June 25, 1957 M. ALPERT 2,797,132

DEVICE FOR MIXING A CLEANING AGENT WITH A STREAM OF WATER

Filed Nov. 30, 1954

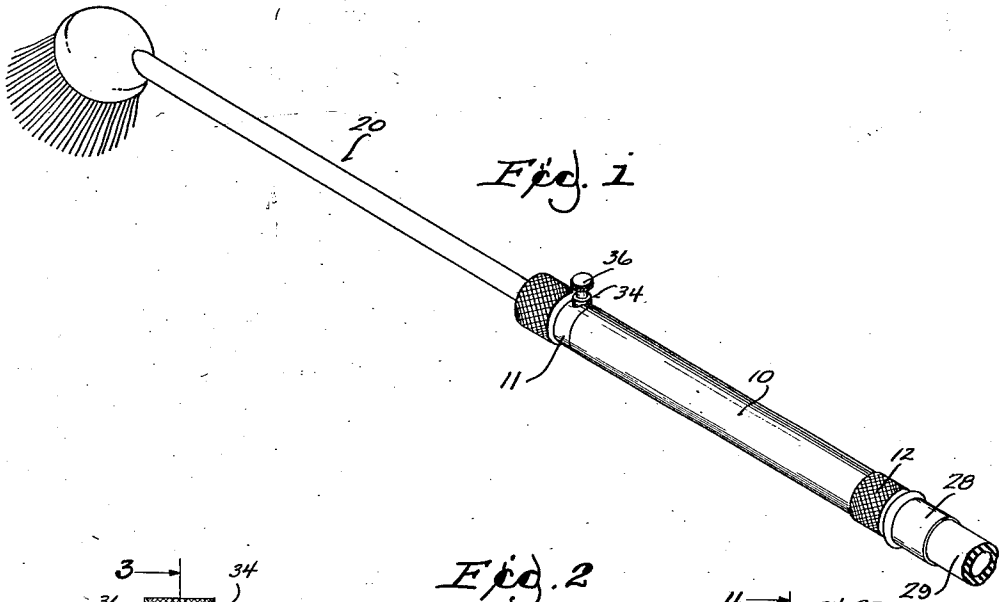


Fig. 1

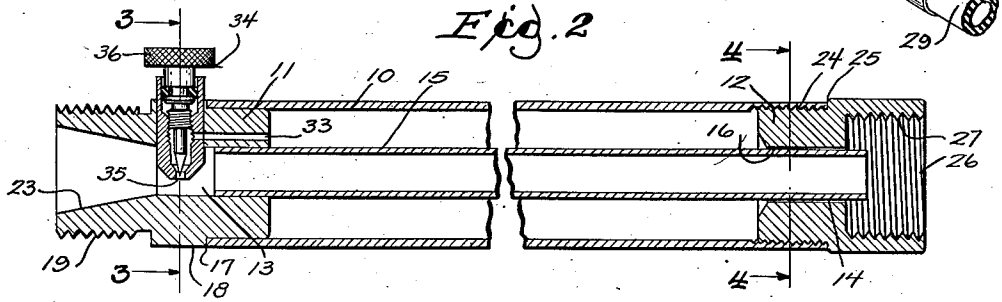


Fig. 2

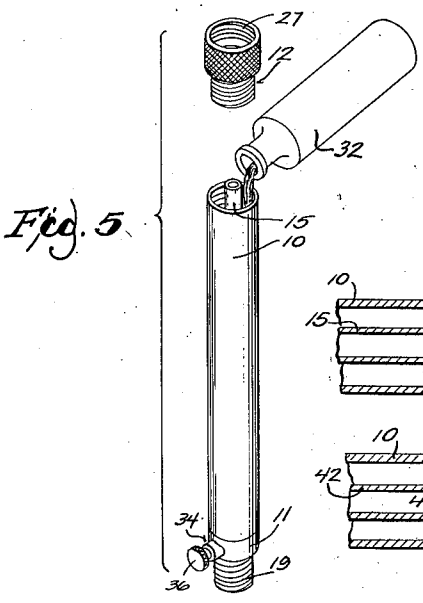


Fig. 5

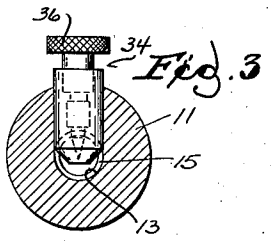


Fig. 3

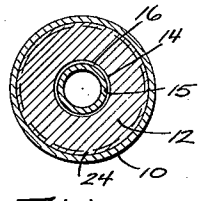


Fig. 4

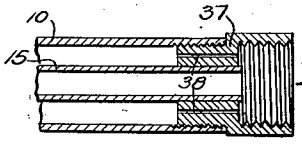


Fig. 6

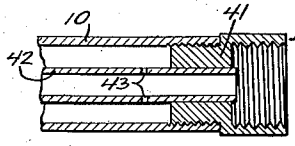


Fig. 7

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United States Patent Office 2,797,132 Patented June 25, 1957

2,797,132

DEVICE FOR MIXING A CLEANING AGENT WITH A STREAM OF WATER

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Application November 30, 1954, Serial No. 472,024

4 Claims. (Cl. 299—84)

This invention relates to a device for mixing a cleaning agent such as soap or a detergent with a stream of water.

The device has particular utility for mixing soap or detergent with a stream of water for washing automobiles, although it may be adapted for use wherever it is desired to mix any fluid borne additive with another fluid stream.

The invention resides in my novel structure in which the detergent storage chamber and fluid flow tube are concentric, the storage chamber being exposed to the pressurized fluid to place the detergent within the storage chamber under pressure to force it to enter the fluid stream under the control of a needle valve. I have found it advantageous in the embodiment of the invention shown herein to provide a loose fit between the flow tube and the bore of the chamber closure plug through which the pressurized fluid enters the flow tube to provide for substantial leakage of pressurized fluid into the storage chamber for the purpose aforesaid.

I also find it advantageous to make the overall diameter of the storage chamber not materially greater than the diameter of a conventional garden water hose. Accordingly, the device may be coupled to the end of the hose and handled therewith with ease and facility. In the combination aforesaid the mixing device may be held in the hand as part of the handle of an automobile washing brush, for example.

Other objects and advantages of the invention will be more apparent from the following disclosure in which:

Fig. 1 is a view in perspective showing my device attached between an auto wash brush and a garden hose.

