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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

Declaration of Michael Jobin

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Patent Trial and Appeal Board
US Patent and Trademark Office
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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	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

I, Mr. Michael Jobin, do hereby declare under penalty of perjury that the following statements are made based on my personal knowledge and are true and correct:

I. EDUCATION AND WORK EXPERIENCE

1. I have personal knowledge of the facts contained in this Declaration, am of legal age, and am otherwise competent to testify.

2. I am currently the Director of Product Development at 908 Devices in Boston, Massachusetts. I have more than 30 years of experience in product and technology development as a mechanical engineer, consultant and entrepreneur. I have summarized in this section my professional background, educational background, and patents. My full curriculum vitae is attached as EX2014.

3. I received two degrees from the University of Michigan in 1991, a Bachelor of Science, Engineering with a focus on mechanical engineering, and a Bachelor of Fine Arts, Industrial Design with a focus on product development, both cum laude. I was the recipient of the Kiefer Award for excellence in Industrial Design.

A. Career History

4. I have worked in various product development companies throughout my 33-year career and have developed many products that demonstrate knowledge

and experience with the subject matter relevant in this case. I provide below a summary of my work experience and relevant project examples.

5. After my undergraduate degrees, I was hired as a program manager by Design 4 Plastics, Inc. I leveraged my industrial design and engineering education to develop a wide range of products. My projects included a heavy emphasis on plastic part design (including injection molding, rotational molding, vacuum and pressure forming) and sheet metal fabrication (stamping, forming). While there, I designed fluid pumps for laboratory and industrial fluid dispensing applications and a custom impeller pump for insufflation of the abdomen during laparoscopic surgery. I also developed garden hose accessories such as hose reels and sprayers that used quick disconnect fittings and valves.

6. Next, in 1996, I joined Proteus, Inc. as Senior Mechanical Engineer. There, I focused on product design and engineering of products for consumer, medical, and laboratory applications. For example, I developed a disposable cartridge for laboratory analysis of blood samples, which included a quick disconnect fluid manifold for ease of use. For PUR, I developed a faucet mounted water filter with replaceable cartridge and a rotary actuated valve.

7. I founded Boston Innovation in 1998, focusing on developing precision fluidic dispensing instruments for pharmaceutical research applications that leveraged a novel pressure activated valve technology that I invented. In these

instruments, sample fluid was stored in small, sealed reservoirs, and precision low volumes were dispensed by the translation of a needle and application of a rinse fluid and/or air pressure. *See, e.g.*, U.S. Pat. Nos. 6,085,773 and 6,706,538.

8. During this time, I developed and licensed novel valve technology to Delta Faucet. This project was focused on a high flow tub fill valve for residential plumbing use. I also developed a custom pressure activated backflow diverter valve for use in swimming pool plumbing.

9. In 2000, I joined Arthur D. Little, where I led mechanical engineering of a next-generation network storage product, integrating contributions of mechanical, software, hardware and industrial designers.

10. I founded MicroBioSciences in 2001. There, I invented and developed novel disposable fluid handling cartridges for high throughput screening in pharmaceutical research. Precision controlled pressure and vacuum was used to deliver and retrieve samples.

11. Later in 2001, I joined Altitude, Inc., a product development consulting firm, first as Engineering Manager, and then I was promoted to Director of Engineering in 2005. I performed design and engineering activities and led a team of designers and engineers to develop a wide range of consumer products, medical devices and instrumentation, many of which included fluid handling, valves and connectors.

12. I developed coffee makers for Sunbeam and Mr. Coffee.
13. I developed a wide range of home humidifiers for Honeywell, Kaz, and Vicks.
14. I developed a bottled water dispenser for PUR with chilled and heated water and dispensing valves.
15. I developed the first integrated ice shaving and blending frozen drink appliances for home use for Margaritaville. These products included a reservoir for ice, a robust motor and rotary ice shaving blade, a blender, and electronic controls.
16. I developed a wine preservation and dispensing system for home use. The product stored multiple wine bottles at the user-selected optimum temperature using thermoelectric chiller technology, and used valves and air pressure for dispensing, and vacuum for preservation.
17. I developed a handheld eye medication dispenser for Optimyst. This product included a custom disposable fluid reservoir and ultrasonic dispensing technology. *See* U.S. Pat. Nos. D597,206; 8,545,463; 8,012,136.
18. I developed commercial carpet cleaning extraction technology for Tennant Company. This included fluid reservoirs, valves and plumbing connections.
19. I developed novel toilet tank flush mechanisms for American Standard. This project involved the development of a range of concepts, mechanical engineering, and prototyping of components and assemblies for evaluation.

20. I developed pressure washers for Briggs and Stratton. These included gas-powered high-pressure pumps with quick disconnect hose connectors and a hose end sprayer with pressure boost and adjustable nozzles.

21. I developed a range of safety eyewear for UVEX. These included a range of adjustable features leveraging advanced injection molding techniques such as in-mold assembly. *See, e.g.*, U.S. Pat. Nos. 7,758,789; 7,246,901; 7,237,892; 7,210,777; 7,175,270.

22. In 2008 I founded Aston Technology Advisors and continued with product development and consulting activities. As part of my work with Aston, I developed an instrument that uses sound to measure wind. As part of this instrument, I developed a novel hydronic heating system for melting snow. *See* U.S. Pat. Nos. 8,958,269 and 9,279,821.

23. In 2012, I cofounded 908 Devices Inc. to develop portable chemical detection instrumentation based on mass spectroscopy. While at 908 Devices Inc., I have developed various instruments with applications in pharmaceutical research, forensics and hazardous material identification at the point of need. These instruments include complex fluid handling, fluidic and pneumatic connectors, custom vacuum pumps, pressure regulators and pressure sensors. *See* U.S. Pat. Nos. D703,074; D703,075; 9,093,253; 9,502,226; 9,698,000; 9,978,574; 10,438,787.

