

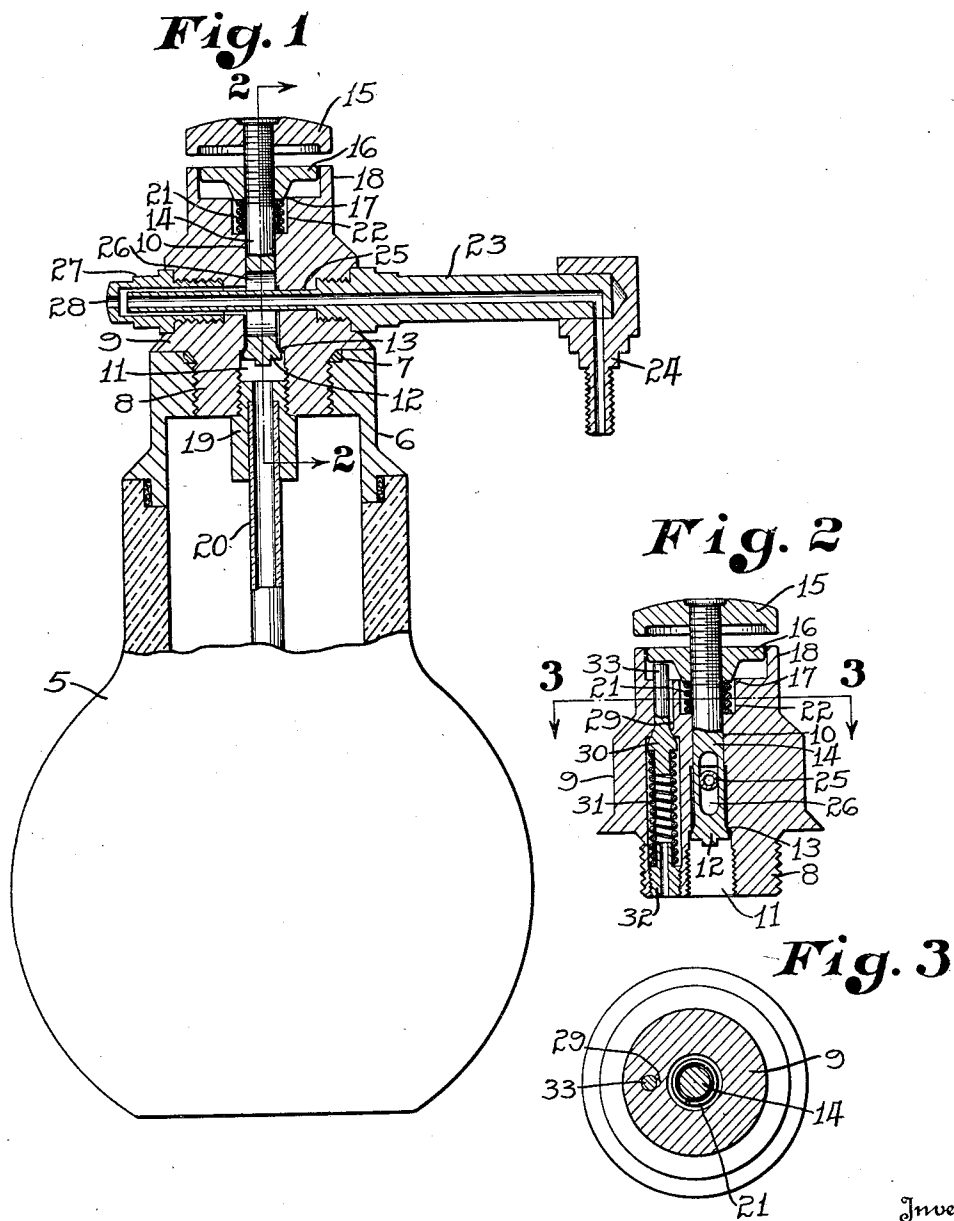
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ATOMIZER

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UNITED STATES PATENT OFFICE

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ATOMIZER

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This invention relates to an atomizer particularly adapted to be attached to a receptacle containing perfume or other liquid.

One object of the invention is to provide a spraying device so arranged that the receptacle, in connection with which it is used, and also the liquid outlet passageway leading therefrom are normally completely closed, so that none of the volatile contents of the receptacle can evaporate and escape into the atmosphere, yet the liquid passageway may be instantly opened, when desired, to permit the spraying device to be used. For this purpose, the liquid passageway is controlled by a yieldably held manually operable valve, and in its preferred form a stop is also provided, which may be adjusted to lock the valve to its seat and thereby prevent accidental escape of the contents of the receptacle when the latter is packed in a traveling bag or the like.

