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

SUPPLEMENTAL DECLARATION OF KIMBERLY K. CAMERON, PH.D.

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TABLE OF EXHIBITS

Exh. No.	Description of Exhibit
EX1001	U.S. Patent No. 10,934,698 to Schuster et al.
EX1002	Prosecution History of U.S. Patent No. 10,934,698 to Schuster et al. (Application No. 16/686,328, filed Nov. 8, 2019)
EX1003	Complaint (Dkt. 1) in *Danco, Inc. v. Fluidmaster, Inc., et al.*, Case No. 8:23-cv-01156 (C.D. Cal.), filed June 28, 2023
EX1004	Expert Declaration of Dr. Kimberly Cameron, Regarding Invalidity of the Challenged Claims of U.S. Patent No. 9,139,993 to Schuster et al.
EX1005	U.S. Patent No. 9,103,105 to Schuster et al.
EX1006	Prosecution History of U.S. Patent No. 9,103,105 to Schuster et al. (Application No. 14/457,697, filed August 12, 2014)
EX1007	U.S. Patent No. 9,139,993 to Schuster et al.
EX1008	Prosecution History of U.S. Patent No. 9,139,993 (Application No. 14/164,424, filed January 27, 2014)
EX1009	Prosecution History of U.S. Patent No. 8,650,671 to Schuster et al. (Application No. 13/346,355, filed January 9, 2012)
EX1010	Prosecution History of U.S. Patent No. 8,104,105 to Schuster et al. (Application No. 12/786,904, filed on May 25, 2010)
EX1011	Prosecution History of U.S. Patent No. 7,743,436 to Schuster et al. (Application No. 10/958,797, filed October 5, 2004)
EX1012	Prosecution History of U.S. Patent No. 6,823,889 to Schuster (Application No. 10/798,606, filed on Mar. 11, 2004)
EX1013	Amended Complaint (Dkt. 35) in *Danco, Inc. v. Fluidmaster, Inc., et al.*, Case No. 8:23-cv-01156 (C.D. Cal.), filed October 2, 2023
EX1014	U.S. Patent No. 6,546,568 B1 to Schuster issued April 15, 2003 from Application No. 09/969,320 filed October 1, 2001, as a continuation of Application No. 09/634,249 filed August 8, 2000 (now U.S. Patent No. 6,295,660)

Exh. No.	Description of Exhibit
EX1015	Registered Utility Model Publication Number CN2447417Y to Guoxin published September 12, 2001
EX1016	Certified Translation (together with a statement that the translation is true and accurate) of Registered Utility Model Publication Number CN2447417Y to Guoxin published September 12, 2001
EX1017	U.S. Patent No. 5,926,868 to Bjerke issued July 27, 1999
EX1018	U.S. Patent No. 5,249,830 to Calmettes, et al. issued October 5, 1993
EX1019	U.S. Patent No. 989,251 to Hall issued April 11, 1911
EX1020	Canadian Patent No. 1,320,235 to Kimber granted and published July 13, 1993
EX1021	U.S. Patent No. 3,086,546 to Brown issued April 23, 1963
EX1022	U.S. Patent No. 5,862,538 to Ho issued June 26, 1999
EX1023	U.S. Patent No. 4,980,932 to Stemples issued January 1, 1991
EX1024	U.S. Patent No. 5,708,991 to DeMarco issued January 20, 1998
EX1025	U.S. Patent No. 5,715,860 to Horad issued February 10, 1998
EX1026	U.S. Patent No. 5,134,729 to Shaw issued August 4, 1992
EX1027	U.S. Patent No. 5,855,025 to Williams issued January 5, 1999
EX1028	U.S. Patent No. 6,219,856 to Alles issued April 24, 2001
EX1029	U.S. Patent No. 8,104,105 to Schuster et al. issued January 31, 2012
EX1030	Order Re: Civil Jury/Court Trial I. Schedule II. Trial Preparation III. Conduct Of Attorneys And Parties (Dkt. 45) in *Danco, Inc. v. Fluidmaster, Inc., et al.*, Case No. 8:23-cv-01156 (C.D. Cal.), entered February 7, 2024
EX1031	[Reserved]
EX1032	Order Granting Stipulation Regarding Patent Schedule (Dkt. 47) in *Danco, Inc. v. Fluidmaster, Inc., et al.*, Case No. 8:23-cv-01156 (C.D. Cal.), entered February 28, 2024