24. Throughout my professional career, I have designed products that have won various awards, including: Industrial Designers Society of America (IDSA) IDEA Awards, R&D 100, The Scientist Top 10 Innovations, and The Instrument Business Outlook Industrial Design Gold Award.

B. Patents

25. I am a named inventor on nineteen issued utility patents and six issued design patents, which are listed below. These patents range in technologies from consumer products to medical devices to instrumentation, and address technical issues like precision fluid handling, injection molding, and compact mass spectroscopy.

- U.S. D932,046 Fluidic cartridge assembly
- U.S. 10,438,787 Integrated mass spectrometry systems
- U.S. 9,978,574 Sample collection in compact mass spectrometry systems
- U.S. 9,698,000 Integrated mass spectrometry systems
- U.S. 9,502,226 Sample collection in compact mass spectrometry systems
- U.S. 9,279,821 Deicing system in sodar systems
- U.S. 9,093,253 High pressure mass spectrometry systems and methods
- U.S. 8,958,269 Transducer for phased array acoustic systems
- U.S. D703,074 Handheld sensor
- U.S. D703,075 Sensor device

- U.S. 8,545,463 Ophthalmic fluid reservoir assembly for use with an ophthalmic fluid delivery device
- U.S. 8,525,111 High pressure mass spectrometry systems and methods
- U.S. 8,012,136 Ophthalmic fluid delivery device and method of operation
- U.S. 7,758,789 Temple bar assembly for eyeglasses
- U.S. D597,206 Ophthalmic misting device
- U.S. 7,246,901 Adjustable length upper frame member for eyeglasses
- U.S. 7,237,892 Temple bar with ball and socket hinge and method of making same
- U.S. 7,210,777 Floating lens brow bar attachment for eyeglasses
- U.S. 7,175,270 Flexible frame assembly for eyeglasses
- U.S. D534,446 Handheld instrument
- U.S. 7,080,904 One-piece spectacle with temple pre-load
- U.S. 6,706,538 Microvolume liquid dispensing array
- U.S. 6,085,773 Automatic fluid switching valve
- U.S. D425,979 Window fan
- U.S. 5,794,897 Transmission line hanger, a method of attaching the hanger and the resulting assembly

II. SCOPE OF ENGAGEMENT

26. I have been retained by Perilla Knox & Hildebrandt LLP on behalf of Danco Inc. (“Danco”) to provide analysis and opinion with Danco’s Patent Owner Response to IPR2024-00635.

27. I understand that the Petition involves U.S. Patent No. 10,934,698 (the “’698 Patent”) (EX1001). I have been asked to provide my opinions as to the validity of Claims 1-14 (the “Challenged Claims”) of the ’698 Patent.

28. I also understand that Petitioner has challenged the validity of two related patents. Specifically, Petitioner has challenged the validity of U.S. Patent No. 9,139,993 in IPR2024-00633 and U.S. Patent No. 9,103,105 in IPR2024-00634. I expect to provide opinions regarding the validity of both the ’993 Patent and the ’105 patent in the respective appropriate proceedings.

29. This Declaration sets forth the opinions that I have formed related to the Challenged Claims based on my personal knowledge, education, research, personal and professional experience, and the information I have reviewed as of the date of this Declaration. In connection with my analysis, I have reviewed the full record of IPR2024-00635, including Fluidmaster’s Petition and all exhibits thereto, the Board’s Institution Decision, the exhibits listed in the above list of exhibits, and all documents referenced herein.

30. I am being compensated at the hourly rate of \$400 for my work in this proceeding, including studying this matter, preparing this declaration, and providing deposition and trial testimony. This is my standard hourly rate for engagements of this nature. My compensation is not contingent upon the outcome of this proceeding or the particular testimony or opinions that I express. I am also being reimbursed for expenses incurred as a result of activities performed as an expert in this matter.

31. Between now and such time that I may be asked to testify, I expect to continue my review, evaluation, and analysis of evidence presented during this proceeding. I expressly reserve the right to amend or supplement this Declaration, as appropriate. I have personal knowledge of the facts stated in the declaration, and I am willing to competently testify to them if and when called to do so. In the event that additional relevant information becomes available to me, I also reserve the right to review and consider that information in further developing or refining my opinions.

III. PERSON OF ORDINARY SKILL IN THE ART

32. I understand that validity of a patent must be analyzed from the perspective of a hypothetical person of ordinary skill in the art. I understand that there are several factors to consider in determining the level of skill of a POSITA, including (i) the educational level of workers in the field, (ii) the types of problems

encountered in the art, (iii) prior-art solutions to these problems, (iv) the rapidity with which innovations are made, and (v) the complexity of the technology.

33. I understand that Patent Owner previously proposed that 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.” Paper 13 (POPR), 14.

34. I further understand that Petitioner’s expert Dr. Cameron previously asserted that a POSITA “with respect to the subject matter of the ’698 [P]atent at the time of the priority date, March 11, 2004, would have had an undergraduate degree in mechanical engineering, or other technical training in product design or equivalent work experience. This person would also possess at least one year of experience in developing and/or evaluating mechanical aspects of fluid systems.” Ex. 1004 (Cameron Decl.), ¶28.

35. I further understand that for purposes of its Institution Decision, the Board “adopt[ed] Patent Owner’s proposed definition of a POSITA, as it appears to be consistent with the ’698 [P]atent and the asserted prior art.” Paper 20 (Institution Decision), 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.*

36. I had, and presently have, the capabilities set forth in both Patent Owner's and Dr. Cameron's definitions of a POSITA at the time of the alleged invention as I both (1) met the educational requirements, and (2) had at least one year of experience in developing and evaluating mechanical aspects of fluid systems. *See* Section I ("Education and Work Experience"), above.

IV. UNDERSTANDING OF APPLICABLE LEGAL PRINCIPLES

37. I use the legal principles below, which I understand from counsel, as a guide in formulating my opinions.

A. Scope of the Proceedings

38. I understand that a Petition must identify in writing and with particularity (1) each claim challenged, (2) the grounds on which the challenge to each claim is based, and (3) the evidence that supports the grounds for the challenge to each claim.

