

[54] **MOVABLE BIDET**

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[51] Int. Cl. A47k 3/22, A47k 11/08

[58] Field of Search 4/6, 7, 1

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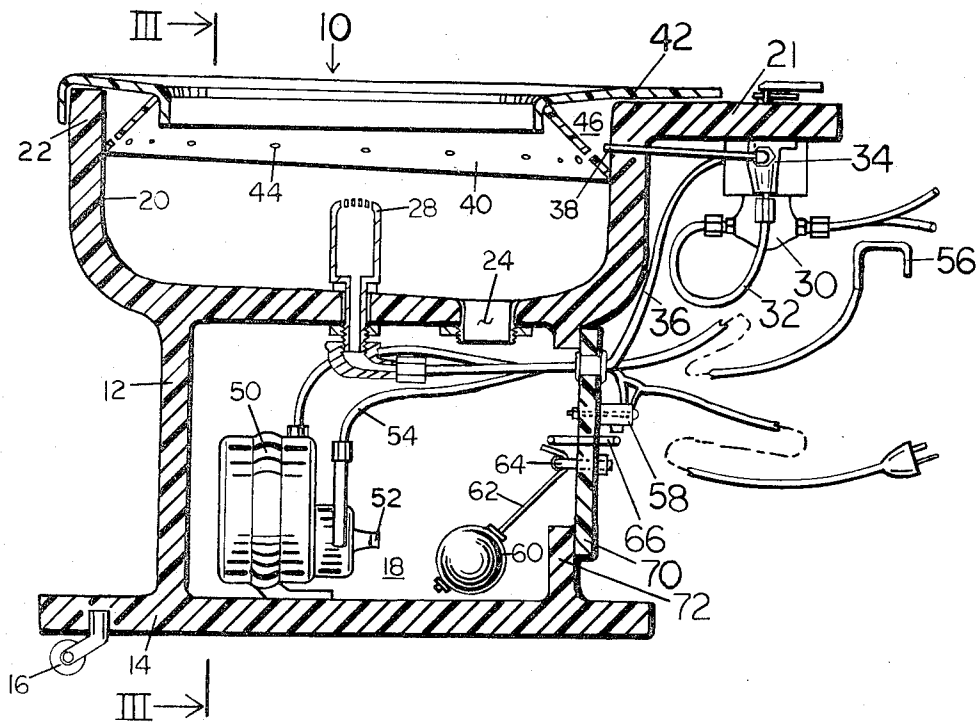
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[57] **ABSTRACT**

A self-supporting bidet movable on rollers or the like, and having flexible lines connecting it with a water supply; the bidet also has a reservoir for accumulating waste liquids therein, and a pump for evacuating the reservoir into a water closet or other sewer-connected fixture. Flexible tubing is provided to connect a mixing valve to hot and cold water supply lines, and also to connect the pump exhaust to existing plumbing fixtures. Preferably, an on-off valve for the water is independent of the mixing valve so that turning the water on and off will not inadvertently affect a desired temperature setting for the water supply. Means are also provided to selectively divert at least some of the supply water through a continuous cavity in the bidet's seat, for warming the seat. Apertures in the continuous cavity provide communication with the bowl to produce a type of rim rinse. One embodiment utilizes a stand made of light-weight material so that the bidet may be fairly easily moved about in a bathroom without the need for rollers or casters.

