

Fluidmaster, Inc. v. Danco, Inc.

Patent Trial and Appeal Board

June 10, 2025

The Challenged Patents

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

<u>Guoxin:</u> '993 Grounds 1-2 '105 Grounds 1-2 '698 Ground 1	Overflow Tube / Overfill Tube
	Integrally Molded With
	Motivation to Combine
	Dependent Claims
<u>Brown:</u> '993 Grounds 3-4 '105 Grounds 3-4	Motivation to Combine / Reasonable Expectation of Success
	Attach Directly to the Water Flow Regulator / Bowl Fill Restriction
	Integrally Molded With
	Dependent Claims
<u>Priority:</u> '993 Ground 5 '105 Ground 5	The '606 Application
	Genus/Species
	Claims 19-20
	Inadequate Disclosure in Petition

Guoxin in view of Ho:

'993 Grounds 1-2

'105 Grounds 1-2

'698 Ground 1

Overflow Tube / Overfill Tube

Integrally Molded With

Motivation to Combine

Dependent Claims

- U.S. Patent No. 9,139,993:
 - Claims 1-18
- U.S. Patent No. 9,103,105:
 - Claims 1-24
- U.S. Patent No. 10,934,698:
 - Claims 8-9, 12-13

Overflow Tube

9,139,993

- **Claim 1:** a tube that is configured to attach directly to the water flow regulator, wherein the tube is configured to direct the second portion of the water from the water flow regulator directly to a toilet tank overflow tube
- **Claim 8:** providing, via the tube, the second portion of the water to a toilet tank overflow tube
- **Claim 14:** wherein the tube is configured to direct the water from the water flow regulator directly to a toilet tank overflow tube

9,103,105

- **Claim 1:** wherein the tube is configured to direct the second portion of the water from the bowl fill restriction directly to a toilet tank overflow tube
- **Claim 9:** providing, via the tube, the second portion of the water to a toilet tank overflow tube
- **Claim 15:** wherein the tube is configured to direct the water from the bowl fill restriction directly to a toilet tank overflow tube
- **Claim 24:** wherein the tube is configured to direct the second portion of the water from the bowl fill restriction to a toilet tank overflow tube

10,934,698

- **Claim 18:** 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
- **Claim 12:** 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

Overflow Tube

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

FLUIDMASTER, INC.
Petitioner

v.

DANCO, INC.
Patent Owner

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

PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE TO PETITION

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Alexandria, VA 22313-1450

Claim 1[E] is the first (and only) time that an “overflow tube” is mentioned in Claim 1; it is not separately recited earlier. In contrast, the other claimed structures of Claim 1 are separately and affirmatively recited.³ Moreover, Claim 1[E] requires only a tube “*configured to attach directly to the water flow regulator.*” Thus, the overflow tube is not separately claimed; it serves solely as a “reference point” to define the “purpose and structure” of the first tube. *Eko Brands, LLC v. Adrian*

IPR2024-00633: Paper 30, 3
IPR2024-00634: Paper 32, 2
IPR2024-00635: Paper 30, 3-4

Overflow Tube

“Configured to has a narrower meaning than merely capable of.”

Wapp Tech Ltd. P’ship v. Seattle SpinCo, Inc., No. 4:18-CV-519, 2020 U.S. Dist. LEXIS 73089, at *55 (E.D. Tex. Apr. 27, 2020) (citing *Aspex Eyewear, Inc. v. Marchon Eyewear, Inc.*, 672 F.3d 1335, 1349 (Fed. Cir. 2012)) (cleaned up).

IPR2024-00633: Paper 36, 2-3

IPR2024-00634: Paper 38, 2-3

IPR2024-00635: Paper 36, 3

Overflow Tube

(12) **United States Patent**
Schuster et al.

(10) Patent No.: US 9,139,993 B1
(45) Date of Patent: *Sep. 22, 2015

(54) **TOILET FILL VALVE**

(56) **References Cited**

(71) Applicant: **Danco, Inc.**, Irving, TX (US)

U.S. PATENT DOCUMENTS

(72) Inventors: **Michael J. Schuster**, Shorewood, IL (US); **Larry Schneider**, Wadsworth, IL (US)

136,128 A	2/1873	Bralley
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2,799,865 A	7/1957	Schuster
3,040,769 A	6/1962	Lamb
3,086,546 A	4/1963	Brown

(Continued)

(73) Assignee: **Danco, Inc.**, Irving, TX (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: 14/164,424

OTHER PUBLICATIONS

(22) Filed: **Jan. 27, 2014**

US Patent 6,823,889, File History, 2004-2005 Great-Great-Grand-
parent Patent to this Application (copy not attached).

(Continued)

Related U.S. Application Data

(63) Continuation of application No. 13/346,355, filed on Jan. 9, 2012, now Pat. No. 8,650,671, which is a continuation of application No. 12/786,904, filed on May 25, 2010, now Pat. No. 8,104,105, which is a continuation of application No. 10/958,797, filed on Oct. 5, 2004, now Pat. No. 7,743,436, which is a continuation-in-part of application No. 10/798,606, filed on Mar. 11, 2004, now Pat. No. 6,823,889.

Primary Examiner — Tuan N Nguyen

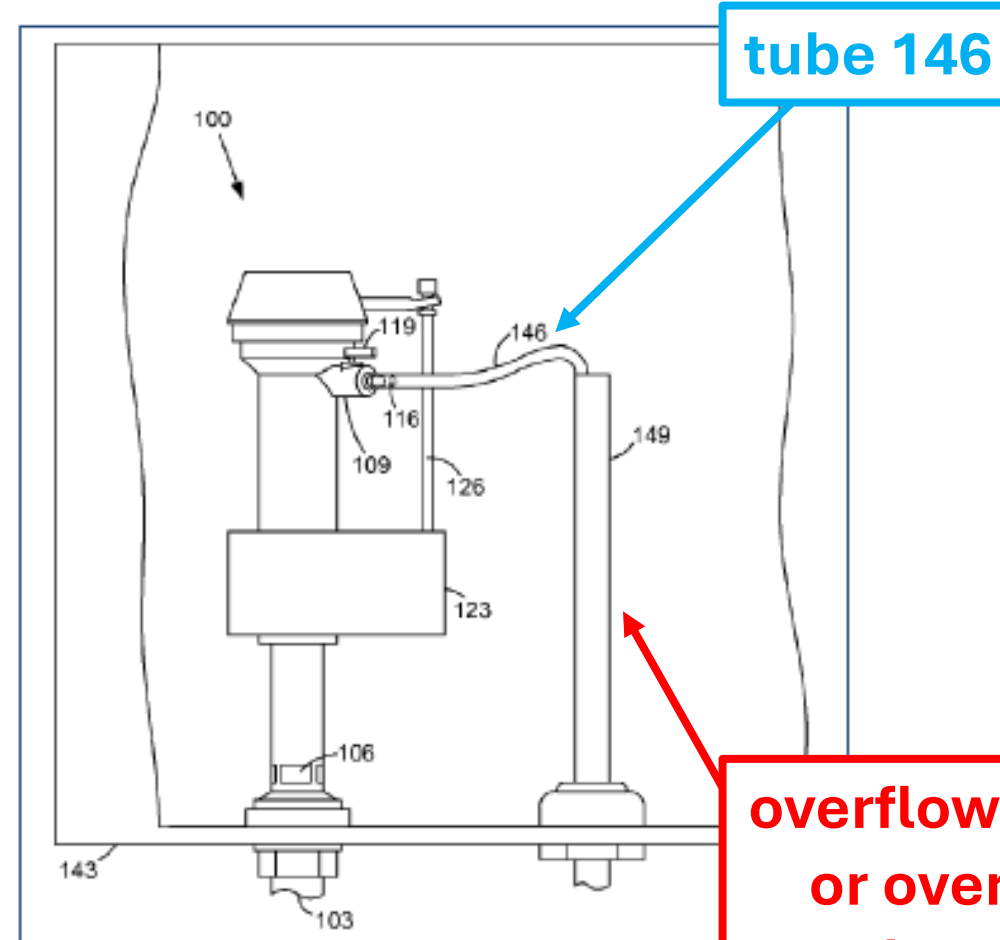
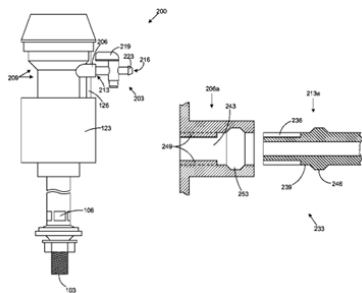
(74) *Attorney, Agent, or Firm* — Thomas I Horstemeyer, LLP

(57) **ABSTRACT**

In various embodiments, a water inlet of a toilet fill valve receives water from a water supply. A tank water outlet of the toilet fill valve provides a first portion of the water to a toilet tank. A bowl fill outlet port of the toilet fill valve provides a second portion of the water to a bowl fill restriction that is in direct contact with an extended portion of the toilet fill valve. The bowl fill restriction restricts the flow of the second portion of the water. The bowl fill restriction provides the second portion of the water to a tube that is in direct contact with the bowl fill restriction. The tube provides the second portion of the water to a toilet tank overflow tube.

20 Claims, 9 Drawing Sheets

See application file for complete search history.



EX1001, Fig. 3

Overflow Tube

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

PATENT OWNER'S RESPONSE

1. A POSITA would have understood an overflow tube must be above the water line.
2. Dr. Cameron also testified a tube directed to an overflow tube would likely include either anti-siphoning means or a clip to hold it above the water line.

IPR2024-00633: Paper 36, 1-2

IPR2024-00634: Paper 38, 1-2

IPR2024-00635: Paper 36, 1-2

Overflow Tube

Case IPR2024-00633
Petition for Inter Partes Review of US 9,319,993

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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v.

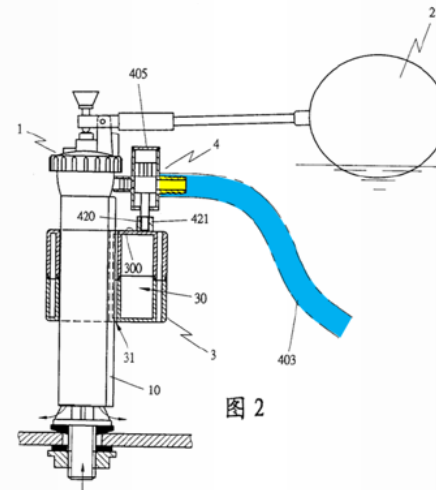
DANCO, INC.
Patent Owner

Case IPR2024-00633
Patent 9,139,993 B1

PETITION FOR INTER PARTES REVIEW UNDER 37 C.F.R. § 42.100

i. 1[E]

Guoxin discloses a tube configured to attach directly to the water flow regulator to direct the second portion of water to a toilet tank overflow tube, as is conventional in the art. See annotated figure of Guoxin illustrated above regarding claim element 1[Pre] and annotated Fig. 2 below; EX1004, ¶149.



Guoxin discloses tube 403 (Fig. 2), that is configured to provide water supply to the toilet bowl. EX1016, 2:17-18; EX1004, ¶149. Guoxin therefore satisfies this element. *Id.*

IPR2024-00633: Paper 1, 41-42

IPR2024-00634: Paper 1, 38-39

IPR2024-00635: Paper 1, 46

Overflow Tube

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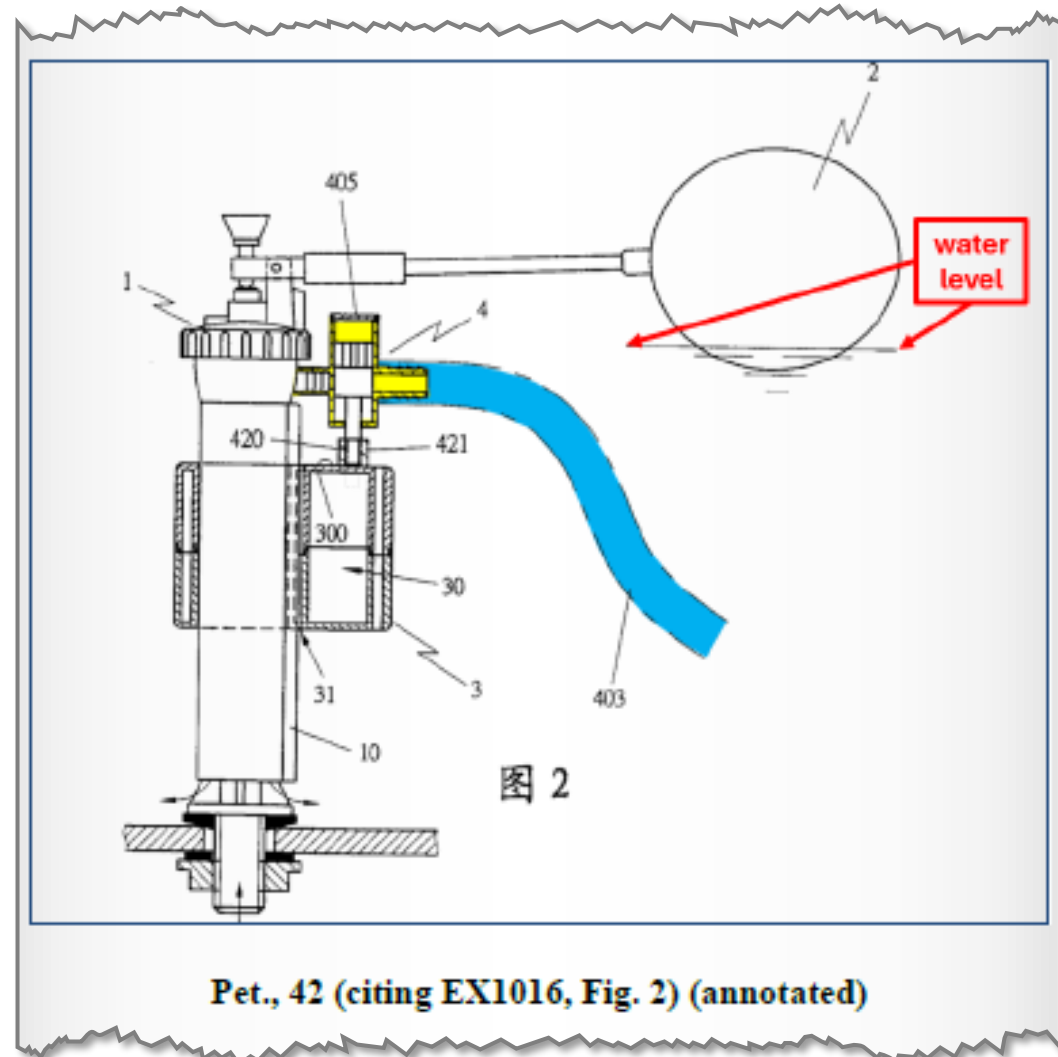
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U.S. Patent No. 9,139,993 B1

PATENT OWNER'S RESPONSE



IPR2024-00633: Paper 26, 18-20

IPR2024-00634: Paper 28, 17-19

IPR2024-00635: Paper 26, 13-15

Overflow Tube

UNITED STATES PATENT AND TRADEMARK OFFICE

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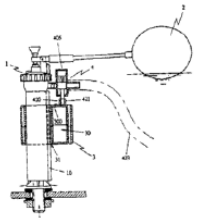
SUPPLEMENTAL DECLARATION OF KIMBERLY K. CAMERON, PH.D

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33. 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.

IPR2024-00633: Paper 30, 4-5 (citing EX1036, ¶¶33–34)
IPR2024-00634: Paper 32, 4-5 (citing EX1036, ¶¶33–34)
IPR2024-00635: Paper 30, 6-7 (citing EX1036, ¶¶24–25)

Overflow Tube

[19]State Intellectual Property Office of the People's Republic of China	
[12]Utility Model Patent Specification	
[21]ZL Patent No. 0023	
[45]Publication Date September 12, 2001	
[22]Application date 2000.10.10	
[73]Patentee Wang Guoxin	
Address Tainan County, Taiwan Province	
[72]Designer(s) Wang Guoxin	
[21]Applicant	
[74]Patent agent	
Specification Attached Drawings 3	
Claims 1 Page 3 Pages Pages	
[54]Name of Utility Model Toilet Water Tank Water Supply Switching Device	
[57]Abstract	
The present utility model relates to a toilet water tank water supply switching device. It comprises a water inlet. The water inlet is fitted with a secondary ball float with a hollow slot beneath. The switch mechanism is provided on one side of the water inlet, which is equipped with a valve seat. This valve seat has a slot to house the switch valve, and the valve seat is equipped with a water inlet and water outlet. The water outlet connects to the water supply pipeline and is equipped with an annular surround combined with the valve cover. The switching valve itself is equipped with upper and lower annular surrounds, as well as a small annular surround between them. Additionally, the valve stem is equipped with an external thread and is fastened with a T-shaped nut. This achieves more accurate control of the switching valve for the water supply, and the structure is also simple.	
	
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Published by Intellectual Property Publishing House	
Danco, Inc. - EX2007, Page 002	
Fluidmaster, Inc. v. Danco, Inc. - IPR2024-00633	

17. On one side of the inlet device, there is a switching mechanism 4. The switching mechanism
18. 4 is equipped with a valve seat 40. This valve seat 40 has a slot 400 to accommodate a switching
19. valve 41. The valve seat 40 has water inlet and outlet 401 and 402, where the water outlet 402 can
20. be connected to the water supply pipeline 403, and the water supply line 403 is directed to the
21. toilet to directly provide water supply to the toilet. An annular surround 404 is designed to
22. combine with the valve cover 405, thereby securing the switching valve 41 in the slot of the valve
23. seat, restricting its upward and downward movement distances.

IPR2024-00633: Paper 26, 18 (citing EX2007, 2:18-21)
IPR2024-00634: Paper 28, 17 (citing EX2007, 2:18-21)
IPR2024-00635: Paper 26, 13-14 (citing EX2007, 2:18-21)

Guoxin in view of Ho:

'993 Grounds 1-2

'105 Grounds 1-2

'698 Ground 1

Overflow Tube / Overfill Tube

Integrally Molded With

Motivation to Combine

Dependent Claims

– Additional Exhibits

Overflow Tube – Brown

4/23/2025 Fluidmaster, Inc. v. Danco, Inc. Kimberly K. Cameron, PH.D.

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U.S. Patent No. 9,139,993 B1
Case No. IPR2024-00634
U.S. Patent No. 9,103,105 B1
Case No. IPR2024-00635
U.S. Patent No. 10,934,698 B1

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Fluidmaster, Inc. v. Danco, Inc. - IPR2024-00633

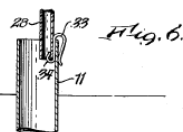
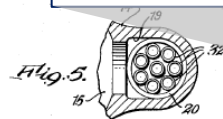
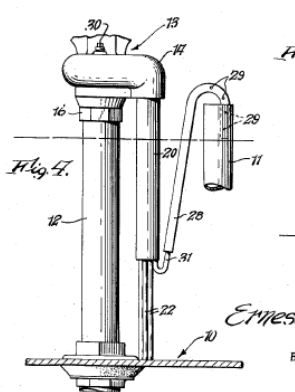
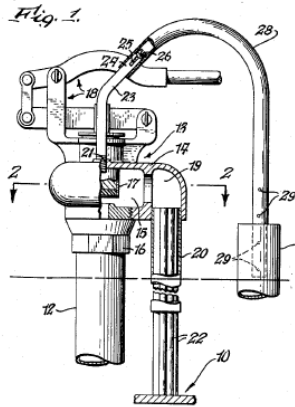
5 Q. Okay. And in both instances, tube 28
6 has some holes in it that are labeled 29; is that
7 correct?
8 A. Yes.
9 Q. Okay. What are the purposes -- what is
10 the purpose of the holes labeled 29?
11 A. I think that they're there just on the
12 off chance, I guess, that your overflow tube was
13 below the water or not working somehow. So you
14 have an extra secondary way for water to exit.

