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DETERGENT-WATER MIXER AND DISPENSER

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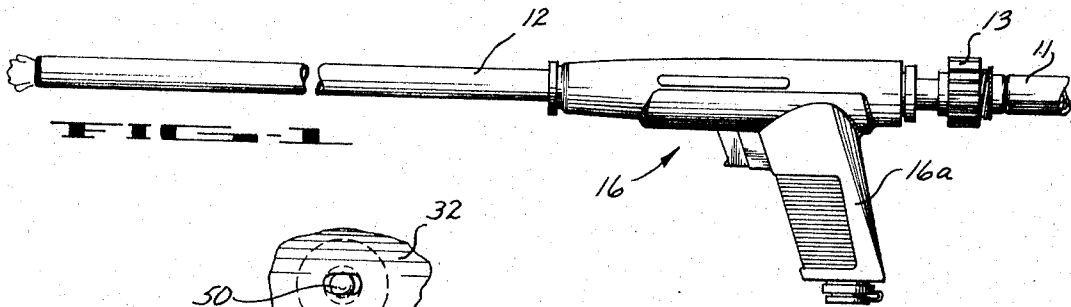


FIG. 1

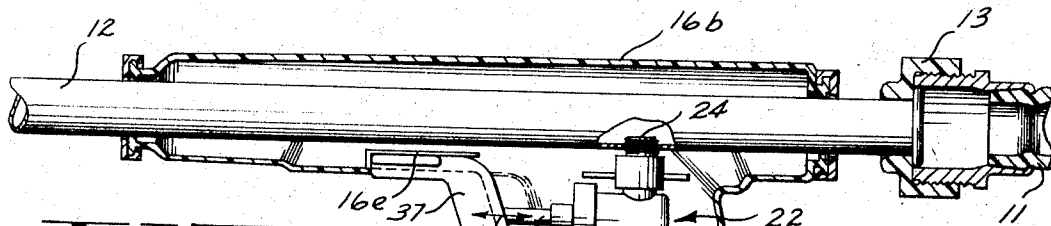


FIG. 2

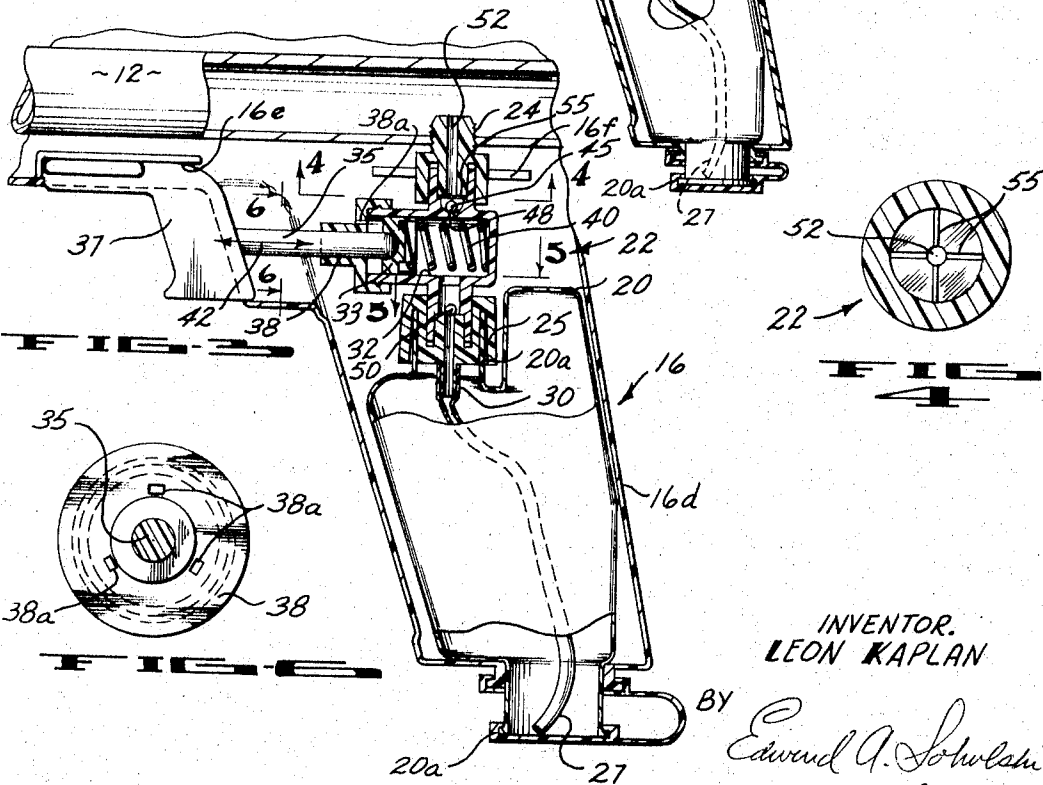


FIG. 3

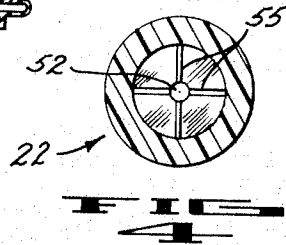


FIG. 4

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**DETERGENT-WATER MIXER AND DISPENSER**

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**ABSTRACT OF THE DISCLOSURE**

A detergent-water mixer comprised of a tube through which the water is directed and a separately formed detergent container and dispensing controls assembly is secured to the tube with means to pump the detergent into the tube through the dispersing assembly.

This invention relates to a detergent-water mixer and dispenser and more particularly to such device suitable for washing automobiles and the like.

In washing automobiles and the like, a detergent is generally utilized to loosen the dirt on the surfaces to be cleaned, this detergent then being washed away with clear water. To facilitate this operation, mixer and dispenser devices have been developed for mixing the water being dispensed with detergent when a hand actuator is depressed, clear water being fed through the dispenser at all other times.

Devices of the prior art along these lines have several shortcomings. Firstly, they tend to be overly complicated and expensive in their construction, involving a number of separately formed pieces which require a more complicated and time-consuming assembly procedure than would be desired. Further, in many of these prior art devices inadequate means are provided to isolate the water stream from the detergent container and the associated parts, such that there tends to be considerable leakage with resultant discomfort to the operator.

The device of this invention overcomes the shortcomings of prior art devices by providing a detergent-liquid mixer and dispenser of relatively simple and economical construction which involves a minimum number of parts to assemble, and which is substantially leakproof.

