# United States Patent [19]

**Godwin et al.**

[11] **3,919,726**

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[54] **WATER CLOSET HAVING A BOWL AND A WASH MEANS**


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[73] Assignee: **General Electric Company,** Louisville, Ky.



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[21] Appl. No.: **529,536**

[52] **U.S. Cl.** ..... **4/10;** 4/1; 4/DIG. 2

[51] **Int. Cl.**[2] .... **E03D 1/00;** E03D 3/00; E03D 5/00

[58] **Field of Search** ..... 4/1, 10, DIG. 2, 73, 166, 4/167, 168, 263, 76, 169, 170, 89



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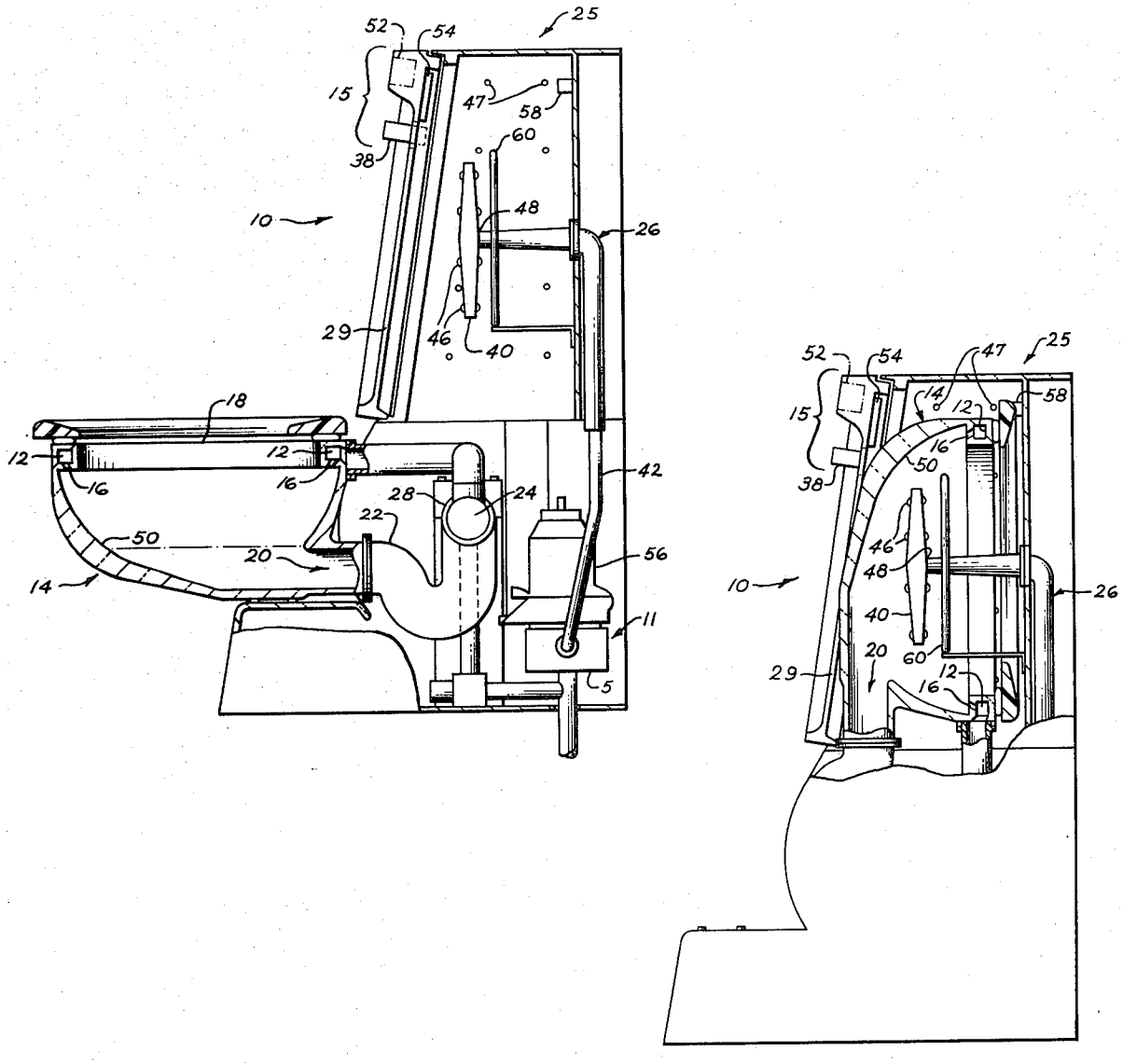
*Primary Examiner*—Henry K. Artis