16 Claims, 8 Drawing Figures



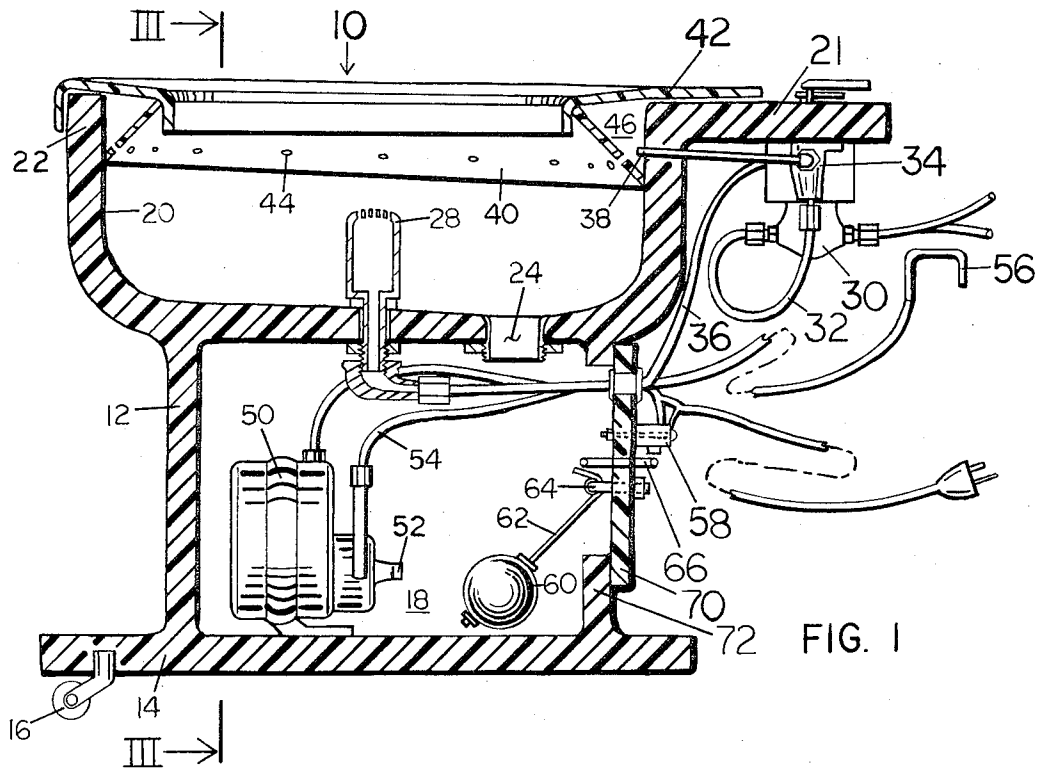


FIG. 1

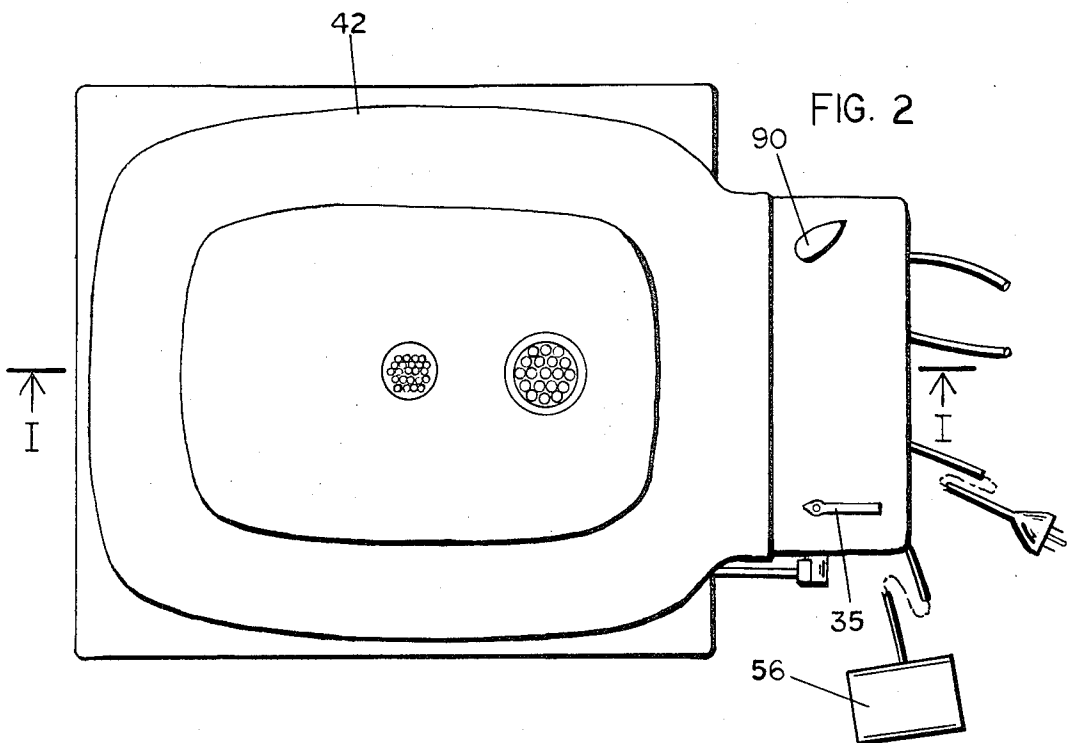


FIG. 2

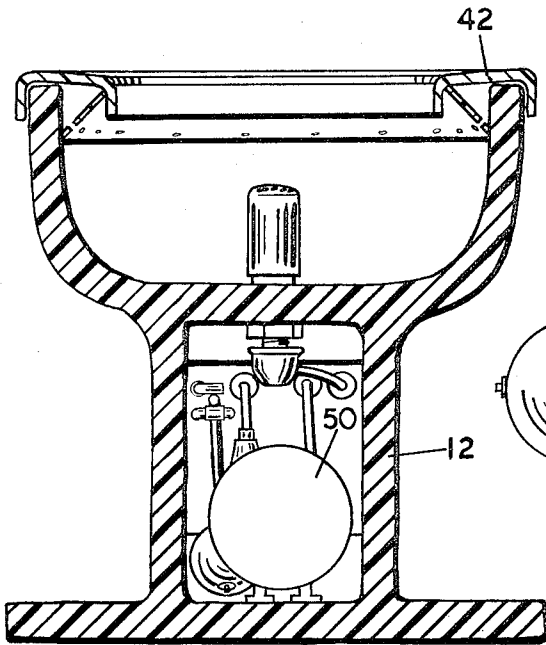


FIG. 3

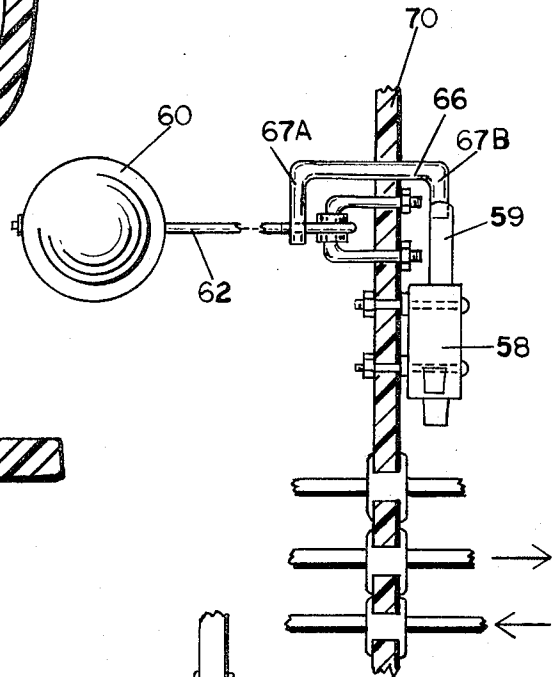


FIG. 5

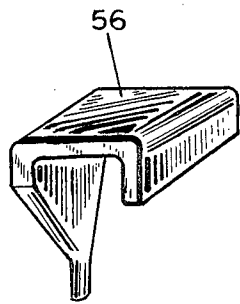


FIG. 8

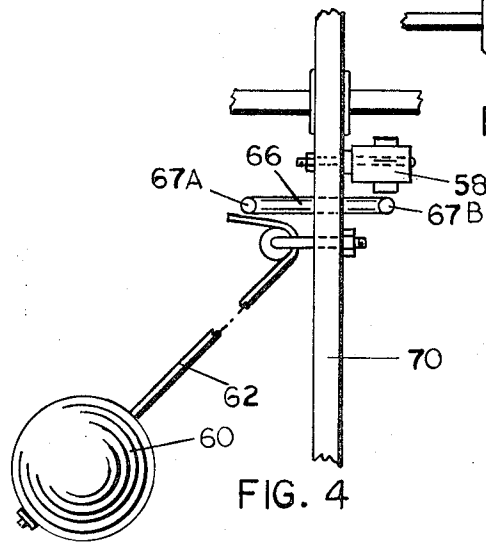
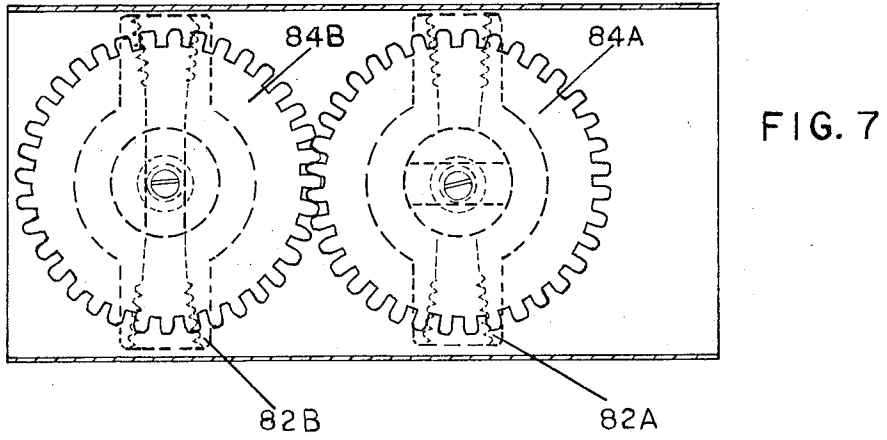
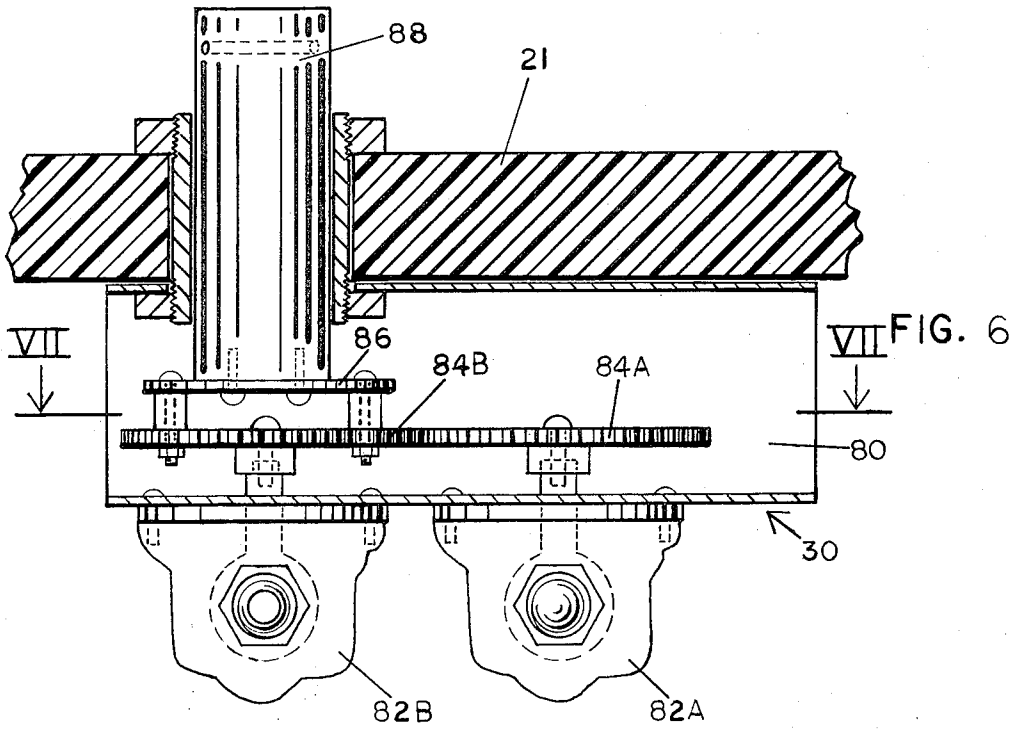


FIG. 4



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MOVABLE BIDET

This invention relates to improvements in a bidet, and more particularly to a bidet which does not have to be permanently installed or rigidly connected to a sewage system.

It is usual to install a conventional bidet as a permanent plumbing fixture in a bathroom. Like other fixtures such as water closets or bathtubs, they are most conveniently