

NIAGARA 6.1-008

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NEW JERSEY

NIAGARA CONSERVATION
CORPORATION.,

PLAINTIFF,

v.

AM CONSERVATION GROUP,
INC.,

DEFENDANT.

04-6344
Civil Action No.: C/KSH

COMPLAINT FOR PATENT
INFRINGEMENT

DEMAND FOR JURY TRIAL

Plaintiff, by its attorney, as and for its complaint against the defendant, complain
and allege as follows:

Parties

1. Niagara Conservation Corporation, a corporation organized under the laws of New Jersey, is located at 45 Horsehill Road, Cedar Knolls, New Jersey 07927. Niagara Conservation Corporation is hereinafter referred to as "Niagara."

2. Upon information and belief, defendant AM Conservation Group, Incorporated (hereinbelow sometimes referred to as "AM") is a business organization and has a regular and established place of business at 911 W. Hamilton Street, Allentown, PA 18101.

Jurisdiction and Venue

3. This is an action for patent infringement under the patent laws of the United States (Title 35, United States Code). This Court has jurisdiction under 28 U.S.C. §1332 and 1338. Venue is proper in this judicial district under the provisions of 28 U.S.C. §1391 and 1400(b).

4. Defendant AM is doing business and is carrying out the wrongful acts within the jurisdiction of this Court, by selling infringing products that infringe the numbered patents as set forth below.

Cause of Action for Patent Infringement

5. Niagara owns United States Letters Patent No. 5,143,300 entitled "Showerhead." A copy of said patent is attached hereto as Exhibit A.

6. Niagara is a licensee of United States Letters Patent No. 5,287,565 owned by RCT Incorporated entitled "Water Saving Dispensing Device." A copy of said patent is attached hereto as Exhibit B.

7. Niagara owns United States Letters Patent No. 5,259,075 entitled "Water-Saving Device for a Water Closet." A copy of said patent is attached hereto as Exhibit C

8. United States Letters Patent Numbers 5,143,300; 5,287,565; and 5,259,075 (hereinafter collectively referred to as "the Patents in Suit") are subsisting, unexpired and in full force and effect.

9. Niagara is the owner and/or licensee of the entire right, title and interest in and to the Patents-in-Suit and has the right to sue for infringement thereof and for an injunction and damages for such infringement.

10. Upon information and belief, Niagara has given notice of the Patents-in-Suit by duly and properly marking products incorporating the inventions of the Patents-in-Suit in accordance with 35 U.S.C. §287.

11. Upon information and belief, Defendant AM has sold and induced others to use infringing products which correspond to and come within the scope of the claims of said Patents-in-Suit, and has thereby infringed said Patents within the District of New Jersey and elsewhere in the United States, all of which was done willfully and without the consent of Niagara.

12. Upon information and belief, Defendant AM has been given notice of the Patents-in-Suit and knows of its infringements thereof, but has failed to discontinue such infringements, and has continued to sell and induce the use of infringing products corresponding to and coming within the scope of the claims of said Patents, in knowing and willful infringement of said Patents.

13. Defendant AM has made unlawful gains and profits from its infringement of the Patents-in-Suit, and Plaintiff has been deprived thereby of rights and profits which would otherwise come to Plaintiff. The infringing activities of AM have significantly diminished the commercial value of Plaintiff's products and have materially damaged Plaintiff's business therein. AM has thereby caused Niagara monetary damage in the amount of at least \$300,000, and threatens to continue to cause Niagara irreparable damage unless relief is granted to Niagara by this Court.

WHEREFORE, plaintiff Niagara prays for:

A. Preliminary and permanent injunctions enjoining and restraining the defendant, its officers, agents, servants, employees, privies, successors and assigns, and all persons in active concert, participation and combination with them, from selling or causing to be sold or inducing others to sell, or using or causing to be used or inducing others to use, any infringing products covered by or coming within the scope of the Patents-in-Suit, or otherwise infringing said Letters Patent Numbers 5,143,300; 5,287,565; and 5,259,075

B. An order requiring the defendant and its officers, agents, servants and employees to deliver up to this Court for destruction all products infringing said Letters Patent Numbers 5,143,300; 5,287,565; and 5,259,075 or the use of which would infringe any of said Letters Patent.

C. An order requiring the defendant to account for and to pay over to the plaintiff all proceeds made by defendant by reason of the wrongful acts of patent infringement complained of herein, and pay to plaintiff all damages incurred by plaintiff by such wrongful acts including lost profits, and not less than a reasonable royalty as may be determined by an accounting, and that said damages be trebled pursuant to 35 U.S.C. §284 in view of the flagrant and willful nature of defendant's conduct.

D. An order requiring the defendant to pay plaintiff its costs and disbursements in this action together with all reasonable attorney's fees pursuant to 35 U.S.C. §285.

E. Such other and further relief as the Court may deem just and equitable and as the circumstances warrant.

Demand for Jury Trial

Plaintiff demands a trial by jury on all issues of fact in this case.

Respectfully submitted,

Dated: December 27, 2004



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Attorney for Plaintiff
Niagara Conservation Corporation

exhibit A



US005143300A

United States Patent [19][11] **Patent Number:** 5,143,300**Cutler**[45] **Date of Patent:** Sep. 1, 1992[54] **SHOWERHEAD**

[56]

References Cited**U.S. PATENT DOCUMENTS**[76] **Inventor:** William Cutler, 230 Rte. 206, Bldg. #2, Flanders, N.J. 07836

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4,591,098	5/1986	Ridenour	239/586

[21] **Appl. No.:** 547,051

Primary Examiner—Andres Kashnikow
Assistant Examiner—Karen B. Merritt
Attorney, Agent, or Firm—Ezra Sutton

[22] **Filed:** Jul. 2, 1990

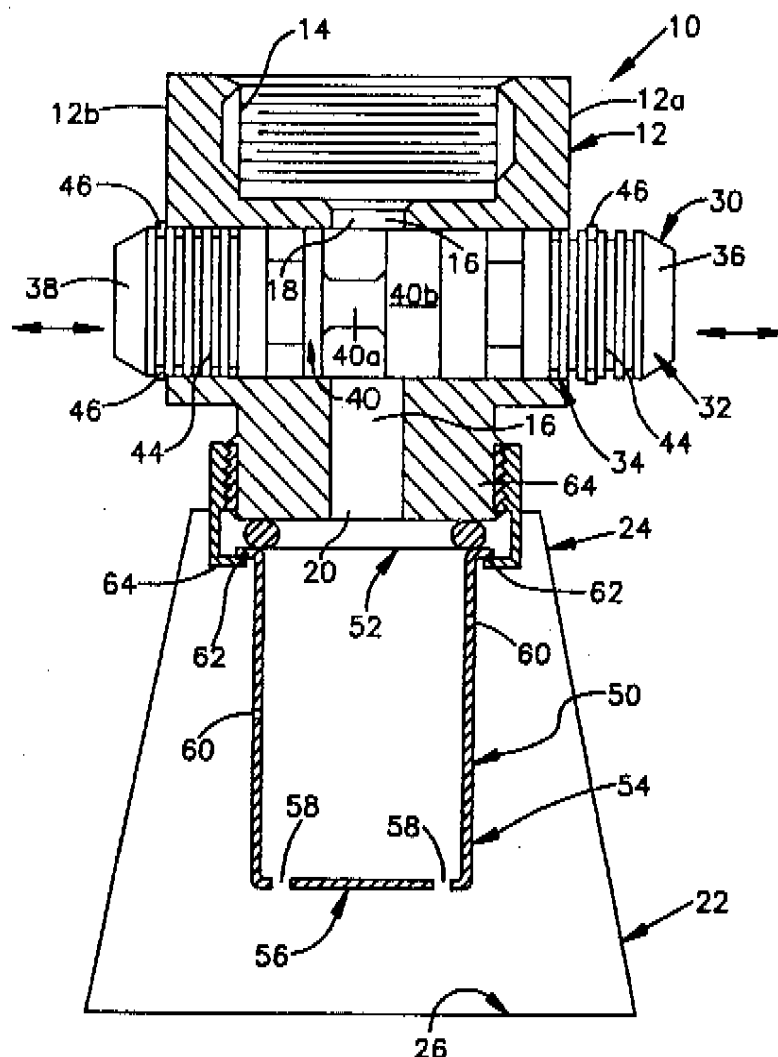
[57]

ABSTRACT

A showerhead having a water-pressure regulator in the form of a presettable pin and a one-piece, cup-shaped member disposed in the nozzle for controlling the fluid spray.

