate. EX2013, ¶101. Instead, Petitioner claims that adjusting Guoxin’s T-shaped nut “in turn alters amount of water that can leave the bowl fill restriction before the float valve stops water from entering the water inlet.” Pet., 42 (citing EX1016, 2:25-33; EX1004, ¶137). Specifically, the Petition explains that the bowl fill valve disclosed by Guoxin is adjustable to alter the circumstances under

which the bowl fill valve terminates the flow of water – not the flow *rate* of the water passing through the valve. EX2013, ¶101.

This interpretation of the Petition is confirmed by reference to Guoxin, which explains that “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.” EX1016, p. 005; EX2007, 2:26-39; *see also* Figs. 2-4, EX2013, ¶102.

Simply put, Guoxin discloses a mechanism to adjust when the flow of water through the switching mechanism is discontinued. Increasing the length of the valve stem (by loosening the T-shaped nut) causes the switching mechanism to close earlier in the tank fill cycle. Although this reduces the total *amount* of water that enters the toilet bowl, it does nothing to impact the flow *rate* of the water passing through the switching valve. EX2013, ¶103.

Conversely, decreasing the length of the valve stem (by tightening the T-shaped nut) causes the switching mechanism to close later in the tank fill cycle. Again, this increases the total *amount* of water which enters the toilet bowl but similarly does not have any impact on the flow *rate* of water passing through the switching valve. EX2013, ¶104.

2. The Petition does not articulate a motivation to combine the teachings of the prior art.

“A party seeking to invalidate a patent based on obviousness must prove ... that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention.” *Novartis Pharm. Corp. v. W.-Ward Pharm. Int’l Ltd.*, 923 F.3d 1051, 1059 (Fed. Cir. 2019).

a) The Petition does not articulate a motivation to reverse the configuration of Guoxin’s male and female fluid flow connectors based on the teachings of Ho.

Guoxin discloses a bowl fill valve, wherein a portion of the toilet fill valve is configured to insert into the bowl fill valve. The Challenged Claims, meanwhile, require the reverse arrangement—namely, a bowl fill valve wherein a portion of the bowl fill valve is configured to insert into the toilet fill valve. EX2013, ¶105.

The Petition relies on reversing the configuration of Guoxin’s male and female fluid flow connectors—based on the alleged teachings of Ho—for each of limitations 1[B4], 8[C], 10[B4], and 12[C]. Pet., 36-41, 46, 48. EX2013, ¶106.

(1) The Petition does not identify the alleged “design preferences” which allegedly motivate reversal.

The Petition alleges that male and female fluid flow connectors are interchangeable as a matter of design preference but fails to identify (1) what those design preferences are, or (2) why the unidentified “design preferences” would have motivated a POSITA to reverse the fluid flow connector arrangement. Pet., 24-25

(citing EX1004, ¶¶101; EX1017, 7:15-24, Figs. 5-6; EX1006, 80-81); Pet., 27 (citing EX1004, ¶105); *see also* Pet., 41-42 (citing EX1004, ¶¶133-135); EX2013, ¶107.⁴

The question of whether a POSITA would have been capable of reversing the fluid flow connector configuration is not in dispute. Indeed, the mere fact that a POSITA *could* have reversed Guoxin's fluid flow connection does not mean that they *would* have been motivated to do so. Petitioner has failed to meet its burden to show the latter. EX2013, ¶108.

(2) The Petition *ignores* potential design preferences discussed by the prior art.

Petitioner correctly notes that Bjerke discloses multiple configurations of fluid flow connectors. EX2013, ¶¶109-110.

However, the Petition does not acknowledge that uncited portions of Bjerke provide *design preferences* which provide a POSITA with guidance regarding when to use a particular fluid flow connector configuration. EX1017 (Bjerke), 7:24-29; EX2013, ¶111. Despite having a clear example of how design preferences impact the selected fluid flow connection configuration, the Petition makes no effort to (1)

⁴ Dr. Cameron's testimony largely corresponds to the statements made in the Petition.

identify any relevant design preference, or (2) explain why the (unidentified) preferences would have motivated the suggested modification. EX2013, ¶112.

(3) The Petition relies on improper hindsight.

The only potential “design preferences” articulated by the Petition are based on the teachings of the ’698 Patent itself, which constitutes impermissible hindsight before the Board. EX2013, ¶113.

First, Dr. Cameron relies on the prosecution history of the ’698 Patent as providing “another example of the interchangeability of male and female connectors, and specifically connectors for toilet fill valves” (U.S. Patent No. 10,934,698). EX1004, ¶102. EX2013, ¶113. Dr. Cameron’s allegation that the ’698 Patent’s specification provides support for “the precise arrangement disclosed by Guoxin” while also teaching that “it is possible that this arrangement may be reversed” is the very definition of speculative hindsight. EX1004, ¶¶102-104; EX2013, ¶113; *see also W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553 (Fed. Cir. 1983) (“To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.”).