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Exh. No.	Description of Exhibit
EX1033	Declaration of Ranjini Acharya in Support of Petitioner's Motion for Admission *Pro Hac Vice* of Ranjini Acharya
EX1034	Order Granting Defendant's Motion to Stay Case Pending IPR (Dkt. 48) in *Danco, Inc. v. Fluidmaster, Inc., et al.*, Case No. 8:23-cv-01156 (C.D. Cal.), entered April 3, 2024
EX1035	Comparison of Annotated Figures in Petition (Paper 1) and Expert Declaration (EX1004)
EX1036	Supplemental Expert Declaration of Dr. Kimberly K. Cameron, Ph.D., dated March 19, 2025
EX1037	Transcript of Deposition of Michael Jobin, taken March 11, 2025
EX1038	Demonstrative of Figure 7 of EX1022 (Ho), marked during deposition of Michael Jobin, taken March 11, 2025

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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
’698 Patent	U.S. Patent No. 10,934,698
’993 Patent	U.S. Patent No. 9,139,993
Board	USPTO Patent Trial and Appeal Board
Challenged Claims	Claims 1-14 of the ’698 Patent
Danco, Patent Owner, or PO	Danco, Inc.
Fluidmaster or Petitioner	Fluidmaster, Inc.
Institution Decision, or ID	IPR2024-00635 Paper 20
Lampi	*Lampi Corp. v. Am. Power Prods.,* 228 F.3d 1365 (Fed. Cir. 2000)
Parties	Danco and Fluidmaster, collectively
Petition	IPR2024-00635 Paper 1
POR	IPR 2024-00635 Paper 26 (Patent Owner Response)
POSITA	Person of Ordinary Skill in the Art
QCA	QCA
Smythe	*In re Smythe*, 480 F.2d 1376 (CCPA 1973)
USPTO	United States Patent and Trademark Office

I, Kimberly K. Cameron, Ph.D., declare as follows:

1. I have been retained by counsel for Fluidmaster, Inc. ("Petitioner") as an independent expert to review U.S. Patent No. 10,934,698 (the "'698 Patent") and specifically claims 1–14 of the '698 Patent ("Challenged Claims"), and to provide my opinions in connection with a petition for inter partes review before the Patent Trial and Appeal Board ("the Petition") in Proceedings No. IPR2024-006635 (the "Proceedings").

2. I have previously submitted a declaration in the Proceedings, on March 3, 2024. EX1004. My resumé and detailed description of my experience can be found in EX1004.

3. I have previously testified in deposition in the Proceedings, on November 19 and November 20, 2024. EX2008.

4. This declaration incorporates by reference the full contents of EX1004 and EX2008 as if set forth herein, including all reservations of rights as described therein, and supplements my opinions reflected therein.

I. DOCUMENTS RELIED UPON

5. In preparing for and writing this supplemental declaration and forming the opinions expressed herewith, and in addition to the materials I previously identified, I have also reviewed the Board's Institution Decision in the Proceedings

(Paper 20) and Patent Owner's Response ("POR") in the Proceedings, submitted on December 24, 2024 (Paper 26), as well as all exhibits thereto.

6. I have also reviewed the transcript of the deposition of Patent Owner's expert Michael Jobin, taken March 11, 2025, as well as all exhibits thereto. EX1037.

II. SUMMARY OF SUPPLEMENTAL OPINIONS

7. I submit this supplemental declaration in these Proceedings to address evidence and arguments that have been submitted since I provided my prior declaration including arguments raised by Patent Owner ("PO") in the POR, and various documents that discuss or refer to the subject matter of these references.