[51] **Int. Cl.** B05B 1/18[52] **U.S. Cl.** 239/562; 239/586; 239/590.3[58] **Field of Search** 239/586, 589, 282, 562, 239/567, 288.5, 590.3, 596

8 Claims, 3 Drawing Sheets



Ex. A

U.S. Patent

Sep. 1, 1992

Sheet 1 of 3

5,143,300

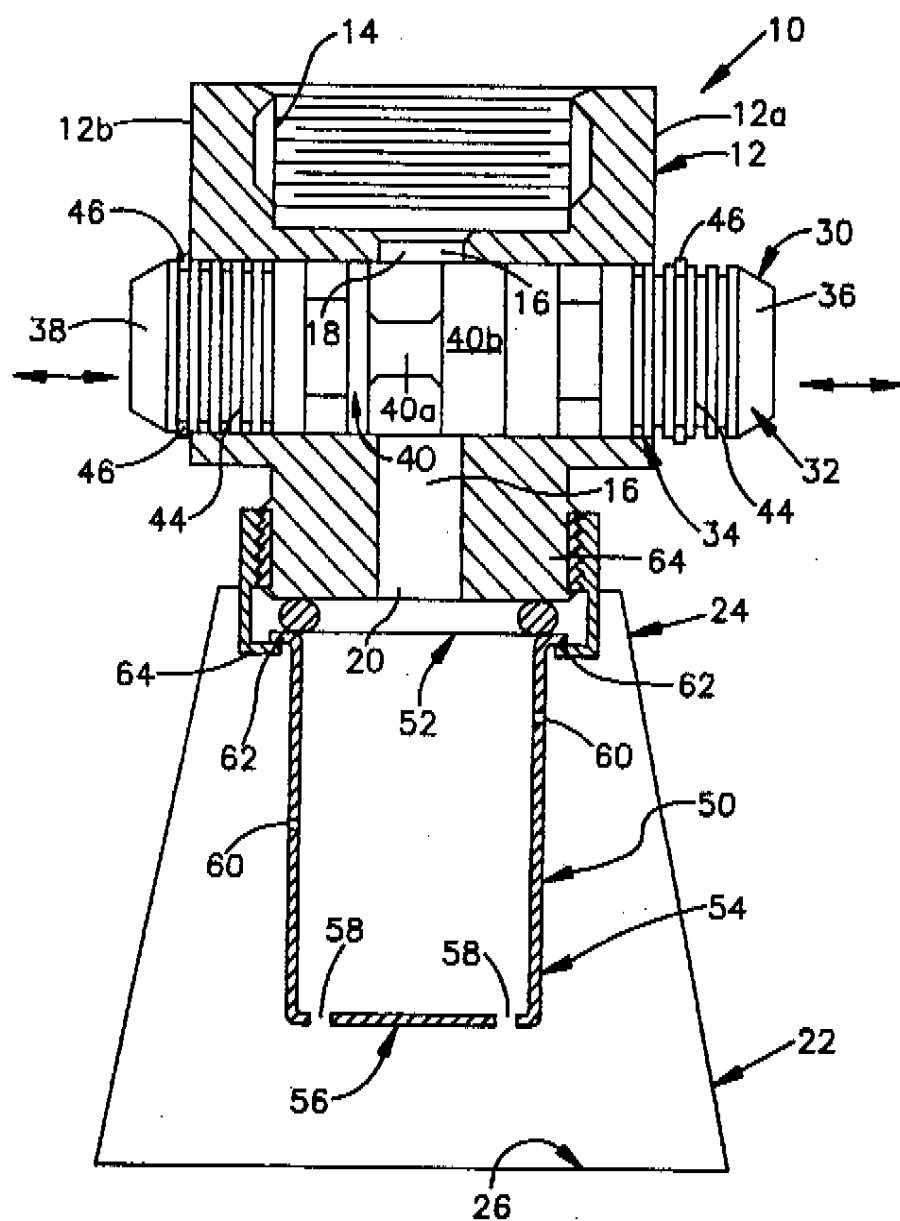


FIG. 1

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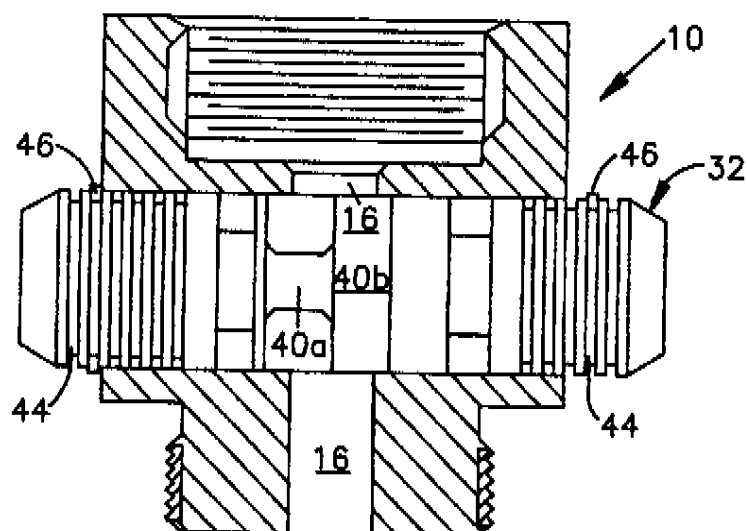


FIG. 2

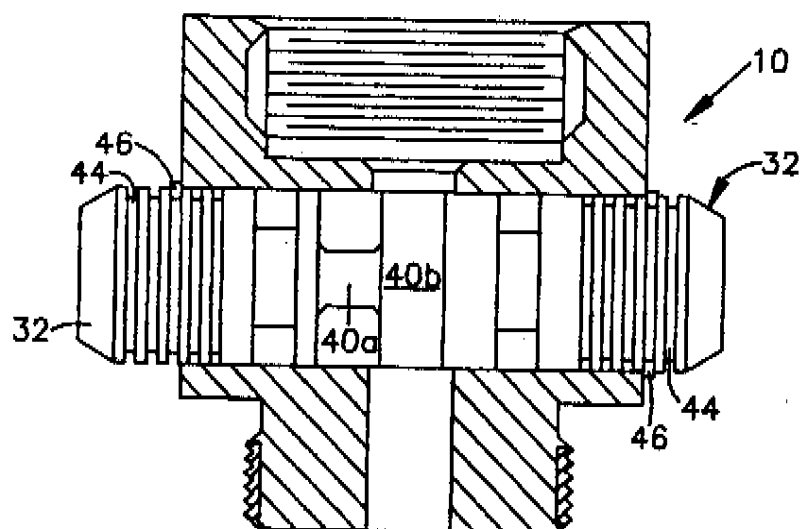


FIG. 3

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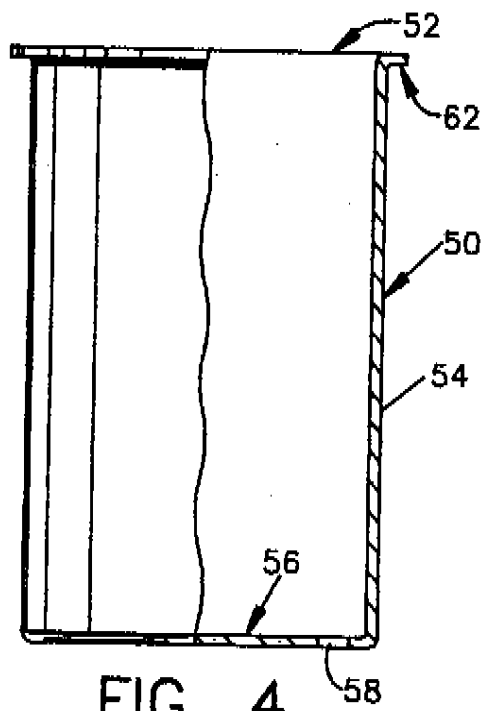


