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2,665,170

ATOMIZER

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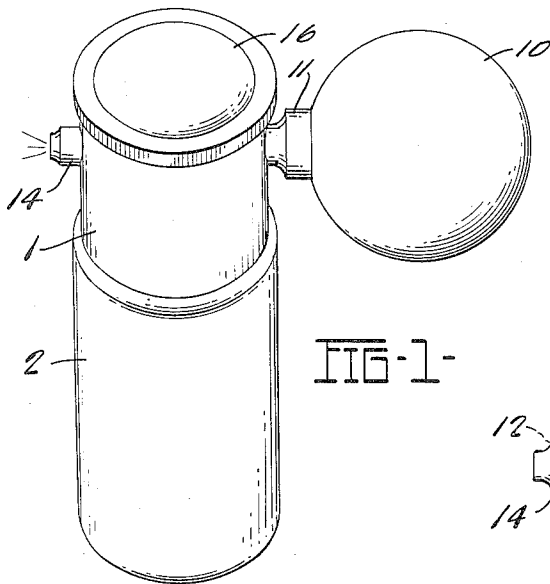


FIG-1-

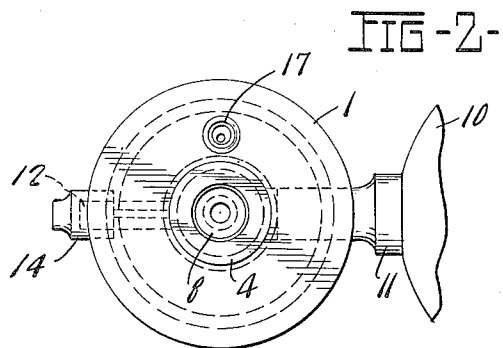


FIG-2-

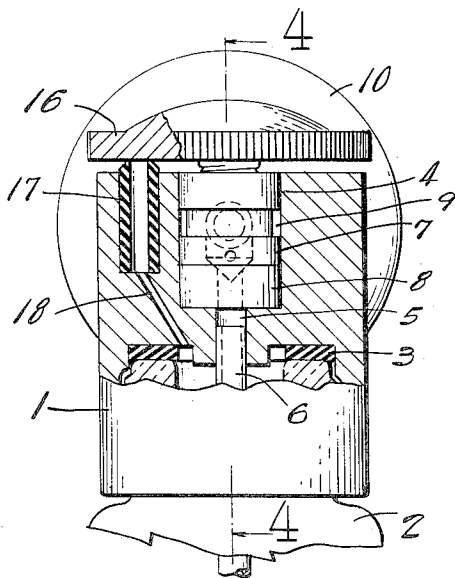


FIG-3-

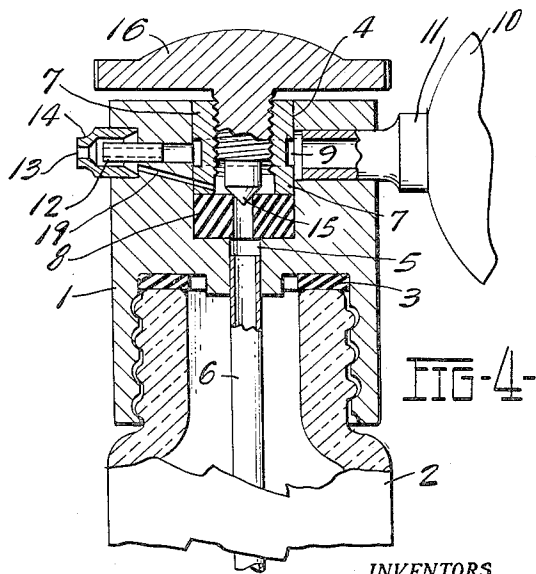


FIG-4-

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ATOMIZER

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4 Claims. (Cl. 299—88)

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This invention relates to hand operated atomizers of the type generally used for applying perfume, colognes and other toilet and medicinal liquid preparations, and more particularly to such atomizers incorporating a closure device for sealing the atomizer to prevent leakage and evaporation of the spray liquid when the atomizer is not in use.

Many efforts have been made to devise an atomizer closure which is not only effective but also inexpensive to manufacture. In the ordinary atomizer there are two passages communicating with the container which must be closed. These are the liquid passages through which the liquid reaches the spray discharge nozzle and an air vent passage which admits atmospheric air to provide pressure for delivering the liquid to the nozzle.