In the present embodiment of the invention, a vent is also provided in the top of the receptacle, and is normally closed by a spring held air valve, which is automatically opened at the same time as the liquid outlet valve, to permit relief of the partial vacuum caused by the flow of liquid from the receptacle.

The above and other advantages of the invention will be more particularly explained in connection with the accompanying drawings which illustrate one embodiment thereof.

In the drawings:

Figure 1 is a vertical sectional view of the atomizer as applied to a liquid receptacle.

Figure 2 is a section taken on the line 2—2 of Figure 1.

Figure 3 is a section taken on the line 3—3 of Figure 2.

As illustrated in the drawings, the atomizer is used in connection with a liquid receptacle 5, of glass or other suitable material, which has a metallic collar 6 secured to its upper end. The edge of the collar 6 is preferably lined with a lead washer 7 and is internally threaded to receive the correspondingly threaded extension 8 of the head 9. The head 9 is formed with a central vertical bore 10, the lower portion of which constitutes a

liquid outlet passageway. The lower end of the bore 10 is enlarged to form a chamber 11 to receive a valve 12 which controls the discharge of the liquid from the receptacle and is adapted to seat against the shoulder 13.

The valve 12 is formed with a stem 14 extending upwardly through the bore 10 and the bore, or at least its lower portion, is appreciably greater in diameter than the diameter of the stem, to permit the liquid to be discharged when the valve is opened. The stem 14 has a cap 15 at its upper end, which is adapted to be engaged by the thumb or finger to open the valve. A collar 16 encompassing the upper end of the stem 14 limits the downward movement of the valve by engaging a seat 17 which is formed by an upward extension of the head 9. The cap 15 also preferably has a threaded connection with the stem 14, whereby it may be adjusted tightly against an annular flange 18 at the upper end of the head 9 to lock the valve 12 against the seat 13 and thereby prevent any possible escape of the contents of the receptacle when the latter is packed in a traveling bag or the like.

A sleeve 19 is secured to the head 9 at the lower end of the chamber 11 and has a tubular extension 20 of glass or other suitable material secured to its lower end and extending substantially to the bottom of the receptacle 5. A coil spring 21 is disposed within a recess 22 formed in the head 9 and bears against the collar 16 to hold the valve 12 normally against its seat.

The head 9 is provided with a lateral air inlet tube 23, having a suitable fitting 24 connected to its outer end and adapted to be connected to a rubber bulb or other source of air pressure. The tube 23 has a continuation 25, which extends transversely through the head 9 and through a slot 26 formed in the stem 14. The head 9 also has an extension 27 encompassing the outlet end of the tube 25 and spaced therefrom to provide an outlet for the liquid from the chamber 11. The extension 27 is provided with an outlet port 28, in alignment with the tube 25, so that air forced through the latter will be mixed with liquid drawn through the tube 20 and

chamber 11 and will be discharged in the form of spray from the port 28.

A vent may also be provided to maintain substantially normal atmospheric pressure within the receptacle as liquid is discharged therefrom through the outlet 28. Such a vent is shown at 29 extending vertically through the head 9 beneath the collar 16. This vent is normally closed by a valve 30 which is held by a coil spring 31 acting between the valve and a bushing 32 secured within the extension 8. The valve 30 has a stem 33 extending upwardly into close proximity to the collar 16 and adapted to be engaged by the latter to open the vent simultaneously with the opening of the liquid outlet valve 12.

From the foregoing description, it will be seen that the valves 12 and 30 are both held normally closed by the respective springs 21 and 31, so that there is no possible chance for the liquid to escape by evaporation from the receptacle when the atomizer is not in use, yet by a slight pressure on the cap 15, both valves may be opened so that the atomizer may be used. At the same time the collar 16 closes tightly against the seat 17, thereby dispensing with the necessity of providing packing for the outer portion of the stem 14. The adjustability of the cap 15 to engage the rim 18 and thereby to lock the valve 12 to its seat, at the same time preventing the valve 30 from opening, is also an important consideration when traveling.

While I have shown and described in detail the preferred embodiment of the invention, it is to be understood that the same may be considerably modified without any material departure from the scope of the invention as defined in the appended claims.

