

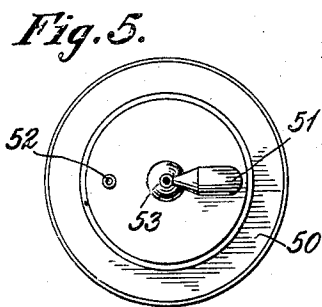
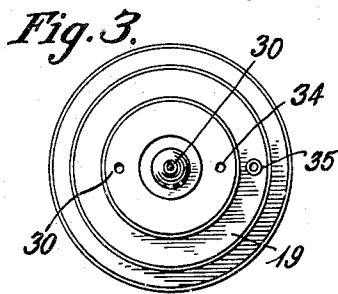
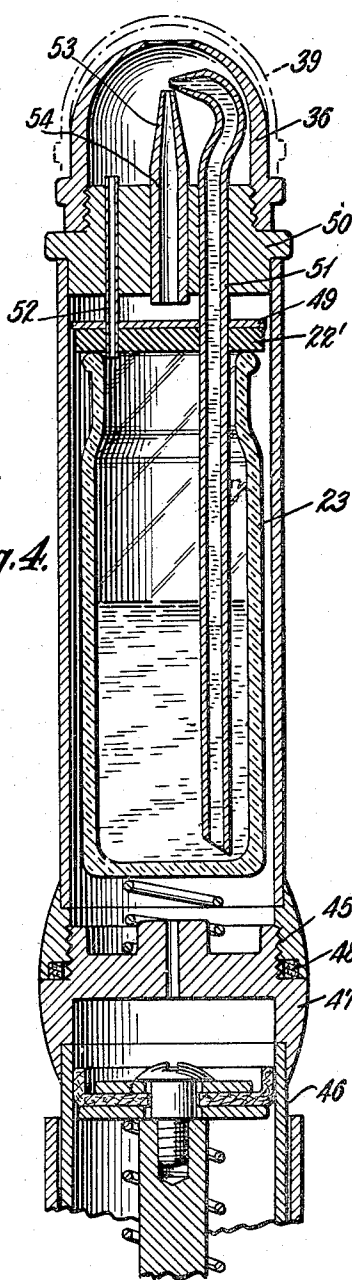
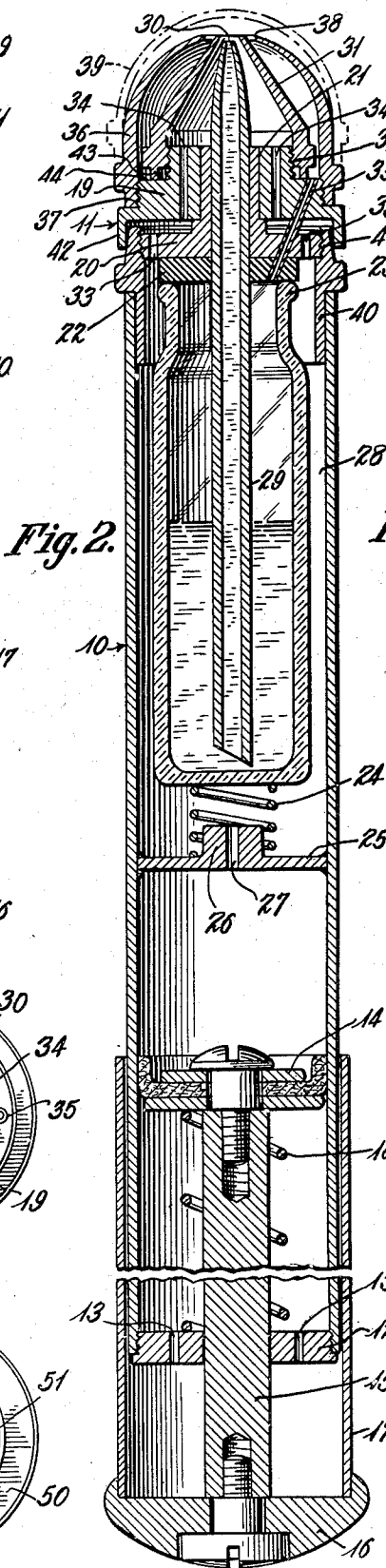
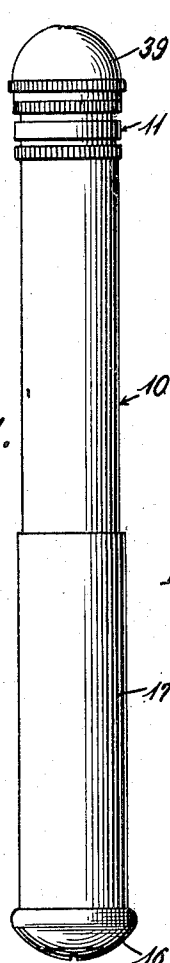
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ATOMIZER

