

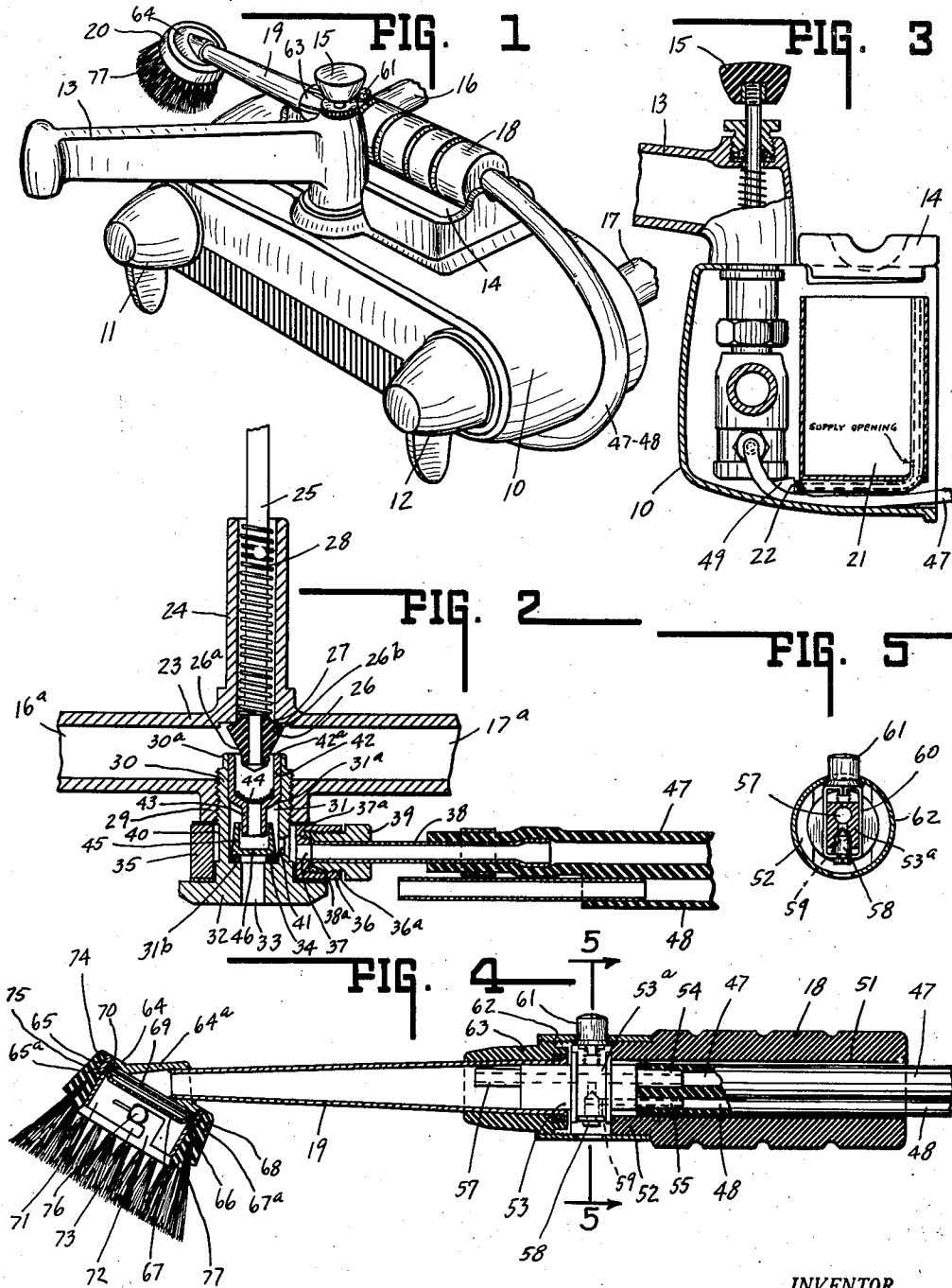
Sept. 22, 1953

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2,652,850

BACKFLOW PREVENTING UNIT FOR DISHWASHING APPARATUS

Filed Aug. 2, 1949



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UNITED STATES PATENT OFFICE

2,652,850

BACKFLOW PREVENTING UNIT FOR
DISHWASHING APPARATUS

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Application August 2, 1949, Serial No. 108,071

1 Claim. (Cl. 137-218)

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This invention relates to a fountain brush type of dish washing apparatus of the general character shown and described in my Letters Patent No. 2,508,958, issued May 23, 1950, and incorporating certain improvements thereover as shown and described in my copending application Serial No. 109,774, filed August 11, 1949, entitled "Dish Washing Apparatus."