8. After reviewing the POR, my opinion remains unchanged that all claims of the '698 Patent are unpatentable as obvious in light of one or more of the prior art references cited in my previous declaration.

III. SUPPLEMENTAL OPINIONS

A. CLAIM CONSTRUCTION

1. "Means for Adjusting Water Flow"

9. I understand that the Board has adopted certain constructions in its Institution Decision, including with respect to the term "means for adjusting water flow." Paper 20, 17. I understand that the Board has applied Patent Owner's construction of this limitation, such that "means for adjusting water flow" recited in Claim 12 is a means-plus-function limitation under 35 U.S.C. § 112 and covers "an

adjustment handle and equivalents thereof (structure) for adjusting or regulating water flow (function)." *Id.,*

10. I believe that my prior opinions are consistent with this construction. My opinions have not changed because of this construction.

B. SUPPLEMENTAL OPINIONS AS TO THE PRIOR ART REFERENCES

1. Guoxin

11. I have previously discussed Registered Utility Model Publication Number CN2447417Y to Guoxin (EX1015, Certified Translation at EX1016, "Guoxin").

12. I understand PO is not challenging the status of this printed publication as prior art.

13. I have also reviewed the Certified Translation of Guoxin provided by Patent Owner (EX2007). To the extent that the page/line citations to EX1016 are inconsistent with the page/line citations in EX2007, I have herein referred to EX2007 for the convenience of the reader.

14. I understand that, in its response, PO argues that: (1) I have failed to identify a separate toilet tank overflow tube "as required by limitations 8[C] and

12[B]"[1] and that (2) Guoxin does not disclose a separate toilet tank overflow tube. POR, 12. I disagree with both of these arguments.

15. I previously opined that independent claims 8 and 12 of the '698 patent are obvious over Guoxin in view of Ho and the Quick Connection Art. *See* EX1004, ¶145. I also opined that the elements of independent claims 8 and 12 largely mirror the bowl fill valve elements of claim 1 but omit other additional elements, including those that are generic to a toilet fill valve. *Id.,*

16. In my view, an overflow is conventionally part of the toilet tank system. An overflow tube is not considered a structural element of a bowl fill valve or other water flow regulator that is affixed to a toilet fill valve, but is a generic component of the toilet.

17. I have previously shown that an overflow tube is conventionally connected to the toilet fill valve. *See, e.g.,* EX1004, ¶ 75 ("The toilet fill valve is connected to the water supply line for the toilet and allows water to flow (1) into the tank and (2) into the bowl through a connection to the toilet's overflow tube.").

[1] PO refers throughout to Claims 8[***C***] and 12[B] in discussing the "overflow tube." *See* POR, 10–15. I believe this is a typographical error and understand that PO in fact intended to refer to Claims 8[***B***] and 12[B]. *See* Petition, viii, ix, 46.

18. Thus, I believe that one of ordinary skill in the art would not conventionally consider the overflow tube to be an element of the bowl fill valve, but rather, part of the conventional connections to a generic toilet fill valve inside a toilet tank system. Accordingly, because I did not consider independent claims 8 and 12 of the '698 patent to recite structures generic to the toilet fill valve, I did not explicitly address the connection of the bowl fill valve, via a first tube, to the overflow tube in my first declaration.

19. However, even if the overflow tube is part of these claims, it is obvious in light of Guoxin because a POSITA would understand that the water supply line 403 of Guoxin is connected to an overflow tube, as is conventional in the art