FIG. 4

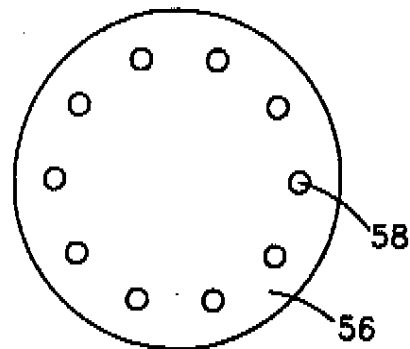


FIG. 5

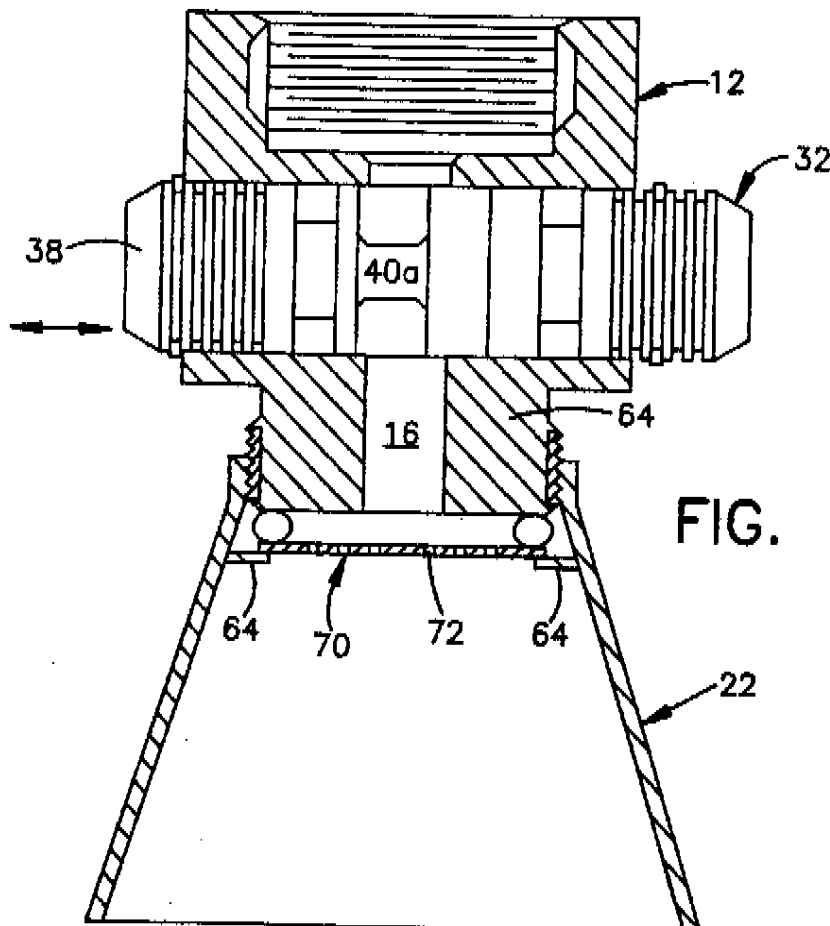


FIG. 6

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SHOWERHEAD

FIELD OF THE INVENTION

The present invention relates to a showerhead which includes a device to make the showerhead operate in a quiet, non-aerating manner, and which includes a water-pressure regulator to control the amount and pressure of the water emitted from the showerhead.

BACKGROUND OF THE INVENTION

The prior art showerheads do not include a water-pressure regulator in the form of a presettable pin or a one-piece, cup-shaped member disposed in the nozzle for controlling the fluid spray.

It is an object of the present invention to provide a showerhead which accomplishes the foregoing.

SUMMARY OF THE INVENTION

In accordance with the principles of the present invention, there is provided a showerhead for attachment to a fluid supply; a nozzle having an inlet end connected to the fluid supply and an outlet end; a cylindrical cup-shaped member disposed in said nozzle and having an open end in fluid communication with the water supply and another end having a circular disc section with spray-forming holes formed therein. The showerhead also includes a water-pressure regulator having a movable pin movable relative to the nozzle to restrict the flow of water through the nozzle as the pin is moved in one direction, and to increase the flow of water through the nozzle as the pin is moved in the opposite direction.

BRIEF DESCRIPTION OF THE DRAWINGS

Further objects, features, and advantages of the present invention will become apparent upon the consideration of the following detailed description of the presently-preferred embodiment when taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a cross-sectional view of the showerhead with the pressure regulator pin in one position;

FIG. 2 is a cross-sectional view of the showerhead with the pressure regulator pin in a second position;

FIG. 3 is a cross-sectional view of the showerhead with the pressure regulator in a third position;

FIG. 4 is a cross-sectional view of the cup-shaped member;

FIG. 5 is a plan view of the disc portion of the cup-shaped member; and

FIG. 6 is a cross-sectional view of the showerhead with the water pressure regulator and a conventional spray disc.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The showerhead 10 of the present invention includes an annular member 12 for attaching the showerhead to a water pipe (not shown) or fluid supply. Annular member 12 includes an internally-threaded section 14 for connection to the fluid supply. The annular member 12 further includes a fluid channel 16 having an inlet port 18 and an outlet port 20. A nozzle 22 is threadably connected to member 12 and has an inlet end 24 and an outlet end 26.

In one embodiment, the fluid channel 16 has a water-pressure regulator 30 movably mounted therein, which includes a movable pin 32, movable in a cylindrical

channel 34, for controlling the flow of fluid through fluid channel 16 and nozzle 22.

The movable pin 32 has end sections 36 and 38 and a mid-section 40 having a reduced diameter section at 40a and a restrictor at 40b having a full diameter relative to channel 34. Pin 32 has a plurality of grooves 44 on each end and selector rings 46 disposed in grooves 44. A detent may be used in place of selector rings 46.

Pin 32 is movable into different positions for controlling fluid flow. To select and preset the maximum flow position shown in FIG. 1, selector ring 46 is placed in left-most groove 44, and all of reduced section 40a is disposed within fluid channel 16, which allows the maximum amount of fluid or water to flow through channel 16. For example, this maximum position typically allows 2.2 gallons of water per minute to flow at a pressure of 70 psi. In an intermediate flow position shown in FIG. 2, selector ring 46 is placed in a different groove 44, and only a portion of reduced section 40a is disposed within fluid channel 16, which reduces the amount of water which flows through channel 16. For example, in this intermediate position of movable pin 32, 1.6 gallons of water per minute will flow at 60 psi. In the minimum flow position shown in FIG. 3, selector ring 46 is shown placed in a groove 44, and only a minimum portion of reduced section 40a is disposed in fluid channel 16 and allows the minimum amount of water to flow through channel 16. For example, this minimum position typically allows only 0.8 gallon of water per minute to flow at a pressure of 40 psi.

As will be understood, the desired groove 44 is selected on either end of pin 32, and retainer ring 46 is preset into the selected groove. Then pin 32 is moved horizontally, so that the preset retainer ring 46 (or detent) engages either surface 12a or 12b, as shown in the drawings. Thus, by moving pin 32 relative to nozzle 22, the amount of water saved can be adjusted and maximized.

An integral and cylindrical cup-shaped member 50 having an open end 52 in fluid communication with fluid channels 16 and 20 is disposed in nozzle 22. Cup-shaped member 50 is integrally formed with a cylindrical wall 54 and an end wall member or circular disc section 56, having spray-forming holes 58 formed therein. In addition, cylindrical wall 54 may have additional holes 60 formed therein. Cup-shaped member 50 includes an annular lip 62 for engagement with surface 64 on the inside of nozzle 22.

Since cup-shaped member 50 is an integral unit, it can be installed into conventional showerheads to change their spray pattern and to make them quiet and non-aerating showerheads. However, when holes 60 are utilized, the showerhead is changed to the aerating type.

Referring to FIG. 6, the pressure regulator pin 32 is shown used in conjunction with a conventional spray disc 70 having spray holes 72, instead of with cup-shaped member 50. It should be understood that in accordance with the present invention, spray disc 70 may be replaced with integral cup-shaped member 50, depending on the desired use of the showerhead.

Advantageously, there has been provided in accordance with the present invention an integral, cup-shaped member 50 which can be easily placed into a conventional showerhead to change its spray pattern and to make it quiet, non-aerating, and pulsating with a strong spray, even when the flow rate is low. Thus, it delivers less water with more force than conventional

5,143,300

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spray devices. Further, the cup-shaped member 50 can be used to refurbish a conventional showerhead when the nozzle has been improperly manufactured or machined. In addition, the present invention has provided the advantage of a movable pressure regulator pin 32 with preset selector rings that can be employed on most showerheads to preset and control water usage.

A latitude of modification, change, and substitution is intended in the foregoing disclosure, and in some instances, some features of the invention will be employed without a corresponding use of other features. Accordingly, it is appropriate that the appended claims be construed broadly and in a manner consistent with the spirit and scope of the invention herein.

What is claimed is:

1. A showerhead comprising:

- a) means for attaching said showerhead to a water supply;
- b) a nozzle having an inner wall, and inlet end and an outlet end;
- c) a one-piece and cylindrical cup-shaped member disposed in said nozzle and having a cylindrical-shaped wall spaced from the inner wall of said nozzle and having an open end in fluid communication with said water supply and another end having a circular disc section;
- d) said disc section being closer to the outlet end of said nozzle than to the inlet end of said nozzle;
- e) said disc section having spray-forming holes formed therein for producing a pulsating spray of water;
- f) a water pressure regulator having a movable pin movable relative to said nozzle to a plurality of flow positions to restrict the flow of water as said pin is moved in one direction and to increase the flow of water as said pin is moved in the opposite direction;
- g) said movable pin having means for selecting an presetting maximum and minimum flow positions; and
- h) having cylindrical cup-shaped member having holed in said cylindrical wall.