Fig. 2 is an axial cross section taken through a device embodying my invention.

Fig. 3 is a cross sectional view taken along the line 3—3 of Fig. 2.

Fig. 4 is a cross sectional view taken along the line 4—4 of Fig. 2.

Fig. 5 is a view in perspective on a reduced scale showing an end plug of my device removed to expose the storage chamber for filling.

Fig. 6 is a fragmentary axial cross sectional view taken through a modified embodiment of the invention.

Fig. 7 is a fragmentary axial cross sectional view taken through a further modified embodiment of my invention.

The device of my invention comprises an elongated annular storage chamber having a cylindrical outer wall **10** and a concentric cylindrical inner wall **15**. The ends of the storage chamber are closed by end plugs **11** and **12**. The plugs **11** and **12** respectively have axially aligned bores **13**, **14** which receive the ends of cylindrical wall **15**, which further comprises a water flow tube. Tube **15** is fast in the bore **13** of plug **11** and is desirably pressed in bore **13** to receive sole support from plug **11**. Bore **14** of plug **12**, however, is desirably of greater diameter than tube **15** to provide a circumferential clearance space **16** therebetween.

Tube **10** is desirably in pressed fit connection with the

outer periphery of plug **11** and engages the shoulder **17** of peripheral ridge **18** formed on the plug. The end of plug **11** beyond ridge **18** is desirably threaded at **19** for connection to any means for dispensing water, such as a conventional garden hose faucet or the automobile wash brush **20** shown in Fig. 1. The threaded portion **19** of the plug **11** is provided with a tapering passageway **23** which communicates with bore **13**.

The end of tube **10** connected to plug **12** is provided with an internal thread **24** to receive complementary external threads on plug **12**. Plug **12** is provided with a shoulder **25** against which the end of the tube **10** seats when the plug is fully threaded thereon. Plug **12** is provided with a cavity **26** and with internal threads **27** to receive the externally threaded coupling **28** of a conventional hose such as the garden hose **29** shown fragmentarily in Fig. 1.