IPR2024-00633: Paper 36, 1-2 (citing EX2015, 75:9-79:19)
IPR2024-00634: Paper 38, 1-2 (citing EX2015, 75:9-79:19)
IPR2024-00635: Paper 36, 1-2 (citing EX2015, 75:9-79:19)

Overflow Tube – Brown

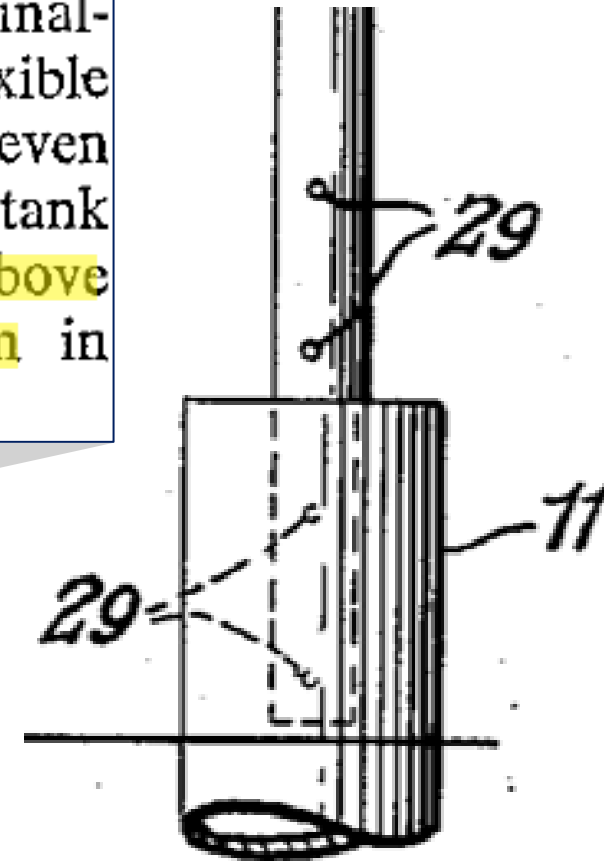
said siphoning action. In order to prevent this, an anti-siphoning means is provided, and as shown in FIG. 1, it preferably takes the form of a plurality of longitudinally spaced openings 29 located adjacent the end of flexible tube 28 connected to overflow pipe 11. Thus, even though the open end of tube 28 might lie below the tank water level, one or more of these openings will be above the water level and effectively break any vacuum in tube 28.

April 23, 1963
E. H. BRO
WATER SILENCING AND SAVING
VALVE ASSEMBLY IN TOI
Filed March 6



INVENTOR
Ernest Harold Brown
BY *Gopp and Sommer*
ATTORNEY

Fluidmaster, Inc. - EX1021, Page 001
IPR2024-00633 (Fluidmaster Inc v. Danco Inc)



Overflow Tube – Brown

4/23/2025 Fluidmaster, Inc. v. Danco, Inc. Kimberly K. Cameron, PH.D.

UNITED STATES PATENT AND TRADEMARK OFFICE

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Q. Is it important to include anti-siphoning means in a tube, such as tube 28 here?

MS. ACHARYA: Objection; form.

THE WITNESS: I would say if you're -- in general, it's more common to just design it so that your 28 and 11 are above the water level. If you are -- for some reason haven't done that adequately and you're worried about it being below the water level, then you could provide those holes like you do here. But I would say it's more common to not have those holes.

IPR2024-00633: Paper 36, 1-2 (citing EX2015, 75:9-79:19)
IPR2024-00634: Paper 38, 1-2 (citing EX2015, 75:9-79:19)
IPR2024-00635: Paper 36, 1-2 (citing EX2015, 75:9-79:19)

Overflow Tube – Brown

4/23/2025 Fluidmaster, Inc. v. Danco, Inc. Kimberly K. Ca

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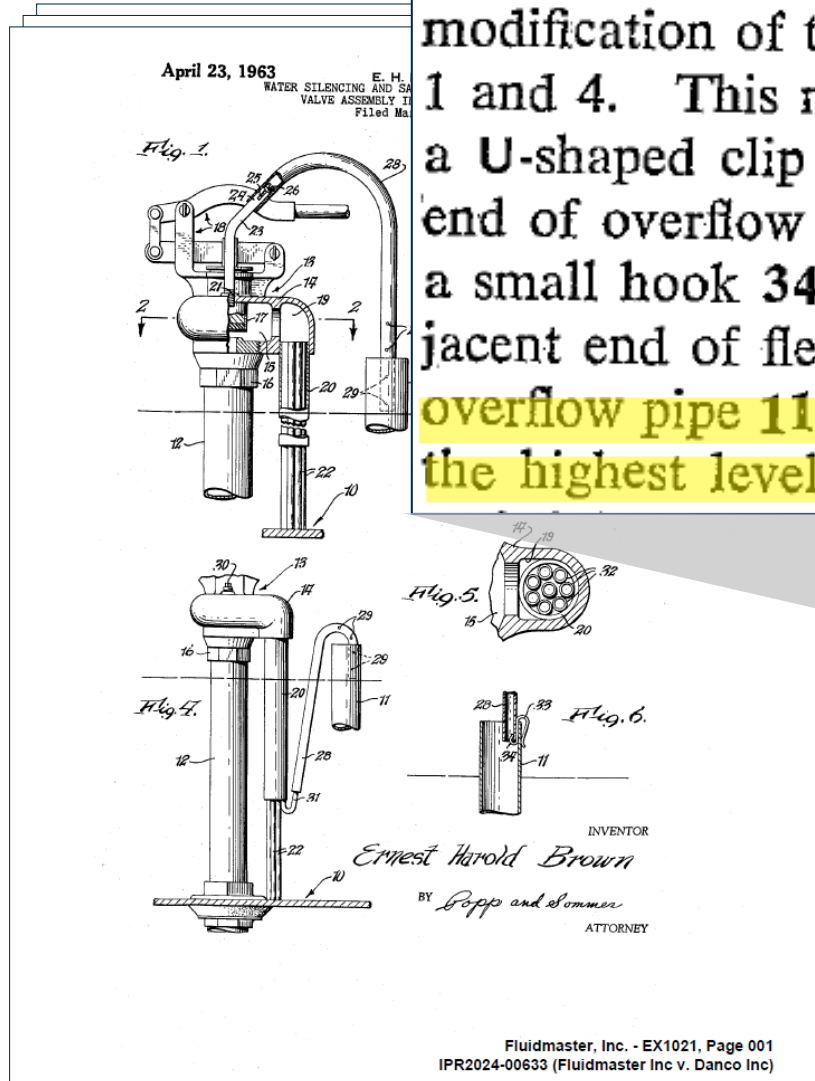
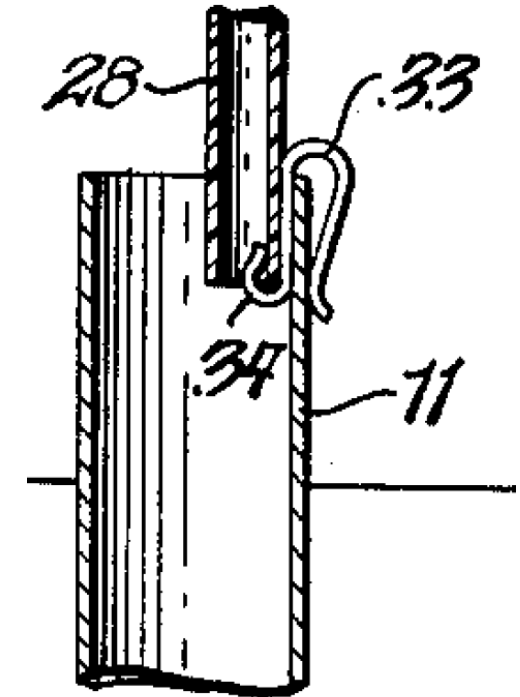
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Danco, Inc. - EX2015, Page 001
Fluidmaster, Inc. v. Danco, Inc. - IPR2024-00633

5 THE WITNESS: Okay. I took just a quick
6 skim through. I guess before we talk about your
7 water silencing question, I just wanted to note
8 that it also talks about not having the holes 29,
9 and it would be normal to have, like I described,
10 just the clips so that it's above the water level.
11 BY MR. FINCH:
12 Q. And so you believe that it would be more
13 common to use a clip, such as depicted in
14 Figure 6, to hold tube 28 above the water level?
15 A. Yes, I do.

IPR2024-00633: Paper 36, 1-2 (citing EX2015, 81:5-15)
IPR2024-00634: Paper 38, 1-2 (citing EX2015, 81:5-15)
IPR2024-00635: Paper 36, 1-2 (citing EX2015, 81:5-15)

Overflow Tube – Brown

Referring now to FIG. 6, there is illustrated therein a modification of the anti-siphoning means shown in FIGS. 1 and 4. This modification preferably takes the form of a U-shaped clip 33 adapted to fit snugly over the upper end of overflow pipe 11 and which clip is provided with a small hook 34 at one end for snugly receiving the adjacent end of flexible tube 28. It will be noted that the overflow pipe 11 is designed so as to always extend above the highest level of the water in the tank. Thus, some



Fluidmaster, Inc. - EX1021, Page 001
IPR2024-00633 (Fluidmaster Inc v. Danco Inc)

Overflow Tube – Conventional in the Art

United States Patent Ho

[11] Patent Number: 5,862,538
[45] Date of Patent: Jan. 26, 1999

[54] TOILET FLUSHING DEVICE

[76] Inventor: Chung-Yi Ho, 2f, No. 1-1, Alley 49,
Lane 101, Ching-Shan Rd., Shih-Lin
Dist., Taipei City, Taiwan

4,420,845 12/1983 Antunez 4/366
4,996,726 3/1991 Schuck et al. 4/366 X
5,175,894 1/1993 Chen 4/331

Primary Examiner—Henry J. Recla
Assistant Examiner—Kathleen J. Prunner
Attorney Agent, or Firm—Baker & Botts, L.L.P.

[21] Appl. No.: 975,184

[22] Filed: Nov. 20, 1997

[51] Int. Cl.⁶ E03D 1/08

[52] U.S. Cl. 004/366; 4/331; 137/441;
137/625,048; 137/881

[58] Field of Search 4/366, 367, 329,
4/332; 137/881, 625.48, 441, 423

[56] References Cited

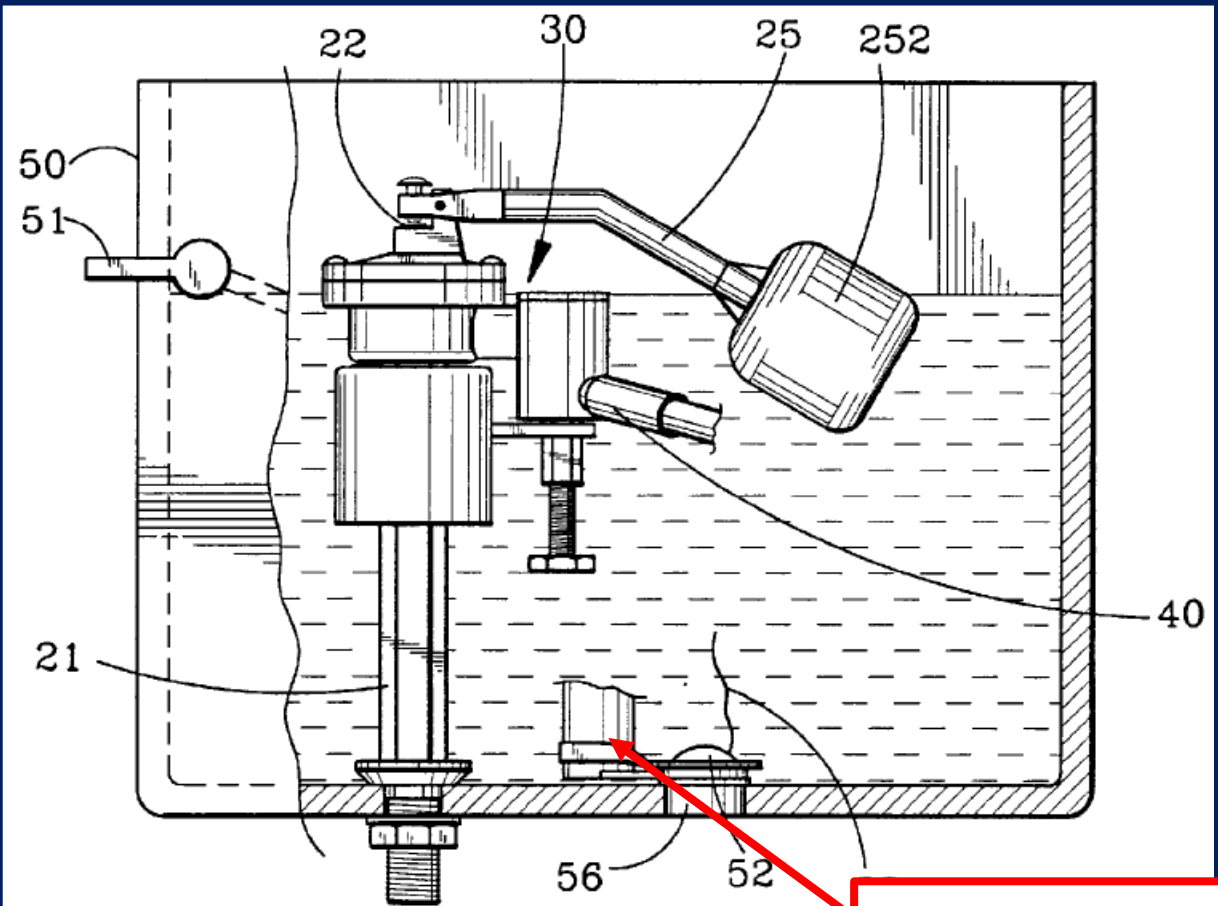
U.S. PATENT DOCUMENTS

3,086,217 1/1963 Barlow 4/367
4,318,194 3/1982 Pinkston 4/366

5 Claims, 10 Drawing Sheets

[57] ABSTRACT

A toilet flushing device is to be installed in a water supply tank and has a diverter valve which permits the supply of high pressure water to the rim flushing conduit of a toilet bowl when the toilet bowl is flushed. The diverter valve has a valve housing and a valve rod disposed movably in the valve housing in response to increase or decrease of the water level. A passage is formed longitudinally through the valve rod so as to direct high pressure water to the water supply tank, thereby preventing fouling formation in the passage of the valve rod.



overflow tube

IPR2024-00633: Paper 26, 18-19

IPR2024-00634: Paper 28, 17-18

Overflow Tube – Conventional in the Art

United States Patent Ho

[11] Patent Number: 5,862,538
[45] Date of Patent: Jan. 26, 1999

[54] TOILET FLUSHING DEVICE

[76] Inventor: Chung-Yi Ho, 2f, No. 1-1, Alley 49,
Lane 101, Ching-Shan Rd., Shih-Lin
Dist., Taipei City, Taiwan

4,420,845 12/1983 Antunez 4/366
4,996,726 3/1991 Schrock et al. 4/366 X
5,175,894 1/1993 Chen 4/331

Primary Examiner—Henry J. Recla
Assistant Examiner—Kathleen J. Prunner
Attorney, Agent, or Firm—Baker & Botts, L.L.P.

[21] Appl. No.: 975,184

[22] Filed: Nov. 20, 1997

[51] Int. Cl.⁶ E03D 1/36

[52] U.S. Cl. 004/366; 4/331; 137/441;
137/625 048; 137/881

[58] Field of Search 4/366, 367, 329,
4/332; 137/881, 625.48, 441, 423

[56] References Cited

U.S. PATENT DOCUMENTS

3,086,217 4/1963 Barlow 4/367
4,318,194 3/1982 Pinkston 4/366

5 Claims, 10 Drawing Sheets

[57] ABSTRACT

A toilet flushing device is to be installed in a water supply tank and has a diverter valve which permits the supply of high pressure water to the rim flushing conduit of a toilet bowl when the toilet bowl is flushed. The diverter valve has a valve housing and a valve rod disposed movably in the valve housing in response to increase or decrease of the water level. A passage is formed longitudinally through the valve rod so as to direct high pressure water to the water supply tank, thereby preventing fouling formation in the passage of the valve rod.

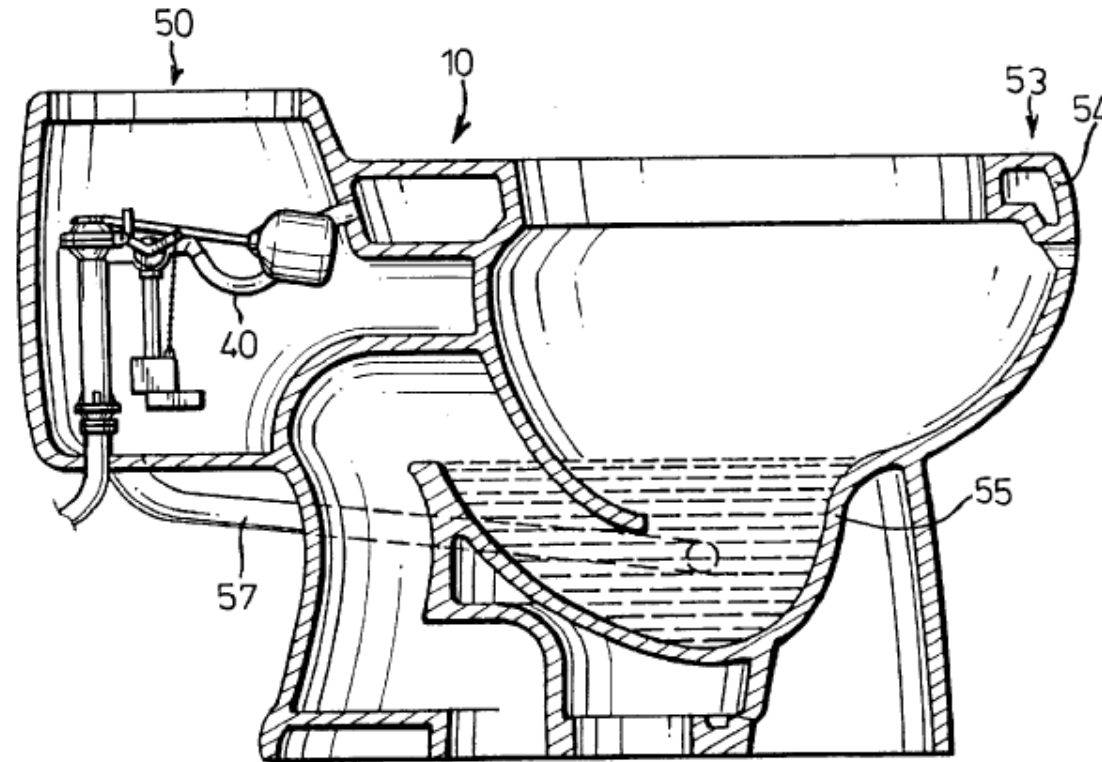
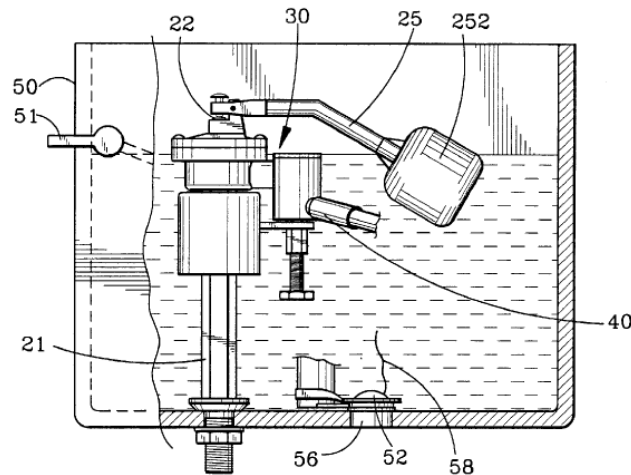


FIG. 1

Overflow Tube – Conventional in the Art

(12) United States Patent Schuster

(10) Patent No.: **US 6,546,568 B1**
(45) Date of Patent: **Apr. 15, 2003**

(54) TOILET TANK WITH SEDIMENT REMOVAL ASSEMBLY

(76) Inventor: **Michael J. Schuster**, 612 Nicholson St., Joliet, IL (US) 60435

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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3,762,395 A 10/1973 Taylor 126/850
4,134,164 A 1/1979 Sammartin Rial 4/53
4,505,231 A 3/1985 Syler 122/159
4,527,295 A 7/1985 Lacore 4/221
4,808,124 A 2/1990 Granberg et al. 122/381
5,794,279 A 8/1998 Schwartz 4/415
5,862,537 A 1/1999 Osmond 4/363
6,295,660 B1 * 10/2001 Schuster 4/353

* cited by examiner

(21) Appl. No.: **09/969,320**

(22) Filed: **Oct. 1, 2001**

Related U.S. Application Data

(63) Continuation of application No. 09/634,249, filed on Aug. 8, 2000, now Pat. No. 6,295,660.