39. I further understand that, with respect to IPR proceedings, the scope of the proceedings is limited to the grounds recited in the Petition. Specifically, I understand that the Petition is required to include a full statement of the reasons for relief requested, including a detailed explanation of the significance of the evidence and all material facts.

40. I further understand that the expedited nature of IPRs bring with it an obligation for petitioners to make their case in their petition to institute. Rather than

relying on vague conclusory statements to support unpatentability based on obviousness under 35 U.S.C. §103, Petitioners must provide specific reasoning supported by evidence.

41. Specifically, in order to satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. Instead, the Petitioner has the burden to submit facts to the record that show whether the prior art discloses a claim limitation, whether a skilled artisan would have been motivated to modify or combine teachings in the prior art, and whether she would have had a reasonable expectation of success in doing so.

42. If the Petition does not clearly demonstrate how the cited prior art meets each claim element, the Petitioner will fail to meet its burden. Failure to prove the matter as required means that the party with the burden of persuasion loses on that point—thus, if the fact trier of the issue is left uncertain, the party with the burden (the petitioner) loses. Consequently, if the Petition fails to particularly point out how the cited prior art meets each of the claimed elements as construed by the Petitioner, the Petitioner loses, and the IPR should be denied.

B. Claim Interpretation

43. My opinions concern what I believe the person having ordinary skill in the art would have understood the meaning of certain claim terms to be based on the patent documents.

44. I understand that assessing the validity of a patent claim requires a two-step analysis. The first step involves the proper interpretation or construction of the claim language in order to determine its scope and meaning. The second step requires comparing the claim, as properly construed, to the alleged prior art to determine whether the limitations of the claim are met by the prior art.

45. My methodology for determining the meaning of claim phrases involved the following steps. My first step was to study the patent carefully. In particular, I studied the claims themselves, followed by the background, detailed specification, figures, and other patent content. Next, I reviewed the prosecution history and looked for any clarifications or limitations that might be attached to various claim terms. Finally, in some circumstances, I looked at other documents, such as dictionary definitions and references applied by the patent office.

46. I understand that in an inter partes review, claim terms are to be given their ordinary and customary meaning as understood by persons having ordinary skill in the art in the context of the entire disclosure at the time of the invention. I understand that one must be careful not to read a specific embodiment appearing in the written description into the claim if the claim language is broader than the embodiment. I further understand that any special definition for a claim term must be set forth with reasonable clarity, deliberateness, and precision.

47. I have been informed that this standard is the same as that used in United States district courts, in which claim terms are given their ordinary and customary meaning as would be understood by persons having ordinary skill in the art at the time of the invention having taken into consideration the language of the claims, the specification, and the prosecution history of record under the *Phillips* claim construction standard. *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005).

C. Prior Art

48. I understand that information that satisfies one of the categories of prior art set forth in 35 U.S.C. § 102 (either pre- or post-AIA) may be used in an invalidity analysis under §§ 102 or 103. If information is not properly classified as prior art under one of the subsections of § 102 of the Patent Code, then it may not form the basis of an anticipation or obviousness determination. It is also my understanding that, for inter partes review, applicable prior art is limited to patents and printed publications.

D. Obviousness

49. I also understand that a patent claim is invalid under 35 U.S.C. § 103 if the differences between the invention and the prior art are such that the subject matter as a whole would have been obvious at the time of the invention to persons having ordinary skill in the art to which the subject matter pertains. Obviousness, as I understand, is determined based on the scope and content of the prior art; the level

of ordinary skill in the art at the time of the alleged invention; differences between the alleged invention and the prior art; and objective evidence of non-obviousness.

50. I further understand that a party seeking to invalidate a patent on obviousness grounds must demonstrate by clear and convincing evidence that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.

51. I understand that the pertinence of the prior art 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, and that 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.

V. PETITIONER'S INVALIDITY CHALLENGES

52. I understand that Petitioner challenges Claims 1-14 of the '698 Patent based on the following ground: Ground 1 – Claims 1-14 are allegedly obvious pursuant to 35 U.S.C. § 103 over Guoxin in view of Ho, in further view of, Calmettes, Hall, and/or Kimber.

53. Throughout my declaration, I rely on the designation of claim elements as set forth in the Petition for convenience. Pet., vii-iv.

54. Petitioner has not met their burden to show that the Challenged Claims are invalid. As such, and for the additional reasons set forth below, in my opinion each of the Challenged Claims are not invalid.

VI. BACKGROUND

55. The '698 Patent teaches that in conventional toilet systems, “the water flowing out of such conventional water outlets to fill a toilet bowl provides much more water than is necessary to fill the average toilet bowl.” EX1001, 1:28-36. As such, “much of the water that flows into a toilet bowl during the average flush cycle is lost down the drain,” which “translates into a loss of millions of gallons of water each year.” *Id.* Ultimately, this contributes to overall water wastage in households and commercial buildings.

56. The '698 Patent describes a toilet fill valve system that prevents excessive water waste during toilet flush cycles. EX1001, 2:35-46. Specifically, it discloses a toilet fill valve system configured to restrict and/or regulate the flow of water into the toilet bowl during toilet flush cycles so that no excess water is used. *Id.* The '698 Patent also discloses an optional manual adjustment handle that allows users to adjust flow rate in order to control the amount of water used during a toilet flush cycle. *Id.*

57. Prior art bowl fill valves were typically provided in the middle of a tube, which caused a “pressure head” to form within the tube. EX1001, 4:3-21. The '698

Patent describes a toilet fill valve configuration that ensures that “a pressure head is not created in any portion of the tube 146 and prevents the tube 146 from working its way off of the bowl fill valve outlet 116 over time.” *Id.* “By virtue of the fact that the bowl fill valve 100 is integrated within the toilet fill valve 100, a pressure head is prevented from being created due to any potential pinching of the tube 146 or other similar adjustment mechanism.” *Id.* at 4:53-67.

