Dispensing Device

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6
This invention relates to improvements in dispensing devices and has particular reference to a device that may be applied to any container of fluids or liquids for dispensing the said fluids or liquids from the container in either an atomized spray form or in a fine stream which spray or stream is ejected from the container by a slight pressure upon a flexible bulb associated with the device.

The principal object of the invention is the provision of a dispensing device that may be universally applied to any container of liquids or fluids to eject or atomize the contents thereof in a fine spray or in a small stream as the case may be from the said containers.

A further object of the invention is the provision of a simple and efficient capping device for liquid or fluid containers that embodies either a slip-cap or a screw-cap element adapted to be used on any size bottle or other container and that with which is associated a soft rubber ejector cap and an ejector tube combined as a unit.

Still further object of the invention is to provide a capping, ejecting and atomizing device for various containers of liquids or fluids that is most positive in operation, that is also cheap in construction, and that may be applied to bottles or containers, ranging from the smallest sized vial to a gallon jug or any larger sized container of liquids or fluids to be dispensed in a small stream or in an atomized spray from the container to which it is attached.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawing forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

Fig. 1 is an elevation showing a fluid or liquid container such as a small bottle or vial with my improved dispensing device in place thereon,

Fig. 2 is a greatly enlarged sectional detail of the capping device illustrating the means of attachment to the container and further illustrating the liquid ejecting means of the device,

Fig. 3 is an enlarged sectional view of a liquid spraying device of a slightly modified form in which is included an air inlet ball-check valve,

Fig. 4 is an enlarged sectional view of the ball-check valve shown in Fig. 3,

Fig. 5 is a sectional detail of another modified form of the device in which a slightly different arrangement of parts is illustrated, and

Fig. 6 is a sectional detail of a spray nozzle that may be employed in connection with the device.

Referring now more particularly to the drawing and especially to Figures 1 and 2 thereof, the improved spraying device consists generally of a bottle or like capping member 10, which in the instance shown embodies the usual screw cap member 11 of a small liquid container 12, such for instance, as a pint or half-pint container of liquids or fluids.

In detail the dispensing device consists of either a screw cap or slip member 13 upon which is fitted a soft rubber fluid ejecting element 14 adapted to fit tightly over the screw or like cap member 13. It is, of course, to be understood that the container 12 may be of large or small capacity as the occasion requires.

Noting particularly Figure 2, which is an enlarged sectional view of Figure 1, it will be observed that the cap 13, in this instance, includes a rubber washer 16 having a central perforation 15 through which extends the ejector tube 17 which tube has an outwardly bent section 18 upon which bent end is provided a spray or like nozzle 19 of suitable form. In this form of the device it will be observed that if pressure is applied to the fluid ejecting element 14, air is forced by this pressure down and through the perforation 16 in the cap and a certain amount of the liquid content of the container is displaced and raised through the glass tube 17 and is ejected from the spray nozzle 19 on the bent end 18 of the device, which end 18, by the way, extends through the soft rubber ejecting element 15, as clearly shown in Figure 2.

In Figure 3 I have shown a slightly modified form of the device in which is included a ball-check valve 20 enclosed in a tube 21, inserted in the member 16. In this arrangement the only difference is that the ball-check valve which closes when the element 14 is depressed is opened when said element is released, thus allowing air to enter the chamber 22 providing fluid pressure for the next ejection of liquid or fluid through the nozzle of the device.

In Figure 5 a somewhat different form is shown and includes:—A flexible or soft rubber ejector 14 positioned upon a hard rubber or like member 23 which member, between its partition 24 and the ejector forms a chamber 25, the partition 24 having a gasket 26 arranged thereunder to cause a tight fit between the cap and container and further embodying a glass ejector tube 27 of tapered form in the lower end of which is arranged...
a ball valve 28. An ejector nozzle 29, in which a ball-check 30 is included, completes this modified form which functions as follows:

When pressure is applied to the member 14 the ball check 30 is unseated and the check 28 is seated in the tapered tube 27, however, when the element 14 is released the vacuum caused by this action causes the unseating of the ball check 28 and the drawing of a measured amount of liquid or fluid to and through the tube 27, and into the chamber 25; and when pressure is again applied to the element 14 the charge is ejected through the ball-check 30 and the nozzle 29.

Referring to Fig. 5 it will be noted that I have shown a particular form of ejector nozzle which may be employed in connection with my invention and which consists of an ejector tube 31 having a closure valve 32 arranged therein, and which valve may be employed to close the discharge tube especially for sealing the contents of the container for storage purposes. I have found from experience that the present device is highly serviceable as an eye dropper. It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same and that various changes relative to the material, size, shape and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claim.

Having thus described my invention, I claim:

In a device of the class described, a liquid container, a screw cap member therefor, a resilient washer fitted in the upper end of said screw cap and having a perforation formed therein, an ejector tube extending through the perforation in said washer and having a spray nozzle formed at its outwardly bent end, a resilient ejector element fitted over the upper edge of said screw cap and forming a chamber above said washer, and a ball check valve fitted through one side of said resilient element, whereby when pressure is applied to said ejector element, fluid is forced from the container through said ejector tube, thereby simultaneously closing said check valve, and when said ejector element is released, said check valve opens, allowing a charge of air to enter the chamber for the next ejecting operation.

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