(51) Int. Cl. **F03D 1/00**

(52) U.S. Cl. **4/353; 122/383**

(58) Field of Search **4/321, 323, 353, 4/366, 367, 490, 508; 122/383; 137/432, 436, 437, 438, 441, 444; 134/104.1**

References Cited

U.S. PATENT DOCUMENTS

994,727 A * 6/1911 Dwyer et al. 122/383
996,743 A * 7/1911 Yancey 137/436
1,113,057 A 10/1914 Schuman 4/262
2,465,866 A * 3/1949 Gaines 4/353 X
2,736,037 A 2/1956 Hardie 4/354
2,799,865 A * 7/1957 Dufault 4/366

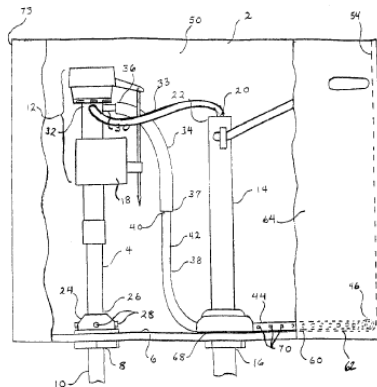
Primary Examiner—Robert M. Fetsuga

(74) Attorney, Agent, or Firm—Michael J. D'Aurelio

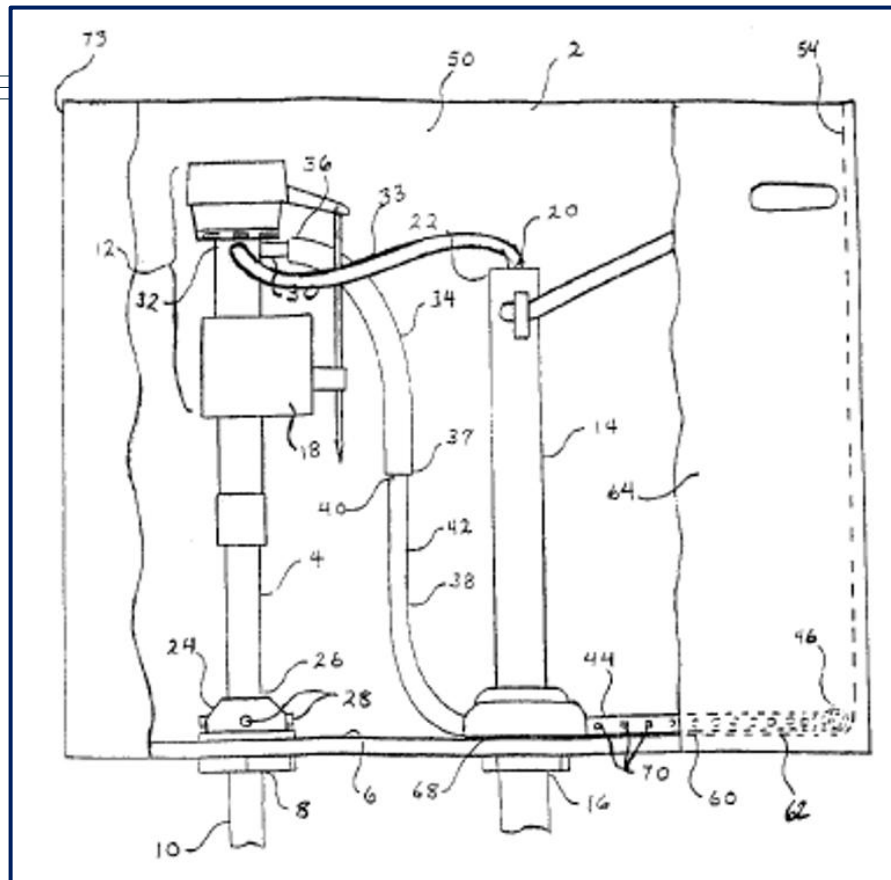
(57) ABSTRACT

A toilet tank with a sediment removal assembly comprises a flexible tube connected to the upper discharge spout of the intake standpipe in the toilet tank cavity, and a configured length of copper tubing connected to the flexible tube for water to flow therethrough when the float valve is open to flow water into the tank during a flushing operation. The copper tubing has a longitudinal section which extends downwardly and vertically from its connection to the flexible tube, an integrally joined first lateral or horizontal section curved or bent to lie on the bottom wall of the tank adjacent to the rear wall, and an integrally joined second lateral or horizontal section curved or bent to extend substantially normal to the first lateral section and lie on the bottom wall of the tank adjacent to the then facing end wall of the tank.

14 Claims, 4 Drawing Sheets



Fluidmaster, Inc. - EX1014, Page 001
IPR2024-00633 (Fluidmaster Inc v. Danco Inc)



IPR2024-00633: Paper 26, 16-17, 19-20

IPR2024-00634: Paper 28, 15-16, 18-19

Overflow Tube – Conventional in the Art

11/19/2024 Fluidmaster, Inc. v. Danco, Inc. Kimberly K. Cameron, Ph.D. Page 1

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

-----X

FLUIDMASTER, INC.,
Petitioner, C.A. No.
v. 2484CV00766-BLS1
DANCO, INC.,
Patent Owner.
-----X

IPR2024-00633 U.S. Patent No. 9,139,993
IPR2024-00634 U.S. Patent No. 9,103,105
IPR2024-00635 U.S. Patent No. 10,934,698

DEPOSITION of KIMBERLY K. CAMERON, Ph.D.
Tuesday, November 19, 2024
Boston, Massachusetts

Reporter: Michael D. O'Connor, RMR, CRC, CRR

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Washington, D.C. 20036
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6 Q. Water comes from the water supply
7 into the fill valve?
8 A. Correct.
9 Q. Then after water enters the fill
10 valve, where does it go next?
11 A. So it can go into the bowl.
12 Q. How does it go into the bowl?
13 A. Through a tube.

IPR2024-00633: Paper 30, 3 (citing 2008, 85:6-13)

IPR2024-00634: Paper 32, 3 (citing 2008, 85:6-13)

IPR2024-00635: Paper 30, 5 (citing 2008, 85:6-13)

Overflow Tube – Conventional in the Art

11/19/2024 Fluidmaster, Inc. v. Danco, Inc. Kimberly K. Cameron, Ph.D. Page 1

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

-----X

FLUIDMASTER, INC.,
Petitioner, C.A. No.
v. 2484CV00766-BLS1
DANCO, INC.,
Patent Owner.

-----X

IPR2024-00633 U.S. Patent No. 9,139,993
IPR2024-00634 U.S. Patent No. 9,103,105
IPR2024-00635 U.S. Patent No. 10,934,698

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14 Q. Through what tube?

15 A. I don't know what you mean by

16 that.

17 Q. When you say it goes through a

18 tube, what are you referring to?

19 A. I don't know how to describe that.

20 I don't know how to answer your question.

IPR2024-00633: Paper 36, 5 (citing EX2008, 85:9-20)

IPR2024-00634: Paper 38, 5 (citing EX2008, 85:9-20)

IPR2024-00635: Paper 36, 6 (citing EX2008, 85:9-20)

Guoxin in view of Ho:

'993 Grounds 1-2

'105 Grounds 1-2

'698 Ground 1

Overflow Tube / Overfill Tube

Integrally Molded With

Motivation to Combine

Dependent Claims

- U.S. Patent No. 9,139,993:
 - Claims 1-20
- U.S. Patent No. 9,103,105:
 - Claims 1-24

Integrally Molded With

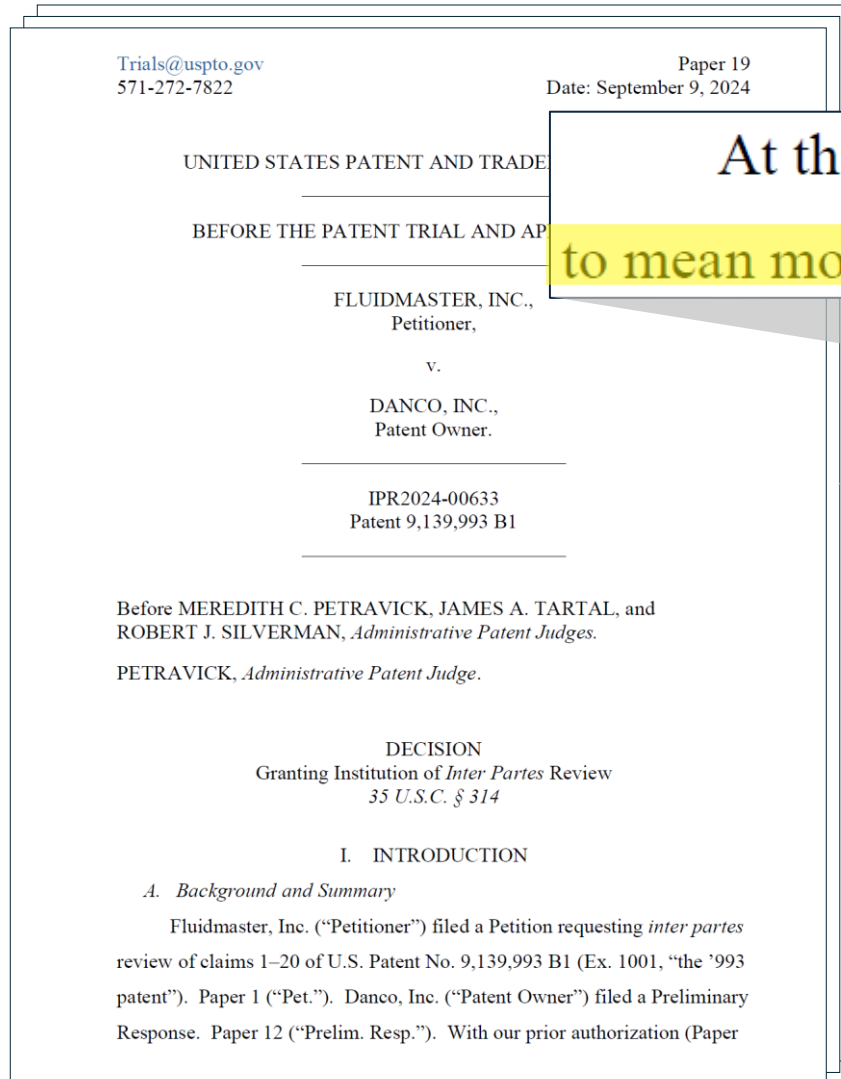
9,139,993

- **Claim 1:** a body comprising an extended portion, wherein the extended portion is integrally molded with the body
- **Claim 8:** wherein the extended portion is integrally molded with the toilet fill valve
- **Claim 14:** wherein the extended portion is integrally molded with the body

9,103,105

- **Claim 1:** a body comprising an extended portion, wherein the extended portion is integrally molded with the body
- **Claim 9:** wherein the extended portion is integrally molded with the toilet fill valve
- **Claim 15:** wherein the extended portion is integrally molded with the body
- **Claim 24:** wherein the extended portion is integrally molded with the body

Integrally Molded With



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

The Board’s construction requires the fill valve and extended portion be:

1. A Single Structure
2. Molded

IPR2024-00633: Paper 19, 14-15; Paper 36, 6
IPR2024-00634: Paper 21, 14-15; Paper 38, 6

Integrally Molded With – Guoxin

Case IPR2024-00633
Petition for Inter Partes Review of US 9,319,993

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FLUIDMASTER, INC.

Petitioner

V.

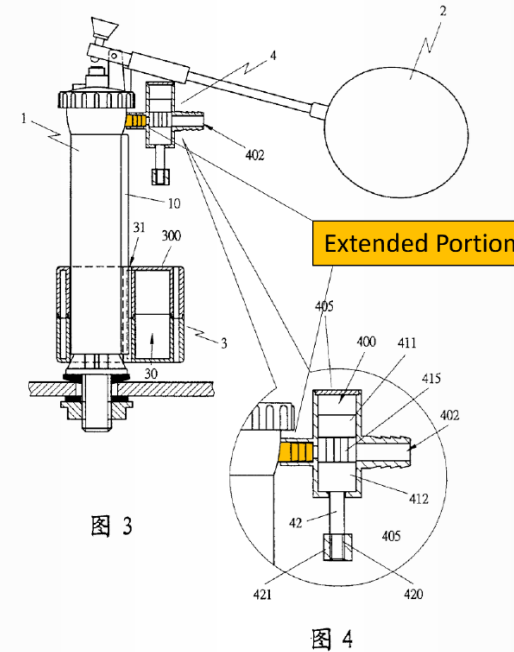
DANCO, INC.
Patent Owner

Case IPR2024-00633
Patent 9,139,993 B1

PETITION FOR INTER PARTES REVIEW UNDER 37 C.F.R. § 42.100

b. $1[A]$

Guoxin discloses a toilet fill valve having an extended portion that is integrally molded with the water inlet device 1, as shown in Figure 3 and the exploded view of Figure 4. EX1004, ¶123. The extended portion of Guoxin's toilet fill valve forms a bowl fill outlet port. *Id.*



IPR2024-00633: Paper 1, 32
IPR2024-00634: Paper 1, 28

Integrally Molded With – Ho

Case IPR2024-00633
Petition for Inter Partes Review of US 9,319,993

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FLUIDMASTER, INC.
Petitioner

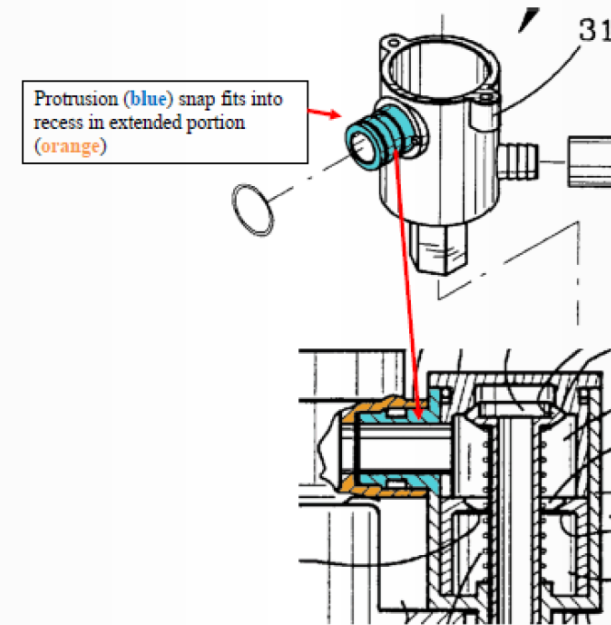
v.

DANCO, INC.
Patent Owner

Case IPR2024-00633
Patent 9,139,993 B1

PETITION FOR INTER PARTES REVIEW UNDER 37 C.F.R. § 42.100

To the extent PO *incorrectly* argues that the extended portion illustrated in Guoxin is not “integrally molded,” Ho most clearly discloses an integrally molded extended portion on a toilet fill valve with a recess into which a water flow regulator with a protrusion is inserted and locked into place. See EX1022, annotated Figs. 3 and 5 below; EX1004, ¶124.



IPR2024-00633: Paper 1, 33
IPR2024-00634: Paper 1, 28-29

Integrally Molded With – A Single Structure

Paper No. 28
Filed: March 19, 2025

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FLUIDMASTER, INC.

Petitioner

v.

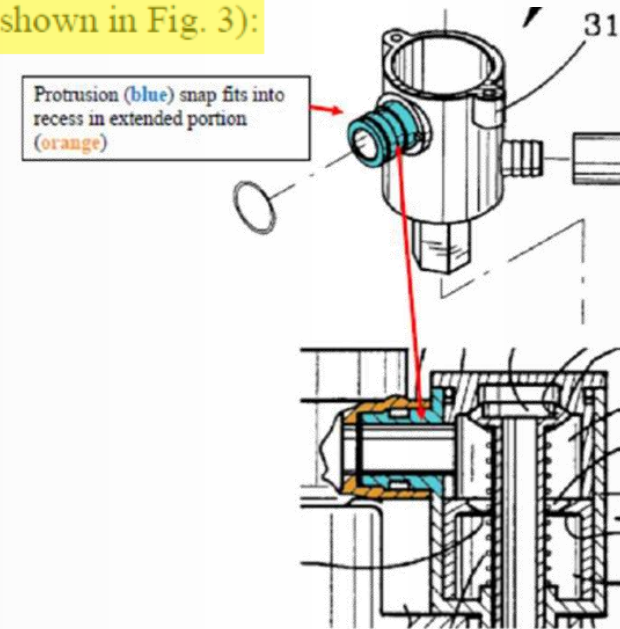
DANCO, INC.
Patent Owner

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

PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE TO
PETITION

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Alexandria, VA 22313-1450

PO also claims that Ho does not show an “integrally molded” extended portion. POR, 30–33. But Ho’s disclosures contradict this. *See* EX1004, ¶124 (discussing annotated Figs. 3 and 5, reproduced below; explaining a POSITA would understand that the protrusion (blue) in Fig. 5 slots into the extended portion (orange) of the fill valve, as shown in Fig. 3):



IPR2024-00633: Paper 30, 10
IPR2024-00634: Paper 32, 10-11

Integrally Molded With – A Single Structure

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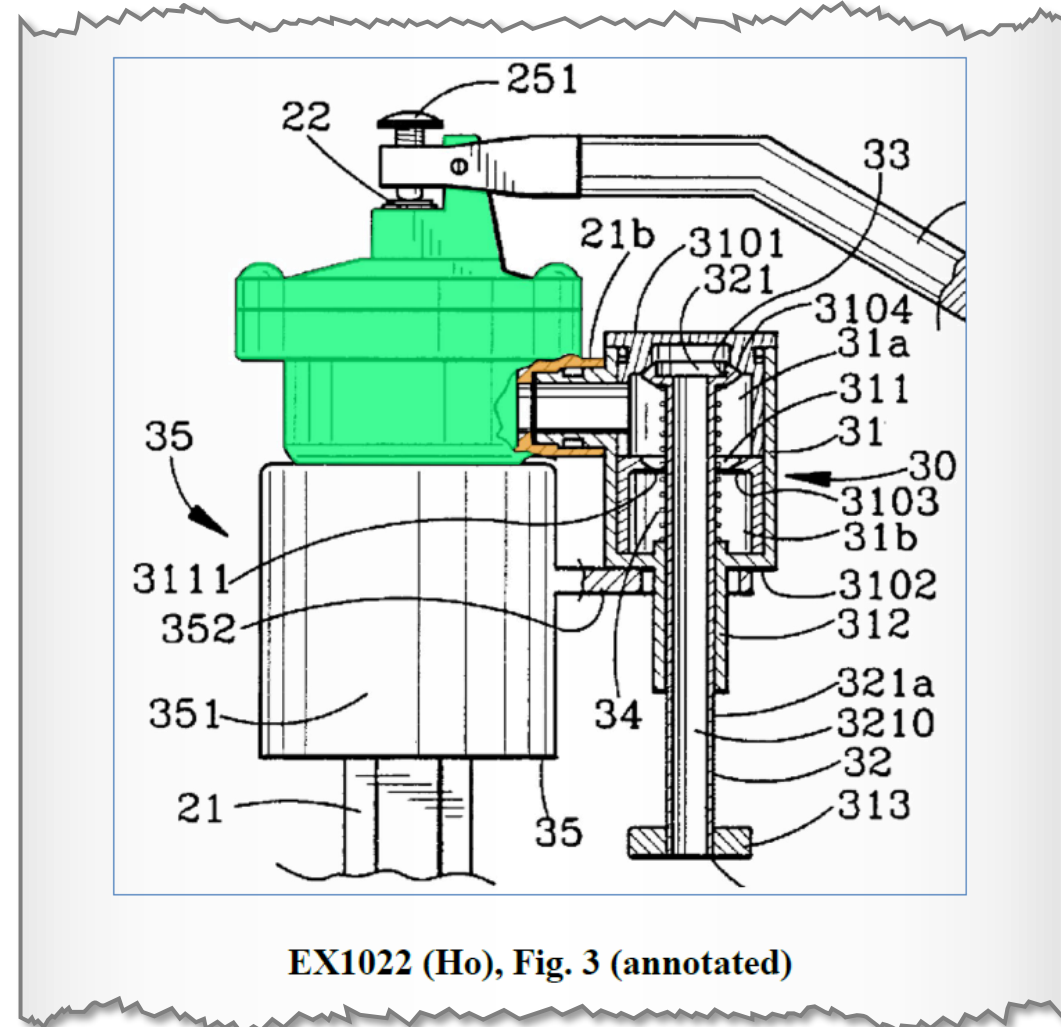
FLUIDMASTER, INC.,
Petitioner,

v.