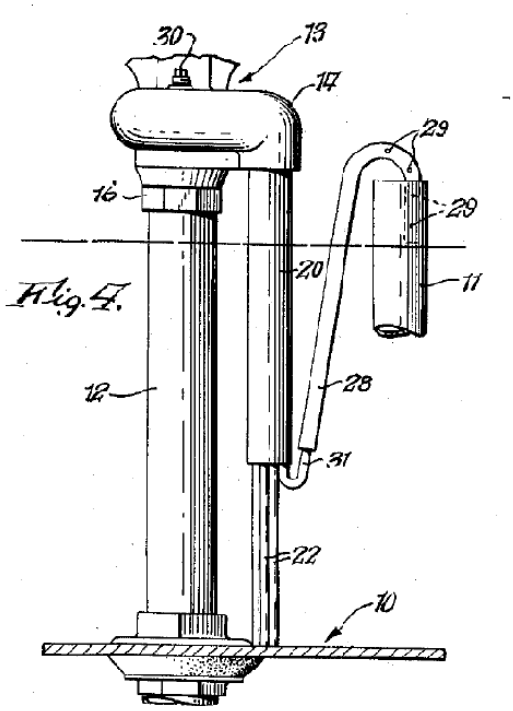
20. I previously discussed prior art that confirms that overflow tubes are conventional in toilet design. *See, e.g.,* EX1004, ¶75; ¶¶78–79.

21. Moreover, although I did not explicitly use the word "overflow," I also confirmed this in my deposition. EX2008, 85:6–13 ("Q. How does [water] go into the bowl? A. Through a tube.").

22. I also previously identified prior art that confirms that it is conventional for the first tube that is attached to a water flow regulator to be connected to a second, separate, overflow tube to allow for the discharge of water into the bowl. *See, e.g.,* EX1004, ¶76 (citing Brown (EX1021) at 4:20–44, which discusses Fig. 4, as shown below):

Referring now to FIG. 4, another embodiment of the water silencing and saving means comprising the invention is illustrated therein. In this embodiment, the opening **21** in main chamber **15** is closed by a plug **30**, and the improved water saving means is inserted into the fill tube **20** together with the water silencing rods **21**. The preferred form of this water saving means differs from that illustrated in FIG. 1 in that adapter tube **23**, and the slotted portion **24** and set screw **26** forming the metering valve are completely eliminated, and replaced by a smaller tube **31** forming the desired restricted opening. This relatively short tube **31** is bent into a substantially U-shape, and one end is inserted into fill tube **20**, being held securely in place therein by the water silencing rods **21**. The other end of U-shaped tube **31** is inserted into the relatively long flexible tube **28** which is connected to the overflow pipe **11**, as in FIG. 1.

As will be apparent, the U-shaped tube **31** provides a restricted opening for the water saving means, which opening is much smaller than that found in the conventional valveless refill tube (not shown), in order to accomplish substantially the same results as the adapter tube **23** and the metering valve formed by slotted portion **24** and set screw **26** of FIG. 1, albeit lacking their feature of adjustability.



23. For all of these reasons, I am of the opinion that Guoxin discloses a tube (water supply line 403) that is conventionally connected to an overflow tube.

24. I note that Guoxin only provides a partial illustration of water supply line 403 in Fig. 2, and does not otherwise specify the configuration or terminus point of water supply line 403.