VII. OVERVIEW OF THE '698 PATENT

58. The '698 Patent is one among a family of applications and patents filed by Patent Owner. Table I, below, identifies the entire family as of December 4, 2024, with the '698 Patent emphasized in bold.

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

Table I: '698 Patent Family

59. The '698 Patent was filed on November 18, 2019 (EX1001, p. 1), and was filed as a continuation of U.S. Patent No. 10,519,639, which was a continuation

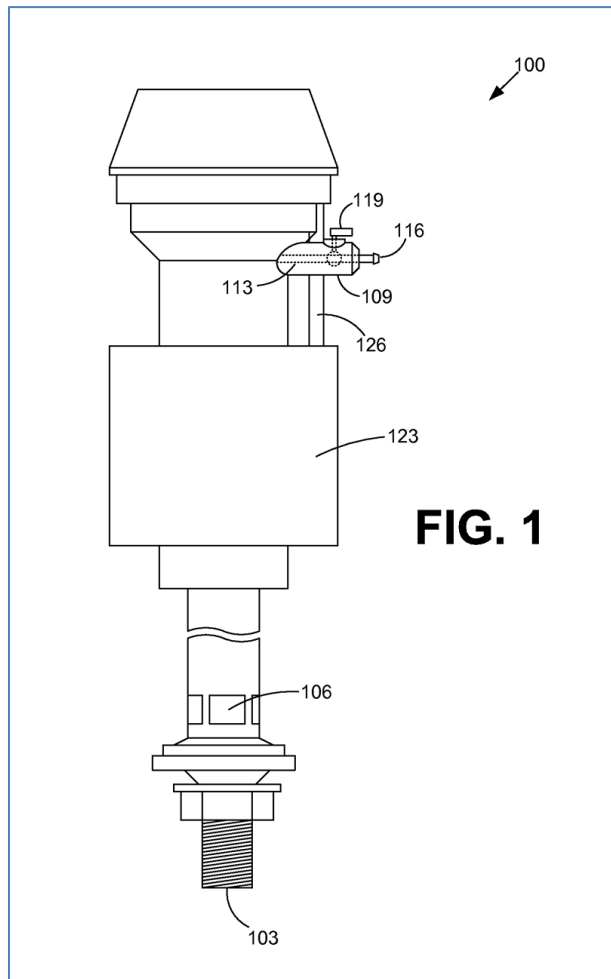
of U.S. Patent No. 9,103,105, which a continuation of U.S. Patent No. 9,139,993, which was a continuation of U.S. Patent No. 8,650,671, which was a continuation of U.S. Patent No. 8,104,105, which was a continuation of U.S. Patent No. 7,743,436 (the “436 Patent”), which was a continuation-in-part of U.S. Patent No. 6,823,889 (the “889 Patent”). *Id.* The ’698 Patent includes four independent claims, including claims 1, 8, 10, and 12, as discussed in more detail below. *Id.*, Cls. 1, 8, 10, and 12.

A. Subject Matter of the ’698 Patent

60. The following description of the ’698 Patent is adopted from Patent Owner’s Preliminary Response. Paper 13, 10-12. I have reviewed the ’698 Patent in its entirety, and the description below is consistent with my understanding of the ’698 Patent.

The ’698 Patent is entitled “Toilet 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 forming a bowl fill outlet port. *Id.*, 2:21-24 and 2:35-46. 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 a bowl fill valve configured to attach directly to the extended portion of the valve body. *Id.*, 2:25-34, Fig. 3. This restriction is designed to receive, regulate, and constrict the flow rate of a second portion of water during the flush cycle. *Id.* (“the flow of water is regulated so that enough water flows out of the bowl fill

valve 109 to fill a toilet bowl without wasting any water down a drain.”).



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, 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.

B. Prosecution History of the '698 Patent

61. I have reviewed the prosecution history of the '698 Patent. EX1002. 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.

62. 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.

VIII. CLAIM CONSTRUCTION

A. “means for adjusting water flow ”

63. I understand that 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. I further understand that 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.

IX. THE ALLEGED PRIOR ART

A. Guoxin

64. Guoxin is a Chinese reference disclosing a water supply switching device specifically designed for one-piece toilets¹ that have insufficient water storage capacity in the tank. EX1016, p. 004; EX2007, 1:1-5. Guoxin's switching device provides sufficient water volume to thoroughly flush the toilet of waste despite the reduced capacity in the tank. EX1016, p. 004; EX2007, 1:5-7. Unlike the '698 Patent (which is directed to *reducing* the amount of water flowing into the toilet bowl), the water supply switching device of Guoxin aims to increase the amount of water flowing into the toilet bowl during the flush cycle in order to address the issue of insufficient water volume in one-piece toilets. *Id.*

65. Specifically, the switching device directs a portion of the water supply straight into the toilet during flushing to compensate for the deficiency in the water volume, thereby ensuring a thorough flush. *Id.* As such, Guoxin is not directed to saving water by regulating or restricting the flow of water in the toilet bowl, but instead is directed to increasing the flow of water.

¹ A one-piece toilet does not have a separate tank and bowl. Instead, the tank and bowl are combined as a single structure.

66. 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. This valve seat is designed with an inlet and an outlet for water flow, where the outlet is connected to a water supply pipeline that is directed to the toilet to provide water supply to the toilet. *Id.* 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.

B. Ho

67. Ho describes a toilet flushing device designed to be installed in a water supply tank. The toilet flushing device includes a diverter valve that directs high-pressure water to the rim flushing conduit of a toilet bowl during the flush cycle. EX1022, Abstract. Like Guoxin, Ho’s diverter valve ***increases*** the amount of water directed to the toilet bowl. 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.

68. Ho's diverter valve aims to address issues found in prior art, such as the fouling that can occur on the rotation axle of a flap in the diverter valve, which can lead to malfunctions. *Id.*, 2:8-11. The device includes a water supplying pipe connected to an external water source, a float-controlled valve to regulate water flow, a manually operated flush valve for discharging water, and a diverter valve. *Id.*, 2:51-67.