installed at the time of the original construction of a house or hotel room, etc. Such installations are typically performed by skilled craftsman, usually at considerable expense. Of course, bidets could be added to any bathroom at a date subsequent to the initial construction; but the even greater cost involved in modification of an existing bathroom has perhaps contributed to a rather slow spread in the use of bidets in the United States—in spite of the fact that they are now being more widely appreciated as very beneficial hygienic fixtures. Many efforts have been undertaken to design somewhat abbreviated units for attachment to bathtubs or toilet bowls, but it seems that such alternative units have failed to gain appreciable acceptance because, among other things, they seem to be inconvenient to connect and use.

In the drawing:

FIG. 1 is a side elevation view of the bidet of the invention, taken in the plane represented by lines I—I in FIG. 2;

FIG. 2 is a top view of the bidet shown in FIG. 1;

FIG. 3 is a front elevation view, in section, as seen in the plane represented by the lines III—III in FIG. 1;

FIG. 4 is a fragmentary view of the float and its associated electrical switch, constituting somewhat of an enlarged view of the same apparatus which can be seen in FIG. 1;

FIG. 5 is a top view of the float apparatus as shown in FIG. 4;

FIG. 6 is a front elevation view of the water mixing valve;

FIG. 7 is a top view of a portion of the mixing valve, taken in the plane represented by the lines VII—VII in FIG. 6; and

FIG. 8 is a perspective view of the terminal end of an exhaust tube which is adapted to discharge waste liquids into a toilet bowl.