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2. A showerhead in accordance with claim 1, wherein said means for selecting and presetting includes a plurality of grooves formed in said movable pin and selector means disposed in said grooves.

3. A showerhead in accordance with claim 2, wherein said selector means includes retainer rings.

4. A showerhead in accordance with claim 1, wherein said means for selecting and presetting includes a first groove on one end of said movable pin to select and preset a maximum flow position and a second groove on the other end of said movable pin to select and preset a minimum flow position.

5. A showerhead in accordance with claim 1, wherein said cylindrical member has a lip formed thereon to hold said member in contact with said inlet end.

6. A showerhead in accordance with claim 1, wherein said movable pin has mid-section and end sections, said mid-section being of a smaller diameter than said end sections, said mid-section being movable relative to said nozzle to change the flow of water through said nozzle.

7. A showerhead comprising:

- a) means for attaching said showerhead to a water supply;
- b) a nozzle having an inner wall, and inlet end and an outlet end;
- c) a one-piece and cylindrical cup-shaped member disposed in said nozzle and having a cylindrical-shaped wall spaced from the inner wall of said nozzle and having an open end in fluid communication with said water supply and another end having a circular disc section;
- d) said disc section being closer to the outlet end of said nozzle than to the inlet end of said nozzle;
- e) said disc section having spray-forming holes formed therein for producing a pulsating spray of water; and
- f) said cylindrical cup-shaped member having holes in said cylindrical wall.

8. A showerhead in accordance with claim 7, wherein said cylindrical member has a lip formed thereon to hold said member in contact with said inlet end.

* * * * *

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 5,143,300
DATED : September 1, 1992
INVENTOR(S) : William Cutler

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 2, line 62, change "&here" to --there--.

Column 3:

Claim 1, line 4, first occurrence, change "and" to --an--.

Claim 1, line 38, change "an" to --and--.

Claim 1, line 41, first occurrence, change "having" to --said--.

Claim 1, line 42, change "holed" to --holes--.

Claim 7, line 24, first occurrence, change "and" to --an--.

Claim 7, line 32, change "sic" to --disc--.

Signed and Sealed this

Seventh Day of September, 1993



Attest:

BRUCE LEHMAN

Attesting Officer

Commissioner of Patents and Trademarks

Exhibit B



US005287565A

United States Patent [19]

Auman et al.

[11] Patent Number: 5,287,565

[45] Date of Patent: Feb. 22, 1994

[54] WATER SAVING DISPENSING DEVICE

4,980,932 1/1991 Stemples 4/415

[75] Inventors: C. David Auman; Jack L. Martin,
both of Belleville, Ill.

FOREIGN PATENT DOCUMENTS

217654 6/1957 Australia 137/561 A

[73] Assignee: Aqua Smart, Inc., Belleville, Ill.

[21] Appl. No.: 990,652

Primary Examiner—Robert M. Fetsuga
Attorney, Agent, or Firm—Senninger, Powers, Leavitt &
Roedel

[22] Filed: Dec. 14, 1992

[57] ABSTRACT

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 624,599, Dec. 10,
1990, abandoned, and a continuation-in-part of Ser.
No. 824,997, Jan. 27, 1992, abandoned.[51] Int. Cl.⁵ E03D 1/00

[52] U.S. Cl. 4/415; 137/561 A

[58] Field of Search 4/415; 137/441, 561 A

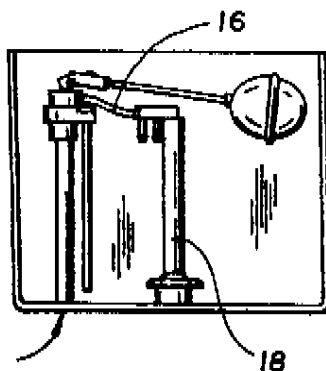
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4,781,309	11/1988	Vogel	222/129.1

A simple yet inexpensive device is presented which is used to divide the water normally supplied to the spill tube and gooseneck reservoir of a commode. Dividing the water supplied to the spill tube and diverting a substantial portion of that water to a holding tank of a commode saves water that is normally unnecessarily fed directly down the drain in the refilling process. The device is a small plastic insert that has a generally rectangular main body. At one end of this main body is a horizontal inlet tube. At the bottom of the main body are a number of lower vertical outlet tubes. In order to evenly disperse the inlet water among the vertical outlet tubes, the upper mouth of the vertical outlet tubes is constricted by narrowing the diameter of the mouth with respect to the inner diameter of the inlet tube. Water is thus distributed evenly among the lower outlet tubes. By changing the number of lower outlet tubes that feed water to the spill tube or holding tank, the correct proportion of water supplied to the gooseneck may be obtained.

20 Claims, 3 Drawing Sheets



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FIG. 1

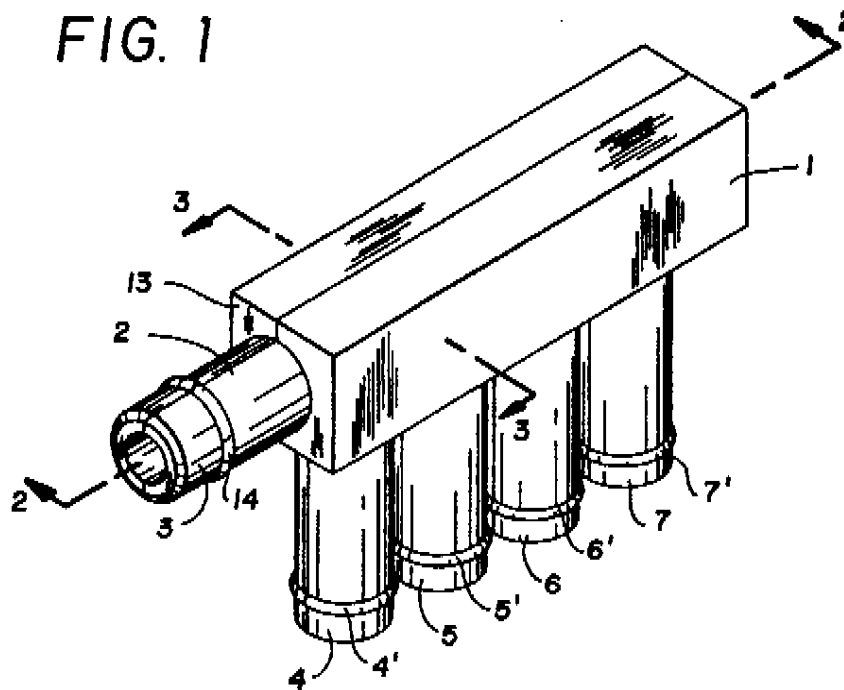
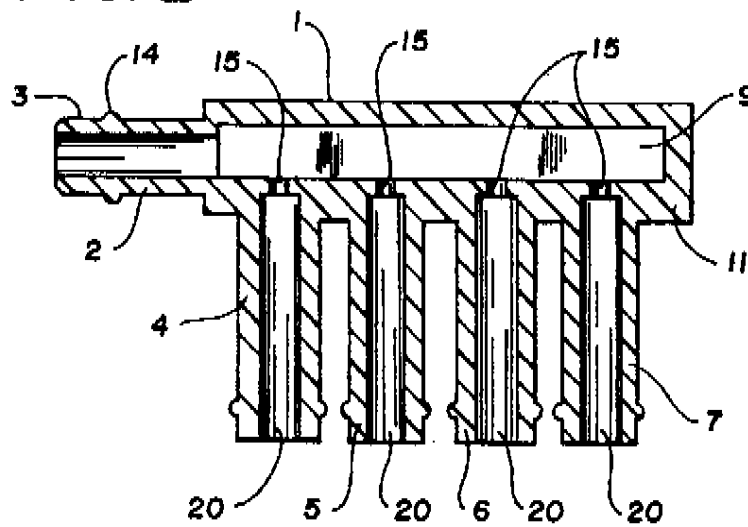