[57] **ABSTRACT**

A self-cleaning water closet wherein either the bowl or a specially provided cabinet-type enclosure is pivotally movable between a first non-cleaning position and a second cleaning position. When in the cleaning position, the cabinet-type enclosure sealably encloses at least a portion of the bowl before washing begins.


**8 Claims, 3 Drawing Figures**



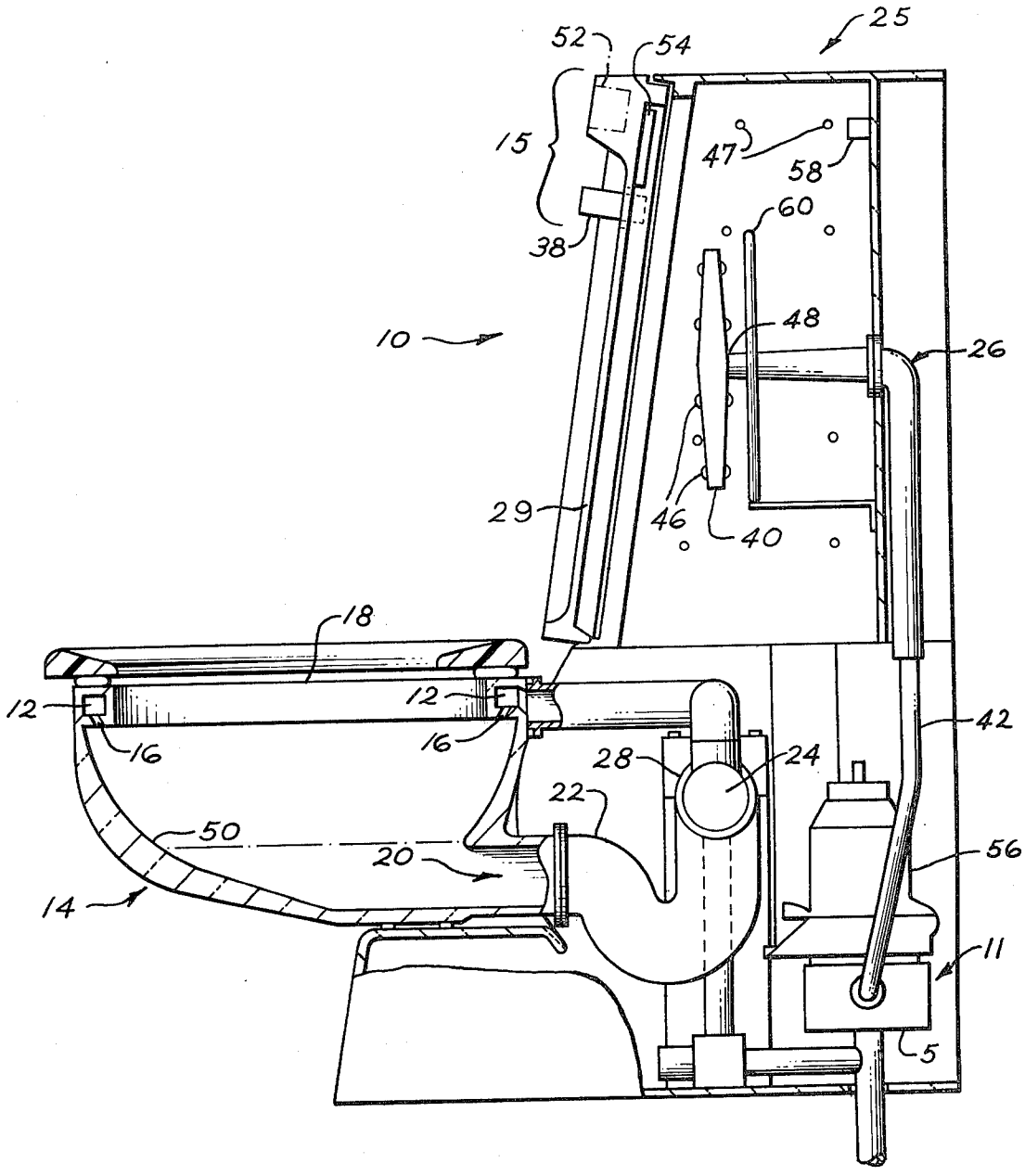

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FIG. 1