69. 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.

C. Fluid Flow Connection References

70. Bjerke was already considered during the prosecution of the application for the '698 Patent. EX1002, 114. 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. The system is designed to be user-friendly, facilitating a shower-like experience for individuals who prefer to bathe while seated or reclining in a tub. *Id.*, 2:4-26.

71. The Petition collectively refers to three different patents (Calmettes, Hall, and Kimber) as the "Quick Connection Art."

72. 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. The device features a locking mechanism that includes a longitudinally grooved outer tube and an inner tube with radially projecting bosses. *Id.*, 10:23; 3-30-47. A flexible locking tab, attached to the outer tube and positioned adjacent to the groove, contains apertures to receive the bosses. *Id.*, 3:67-68; 4:1-2; 10:10-20.

73. 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. The coupling consists of mating sections, one with bayonet slots and the other with corresponding lugs designed to fit into these slots. *Id.*, 1:66-85. A distinctive feature of this coupling is a spring-pressed sleeve or collar that slides over one of the hose sections and is equipped with locking plates that close the entrance to the bayonet slots once the lugs are inserted, thereby locking the hose sections together. *Id.*, 1:100-112. The design also includes a gasket to prevent leakage at the junction of the hose sections and mechanisms to limit the sliding collar's movement and to automatically lock it in place when extended. *Id.*, 1:86-99.

74. Kimber describes a coupling designed to create a sealed connection between two conduits, such as hoses and radiators in automobiles. EX1020, 1. The coupling consists of a tubular male fitting with an external conical portion and a

tubular female fitting that snugly fits over the male fitting, featuring a complementary internal conical portion. *Id.*, 2. A seal is placed within one of these conical portions to ensure a tight seal between the male and female fittings once connected. *Id.* The design includes axially oriented guide means for proper angular alignment and relative axial movement of the fittings, as well as locking means that secure the fittings axially upon assembly. *Id.*, 3. This coupling allows for quick and easy connection and disconnection, which is particularly advantageous in automated assembly lines and maintenance scenarios. *Id.*, 8.

X. THE CHALLENGED CLAIMS OF THE '698 PATENT ARE NOT INVALID

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

75. Ground 1 of the Petition alleges that Claims 1-14 are obvious over Guoxin in view of Ho, in further view of Bjerke, Calmettes, Hall, and/or Kimber.

76. Petitioner has not met their burden to show that the Challenged Claims are invalid. As such, and for the additional reasons set forth below, in my opinion each of the Challenged Claims are not invalid.

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

a) “overflow tube”

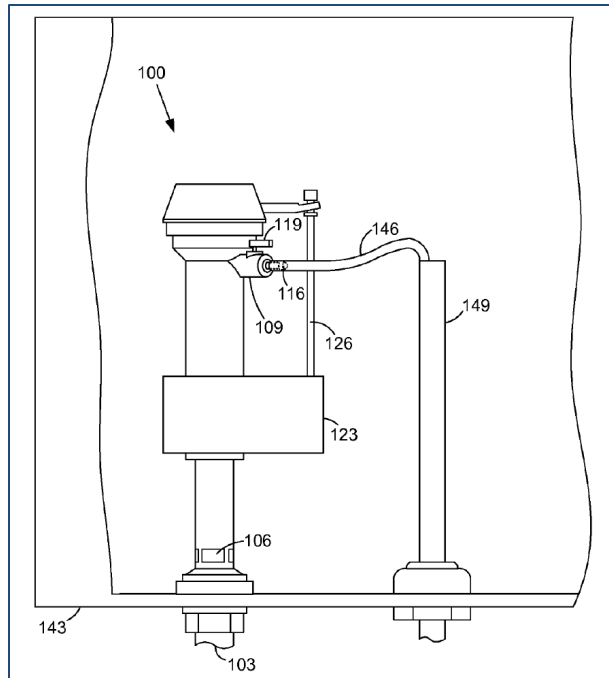
77. Independent claims 8 and 12 require a first tube that transfers water from the bowl fill valve outlet port to a second toilet tank “overflow tube.” *See, e.g.,*

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).

78. 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 reference the claimed overflow tube in any capacity.

79. Limitations 8[C] and 12[B] require both (1) a first tube attached directly to the bowl fill valve, which is directed to (2) a second, separate toilet tank overflow (or overfill) tube. There are two functional reasons for this configuration. First, the overflow tube prevents the tank from overflowing in the case of failure of the fill valve in an open state. Second, 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.

80. This configuration is depicted (for example) in Figure 3 of the ’698 Patent, which depicts tube 146 and overflow tube 149.



EX1001, Fig. 3

81. The '698 Patent explains that “[t]he tube 146 directs water that flows out of the bowl fill valve outlet 116 into the overflow tube 149 and refills the toilet bowl associated with the toilet tank 143 as can be appreciated by those with ordinary skill in the art.” EX1001, 4:3-21. This is consistent with the purpose of the '698 Patent, which is “to minimize or eliminate the amount of water that is lost down the drain of a toilet due to over filling of the toilet bowl during a flush cycle of a toilet.” EX1001, 6:32-53.

(1) The Petition does not identify any evidence that Guoxin’s water supply line 403 or Ho’s supply line 40 directs water to the claimed overflow tube.

82. 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.

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

83. Toilet systems may include overflow tubes that prevent flooding in the event of failure with the fill valve or water inlet. If the water in the tank rises over the level of the overflow tube, it drains through the overflow tube, into the toilet bowl, and ultimately into the sewer system.

84. Additionally, toilet systems may use an overflow tube to assist with refilling the toilet after a flush. This can be accomplished by running a tube from the fill valve to the overflow tube. When the fill valve is activated, water runs from the fill valve to the overflow tube.

85. When questioned on the operation of a conventional residential toilet, Dr. Cameron testified over a form objection 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 (Cameron Tr.), 87:14-21; *see also id.*, 79:19-87:21.