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## UNITED STATES PATENT OFFICE

2,079,587

## ATOMIZER

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5 Claims. (Cl. 128—173)

The invention relates to atomizers and has as an object the provision of a device of this character of a form adapted for being carried about by the user.

It is an object of the invention to provide an atomizer having small overall dimensions for the purpose referred to.

It is a further object of the invention to provide an atomizer having a glass container for the liquid to be atomized sealed in the device but readily removable therefrom.

It is a further object of the invention to provide an atomizer adapted for such uses as spraying perfumery and which also may be used as a nose or throat spray when medicament is supplied therein.

Further objects of the invention will appear from the following description when read in connection with the accompanying drawing showing illustrative embodiments of the invention, and wherein:—

Figure 1 is a side elevation;

Fig. 2 is a central vertical section partly broken away to shorten the figure, and drawn to an enlarged scale;

Fig. 3 is a plan view of the structure of Figure 2 with the seal omitted;

Fig. 4 is a detail central vertical section of another form of embodiment of the invention; and

Fig. 5 is a view similar to Figure 3 of the structure of Figure 4.

As shown the device comprises a casing 10 having an upward closure 11 and a lower closure 12, the latter formed with air passages 13. The lower portion of the casing 10 is utilized as a pump cylinder and a piston 14 is reciprocable therein, said piston being equipped with a piston rod 15 working in an opening in the closure 12 and secured to a head 16 to which is also secured a sleeve 17 freely slidable upon the exterior of the lower end of the casing 10.

A compression spring 18 is provided exerting pressure between the lower closure 12 and the piston 14. This spring is desirably of insufficient strength to cause the pump action in one direction of the piston but is for the purpose of preventing the head 16 from falling by gravity to a projecting position whereby the overall dimensions of the device as carried by the user will be such as shown in Figure 1.

The closure 11 is shown as formed in two parts 19 and 20 rigidly secured together at the joint 21, as for instance by means of solder.

Carried by the portion 20 is shown a sealing means 22 as for instance of soft rubber against which the mouth of a container 23, preferably of glass, is pressed into sealing relation as by means of a compression spring 24 seating upon a diaphragm 25 rigidly secured in the interior of the casing 10.

The diaphragm 25 is shown as provided with an upwardly projecting portion 26 to locate the spring 24 and with a central passage 27 to provide free access for air compressed by piston 14 to the space 28 around the container 23.

Sealed into an opening in the closure 11 there is shown as aspiration tube 29 terminating in a nozzle 30 and with its lower end dipping to a point adjacent the bottom of the container 23.

Surrounding the nozzle 30 in the form shown in Figure 2, there is an aspirating nozzle 31 shown as screw-threaded at 32 upon a projecting portion of the element 19 of closure 11. The portion 20 of closure 11 is shown as spaced apart from the closure 19 and provided with openings 33 for passage of air to the passages 34 whereby air compressed by the piston 14 in the space 28 has access to the interior of the nozzle 31, to escape about the nozzle 30 to cause aspiration and spray of liquid drawn from the container 23 by the aspirating action.

To preserve atmospheric pressure in the container 23 there is shown a passage 35 extending through the seal 22 and through both portions of closure 11. A shield 36 is shown screw-threaded at 37 upon closure 11 and provided with a central opening 38 through which the spray is emitted. The shape of the shield 36 is such that it may be efficiently applied to a nostril of the user when the device is desired for use as a medication instrument.