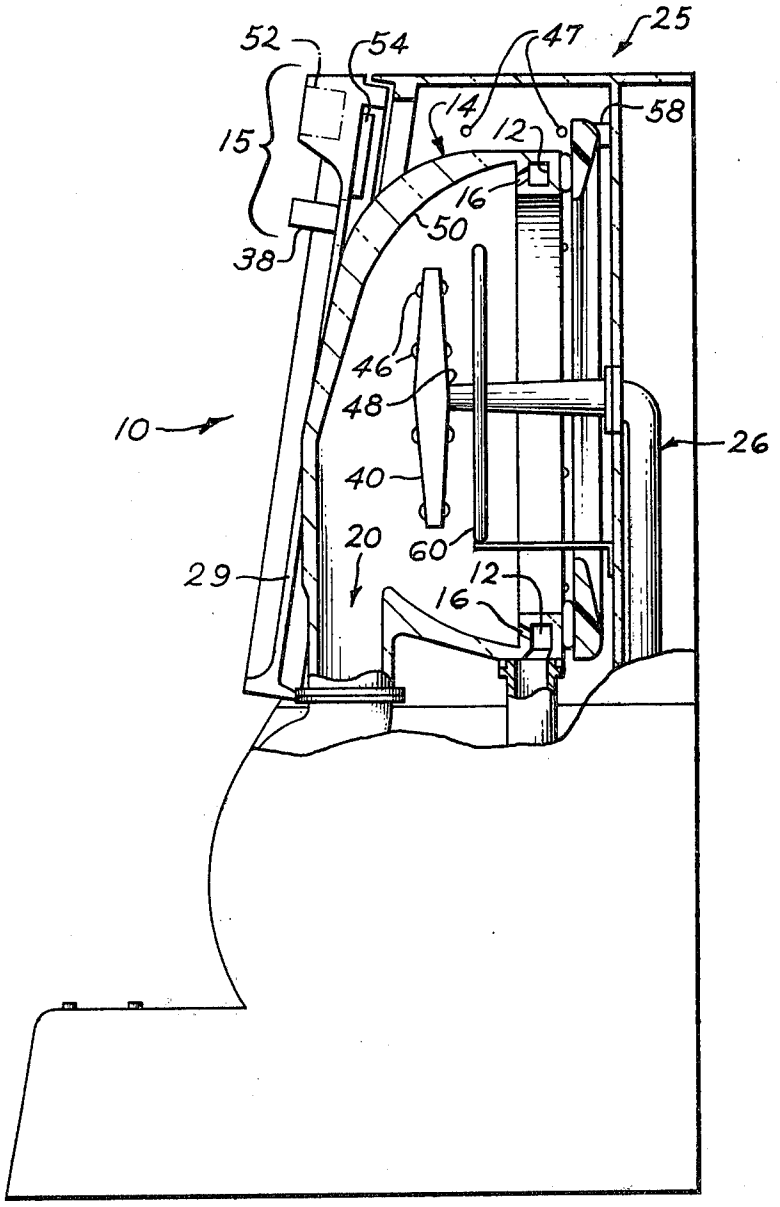



FIG. 2

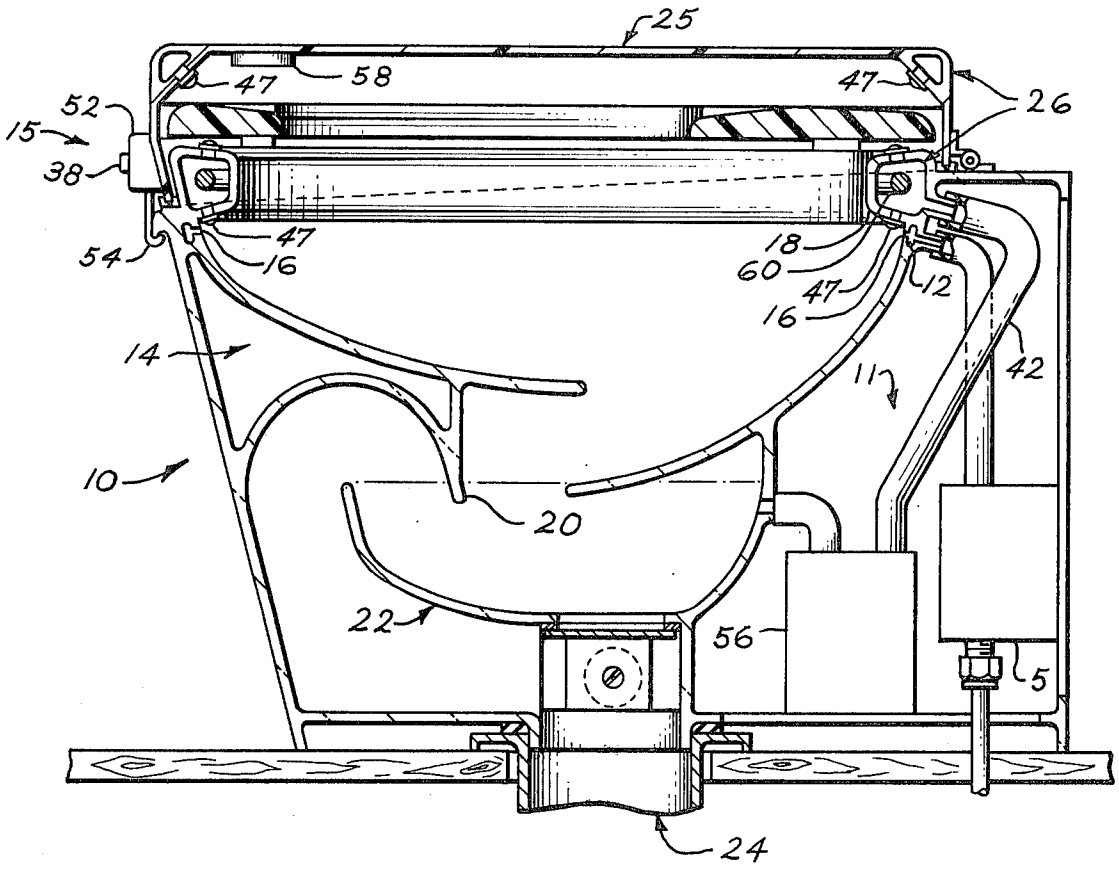



FIG. 3

# WATER CLOSET HAVING A BOWL AND A WASH MEANS

## BACKGROUND OF THE INVENTION

From time to time, the bowl of a conventional water closet must be cleaned in order to maintain it in a hygienically desirable condition. The cleaning operation is an undesirable task when performed manually.

In order to avoid this unpleasant task, the prior art suggests apparatus such as that set forth in U.S. Pat. No. 3,381,312-Whitla. This apparatus functioned to reduce the manual labor required in cleaning the toilet bowl but did not possess the requisite capability to clean it to the preferred high level of sanitation. More specifically, the Whitla apparatus did not provide any means for cleaning the outside and lip portions of the bowl. Further, the Whitla apparatus made no provision for the possibility that water would escape the spray mechanism of the cleaning apparatus and splash onto adjacent areas in the bathroom.