Referring initially to FIG. 1, a bidet 10 is shown which can be placed at essentially any desired position within a room where suitable openings are available into a sewage system. Such rooms may be conventional bathrooms in residences or hotels, or equivalent rooms in hospitals or the like. By "suitable openings" it is intended to encompass, for example, conventional toilets, etc., which are permanently connected to a holding tank or sewage treatment facility. The bidet 10 comprises a stand 12 which is adapted to be placed on the floor of a room. The stand can be made of any material which is customary for permanent plumbing fixtures, such as porcelain-coated iron, etc. A preferred material, however, is a relatively lightweight material, so that the stand may be easily moved around within a bathroom or the like. It has been found that white molding plaster sold by United States Gypsum Company under the trademark "Red Top No. 1 Molding Plaster" is quite suitable for fabrication of a stand, when the same is covered with a water-proof protective coating such as a polyester resin. For example, a rigid

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stand made of white molding plaster can be advantageously coated with a polyester resin such as Evercoat Marine Resin FE 2300 which has been processed with a catalyst of, e.g., methylethylketone peroxide. To provide a pleasing white appearance in the finished bidet 10, it is usually preferably to add a pigment such as white opaque styrene pigment to the uncured resin. Using the above materials, an entire bidet will weigh on the order of 50 pounds, such that it can be readily moved about by most persons—even without the benefit of any casters or rollers on the base of the stand. An optional roller 16 is shown in FIG. 1 mounted on the base 14. When such rollers 16 are utilized, there would probably be three or four of the same spaced around the periphery of the base 14. Also, it is preferred that the rollers be of the spring-mounted variety, so that the rollers hold the bidet away from contact with the floor only when the weight of a person is not added to the normal weight of the bidet.

Inside of the stand 12 is a reservoir 18 for receiving waste liquids. Mounted on top of the stand is a wash-bowl 20 which has a lip 22 which extends upward to reach a height of approximately 16 inches from the floor. The bowl 20 also has a drain 24 which is adapted to empty liquids into the reservoir 18. A water trap 26 is preferably provided so that any gases that may be generated in the reservoir 18 may not find their way upward through the drain 24 into a room. As shown in FIG. 2, it is customary to cover the drain opening with a screen.

As is typical with bidets, a fountain 28 is provided near the center of the bowl 20 for directing a spray of water upward. Also provided is a means for supplying fresh water to the fountain 28. Preferably, the means for supplying water includes a mixing valve 30 which is in communication with sources of hot and cold water. The outlet of the mixing valve 30 is connected through tube 32 to a volume control valve 34. At least one outlet from the volume control valve 34 is in communication through tube 36 to the fountain 28. Hence, the volume control valve 34 is in series between the mixing valve 30 and the fountain 28. The volume control valve 34 is preferably a valve having one inlet and two outlets, and may be a so-called three-way selector valve such as Model 100 CL manufactured by Anderson Brass Company of Detroit, Mich. The tube 32 is connected to the inlet of a three-way valve 34, and tube 36 is connected to one of the outlets. The other outlet of valve 34 is connected to an additional tube which passes through aperture 38 in the wall of bowl 20.

An annular support ring 40 is provided to rest near the top of the bowl 20, said ring having a generally frusto-conical configuration. The base of the ring 40 is adapted to bear against the inside wall of the bowl 20, and may be permanently secured thereto; the top of the ring is adapted to support the inside of a seat 42. At spaced locations around the angular support ring 40 are apertures 44. Water which is diverted at certain times by the three-way valve 34 through appropriate tubing extending through aperture 38 will flow into a cavity 46 which is defined by the outside surface of ring 40, the inside wall of bowl 20 and a portion of the bottom surface of seat 42. Water which flows into this cavity 46 will move around the ring 40 and exit by virtue of gravity through the several apertures 44. This serves to provide a rim flush around the interior of bowl 20. While it is not likely that sufficient water can flow

through the relatively small supply tubes and valves such that the cavity 46 could ever be completely filled with water, it is possible to preclude the accidental overflow of water out of the cavity 46 and onto the floor of a room by designing the top of support ring 40 to be slightly below the top of bowl lip 22. Thus, if cavity 46 should ever become completely filled, and additional water is still being admitted, the additional water would flow over the ring 40 and into the bowl rather than over the higher lip 22.