A dust cap 39 is shown in dot and dash lines which may be applied to the device when not in use, as for instance when being carried in a hand-bag.

The closure 11 is shown as secured in the element 40 of the casing by means of screw threads 41 and when so placed the skirt 42 of the closure 11 is in firm contact with the outer surface of the element 40 whereby to prevent escape of compressed air when the device is operated. For a like reason the nozzle 31 is shown as provided with a depending flange 43 to contact with shoulder 44 of closure 11.

In the form of the invention shown in Figures 4 and 5 the casing is divided into two portions at screw-threaded coupling 45, the lower portion 46 of the casing being rigidly secured to

the coupling member 47 carrying the screw-threads 45.

A gasket is shown at 48 to seal the interior of the device.

5 In this form of the device the upper half of the device may be unscrewed for the removal of the container 23. In this form also the closure 49 for the container 23 carrying the sealing means 22' is secured to the closure 50 for the upper end of the casing by means of the aspirating tube 51 and the vent tube 52, which latter tubes pass through the closure 50, as shown.

The aspirating nozzle 53 is carried by the tube 54 sealed in the closure 50 and opening in the space between closures 49 and 50.

15 By virtue of use of the space 28 about the container 23 as a compressed air chamber and passages therefrom direct to the aspirating nozzle 31 or 53, the usual compressed air tube from the pump to the nozzle is unnecessary and the device may be of minimum diameter. The casing need be of little greater internal diameter than necessary to receive the container as compared with a casing large enough to contain a separate tube from the pump to the nozzle.

Minor changes may be made in the physical embodiments of the invention within the scope of the appended claims without departing from the spirit thereof.

20 I claim:

1. An atomizer comprising, in combination: a casing; a pump piston operating in a portion of said casing to compress air therein; a liquid container; means to support the container in said casing with its interior sealed from the interior of the casing; an aspiration tube dipping into said container, passing through and sealed into an opening in a closure of said casing and formed with a nozzle projecting from the casing; an aspiration nozzle in direct communication with the space in the casing about said container and located to deliver a current of air in aspirating relation to the first named nozzle.

2. The combination of claim 1, with a cap shaped for engagement with a nostril and enclosing said nozzles, said cap having an opening in the path of spray from said nozzles.

3. An atomizer comprising, in combination: a casing comprising a pump cylinder portion and a liquid container housing portion in open communication the one with the other; a pump piston reciprocable in the first named portion to com-

press air in the remaining portion; a closure for the housing portion; a liquid container housed in said housing portion; a closure and sealing means for said container carried by the first named closure; means to preserve sealing contact between the mouth of said container and said sealing means; and atomizing means carried by said first named closure comprising an aspiration tube passing through both closures and dipping into said container and compressed air discharge means opening through the first named closure into the space about said container.

4. An atomizer comprising, in combination: a cylindrical casing; a diaphragm dividing said casing into upper and lower compartments and having an opening placing said compartments in free communication; a pump piston reciprocable in said lower compartment; a closure for the upper compartment; a sealing gasket carried by the inner surface of the closure; a liquid container housed in said upper compartment with its mouth in engagement with said gasket; a spring compressed between the bottom of said container and said diaphragm to hold said container in sealing relation with said gasket; and atomizing means carried by said closure comprising an aspiration tube dipping into said container and compressed air delivery means opening into the space about said container.

5. An atomizer comprising, in combination: a cylindrical casing; a diaphragm dividing said casing into upper and lower compartments and having an opening placing said compartments in free communication; a pump piston reciprocable in said lower compartment; a closure for the upper compartment; a sealing gasket carried by the inner surface of the closure; a liquid container housed in said upper compartment with its mouth in engagement with said gasket; a spring compressed between the bottom of said container and said diaphragm to hold said container in sealing relation with said gasket; and atomizing means carried by said closure comprising an aspiration tube dipping into container, a flaring nozzle having an opening surrounding the delivery opening of said tube and secured at its base to said closure, said closure having openings placing the interior of said nozzle in communication with said upper compartment.

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