Aug. 14, 1951 H. M. WILLIAMS 2,564,618

SOAP SOLUTION DISPENSER

Filed Aug. 4, 1949

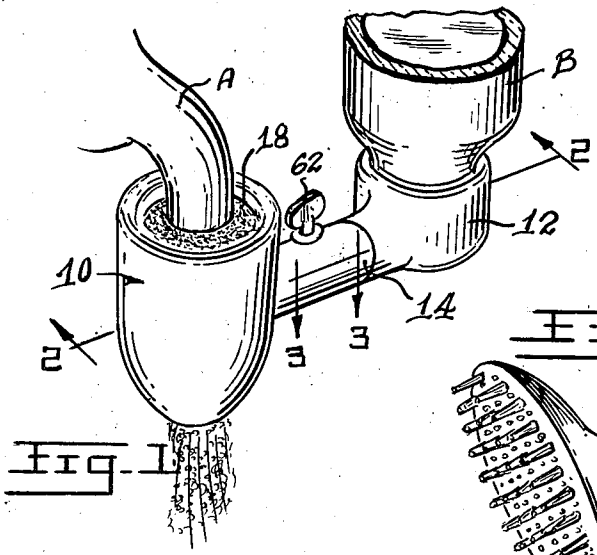


Fig. 1

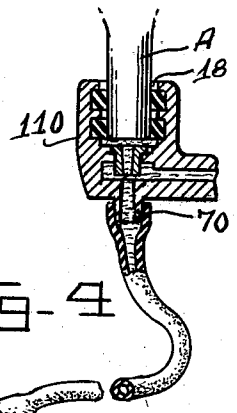
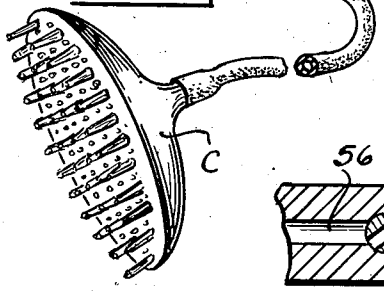


Fig. 4



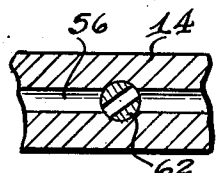


Fig. 3

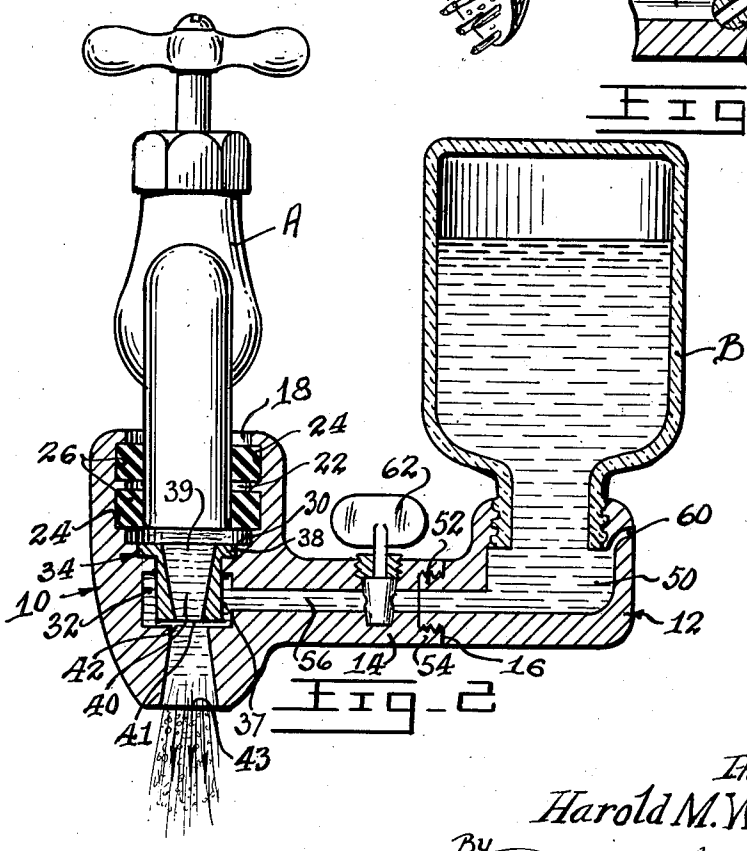


Fig. 2

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Patented Aug. 14, 1951

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UNITED STATES PATENT OFFICE

2,564,618

SOAP SOLUTION DISPENSER

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Application August 4, 1949, Serial No. 108,559

5 Claims. (Cl. 299—84)

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Introduction

The present invention relates to dispensers and more particularly to dispensers adapted for attachment to a household water supply so as to mix various liquids with the water.