FIG. 2



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FIG. 3

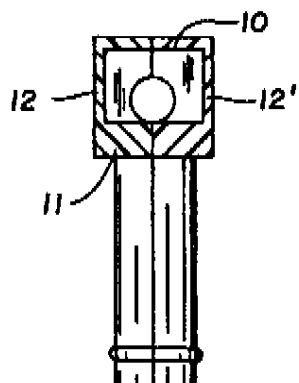


FIG. 4

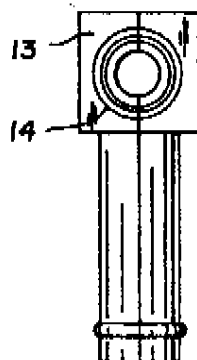


FIG. 5

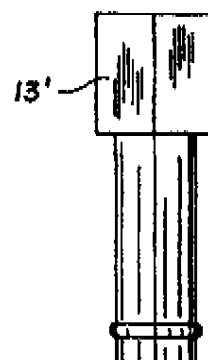


FIG. 9

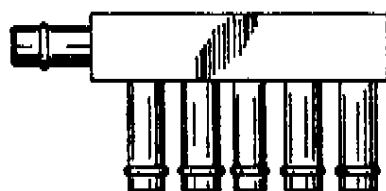
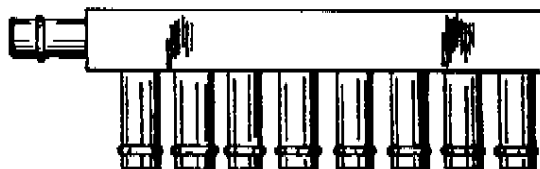


FIG. 10

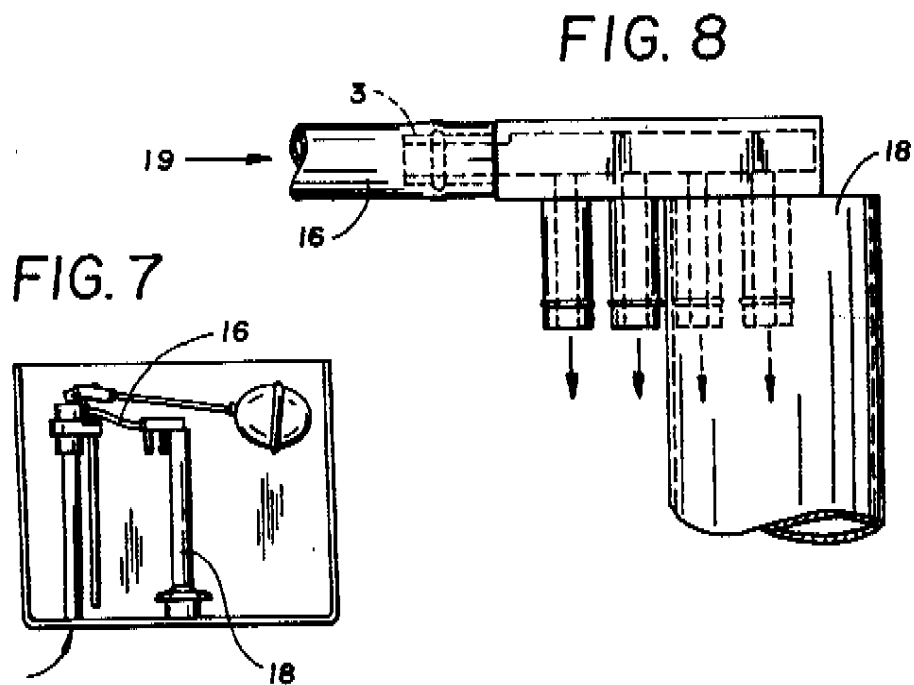
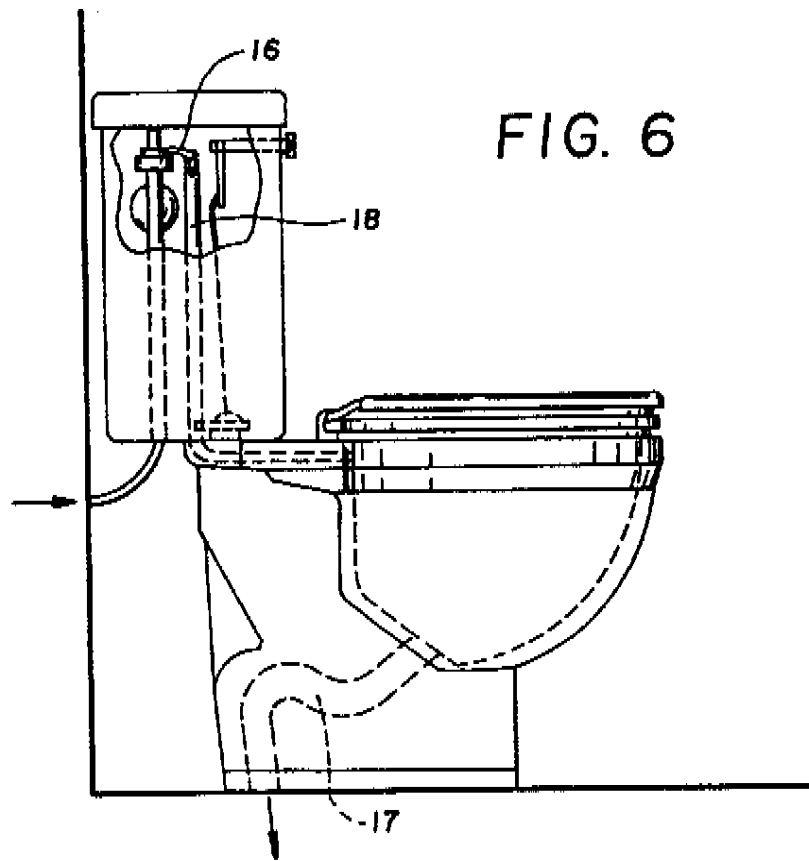


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tube with the wall of the spill tube extending into the space between said at least one outlet tube and an adjacent one of the outlet tubes and being engaged by the engagement means. The outlet tubes deliver a portion of the water from the second supply line into the spill tube and deliver the remainder into the tank.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the device.

FIG. 2 is a side cut away view of the device taken along lines 2-2 of FIG. 1.

FIG. 3 is an end cutaway view of the device taken along lines 3-3 of FIG. 1.

FIG. 4 is a left end view of the device.

FIG. 5 is a right end view of the device.

FIG. 6 is a view of the general layout of a bathroom fixture having a tank, bowl and gooseneck reservoir.

FIG. 7 is a detail view of FIG. 6 showing the second flexible tube and spill tube, with the instant device in place.

FIG. 8 is an enlarged detail view of the alternate embodiment of the instant device as it is placed over the spill tube.

FIG. 9 is an alternate five-pronged embodiment of the device.

FIG. 10 is an alternate eight-pronged embodiment of the device.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Water is supplied to the holding tank and gooseneck of a commode by means of a main water supply tube 19. This water normally is divided between the gooseneck reservoir and the holding tank, with one portion of the water fed directly into the holding tank while the remaining amount of the water is fed through a second flexible supply tube into a cylindrical spill tube. This cylindrical spill tube feeds water down through the bottom portion of the plumbing device and into a gooseneck.

The instant invention herein is a simple means for dividing the water from the second flexible supply tube so that part of the spill tube water flows into the cylindrical spill tube from the second supply tube while the remaining portion of the water supplied by the second flexible supply tube is fed into the holding tank. The holding tank thus fills up more quickly than under the current normal devices and much water is saved.

The device herein comprises an essentially rectangular main body 1. This rectangular main body 1 is hollow and has a plenum chamber 9 as its central portion. The main body 1 has an essentially square cross-section as shown in FIG. 3. This main body has a top 10, a bottom 11, vertical sides and 12 and 12', and vertical ends 13 and 13'.

Attached to one end 13 of the main body 1 is a horizontal water supply inlet tube 2. The flexible water supply tube 16 which is normally used to supply water to the gooseneck reservoir 17 by way of the spill tube 18, is attached to the outer end 3 of the inlet tube 2.

This inlet tube 2 is best shown on FIGS. 1, 2 and 8.

Attached to the bottom 11 of the main body 1 are a plurality of lower tubes 4, 5, 6 and 7. These lower tubes as shown on Drawing FIGS. 1 and 2 may be four in number. However, any number of lower tubes could be used while still within the spirit and conception of the instant invention, as shown in FIGS. 9 and 10. At least two outlet tubes are required to split the water.

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The lower tubes 4 through 7 are used to divide the water supplied by the flexible water tube 16. When the flexible supply tube 16, which is normally attached directly to the inside of the spill tube, is attached to the outer end 3 of the inlet tube 2, as shown in FIG. 8, the water supplied normally to the spill tube is first directed to the hollow plenum chamber 9 of the main body 1. This water, thus supplied, is then discharged through the first lower tube 4, the second lower tube 5, the third lower tube 6 and the fourth lower tube 7.

