June 19, 1962 J. BRUCKER 3,039,492

COMBINATION SUDSING AND RINSING DEVICES

Filed Dec. 14, 1959 2 Sheets-Sheet 1

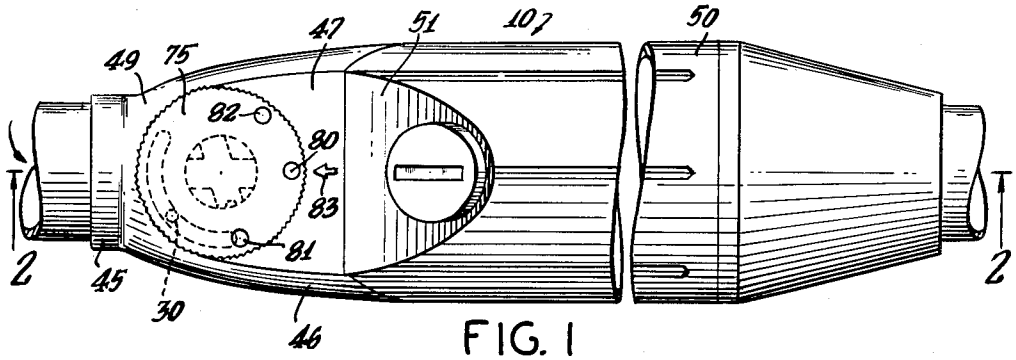


FIG. 1

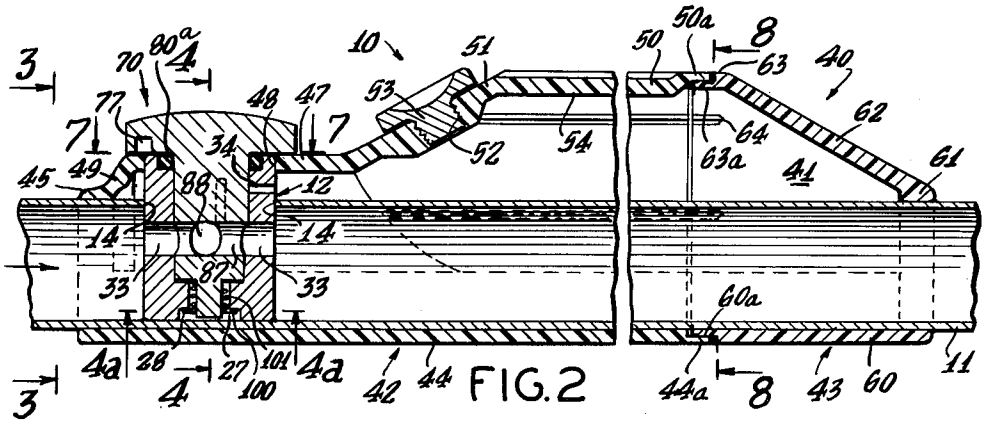


FIG. 2

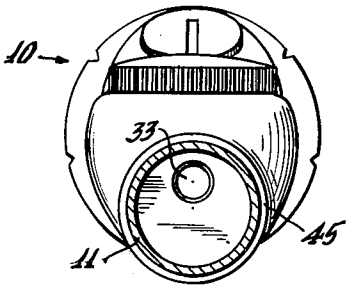


FIG. 3

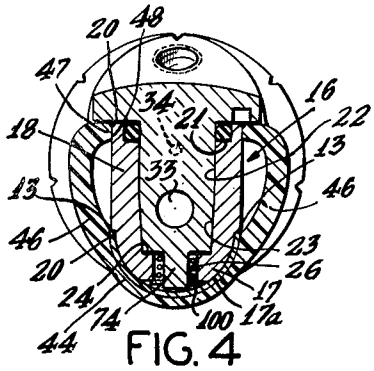


FIG. 4

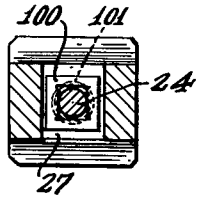


FIG. 4a.

