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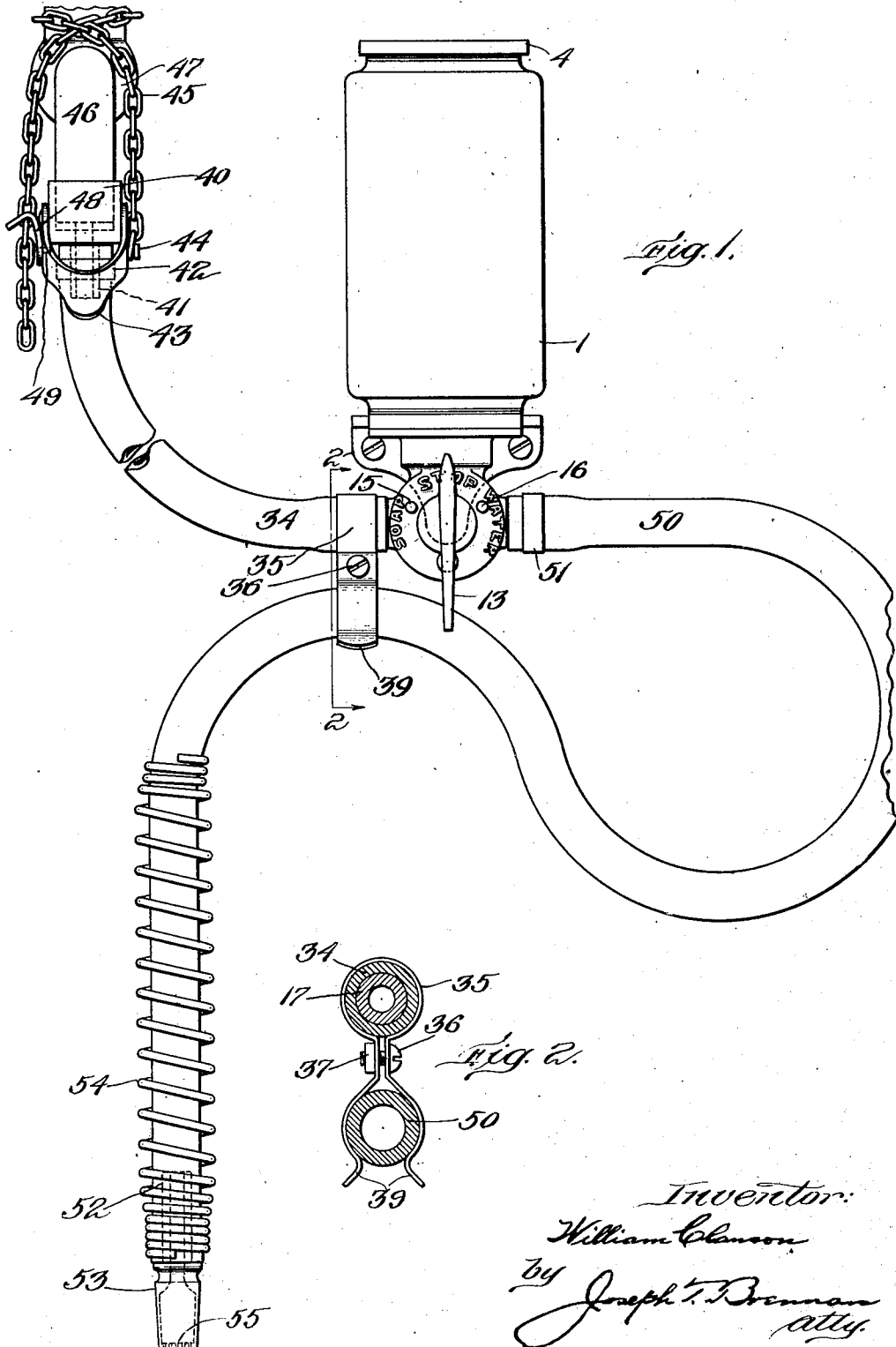
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LIQUID MIXING AND SPRAYING DEVICE