The improvement is achieved in the device of the invention by utilizing an inner detergent container which has attached thereto a dispensing control assembly for controlling the feeding of detergent into a tube through which the water stream passes. A connecting member is provided on the control assembly to join such assembly to the tube in water-tight relationship therewith so that leakage is substantially eliminated. The detergent container, dispensing control assembly and tube are held within a housing. Detergent is dispensed into the water stream in response to an actuator member which drives a piston in the dispensing control assembly to provide the pumping action necessary to draw the detergent out of the detergent container and to force it into the water stream.

It is therefore an object of this invention to provide an improved detergent-water mixer and dispenser.

It is a further object of this invention to provide a detergent-water mixer and dispenser which is less prone to leak than prior art devices.

It is still another object of this invention to provide a detergent-water mixer and dispenser which is of simpler and more economical construction than prior art devices.

It is still a further object of this invention to provide simple yet highly efficient means for washing automobiles.

Other objects of this invention will become apparent from the following description taken in connection with the accompanying drawings, of which

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FIG. 1 is an elevational view of a preferred embodiment of the device of the invention,

FIG. 2 is a cross-sectional view in elevation of the embodiment of FIG. 1,

FIG. 3 is a cross sectional view in elevation showing the details of the dispensing control assembly of the embodiment shown in FIG. 1,

FIG. 4 is a cross-sectional view taken along the plane indicated by 4-4 in FIG. 3,

FIG. 5 is a cross-sectional view taken along the plane indicated by 5-5 in FIG. 3, and

FIG. 6 is a cross-sectional view taken along the plane indicated by 6-6 in FIG. 3.

Referring now to the figures, water is fed from hose 11 to dispenser tube 12 which is connected to the hose by means of threaded connector 13. Housing 16 is in the shape of a pistol and is formed from similar half members 16a and 16b, which may be fabricated of plastic. Members 16a and 16b are joined together, for example, by cementing. Held within the handle portion 16d of the housing is detergent container 20, which is also preferably fabricated of plastic.