Q. Other than a tube from a toilet fill valve that goes directly to the bowl, and water from the tank passing through the flush valve into the bowl, are you aware of any other ways that water enters the toilet bowl?

MS. TOTO: Objection to form.

A. No. That's how water goes to the bowl.

86. Notably absent from Dr. Cameron's testimony was any reference to an overflow tube, and more specifically any reference to the claimed configuration (namely, a first tube that directs water from a bowl fill valve to a second, separate overflow tube).

87. Regardless of the prevalence of overflow tubes among residential toilets, the claimed configuration—a tube that directs water from a bowl fill valve to a separate overflow tube—is not conventional in the art. Bowl fill valves perform a variety of different functions in toilet systems. The specific function of a bowl fill valve 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 diverter valve 30 disclosed by Ho, "permit[] 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.”).

88. Still others, like switching mechanism 4 disclosed by Guoxin, are “specifically targeted at the tanks of commercially available one-piece toilets that have insufficient water storage capacity in the tank, which results in insufficient water volume to thoroughly flush the toilet of waste.” EX1016, p. 004; EX2007, 1:2-5. Again, rather than directing water to an overflow tube, “each time a toilet is flushed, *a portion of the water from the inlet device is directly supplied to the toilet bowl* to compensate for the lack of water in the tank, thereby ensuring the toilet is flushed clean in a single flush.” EX1016, p. 004; EX2007, 1:5-7.

89. The claimed configuration—a tube that directs water from a bowl fill valve to an overflow tube—is not conventional in the art. Numerous other configurations of tubes, bowl fill valves, and overflow tubes exist. Petitioner has not identified any evidence that even suggests that Guoxin or Ho disclose the claimed configuration. Likewise, Petitioner has not alleged (or provided any evidence to support) that the claimed configuration is an obvious modification of Guoxin and/or Ho in view of the knowledge of a POSITA.

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

90. Petitioner’s citations and analysis of Guoxin are deficient, and that alone justifies a find that Petitioner has failed to meet its burden and the Challenged

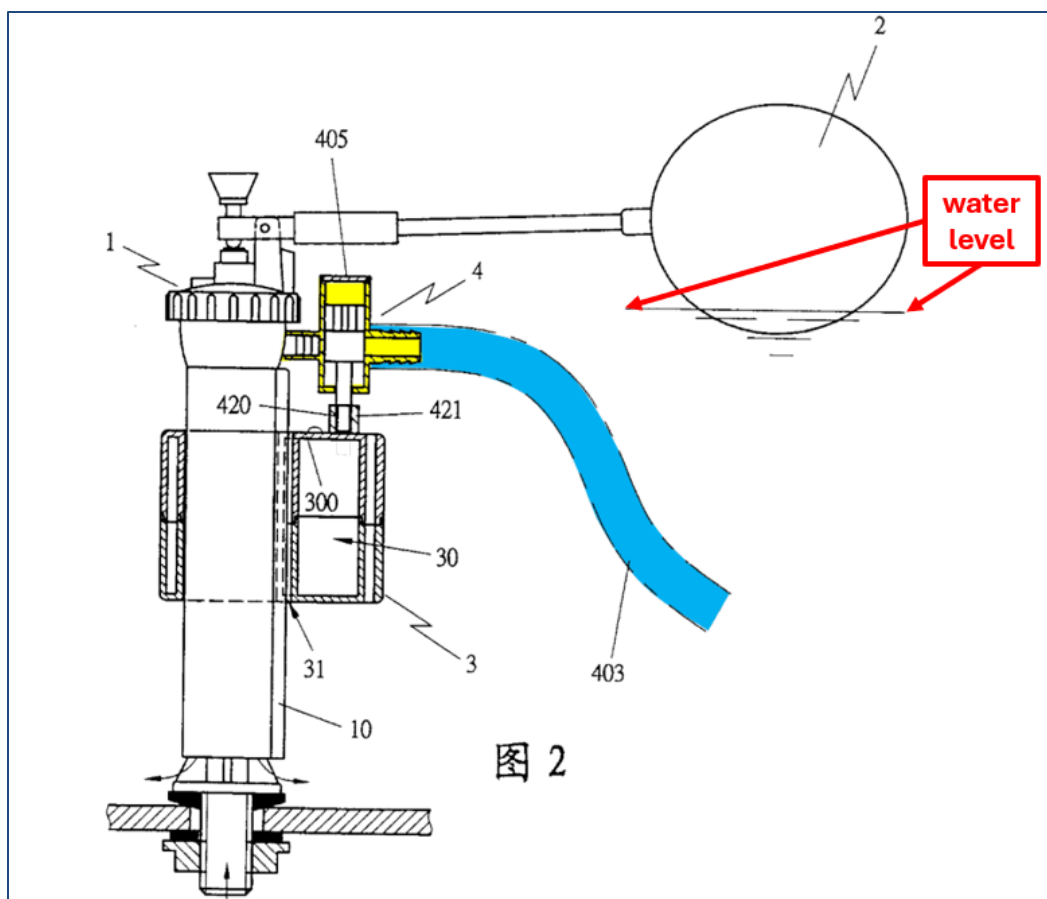
Claims are not invalid. However, further analysis of uncited portions of Guoxin confirms that water supply line 403 is not directed to an overflow tube.

91. Consistent with its stated purpose, Guoxin explicitly teaches that water supply line 403 (1) “is directed to the toilet” and (2) “***directly*** provide[s] water supply to the toilet,” which forecloses the possibility of supply line 403 directing water to a toilet tank overflow tube:

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.***

EX1016, p. 005; EX2007, 2:18-21. Simply put, Guoxin supplies water directly to the bowl in order to increase flush volume.

92. This is confirmed by reference to Petitioner’s annotations of Figure 2. Guoxin confirms that Figure 2 presents “[a] view of the present utility model when the water level is full.” EX1016, p. 005; EX2007, 2:6. Additional annotations have been added to Petitioner’s annotated Figure 2, below, which identify the water level. 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.