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2 Sheets-Sheet 1



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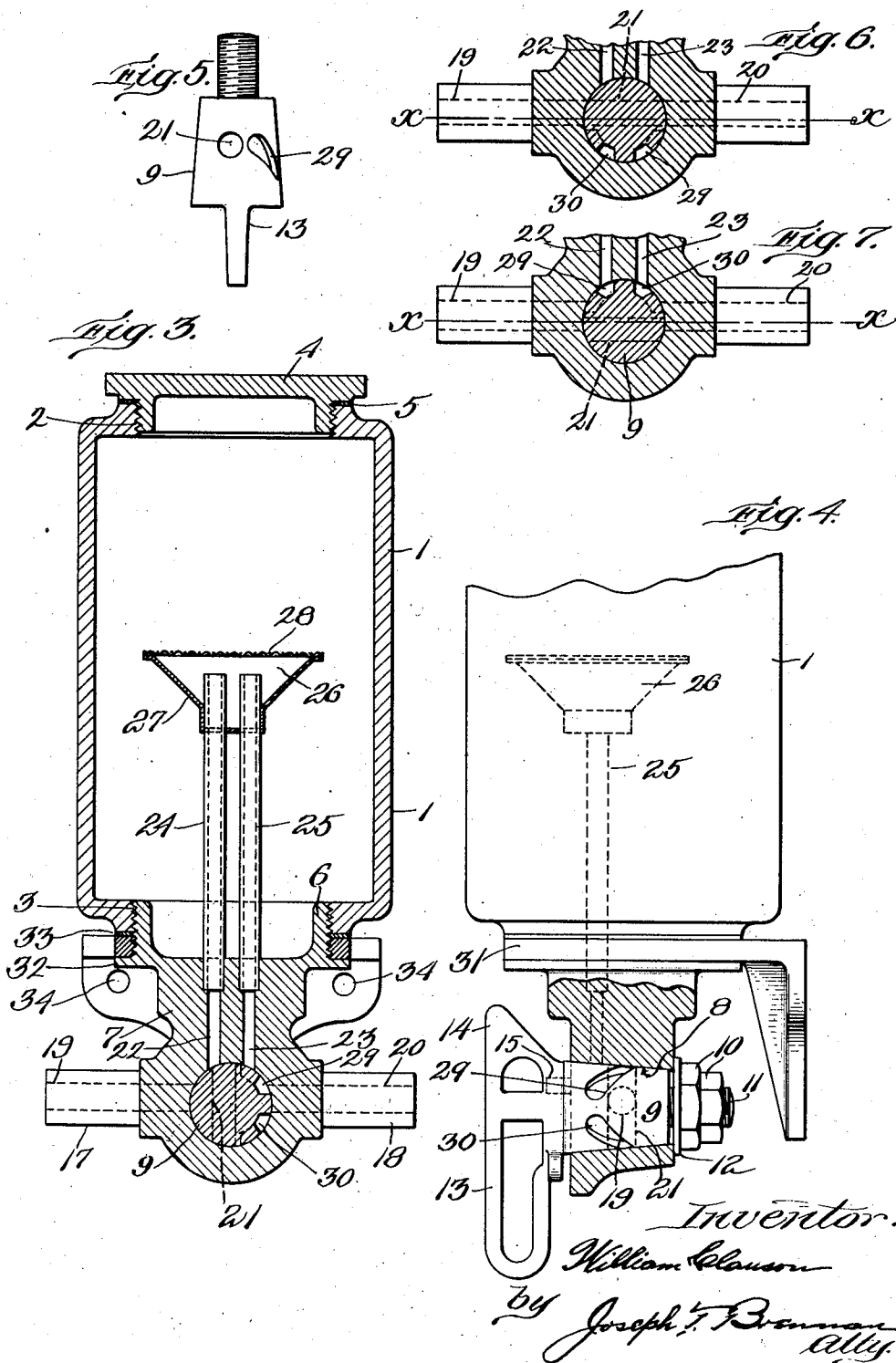
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UNITED STATES PATENT OFFICE.