DANCO, INC.
Patent Owner.

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

PATENT OWNER'S RESPONSE



IPR2024-00633: Paper 26, 32-33

IPR2024-00634: Paper 28, 30-31

Integrally Molded With – A Single Structure

By: Jason M. Perilla (j.perilla@pkhip.com)
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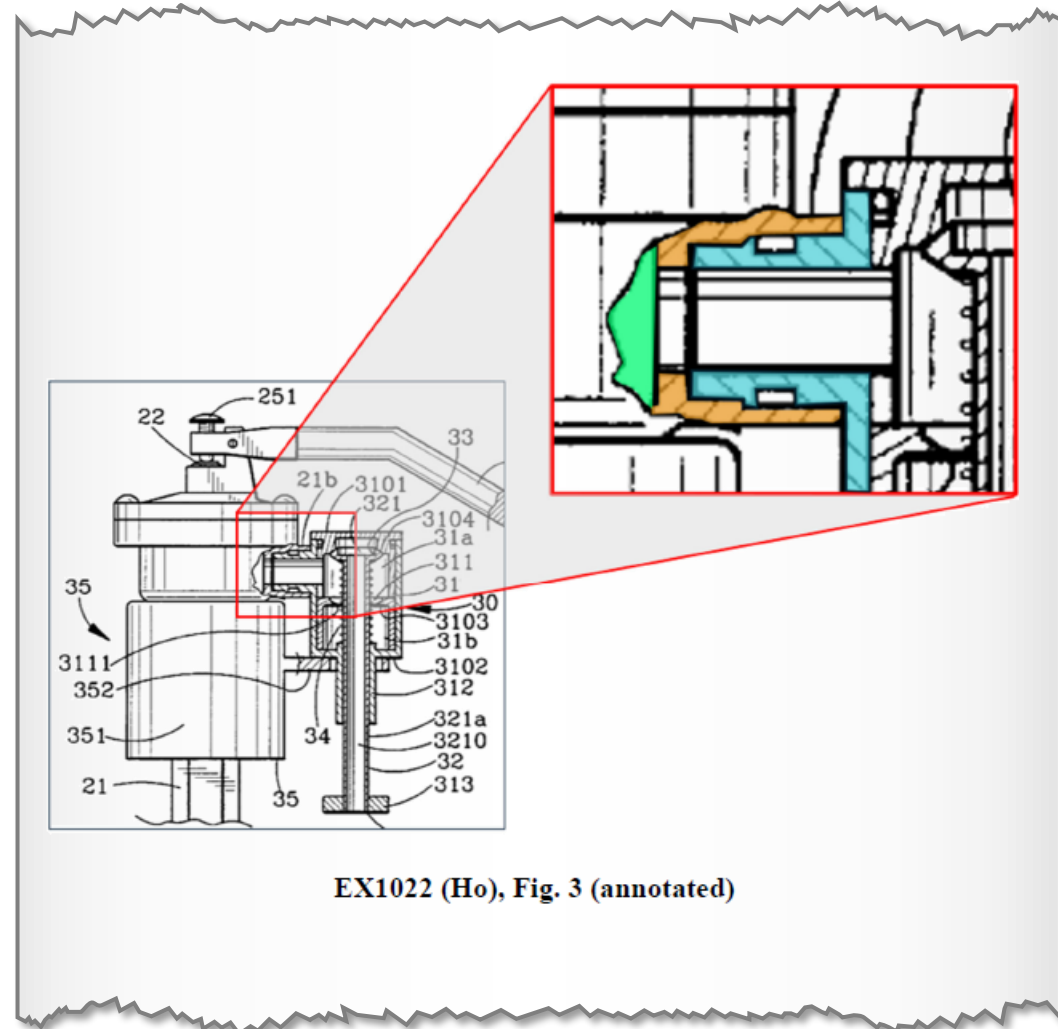
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DANCO, INC.
Patent Owner.

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

PATENT OWNER'S SURREPLY TO PETITIONER'S REPLY



IPR2024-00633: Paper 26, 32-33

IPR2024-00634: Paper 28, 30-31

Integrally Molded With

Trials@uspto.gov
571-272-7822

Paper 19
Date: September 9, 2024

UNITED STATES PATENT AND TRADE
BEFORE THE PATENT TRIAL AND AP

FLUIDMASTER, INC.,
Petitioner,
v.
DANCO, INC.,
Patent Owner.

IPR2024-00633
Patent 9,139,993 B1

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

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

I. INTRODUCTION

A. Background and Summary

Fluidmaster, Inc. ("Petitioner") filed a Petition requesting *inter partes* review of claims 1–20 of U.S. Patent No. 9,139,993 B1 (Ex. 1001, "the '993 patent"). Paper 1 ("Pet."). Danco, Inc. ("Patent Owner") filed a Preliminary Response. Paper 12 ("Prelim. Resp."). With our prior authorization (Paper

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

The Board's construction requires the fill valve and extended portion be:

1. A Single Structure
2. Molded

IPR2024-00633: Paper 19, 14-15; Paper 36, 6

IPR2024-00634: Paper 21, 14-15; Paper 38, 6

Integrally Molded With – Molded

By: Jason M. Perilla (j.perilla@pkhip.com)
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UNITED STATES PATENT AND TRADEMARK

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FLUIDMASTER, INC.,
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v.

DANCO, INC.
Patent Owner.

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

PATENT OWNER'S RESPONSE

If two structures are “molded together as a single structure,” they must comprise a single molded structure. In the context of the toilet fill valves recited by the Challenged Claims, a POSITA would have understood the term “molded” to refer to plastic structures, which are manufactured through processes such as injection molding, overmolding, or extrusion molding. EX2008, 35:10-39:12. EX2013, ¶133.

IPR2024-00633: Paper 26, 24-25

IPR2024-00634: Paper 28, 22-23

Integrally Molded With – Molded

The '993 Patent is not directed to the composition or method of manufacture of its claimed structure. The claims and specification are silent as to material composition. EX1037, 16:25–17:13; 18:24–19:10.

Dr. Cameron testified that in her view, the Challenged Claims cover “a fill valve and an extended portion” that were “chiseled ... out of a block of wood.”

IPR2024-00633: Paper 30, 8; Paper 36, 8-9
IPR2024-00634: Paper 32, 8; Paper 38, 9

Paper No. 30
Filed: March 19, 2024

UNITED STATES PATENT AND TRADEMARK OFFICE

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v.

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Patent Owner

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

PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE TO
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Integrally Molded With – Molded

“[W]ords of limitation that can connote with equal force a structural characteristic of the product or a process of manufacture are commonly and *by default interpreted in their structural sense.*”

In re Nordt Dev. Co., LLC, 881 F.3d 1371, 1375-76 (Fed. Cir. 2018)

IPR2024-00633: Paper 36, 8-9

IPR2024-00634: Paper 38, 9

Integrally Molded With – Molded

United States Patent Ho

[11] Patent Number: 5,862,538
[45] Date of Patent: Jan. 26, 1999

[54] TOILET FLUSHING DEVICE

[76] Inventor: Chung-Yi Ho, 2f, No. 1-1, Alley 49,
Lane 101, Ching-Shan Rd., Shih-Lin
Dist., Taipei City, Taiwan

4,420,845 12/1983 Antunez 4/366
4,996,726 3/1991 Schrock et al. 4/366 X
5,175,894 1/1993 Chen 4/331

Primary Examiner—Henry J. Recla
Assistant Examiner—Kathleen J. Prunner
Attorney, Agent, or Firm—Baker & Botts, L.L.P.

[21] Appl. No.: 975,184

[22] Filed: Nov. 20, 1997

[51] Int. Cl.⁶ E03D 1/36

[52] U.S. Cl. 004/366; 4/331; 137/441;
137/625,048; 137/881

[58] Field of Search 4/366, 367, 329,
4/332; 137/881, 625.48, 441, 423

[56] References Cited

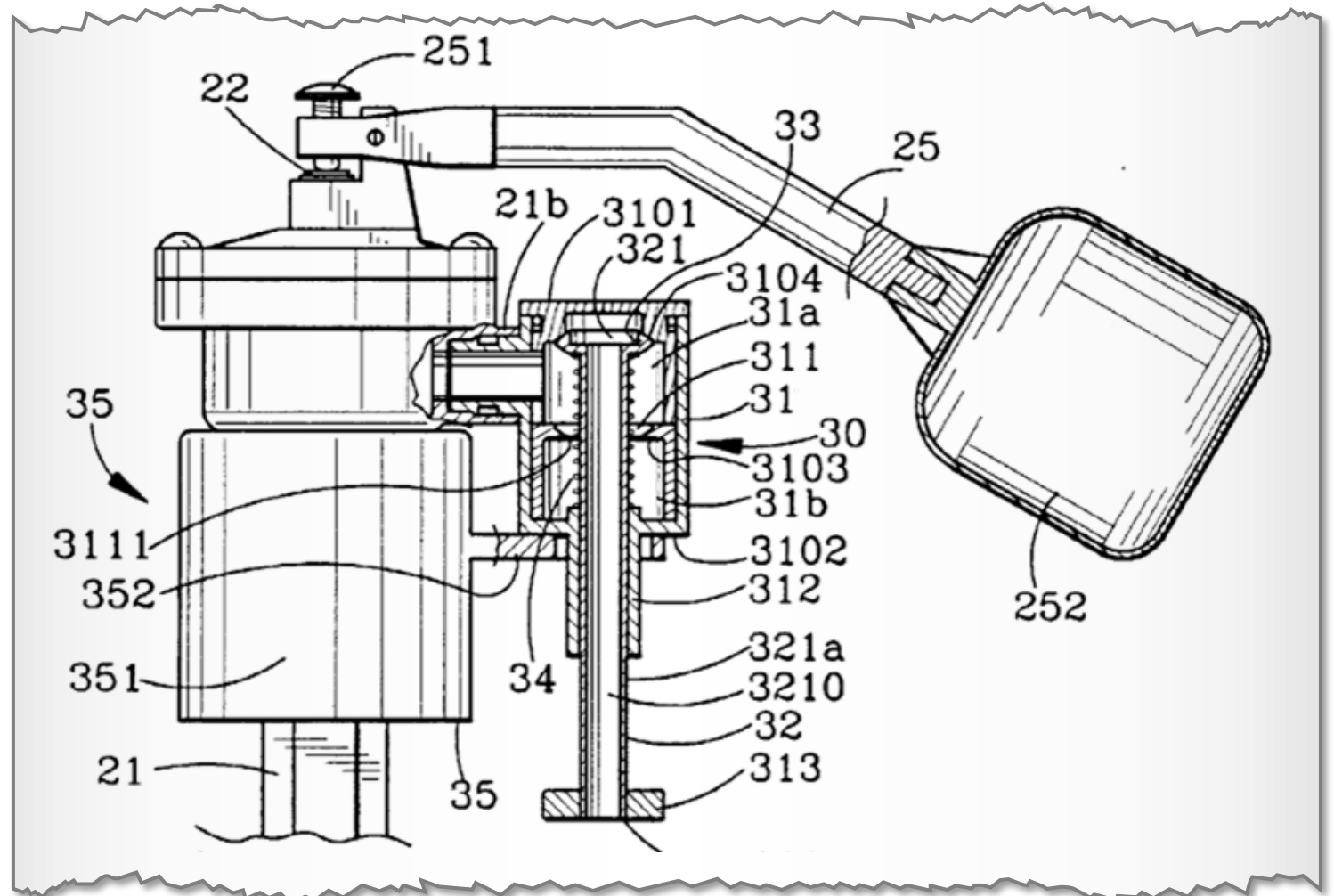
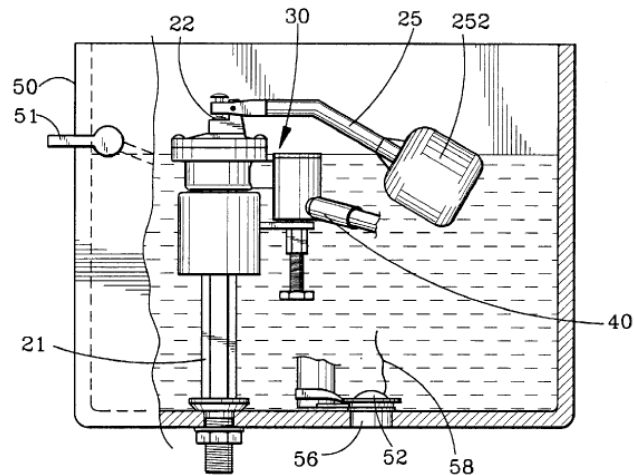
U.S. PATENT DOCUMENTS

3,086,217 4/1963 Barlow 4/367
4,318,194 3/1982 Pinkston 4/366

[57] ABSTRACT

A toilet flushing device is to be installed in a water supply tank and has a diverter valve which permits the supply of high pressure water to the rim flushing conduit of a toilet bowl when the toilet bowl is flushed. The diverter valve has a valve housing and a valve rod disposed movably in the valve housing in response to increase or decrease of the water level. A passage is formed longitudinally through the valve rod so as to direct high pressure water to the water supply tank, thereby preventing fouling formation in the passage of the valve rod.

5 Claims, 10 Drawing Sheets



Integrally Molded With – Molded

4/23/2025 Fluidmaster, Inc. v. Danco, Inc. Kimberly K. Cameron, Ph.D. Page 1

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FLUIDMASTER, INC.
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Case No. IPR2024-00634
U.S. Patent No. 9,103,105 B1
Case No. IPR2024-00635
U.S. Patent No. 10,934,698 B1

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8 Q. And so correct me if I'm wrong, but my
9 understanding is that your testimony is that
10 Figure 2 and Figure 3 would not look different if
11 the extended portion were made of metal, but there
12 would be an indication in the specification that
13 that was the case?

14 MS. ACHARYA: Objection; form.

15 THE WITNESS: That would probably be
16 my -- that would probably be my expectation.
17 Whether you could convey that another way, you
18 know, that's probably what I would do, if this is
19 me. Whether somebody chooses something different,
20 I would need to look at what that was. But that
21 would be -- that would be my expectation, yes.

IPR2024-00633: Paper 36, 8 (citing EX2015, 138:12-140:21)

IPR2024-00634: Paper 38, 8 (citing EX2015, 138:12-140:21)

Integrally Molded With – Molded

4/23/2025 Fluidmaster, Inc. v. Danco, Inc. Kimberly K. C

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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19 Q. Okay. What if you weren't trying to
20 convey that, what if it wasn't relevant and
21 Figure 2 just depicted a metal fill valve body in
22 a metal extended portion, would you expect the
1 figure to look any different if those portions
2 were welded together?

IPR2024-00633: Paper 36, 8 (citing EX2015, 184:2-186:2)
IPR2024-00634: Paper 38, 8 (citing EX2015, 184:2-186:2)

Integrally Molded With – Molded

4/23/2025 Fluidmaster, Inc. v. Danco, Inc. Kimberly K. Cameron

UNITED STATES PATENT AND TRADEMARK OFFICE

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Fluidmaster, Inc. v. Danco, Inc. - IPR2024-00633

20 A. That may not be how everyone does it,
21 but I think if you're asking me personally, yeah,
22 I would probably -- probably leave the figure
1 unchanged and make a note in the specification,
2 yes.

IPR2024-00633: Paper 36, 8 (citing EX2015, 184:2-186:2)
IPR2024-00634: Paper 38, 8 (citing EX2015, 184:2-186:2)

Integrally Molded With – Molded

4/23/2025 Fluidmaster, Inc. v. Danco, Inc. Kimberly K. Cameron

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Danco, Inc. - EX2015, Page 001
Fluidmaster, Inc. v. Danco, Inc. - IPR2024-00633

10 Q. And what is it from the figures and the
11 description specifically that leads to your
12 understanding that that is a molded structure?
13 MS. ACHARYA: Objection; form.
14 THE WITNESS: Because that is
15 typically -- that's typically how these are made,
16 and there's nothing in here that to indicate that
17 this is anything other than normal.

IPR2024-00633: Paper 36, 8 (citing EX2015, 104:10-105:1)
IPR2024-00634: Paper 38, 8-9 (citing EX2015, 104:10-105:1)

Integrally Molded With – Molded

“In an *inter partes* review, the petitioner shall have the burden of proving a proposition of unpatentability by a preponderance of the evidence. The *absence* of a finding that [a reference] does not have [certain claimed features] therefore cannot establish [the reference] in fact has those features.”

Medtronic, Inc. v. Teleflex Innovations S.A.R.L., 70 F.4th 1331, 1338 (Fed. Cir. 2023) (citing 35 U.S.C. § 316(e)).

Guoxin in view of Ho:

'993 Grounds 1-2

'105 Grounds 1-2

'698 Ground 1

Overflow Tube / Overfill Tube

Integrally Molded With

Motivation to Combine

Dependent Claims

– Additional Exhibits

Integrally Molded With – A Single Structure

By: Jason M. Perilla (j.perilla@pkhip.com)
Kenneth A. Knox (k.knox@pkhip.com)
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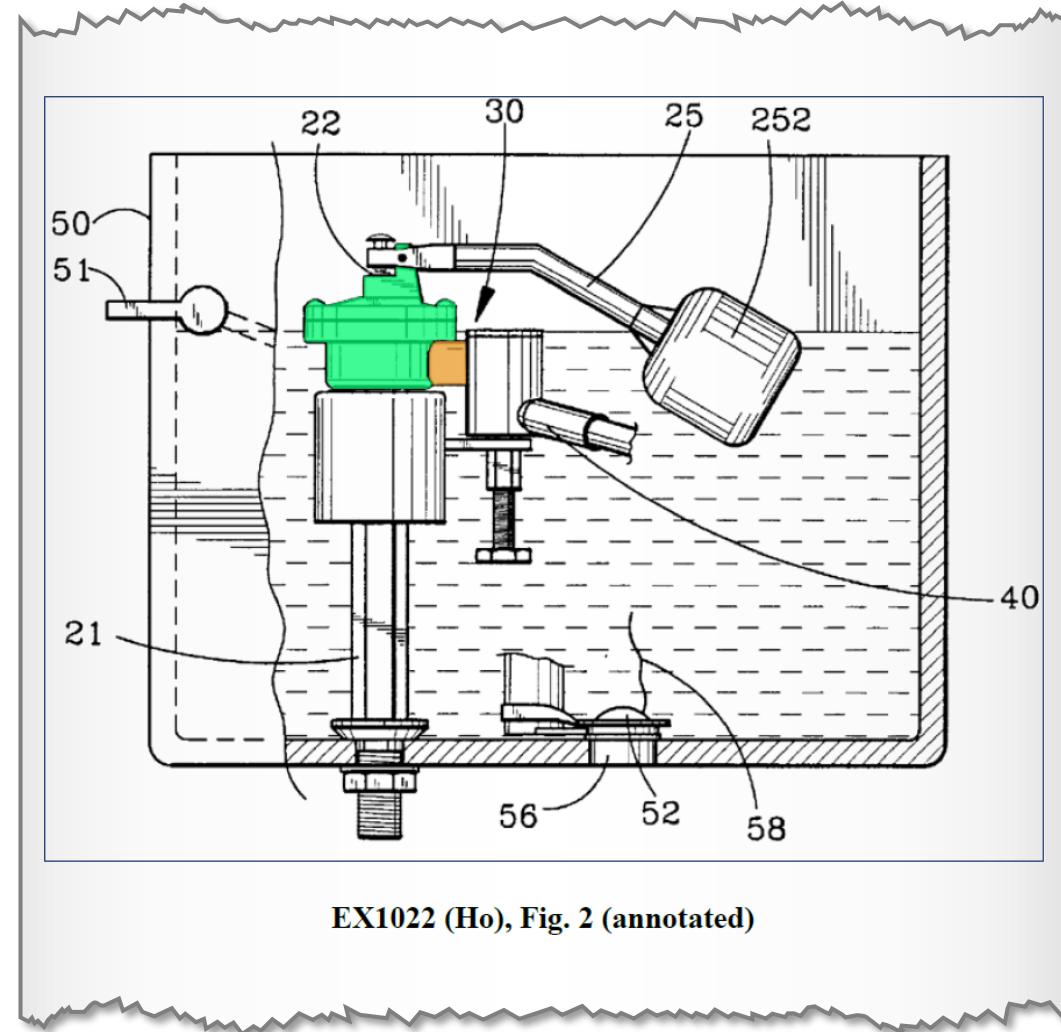
FLUIDMASTER, INC.,
Petitioner,

v.