Elsewhere, when describing what she deems “an obvious design choice,” Dr. Cameron explains that “[i]t is *clear from the ’698 patent specification* and the

intrinsic evidence that PO placed no criticality on which portion of the coupling was the male portion and which portion was the female portion.” EX1004, ¶103. However, the mere fact that the specification discloses multiple options for fluid flow connector configurations is irrelevant. The ’698 Patent claims a specific configuration, and Dr. Cameron fails to identify any rationale (other than the teachings of the ’698 Patent itself) regarding why a POSITA would be motivated to modify Guoxin with this configuration. EX2013, ¶114. *Sci. Plastic Prods. v. Biotage AB*, 766 F.3d 1355, 1359 (Fed. Cir. 2014) (“The pertinence of the reference as a source of solution to the inventor’s problem must be recognizable with the foresight of a person of ordinary skill, not with the hindsight of the inventor's successful achievement.”).

Second, the Petition alleges that “[t]he toilet fill valve connectors here are likewise interchangeable.” Pet., 26 (citing EX1004, ¶104; EX1001, 7:36-48). However, as support for this statement both Dr. Cameron and the Petition rely *only* on the teachings of the ’698 Patent which (according to Dr. Cameron) “confirms the obvious interchangeability of protrusions, ribs, recesses, etc., on the respective couplings. EX1004, ¶104 (citing EX1001, 7:36-48). Again, reliance on the specification of the challenged patent itself to provide the motivation to modify the prior art is the definition of impermissible hindsight. EX2013, ¶115.

Consequently, the Petition fails to identify *any* design preferences which would allegedly motivate a POSITA to reverse the fluid flow connector configuration disclosed by Guoxin. In fact, Petitioner ignores the design considerations plainly disclosed by Bjerke and fails to provide any analysis supporting how those considerations would—or would not—motivate a POSITA to make the suggested changes. The *only* support for the proposed modification is the '698 Patent itself, consideration of which is impermissible hindsight. EX2013, ¶116; *see also KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2006) (“A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon ex post reasoning.”).

b) The Petition does not articulate any motivation to combine the Quick Connection Art with Guoxin and/or Ho, nor any reasonable expectation of success in doing so.

The Petition’s motivation to combine analysis is also deficient with respect to the Quick Connection Art. Specifically, Petitioner relies on the conclusory allegation that the art discloses “well-known fluid flow connections.” Pet., 24. But, the mere fact that the fluid flow connections were allegedly well known says nothing about whether a POSITA would have been motivated to combine the known Quick Connection Art with Guoxin and/or Ho. EX2013, ¶117.

Rather than identify a single motivation to combine any particular reference with Guoxin or Ho (or the combination of the two), Petitioner makes the conclusory

allegation that “using the mating engagements of Hall or Kimber to attach the extended portion of Guoxin’s toilet fill valve to switching mechanism 4 would have been obvious to a POSITA as a matter of design preference.” Pet., 41. But, once again, Petitioner fails to identify the specific considerations which would have motivated a POSITA to further modify the fluid flow connections disclosed by Guoxin and/or Ho. Not only did Petitioner fail to explain why a POSITA would have been motivated to make the suggested modification, but Petitioner also ignored evidence against the proffered combination. EX2013, ¶118.

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

The Petition’s conclusory recitation that certain fluid flow connectors are well known in the art is insufficient to show that a POSITA would have been motivated to make the proposed modifications. *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d

1364, 1380 (Fed. Cir. 2016). As such, Ground 1 fails to show that the proposed combinations would have been obvious to a POSITA. EX2013, ¶120.

VIII. CONCLUSION

For at least the reasons discussed above, the Petition fails to establish that the Challenged Claims are invalid.

Dated: December 4, 2024

Respectfully submitted,

/Kenneth A. Knox/

Jason M. Perilla (Reg. No. 65,731)
Kenneth A. Knox (Reg. No. 71,306)
Eric G. Maurer (*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

CERTIFICATE OF SERVICE

In accordance with 37 C.F.R. § 42.6(e), the undersigned certifies that on December 4, 2024, a complete and entire copy of the foregoing Patent Owner's Response, 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 (<i>Pro Hac Vice</i> 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.

Dated: December 4, 2024 Respectfully submitted,

/Kenneth A. Knox/

Jason M. Perilla (Reg. No. 65,731)
Kenneth A. Knox (Reg. No. 71,306)
Eric G. Maurer (*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

CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that the foregoing Patent Owner's Preliminary Response, excluding the portions exempted under 37 C.F.R. § 42.24(b), contains 5,020 words according to Microsoft Word's word count feature.

Dated: December 4, 2024

Respectfully submitted,

/Thomas F. Finch/

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