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LIQUID MIXING AND SPRAYING DEVICE.

Application filed July 12, 1922. Serial No. 574,572.

My invention relates to mixing and washing apparatus for use in washing articles with a liquid, or a liquid solution, and the object of my invention is to provide an improved device or apparatus of this kind. It is also an object of this invention to provide a simple, efficient and inexpensive apparatus of this class adapted to be attached to a water supplying faucet and to be used in washing dishes and the like.

My improved washing apparatus in its best form, is constructed with a vessel for holding soap or the like associated with a four-way cock whose valve chamber is provided with a main inlet port connected with one end of a flexible hose adapted at its opposite end to be separably connected with a water supply or the like, for example with the faucet of a water system; a main outlet port connected with a manually manipulated flexible delivery hose, and two by-pass ports communicating with the interior of said vessel. Within the valve chamber is arranged a valve controlling all of the ports and constructed so that when placed in one position the by-pass ports that communicate with the interior of the vessel are closed and unrestricted communication is established between the other two ports; when placed in a second position the two by-pass ports communicating with the interior of the vessel are connected, one with the main inlet port and the other with the main outlet port, while at the same time restricted communication is established between the two main ports, and when placed in a third position said valve stops altogether the flow of liquid through the apparatus. Thus when the valve is placed in the first position clear water only will be discharged from the delivery hose; when placed in the second position a portion of the stream passing through the apparatus will be diverted through the soap holding vessel so that soapy water will be discharged from the delivery hose, and when placed in its third position the valve will stop the flow of water through the apparatus.

In the best form of my invention the soap holding vessel is constructed so that it can be fastened to a wall or other support.

Other important features of my invention are hereinafter pointed out.

In the accompanying drawings:

Figure 1 is an elevation of a mixing and

washing apparatus constructed in accordance with my invention showing the same applied to a hot water faucet.

Figure 2 is a section on line 2—2 of Fig. 1.

Figure 3 is a sectional view of the soap holding vessel of the apparatus.

Figure 4 is a side elevation, partly in section, of the lower portion of the soap holding vessel.

Figure 5 is an elevation of the valve of the four-way cock.

Figures 6 and 7 are sectional details showing different positions of the valve of the four-way cock.

Having reference to the drawings, 1 represents the body of a substantially cylindrical metal vessel formed at its upper and lower ends with threaded apertures 2 and 3, respectively, the upper opening 2 being normally closed by a removable threaded cap 4 screwed therein. A gasket 5 of leather or the like may be positioned between the cap 4 and the body 1 as shown in Fig. 3 to seal the joint between said parts. Into the lower threaded aperture 3 is screwed an exteriorly threaded nipple 6 forming part of the body 7 of a four way cock. The body 7 is made with a valve chamber 8 within which a rotatable valve plug 9 is held by means of a pair of nuts 10 mounted upon the threaded stem 11 of said valve 9, a washer 12 being positioned between said nuts and the body 7 of the cock, as usual. At its opposite larger end the valve plug 9 is made with an integral handle 13 by means of which it is manually operated, said handle being formed at one end with a pointer 14 co-operating with the position indicating lettering "Soap," "Stop" and "Water" cast upon the outer face of the body 7. Stops 15 and 16 in the form of lugs on said outer face engage the handle 13 to limit the movement thereof to one-half of a revolution.