The bidet 10 also includes a means for evacuating waste liquids from the reservoir into a sewage system. Said means includes a pump 50 having an inlet port 52 within the reservoir 18, and a tube 54 for connecting the pump's exhaust port with the sewage system. The pump 50 is preferably an electric pump such as Teel model no. 1T808, which is a submersible centrifugal pump having a capacity to pump 500 gallons per hour. Provided at the end of flexible tube 54 is a terminal attachment 56 for mounting on the lip of a permanent bathroom fixture, such as a toilet. The terminal attachment preferably has a generally U-shape such that it can securely hang on the rim of a toilet without risk of falling off. The attachment preferably has at least one flat surface for resting against the toilet lip, such that the attachment will be stabilized and not tend to roll in response to any tension on tube 54.

The pump 50 is preferably operated in response to the presence of a certain level of liquid in the reservoir 18. This is accomplished by providing a float 60 which is attached to an arm 62 which pivots about a rod 64, causing an arm 66 to actuate a switch 58. The switch 58 may be a Cutler-Hammer electric switch rated for 10 amps at 125 volts AC, and having an operating force of 2 ounces. From FIG. 1, it will be understood that when the reservoir 18 fills with liquid, the float 60 will rise, and arm 62 will rotate about pin 64. Actuating arm 66 extends through an aperture in end panel 70, applying the necessary force to activate switch 58. It is common to have a certain amount of liquid remain in the reservoir 18 at all times, so that the pump will always be primed. To insure that liquids remaining within the reservoir do not tend to leak out of the reservoir, an up-standing ledge 72 is provided at the rear of the bidet 10. The height of the ledge 72 is such that the float 60 will cause switch 58 to turn off when the water level is just below the top of ledge 72 but still above the pump inlet 52. The presence of some liquid in the bidet at all times naturally contributes to a generally bottom-heavy condition in the bidet, such that it has a relatively low center of gravity and is characterized as being very stable. To insure that liquids will not leak out of the reservoir 18 when the bidet is in use and liquids are draining into the reservoir, a rubber gasket is preferably provided between the end panel 70 and the stand 12. Such gasket may be made of closed cell neoprene sponge rubber manufactured by BF Goodrich Company. Such a gasket can be durable enough to last for years before showing any deterioration; but it is preferable that the up-standing ledge 72 be integral with or otherwise permanently sealed with respect to the base of the stand. With such a construction, there are no seams through which liquids normally remaining in the bottom of the reservoir could escape.

The spatial arrangement of the seat 42 with respect to the base 12 can also be seen in FIGS. 2 and 3. In these views it will be apparent that the seat 42 is de-

signed to rest securely upon the top of the bidet 10, either permanently or with temporary fasteners. The depending sides of the seat 42 keep it securely in its proper position over the bowl 20. Hence, it can be easily removed for cleaning or replacement, merely by lifting it straight up.

Referring next to FIGS. 4 and 5, the arrangement of the float 60 and the switch 58 which is actuated by the float can be seen in the fragmentary elevation and top views. As can perhaps be best seen in FIG. 5, the rod 62 is bent at its upper end to underlie an extension or a leg 67A protruding from arm 66. A second leg 67B also protrudes from arm 66 in the same direction but on the outside of end panel 70. When leg 67A is rotated upwardly, leg 67B also is rotated upwardly, and switch arm 59 thereby actuates the switch 58.

Referring next to FIGS. 6 and 7, the temperature mixing valve 30 includes a body 80 to which are rigidly fixed two ball valves 82A, 82B, such as the commercially available Crane Gem No. 2108 ball valve. The first of the valve devices 82A is adapted to be in communication with a cold water supply line, and the second valve device 82B is adapted to be in communication with a hot water supply line. Rigidly attached to the top of each of the valves 82A, 82B (instead of the customary handle) is a spur gear 84A, 84B. The respective bodies of the valve devices 82A, 82B are located on the body 80 at such a position that the teeth of the spur gears 84A, 84B mesh with one another. Hence, turning one gear 84A in a clockwise direction will turn the other gear 84B in a counterclockwise direction. When the valve devices 82A, 82B are initially installed, the gears (and their associated closure elements) are turned to a position such that one of the valve devices is fully closed when the other is fully opened.