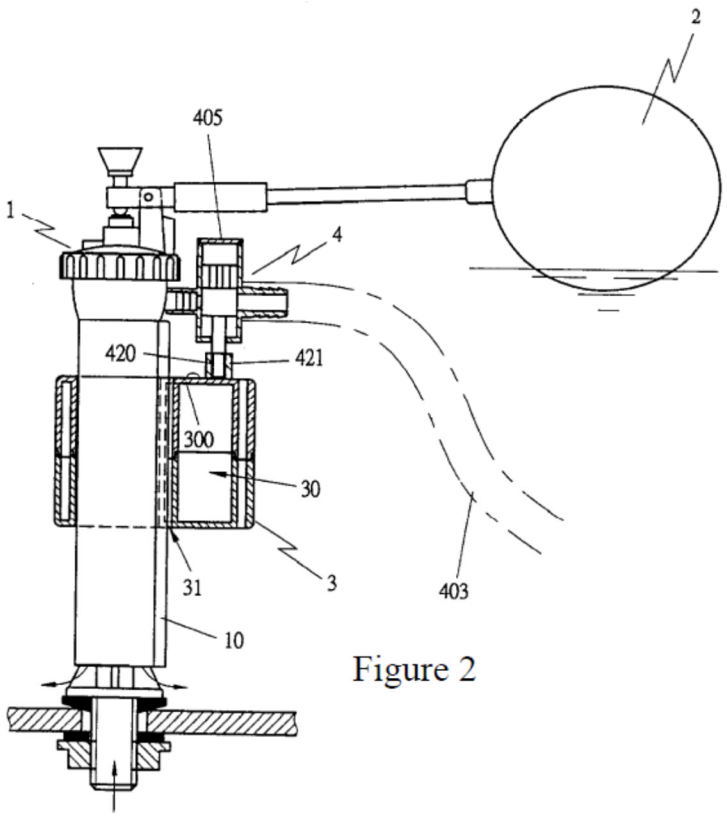


Figure 2

25. I do not attach any weight to the depiction of water supply line 403 descending from the point of attachment in Fig. 2. Line 403 is likely shown as descending simply to not clutter the depiction of the float. Regardless of the path and curvature of line 403, a POSITA would understand line 403 to terminate in the overflow tube so that that water can be directed to the bowl. Based on my review, the prior art confirms that it is possible for the water supply line 403 to take any number of configurations depending on the physical constraints of the toilet design and a POSITA would understand that the water supply line 403 could ascend and descend past the point shown in Figure 2 before being connected to the overflow tube.

26. I also disagree that water supply line 403 in Fig. 2 must terminate at the bowl. Elsewhere, Guoxin teaches that "a portion of the water from the inlet device is directly supplied to the toilet bowl." EX2007, 2:5–7. A POSITA would not understand that to mean that the water must go from the inlet to the toilet bowl without passing through any connections or parts. Consistent with this, Guoxin shows several intermediate connections between that inlet device and the bowl (including the switching mechanism 4).

27. Similarly, Guoxin's disclosure that the water supply line 403 "is directed to the toilet to directly provide water supply to the toilet," (EX2007, 2:18–21) does not preclude the water going from the water supply line 403 through the overflow tube to the toilet, particularly when such a connection is conventional in the art.

2. Guoxin Discloses The "Flow Limitations" of the '698 Patent

28. I understand that PO is arguing that Guoxin does not disclose a mechanism of adjusting the flow rate of water flowing through Guoxin's switching means 4. POR, 15–18. I understand that PO argues that what it calls "The Flow Limitations" (1[B5]: "a water flow adjustment handle," 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," 11: "adjusting a flow of water out of the bowl fill valve," 12[E]: "means for adjusting water flow out of the bowl fill valve

outlet port," and 13: "the means for adjusting water flow out of the bowl fill valve outlet port comprises an adjustment handle") require "adjusting the rate at which water passes through the bowl fill valve." POR, 15–18.

29. As an initial matter, the claim language of the '698 Patent discusses adjusting the water flow, not specifically the "flow rate." To the extent that flow rate is a relevant concept here, I agree with PO's expert that flow rate is generally understood as the volume of water through a conduit over a period of time. *See* EX1037, 69:4–6.

30. Thus, in my view, the relevant rate of water flow is the amount of water that leaves the bowl fill valve during refilling of the toilet tank divided by the time it takes to complete a flush cycle (the time it takes for the tank to return to full).

31. This is consistent with the specification of the '698 Patent, which discusses the amount of water leaving the switching valve means during the time the tank is refilled. *See* EX1001, 4:53–63 ("Ultimately during use of the toilet that includes the toilet fill valve 100 and the toilet tank 143, a user flushes the toilet and a predetermined flow of water exits the bowl fill valve outlet 116 and is directed into the toilet bowl. . . The amount of water supplied by the bowl fill valve in the time it takes to refill the toilet tank should be approximately equal to the amount of water needed to fill the toilet bowl."). The specification also describes how adjustments to "the setting of the handle 119" determines "the precise flow rate of the water that

flows out the bowl fill valve outlet 116," and "refills the toilet bowl of the respective toilet." EX1001, 3:19–32.