What I claim is:

1. In an atomizer, the combination of a receptacle having a liquid outlet and an air vent, a spray nozzle connected with said liquid outlet, normally closed valves for the liquid outlet and air vent respectively, and a depressible member operable to open both of said valves and to provide a seal around the stem of the liquid valve substantially at the same time.

2. In an atomizer, the combination of a receptacle having a liquid outlet and an air vent, a spray nozzle connected with said liquid outlet, normally closed valves for the liquid outlet and air vent respectively, a manually engageable element connected directly to the liquid outlet valve and operable to open the same, and means in the path of said element and engageable thereby to open the air vent valve when the liquid outlet valve is opened.

3. In an atomizer, the combination of a receptacle having a liquid outlet and an air vent, a spray nozzle connected with said liquid outlet, normally closed valves for the

liquid outlet and air vent respectively, a member normally movable by direct pressure thereon to open both of said valves substantially at the same time, and means to lock said member in a position to prevent such movement, said last mentioned means including a cap covering said air vent.

4. In an atomizer, the combination of a receptacle having a liquid outlet and an air vent, a spray nozzle connected with said liquid outlet, normally closed valves for the liquid outlet and air vent respectively, a manually engageable element connected directly to the liquid outlet valve and depressible to open the same, means in the path of said element and actuated thereby to open the air vent valve when the liquid outlet valve is opened, and means to lock said member and prevent its depression, thereby positively preventing either valve from being opened.

5. In an atomizer, the combination of a receptacle, a top for the receptacle having a bore with a liquid outlet terminating in a spray nozzle and having also an air vent, means for directing liquid from the receptacle through said bore and outlet, means for discharging the same from the nozzle in the form of spray, a liquid outlet valve having a stem disposed in said bore, a valve for said air vent means normally holding said valves closed, said stem being depressible to open the valves and render the spraying means operable, and means on said stem to close the outer end of said bore when the valves are opened.

6. In an atomizer, the combination of a receptacle having a top with a bore there-through and a liquid outlet leading from said bore, means for directing liquid into said bore and to the outlet, means for directing air under pressure past said outlet to induce a flow of liquid thereto and discharge it in the form of spray, a valve having a stem disposed in said bore, said stem having a slot through which the air directing means passes, means normally holding said valve closed, said stem being depressible to open the valve and render the spraying means operable, and means on said stem to close the outer end of said bore when the valve is opened.

7. In an atomizer, the combination of a receptacle having a top with a bore there-through and a laterally disposed liquid outlet leading from said bore and terminating in a spray nozzle, tubular means for directing liquid from the receptacle into the inner end of said bore, means for discharging the liquid in the form of spray from said nozzle, a liquid outlet valve having a stem disposed in said bore, resilient means normally holding said valve closed, said stem being depressible to open the valve and render the spraying means operable, said top having also an air vent at one side of the bore, and means carried by said stem and adjustable to simultaneously

cover the air vent and to lock the stem positively in its outer position with said liquid outlet valve tightly closed.

8. In an atomizer, the combination of a
5 receptacle, a top for the receptacle having a bore therethrough with a laterally disposed liquid outlet terminating in a spray nozzle, means for directing air under pressure transversely across said bore to said nozzle to induce a flow of liquid thereto and discharge it
10 in the form of spray, a valve having a stem disposed in said bore, said stem having a slot through which the air directing means passes, means normally holding said valve closed, said top, when the valve is closed, constituting a tight closure for the receptacle preventing any escape of the contents thereof by leakage or evaporation, said stem being depressible to open the valve and render the
20 spraying means operable, and means on said stem to close the outer end of said bore when the valve is opened, said last mentioned means being adjustable to lock the stem positively in its outer position with said valve tightly
25 closed.

9. A spray head having a bore there-
through, a nozzle at one side of the bore, means for supplying air under pressure to said nozzle, a liquid passageway connecting
30 said bore to the nozzle, means for directing liquid, induced by the air current, to the intake end of the bore and thence through said passageway, to be discharged from the nozzle in the form of spray, a valve controlling the
35 flow of liquid and having a stem disposed in said bore, means normally holding said valve closed but yieldable to permit the same to be opened by depression of said stem, and means carried by said stem to close the outer end
40 of the bore when the valve is opened, said air supply means including a tube traversing said bore at right angles thereto, said valve stem having a slot through which said tube passes.

45 In testimony whereof I have hereunto signed my name to this specification.

FRED CUSTER.

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