

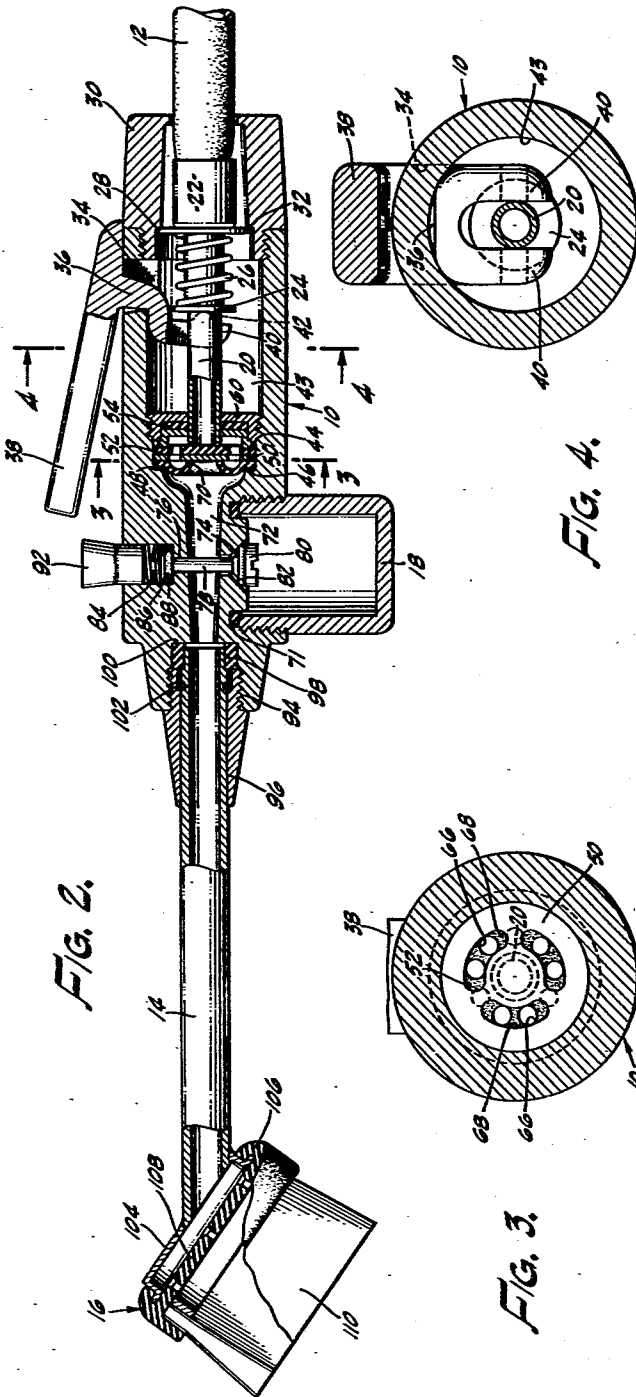
June 11, 1957

R. E. BLETCHER ET AL
DETERGENT DISPERSING DEVICE

2,795,460

Filed March 9, 1953

3 Sheets-Sheet 1



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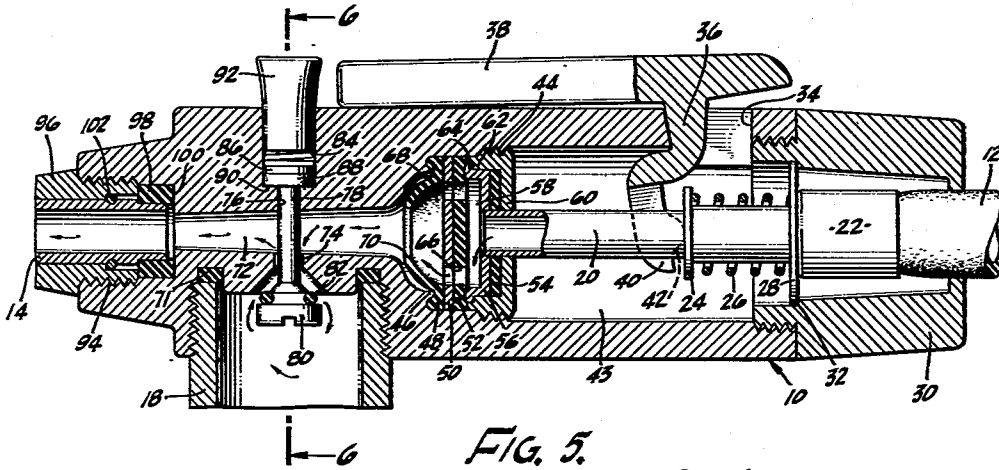


FIG. 5.