In the operation of the instant device certain problems have been encountered due to the fluctuating pressure of the inlet water and variations between plumbing fixtures. The main water source 19 to the entire plumbing fixture is introduced into the fixture as best shown in FIG. 6. Sometimes the pressure of the inlet water 19 is high, but in some applications, in varying parts of the United States or in varying countries, the water pressure is low. Varying water pressure, as well as varying configurations of the plumbing fixtures themselves, can result in an uneven distribution of outlet water through the outlet tubes 4-7. In order to adapt the instant device to all variations, it has been found that constricting the upper openings 15 of the lower outlet tubes 4-7 is a solution. The constrictions, as shown, have been found to be optimum when the constriction opening is approximately one-half the inner diameter of the vertical outlet tube.

As best shown on FIG. 2, the lower outlet tubes 4, 5, 6 and 7 are fluidly connected to the plenum chamber 9 (and hence the inlet tube 2) by connecting the lower tubes to the bottom 11 of the main body 1 of the device. However, each lower vertical outlet tube has its upper mouth 15 narrowed, as shown on FIG. 2. This narrowing of the mouth of the vertical inlet tubes is a pressure regulating means and helps to evenly distribute the water among all outlet tubes so the amount of water discharged from the lower ends 20 of the vertical outlet tubes are similar.

In order to facilitate attachment of the flexible spill tube water supply 16, a tube attaching flange 14 is supplied near the end 3 of the inlet tube 2. Similar flanges are also present near the bottom of the outlet tubes as shown on FIG. 2. However, these lower flanges 4', 5', 6' and 7' are used to secure the lower outlet tubes 4 through 7 to the vertical side of the spill tube 18. These flanges allow the flexible lower tubes to grip the side of the spill tube, so that various wall thicknesses of spill tubes may be accommodated.

The number of lower divider tubes may vary, depending on the precise applications and different plumbing devices used. Since different plumbing devices may have various volumes of water trap reservoirs, the use of this invention allows a different amount of water supplied to the gooseneck reservoir 17 by diverting it from the cylindrical spill tube which feeds the gooseneck directly to the holding tank. This diversion of water can be accomplished by simply changing the number of lower divider tubes which feed the cylindrical spill tube.

For example, if one desired to have half of the water from the flexible water supply tube 16 which feeds the spill tube to be fed into the cylindrical spill tube and hence to the water trap reservoir, half of the lower divider tubes should be placed inside the cylindrical spill tube with the other half of the outlet tubes remaining on the outside of the cylindrical spill tube. This

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particular mode of using the device is shown on FIGS. 7 and 8.

If the ratio sought to be supplied from the flexible supply tube 16 to the water trap gooseneck reservoir was 1:4 to the holding tank, then one lower outlet tube (the furthest from the inlet tube or the fourth lower tube 7 on Drawing FIGS. 1 and 2) would be inserted within the cylindrical spill tube while the remaining three outlet tubes would supply $\frac{3}{4}$ of the water normally supplied from the flexible supply tube 16 to the gooseneck water reservoir to the holding tank instead. The holding tank would then be receiving the normal amount of the water supplied to the device plus $\frac{1}{4}$ th of the remaining water from the supply tube 16. This means that a much greater portion of the water supplied to the plumbing device would feed the holding tank while a smaller portion of the water would feed the gooseneck water trap reservoir. Because the volume of the gooseneck water trap reservoir as compared to the volume of the holding tank would be anywhere from 1:3 to 1:7, this device may be used in various applications. A great benefit to the user in terms of lower water bills as well as a benefit to society in terms of less water use per plumbing device is thus gained by use of this simple, inexpensive device.

This device is most simply manufactured of acrylics by simple injection molding in two pieces. The device is normally split along its longitudinal axis, with the lines of split best shown in FIG. 3. The two pieces are molded and then sealed together to form the completed union shown in FIG. 1.

In actual production, the main body 1 is approximately 3.7 cm in length while the square cross-section of the main body is approximately 0.9 cm in length. In the preferred embodiment the inlet tube 2 is approximately 1 cm in length while the lower outlet tubes are approximately 1.5 cm in length. The inside diameter of the vertical outlet tubes is approximately 0.32 cm while the diameter of the opening of the mouth 15 of the vertical outlet tubes would be approximately 0.16 cm. Various lengths and sizes may be used in practicing this invention while keeping within the general spirit and conception of the instant device. The above measurements are meant as an illustration only and not as a limitation on the general concept disclosed herein.

I claim:

1. In a flush closet including a toilet bowl and a toilet tank for supplying flush water to the bowl, the tank having a main conduit for supplying water from a water supply source to the tank and bowl after each flush, the main conduit feeding a first supply line for supplying the tank with water after a flush and a second supply line for supplying the toilet bowl with water after a flush, the second supply line dispensing water into a spill tube in fluid communication with the bowl, the improvement comprising a water saving device for dividing the flow of water from the second supply between the spill tube and the tank, said device comprising an elongate manifold having an inlet connected to the end of the second supply line, an elongate chamber in fluid communication with the inlet for receiving water from the inlet, and a plurality of outlet ports arranged in a row extending generally lengthwise of the manifold and spaced at intervals along the length of the manifold in fluid communication with the chamber, the manifold having a plurality of outlet tubes extending laterally from the manifold at spaced intervals, one for each port of the manifold, along the length of the mani-

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fold, said outlet tubes having spaces therebetween with each space having a width greater than the thickness of the wall of the spill tube for interfitting of the device with the upper end of the spill tube, said outlet tubes having means on the outside thereof for frictionally gripping the wall of the spill tube for holding the device in a generally secure position with respect to the spill tube, the device as applied to the upper end of the spill tube having at least one of the outlet tubes extending down into the upper end of the spill tube with the wall of the spill tube extending into the space between said at least one outlet tube and an adjacent one of the outlet tubes and being engaged by said engagement means, said outlet tubes delivering a portion of the water from the second supply line into the spill tube and delivering the remainder into the tank.

2. A device as set forth in claim 1 wherein the manifold includes pressure regulating means for maintaining a generally constant fluid pressure within the chamber.

3. A device as set forth in claim 2 wherein said pressure regulating means comprises, for each port of the manifold, a reduction in the diameter of the port with respect to the diameter of the inlet tube for constricting the amount of water adapted to enter the outlet tube and for creating and maintaining a substantially constant pressure in the chamber, whereby water is adapted to flow into each outlet tube at a substantially constant rate, independent of the location of the outlet tube relative to the inlet.

4. A device as set forth in claim 3 wherein each port has a diameter approximately one-half the diameter of its respective outlet tube.

5. A device as set forth in claim 3 wherein the device is a one-piece molded plastic member.

6. A device as set forth in claim 3 wherein the diameter of each port of the manifold is reduced with respect to the diameter of each outlet tube for each port.

7. A device as set forth in claim 1 wherein the inlet comprises an outwardly extending inlet tube for connecting the second supply line to the device.

8. A device as set forth in claim 1 wherein said engagement means comprises a flange formed on each outlet tube, each of the flanges being spaced an equal distance from the manifold, the flanges of adjacent outlet tubes defining a space therebetween less than the thickness of the wall of the spill tube for gripping the wall of the spill tube and securely connecting the device to the spill tube.

9. A device as set forth in claim 8 wherein each flange extends laterally outwardly from the outer wall of its respective outlet tube.

10. A device as set forth in claim 1 wherein the diameter of each port of the manifold is reduced with respect to the chamber's cross section to evenly distribute the water among the plurality of outlet tubes.

11. A water saving device for use in a flush closet of the type including a toilet bowl and a toilet tank for supplying flush water to the bowl, the tank having a main conduit for supplying water from a water supply source to the tank and bowl after each flush, the main conduit feeding a first supply line for supplying the tank with water after a flush and a second flexible supply line for supplying the toilet bowl with water after a flush, the second supply line dispensing water into a spill tube in fluid communication with the bowl, the device comprising an elongate manifold having an inlet adapted for insertion thereof in the end of the second supply line for relatively sealed interconnection of the second supply

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line with the manifold, the manifold having an elongate chamber in fluid communication with the inlet for receiving water from the inlet, a plurality of outlet tubes extending laterally from the manifold at spaced intervals along the length of the manifold, said outlet tubes having spaces therebetween for receiving the wall of a spill tube in the tank, said manifold having a series of outlet ports, one for each outlet tube, for flow of water from said chamber into and through the outlet tubes, said outlet tubes having means on the outside thereof for frictionally gripping the wall of the spill tube, whereby the device may be applied to the upper end of the spill tube with at least one of the outlet tubes extending down into the upper end of the spill tube with the wall of the spill tube extending between adjacent outlet tubes and being engaged by said engagement means and with another one of said outlet tubes extending down on the outside of the spill tube for delivering a portion of the water from the second supply line into the spill tube and delivering the remainder into the tank.

12. A device as set forth in claim 11 wherein the manifold includes pressure regulating means for maintaining a generally constant fluid pressure within the chamber.