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COMBINATION SUDSING AND RINSING DEVICES

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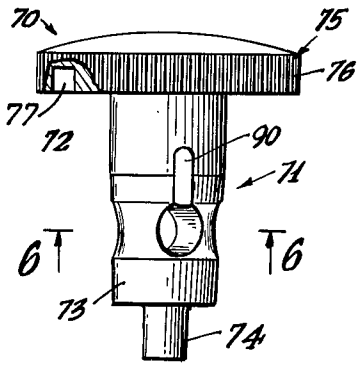


FIG.5

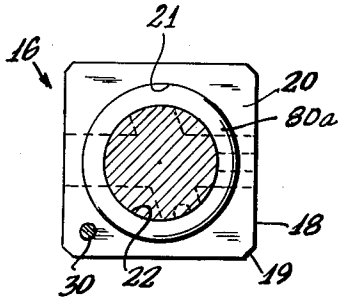


FIG.7

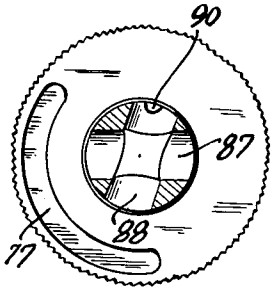


FIG.6

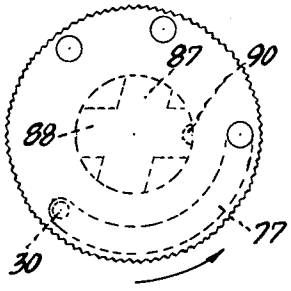


FIG.6a

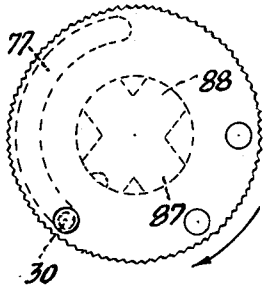


FIG.6b

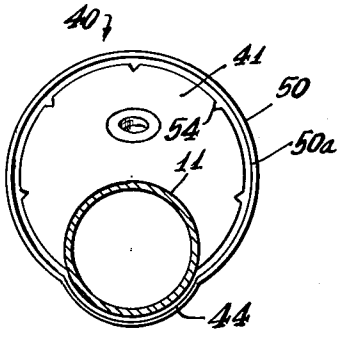


FIG.8

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COMBINATION SUDSING AND RINSING DEVICES

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Filed Dec. 14, 1959, Ser. No. 859,327
9 Claims. (Cl. 137—625.41)

This invention relates to combination sudsing and rinsing devices.

An object of this invention is to provide a device of the character described comprising a pipe or tube adapted to be connected to a supply of water, a casing fixedly mounted on the tube and adapted to contain liquid soap, and valve means, including a single movable valve member which in one position thereof shuts off the flow of water through the tube and shuts off flow of liquid soap from the casing to the tube; which in another position thereof allows flow of water through the tube for rinse operation while shutting off flow of soap from the casing to the tube; and which in still another position thereof, allows flow of water through the tube and allows flow of soap from the casing to the tube for the sudsing operation.

Another object of this invention is to provide in a device of the character described, means to indicate the three positions of the movable valve member, and means to limit movement thereof toward the complete shut off position, and toward the sudsing position, and in which the rinse position is between the limits of movement of said movable valve member, so that said valve member moves through rinse position from shut off position to sudsing position or therefrom back to shut off position.

Still another object of this invention is to provide a strong, rugged and durable device of the character described which shall be relatively inexpensive to manufacture, easy to manipulate, shall be leakproof and yet practical and efficient to a high degree in use.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts, which will be exemplified in the construction hereinafter described and of which the scope of invention will be indicated in the following claims.

In the accompanying drawings in which is shown an illustrative embodiment of this invention,

FIG. 1 is a top plan view of a device embodying the invention;

FIG. 2 is a cross-sectional view taken on line 2—2 of FIG. 1;

FIG. 3 is a cross-sectional view taken on line 3—3 of FIG. 2;

FIG. 4 is a cross-sectional view taken on line 4—4 of FIG. 2 and with the closure cap for the soap casing removed;

FIG. 4*a* is a cross-sectional view taken on line 4*a*—4*a* of FIG. 2;

FIG. 5 is a front elevational view of the movable valve member with part broken away and in cross-section;

FIG. 6 is a cross-sectional view taken on line 6—6 of FIG. 5;

FIG. 6*a* is a top view of the rotary valve member in sudsing position.