The cock body 7 is made with radially disposed nipples 17 and 18 projecting from opposite sides thereof, the nipple 17 being made with a main inlet port 19 through it, which communicates with the valve chamber 8, and the nipple 18 being made with a main outlet port 20 through it, which also communicates with said valve chamber. The axes of these two ports 19 and 20 are alined, relatively, but offset with relation to the axis of the valve 9 as will be clear by reference to Figs. 6 and 7 where the line $x-x$

is shown passing through the axis of said valve. Formed transversely through the valve 9 is a port 21 which is correspondingly offset relatively to the axis of the valve 9, the end of said port 21 co-operating with the ports 19 and 20 so that when handle 13 occupies one extreme position against stop 15 said ends register fully, each with one of the ports 19, 20, as shown in Fig. 6, and so that when handle 13 occupies its other extreme position against stop 16 said ends register only partially with the ports 19 and 20 thereby restricting the flow from port 19 through port 21 to port 20.

Opening into valve chamber 8 at right angles to the ports 19 and 20 is a pair of upwardly extending by-pass ports 22 and 23 formed in the body 7. Fixed within the upper ends of the ports 22 and 23, respectively, are two tubes 24 and 25 whose upper ends occupy positions within a shield 26 having a funnel-shaped sheet metal body 27 and a wire gauze top wall 28. The ends of the ports 22 and 23 which open into the valve chamber 8 are disposed to co-operate, respectively, with the proximate ends of ports 29 and 30 formed as grooves in the periphery of the valve plug 9, said groove-ports being angularly or spirally disposed so that their separated ends are adapted to co-operate with the inner ends of the main ports 19 and 20. Thus when the valve plug 9 occupies its second position where the handle 13 is against stop 16, the ports 19 and 20 are connected, by ports 29 and 30 with ports 22 and 23 and restricted communication is at the same time established between ports 19 and 20 by the port 21 of the valve plug. It will thus be clear that with the valve plug 9 occupying this position (Fig. 7) water entering inlet port 19 under pressure or head will not only pass directly through the port 21 into outlet port 20 but also upwardly through ports 29 and 22 and tube 24 into the interior of vessel 1 and then from the latter downwardly through tube 25, and ports 23 and 30, into outlet port 20. This diversion of a portion of the water through the vessel 1 is occasioned, not only by the pressure or head within the inlet port 19, but also by the suction or aspirator effects produced within outlet port 20 at the discharge end of port 30 by the water discharging from the port 21 of the valve plug at one side only of the outlet port.

The nipple 6 of the body of the cock extends through an aperture formed through a bracket 31 and said bracket is clamped rigidly to the vessel 1 by a flange 32 provided upon said body; a gasket 33 of leather or the like being placed between said bracket and the vessel to close the joint. Screw holes 34 in bracket 31 provide for

fastening said bracket to a wall or other support.

The inlet nipple 17 has telescopically applied to it one end of a flexible hose pipe 34 that is rigidly fastened thereto by means of a clamp consisting of a metal strap 35 surrounding the portion of the hose occupied by the nipple, and a bolt 36 and nut 37 by means of which the ends of the strap are drawn together. The ends of the strap are extended beyond the bolt 36 to provide curved spring jaws 39. These spring jaws are provided for a purpose presently to be described.

At the opposite end of the section of hose 34 is a cup-shaped socket 40 provided with a ported nipple 41 fitted telescopically within said end and to which the latter is clamped by a strap 42. Straddling the socket 40 and fulcrumed thereon is a lever 43 to one arm of which is fastened, at 44, one end of a chain 45. The socket 40 is provided to receive the delivery end of the nozzle 46 of a hot water faucet 47, the chain 45 being passed upwardly, wrapped around the body of the faucet and having its other end separably and adjustably connected with the other arm of the lever 43. As herein shown the means by which said end of the chain is separably and adjustably connected with the lever 43 consists of a forked or double-tined hook 48 pivotally connected at 49 to said lever 43, the pivot 49 being the same distance from the fulcrum of lever 43 as the pivotal connection 44 and disposed directly opposite the latter. When a link of the chain 45 is passed into position between the tines of the hook 48 the next lowest link engages said tines so as to lock the chain and hook together.