In a similar vein, U.S. Pat. No. 3,829,906-McPhee shows an arrangement for flushing and cleaning a bedpan inside a hospital patient care unit. Such an arrangement demonstrates a long-felt need for a high level of cleanliness for toilet facilities. Although the McPhee apparatus is suggestive of the desirability of a high level of cleanliness in connection with conventional water closets, the problems faced by Applicant and the technology used to overcome them is so unlike those faced by McPhee that there is no interface between the McPhee apparatus and Applicant's invention.

The present invention is a straightforward, easily-used, readily-maintained, self-cleaning water closet which overcomes the above prior art defects.

## SUMMARY OF THE INVENTION

The invention includes a self-cleaning water closet which operates to flush and clean the bowl on both the inside, and, at least the lip area on the outside, to a level of cleanliness not readily obtainable by hand washing. The water closet provides for rotation of either the bowl or a cabinet-type cleaning enclosure so that the bowl is enclosed during the cleaning operation. More specifically, the invention includes a water closed comprising: a base; a bowl attached to the base in fluid-flow communication with a sewer; a cabinet-type enclosure mounted in enclosing relationship to the bowl and dimensioned to receive the bowl; a plurality of spray means located within the cabinet-type enclosure, the spray means being adapted to distribute a washing liquid within the enclosure; water-handling means for supplying water to the spray means and for flushing of the water closet; and control means to effect flushing and cleaning of the water closet; the water closet being further defined in that at least one of the bowl or the cabinet-type enclosure is pivotally movable between a first position in which the bowl is ready for use and a second position in which the bowl is received within the cabinet-type enclosure in liquid-tight fashion for cleaning thereof.

## DESCRIPTION OF THE DRAWING

FIG. 1 is a diagrammatic partially sectioned view of the water closet of this invention showing the bowl ready for use;



FIG. 2 is a diagrammatic partially sectioned view of the water closet of this invention showing the bowl in cleaning position; and

FIG. 3 is a diagrammatic partially sectioned view of another embodiment of the water closet of this invention showing it in the cleaning position.

## DETAILED DESCRIPTION OF THE INVENTION

Referring to the Figures, a toilet or water closet **10** has a water-handling means **11** for supplying water to the water closet. This water-handling means comprises, in general, a water inlet pipe, a solenoid valve attached thereto and an outlet conduit for deliverance of water to the bowl. The water-handling means also includes a pump and motor and a pump discharge conduit for supplying water to a bowl spray means. The bowl includes conduit **12** circumscribing its outer edge. Bowl **14** has openings **16** in flow-through relationship to conduit **12** for the passage of water from conduit **12** into bowl **14** during flushing of the water closet **10.** Control means **15** is operably associated with the solenoid valve **5** for conventional flushing, as is known in the art.

In addition, the bowl **14** has a top opening **18** and a drain opening **20.** The drain opening **20** is connected via a drain trap **22** for passing water and waste material from the bowl **14** into a sewer. The drain trap **22** may be of U-shaped configuration for forming a water block to prevent gases from passing in a reverse direction from the sewer line **14;** alternatively, the trap may be a water pool type of trap as shown in FIG. **3.** The drain trap **22,** shown in FIGS. **1** and **2,** includes a pivotal connection **28** to the sewer line **24.** Such an arrangement allows rotatable movement of the bowl **14** upwardly to be received in cabinet-type enclosure **25** for cleaning.

The control means is designated generally by numeral **15** and includes the conventional flushing capability as is known in the art. Such flushing is initiated by operating button **38.**

The water closet of this invention further includes spray means **26** which, in the embodiment of FIGS. **1** and **2,** comprises a rotatable spray arm **40.** Spray means **26** is operably connected to water supply line **42.** The spray arm **40** in FIGS. **1** and **2** has openings or nozzles **46** which are directed tangentially relative to the rotatable connection **48** thereof, for rotation of the spray arm in response to the discharge of water therethrough. As shown in FIG. **2,** the nozzles **46** are also oriented relative to the bowl **14** such that the water discharged from the nozzles **46** during the cleaning operation impinge upon and are directed along the inner surface **50** of the bowl.