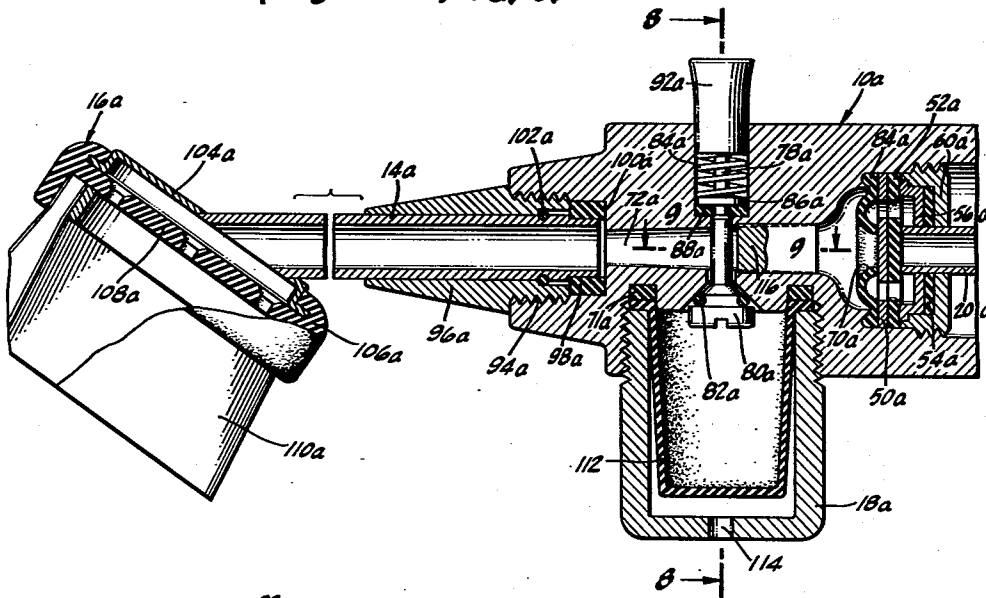


FIG. 7.

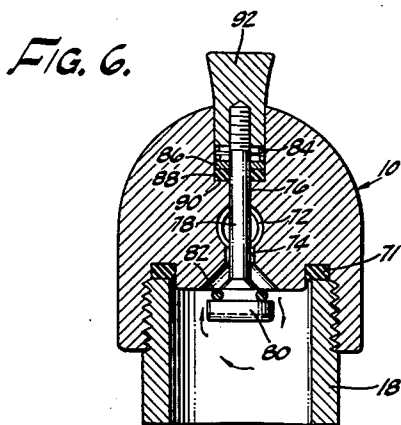


FIG. 6.

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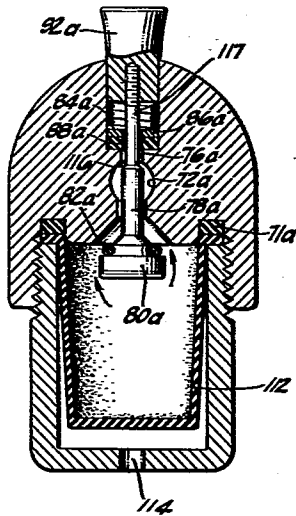


FIG. 8.

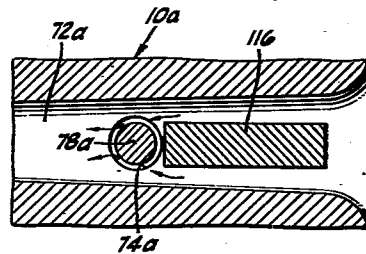


FIG. 9.