DANCO, INC.
Patent Owner.

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

PATENT OWNER'S RESPONSE



EX1022 (Ho), Fig. 2 (annotated)

IPR2024-00633: Paper 26, 18-19

IPR2024-00634: Paper 28, 17-18

Integrally Molded With – Molded

By: Jason M. Perilla (j.perilla@pkhip.com)
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UNITED STATES PATENT AND TRADEMARK

BEFORE THE PATENT TRIAL AND APPEALS

FLUIDMASTER, INC.,
Petitioner,

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Patent Owner.

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

PATENT OWNER'S RESPONSE

“Molded” does not refer to metal structures, which are typically “cast” or “machined.” EX2013, ¶134; EX2008, 63:21-65:21. Dr. Cameron has failed to show (1) that general reference to a patent figure alone is enough to determine whether a structure is plastic, and (2) that Ho, in particular, discloses a plastic structure. These deficiencies are fatal to the Petition. EX2013, ¶134.

IPR2024-00633: Paper 26, 24-25

IPR2024-00634: Paper 28, 22-23

Integrally Molded With – Molded

4/23/2025 Fluidmaster, Inc. v. Danco, Inc. Kimberly K. Cam

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FLUIDMASTER, INC.
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Patent Owner.

Case No. IPR2024-00633
U.S. Patent No. 9,139,993 B1
Case No. IPR2024-00634
U.S. Patent No. 9,103,105 B1
Case No. IPR2024-00635
U.S. Patent No. 10,934,698 B1

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Danco, Inc. - EX2015, Page 001
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2 Q. Okay. But there isn't anything in the
3 specification that indicates that that structure
4 is molded; is there?

5 A. It doesn't specifically say that it's --
6 I don't think it specifically uses the words
7 "integrally molded" or "molded," but from my
8 looking at the figures and the description, that
9 is my understanding.

IPR2024-00633: Paper 36, 8 (citing EX2015, 104:2-9)
IPR2024-00634: Paper 38, 8-9 (citing EX2015, 104:2-9)

Integrally Molded With – Molded

4/23/2025 Fluidmaster, Inc. v. Danco, Inc. Kimberly K. Cameron, Ph.D. Page 1

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FLUIDMASTER, INC.
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DANCO, INC.
Patent Owner.

Case No. IPR2024-00633
U.S. Patent No. 9,139,993 B1
Case No. IPR2024-00634
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17 Q. As a person of ordinary skill in the
18 art, do you have any understanding as to what the
19 material composition of that structure is?
20 A. I don't know precisely what the
21 composition is, no.
5 Q. You have no understanding of the
6 material composition of that structure?
7 A. That -- that's not specified in Ho,
8 that's correct.

IPR2024-00633: Paper 36, 8 (citing EX2015, 121:13-122:8)
IPR2024-00634: Paper 38, 8-9 (citing EX2015, 121:13-122:8)

Integrally Molded With – Molded

4/23/2025 Fluidmaster, Inc. v. Danco, Inc. Kimberly K. Cameron, PH.D.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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Case No. IPR2024-00633
U.S. Patent No. 9,139,993 B1
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7 Q. How would Figure 2 and Figure 3 of Ho
8 look different if this structure were made out of
9 metal?
10 MS. ACHARYA: Objection; form.
11 THE WITNESS: If Ho is trying to convey
12 that you are not kind of just using standard
13 things for this, then I would expect either a
14 mention of that, or I suppose maybe you could use
15 what you're pointing me to, the MPEP. But,
16 frankly, I find that to be pretty uncommon, and
17 probably there would just be a mention
18 specifically that it was.

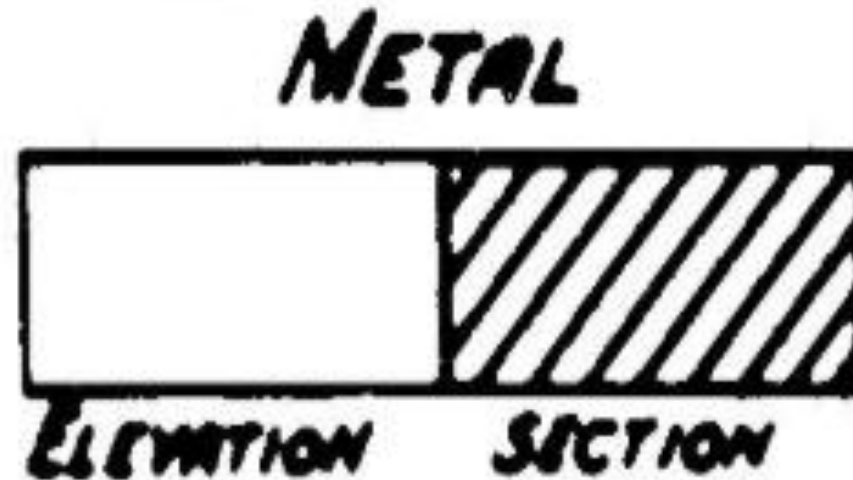
IPR2024-00633: Paper 36, 8 (citing EX2015, 138:12-140:21)

IPR2024-00634: Paper 38, 8 (citing EX2015, 138:12-140:21)

Integrally Molded With – Molded

“The following symbols should be used to indicate various materials **where the material is an important feature of the invention.** The use of conventional features is very helpful in making prior art searches.”

MPEP § 608.02



IPR2024-00633: Paper 36, 8

IPR2024-00634: Paper 38, 8

Guoxin in view of Ho:

'993 Grounds 1-2

'105 Grounds 1-2

'698 Ground 1

Overflow Tube / Overfill Tube

Integrally Molded With

Motivation to Combine – Fluid Flow

Dependent Claims

Motivation to Combine – Fluid Flow Connectors

Guoxin

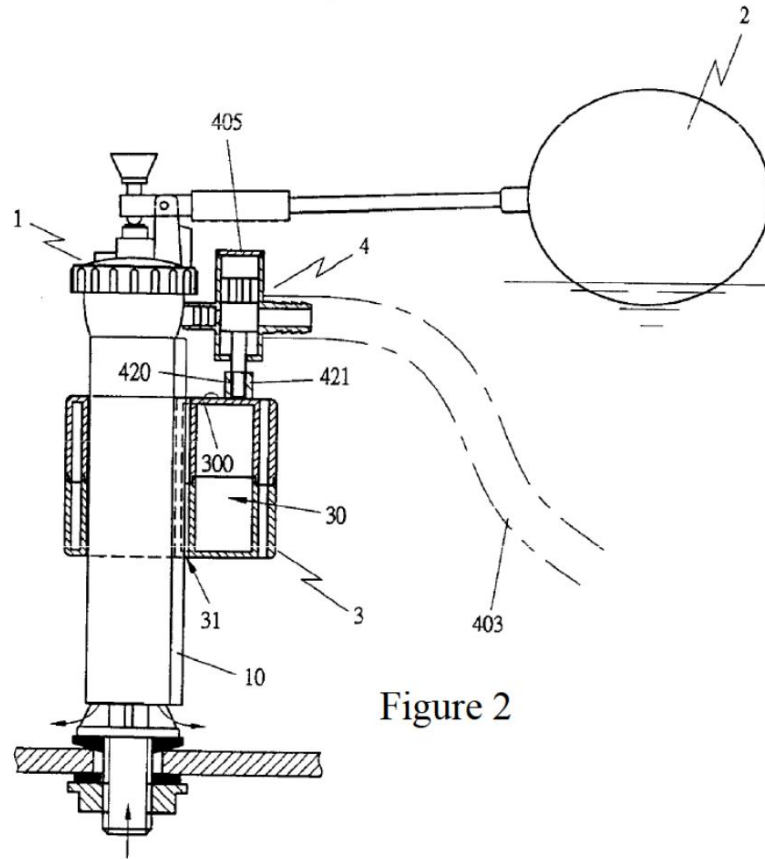
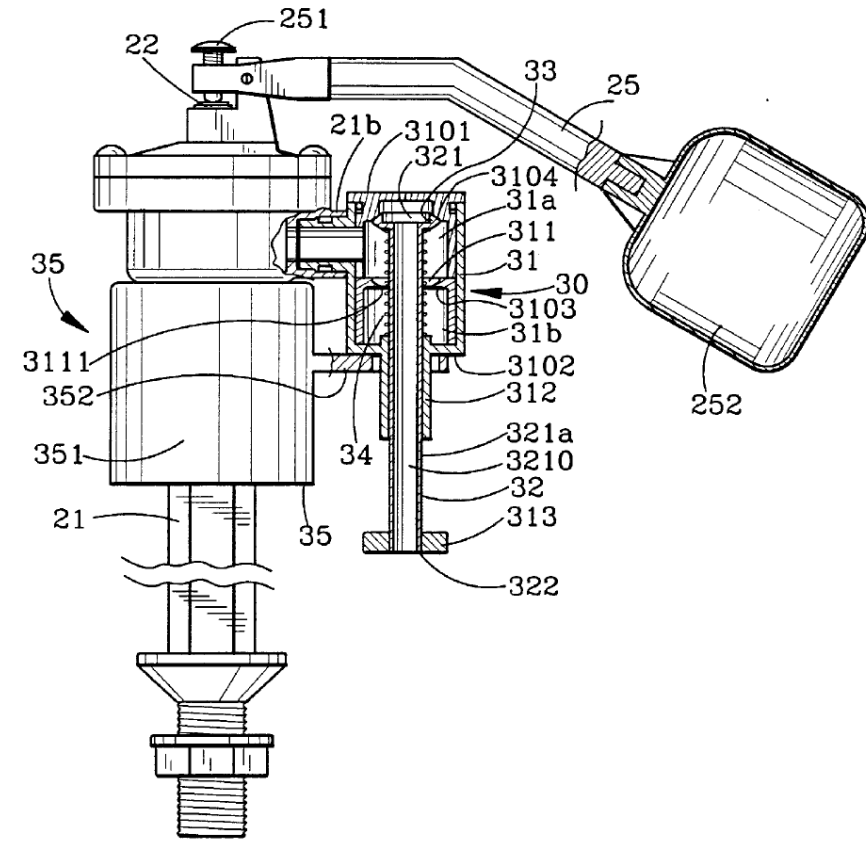


Figure 2

Ho (Fig. 3)



Motivation to Combine – Fluid Flow Connectors

See, e.g., EX1016, 2, 5:1-2; EX1022, 1, 1:6-9, Figs. 1-5; EX1004, ¶114. 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. *See* EX1004, ¶¶114-115; EX1017, 7:15-24, Figs. 5-6 (Bjerke showing interchangeability of male and female connectors); EX1006, 80-81 (male and female connector arrangements can be reversed); EX1004, ¶¶115-117. The toilet fill valve connectors here are likewise interchangeable. EX1004, ¶118; EX1001, 7:21-33 (acknowledging the interchangeability of protrusions, ribs, recesses, etc., on the respective couplings).

Case IPR2024-00633
Petition for Inter Partes Review of US 9,319,993 B1

UNITED STATES PATENT AND TRADEMARK OFFICE

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FLUIDMASTER, INC.

Petitioner

v.

DANCO, INC.
Patent Owner

Case IPR2024-00633
Patent 9,139,993 B1

PETITION FOR INTER PARTES REVIEW UNDER 37 C.F.R. § 42.101

IPR2024-00633: Paper 1, 28-29

IPR2024-00634: Paper 1, 24-25

IPR2024-00635: Paper 1, 24

Motivation to Combine – Fluid Flow Connectors

United States Patent [19] **Patent Number:** [11]
Bjerke [45] **Date of Patent:** [45]

[54] **QUICK CONNECT WATER FLOW SYSTEM** 5,577,706 11/1996 King .
[76] Inventor: **Thomas E. Bjerke**, 1788 Duffield La., 5,608,928 3/1997 Wang .
Alexandria, Va. 23307 5,634,624 6/1997 Lacroix et al.

FOREIGN PATENT DO
[21] Appl. No.: **08/992,213** 2 067 697 7/1981 United King
[22] Filed: **Dec. 17, 1997** 2 223 961 4/1990 United King

[51] Int. Cl.⁶ **E03C 1/04** *Primary Examiner—Henry J. Recla*
[52] U.S. Cl. **4/675; 4/615; 4/678; 137/801** *Assistant Examiner—Yuan Nguyen*
[58] **Field of Search** **4/675; 676; 677;** *Attorney, Agent, or Firm—Nixon &*
4/678, 668, 615, 567, 568, 518; 137/218, 515, 801, 215–217, 843, 859; 239/588; 285.8 [57] **ABSTRACT**

The bathtub shower system in screwthreaded connection to the bat cooperates with a backflow preventer quick connect/disconnect such that can be readily and easily connected to the fitting. The backflow preventer a shower head hose for use by an indiv in a bathtub. The backflow preventer siphoning of water from the tub to event the water supply is curtailed or The quick connect/disconnect enable be removed from the bathtub faucet bathtub faucet to operate in a conve

[56] **References Cited**
U.S. PATENT DOCUMENTS
2,608,412 8/1952 Bletcher et al. .
2,638,382 5/1953 Evans et al. .
2,647,798 8/1953 Ballard .
3,131,868 5/1964 Coleman .
3,136,570 6/1964 Lee .
4,198,080 4/1980 Carpenter .
5,024,419 6/1991 Mulvey .
5,046,763 9/1991 Marucci et al. .
5,070,553 12/1991 Chambers .
5,361,431 11/1994 Freier et al. .
5,478,046 12/1995 Szabo .

8 Claims, 4 Drawing

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. The arrangement set forth in FIG. 5 is preferred, 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. It will also be

IPR2024-00633: Paper 26, 35-36 (citing EX1017 (Bjerke), 7:24-29)
IPR2024-00634: Paper 28, 33 (citing EX1017 (Bjerke), 7:24-29)
IPR2024-00635: Paper 26, 20-21 (citing EX1017 (Bjerke), 7:24-29)

Motivation to Combine – Fluid Flow Connectors

“[I]t can be important to identify a reason that would have prompted a [POSITA] to combine the elements in the way the claimed new invention does” and “this analysis should be made explicit.”

KSR Int’l Co. v. Teleflex Inc., 550 U.S. 398, 418 (2007)

IPR2024-00633: Paper 36, 16

IPR2024-00634: Paper 38, 17

IPR2024-00635: Paper 36, 11

Guoxin in view of Ho:

'993 Grounds 1-2

'105 Grounds 1-2

'698 Ground 1

Overflow Tube / Overfill Tube

Integrally Molded With

Motivation to Combine – Quick Connect

Dependent Claims

Motivation to Combine – Quick Connection Art

Cas
Petition for Inter Partes Review

UNITED STATES PATENT AND TRADEMARK O
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DANCO, INC.
Patent Owner

Case IPR2024-00633
Patent 9,139,993 B1

PETITION FOR INTER PARTES REVIEW UNDER 37 C.F.R. § 42.100

regulator to the extended portion. To the extent Guoxin in view of Ho do not expressly disclose these mechanisms of attachment, it would have been obvious to a POSITA to use any known method of connecting two fluid channels to one another, such as any of those disclosed in the quick connection art. EX1004, ¶207. The '993

IPR2024-00633: Paper 1, 57

IPR2024-00634: Paper 1, 53

IPR2024-00635: Paper 1, 41

Motivation to Combine – Quick Connection Art

“[K]nowledge of a problem and motivation to solve it are entirely different from motivation to combine ***particular references...***”

Innogenetics, N.V. v. Abbott Labs., 512 F.3d 1363, 1373 (Fed. Cir. 2008)

IPR2024-00633: Paper 36, 16

IPR2024-00634: Paper 38, 17

IPR2024-00635: Paper 36, 11

Motivation to Combine – Quick Connection Art

– Calmettes:

- Provides a device for locking two coaxial tubes, “for example those constituting elements of a cooling circuit in a vehicle motor.”
- Further describes that these types of connections are “generally made of metal.”

– Hall:

- Given the timing of the invention (1911), likely refers to connections regarding metal pipes and/or rubber hoses, **not** plastic piping or tubing.
- Couplings depicted therein have characteristics of cast and/or machined metal parts, not molded plastic parts.

– Kimber:

- Relates to “the coupling of hoses to the radiators of automobiles.”

– Bjerke:

- Discloses a detachable bathtub shower system with mechanisms to prevent upward spray at the connection
- Requires movement of the quick connect/disconnect in an upward direction.

IPR2024-00633: Paper 26, 39-40 (citing EX2013, ¶¶173-174)

IPR2024-00634: Paper 28, 37-38 (citing EX2013, ¶¶172-173)

IPR2024-00635: Paper 26, 23-24 (citing EX2013, ¶¶118-119)

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Declaration of Michael Jobin

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Danco, Inc. - EX2013, Page 001
Fluidmaster, Inc. - IPR2024-00634

Guoxin in view of Ho:

'993 Grounds 1-2

'105 Grounds 1-2

'698 Ground 1

Overflow Tube / Overfill Tube

Integrally Molded With

Motivation to Combine

Dependent Claims

– Additional Exhibits

Motivation to Combine – Fluid Flow Connectors

Paper No. 28
Filed: March 19, 2025

UNITED STATES PATENT AND TRADEMARK OFFICE

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U.S. Patent No. 9,139,993 B1

PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE TO
PETITION

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Halliburton Oil Well Cementing Co., 324 U.S. 320, 330 (1945). That is, if replacing one coupling mechanism with another “as a matter of simple substitution” would “achieve the same locking function and achieve a predictable result,” then that is sufficient to satisfy *KSR*. *Ex Parte Franck Carrel & Laurent Barrelle*, No. 2013-006623, 2015 WL 6774483, at *3 (PTAB Oct. 23, 2015) (citing *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007)).

IPR2024-00633: Paper 36, 12-13

IPR2024-00634: Paper 38, 13-14

IPR2024-00634: Paper 38, 14

Motivation to Combine – Fluid Flow Connectors

Paper No. 28
Filed: March 19, 2025

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Moreover, the prior art confirms that such substitution would have predictable results (EX1004, ¶119) while satisfying the common goal of accurately controlling water flowing into the bowl. *Id.*, ¶114. It would additionally achieve the benefit of improved strength and integrity of connection. *Id.*, 19 (citing EX1004, ¶125).

119. In view of the foregoing, using a male connector on the bowl fill restriction, 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 preference. They 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.

IPR2024-00633: Paper 36, 13 (citing EX1004, ¶119)
IPR2024-00634: Paper 38, 14 (citing EX1004, ¶118)

Motivation to Combine – Fluid Flow Connectors

Paper No. 28
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Moreover, the prior art confirms that such substitution would have predictable results (EX1004, ¶119) while satisfying the common goal of accurately controlling water flowing into the bowl. *Id.*, ¶114. It would additionally achieve the benefit of improved strength and integrity of connection. *Id.*, 19 (citing EX1004, ¶125).

114. Both Guoxin and Ho are directed to toilet valve systems. *See, e.g.*, Guoxin (EX1016), p. 2 (title “Toilet Water Tank Water Supply Switching Device”); Ho (EX1022), p. 1 (title “Toilet Flushing Device”). The systems of both Guoxin and Ho utilize and describe bowl fill restrictions (e.g., “switching mechanism 4” in Guoxin and “diverter valve means 30” in Ho) that attach directly to the toilet fill valve to accurately control the amount of water that flows from the toilet fill valve into the toilet bowl.

IPR2024-00633: Paper 36, 13 (citing EX1004, ¶114)
IPR2024-00634: Paper 38, 14 (citing EX1004, ¶113)

Motivation to Combine – Fluid Flow Connectors

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Filed: March 19, 2025

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Moreover, the prior art confirms that such substitution would have predictable results (EX1004, ¶119) while satisfying the common goal of accurately controlling water flowing into the bowl. *Id.*, ¶114. It would additionally achieve the benefit of improved strength and integrity of connection. *Id.*, 19 (citing EX1004, ¶125).

125. Integrally molding the extended portion of Guoxin with the inlet device as taught by Ho would be advantageous in improving the strength and integrity of the connection, and to make it easier to manufacture and assemble. Thus, it would have been obvious to integrally mold the extended portion of Guoxin with the inlet device as taught by Ho achieve these benefits. In view of the foregoing, Guoxin, and the combination of Guoxin and Ho, satisfy element 1[A].