13. A device as set forth in claim 12 wherein said pressure regulating means comprises, for each port of the manifold, a reduction in the diameter of the port with respect to the diameter of the inlet tube for constricting the amount of water adapted to enter the outlet tube and for creating and maintaining a substantially constant pressure in the chamber, whereby water is

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adapted to flow into each outlet tube at a substantially constant rate, independent of the location of the outlet tube relative to the inlet.

14. A device as set forth in claim 13 wherein each port has a diameter approximately one-half the diameter of its respective outlet tube.

15. A device as set forth in claim 13 wherein the device is a one-piece molded plastic member.

16. A device as set forth in claim 13 wherein the diameter of each port of the manifold is reduced with respect to the diameter of each outlet tube for each port.

17. A device as set forth in claim 11 wherein the inlet comprises an outwardly extending inlet tube for connecting the second supply line to the device.

18. A device as set forth in claim 11 wherein said engagement means comprises a flange formed on each outlet tube, each of the flanges being spaced an equal distance from the manifold, the flanges of adjacent outlet tubes defining a space therebetween less than the thickness of the wall of the spill tube for gripping the wall of the spill tube and securely connecting the device to the spill tube.

19. A device as set forth in claim 18 wherein each flange extends laterally outwardly from the outer wall of its respective outlet tube.

20. A device as set forth in claim 11 wherein the diameter of each port of the manifold is reduced with respect to the chamber's cross section to evenly distribute the water among the plurality of outlet tubes.

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exhibit C



US005259075A

United States Patent [19][11] **Patent Number:** 5,259,075**Cutler**[45] **Date of Patent:** Nov. 9, 1993[54] **WATER-SAVING DEVICE FOR A WATER CLOSET**3,877,081 4/1975 Klein 4/415
4,451,941 6/1984 Gray 4/227.4[75] **Inventor:** William Cutler, Flanders, N.J.*Primary Examiner*—Henry J. Recla[73] **Assignee:** Niagara Conservation Corp.,
Flanders, N.J.*Assistant Examiner*—Charles R. Eloshway*Attorney, Agent, or Firm*—Ezra Sutton[21] **Appl. No.:** 836,236[57] **ABSTRACT**[22] **Filed:** Feb. 18, 1992[51] **Int. Cl.³** E03D 9/00[52] **U.S. Cl.** 4/415; 4/661[58] **Field of Search** 4/415, 227.1, 227.2,
4/227.4, 277.5, 227.6, 228.1; 383/23, 66

A water-saving device for the tank of a water closet, wherein a plastic container is filled with water and placed in the tank to reduce the amount of water used on each flush. The container includes a watertight valve for sealing the container to prevent the evaporation of water from the container and a mounting bracket for securely mounting the container on a sidewall of the tank of the water closet.

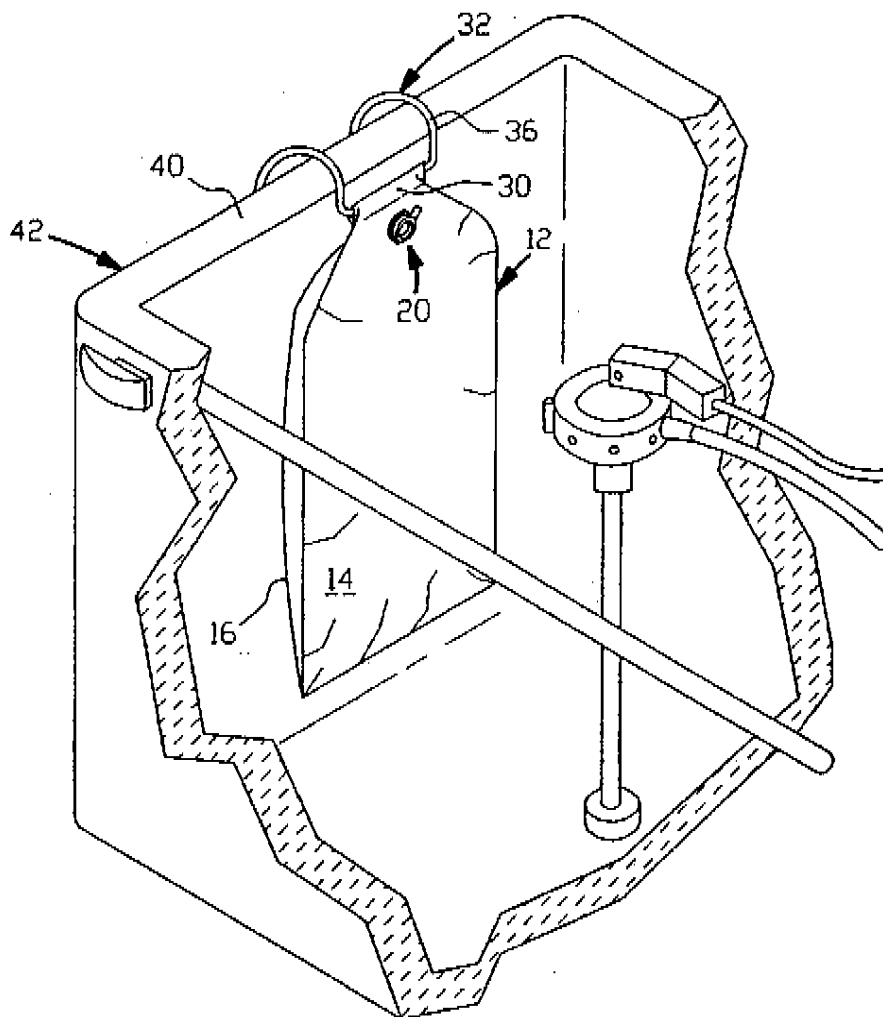
[56] **References Cited****U.S. PATENT DOCUMENTS**2,314,650 3/1943 Madsen 383/66
2,757,699 8/1956 Fancher et al. 383/23**3 Claims, 2 Drawing Sheets**