As shown in Fig. 5, plug **12** may be unscrewed from its connection to the tube **10** whereupon a cleaning agent, such as a liquid detergent, may be poured into the storage chamber from the detergent bottle **32**. The plug **12** is then re-threaded to the tube **10** and the coupling **28** of hose **29** threaded thereto. When the hose **29** is pressurized with water, or other fluid, the pressurized fluid is admitted to the storage chamber through the space **16** between tube **15** and the bore **14** of plug **10** to tend to force the detergent out of the other end of the chamber as hereinafter described.

Plug **11** is provided with a duct **33** which communicates with a needle valve **34** of conventional structure having an outlet **35** in bore **13** and in the path of water flowing through flow tube **15**. Accordingly, by adjusting the needle valve by its handle **36**, any desired amount of detergent may be passed from the storage chamber into the stream of liquid. The water or other fluid admitted through the clearance space **16** into the storage chamber may mix with the detergent. This is not regarded as undesirable as mixing of the two fluids is the ultimate purpose of the device.

Devices fabricated according to my invention have a storage chamber capacity of several ounces of liquid detergent. This is adequate to wash two or three cars before additional detergent need be added to the chamber. When it is desired to rinse the object washed, needle valve **34** is simply closed and clear water will flow from the discharge passage **23**. Accordingly, the needle valve may be alternately opened and closed to wash and rinse the object.

In Figs. 6 and 7 I show modified means for admitting pressurized fluid from hose **29** into the storage chamber. In Fig. 6 the plug **37** is provided with one or more ducts **38** which lead directly into the storage chamber. In Fig. 7 the plug **41** supports the end of the flow tube **42** which may have one or more radial openings **43** for this purpose. The device shown in Fig. 2 is preferred, however, as it eliminates need for additional machining operations.

As before indicated, tube **10** is desirably made of a diameter not materially larger than that of the hose **29**. Accordingly, the device may function as a handle for wash brush **20** or any other faucet or discharge device that may be coupled to the threads **19** on plug **11**.

I claim:

1. In a device for mixing an additive to a pressurized fluid stream, the combination with a first tube forming an additive storage chamber, a second tube of smaller diameter than the first tube and within said first tube and forming a passage for said fluid stream and a partition between said additive chamber and said fluid stream, outlets for said first and second tubes, means for commingling additive and fluid issuing from said outlets, and means for admitting pressurized fluid from said stream into said additive chamber at a point remote from its outlet to pres-

surize said additive and force it through its outlet, the end of the first tube opposite its outlet being provided with a closure plug having means for connecting it to a source of fluid, said means for admitting pressurized fluid to said additive chamber comprising said plug having a bore into which said second tube extends, the bore being of greater diameter than the second tube whereby pressurized fluid will flow between the wall of the bore and the second tube and into the additive chamber.

2. The device of claim 1 in which the end of the first tube opposite its outlet is provided with a hose coupling having a diameter substantially equal to the diameter of the first tube whereby said device comprises an extension of the hose without material change in cross section.

3. A device for mixing a cleaning agent with a stream of water and comprising a tubular storage chamber for the cleaning agent, a concentric flow tube within said chamber and disposed on the axis of said chamber, closure plugs for the ends of the storage chamber, said plugs having axially aligned bores in which the ends of said flow tube are disposed, one of said plugs having a discharge opening from its bore and the other having means for connecting a source of water pressure to its bore,

duct means from said storage chamber to said discharge opening and a control valve in said duct means, and means for admitting pressurized water from said stream to said storage chamber to pressurize said chamber and force its contents into the discharge opening under control of said valve, said flow tube being fast in one of said plug bores and loose in the other plug bore whereby said other plug bore may be removed from the storage chamber to expose said chamber for filling with cleaning agent, the chamber wall, said one end plug and flow tube being sealed to confine said cleaning agent pending restoration of the other plug.

4. The device of claim 3 in which the loose fitting of the flow tube in the other plug bore comprises said means for admitting pressurized water into said storage chamber.

References Cited in the file of this patent

UNITED STATES PATENTS

2,135,969	Donaldson	Nov. 8, 1938
2,540,064	Weber	Jan. 30, 1951
2,545,110	Schaar et al.	Mar. 13, 1951