32. PO argues that Guoxin's T-shaped nut discloses a mechanism to adjust "when the flow of water through the switching mechanism is discontinued," but "does nothing to impact the flow *rate* of the water passing through the switching valve." POR, 18 (underlined emphasis added, italics in original). PO also argues that loosening Guoxin's T-shaped nut causes the switching mechanism to close earlier in the fill cycle, but "[a]lthough 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. *Id.,* (*citing* EX2013, ¶103). PO also argues that tightening the T-shaped nut causes the switching mechanism to close later in the tank fill cycle and that "[a]gain, 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." *Id.,* (*citing* EX2013, ¶104).

33. PO's arguments do not change my analysis or conclusion. I agree with PO that loosening or tightening the T-shaped nut in Guoxin reduces or increases the total amount of water that enters the toilet bowl. I note that this was also its expert's written testimony. *See, e.g.,* EX2013, ¶¶ 103–104.

34. Nothing in the claim language of the '698 Patent requires that the flow through the bowl fill valve cannot change during the fill cycle, as PO seems to

suggest. The flow through the bowl fill valve can be changing or intermittent (as is the case with many valves), including changing between relatively large, relatively small and no flow conditions. Similarly, in the '698 Patent, the toilet fill valve does not change from closed to fully open instantaneously, and so the flow through the toilet fill valve will change as that valve opens.

35. In the case of Guoxin, the switching mechanism 4 reduces and then eliminates water flow to achieve a particular desired flow rate (amount of water exiting the bowl fill valve per the time to return the toilet to full). This flow rate is changeable by altering the setting of the T-shaped nut. *See* EX2007, 2:31–41.

36. Adjusting the T-shaped nut in Guoxin in this way does not materially change the time it takes to return the tank to full. Any pressure drop from opening the switching mechanism 4 will typically be negligible in a well-designed plumbing system with adequate supply pressure, and in any event it would not be sufficient to negate the change in flow rate (amount of water exiting the switching mechanism 4 and entering the toilet bowl per the time to return the toilet to full) that occurs from adjusting the T-shaped nut.

37. PO's argument that Guoxin does not disclose adjusting the flow rate is thus incorrect. Adjusting the T-shaped nut in Guoxin adjusts the flow rate because, as is undisputed, the adjustment of the T-shaped nut of the switching mechanism 4 changes the amount of water that exits the switching mechanism 4 of Guoxin and

enters the bowl, divided by the time it takes the tank to return to full (which stays relatively constant).

38. As explained in Guoxin, "[b]y 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." EX2007, 2:34–36. This means that Guoxin's switching mechanism 4 will change from closed to open (and open to closed) at a different particular height of water in the tank (the open position is shown in Figure 3 where water is also delivered to the bowl while the closed position is shown in Figure 2 where water is not being delivered to the bowl). For example, when the T-shaped nut is turned so that it is moved further down, the switching mechanism 4 will both open later and close earlier. Opening later and closing earlier both reduce the amount of water that exits switching mechanism 4 to be delivered to the toilet bowl. Turning the nut, therefore, does alter (in this case decreases) the amount of water exiting switching mechanism 4 and delivered to the bowl during the time it takes to refill the bowl (and hence in this case decreases the flow rate).

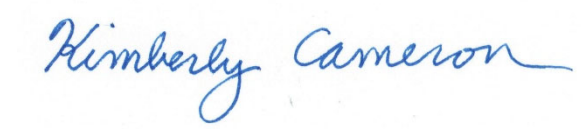
39. I note that in his deposition, Mr. Jobin appears to have contradicted his earlier opinions, as well as PO's position. Specifically, Mr. Jobin testified that adjusting the T-shaped nut does not impact the volume delivered. *See* EX1037, 54:25–56:25. To the extent that Mr. Jobin is now arguing (contrary to PO's

assertions) that tightening or loosening the T-shaped nut in Guoxin does not impact the volume of water delivered to the bowl, I disagree for the reasons set forth above.

40. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the results of these proceedings.

[SIGNATURE ON FOLLOWING PAGE]

Dated: March 19, 2025



Kimberly K. Cameron, Ph.D.