FIG. 6*b* is a view similar to FIG. 6*a* but showing the rotary valve member in shut off position;

FIG. 7 is a cross-sectional view taken on line 7—7 of FIG. 2; and

FIG. 8 is a cross-sectional view taken on line 8—8 of FIG. 2.

Referring now in detail to the drawing, 10 designates a device embodying the invention. The same comprises

a pipe or tube 11 which may be made of aluminum or the like metal. Said tube 11 is provided with an opening or cut out 12 forming a pair of opposed parallel straight edges 13 in a horizontal plane passing through the axis of the tube, interconnected at their ends by a pair of parallel, semi-circular edges 14. The lengths of edges 13 is substantially equal to the inner diameter of the pipe 11. Mounted on the tube is a valve body member 16 which may be made of rigid synthetic plastic. Said member 16 has a lower, semi-cylindrical portion 17 projecting down through opening 12 to contact an inner surface of the pipe 11. Above the semi-cylindrical portion 17, member 16 has a portion 18 of square transverse cross-section with beveled vertical corners 19. Between portions 17 and 18, body member 16 has under-shoulder portions 20 resting on edges 13. The semi-cylindrical edges 14 contact opposite side surfaces of portion 18 of body member 16. The curved outer surface 17*a* of portion 17 of body member 16 may be glued or adhered to the inner surface of pipe 11. Body member 16 extends upwardly above pipe 11 and has a top surface 20. In its top end, member 16 is formed with an annular central counterbored depression 21, from which extends downwardly a cylindrical axial bore 22, from which extends downwardly a slightly tapering bore 23 decreasing in diameter in a downward direction. At the lower end of bore 23 is an annular shoulder 24 from which extends downwardly, an axial cylindrical bore 26 communicating with a longitudinal slot 27 at the lower end of body member 16, forming an under-shoulder 28. Slot 27 has a width greater than the diameter of opening or bore 26. Fixed to the upper end of body member 16 and extending up from upper surface 20 thereof, at one corner thereof, in spaced relation to the counterbore 21, is a pin or lug 30 located in a vertical plane passing through the axis of said body member at 45% to the axis of pipe 11.

Said body member 16 is further formed with a pair of horizontal aligned through openings 33 parallel to the axis of pipe 11 and communicating with bore 23. The axis of openings 33 crosses the axis of body member 16, and is at a level above the level of the axis of pipe 11. Said openings 33 are totally within the pipe 11. Valve body member 16 is also formed with a small opening 34 perpendicular to bore 22, and parallel to openings 33 and disposed above one of said openings.

Mounted on the pipe 11 is a casing 40 forming with said pipe a chamber 41 for liquid soap or detergent. Said casing 40 may comprise two assembled together parts 42, 43 made of rigid plastic.

Part 42 has a lower, longitudinal portion 44 hugging a lower semi-cylindrical portion of pipe 11. At its rear end, said part 42 has a circular collar portion 45 completely surrounding the pipe 11 on one side of opening 12. Forwardly of circular portion 45, said part 42 has enlarged curved portions 46 extending upwardly from the lower portion 44 (FIG. 4) in spaced relation to pipe 11 and valve body member 16. The curved portions 46 are connected by a top flat portion 47 formed with a square hole 48 with beveled corners receiving the upper end of body member 16. The top surface of top wall 47 is at the level of the top surface 20 of said body member 16. Curved portions 46 and top wall 47 are connected to the collar by tapered portions 49. Wall portions 46 diverge away from collar 45 increasing in height and merging into an enlarged substantially cylindrical portion 50. Piston 50 is connected to wall 47 by a top inclined wall 51 formed with a screw threaded filler opening 52, which may be closed by a screw plug or cap 53. Portion 50 also merges with portion 44 and is formed with a plurality of longitudinal reinforcing indented V-shaped ridges 54.

At its outer end, portions 50 and 44 are formed with reduced flanges 50*a*, 44*a*, being counter-bored at their inner surfaces. Portions 44 and 45 of part 42 are glued or otherwise adhered to pipe 11. Collar 45 may have a tight or press fit on said pipe.