Attached to container 20 is a press-tight fit therewith is dispensing control assembly 22. Dispensing control assembly 22 is preferably made of a resilient plastic and has a threaded top portion 24 which threadably engages dispensing tube 12 in water tight relationship therewith. The bottom portion 25 of the dispensing control assembly has a groove formed therein which mates with flange portion 20a of the container in water tight relationship. Flexible tube 27 which extends to the bottom of container 20 fits over spout 30 formed in the bottom of dispensing control assembly 22. Dispensing control assembly 22 has a chamber 32 formed therein in which is slidably mounted piston member 33. Attached to piston 33 in a press-tight fit therewith is rod member 35. Rod member 35 in turn is fixedly attached to trigger 37. Trigger 37 is slidably mounted in channels 16e formed in housing 16 while rod member 35 is slidably mounted in cap member 38 which fits over the end of chamber 32 in watertight relationship therewith.

Piston 33 is urged against the inner walls of cap 38 by spring 40 which engages the end of the piston on one end thereof and abuts against the wall of chamber 32 at the other end thereof. Trigger 37, rod 35 and piston 33 thus can be slidably positioned along the axis indicated by arrows 42 in response to the actuation of trigger 37 and the reciprocal action of spring 40.

Dispensing control assembly 22 is held in position by flanges 16f which protrude from the inner walls of the housing and have semicircular grooves (not shown) formed therein, which engage the top portions of the dispensing control assembly.

With trigger 37 unactuated (as indicated in the figures) ball valve 45 is kept seated over aperture 48 formed in the top wall of chamber 32 by the pressure of the water stream in tube member 12. Detergent container 20 has a cap 20a which snaps onto the end of the container in watertight relationship therewith through which the container may be filled with detergent. With trigger 37 unactuated, the detergent remains in the container, except perhaps for small amounts thereof which may be drawn up into chamber 32. When trigger 37 is actuated to drive piston 33 to the right, the piston forces air out of the chamber, around the sides of ball valve 45, creating a partial vacuum in such chamber which causes detergent from container 20 to be drawn up through tube 27 and ball valve 50 into the chamber.

Ball valve 50 is a one-way valve which permits the detergent to enter the chamber but prevents its reentry from the chamber into container 20. Once chamber 32 has been "primed" by a small amount of pumping action of trigger 37 it will fill with detergent and then subsequent

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actuations of the trigger will cause piston 33 to force the detergent within the chamber through ball valve 45 and thence through channel 52 into tube 12 where it is mixed with the water stream. When the piston returns to its original resting position, the chamber will refill with detergent by virtue of the partial vacuum created therein.

The flow of the detergent into channel 52 is facilitated by means of grooves 55 (see FIG. 4) formed in the walls of the top portion of the dispensing control assembly. Apertures 38a are provided in member 38 to prevent the build up of a pressure or vacuum condition behind piston 33.

It is to be noted that the device of this invention is preferably fabricated of molded plastic parts except perhaps for tube member 12, which may be fabricated of metal. Such parts can then readily be assembled together with a minimum amount of labor and time to form the integral unit. The device of this invention thus provides a highly efficient detergent-water mixer and dispenser which is of relatively economical and simple construction and which accomplishes its cleaning functions with a minimum amount of leakage and a highly efficient utilization of detergent.

While the device of the invention has been described and illustrated in detail, it is to be clearly understood that this is intended by way of illustration and example only and is not to be taken by way of limitation, the spirit and scope of this invention being limited only by the terms of the following claims.

I claim:

1. A detergent-water mixer and dispenser, comprising a tube member having an aperture provided at a point longitudinally thereof, means for connecting one end of said tube member to a source of water, a separately formed detergent container having an aperture therein for filling said container with detergent, said container further having a second aperture formed in one end thereof, a detergent dispensing control assembly fitted on said detergent container integral with said second aperture, said assembly including a chamber centrally located therein with a piston slidably mounted in said chamber,

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a one-way ball valve disposed in said assembly between said chamber and said container, permitting fluid flow solely from said container to said chamber, a flange extending from said chamber, said flange being secured in said aperture provided in said tube member,

a one-way ball valve located in said flange permitting fluid flow solely from said chamber to said tube member,

a housing for receiving and holding said tube member, said detergent container and said dispensing control assembly,

means affixed to said housing for surrounding said flange to secure said assembly in place in said housing,

a trigger slidably mounted on said housing, said trigger having a plunger integrally formed therewith,

an opening in said chamber for slidably engaging said plunger with the end of said plunger in tight fitting engagement with said piston,

whereby when said trigger is actuated, detergent is drawn from said container into said chamber and dispensed into said tube member.

2. The device of claim 1 wherein said control assembly is provided with a plurality of apertures surrounding said plunger, said apertures communicating with said chamber.

3. The device of claim 2 wherein said flange for engagement with said tube member is externally threaded for engagement with said tube member.

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