Rigidly attached to spur gear 84B by bolts or the like is a plate 86, which in turn is rigidly connected to shaft 88. A handle, such as the handle 90 shown in FIG. 2, is rigidly attached to the top of shaft 88. Preferably, the handle 90 is not symmetrical, and ideally has a pointer of some type forming an integral part of the handle. The purpose of the pointer is to provide a readily perceptible display of the condition of the mixing valve attached thereto. As shown in FIG. 2, the pointer is oriented toward the left, in the customary position for receiving mostly hot water from a mixing valve. If desired, the excursion path of the handle 90 can be graduated into increments which are suitably marked on top of the shelf so that a person may learn from experience that a setting of, say, 6 on a scale that goes from 0 to 10, will provide a satisfying water temperature. Hence, if more than one person uses the bidet, each can quickly turn the handle to a desired setting based upon personal preference and experience. It will be apparent that turning the handle 90 will turn both plate 86 and gear 84B in the same direction, while at the same time gear 84A turns in an opposite direction. Hence, turning handle 90 so as to open valve 82B will tend to close valve 82A, such that the resultant mixture of water coming from the mixing apparatus 30 will be hotter than it was before the handle was turned. The handle 35 of the volume control valve then may be independently turned as far as is desirable to adjust the volume of water.

While dividing the volume control function and the temperature control function into two separate valves is not absolutely necessary, it does provide response

characteristics that are not guaranteed with combination valves that are frequently used in some kitchens and bathrooms. That is, the use of two separate valve units more nearly insures that a person who wants to change only the temperature of a spray will accomplish such a change, and will not also affect the volume of water being emitted. Also, the mixing valve 30 disclosed herein accomplishes its purpose with components that are both economical and simple in design; in particular, the simplicity in design means that the valve can be truly characterized as being reliable and long lasting.

In operation of the invention, it is assumed that the bidet has been kept in some remote spot away from its desired place of usage. This assumption is made because the flexible water supply lines and the pump for evacuating waste liquids make possible the storage of the bidet 10 in one place and the use of the bidet in another place. It is logical, then, to assume that the owner is taking advantage of this capability. If the owner happens to be a hospital, it is possible that the bidet has been in a central storage room along with other equipment. When a doctor prescribes the use of the bidet, it is moved from the storage room to the patient's bathroom where quick connect/disconnect fittings can be used to quickly tie the bidet into the hospital's water-supply system. If the bidet is privately owned and kept in a residence, it may be stored in some concealed but conveniently accessible spot such as a closet or cabinet, or under a specially designed cover where it is out of sight. After the water-supply tubes have been connected, the exhaust terminal 56 is physically positioned so that liquids will drain from tube 54 into a sewage opening. This can be accomplished by hanging the terminal 56 onto the edge of a toilet, or letting the terminal merely rest in the bottom of a shower stall or the like.

If the person using the bidet wishes the seat to be warmed, the volume control and diversion valve handle 35 is turned so as to divert water into the cavity 46. To more quickly heat the seat, it is assumed that the mixing valve 30 would be adjusted at this time to its "full hot" position, and water would be passed through the cavity 46 for as long as seemed desirable to warm the seat.

Next, the volume control and diversion valve 34 would be manually turned to divert the water to the fountain 28. The handle of the mixing valve 30 would then probably be turned to a more central position, such that cold water is being admitted through the valve in addition to hot water. Once the desired temperature of water has been achieved by mixing an appropriate amount of hot and cold water, the volume of water flowing through the fountain 28 is adjusted as desired. Liquids contained in the bowl 20 will eventually flow through drain 24 into the reservoir 18. After the level of liquids in the reservoir has risen sufficiently, the pump will be actuated so that the liquids will be evacuated through the exhaust tube 54. At the conclusion of use of the bidet, the volume control and diversion valve 34 may again be turned to divert water into the cavity 46, this time more for the purpose of providing a rinse through the apertures 44 than to warm the seat 42. The handle 35 may then be turned to its OFF position, which is preferably between the SPRAY and RIM RINSE positions.

When the incoming water has been turned off, the float 60 will eventually fall and the pump 50 will be turned off. The user will then normally lift terminal 56 from its discharge location and return it to a storage place. The electric plug may then be pulled from the convenience outlet, and the flexible supply tubes disconnected from the water supply, in which case the bidet is ready to be moved to any storage location.

While only the preferred embodiment of the invention has been disclosed in great detail herein, it will be apparent to those skilled in the art that modifications thereof can be made without departing from the spirit of the invention. Thus, the specific structure shown herein is intended to be exemplary and is not meant to be limiting, except as described in the claims appended hereto.

What is claimed is:

1. A bidet, comprising:

- a. a stand adapted to be placed at a desired location on the floor of a room having openings into a sewage system, said stand having an internal reservoir for receiving waste liquids;
- b. a wash bowl mounted on the top of the stand, and the bowl having a drain which is adapted to empty liquids into the reservoir;
- c. means for supplying fresh water to a fountain in the bowl; and
- d. means for evacuating waste liquids from the reservoir into a sewage system, including a pump having an inlet port within the reservoir, and a tube for connecting the pump's exhaust port with the sewage system.