Part 43 of the casing is assembled with part 42 in end to end relation. Part 43 is made of stiff plastic and comprises a portion 60 hugging the semi-cylindrical underside of pipe 11, similarly to portion 44 of part 42. At one end pipe 11 has a completely annular collar 61 surrounding and contacting pipe 11. Portions 60, 61 may be adhered to pipe 11. Collar 61 may be press fitted thereon. Extending from collar 11 and portion 61 is a tapering portion 62 terminating in an enlarged part cylindrical portion 63 merging with portion 60. Portions 63, 60 have portions 63*a*, 60*a* of reduced diameter fitted within portions 44*a*, 50*a* of casing part 42, and glued or otherwise adhered thereto.

Part 43 may have ridges 64 corresponding to ridges 54 and forming continuations thereof when parts 42, 43 are assembled.

It will now be understood that when parts 42, 43 are assembled, a chamber 41 is formed which may receive liquid soap or detergent for controlled mixture with water passing through pipe 11 as will be explained hereinafter.

Rotatably mounted on the valve body 16 is a valve member 70 having a stem 71. Stem 71 has an upper cylindrical portion 72 rotatable in bore 22 and extending up through counter bore 21. Extending down from stem portion 72 is a tapered stem portion 73 rotatable in bore 23 and fitted therein. Extending down from stem portion 73 is a coaxial reduced stem portion 74 projecting down through bore 26 to a point below the under-shoulder 28. The diameter of stem 74 is less than the diameter of bore 26.

At the upper end of stem 71 is a head 75 formed with knurled outer edge 76. Head 75 overlies top surface 21 of valve body member 16 and flat surface of wall 47. At its underside, head 75 is formed with an arcuate slot 77 having rounded ends. The slot may be 127½° in angular extent from the axis of the rounded end to the axis of the other rounded end.

In one angular position of the valve member 70, pin 30 is between the ends of slot 77, being 75° from the axis of one rounded end and 52½° from the axis of the other rounded end of said slot. This is "Rinse" position as illustrated in FIGS. 1 and 2. In counterbore 21 is an O-ring 80*a* contacting the inner surface of the counterbore and the outer surface of stem portion 72, to prevent leakage.

The top surface of head 75 has three circular indentations 80, 81, 82. Indentation 80 is marked "Rinse"; indentation 81 is marked "Suds" and indentation 82 is marked "Off." The "Rinse" indentation is adjacent arrow 83 marked on wall 47 located in a vertical plane through the axis of the pipe 11 and on the right side of the head 75 (looking at FIG. 1). This is the "Rinse" position. The "Suds" indentation 81 is located about 75° in a clockwise direction from the "Rinse" indentation 80. The "Off" indentation 82 is located about 52½° in a counterclockwise direction from "Rinse" indentation 80. Thus, upon turning the knob or head 75 through an angle of 75° in a counterclockwise direction, pin 30 will stop rotation of the valve member with the "Suds" indentation at arrow 83. This position is shown in FIG. 6*a*.

Upon rotating knob 75 in a clockwise direction from the position of FIG. 1 through 57½° to the position of FIG. 6*b*, the "Off" indentation reaches the arrow 83 and pin 30 stops rotation of the knob.

Stem portion 73 is formed with two crossing horizontal transverse through valve openings 87, 88 at the level of openings 33. In the "Rinse" position of FIGS. 1 and 2, opening 87 is aligned with openings 33 so that water may flow through the pipe 11 to a brush or other cleaning or washing device in said pipe.

Stem portions 72, 73 of the valve member 70 is formed with a vertical external groove 90 extending up from one end of opening 88 to the level of opening 34. In the "Rinse" position of FIGS. 1 and 2, groove 90 is aligned with and adjacent the "Suds" indentation 81 and is hence closed by the inner surface of bores 22, 23 of body member 16. Opening 34 communicates with the soap chamber 41, but in the "Rinse" position no soap may flow from the soap chamber to the water flowing in pipe 11.

In the "Suds" position of FIG. 6*a* however, groove 90 becomes aligned with opening 34 and through passage 88 becomes aligned with openings 33 so that water flows through pipe 11 and soap is pulled through opening 34, groove 90 into opening 88 and hence through pipe 11 to mix with water for the sudsing operating.

Upon moving the valve 70 to the "Off" position, as shown in FIG. 6*b*, groove 90 is closed, opening 34 is closed and openings 87, 88 are closed so that no water or soap can flow. This is the complete shut off position of the apparatus.