Pet., 39 (citing EX1016, Fig. 2) (annotated)

93. 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, it would need to *ascend* from the point of attachment.

94. 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.”).

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

b) The Flow Limitations

96. 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*:

- 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].”)

97. 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.

98. 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.

99. 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 shown in the table below, the cited portions of Guoxin do not relate to the propositions they are cited for.

Citation	Proposition	Actual Disclosure of Guoxin
2:25-27	Guoxin discloses an adjustable bowl fill valve that adjusts the flow rate of water based on a setting of the bowl fill valve.	“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”
2:27-33	That level is set by adjusting the T-shaped nut to change the position of how the switching valve’s stem is driven, which in turn alters amount of water that can leave the bowl fill restriction before the float valve stops water from entering the water inlet.	“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”

100. When asked about an exemplary deficient citation to Guoxin at her deposition, Dr. Cameron explained: “I don’t think it’s that complicated. If you don’t understand that, there is more at the [uncited] end of that paragraph as well, and I likely intended to cite to that whole paragraph.” EX2008 (Cameron Tr.), 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* that water passes through the bowl fill valve.

101. Regardless of Petitioner’s deficient citations, the Petition does not *actually* allege that the prior art discloses an adjustable flow rate. Petitioner’s complete analysis is reproduced below:

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. The water level is set by adjusting the T-shaped nut (water flow adjustment handle) to change the position of how the switching valve’s stem is driven—*this 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).² After a conclusory recitation of claim language, the Petition explains that the bowl fill valve disclosed by Guoxin is

² Dr. Cameron merely repeats the conclusory allegations in the Petition verbatim.

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.

102. This interpretation of the Petition is confirmed by reference to Guoxin, which states:

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. This achieves a practical design for water supply switching. Additionally, the switching valve and the secondary ball float are set in a separate state, allowing the ascension and descension of the switching valve to be driven by the pushing action of the top surface 300 of the secondary ball float.

EX1016, p. 005; EX2007, 2:26-39; *see also* Figs. 2-4.

103. Simply put, Guoxin discloses a mechanism to adjust the timing of 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.

104. 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 that enters the toilet bowl but does not have any impact on the *flow rate* of water passing *through* the switching valve.

2. The Petition does not articulate a motivation to combine the teachings of the prior art or a reasonable expectation of success in doing so.

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.

105. 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.

106. 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.

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

107. 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. Specifically, the Petition states:

- “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*.” Pet., 24-25 (citing EX1004, ¶¶101; EX1017, 7:15-24, Figs. 5-6).³
- “[U]sing a male connector on the bowl fill restriction [sic], such as the one shown in Ho, instead of the female connector, such as the one shown in Guoxin, would have been obvious to a POSITA *as a matter of design*

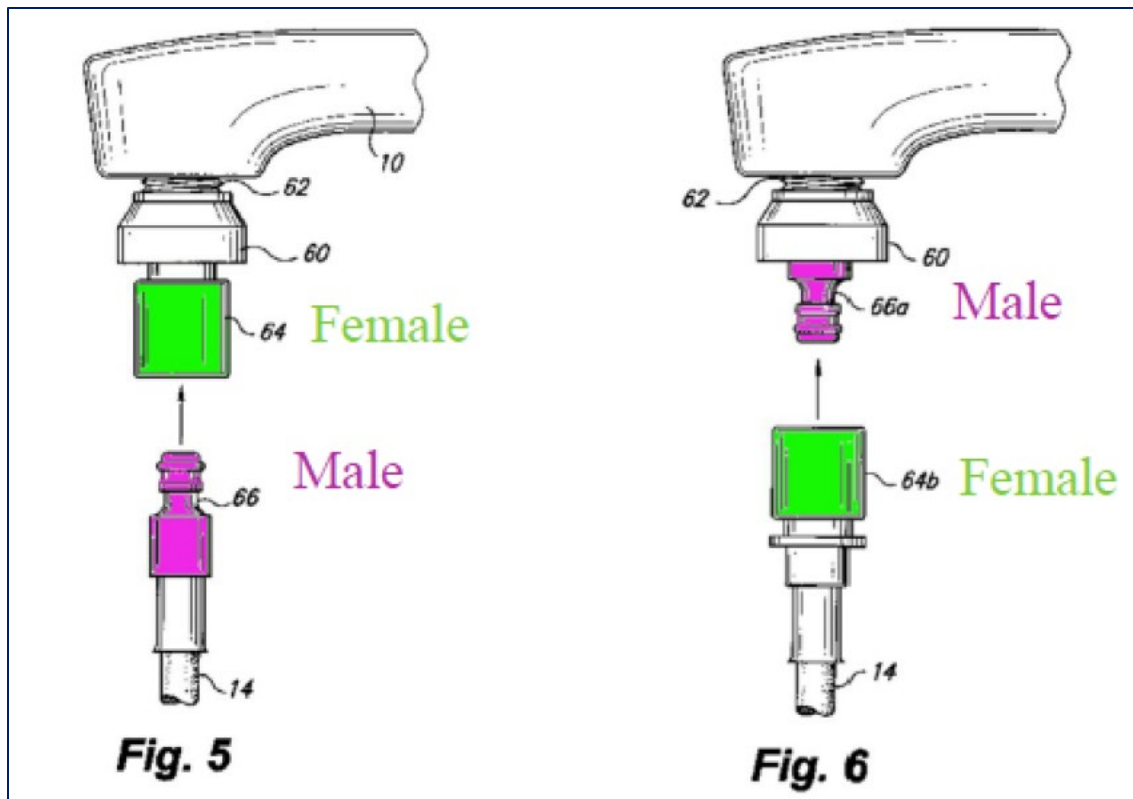
³ Dr. Cameron’s testimony largely corresponds to the statements made in the Petition. Where Dr. Cameron provided additional analysis, I address it directly.

preference” because “[t]hey are well-known substitute structures for performing the same function in their known and expected manner and would require only a simple substitution of one known coupling arrangement for another to obtain predictable results.” Pet., 27 (citing EX1004, ¶105); *see also* Pet., 41-42 (citing EX1004, ¶¶133-135).