The purpose of the present invention is to provide a device of this nature that can be attached to any household water outlet so as to mix and dispense liquids such as water softeners, soaps, perfumes, and antiseptics by the action of the water flowing from the outlet.

Applicant's development

Accordingly, the present invention comprises of a dispensing and mixing device adapted for attachment to a water supply and includes means whereby the pressure of water flowing into the device is adapted to withdraw the liquid to be dispensed with the water in any predetermined solution strength from a supply receptacle supported by the device.

More specifically, a preferred construction of a dispenser according to the invention comprises of a main dispenser body having a pair of bulbous end portions connected by a substantially cylindrical joining portion. One of the end portions is formed so as to have an opening passing through the portion from top to bottom so as to constitute a liquid passage with the upper portion of the opening enlarged so as to provide a main inlet chamber adapted to fit over the end of a household tap.

Preferably, a pair of resilient washers are mounted in this chamber with the inner diameter of the washers slightly smaller than the outside of the top so as to retain the dispenser firmly in engagement on the top by frictional contact.

A further enlargement of the passage coextensive with and slightly smaller than the main inlet chamber provides an annular seat adapted to receive a liquid restricting member that extends from the main inlet chamber into a still further enlargement of the passage adapted to provide a mixing chamber. The liquid restricting member comprises of a cylindrical body having an outstanding annular head adapted to fit in the chamber seat and includes an opening through the body that tapers from a comparatively wide opening in the head to a comparatively narrow opening at the end of the body so as to effect an increase in the water velocity discharged from the restricting member when the device is in operation. The end portion of the passage extending from the mixing chamber to the outside of the

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end portion is also tapered but in the opposite direction, the smaller opening being disposed at the chamber with the larger opening at the outer surface to provide an unrestricted outlet. As the restricting member extends to adjacent the bottom of the mixing chamber and the lower opening in this member is slightly smaller than the outlet opening leading from the chamber, the increased velocity of the water passing through the member and out of the outlet passage creates a suction.

The other end portion of the dispenser is recessed so as to provide an inlet chamber for the soap or other fluid that is to be dispensed and is preferably tapped so as to receive and retain a threaded fluid supply receptacle, for example, a bottle or the like.

An opening is provided through the joining portion so as to provide a passage connecting the mixing chamber of one end portion with the liquid receiving chamber of the other portion and a control valve is provided in this passage so that the right amount of liquid is allowed to be drawn from the liquid receiving chamber and supply so as to produce the desired solution strength.

In an alternative construction the body end portion containing the mixing chamber is provided with a cylindrical extension projecting from the lower end so as to provide a means of attaching a hose or conduit, for example, a dish washing attachment.

Detailed description

Having thus generally described the nature of the invention, particular reference will be made to the accompanying drawings, and in which:

Figure 1 is a front view in perspective elevation of a preferred form of dispensing device constructed according to the invention as it may be connected to a water supply.

Figure 2 is a section of Figure 1 along the line 2—2 illustrating the construction in more detail.

Figure 3 is a section of Figure 1 along the line 3—3 illustrating the control valve arrangement.

Figur 4 is a front view of a portion of an alternative form of dispenser, corresponding to Figure 2, and illustrating a construction of the dispenser outlet adapting it for connection by a hose or conduit.

With particular reference to the drawings, the dispenser comprises of a main body having a pair of bulbous end portions 10 and 12 connected by a substantially cylindrical joining portion 14. In the preferred construction illustrated the end portion 10 and the joining portion 14 are made as being in one piece with the end portion 12 thread-

ably connected as indicated at 16. The end portion 10 is formed with an opening 18 extending completely through from top to bottom so as to provide a passage for liquid delivered from a source under pressure, for example, water from a tap A.

The upper portion of the opening 18 is enlarged to provide a main inlet chamber 22 and recesses 24 are provided in the walls of the chamber 22 so as to receive and retain a pair of resilient washers 26.

The resilient washers 26 preferably have an inside diameter slightly smaller than the usual outside diameter of the tap A so as to retain the dispenser firmly on the tap by frictional engagement. Coextensive with the chamber 22, a second cavity or enlargement of the passage 18 provides a seat 30 and a third enlargement of the passage 18 provided below the seat 30 provides a mixing chamber, 32. A liquid restricting member 34 is mounted in the seat 30 with a portion extending into the mixing chamber 32. The liquid restricting member 34 includes a cylindrical body 37 with an outstanding annular head 38 adapted to fit in the seat 30 with the body 37 fitting in the passage 18 and extending downwardly to adjacent the bottom of the chamber 32. An opening 40 is provided in the member 36 that tapers from a comparatively wide opening 39 adjacent the annular head 38 to a comparatively narrow opening 41 at the end of the body 37.

