Nov. 20, 1951 E. LIPMAN 2,575,632

NORMALLY SEALED ATOMIZER

Filed April 27, 1950

Fig. 2

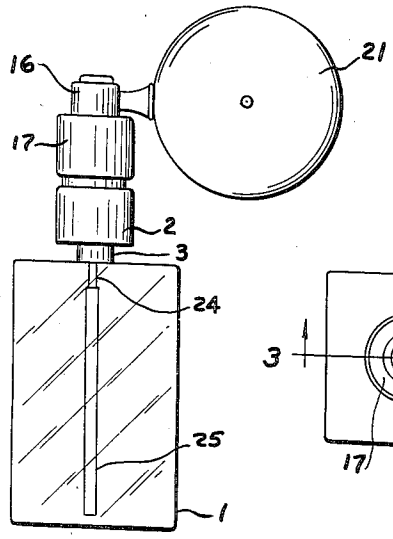
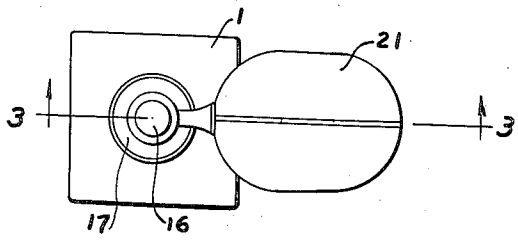


Fig. 1



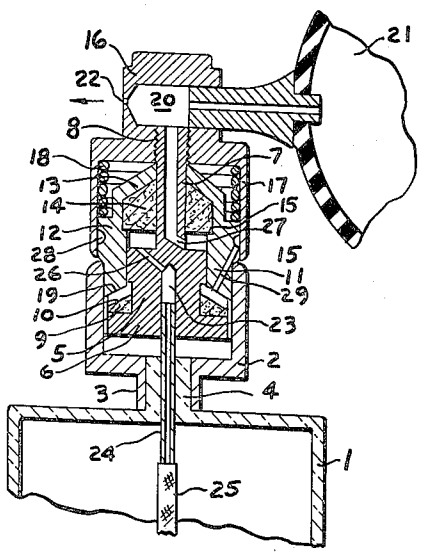


Fig. 3

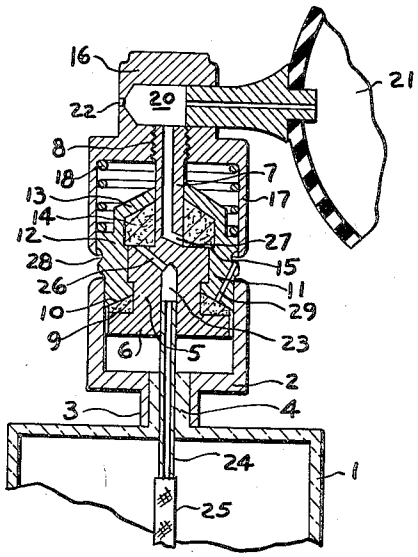


Fig. 4

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NORMALLY SEALED ATOMIZER

Elmer Lipman, Detroit, Mich.

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4 Claims. (Cl. 299—88)

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The present invention pertains to a novel atomizer designed particularly for cosmetic use but also suitable for medicinal purposes.

The conventional cosmetic atomizer is normally open to atmosphere through both the liquid passage and the venting passage. Consequently there is a constant evaporation of the liquid, especially the alcohol or other volatile solvents employed. The resulting concentration, particularly of a perfume or toilet water, produces a solution that is foul smelling and also injurious to fabrics. This condition is not only disagreeable to the ultimate user of the atomizer but is also detrimental to sales in stores where an atomizer containing a sample prefume or toilet water is kept on the counter.

Further, because of its constantly being open to the atmosphere, the conventional atomizer leaks when tilted and therefore is unsuited for traveling.

The principal object of this invention is to overcome these difficulties and is accomplished generally by providing an atomizer that is normally sealed both at the liquid passage and at the venting passage. These passages are opened for use by pressing the head of the atomizer against a spring incorporated in the assembly. More particularly, the head is attached to a ported valve member cotrolling both of the named passages but normally obstructed against packings or other sealing means by the expanded spring. Manual pressure on the head, as described, opens these passages to permit operation of the device.

Another advantage of the invention in this connection is that the novel atomizer cannot be used, without authorization, by children, employees, guests and strangers, since there is no outward indication that the head must first be pressed against the action of a concealed spring.

The invention is fully disclosed by way of example in the following description and in the accompanying drawings in which:

Figure 1 is a plan view of the atomizer;

Figure 2 is a side view;

Figure 3 is a section on the line 3—3 of Figure 1; showing the device in operating or discharge position;

Figure 4 is a similar section showing the atomizer normally sealed.

Reference to these views will now be made by use of like characters which are employed to designate corresponding parts throughout.

In Figure 1 is shown an atomizer applied to a bottle 1 by means of an adapter 2 which is a portion of the mechanical assembly of the atomizer.

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The adapter is a tubular member having at its lower end a reduced nipple 3 that is fitted suitably on the neck 4 of the bottle.

In the adapter is mounted a slide or plunger 5 of considerably smaller diameter than the interior of the adapter and having its lower end formed with a flange or shoulder 6 which remains spaced from the inner wall of the adapter to permit flow of liquid as will presently be described. A tube 7 extends integrally upward from the top of the slide and has its upper end threaded at 8 for attachment of an operating member as described hereinafter.

A packing ring 9, preferably with an upper conical surface 10, is fitted around the member 5 at the flange 6. The adapter also contains the lower end of a core 11 formed with an intermediate collar 12 which rests on the upper end of the adapter. The core is shaped as a hood having a top 13 which slidably encloses the tube 7 below the threaded end. Beneath this top is fitting another packing 14 which rests on an internal shoulder 15 formed in the core 11 in a position to be normally engaged by the top of the body of the plunger 5.