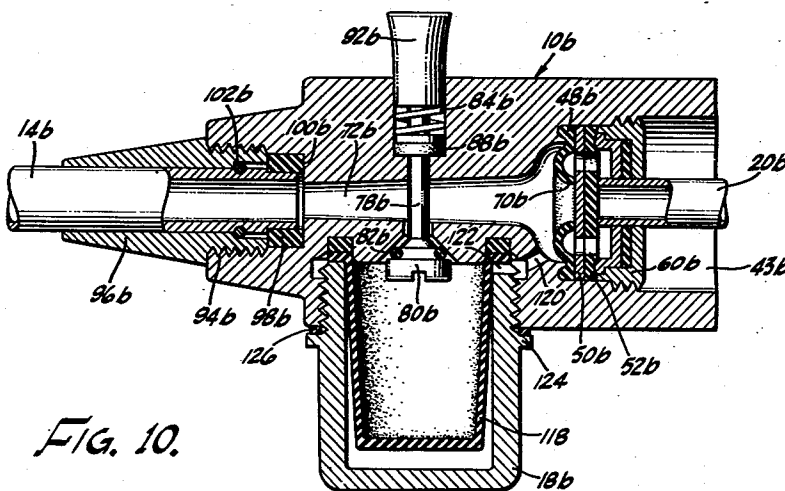


FIG. 10.

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DETERGENT DISPERSING DEVICE

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Application March 9, 1953, Serial No. 341,040

10 Claims. (Cl. 299—84)

This invention relates to a detergent dispersing device. An object of this invention is to provide a dishwashing mechanism wherein a detergent is mixed with water and ejected from the structure.

A further object is to provide such a device wherein either clear water or water mixed with detergent may be selectively discharged.

Other objects and advantages will be apparent from the following description.

In the drawings:

Figure 1 is a plan view of a detergent dispersing device embodying this invention.

Figure 2 is a section taken along line 2—2 of Figure 1.

Figure 3 is a section taken along line 3—3 of Figure 2.

Figure 4 is a section taken along line 4—4 of Figure 2.

Figure 5 is a fragmentary view in section of the device in the detergent dispersing position.

Figure 6 is a section taken along line 6—6 of Figure 5.

Figure 7 is a fragmentary section of a modified form of this invention.

Figure 8 is a section taken along line 8—8 of Figure 7.

Figure 9 is a section taken along line 9—9 of Figure 7.

Figure 10 is a fragmentary section of another modified form of this invention.

The principal embodiment as illustrated in Figures 1 through 6 has a generally cylindrical body 10. The body 10 at one extremity receives resilient hose 12 which hose is connected to a suitable source of water (not shown) at the opposite extremity of the body. A tube 14 is suitably attached which directs water to a nozzle 16. A detergent reservoir 18 is carried by the body and valve means are provided in said body for selectively discharging plain water or water mixed with detergent from the nozzle.

The hose 12 is of rubber or similar material and is clamped onto metal tube 20 by clamp 22. The tube 20 has a flange 24 formed thereon spaced from the clamp 22. A spring 26 has one extremity anchored to flange 24 and at its opposite extremity carries a washer 28 which bears against clamp 22. Cap 30 has a threaded extremity screwing into the extremity of body 10 adjacent the hose 12. The cap has an internal shoulder 32 which has a smaller inner diameter than the outer diameter of washer 28 so that the cap retains the tube 20 centrally positioned within the body 10. When the flange 24 is moved rearwardly against spring 26 the tube 20 and hose 12 are likewise moved rearwardly.

The body 10 is provided with a suitable aperture 34 through which the depending segment 36 of trigger 38 projects. The segment 36 carries a pair of fingers 40 which are spaced from one another to permit tube 20 projecting therebetween. Each finger has a protuberance 42 formed thereon which bears against flange 24. When the trigger 38 is depressed the flange 24 is forced rearwardly.

The tube 20 projects into a chamber 43 which is threaded as at 44 in the front extremity. In advance of threads 44 an internal shoulder 46 is formed. On as-

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sembly the resilient check valve 48 which will be described in greater detail later, is first inserted until it bears against shoulder 46. After this the metal seat washer supporting disk 50 is positioned to bear against the check valve. The resilient seat washer 52 is then inserted bearing against the supporting disk 50. The tube 20 is of sufficient length to bear against the seat washer 52 when the trigger 38 is in its undepressed position, thereby sealing off flow of water from hose 12 and tube 20. When the trigger is depressed as in Figure 2, the tube 20 is moved rearwardly permitting flow of water through the device.