The end of the passage 18 extending from the bottom of the chamber 32 to the outer surface of the end portion 10 is also tapered from a comparatively narrow opening 42 at the mixing chamber 32 to a comparatively wide opening 43 forming the outlet. As the restricting member 34 extends to adjacent the bottom of the mixing chamber 32 and the lower opening 41 in the member 34 is slightly smaller than the opening 42 leading from the chamber 32, the increased velocity of the water passing through the member 34 and out of the outlet passage creates a suction adapted to draw the liquid to be dispensed into the mixing chamber 32, where it is mixed and dispensed with the water.

The other end portion 12 includes a recess providing an inlet chamber 50 adapted to receive the liquid that is to be dispensed. Preferably, the upper portion of the recess 50 is tapped and a supply source of liquid attached, as for example, a bottle B of liquid soap or the like, as is shown in Figure 2. The end portion 12 includes a suitably threaded extension 52 adapted for threadably engaging the tapped end 54 of the joining section 14 and an opening is provided through the extension 52 and the joining section 14 so as to constitute a liquid delivery passage 56 from the inlet chamber 50 to the mixing chamber 32. A small opening 60 leading into the inlet chamber 50 is provided in the end portion 14 so as to allow air to replace the liquid as it is withdrawn from the chamber 50. A control valve 62 is provided in the passage 56 to control the flow of liquid from the chamber 50.

In use, the flow of the water from the tap A is directed into the restricting member 34 and due to the particular construction of this member and its position relative to the opening 42, the suction created in the mixing chamber 32 draws liquid through the passage 56 from the chamber 50 and mixes the liquid intimately with the water as it flows from the outlet 43.

In an alternative construction as illustrated

in Figure 4, the end portion 110 is provided with a cylindrical extension 70 so as to provide a means of connecting a hose or conduit, for example, a dishwashing attachment C as illustrated.

A dispenser constructed in accordance with the invention can be placed on a household tap or other outlet with the container B filled with liquid soap or other cleansing fluid and can be left in position while the tap is in normal use. When it is desired to add soap to the water the control valve 62 is opened allowing the soap to be drawn into the mixing chamber and dispensed with the water from the outlet.

I claim:

1. A dispensing and mixing device for liquids comprising, a main dispenser body having a pair of bulbous end portions connected by a substantially cylindrical joining portion, an unobstructed opening through one of said end portions constituting a direct liquid passage, a first circular cavity coaxial with said liquid passage and constituting an inlet chamber, said first circular cavity having at least one inwardly extending annular recess adapted to receive and retain an annular washer of resilient material, said first circular cavity being of considerably greater diameter than the remainder of said liquid passage so as to provide an annular shoulder surrounding said passage at the lower end of said cavity, said annular shoulder including an inset annular seat, a second circular cavity disposed below and in spaced apart relationship with said first cavity and coaxial with said passage, said second circular cavity being of greater diameter than said passage so as to constitute a mixing chamber, a cylindrical liquid restricting member having an outwardly extending flange head disposed in said liquid passage between said first and second cavities with said flange head fitting in said first cavity annular seat, said liquid restricting member having a tapered bore in axial alignment with said passage and being of sufficient length to extend from the shoulder portion of said first cavity to adjacent the bottom of said second cavity, the lower end of said liquid passage extending from said second cavity to the outer surface of said end portion and being tapered outwardly to provide an unrestricted outlet, said other end portion including a circular cavity constituting a second inlet chamber adapted to receive liquid for dispensing, an opening through said joining portion constituting a liquid passage between said first and second body portions and a control valve mounted in said passage.

2. A dispensing mechanism device as claimed in claim 1, wherein the tapered bore in said liquid restricting member tapers from a substantially wide opening adjacent said flanged head to a substantially narrow opening adjacent the lower end of said member.

3. A dispensing and mixing device for liquids, as claimed in claim 1, wherein the dispenser body is made in two parts, said second end portion being adapted to be threadably connected to said joining portion.

4. A dispensing and mixing device as claimed in claim 1, wherein the recess in said other end portion constituting said second inlet chamber is tapped for threadable engagement with a liquid supply container.

5. A dispensing and mixing device as claimed in claim 1, wherein said first end portion includes a cylindrical portion extending from the bottom

thereof and said opening constituting said liquid passage through said end portion continues through said extension, the lower portion of said opening extending from said mixing chamber to the end of said extension body tapering from a substantialy narrow opening adjacent said mixing chamber to a substantially wide opening at the end of said extension thereby to provide an unrestricted outlet.

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