A head 16 is screwed on the upper end of the tube 7 and is formed with a skirt 17 in the nature of a cap surrounding the collar 12 at a clearance of about .01 inch. A coil spring 18 rests upon the collar 12 and bears against the bottom of the head 16 to bring the body of the plunger 5 against the packing 14 and also to bring the top 10 of the packing 9 against the conical lower end 19 of the core 11. The head 16 is formed as a mixing chamber 20 into one end of which is fitted an air compressing bulb 21 in the usual manner. The other end of the chamber is closed except for a small port 22 which constitutes the spray outlet.

The slide or plunger 5 is in fact a valve governing the flow of liquid out of the bottle and the flow of venting air into the bottle. A central cavity 23 is formed in the plunger from the lower end thereof and receives a tube 24 which is extended nearly to the bottom of the receptacle 1 directly or by means of a wick 25. From this cavity extends a port 26 to the top of the plunger. Also, a port 27 extends from the interior of the tube 7 to a point at or above the top of the plunger.

The cylindrical wall of the collar 12 is formed with a peripheral groove 28 which is constantly in communication with the atmosphere through the clearance between this wall and the skirt 17 as previously set forth. From this groove a port

29 extends through the lower edge or wall of the core 11 to a point above the packing 9.

Normally, the expanded spring 18 lifts the head 16 and attached plunger 5 until the packing 9 engages and closes the lower end of the vent port 29. At the same time the tube 7 is lifted until its support 27 is obstructed within the packing 14, thereby closing the chamber 20 and outlet port 22 from the interior of the receptacle 1.

In this condition, which is the normal idle condition of the atomizer, there can be no evaporation through the liquid channel or through the venting channel. In this connection, as previously stated, it is well known that the concentration of a perfume through evaporation of the alcohol causes it to become foul smelling and also injurious to the clothing. This difficulty is of course overcome by the normally sealed atomizer disclosed herein. Again, the atomizer is less subject to waste of the contents through unauthorized tampering by children and guests. Another and important advantage of this device is that it can be carried in luggage without any special precaution against leakage.

When the atomizer is to be used, the head 16 is pressed down with the thumb of one hand to lower the plunger 5 while compressing the spring 18. The ports 27 and 29 are thus uncovered on being freed from the respective packings 14 and 9. The bulb 21 is then operated by the other hand in the usual manner.

The suction created in the chamber 20 permits liquid from the receptacle to flow upward through the tube 24, chamber 23, port 26, the space now existing between the top of the plunger and the the bottom of the packing 24, the port 27, tube 7, and chamber 20 to be sprayed through the outlet 22. Venting occurs through the clearance between the skirt 17 and collar 12, the groove 28, port 29, the space between the lower end of the core 11 and the top of the packing 9, the space between the flange 6 and the inner wall of the adapter 2, and thence through the nipple 3 to the interior of the receptacle.

The manner of operating the atomizer is not apparent from its outward appearance. Consequently, tamperers will be unsuccessful in their first attempts to use the atomizer and will make no further attempt in the great majority of cases.

Although a specific embodiment of the invention has been illustrated and described, it will be understood that any alterations in the details of construction may be made without departing from the scope of the invention as indicated by the following claims.

What I claim is:

1. An atomizer comprising an adapter for connection to a receptacle, a core fitted in said adapter, a slide fitted in said adapter and core, a head mounted on said slide and having a chamber and an outlet port, said slide having an interrupted fluid passage from its lower end to said chamber, with an intermediate exposed port, packing in said core, and a spring between said core and head normally drawing said port against said packing, whereby said passage is opened only on actuating said slide against the pressure of said spring, said core having a venting passage, and a packing on said slide positioned to close said venting passage on expansion of said spring.

2. An atomizer comprising an adapter for connection to a receptacle, a core fitted in said adapter, a slide fitted in said adapter and core, said slide having a fluid passage from its lower to its upper end, a tube extending upward from said slide and having a lateral port at the upper end of said slide, a head mounted on said tube and having a chamber and an outlet port, a packing in said core over said upper end, and a spring between said core and head and normally drawing said lateral port against said packing, whereby said passage is opened only on actuating said slide against the pressure of said spring, said core having a venting passage, and a packing on said slide positioned to close said venting passage on expansion of said spring.

3. An atomizer comprising an adapter for connection to a receptacle, a core fitted in said adapter, a slide fitted in said adapter and core, said slide having a fluid passage from its lower to its upper end, a tube extending upward from said slide and having a lateral port at the upper end of said slide, a head mounted on said tube and having a chamber and an outlet port, a packing in said core over said upper end, and a spring between said core and head and normally drawing said lateral port against said packing, whereby said passage is opened only on actuating said slide against the pressure of said spring, said core having a peripheral groove open to atmosphere and a venting passage extending from said groove, and a packing on said slide positioned to close said venting passage on expansion of said spring.

4. An atomizer comprising an adapter for connection to a receptacle, a core fitted in said adapter, a slide fitted in said adapter and core, said slide having a fluid passage from its lower to its upper end, a tube extending upward from said slide and having a lateral port at the upper end of said slide, a head mounted on said tube and having a chamber and an outlet port, a packing in said core over said upper end, and a spring between said core and head and normally drawing said lateral port against said packing, whereby said passage is opened only on actuating said slide against the pressure of said spring, a skirt depending from said head and enclosing said spring, said skirt also enclosing said core with clearance, said core having a peripheral groove within said skirt open to atmosphere and a venting passage extending from said groove, and a packing on said slide positioned to close said venting passage on expansion of said spring.

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