FIG. 1

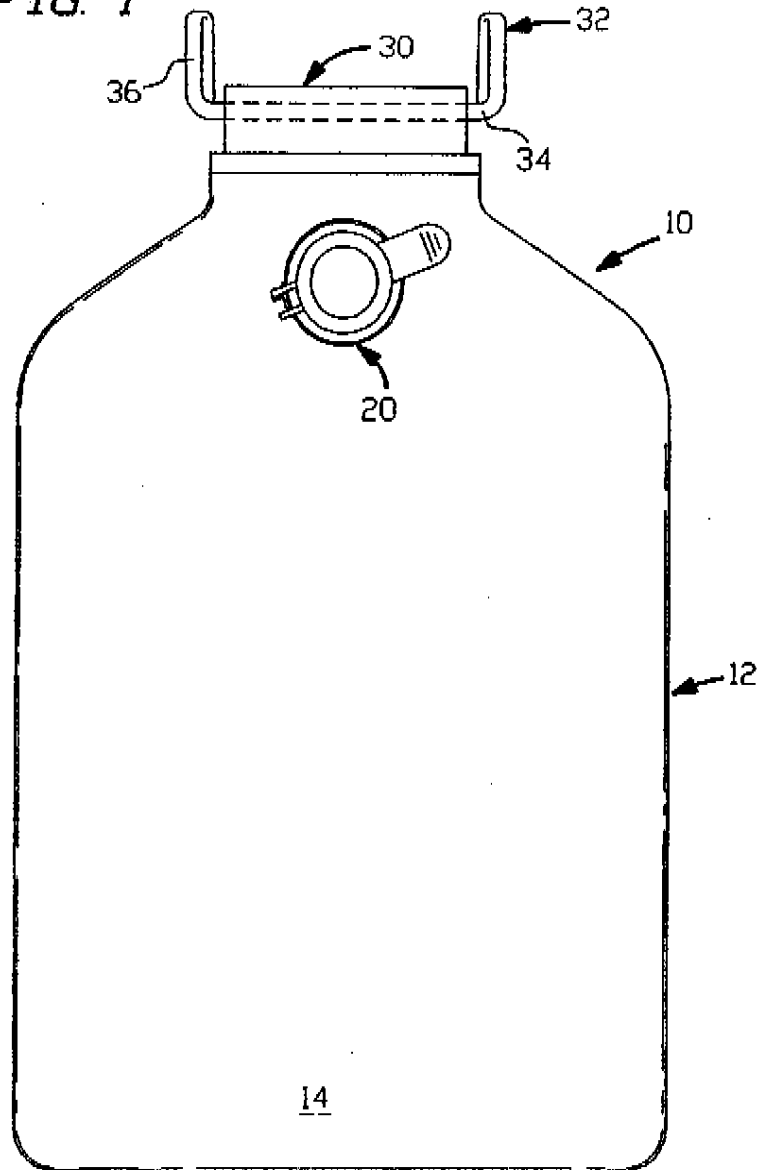
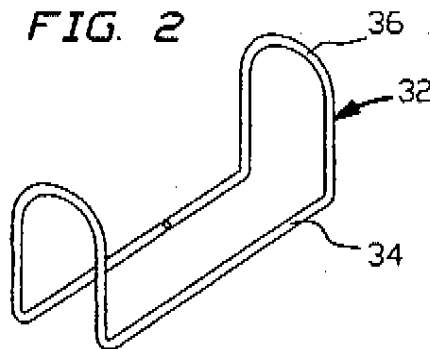
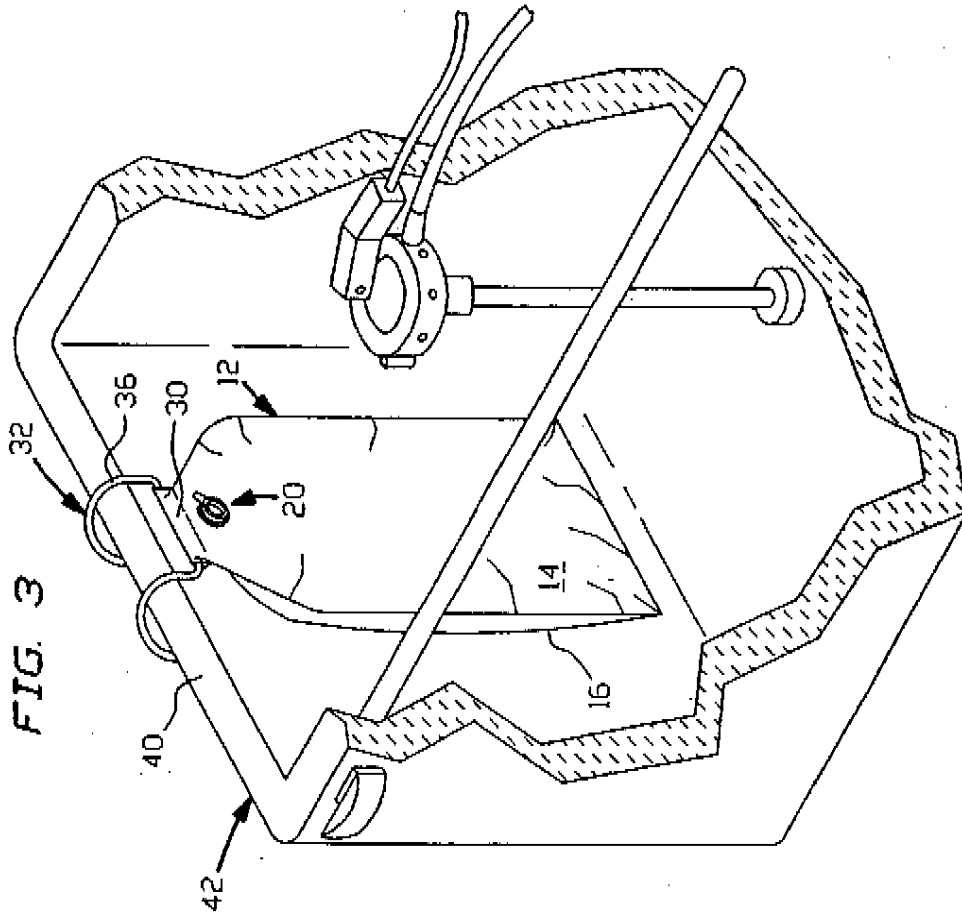


FIG. 2





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WATER-SAVING DEVICE FOR A WATER CLOSET**FIELD OF THE INVENTION**

The present invention relates to a water-saving device for a water closet.

BACKGROUND OF THE INVENTION

In order to conserve water, various devices have been developed for installation in the tanks of water closets. Matching panels have been used to create a dam within the tanks, and in other cases, containers have been placed in tanks to reduce the amount of water necessary to fill the tanks. Such an example is shown in U.S. Pat. No. 3,877,081. However, the container in this patent has a number of drawbacks. For example, the container is not positively and securely held in position within the toilet tank. Also, water in the container evaporates and has to be refilled.

Accordingly, it is an object of the present invention to provide an improved water-saving device for a toilet tank which is securely held in position within the tank and which is securely sealed to prevent evaporation of water from the water-saving device.

It is a further object of the present invention to provide a simple and secure device for mounting the water-saving device within the toilet tank and which is easy to fill.

SUMMARY OF THE INVENTION

In accordance with the principles of the present invention, a water-saving device is provided having a flexible, collapsible, water impervious, watertight, bag-like container fillable with a fluid and having a front wall and a back wall. A watertight valve is provided on the container for filling the container with a quantity of fluid equal to the quantity by which the volume of water discharged from the tank of the water closet is to be reduced. A removable mounting bracket is connected to the container for mounting the container on a sidewall of the tank.

BRIEF DESCRIPTION OF THE DRAWINGS

Further objects, features, and advantages of the present invention will become apparent upon consideration of the detailed description of the presently-preferred embodiment, when taken in conjunction with the accompanying drawings wherein:

FIG. 1 is an elevational view of the water-saving device of the present invention;

FIG. 2 is a perspective view of the hook; and

FIG. 3 is a perspective view showing the water-saving device mounted on the wall of the tank in a water closet.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1, there is shown a water-saving device 10 in the form of a flexible, collapsible, watertight, bag-like container 12 having a front wall 14 and a back wall 16.

A watertight valve 20 is disposed on the upper portion of front wall 14 of the container 12 for filling container 12 with a quantity of water or fluid equal to the quantity by which the volume of water discharged from the tank of the water closet is to be reduced. Typically, the container 12 may hold a gallon of water or less,

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depending on the amount of water to be saved. Valve 20 substantially prevents evaporation of the water or fluid from container 12 so that it does not have to be refilled.

The upper end of container 12 is also provided with a circular-shaped sleeve 30 integrally formed with the container 12 for receiving a mounting bracket 32. The mounting bracket 32 includes a rod 34, which passes through sleeve 30 and also includes a hook-shaped member 36 for engaging the top edge of the sidewall 40 of the toilet tank 42, as shown in FIG. 2. The mounting bracket 32 is typically formed of stainless steel to prevent corrosion.

In addition, the container 12 is formed of a plastic material which is impervious to water. Other suitable water-impervious materials may also be used.

In use, the container 12 is filled to the fill line, which is adjacent the fill valve 20. The valve 20 is closed to seal container 12 and to prevent the water in the container 12 from evaporating. The container 12 is placed in the tank 42 between the sidewall 40 and the intake valve of the tank, and the mounting bracket 32 is used to securely mount the container 12 on the upper edge of sidewall 40. The hook-shaped member 36 of bracket 32 is used to engage the upper edge of sidewall 40. The lid of the tank is then replaced, which helps to maintain mounting bracket 32 from moving.

A latitude of modification, change, and substitution is intended in the foregoing disclosure, and in some instances, some features of the invention will be employed without a corresponding use of other features. Accordingly, it is appropriate that the appended claims be construed broadly and in a manner consistent with the spirit and scope of the invention herein.

What is claimed is:

1. A water-saving device to be disposed in the tank of a water closet, wherein the tank has a sidewall and an upper edge on the sidewall, comprising:

- a) a flexible, collapsible, water impervious, watertight, bag-like container fillable with a fluid and having a front wall and a back wall;
- b) a watertight valve on said container for filling said container with a quantity of fluid equal to the quantity by which the volume of water discharged from the tank of the water closet is to be reduced;
- c) said watertight valve including an opening and a removable closure for sealing said opening to prevent the evaporation of water from said container and for filling said container with water when said removable closure is removed from said opening;
- d) a removable mounting bracket connected to said container for mounting the container on the sidewall of the tank; and
- e) said bag-like container having a sleeve extending across at the upper end thereof for receiving said removable mounting bracket, said bracket having a first portion extending through said sleeve and a second portion configured to be hung over the upper edge of the tank.

2. A water-saving device in accordance with claim 1, wherein said mounting bracket includes a rod for passing through said sleeve and a hook-shaped member for engaging the upper edge of the sidewall of the tank of the water closet.

3. A water-saving device in accordance with claim 1, wherein said watertight valve includes a removable plastic closure which is press-fit into said opening.

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 5,259,075
DATED : November 9, 1993
INVENTOR(S) : William Cutler

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Claim 1, column 2, line 41, change "vale" to --valve--.

Claim 1, column 2, line 45, change "vale" to --valve--.

Claim 3, column 2, line 65, change "vale" to --valve--.

Signed and Sealed this
Twelfth Day of April, 1994

Attest:



BRUCE LEHMAN

Attesting Officer

Commissioner of Patents and Trademarks