108. 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. Simply put, the Petition is deficient because it (1) fails to identify the alleged “design preferences” that motivate the proposed reversal, and (2) explain why a POSITA would have been motivated to reverse the fluid flow connection on the basis of those preferences.

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

109. As referenced above, Petitioner correctly notes that Bjerke discloses multiple configurations of fluid flow connectors, as disclosed in Petitioner’s annotations of Bjerke’s Figures 5 and 6, reproduced below:



Pet., 39-40 (citing EX1017 (Bjerke), 7:15-24, Figs. 5-6).

110. The cited portion of Bjerke is also reproduced below:

As illustrated in FIG. 6, the backflow preventer 60 may be provided with the male portion 66a of the quick connect/disconnect, while the hose 14 may be provided with the female portion 64a of the quick connect/disconnect. ***Consequently, FIG. 6 illustrates the reversal of the male and female portions of the quick connect/disconnect in comparison with the form of the invention illustrated in FIG. 5.*** It will also be appreciated that the male threads 62 and female threads on the faucet 10 may be reversed, depending upon whether the faucet has male or female threads.

EX1017 (Bjerke), 7:15-24.

111. However, the Petition does not acknowledge that uncited portions of Bjerke also provide *design preferences* that provide a POSITA with guidance regarding when to use a particular fluid flow connector configuration. Specifically, Bjerke explains that:

The arrangement set forth in FIG. 5 is preferred [for the use case contemplated by Bjerke], however, because the female connection 64 prevents upward spray at the connection and also affords an easier connection method by requiring movement of the male and female portions of the quick connect/disconnect in an upward direction.

EX1017 (Bjerke), 7:24-29. Bjerke teaches that (with respect to the problems Bjerke is designed to solve), a particular configuration is preferred because it (1) prevents upward spray at the connection, and (2) affords an easier connection by requiring an upward movement. Neither consideration is relevant here. Indeed, the connections at issue are horizontal, and contained within a toilet tank, eliminating the relevance of upward spray or connection via an upward movement.

112. As explained above, the Petition fails to identify any design considerations relevant to the problem considered by the prior art, which would lead a POSITA to modify the fluid flow connection configuration disclosed by Guoxin. Additionally, the Petition does not explain how the (unidentified) “design preferences” would have motivated a POSITA to make the modification.

(3) The Petition relies on improper hindsight.

113. In fact, the only potential “design preferences” articulated by the Petition are based on the teachings of the ’698 Patent itself, which is impermissible hindsight. *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.” EX1004, ¶102. Dr. Cameron’s allegation that portions of the ’698 Patent’s specification provide 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 hindsight. EX1004, ¶¶102-104.

114. In fact, 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 that specific configuration.

115. *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 itself rely **only on** the teachings of the '698 Patent that (according to Dr. Cameron) “confirms the obvious interchangeability of protrusions, ribs, recesses, etc., on the respective couplings.” EX1004, ¶104 (citing EX1001, 7:36-48). Once again, reliance on the challenged patent itself to provide the motivation to modify the prior art is the definition of impermissible hindsight.

116. In summation, the Petition fails to identify **any** design preferences that would allegedly motivate a POSITA to reverse the fluid flow connector configuration disclosed by Guoxin. In fact, Petitioner ignores the design considerations 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, which is impermissible hindsight.

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.

117. 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 Quick Connection Art with Guoxin and/or Ho.

118. Rather than identify any particular motivation to combine any particular reference with Guoxin or Ho (or the combination of the two), Petitioner makes the conclusory statement 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 that would have motivated a POSITA to further modify the fluid flow connections disclosed by Guoxin and/or Ho. As set forth below, not only did Petitioner fail to explain why a POSITA would have been motivated to make the suggested modification, but Petitioner also ignored evidence that suggested against the combination:

- **Calmettes**: Calmettes provides a device for locking two coaxial tubes, “for example those constituting elements of a cooling circuit in a vehicle motor.” EX1018, 1:4-16. It further describes that these types of connections are “generally made of metal.” EX1018, 1:35-43.
- **Hall**: Hall, likewise, gives no indication that it relates to molded plastic components. Given the timing of the invention in question (1911), it seems likely that it refers to connections regarding metal pipes and/or rubber hoses,

not plastic piping or tubing. The couplings depicted therein have characteristics of cast and/or machined metal parts, not molded plastic parts. EX1019.

- **Kimber:** Kimber relates to “the coupling of hoses to the radiators of automobiles.” EX1020, p. 003.

119. Dr. Cameron testified in her deposition that a POSITA would have typically used either metal or plastic in a fluid system (but not both). EX2008 (Cameron Tr.), 57:14-58:13. Dr. Cameron also testified 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 (Cameron Tr.), 56:2-57:13. Despite this testimony, 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 for molded plastic toilet systems.

120. As discussed above, there are numerous design considerations that a POSITA would have taken into account when designing a fluid flow connection. 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.

XI. CONCLUSION AND SUPPLEMENTATION

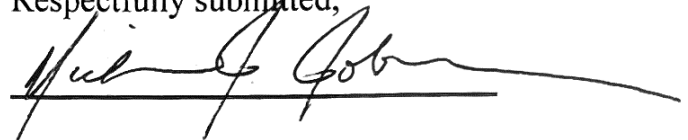
121. Petitioner has not met their burden to show that the Challenged Claims are invalid. As such, and for the additional reasons set forth above, in my opinion each of the Challenged Claims are not invalid.

122. In this Declaration, I have presented my opinions regarding the validity of the Challenged Claims of the '698 Patent based on the information available to me. My opinions are subject to change in view of opinions provided by the Petitioner or its expert, or any additional information that I may receive. I reserve the right to supplement my opinions accordingly.

I hereby declare that all statements made herein of my own knowledge are true and that all opinions expressed herein are my own, and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: December 4, 2024

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Michael Jobin", is written over a horizontal line.

Michael Jobin