Spray means **26** includes nozzles **47** located within enclosure **25** in position to cleanse the bowl **14** during the cleaning operation. Timer control means **52** and a latch mechanism **54** of the wash means **26** are provided and operate to pass water from lines **42** at only the second position of the water closet **10.**

As shown, the wash means **26** includes a pump **56** to provide a high pressure water flow through the spray means **26,** thereby providing a water-scouring action to the bowl **14.** Further, a cleaning material dispenser **58** can be operably associated with the spray means **26** for automatically discharging a volume of soap or cleaning material into the wash enclosure in response to actuation by control means **15.** A heating means **60** can also be provided for increasing the temperature within the enclosure for drying the bowl and increasing the sterilizing capabilities of the cleaning operation.

The control means **15,** latch mechanism **54,** rotatable spray arm **40,** soap dispenser **48,** and heating means **60** can be like or similar to the corresponding elements of an automatic dishwasher. Example elements can be found in U.S. Pat. Nos. 3,811,600; 3,798,465; 3,771,725; 3,555,242; and 3,490,486.

In the operation of the apparatus of this invention, the water closet is used in a normal fashion until it is desired to automatically clean the bowl **14.** Then, control means **15** is activated to cause either the bowl **14** (FIGS. **1** and **2**) or the cabinet type enclosure **25** (FIG. **3**) to be pivotally rotated, thereby providing for the bowl to be received therewithin. Doors **29** are then closed in the embodiment of FIGS. **1** and **2.** Next, latch mechanism **54** operates to insure that the enclosure remains sealed during the cleaning cycle. Pump **56** then causes washing liquid to be directed onto the bowl from the nozzles **47** and from the spray arm **40** in FIGS. **1** and **2.** The washing liquid is directed against and along the bowl's surface **54** for a preselected period of time, after which a rinse is initiated, followed by a drying period.

In the preferred embodiment of this invention, hot water is mixed with soap or cleaning material from the dispenser **58** during spraying of the hot water against and along the bowl **14** for a preselected period, cold water is thereafter sprayed against and along the bowl **14** for a preselected period, and the enclosure is thereafter heated to dry and sanitize the bowl.

It should be understood that the particular swivel and sealing connection of the bowl and the enclosure can be different than as herein described without departing from this invention. It is only necessary that at least one of the bowl **14** or enclosure **25** more relative to the other, thereby defining first and second positions and that the drain trap remain sealed during movement of the elements for preventing the escape of fluids therefrom and maintaining the water block.

What is claimed is:

**1.** A water closet comprising:

a base;

a bowl attached to said base in fluid-flow communication with a sewer;



a cabinet-type enclosure mounted in enclosing relationship to said bowl and dimensioned to receive said bowl;

a plurality of spray means located within said cabinet-type enclosure, said spray means being adapted to distribute a washing liquid within said enclosure;

water-handling means for supplying water to said spray means and for flushing of said water closet; and

control means to effect flushing and cleaning of said water closet;

said water closet being further defined in that at least one of said bowl or said cabinet-type enclosure is pivotally movable between a first position in which the bowl is ready for use and a second position in which the bowl is received within said cabinet-type enclosure in liquid-tight fashion for cleaning thereof.

**2.** A water closet, as set forth in claim **1,** wherein the bowl is movable upwardly from the first to the second position.

**3.** A water closet, as set forth in claim **1,** wherein said control means includes an interlock to allow for passing water to the spray means only when the water closet is in the second position.

**4.** A water closet, as set forth in claim **2,** wherein said spray means includes a rotatable spray arm.

**5.** A water closet, as set forth in claim **1,** including a cleaning material dispenser adapted for receiving cleaning material and dispensing said cleaning material into said enclosure.

**6.** A water closet, as set forth in claim **2,** wherein said bowl is connected to the sewer by a discharge line and a drain trap, said drain trap being connected at one end to the discharge line and at the other end to a discharge opening of the bowl, at least one of said connections being a swivel-type connection for providing movement between the first and second positions.

**7.** A water closet, as set forth in claim **1,** including heating means actuated by said control means for drying and sterilizing said bowl

**8.** A water closet, as set forth in claim **2,** wherein the enclosure includes heating means and control means for controllably washing, rinsing and drying said bowl.

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