IPR2024-00633: Paper 36, 13 (citing EX1004, ¶125)
IPR2024-00634: Paper 38, 14 (citing EX1004, ¶125)

Guoxin in view of Ho:

'993 Grounds 1-2

'105 Grounds 1-2

'698 Ground 1

Overflow Tube / Overfill Tube

Integrally Molded With

Motivation to Combine

Dependent Claims

Integrally Molded With

9,139,993

- **Claim 5:** The system of claim 1, wherein the toilet fill valve further comprises:
 - a float; and
 - an actuating arm coupled to the float, wherein the actuating arm extends radially relative to a longitudinal axis of the toilet fill valve, wherein the actuating arm is angularly offset relative to the bowl fill valve, thereby preventing an interference with the water flow regulator and a translational stem that extends from the float to a free end of the actuating arm.

9,103,105

- **Claim 6:** The system of claim 1, wherein the toilet fill valve further comprises:
 - a float; and
 - an actuating arm coupled to the float, wherein the actuating arm extends radially relative to a longitudinal axis of the toilet fill valve, wherein the actuating arm is angularly offset relative to the bowl fill valve, thereby preventing an interference with the bowl fill restriction and a translational stem that extends from the float to a free end of the actuating arm.

Petition

Translational arm attached to float

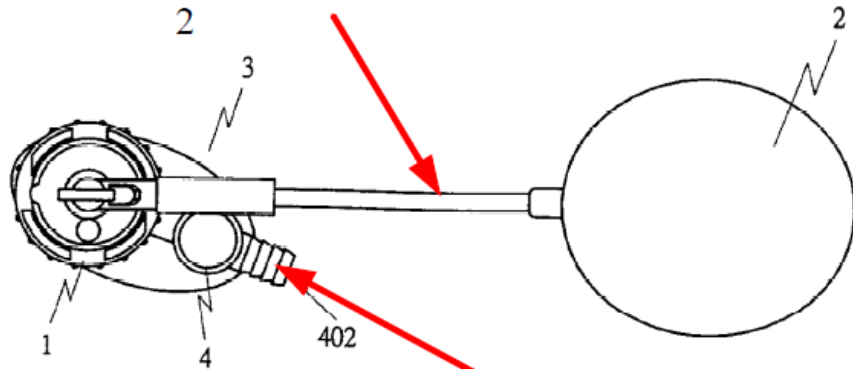
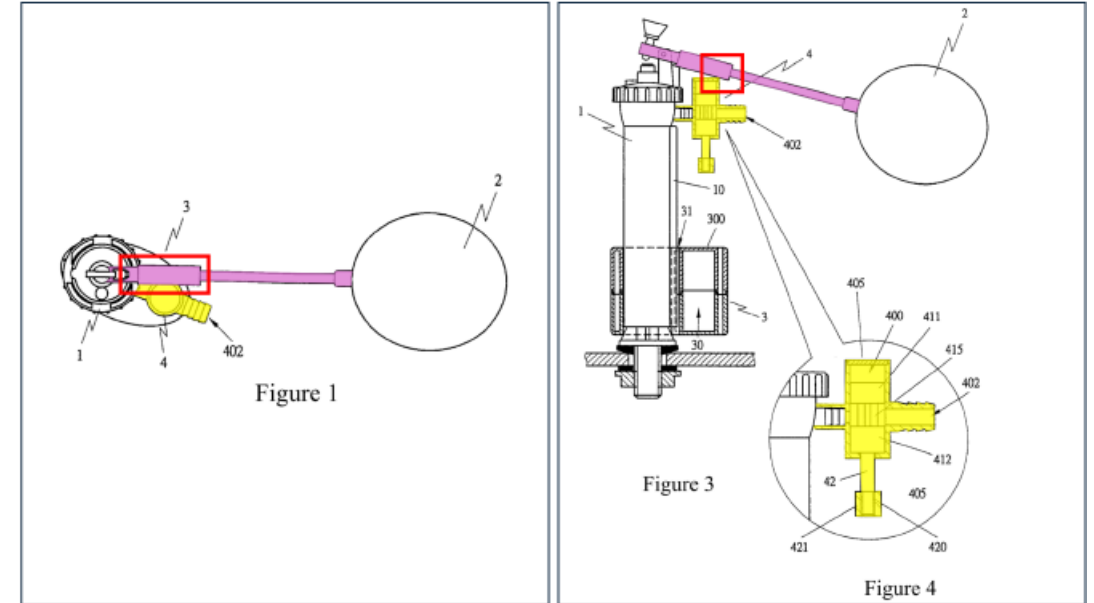


图 1

Water flow regulator attaches here
offset at an angle from float arm

Patent Owner's Response



IPR2024-00633: Paper 1, 53; Paper 26, 43

IPR2024-00634: Paper 1, 49; Paper 28, 41

4/23/2025 Fluidmaster, Inc. v. Danco, Inc. Kimberly

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U.S. Patent No. 9,103,105 B1
Case No. IPR2024-00635
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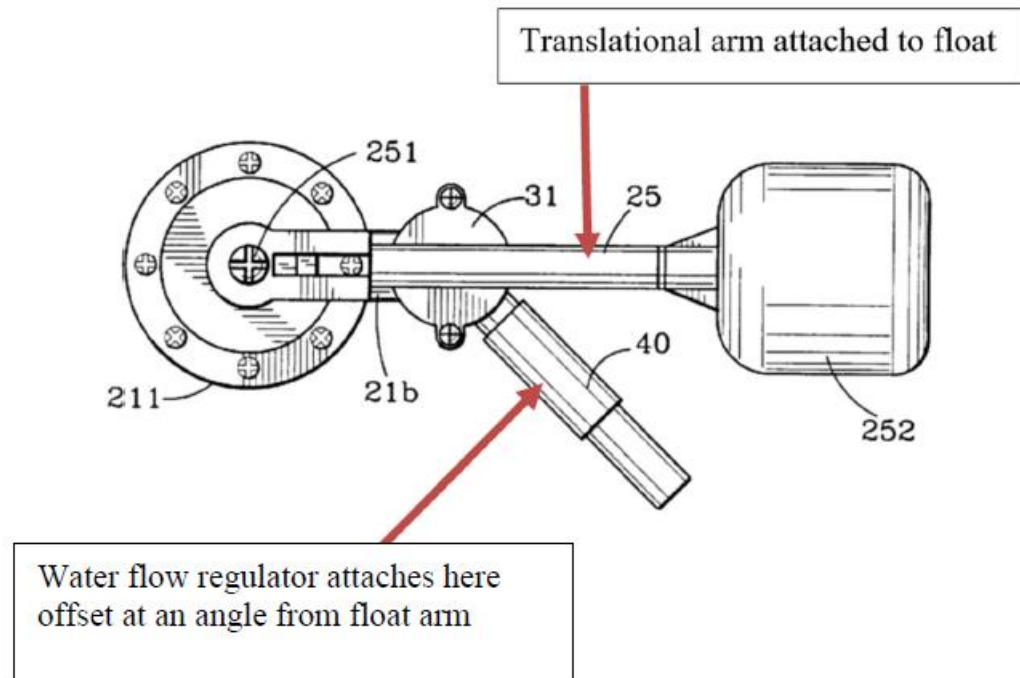
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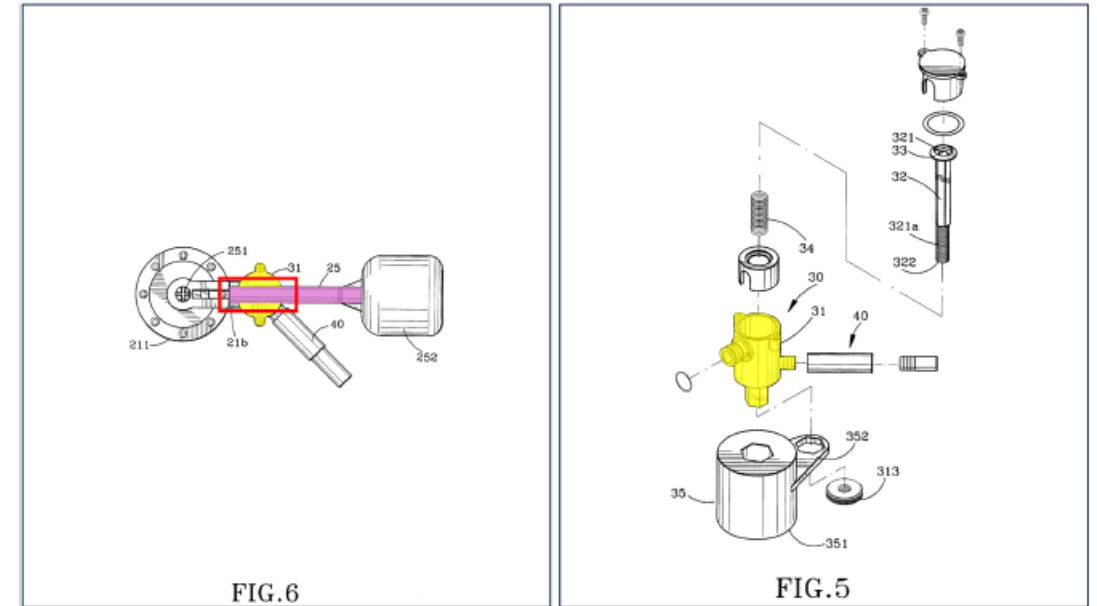
7 Q. Okay. And do you believe it's just a
8 coincidence that that rod happens to be depicted
9 contacting switching valve 42 [sic]?
10 MS. ACHARYA: Objection; form.
11 THE WITNESS: I suppose it's possible
12 that that thing is to prevent the float from going
13 down even further, but I think it's more likely
14 that, yes, that's a coincidence and that there's
15 another mechanism that's stopping that and that
16 that is probably not actually resting there, but I
17 don't know that for sure.

IPR2024-00633: Paper 36, 17 (citing EX2015, 164:4-169:20)
IPR2024-00634: Paper 38, 18 (citing EX2015, 164:4-169:20)

Petition



Patent Owner's Response



IPR2024-00633: Paper 1, 54; Paper 26, 45
 IPR2024-00634: Paper 1, 50; Paper 28, 43

Claims 19 and 20

(12) **United States Patent**
Schuster et al.

(10) **Patent No.:** **US 9,139,993 B1**
(45) **Date of Patent:** ***Sep. 22, 2015**

(54) **TOILET FILL VALVE**

(71) Applicant: **Danco, Inc.**, Irving, TX (US)

(72) Inventors: **Michael J. Schuster**, Shorewood, IL (US); **Larry Schneider**, Wadsworth, IL (US)

(73) Assignee: **Danco, Inc.**, Irving, TX (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.
This patent is subject to a terminal disclaimer.

(21) Appl. No.: **14/164,424**

(22) Filed: **Jan. 27, 2014**

Related U.S. Application Data

(63) Continuation of application No. 13/346,355, filed on Jan. 9, 2012, now Pat. No. 8,650,671, which is a continuation of application No. 12/786,904, filed on May 25, 2010, now Pat. No. 8,104,105, which is a continuation of application No. 10/958,797, filed on Oct. 5, 2004, now Pat. No. 7,743,436, which is a continuation-in-part of application No. 10/798,606, filed on Mar. 11, 2004, now Pat. No. 6,823,889.

(51) Int. Cl. **E03D 1/00** (2006.01)
E03D 1/32 (2006.01)

(52) U.S. Cl. **E03D 1/32** (2013.01)

(58) **Field of Classification Search**
CPC **E03D 1/32**
USPC 4/331, 324, 366, 415, 675; 285/91; 137/15.26, 432, 434, 436, 437, 137/441-444

See application file for complete search history.

(56) **References Cited**
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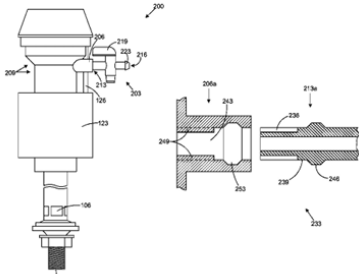
OTHER PUBLICATIONS

US Patent 6,823,889, File History, 2004-2005 Great-Great-Grandparent Patent to this Application (copy not attached).
(Continued)

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(57) **ABSTRACT**
In various embodiments, a water inlet of a toilet fill valve receives water from a water supply. A tank water outlet of the toilet fill valve provides a first portion of the water to a toilet tank. A bowl fill outlet port of the toilet fill valve provides a second portion of the water to a bowl fill restriction that is in direct contact with an extended portion of the toilet fill valve. The bowl fill restriction restricts the flow of the second portion of the water. The bowl fill restriction provides the second portion of the water to a tube that is in direct contact with the bowl fill restriction. The tube provides the second portion of the water to a toilet tank overflow tube.

20 Claims, 9 Drawing Sheets



19. The system of claim 1, wherein the water flow regulator comprises an adjustable water flow regulator that is configured to **adjust the flow rate of the second portion of the water** based at least in part on a setting of the adjustable water flow regulator.

Claim 1[D4]:

wherein the water flow regulator is configured to constrict **a flow rate of the second portion of the water that flows through the water flow regulator;** and

Claims 19 and 20

Case IPR2024-00633
Petition for Inter Partes Review of US 9,319,993 B1

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FLUIDMASTER, INC.

Petitioner

v.

DANCO, INC.
Patent Owner

Case IPR2024-00633
Patent 9,139,993 B1

PETITION FOR INTER PARTES REVIEW UNDER 37 C.F.R. § 42.101

d. Claims 19 & 20

Guoxin discloses an adjustable water flow regulator that adjusts the flow rate of water based on a setting of the water flow regulator. EX1016, 2:25-27; EX1004, ¶203. 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. EX1016, 2:27-33; EX1004, ¶203. Guoxin therefore discloses the elements of dependent claims 19 and 20. *Id.*

IPR2024-00633: Paper 1, 57

Claims 19 and 20

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PATENT OWNER'S SURREPLY TO PETITIONER'S REPLY

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

IPR2024-00633: Paper 36, 20
IPR2024-00635: Paper 36, 8-9

Claims 19 and 20

Paper No. 28
Filed: March 19, 2025

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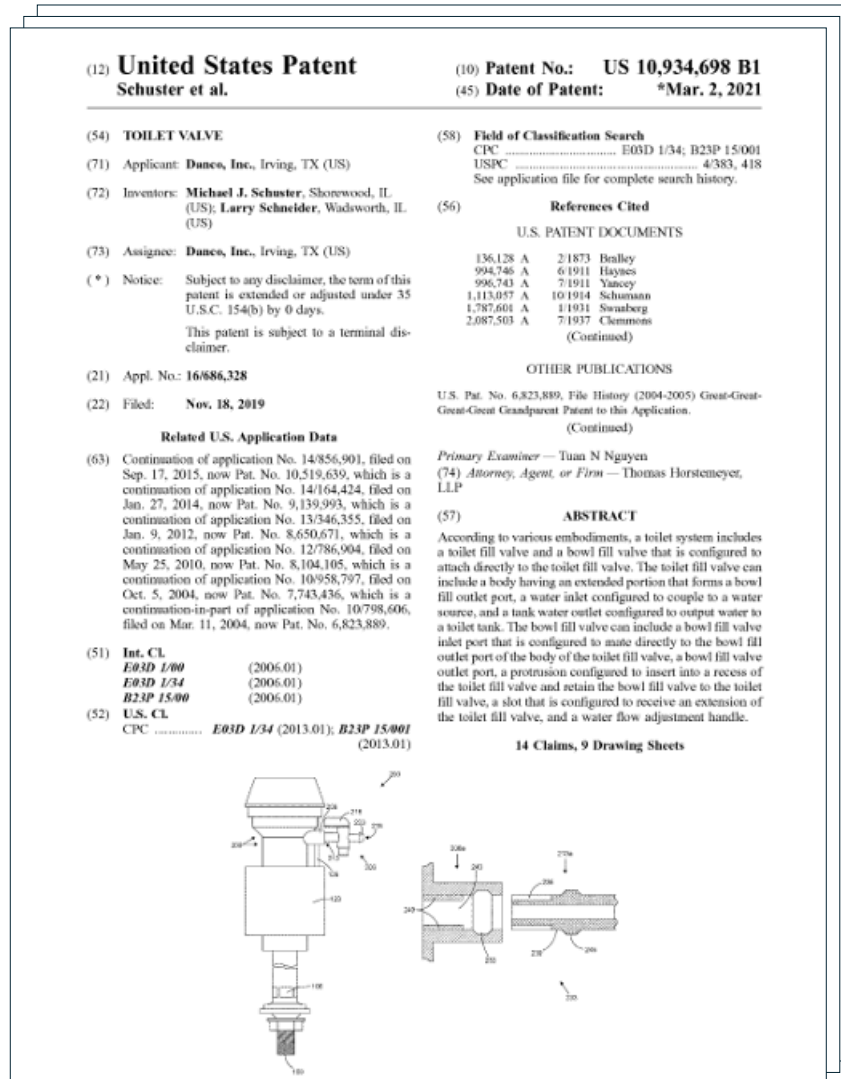
PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE TO
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55. ~~This is consistent with the specification of the '993 Patent,~~ which discusses the amount of water leaving the switching valve means during the time the tank is refilled. *See* EX1001, 4:43–53 (“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.”).

IPR2024-00633: Paper 30, 18 (citing EX1036, ¶55)
IPR2024-00635: Paper 30, 13 (citing EX1036, ¶31)

The Flow Limitations ('698 Patent)



- **Claim 1[B5]:** a *water flow* adjustment handle
- **Claim 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*
- **Claim 11:** adjusting a flow of water *out of the bowl fill valve*
- **Claim 12[E]:** means for adjusting water flow *out of the bowl fill valve outlet port*
- **Claim 13:** the means for adjusting water flow *out of the bowl fill valve outlet port* comprises an adjustment handle”

Brown:

'993 Grounds 3-4

'105 Grounds 3-4

Motivation to Combine / Reasonable Expectation of Success

Attach Directly to the Water Flow Regulator / Bowl Fill Restriction

Integrally Molded With

Dependent Claims

Replacing Brown's Set Screw with Ho's Diverter Valve

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Both Brown and Ho are directed to toilet valve systems that utilize and describe bowl fill restrictions (e.g., “set screw 26” in Brown and “diverter valve means 30” in Ho) that attach directly to the toilet fill valve to accurately control the amount of water that flows from the toilet fill valve into the toilet bowl. EX1004, ¶221; *see, e.g.*, EX1021, 1:2-4, 1:63-70, Figs. 1, 3, 4; EX1022, 1, 1:6-9, Figs. 1-5. Similar to the discussion above in Section VII.A with respect to Guoxin and Ho, the toilet fill valve connectors at issue here are likewise interchangeable; EX1004, ¶221. In view of the foregoing, using the bowl fill restriction of Ho instead of the bowl fill restriction shown in Brown, would have been obvious to a POSITA as a matter of design preference. *Id.*, ¶223.

IPR2024-00633: Paper 1, 65

IPR2024-00634: Paper 1, 60

Replacing Brown's Set Screw with Ho's Diverter Valve

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PATENT OWNER'S RESPONSE

Motivation to Combine:

A POSITA would not have replaced Brown's set screw 26 with Ho's diverter valve 30, because

- 1) they serve different flow control functions,
- 2) Brown explicitly teaches against employing a valve or flow regulator which does not restrict flow rate, and
- 3) Ho's diverter valve 30 serves no purpose in the Brown system.

Reasonable Expectation of Success:

- Replacing Brown's set screw 26 with Ho's diverter valve 30 in a horizontal configuration would defeat Brown's stated goals of reducing turbulence and noise caused by reversal of direction of flow.
- If, however, Ho's diverter valve was substituted in place of Brown's set screw 26 without altering the configuration, the diverter valve would not function properly due to not being properly oriented with respect to gravity.

IPR2024-00633: Paper 26 at 52, 55

IPR2024-00634: Paper 28 at 47, 50

Replacing Brown's Set Screw with Ho's Diverter Valve

Paper No. 28
Filed: March 19, 2025

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Motivation to Combine:

Brown and Ho share a common function, “to accurately control the amount of water that flows from the toilet fill valve into the toilet bowl.” EX1004, ¶221. The connectors in Brown and Ho are interchangeable (*id.*, ¶222) and can be substituted for one another to obtain predictable results. *Id.* ¶223.’