One of the objects of the present invention is to provide a diverter valve for diverting the water from a hydrant through the usual discharge spout, to the fountain brush, and which valve is controlled by the water pressure when admitted to the mixing chamber of the fixture for retaining the valve in its diverting position after being manually moved to such position, and wherein the valve is caused to automatically return to its normal position upon the water pressure in the mixing chamber being dropped by closing the usual faucet valves. By means of this arrangement the apparatus is safeguarded against water inadvertently spraying from the fountain brush before it is placed in proper position. Thus, after turning on the water and obtaining the desired water temperature from the discharge spout and positioning the fountain brush, the valve may be moved to its diverting position where it will be retained only so long as the hydrant water is turned on, and then automatically returns to its normal position upon the hydrant water being turned off.

Another feature of the invention resides in the vacuum breaker or back flow preventer, whereby the back flow of water through the fountain brush which may be carrying detergent or resting in contaminated water is prevented in event of a drop in pressure in the hydrant. This is of particular importance wherein the apparatus is employed in city water systems to prevent contaminating water from back flowing into the water system in event of failure thereof with a consequent drop in pressure. To accomplish this purpose a vacuum break device is provided which, upon drop of pressure in the water system, will automatically move to close off said system and open the fountain brush to the atmosphere for both breaking the vacuum created by the drop in pressure and providing drainage.

The full nature of the invention will be understood from the accompanying drawings and the following description and claim.

In the drawings, Fig. 1 is a somewhat diagrammatic view of a spout provided mixing chamber including a diverter valve, a detergent device and a fountain brush connected to same and embodying the invention.

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Fig. 2 is an enlarged sectional view through the mixing chamber, diversion valve, and vacuum breaking device.

Fig. 3 is a transverse sectional view, through the detergent reservoir and associated conduits.

Fig. 4 is a longitudinal sectional view through the fountain brush.

Fig. 5 is a transverse sectional view through the handle and is taken on line 5-5 of Fig. 4 and in the direction of the arrows.

In Fig. 1 of the drawings there is illustrated a masking shell 10, hot and cold water valve control handles 11 and 12, the spout 13, swingable if desired, the detergent chamber cover 14, the exposed manually operable control 15 of the diverter valve, the main water supplies 16 and 17, and a handled fountain brush having handle 18, stem 19 and brush head 20.

As disclosed in the copending applications the valves are adjusted to discharge water at the desired temperature. This may be tested at the spout. When the brush is properly held over the sink the control 15 is actuated to cause discharge diversion to the brush. Water pressure holds the diversion valve in its actuated open position. Should the pressure lower by excessive draw-off or by the hot or cold water valve being sufficiently cut-off, the diverter valve automatically returns to its closed or spout diversion position.

All of the aforesaid are broadly disclosed in said copending applications as well as the liquid detergent reservoir or chamber 21 and its detergent discharge 22, see Fig. 3. Reference accordingly now will be had to Fig. 2.

Herein 23 indicates the mixing chamber body having supply branches 16^a and 17^a respectively for hot and cold water. Body 23 includes outlet tubular conduit or riser 24 which discharges to spout 13. Disposed in the riser is valve stem 25 which mounts valve 26 which at its lower end 26^b is adapted to engage seat 27 for spout cut-off. A coil spring 28 normally constrains said valve to open spout position, being sufficient to overcome stem friction.

In opposition to riser 24 is the internally threaded tubular portion 29. A plug-like tubular closure member 30 is thread mounted therein and includes upper collar portion 30^a for guide purposes. This closure member extends into the said mixing chamber. The bore 31 thereof includes a stop shoulder 31^a. The end opposite the collar is flanged as at 32 and includes a drain port 33 that vents to the sink

or lavatory bowl. The bore 31 provides a chamber defined by wall 31^b in which the drain port 33 opens. An apertured sealing washer 34 seats on said wall 31^b, its aperture aligning with the port 33.

Surrounding the aforesaid closure member 30, and gasket sealed between the confronting faces of the end of portion 29 and flange 32, is the collar or sleeve portion 35 having radial boss 36 internally threaded at 36^a. Discharge port 37 is defined by flared seat 37^a. The tube 38 with flared end 38^a is secured by gland nut 39.

The exterior of closure member 30 is annularly recessed as at 40, being surrounded by sleeve 35 to form an annular chamber with which port 37 communicates. Closure member 30 also includes a transverse port 41 so that the interior thereof has free communication with said chamber.