Attached to the lower end of stem 74 is a speed nut 100. Surrounding the stem 74 and interposed between nut 100 and under-shoulder of stem portion 73 is a coil compression spring 101 to pull the valve member 70 down and to keep the valve stem 71 in contact relation with the interior surfaces of bores 22, 23.

It will thus be seen that there is provided an apparatus in which the several objects of this invention are achieved, and which is well adapted to meet the conditions of practical use.

As possible embodiments might be made of the above invention, and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. In combination, a pipe, a casing fixed thereon and forming a soap chamber therewith, said pipe having an opening disposed within said chamber, a valve body in the pipe and projecting through said opening in the pipe, said casing having a wall spaced from said pipe and formed with an opening aligned with and spaced from the pipe opening, said valve body projecting into the casing opening, said valve body being formed with an axial bore, a valve member having a stem rotatable in said bore, said body having a pair of through openings located within said pipe and having portions located on opposite sides of and communicating with the bore, and said valve body being formed with an opening longitudinally offset from said pair of openings and connecting the bore with the inside of the chamber, and said stem having a pair of crossing through passages adapted to selectively align with said pair of openings, and with a longitudinal groove at the outer side thereof extending from the outer end of one of said crossing openings to the level of the opening in said valve body which connects the bore thereof with the soap chamber.

2. The combination of claim 1, said valve member having a head at its upper end formed with an arcuate slot at its underside, and a pin on said valve body projecting into said slot.

3. The combination of claim 2, said bore having a tapered portion, said stem having a tapered portion received in the tapered portion of said bore, and spring means to pull the valve member down to press the tapered portion of the stem against the inner surface of the tapered portion of the bore.

4. In combination, a pipe, a casing fixed thereon, a valve body in the pipe, a valve member rotatably mounted in the valve body, and passing through the pipe and casing, said body having a bore, said valve member having a stem within the bore, said body having a pair of aligned openings on opposite sides of the bore aligned with the pipe, and with an opening connecting the bore with the

interior of the casing, said stem having a pair of crossing through openings adapted to be selectively aligned being further formed with the pair of openings, and with an exterior groove extending from one of said crossing openings to the level of the opening which communicates with the casing, said crossing opening from which said groove extends being in alignment with said pair of opposed openings in the valve body, in one angular position of the valve member, said groove being in communication with the opening in the body which communicates with the casing in said angular position, said other crossing opening being aligned with said pair of opposed openings in a second angular position of said valve member, and said groove being closed in said second angular position, and both of said crossing openings and groove being shut off in a third angular position of said rotary valve member.

5. The combination of claim 4, said valve member having a head at its upper end located outside the casing, formed with an arcuate slot, and a pin on said valve body received in said slot.

6. The combination of claim 5, said pin and arcuate slot being arranged to limit movement of the valve member in two of said angular positions.

7. The combination of claim 5, said bore having a tapered portion, said stem having a tapered portion and spring means to pull the tapered portion of the stem into the tapered portion of the bore.

8. The combination of claim 4, said casing having a portion hugging the pipe and collars at the ends thereof surrounding and contacting the pipe.

9. In combination, a pipe, a casing on the pipe and having a chamber, a valve body fixed within the pipe and formed with an axial bore, a valve member having a stem rotatably mounted in said bore of said valve body,

said valve body having a pair of aligned openings communicating with said pipe and with said bore, and also being formed with an opening longitudinally offset from said pair of openings and connecting said bore to said chamber, and said stem having a pair of crossing passages adapted to selectively align with said pair of openings in different angular positions of said stem, said stem also being formed with a longitudinal outer groove extending to one of said crossing openings, and adapted to register with the opening in said body which connects said bore to said chamber, in one angular position of said stem, said one of said pair of crossing openings registering with said pair of aligned openings of said valve body in said angular position of said stem, the other of said pair of crossing openings in said stem registering with said pair of aligned openings in the valve body, in another angular position of said stem, in which position said longitudinal groove is not registering with said opening which connects the chamber to said bore, whereby said last named opening is shut off, and both said crossing openings and said opening which connects said bore with said chamber being shut-off, in yet another angular position of said valve stem.

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