“[K]nowledge of a problem and motivation to solve it are entirely different from motivation to combine *particular references...*”

Innogenetics, N.V. v. Abbott Labs., 512 F.3d 1363, 1373 (Fed. Cir. 2008)

IPR2024-00633: Paper 30, 19-20; Paper 36, 23

IPR2024-00634: Paper 32, 19; Paper 38, 22

Replacing Brown's Set Screw with Ho's Diverter Valve

Paper No. 28
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Reasonable Expectation of Success:

PO's focus on how such a modification would be configured (POR, 55) is again speculative and wrong as it ignores that a POSITA would understand that toilet components must be sized and oriented appropriately to account generally for toilet designs. *See* EX1004, ¶415; EX1036, ¶¶83–84. There are a finite number of known techniques to achieve that result, meaning a POSITA could modify Brown in light of Ho with a reasonable expectation of success. *Id.*

The Federal Circuit “recognizes an important distinction between combining known options into a finite number of identified, predictable solutions, and merely throwing metaphorical darts at a board in hopes of arriving at a successful result.”

Leo Pharm. Prods. v. Rea, 726 F.3d 1346, 1357 (Fed. Cir. 2013) (cleaned up).

IPR2024-00633: Paper 30, 21; Paper 36, 24

IPR2024-00634: Paper 32, 20; Paper 38, 23

Integral Molding

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

Case IPR2
Petition for Inter Partes Review of US

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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v.

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Patent Owner

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Patent 9,139,993 B1

PETITION FOR INTER PARTES REVIEW UNDER 37 C.F.R. § 42.100

IPR2024-00633: Paper 1, 68

IPR2024-00634: Paper 1, 63

Integral Molding

“[A] party’s expert ‘succumbed to hindsight bias in her obviousness analysis’ where such analysis ‘primarily consisted of conclusory references to her belief that one of ordinary skill in the art **could combine these references**, not that they **would have been motivated to do so.**”

InTouch Techs., Inc. v. VGO Commc’ns, Inc., 751 F.3d 1327, 1352 (Fed. Cir. 2014)

The motivation to “do something new that [you] hadn't been able to do before ... is generic and bears no relation to any specific combination of prior art elements.”

ActiveVideo Networks, Inc. v. Verizon Communs., Inc., 694 F.3d 1312, 1328 (Fed. Cir. 2012)

IPR2024-00633: Paper 26, 51; Paper 36, 21-22

IPR2024-00634: Paper 28, 46; Paper 38, 20-21

Integral Molding

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PATENT OWNER'S RESPONSE

The Petition does not:

- 1) identify what the new molding techniques are,
- 2) provide any evidence that these techniques were not available in 1959,
- 3) identify any benefits to the allegedly new molding techniques over those available in 1959,
- 4) identify any deficiencies in the molding techniques used in 1959, or
- 5) provide any evidence or analysis at all in support of the conclusory allegation that a POSITA would have been motivated to use Ho's (unidentified) molding techniques to modify Brown's toilet fill valve.

Ho does not include any disclosure whatsoever regarding molding techniques.

IPR2024-00633: Paper 26, 56-57

IPR2024-00634: Paper 28, 51-52

Brown:

'993 Grounds 3-4

'105 Grounds 3-4

Motivation to Combine / Reasonable Expectation of Success

Attach Directly to the Water Flow Regulator / Bowl Fill Restriction

Integrally Molded With

Dependent Claims

- U.S. Patent No. 9,139,993:
 - Claims 1-20
- U.S. Patent No. 9,103,105:
 - Claims 1-24

The Challenged Claims

9,139,993

- **Claim 1:** a tube that is configured to attach directly to the water flow regulator
- **Claim 8:** providing, via the water flow regulator, the second portion of the water to a tube that is in contact with the water flow regulator
- **Claim 14:** attaching a tube directly to the water flow regulator

9,103,105

- **Claim 1:** a tube that is configured to attach directly to the bowl fill restriction
- **Claim 9:** providing, via the bowl fill restriction, the second portion of the water to a tube that is in contact with the bowl fill restriction
- **Claim 15:** attaching a tube directly to the bowl fill restriction
- **Claim 24:** a tube configured to attach directly to the bowl fill restriction

10,934,698

Attach Directly

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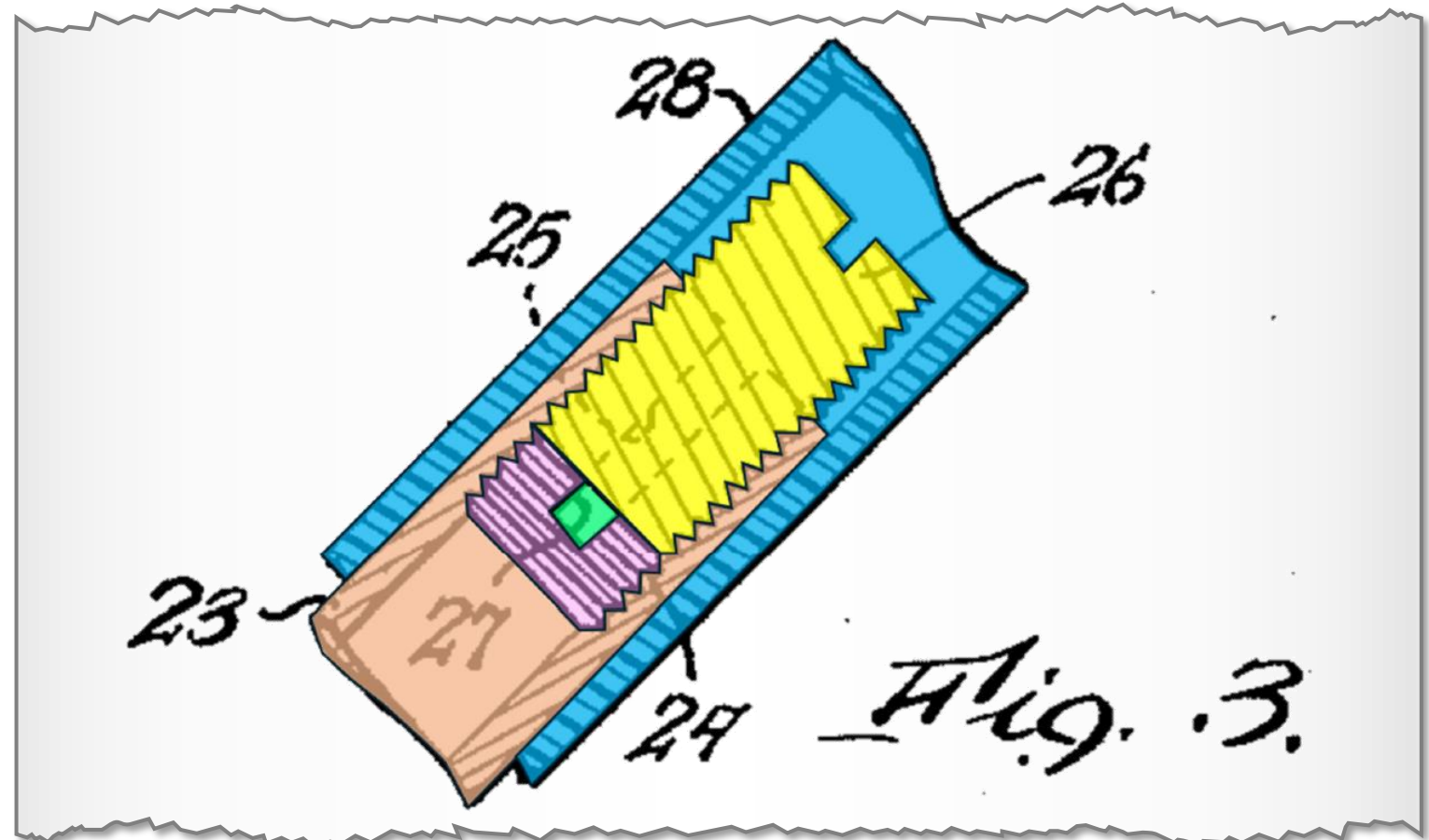
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PATENT OWNER'S SURREPLY TO PETITIONER'S REPLY



– Adapter tube 23 (brown/peach)

– Internally threaded portion 24 (purple)

– Diametrically opposed slots 25
(located behind set screw 26)

– Set screw 26 (yellow)

– Restricted opening 27 (green)

– Flexible tube 28 (blue)

IPR2024-00633: Paper 36, 24-25

IPR2024-00634: Paper 38, 23-24

Attach Directly

1[D1]	a water flow regulator configured to attach directly to the extended portion of the body,
1[D2]	wherein a portion of the water flow regulator is configured to insert into, and come into contact with, the extended portion of the body,
1[D3]	wherein the water flow regulator is configured to receive a second portion of the water from the bowl fill outlet port during at least a portion of the flush cycle,
1[D4]	wherein the water flow regulator is configured to constrict a flow rate of the second portion of the water that flows through the water flow regulator; and
1[E]	a tube that is configured to attach directly to the water flow regulator, wherein the tube is configured to direct the second portion of the water from the water flow regulator directly to a toilet tank overflow tube.



“Brown therefore satisfies this element.”
-- IPR2024-00633,
Paper 1, 70



“Brown alone or in view of Ho satisfies this element.”
-- IPR2024-00633,
Paper 1, 76

Attach Directly

PO wrongly argues Petitioner inconsistently identifies the “water flow regulator” of Brown. POR, 57–62. This misunderstands the evidence. Brown’s water flow regulator is the *combination* of the slotted portion of adaptor tube 23 *and* set screw 26. See EX1004, ¶245. Thus, Brown alone discloses Claim 1[D].

Moreover, tube 28 is attached directly to “the slotted portion 24 of the adaptor tube 23 that forms the metering valve and houses set screw 26.” EX1004, ¶247. Thus, Brown discloses a tube that attaches directly to slotted portion of adaptor tube 23 (which, *together* with set screw 26, forms the water flow regulator), satisfying Claim 1[E]. There is no inconsistency.

IPR2024-00633: Paper 30, 21-22

IPR2024-00634: Paper 32, 21

Filed: March 2024

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Attach Directly

“A petitioner may not rely on a vague, generic, and/or meandering petition and later fault the Board for failing to understand what the petition really meant.”

Netflix, Inc. v. DivX, LLC, 84 F.4th 1371, 1377 (Fed. Cir. 2023)

IPR2024-00633: Paper 36, 21

IPR2024-00634: Paper 38, 20

Brown:

'993 Grounds 3-4

'105 Grounds 3-4

Motivation to Combine / Reasonable Expectation of Success

Attach Directly to the Water Flow Regulator / Bowl Fill Restriction

Integrally Molded With

Dependent Claims

- U.S. Patent No. 9,139,993:
 - Claims 1-20
- U.S. Patent No. 9,103,105:
 - Claims 1-24

Integrally Molded With

9,139,993

- **Claim 1:** a body comprising an extended portion, wherein the extended portion is integrally molded with the body
- **Claim 8:** wherein the extended portion is integrally molded with the toilet fill valve
- **Claim 14:** wherein the extended portion is integrally molded with the body

9,103,105

- **Claim 1:** a body comprising an extended portion, wherein the extended portion is integrally molded with the body
- **Claim 9:** wherein the extended portion is integrally molded with the toilet fill valve
- **Claim 15:** wherein the extended portion is integrally molded with the body
- **Claim 24:** wherein the extended portion is integrally molded with the body

Integrally Molded With

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b. 1[A]

Brown discloses an extended portion 23 that is attached via threaded opening 21. EX1021, 2:65-67. Extended portion 23, or adapter tube 23 of Brown forms a bowl fill outlet port. EX1004, ¶229. Brown's extended portion 23 is integral to the toilet fill valve once attached via threaded opening 21 in view of Petitioner's claim construction. *Id.*

IPR2024-00633: Paper 1, 68
IPR2024-00634: Paper 1, 63

Integrally Molded With

Alternatively, it would have been obvious to mold the toilet fill valve body of

Brown together with the extended portion 23 in a single mold, given the more

recently developed molding techniques that were not readily available in 1959 when

Brown was filed. EX1004, ¶230. Moreover, Ho discloses integrally molded outlets

on a toilet fill valve body that are attached to a water flow regulator, thereby

rendering obvious integrally molding extended portion 23 with the toilet fill valve

body of Brown. *Id.*

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Brown:

'993 Grounds 3-4

'105 Grounds 3-4

Motivation to Combine / Reasonable Expectation of Success

Attach Directly to the Water Flow Regulator / Bowl Fill Restriction

Integrally Molded With

Dependent Claims

Priority:

'993 Ground 5

'105 Ground 5

The '606 Application

Genus/Species

Claims 19-20

Inadequate Disclosure in Petition

- U.S. Patent No. 9,139,993:
 - Claims 1-18
- U.S. Patent No. 9,103,105:
 - Claims 1-24

Priority

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

IPR2024-00633: Paper 26, 71, Fn. 16 (discussing that the “referenced disclosure [in the '606 application] is also present in each intervening application”)

IPR2024-00634: Paper 28, 65, Fn. 15 (discussing that the “referenced disclosure [in the '606 application] is also present in each intervening application”)

Priority: Terms in Question

9,139,993

- **Claim 1:** a water flow regulator configured to attach directly to the extended portion of the body
- **Claim 8:** providing, via a bowl fill outlet port of the toilet fill valve, a second portion of the water to a water flow regulator
- **Claim 14:** inserting a portion of a water flow regulator into an extended portion of a body of a toilet fill valve

9,103,105

- **Claim 1:** a bowl fill restriction configured to attach directly to the extended portion of the body
- **Claim 9:** providing, via a bowl fill outlet port of the toilet fill valve, a second portion of the water to a bowl fill restriction
- **Claim 15:** attaching a bowl fill restriction directly to an extended portion of a body of a toilet fill valve
- **Claim 24:** a bowl fill restriction configured to attach directly to the extended portion of the body of the toilet fill valve

Priority: What is the Inquiry?

Petitioner: The exact phrases “Bowl Fill Restriction” and “Water Flow Regulator” are not present, *in haec verba*, in the Detailed Description.

Here, PO will be unable to show that the applications in the ‘933 patent family lineage prior to January 27, 2014 provide written description support for the full scope of any Challenged Claim. EX1004, ¶324. The patent applications to which the ‘993 patent claims priority do not include the expressions “bowl fill restriction” or “water flow regulator.” *Id.*

Question: Is that the entire inquiry? Answer: No.

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PETITION FOR INTER PARTES REVIEW UNDER 37 C.F.R. § 42.100

IPR2024-00633: Paper 1, 91
IPR2024-00634: Paper 1, 84

Priority: What is the Inquiry?

Petitioner: PO stated that “bowl fill restriction” was broader than “bowl fill valve” during prosecution.

Moreover, during the prosecution of the '993 Patent, in which PO first claimed a “bowl fill restriction” in the place of a “bowl fill valve,” PO unequivocally stated that “bowl fill restriction” was “*broad*er than” the “bowl fill valve”. EX1002, 133.¹⁷

Question: Is that the entire inquiry? Answer: No.

Case IPR2024-00633
Petition for Inter Partes Review of US 9,319,993

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FLUIDMASTER, INC.
Petitioner

v.

DANCO, INC.
Patent Owner

Case IPR2024-00633
Patent 9,139,993 B1

PETITION FOR INTER PARTES REVIEW UNDER 37 C.F.R. § 42.100

IPR2024-00633: Paper 30, 26

IPR2024-00633: Paper 32, 25

Priority: What is the Inquiry?

“To satisfy the written description requirement, an application must describe the claimed invention in sufficient detail such that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention at the time of filing.”

Reiffin v. Microsoft Corp., 214 F.3d 1342, 1345 (Fed. Cir. 2000).

“The function of the written description requirement is to ensure that the inventor had possession of the specific subject matter later claimed as of the filing date of the application relied on; how the specification accomplishes this is not material.” *In re Herschler*, 591 F.2d 693, 700 (CCPA 1979)

Priority:

'993 Ground 5

'105 Ground 5

The '606 Application

Genus/Species

Claims 19-20

Inadequate Disclosure in Petition

- U.S. Patent No. 9,139,993:
 - Claims 1-18
- U.S. Patent No. 9,103,105:
 - Claims 1-24

IPR2024-00633: Paper 26, 71, Fn. 16 (discussing that the “referenced disclosure [in the '606 application] is also present in each intervening application”)

What did the Inventors Possess?

Docket No. 1008-100500

TOILET FILL VALVE WITH ADJUSTABLE BOWL FILL FLOW

BACKGROUND

[0001] A toilet fill valve in a toilet typically includes a water outlet that provides water for refilling a toilet bowl during a flush cycle. Unfortunately, the water flowing out of such conventional water outlets to fill a toilet bowl provide much more water than is necessary to fill the average toilet bowl. Consequently, much of the water that flows into a toilet bowl during the average flush cycle is lost down the drain. This translates into a loss of millions of gallons of water each year.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0002] The invention can be understood with reference to the following drawings. The components in the drawings are not necessarily to scale. Also, in the drawings, like reference numerals designate corresponding parts throughout the several views.

[0003] FIG. 1 is a drawing of a side view of a toilet fill valve according to an embodiment of the present invention;

[0004] FIG. 2 is a drawing of a top view of the toilet fill valve of FIG. 1; and

[0005] FIG. 3 is a drawing of a cutaway view of a toilet tank within which the toilet fill valve of FIG. 1 is installed.

DETAILED DESCRIPTION

[0006] With reference to FIG. 1, shown is a toilet fill valve 100 according to an embodiment of the present invention. The toilet fill valve 100 includes a water inlet 103 at the bottom of the toilet fill valve 100 that is configured to be coupled to a water source outside of a toilet tank within which the toilet fill valve 100 is installed. The toilet fill valve 100 includes one or more water outlets 106 that are configured to supply water into a toilet tank within which the toilet fill valve 100 is installed. The toilet fill valve 100 may be, for example, a pilot style fill valve. However, it is understood that

1

[0008] Within the toilet fill valve 100, the bowl fill valve inlet 113 is operatively coupled to the water inlet 103. In this respect, when the toilet fill valve 100 is open and water flows from the water inlet 103 to the water outlets 106 and into a toilet tank, an amount of water is also supplied to the bowl fill valve inlet 113 that flows through the bowl fill valve 109 and out the bowl fill valve outlet 116. By virtue of the manual setting of the handle 119 of the bowl fill valve 109, the flow of water through the bowl fill valve 109 is regulated. In this manner, 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.

IPR2024-00633: Paper 26, 69 (citing EX1001, 2:28-39 & EX1012, 47 ¶[0008])

IPR2024-00634: Paper 28, 63-64 (citing EX1001, 2:28-39 & EX1012, 47 ¶[0008])

drain.” EX1001, 2:28-39; EX1012, p. 047, ¶[0008]. Thus, the '606 Application clearly discloses *regulating an amount of water supplied* to a toilet bowl using a valve to avoid water loss *or, in other words, a water flow regulator* that regulates the flow of water such that “enough water flows out of the bowl fill valve 109 to fill a toilet bowl.” *Id.*; EX2013, ¶288.

IPR2024-00633: Paper 26, 69 (citing Dr. Jobin Dec. EX2013, ¶288)

IPR2024-00634: Paper 28, 64 (citing Dr. Jobin Dec. EX2013, ¶274)

What did the Inventors Possess?

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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.

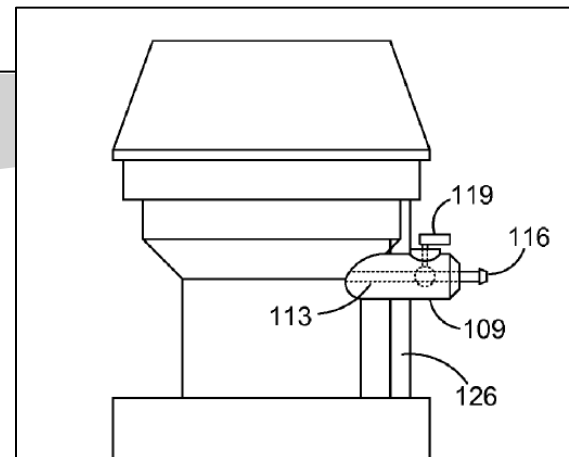
Case No. IPR2024-00634
U.S. Patent No. 9,103,105 B1

Declaration of Michael Jobin

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Danco, Inc. - EX2013, Page 001
Fluidmaster, Inc. - IPR2024-00634

This position is confirmed by reference to the figures filed with the '606 Application. Importantly, both bowl fill valve inlet 113 and bowl fill valve outlet 116 depict fixed restrictors, at least to the extent that they comprise devices with a reduced diameter relative to water inlet 103. As such, both bowl fill valve inlet 113 and bowl fill valve outlet 116 reduce the flow rate of any water passing through them. EX2013, ¶293.