Seated in the bore 31 of closure 30 is a cup-like valve member 42 which at its lower end bears upon shoulder 31^a. Its upper end includes the conical face 26^a of valve seat 42^a for engagement by valve member 26. The opposite partially spherical face 26^b it will be remembered is engageable with seat 27.

Depending from member 42 is tubular stem 43 and disposed adjacent the intake end is a screen 44 if desired. A cup-like valve member includes cylindrical portion 45 and the flat end or plate portion 46. When the cup valve is uppermost it seals the lower discharge end of extension tube 43 preventing back flow through the port 37. When the cup valve is lowered it engages washer 34 and seals off the drain port 33. Thus when the mixing chamber is cut off the line 38 can drain at 33. When the pressure drops the cup valve 45—46 opens the tubular stem 43 and the mixing chamber discharges to line 38 provided valve 26 is elevated. It will be remembered that spring 28 only overcomes friction and the pressure in the chamber can hold valve 26 to spout cut-off position after the valve initially has been manually elevated.

Reference will now be had to Figs. 4 and 5 wherein the improved fountain brush is illustrated. Tube 47 is the main pressure discharge line. Tube 48 is the liquid detergent discharge line. It is connected by flexible tubing 49 to the detergent chamber discharge 22. Tube 47 is connected to tube 38 as shown.

A handle member 18, see Fig 1, includes the tube nesting bore 51, the internal collar portion 52 adapted to take fixture 53 to which at 54 and 55 tubes 47 and 48 connect. This fixture includes opposed slots 53^a, the cylindrical extension 55 and eccentric tube 57. The latter has free communication with tube 47 as shown. Fixture 53 mounts needle valve 58 yielding constrained to seated position and same controls angle passage 59 from tube 48 to tube 57.

A valve hanger 60 is associated with button 61 exposed by handle 18 and controls valve 58 so that when the button is pressed inwardly the water discharging from line 57 can suck detergent from line 48. A shell 62 is internally threaded at its free end. It has a press fit upon portion 52 of said handle 18. The tube 19 terminates in plate 63 threaded to mount in said shell.

The tube 19 at its other end terminates in an externally threaded plate 64 with dished inlet portion 64^a. A sleeve 65 is internally threaded for plate mounting and includes off-set or shoulder

der portion 65^a. A washer 66 bears thereon. On it is disposed the flange 67^a of an outwardly dished screen 67. A washer 68 bears on the flange 67^a and a disc screen 69 bears on the washer 68. A washer 70 backs up said screen. When sleeve 65 is screwed upon plate 64 all the aforesaid are rigidly secured together.

Sleeve 65 includes extension 71 with bayonet slot formations 72 therein arranged to form springs 73. An annular member 74 including internal shoulder 75 includes a corresponding number of bayonet pins 76. The free end of said member is provided with an annularly arranged series of bristle tufts 77. Member 74 when mounted masks all the aforesaid except plate 64 and screen 67.

This fountain brush discharges clear water from line 38—47 or detergent and water from the former and line 48 if button 61 be depressed. When the supply pressure lowers in the mixing chamber, insufficient to permit the diverter valve 26 to close, back pressure upon cup valve 46 causes same to seal tube 43 and thus prevents backflow from the fountain brush to the mixing chamber. Whatever back flow occurs will vent at 33. In normal operation of fountain brush pressure supply the vent 33 is held closed by valve 46.

The present invention has the further advantage that if upon a pressure drop in the main water supply resulting in a partial vacuum developing in the mixing chamber, and the cup 45 does not seat and seal off the end of tube 43, the vacuum is relieved or broken by air admitted through the drain port 33.

While the invention has been illustrated and described in detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character.

The invention claimed is:

In a dish washing apparatus having a vertical chamber communicating with a source of water normally under pressure, an upper conduit leading from the upper portion of said chamber and a lower conduit leading from the lower portion thereof, the combination therewith of an automatic back flow preventing unit including a nipple closing the upper end of said chamber and provided with an upper valve seat, said nipple having a reduced portion extending downwardly into said chamber terminating in a lower valve seat, a third valve seat in said upper conduit in opposed relation to said upper valve seat, a manually-controlled valve interposed between said upper valve seat and said third valve seat movable between open and closed positions in respect to said last-mentioned valve seats respectively, and a cup-shaped valve in the lower portion of said chamber slidable in guiding relation with the reduced end of said nipple movable under pressure from said source free of said lower valve seat to permit flow to said lower conduit upon said manually controlled valve being moved free of said upper valve seat, said cup-shaped valve being slidably movable into seating engagement with said lower valve seat to shut off back flow from said lower conduit upon the manually operable valve being forced from said upper valve seat when a partial vacuum develops in said chamber, for preventing back flow from said lower conduit to said source.

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