To prevent water entering into chamber 43 a packing 54 is provided, having an aperture therein to permit tube 20 projecting therethrough. A water valve packing retainer 56 having a similar aperture spaces the packing from seat washer 52 forming a chamber 58. The packing is positioned to the rear of the seat washer 52 a distance slightly greater than the length of movement of tube 20 when trigger 38 is depressed. To secure the valve assembly in position and to guide movement of tube 20 a water valve retainer nut 60 is provided, screwing into the threaded extremity of chamber 43, also having an aperture through which tube 20 passes. This retaining nut has an internal shoulder 62, which receives an outwardly turned flange 64 formed on the packing retainer 56.

When the retaining nut is tightened it clamps the check valve 48, supporting disk 50, washer 52, packing retainer 56 and packing 54 between said nut and shoulder 46 securing such parts in their respective positions.

When trigger 38 is depressed, as best seen in Fig. 5, the tube 20 is urged rearwardly against spring 26, so that its extremity is moved rearwardly of washer 52 permitting flow into chamber 58. The packing 54 prevents flow rearwardly into chamber 43. The washer 52 comprises a perforated element having a series of apertures 66 formed therein permitting flow through said washer. Similarly, supporting disk 50 has slots 68 formed therein which overlie the apertures 66 permitting flow there-through. The check valve has a curved forward surface with a central aperture 70. When water is flowing from tube 20 the pressure flexes the resilient check valve outwardly from supporting disk 50, permitting flow to the nozzle 16. When the trigger 38 is released and spring 26 urges tube 20 against washer 52, shutting off flow, the check valve again resumes its normal shape with the periphery of aperture 70 engaging the supporting disk 50.

In this manner the device is rendered anti-siphon at this point as any reverse flow forces the check valve against disk 50. A further check valve between tube 20 and washer 52 prevents any possible back flow to the potable supply of water thereby insuring against contamination of the potable supply.

In advance of check valve 48 the body 10 is threaded to receive detergent reservoir 18, which reservoir may be of any suitable size. Suitable packing 71 is provided to prevent leakage.

Above the reservoir the body is provided with a tapered water passage 72 which is of smaller diameter at the forward extremity than the rear extremity to increase the velocity of flow. The rear extremity is adjacent the check valve and receives water therefrom.

The tapered water passage 72 communicates with reservoir 18 through port 74. The body 10 has formed therein a bore 76, through which pin 78 projects. The pin passes through passage 72 and port 74 into reservoir 18 and carries at its extremity a head 80. The head is larger than the port 74 and an O ring 82 of suitable resilient material is mounted upon pin 78 above head 80 which is adapted to engage the flared lower portion of port 74.

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The valve thus formed controls the flow of detergent from reservoir 18. The valve is normally urged closed by a spring 84 which is housed in the enlarged upper extremity of bore 76. At one extremity the spring 84 bears against washer 86 which in turn holds the resilient packing member 88 against shoulder 90. The packing member surrounds pin 78 and prevents water leakage through bore 76. At the other extremity the spring 84 bears against the push button 92 which button screws onto the pin 78. Thus the spring normally urges the detergent flow control valve to the closed position. When the valve is thus closed clear water is dispersed as trigger 38 is depressed. If it is desired to add detergent to the water the button 92 is also depressed. A small portion of the water flowing through passage 72 is diverted into the reservoir 18 and a small portion of detergent is continually ejected from the reservoir as long as button 92 is depressed. When the button is released the valve is seated by spring 84 and clear water is sprayed from nozzle 16 as long as trigger 38 is depressed.

The housing 10 at its forward extremity is threaded internally as at 94 to receive retaining member 96. Tube 14 projects through the retaining member and carries a resilient packing member 98 at its extremity which bears against shoulder 100, and prevents leakage. The tube 14 has an annular recess formed near the extremity of the tube into which a snap ring 102 fits. The retaining member 96 has an internal shoulder which engages the snap ring thereby clamping the tube 14 to body 10.