IPR2024-00633: Paper 26, 74 (citing Dr. Jobin Dec. EX2013, ¶293)

IPR2024-00634: Paper 28, 68-69 (citing Dr. Jobin Dec. EX2013, ¶279)

What did the Inventors Possess?

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Additionally, the '606 Application identifies numerous types of “valves” which would have been considered by a POSITA. EX1012, p. 048, ¶[0012]. EX2013, ¶289. One example of a “valve” which would have been “appreciated by those with ordinary skill in the art” is a flow control valve. EX2009. Despite being commonly considered a “valve,” flow control valves are static (i.e., non-adjustable) devices which restrict the flow rate through the device. *Id.* As such, a POSITA would have understood the '606 Application to disclose both adjustable and non-adjustable flow control structures. EX2013, ¶290.

IPR2024-00633: Paper 26, 73 (citing Dr. Jobin Dec. EX2013, ¶289-290)

IPR2024-00634: Paper 28, 67-68 (citing Dr. Jobin Dec. EX2013, ¶275-276)

Priority:

'993 Ground 5

'105 Ground 5

The '606 Application

Genus/Species

Claims 19-20

Inadequate Disclosure in Petition

- U.S. Patent No. 9,139,993:
 - Claims 1-18
- U.S. Patent No. 9,103,105:
 - Claims 1-24

Disclosure of a Species Supports a Genus

Petitioner overlooks the “general rule that disclosure of a species provides sufficient written description support for a later filed claim directed to the genus.”

There is a “general rule that disclosure of a species provides sufficient written description support for a later filed claim directed to the genus.”

Bilstad v. Wakalopulos, 386 F.3d 1116, 1125 (Fed. Cir. 2004)

IPR2024-00633: Paper 26, 70

IPR2024-00634: Paper 28, 64

Bowl Fill Restriction / Water Flow Regulator

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271. **Restriction** is a concept of a geometry within a fluid system that hinders the flow of water, resulting in a pressure drop and reduced flow rate. As relevant to these proceedings, the term restriction is a generic term for something that restricts the flow of fluid through a system. It includes both adjustable devices (such as the typical valve) and static devices (such as the typical restrictor). Thus, a bowl fill restriction includes any device that restricts the flow of water from the toilet fill valve to toilet bowl.

272. I understand that during prosecution of a parent application, the patentee explained that a bowl fill restriction is broader in scope than a bowl fill valve, in that it includes both adjustable and static devices. This is consistent with my understanding of the term.

273. A **flow regulator** is any device that regulates the flow of fluid through a system. It includes both adjustable devices (such as the typical valve) and static devices (such as the typical restrictor). Thus, a water flow regulator includes any device that regulates the flow of water.

IPR2024-00633: Paper 26, 73 (citing Dr. Jobin Dec. EX2013, ¶280-287)

IPR2024-00634: Paper 28, 67 (citing Dr. Jobin Dec. EX2013, ¶266-273)

Written Description is Assessed in Context

“A patentee may rely on information that is well-known in the art to the extent it informs how a relevant artisan would reasonably understand what is actually described in the specification.”

BASF Plant Sci., LP v. Commonwealth Sci. & Indus. Research Organisation, 28 F.4th 1247, 1264 (Fed. Cir. 2022) (cleaned up)

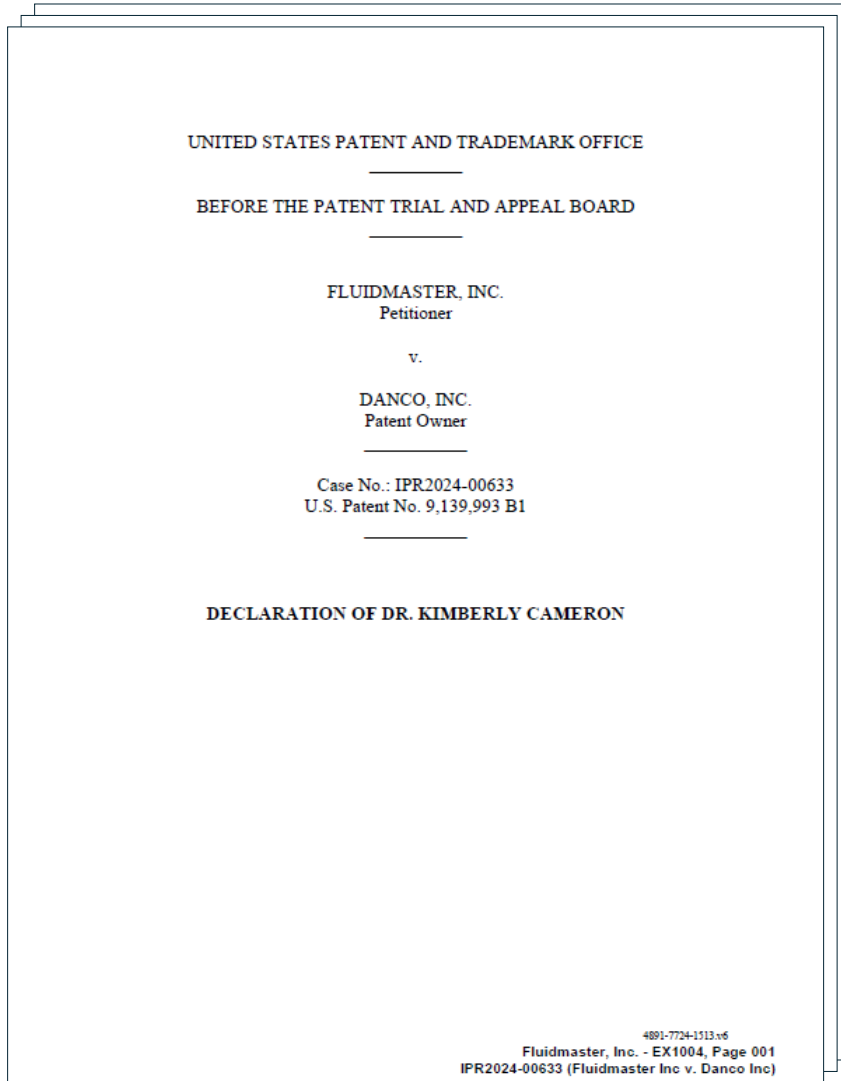
IPR2024-00634: Paper 38, 28

“The ‘written description’ requirement must be applied in the context of the particular invention and the state of the knowledge.... As each field evolves, the balance also evolves between what is known and what is added by each inventive contribution.”

Capon v. Eshhar, 418 F.3d 1349, 1358 (Fed. Cir. 2005)

IPR2024-00634: Paper 38, 28

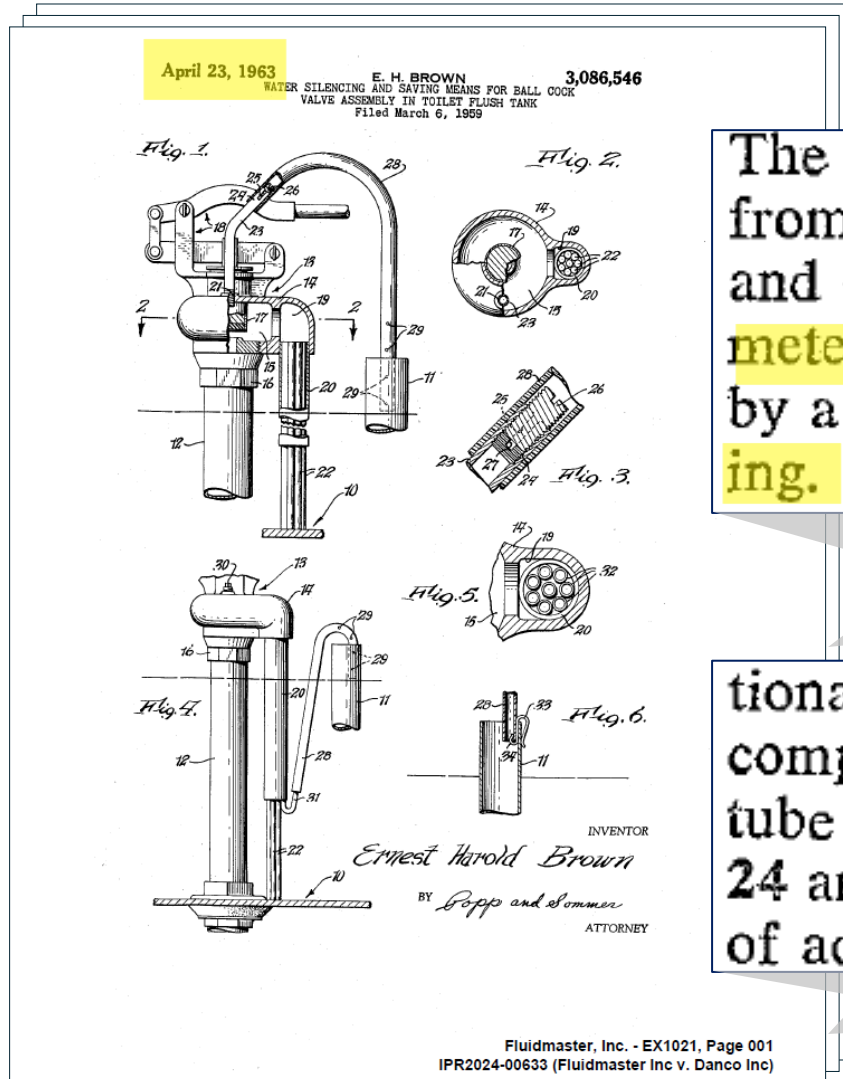
Written Description is Assessed in Context



84. Water saving mechanisms were also well known. For example, Brown discloses two water saving mechanisms. The first mechanism is a valve attached directly to the bowl refill outlet on the toilet fill valve that allows the amount of water flowing into the toilet bowl to “be reduced to the necessary minimum.” Brown (EX1021), 3:65-68. The second mechanism is a U-shaped tube extending from the bowl refill outlet of the toilet fill valve that has a smaller (restricted) diameter than conventional refill tubes but lacks the “feature of adjustability.” *Id.*, 4:20-44. Brown therefore informs a POSITA that both a bowl fill valve and a reduced diameter bowl fill tube can reduce the flow of water to the overflow tube, but that the reduced diameter bowl fill tube lacks adjustability.

IPR2024-00634: Paper 38, 27 (citing EX1004, ¶¶82-86)

Written Description is Assessed in Context



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 substan-

tional 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.

IPR2024-00634: Paper 38, 27 (citing EX1021, 4:20-44)

What are the Exceptions?

“If the difference between members of the group is such that the person skilled in the art would not readily discern that other members of the genus would perform similarly to the disclosed members, *i.e.*, if the art is unpredictable, then disclosure of more species is necessary to adequately show possession of the entire genus.”

Bilstad v. Wakalopulos, 386 F.3d 1116, 1125 (Fed. Cir. 2004)

“[U]npredictability in the particular field may warrant closer scrutiny of whether disclosure of a species is sufficient to describe a genus.”

Bilstad v. Wakalopulos, 386 F.3d 1116, 1125 (Fed. Cir. 2004)

IPR2024-00633: Paper 26, 71-72

IPR2024-00634: Paper 28, 66

How Large is the Group?

4/23/2025 Fluidmaster, Inc. v. Danco, Inc. Kimberly K.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FLUIDMASTER, INC.
Petitioner,
v.
DANCO, INC.
Patent Owner.

Case No. IPR2024-00633
U.S. Patent No. 9,139,993 B1
Case No. IPR2024-00634
U.S. Patent No. 9,103,105 B1
Case No. IPR2024-00635
U.S. Patent No. 10,934,698 B1

Deposition of Kimberly K. Cameron, PH.D.
Conducted Remotely
Wednesday, April 23, 2025
9:05 a.m. Mountain Time

Reported by: Matthew Goldstein, RMR, CRR

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Danco, Inc. - EX2015, Page 001
Fluidmaster, Inc. v. Danco, Inc. - IPR2024-00633

2 Q. So is it fair to say that every device
3 for regulating a flow rate of an amount of water
4 flowing therethrough would be either a fixed
5 device or an adjustable device?

6 A. That would be how I think about it. I,
7 of course, don't have every possible device in
8 front of me right now, but that would be my
9 understanding, yes.

10 Q. Sitting here today, you're not aware of
11 a third category of devices besides fixed and
12 adjustable devices?

13 A. That's correct.

IPR2024-00633: Paper 36, 29 (citing EX2015,47:2-13)

IPR2024-00634: Paper 38, 28 (citing EX2015,47:2-13)

How Predictable is the Field?

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Case No. IPR2024-00634
U.S. Patent No. 9,103,105 B1

Declaration of Michael Jobin

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Danco, Inc. - EX2013, Page 001
Fluidmaster, Inc. - IPR2024-00634

Here, the '105 Patent is in the predictable “mechanical world” like the claims at issue in *Bilstad*. Petitioner admits that “fluid flow restrictors or diverters were well-known.” Paper 1, 19. Given the known regulators, restrictions, and valves at the time of the '606 Application which similarly regulate an amount/flow of water, the reasonable conclusion is that a single species is adequate support for a genus claim. EX2013, ¶¶266-273.

IPR2024-00633: Paper 26, 72 (citing Dr. Jobin Dec. EX2013, ¶280-287)

IPR2024-00634: Paper 28, 66 (citing Dr. Jobin Dec. EX2013, ¶266-273)

Adjustability

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

PATENT OWNER'S SURREPLY TO PETITIONER'S REPLY

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

IPR2024-00633: Paper 36, 28

IPR2024-00634: Paper 38, 27

Priority:

'993 Ground 5

'105 Ground 5

The '606 Application

Genus/Species

Claims 19-20

Inadequate Disclosure in Petition

- U.S. Patent No. 9,139,993:
 - Claims 19-20

Claims 19 and 20

(12) **United States Patent**
Schuster et al.

(10) **Patent No.:** US 9,139,993 B1
(45) **Date of Patent:** *Sep. 22, 2015

(54) **TOILET FILL VALVE**

(71) Applicant: **Danco, Inc.**, Irving, TX (US)

(72) Inventors: **Michael J. Schuster**, Shorewood, IL (US); **Larry Schneider**, Wadsworth, IL (US)

(73) Assignee: **Danco, Inc.**, Irving, TX (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.
This patent is subject to a terminal disclaimer.

(21) Appl. No.: **14/164,424**

(22) Filed: **Jan. 27, 2014**

Related U.S. Application Data

(63) Continuation of application No. 13/346,355, filed on Jan. 9, 2012, now Pat. No. 8,650,671, which is a continuation of application No. 12/786,904, filed on May 25, 2010, now Pat. No. 8,104,105, which is a continuation of application No. 10/958,797, filed on Oct. 5, 2004, now Pat. No. 7,743,436, which is a continuation-in-part of application No. 10/798,606, filed on Mar. 11, 2004, now Pat. No. 6,823,889.

(51) Int. Cl. **E03D 1/00** (2006.01)
E03D 1/32 (2006.01)

(52) U.S. Cl. **E03D 1/32** (2013.01)

(58) **Field of Classification Search**
CPC **E03D 1/32**
USPC 4/331, 324, 366, 415, 675; 285/91; 137/15.26, 432, 434, 436, 437, 137/441-444
See application file for complete search history.

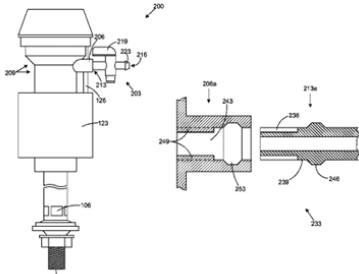
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(Continued)

OTHER PUBLICATIONS
US Patent 6,823,889, File History, 2004-2005 Great-Great-Grand-parent Patent to this Application (copy not attached).
(Continued)

Primary Examiner — Tuan N Nguyen
(74) **Attorney, Agent, or Firm** — Thomas I Horstemeier, LLP

(57) **ABSTRACT**
In various embodiments, a water inlet of a toilet fill valve receives water from a water supply. A tank water outlet of the toilet fill valve provides a first portion of the water to a toilet tank. A bowl fill outlet port of the toilet fill valve provides a second portion of the water to a bowl fill restriction that is in direct contact with an extended portion of the toilet fill valve. The bowl fill restriction restricts the flow of the second portion of the water. The bowl fill restriction provides the second portion of the water to a tube that is in direct contact with the bowl fill restriction. The tube provides the second portion of the water to a toilet tank overflow tube.

20 Claims, 9 Drawing Sheets



19. The system of claim 1, wherein the water flow regulator comprises **an adjustable water flow regulator** that is configured to adjust the flow rate of the second portion of the water based at least in part on a setting of the adjustable water flow regulator.

20. The method of claim 14, wherein the water flow regulator comprises **an adjustable water flow regulator** that is configured to adjust the flow rate of the water based at least in part on a setting of the adjustable water flow regulator.

IPR2024-00633: Exhibit 1001, 12:15-25

Claims 19 and 20: U.S. Patent No. 9,139,993

Paper No. 28
Filed: March 19, 2025

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FLUIDMASTER, INC.

Petitioner

v.

DANCO, INC.
Patent Owner

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

PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE TO
PETITION

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Alexandria, VA 22313-1450

C. Claims 19 and 20

Petitioner agrees that these claims recite “an adjustable water flow regulator.”

POR, 76. They are nevertheless unpatentable for the separate reasons set forth in Grounds 1 & 3 in the Petition and herein.

IPR2024-00633: Paper 30, 28

Priority:

'993 Ground 5

'105 Ground 5

The '606 Application

Genus/Species

Claims 19-20

Inadequate Disclosure in Petition

- U.S. Patent No. 9,139,993:
 - Claims 1-18
- U.S. Patent No. 9,103,105:
 - Claims 1-24

Inadequate Disclosure

Case IPR2024-00633
Petition for Inter Partes Review of US 9,319,993

336. Schuster discloses a toilet fill valve having an extended portion 206 that is integrally molded with the water toilet fill valve, as shown in Figure 4 above.

Schuster thus satisfies this element.

EX1004, ¶ 336

v.

DANCO, INC.
Patent Owner

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Patent 9,139,993 B1

PETITION FOR INTER PARTES REVIEW UNDER 37 C.F.R. § 42.100

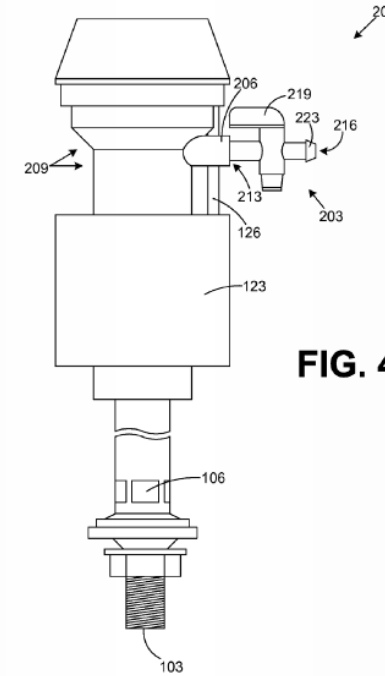


FIG. 4

ii. 1[A]

Schuster discloses a toilet fill valve having an extended portion 206 that is integrally molded with the water toilet fill valve, as shown in Figure 4 above.

EX1004, ¶336. Schuster thus satisfies this element. *Id.*

IPR2024-00633: Paper 1, 94 (citing EX1004, ¶ 336)

IPR2024-00634: Paper 1, 87

Inadequate Disclosure

Second, contrary to PO's claim, Schuster does disclose an extended portion 206 in Fig. 4, which is "integrally molded" with the fill valve. See ~~EX1004, ¶336, EX1029, 6.1-10, EX1036, ¶91~~. PO's expert confirmed this. ~~EX1037, 47.4-23~~.

IPR2024-00633: Paper 30, 28

"The Board may exclude or give no weight to the evidence where a party has failed to state its relevance or to identify specific portions of the evidence that support the challenge."

37 C.F.R. §42.104(b)

IPR2024-00634: Paper 28, 17

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PETITIONER'S

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