As perfume and medicinal preparations frequently include ingredients, such as alcohol, of strong solvent power care must be exercised in selecting as the composition for the sealing elements a material that will not deteriorate from contact with such ingredients.

The principal object of this invention is to provide a closure arrangement of few parts and dependable function.

A further object is to provide a structure that is easy to manufacture and assemble.

Other objects include ease of operation and effective action over a long period of use.

The invention is fully described in the following specification and one embodiment thereof illustrated in the accompanying drawing, in which—

Figure 1 is a perspective view of an atomizer embodying the invention;

Figure 2 is a partial plan view thereof with the closure element removed;

Figure 3 is a front elevation of the upper portion of the atomizer shown in Figure 1 with parts of the head in section; and

Figure 4 is a vertical section on the line 4—4 of Figure 3.

Referring in detail to the drawing the atomizer has a main head portion 1 attached to a bottle 2 with a gasket 3 sealing the joint between them. A central vertical bore in the head 1 has an enlarged upper section 4 and a lower restricted end 5. Depending into the bottle 2 from the lower end 5 of the bore is a liquid outlet tube 6. Held within the upper section 4 of the vertical bore by an internally threaded collar 7, press fitted in place, is a ported valve seat 8. An annular groove 9 in the outer surface of the

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collar 7 constitutes a passage for atomizing air from hand compressible bulb 10 and nipple 11 to air nozzle 12. The ejection of air from nozzle 12 through the discharge orifice 13 of outer nozzle 14 aspirates and atomizes liquid drawn up through liquid tube 6, through the valve seat 8, and angled passage 19 extending through collar 7 and head 1 to the interior of outer nozzle, 14.

Rotatable valve 15 closes the passage through the ported valve seat 8 when brought downward upon its threaded connection with collar 7 by manual turning of its exterior knob 16. At the same time the underside of knob 16 closes the protruding end of rubber nipple 17 through which atmospheric air pressure passes to the bottle 2 through diverging passage 18. The composition of nipple 17 and of valve seat 8 is a synthetic rubber or plastic resistant to solvents utilized in perfume and medicaments and sufficiently compressible to permit closing at both points without the need of critical tolerances between the machining measurements of valve 15, the underside of knob 16, and other parts involved. The plastic "Saran" made by The Dow Chemical Company has proved suitable. The outer end of nipple 17 is tapered to give more pliability and less contact area.

As may be noted the collar 7 has multiple functions in that it holds valve seat 8 in place, incorporates the passage for air around the center of the atomizer head by groove 9 and thirdly furnishes the threaded mounting for the valve 15. It further constitutes a portion of the passage for the liquid.

The knob 16 is broadened beyond the periphery of the head 1 to have its edge readily manipulatable. This size also maintains the symmetry of the top of the atomizer which may be disfigured by the presence of a small knob. The mounting threads for the valve 15 are somewhat coarse so that opening and closing of the valve is secured through minimum turning of the knob 16.

Having thus described our invention, what we claim as new and desire to secure by United States Letters Patent, is:

1. An atomizer having an atomizing head, a liquid container to which the head is attached, a rotatable and axially movable valve threadedly mounted within a vertical bore in the head, a liquid outlet tube depending from the head into the container, a spray discharge nozzle on the head in communication through a connecting passage with the liquid outlet tube, said valve having closing association with said connecting

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passage, means for supplying atomizing air to the discharge nozzle, a nipple extending upwardly from the atomizing head, said nipple composed of a yieldable material, means forming a passage from the nipple to the underside of the atomizing head to supply atmospheric air to the container, and a hand knob on the valve above the atomizing head, the hand knob having a downwardly facing surface in sealing contact with the nipple when the valve has closing association with the liquid connecting passage between the liquid outlet tube and the discharge nozzle.

2. An atomizer according to claim 1 in which the outside diameter of the nipple is gradually reduced toward the upper end of the nipple and the upper end has a thin edge.

3. An atomizer according to claim 1 in which the hand knob extends laterally beyond the periphery of the atomizing head.

4. An atomizer according to claim 1 in which

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the means for supplying atomizing air to the discharge nozzle include a hand compressible bulb fastened to the atomizing head, and means forming a passage therefrom to the spray discharge nozzle, a portion of said last named means being of annular form encircling the vertical bore in the head.

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