2. The bidet as claimed in claim 1 wherein the means for supplying fresh water to the fountain includes a mixing valve in communication with sources of hot and cold water, and further including a volume control valve between said mixing valve and the fountain.

3. The bidet as claimed in claim 1 wherein the evacuating means comprises an electric pump which is operable in response to the presence of a certain level of liquid in the reservoir.

4. The bidet as claimed in claim 1 and further including casters mounted on the base of the stand, whereby the stand may be rolled to any desired location in a bathroom.

5. The bidet as claimed in claim 1 wherein the mixing valve includes a first valve device in communication with a hot water supply line and a second valve device in communication with a cold water supply line, and said valve devices being arranged such that one is fully closed when the other is fully opened, and further including a handle connected to active elements of the two valve devices such that turning the handle in a direction to open one of the valve devices will act to close the other.

6. A bidet as claimed in claim 5 wherein the mixing valve has two meshing gears, with one of the gears being rigidly attached to the stem of one valve device and the second gear being rigidly attached to the stem of the second valve device, whereby turning one of the gears in a clockwise direction will simultaneously turn the other gear in a counterclockwise direction.

7. The bidet as claimed in claim 1 wherein the wash bowl and the stand and at least a portion of the reservoir are integrally formed.

8. The bidet as claimed in claim 1 wherein a flexible tube is adapted to connect the exhaust port of the

pump with the interior of a permanent bathroom fixture having a lip, and the tube has a terminal attachment for mounting on the lip of the fixture, and wherein the terminal attachment has at least one flat surface for resting against the lip.

9. The bidet as claimed in claim 1 wherein the means for supplying fresh water to the bidet includes flexible tubes adapted to be temporarily connected to a permanent water supply system, and the tube connecting the pump with the sewage system is also flexible, whereby the bidet may be selectively moved to a desired position which is determined only by the length of the flexible tubes.

10. The bidet as claimed in claim 1 wherein at least the bottom portion of the walls of the reservoir are permanently sealed with respect to the base of the stand, and said bottom wall portions extend upwardly from the base of the stand for a distance which exceeds the height of the pump's intake port above the base, whereby there are no seams through which liquids which normally remain at the bottom of the reservoir could escape.

11. A movable bidet, comprising:

- a. a stand adapted to be placed at a desired location on the floor of a room which has openings into a sewage system, said stand having an internal reservoir for receiving waste liquids, and the stand having a base with a generally flat and smooth bottom, whereby the stand may be manually pushed or pulled over the floor to said desired location;
- b. a wash bowl mounted on the top of the stand, and the bowl having a drain which is adapted to empty liquids into the reservoir;
- c. a removable seat adapted to stably rest on the top of the wash bowl without being fastened thereto;
- d. means for supplying fresh water to a fountain in the bowl, including both a valve for controlling the quantity of water admitted to the fountain and a separate mixing valve for mixing hot and cold water to achieve a desired water temperature, said mixing valve including a first valve device in communication with a hot water supply line and a second valve device in communication with a cold

water supply line, and said valve devices being arranged such that one is fully closed when the other is fully opened, and further including a handle connected to active elements of the two valve devices such that turning the handle in a direction to open one of the valve devices will act to close the other; and

e. means for evacuating waste liquids from the reservoir into a sewage system, including a pump having an inlet port within the reservoir, and a flexible tube for connecting the pump's exhaust port with a plumbing fixture in communication with the sewage system, and further including a terminal attachment for mounting on the plumbing fixture, with the terminal attachment having a generally U-shaped configuration, whereby the terminal attachment may rest stably on an upstanding lip of a plumbing fixture.

12. The bidet as claimed in claim 11 wherein the stand is made of molding plaster which has been treated in such a way as to have a water-proof surface.

13. The bidet as claimed in claim 11 wherein the pump is an electric pump which is totally enclosed within the reservoir.

14. The bidet as claimed in claim 11 wherein the valve for controlling the quantity of water admitted to the fountain is a three-way valve, and wherein one discharge port of said three-way valve is connected to a means for discharging rinse water into the bowl at locations around the rim of said bowl.

15. The bidet as claimed in claim 11 and further including a structural brace for the seat, which brace extends inwardly and upwardly from the interior wall of the bowl near the top thereof, and said brace having a plurality of scattered openings through which water may flow from above the brace down into the bottom of the bowl.

16. The bidet as claimed in claim 11 wherein the stand additionally has floor-contacting rollers on its base to facilitate movement of the stand to a desired location in a room.

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