The outlet nipple 18 of the four-way cock has telescopically applied to it one end of a flexible delivery hose 50 that is fastened in position thereon by means of a clamping strap 51. The opposite end of the delivery hose 50 is fitted telescopically onto the nipple 52 of a spraying nozzle 53 to which it is clamped by the end convolutions of a coiled helical spring 54. A few convolutions of spring 54 at each end thereof are made to tightly clamp onto the flexible hose 50 while the intermediate convolutions which constitute the greater part of the spring are larger in diameter than the outside diameter of the hose 50. The spring 54 thus constructed and applied to the hose 50 is provided as a handle for the delivery end of the latter; and as will be clear the relatively large convolutions which are out of contact with the hose remain cool and comfortable to the hand regardless of the temperature of the water passing through the hose, and of the hose itself. This, of course, is desirable when using the apparatus with

hot water. The discharge end of the nozzle 53 is made with a wall formed with a multiplicity of perforations 55 as shown in Fig. 8 so that the water discharging from the nozzle is broken up into a spray.

When the apparatus is not in use the delivery hose may be placed between the jaws 39 as shown in Figs. 1 and 2 which serve to support said hose in an out of the way position.

The soap used with my apparatus may be in the form of lumps which are placed within the vessel 1, access to the interior of the latter being had by removing the cover 4. Thus when the apparatus is in use with valve 9 occupying the position shown in Fig. 7 the water diverted or by-passed through vessel 1 is brought into contact with the soap which is dissolved and entrained by said water so that the liquid discharged from port 23 into outlet 20 is a mixture of soap and water.

What I claim is:

1. In an apparatus of the character described, the combination of a vessel having a chamber for holding soap or a substitute ingredient; two by-pass ports connecting with said chamber; an inlet port and an outlet port; a flexible supply hose connected at one end with said inlet port, means at the opposite end of said supply hose for coupling said end to a water faucet or the like; a flexible hose having one end thereof connected with said outlet port, a valve constructed and adapted to be positioned so as to either close the inlet port or to directly connect said inlet port with the outlet port while closing the two by-pass ports or to directly connect said inlet port with the outlet port and with one of the said by-pass ports and at the same time connect the other of said by-pass ports with the outlet port, and means whereby the direct connection between the inlet and outlet ports is restricted by said valve when it occupies the last mentioned position only.

2. An apparatus constructed in accordance with claim 1 wherein said direct connection

is opened to full area when said valve occupies its second mentioned position.

3. In an apparatus of the character described the combination with a soap holding vessel of a four-way controlling cock comprising a body formed with a valve chamber; a rotatable valve plug in said chamber formed with a transverse port that is offset relatively to the axis of said valve; a radially disposed main inlet port communicating with said chamber at one side of the latter; a radially disposed main outlet port communicating with said chamber at the opposite side of the latter; and a pair of by-pass ports connecting said chamber with the interior of said vessel, said inlet and outlet ports being offset relatively to the axis of said chamber to fully register with the transverse port of the valve when the latter occupies one position and to partially register with said transverse port when said valve occupies another position.

4. In a device of the character described, the combination of a chamber holding soap or the like; a valve casing having two passages connecting with said chamber and having an inlet passage and an outlet passage; a rotatable valve in said casing having a passage transverse to its axis and eccentric with respect thereto, whereby upon the valve being turned to one position said valve passage registers with said inlet and outlet passages with full opening therebetween and upon the valve being turned in another direction said valve passage partially registers with said inlet and outlet passages with restricted opening therebetween; said valve having additional passages arranged to connect said inlet passage with one of said chamber passages and to connect the other of said chamber passages with the outlet passage when said valve is turned to the position of partial register with said inlet and outlet passages.

Signed at Boston, Massachusetts, this twenty-fourth day of April, 1922.

WILLIAM CLAUSON.