At the other extremity the tube 14 carries nozzle 16. The nozzle is formed by a plate 104 which carries brush head 106. The brush head has an aperture plate 108 through which water is sprayed, and carries a brush 110 about its periphery which can be utilized to scrub dishes as water or water and detergent are sprayed from nozzle 16.

Referring now to Figures 7, 8 and 9, a modified form of this invention is illustrated wherein like parts are given like numerical designations with the addition of the exponent "a." In this embodiment a bag 112 of suitable resilient material is provided to retain the detergent and an air hole 114 is provided in reservoir 18a. A dam 116 is provided in water passage 72a between check valve 48a and pin 78a, which dam obstructs a part of passage 72a. This obstruction reduces the area of the water passage and increases the velocity of flow. It also creates turbulence resulting in a partial vacuum around pin 78a so that atmospheric pressure in the reservoir collapses bag 112 forcing detergent therefrom into passage 72a.

It is frequently desirable to reduce the size of the upper portion of pin 78a as at 117 in this modification, so that air can pass around the pin into water passage 72a (see Fig. 8), reducing the vacuum and preventing too much detergent flow. This also functions to aerate the mixture of water and detergent so that the discharge is in the form of suds. It is desirable to increase the size of the apertures in the discharge nozzle when this foaming low velocity aerated mixture is developed. The lower portion of pin 78a is the same size as in the previous embodiment so that when the button 92a is released and pin 78a is raised by spring 84a the bore 76a is closed to flow of water. This permits movement of the device in an upright position without spilling water through the bore 76a.

In Fig. 10 a further modification is illustrated wherein like parts are given the same numerical designation with the addition of the exponent "b." It is readily apparent that the difference between this embodiment and the principal embodiment lies in the provision of a suitable resilient bag 118 to retain the detergent. Water is diverted into the reservoir around the bag and this water pressure forces detergent out of the bag into the flow through passage 72b. The water is diverted through passage 120 in body 10b in advance of check valve 48b and through passage 122 in reservoir 18b.

The reservoir 18b has a flange 124 formed thereon

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which carries packing 126 and forces it against body 10b creating a water tight seal.

While what hereinbefore has been described is the preferred embodiment of this invention, it is readily apparent that alterations and modifications can be resorted to without departing from the scope of this invention and hence the appended claims.

We claim:

1. A detergent dispersing device of the type connected to a water supply by a flexible hose comprising, a substantially cylindrical body having a water passage there-through, a washer having a plurality of ports therein in said water passage, a tube in said water passage having one extremity connected to said hose, trigger means externally mounted on said body which when depressed moves said tube out of contact with said washer and permitting flow through said ports, a detergent reservoir mounted upon said body, detergent control valve means controlling discharge of detergent from said reservoir into water flowing through said body, and a push button adjacent said trigger means projecting through said body engaging said detergent control valve means which when depressed permits detergent flow from said reservoir into water flowing through said body.

2. A detergent dispersing device of the type connected to a water supply by a flexible hose comprising, a substantially cylindrical body having a water passage there-through, a washer having a plurality of ports therein in said water passage, a tube in said water passage having one extremity connected to said hose, trigger means externally mounted on said body which when depressed moves said tube out of contact with said washer and permitting flow through said ports, packing surrounding said tube confining flow through said parts, a detergent reservoir mounted upon said body, detergent control valve means controlling discharge of detergent from said reservoir into water flowing through said body, and a push button adjacent said trigger means projecting through said body engaging said detergent control valve means which when depressed permits detergent flow from said reservoir into water flowing through said body.

3. A detergent dispersing device of the type connected to a water supply by a flexible hose comprising, a substantially cylindrical body having a water passage there-through, a washer having a plurality of ports therein in said water passage, a tube in said water passage having one extremity connected to said hose, trigger means externally mounted on said body which when depressed moves said tube out of contact with said washer and permitting flow through said ports, a flexible flow actuated check valve in said water passage in advance of said apertures permitting flow from said water supply through said apertures but covering said apertures and preventing flow through said apertures to said water supply, a detergent reservoir mounted upon said body, detergent control valve means controlling discharge of detergent from said reservoir into water flowing through said body, and a push button adjacent said trigger means projecting through said body engaging said detergent control valve means which when depressed permits detergent flow from said reservoir into water flowing through said body.

4. A detergent dispersing device of the type connected to a water supply by a flexible hose comprising, a substantially cylindrical body having a water passage there-through, a washer having a plurality of ports therein in said water passage, a tube in said water passage having one extremity connected to said hose, trigger means externally mounted on said body which when depressed moves said tube out of contact with said washer and permitting flow through said ports, a flexible flow actuated check valve in said water passage in advance of said apertures permitting flow from said water supply through said apertures but covering said apertures and preventing flow through said apertures to said water supply.

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ply, packing surrounding said tube confining flow through said ports, a detergent reservoir mounted upon said body, detergent control valve means controlling discharge of detergent from said reservoir into water flowing through said body, and a push button adjacent said trigger means projecting through said body engaging said detergent control valve means which when depressed permits detergent flow from said reservoir into water flowing through said body.

5. A detergent dispersing device of the type connected to a water supply by a flexible hose comprising, a substantially cylindrical body having a water passage there-through, a washer having a plurality of ports therein in said water passage, a tube in said water passage having one extremity connected to said hose, and its other end normally engaging against said washer, trigger means externally mounted on said body which when depressed moves said tube out of contact with said washer and permitting flow through said ports, a resilient detergent containing bag carried by said body communicating with said water passage, normally closed detergent flow control valve means for creating a reduced pressure above said bag in said water passage and when moved to its open position permits atmospheric pressure to force detergent from said bag into said water passage, and a push button adjacent said trigger means projecting through said body and engaging said detergent control valve means and which when depressed moves said valve to its said open position.

6. A detergent dispersing device of the type connected to a water supply by a flexible hose comprising, a substantially cylindrical body having a water passage there-through, a washer having a plurality of ports therein in said water passage, a tube in said water passage having one extremity connected to said hose and its other end normally engaging against said washer, trigger means externally mounted on said body which when depressed moves said tube out of contact with said washer and permitting flow through said ports, a detergent reservoir carried by said body, said reservoir having an air vent therein, a resilient detergent containing bag communicating with said water passage and disposed within said reservoir, normally closed detergent flow control valve means for creating a reduced pressure above said bag in said water passage and when moved to its open position permits atmospheric pressure to force detergent from said bag into said water passage, and a push button adjacent said trigger means projecting through said body and engaging said detergent control valve means and which when depressed moves said valve to its said open position.

7. A detergent dispersing device of the type described in claim 5, and dam means inserted into said water passage to increase the reduction of pressure above said bag in said water passage.

8. A detergent dispersing device as defined in claim 5 and means for venting the water passage at a position above said bag to reduce the pressure in said water passage above said bag.

9. A detergent dispersing device of the type connected

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to a water supply by a flexible hose comprising, a substantially cylindrical body having a water passage there-through, a washer having a plurality of ports therein and being disposed in said water passage, a tube in said water passage having one extremity thereof connected to said hose and its other extremity normally engaging against said washer, trigger means externally mounted on said body which when depressed moves said tube out of contact with said washer to permit water flow through said ports, a detergent reservoir carried by said body, a resilient detergent containing bag supported within said reservoir and connecting with said water passage, normally closed detergent control valve means disposed intermediate said water passage and said detergent containing bag, said detergent control valve means when moved to its open position permits water to be diverted from said water passage into said reservoir to force detergent from said bag into said water passage, a push button adjacent said trigger means projecting through said body and engaging said detergent control valve means, said push button upon being depressed engaging said detergent control valve means to move the latter into its open position.

10. A detergent dispersing device of the type connected to the water supply by a flexible hose comprising a body having a water passage extending therethrough, an element disposed in said water passage, a tube inside said water passage having one extremity connected to said hose and its other end normally engaging against said element, said element having at least one perforation extending therethrough disposed in outwardly spaced relation with respect to said other end of said tube, a first manually operable means externally mounted on said body which when depressed moves said tube out of contact with said perforated element to permit water flow therethrough, a detergent reservoir mounted on said body, detergent control valve means controlling discharge of detergent from said reservoir into said water flowing through said body, and a second manually operable means disposed adjacent said first manually operable means and projecting through said body to engage said detergent control valve means, said second manually operable means upon being depressed permitting detergent to flow from said reservoir into water flow through said body.

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