

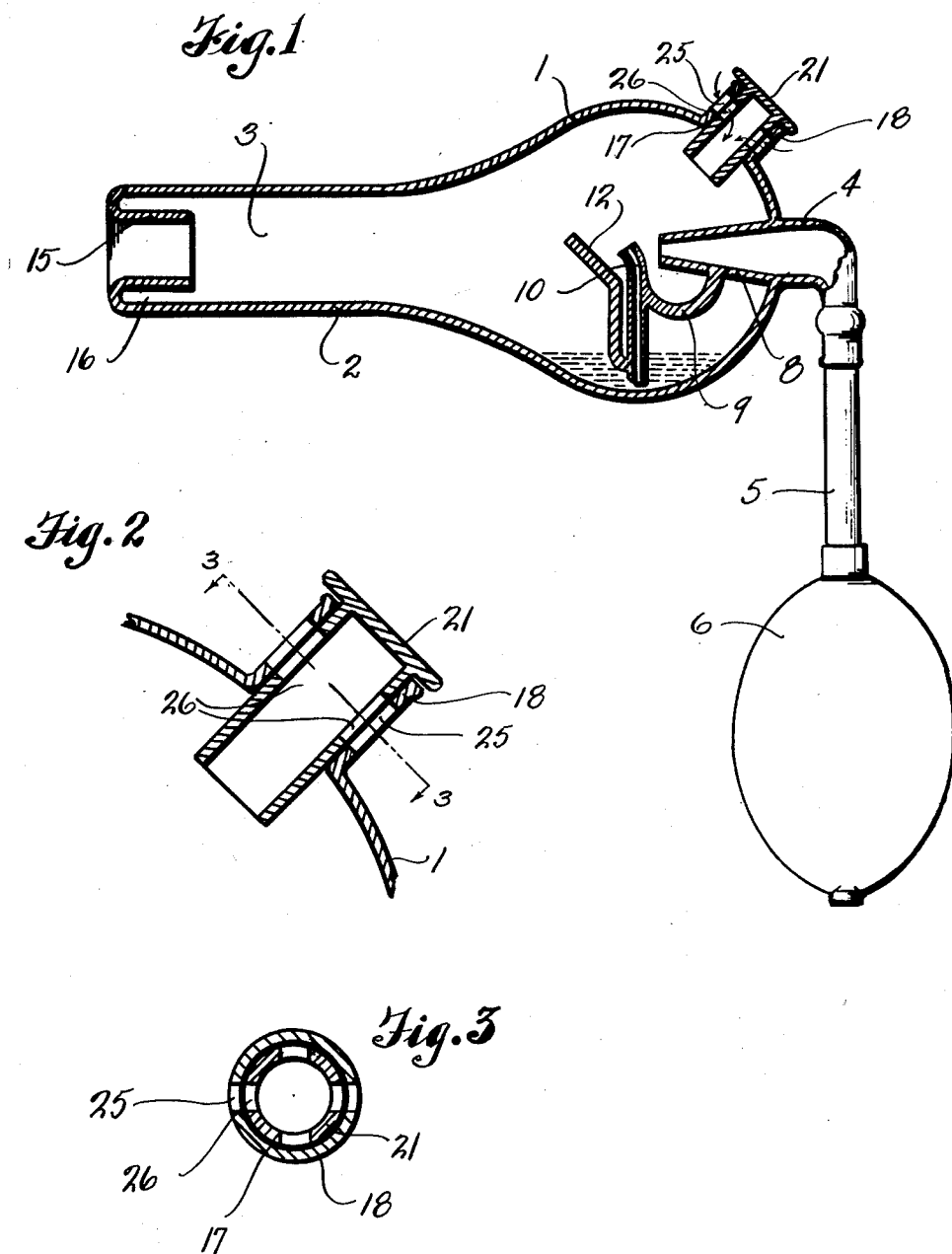
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ATOMIZER

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ATOMIZER

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1 Claim. (Cl. 299—88.5)

1 This invention relates to improvements in devices known as "atomizers." More particularly, it relates to atomizers of that type disclosed in my U. S. Patents Nos. 2,274,669 and 2,111,841, which describe and illustrate devices for the atomization of a liquid to a degree of extreme fineness, that permits it to be easily inhaled; such atomizers being designed primarily for the administering of a liquid medicine by reducing it to vapor form for inhalation by the person being treated.

For a better understanding of the present invention, it will be here explained that each of the above numbered patents discloses an atomizer comprising a globular container of substantial inside volume, designed to retain therein a relatively small quantity of liquid to be atomized; the container having an open tubular discharge neck extending from one side thereof and there being means inside the container whereby liquid may be drawn from the supply, atomized and blown from the container through the tubular neck. This neck portion projects from the container to an extent that it may be placed within the user's mouth, or directed into the mouth, while the atomization is being effected so as to avoid wasting of the vapor and to make it more readily inhaled.

To facilitate the atomization of liquid in the globular container, and furthermore in order that the atomized or vaporized liquid may be more easily blown from the container through the open neck, the container wall is provided with an air inlet port, or breather opening, for admitting air thereinto back of an air jet which effects the atomization, thus to prevent the tendency toward forming of a vacuum that would retard the desired ejection of the vapor through the neck passage.

In view of the fact that such devices are generally used by persons who are ill, and also by persons who use them while reclining in bed, it has been found desirable to so construct the container that the liquid medicine, which is quite expensive in most cases, will not be accidentally spilled out should the atomizer be improperly laid down or accidentally inverted. For this purpose, liquid retaining flanges have been formed about the neck opening and air inlet port. However, this has resulted in making it very difficult to drain the container of moisture after it has been washed preparatory to receiving a supply or charge of medicine.

In view of the foregoing, it has been the principal object of this invention to provide an atom-

2 izer having all the desirable features of those devices of my patents above mentioned, and in addition, having novel details of construction, which insure against accidental spilling of liquid, yet making possible the complete draining of the container of a cleansing liquid after it has been washed, so that the medicine, when applied within the container, will not be diluted.

More specifically stated, the present invention resides in the provision of atomizers for the purpose of those of my above listed patents, which may be similar in design or modified to a material extent without departing from the spirit of the invention, and wherein a breather opening is equipped with a valve-like stopper which may be opened for the admittance of air to facilitate the atomizing of liquid and its discharge through the neck, and which may be closed to seal the opening, and which stopper is of such character that it acts, in the open position of the valve, to prevent outflow of liquid from the container through the breather opening should the container be inverted or improperly laid down while the stopper valve is in its open position of adjustment. Furthermore, the stopper is fitted within a flange that extends outwardly from the container wall, as differentiated from the inwardly extending flanges of the devices of the patents mentioned, thus making possible the complete draining of cleansing liquid from the container.

Other objects of the invention reside in the details of construction of the neck and in the relationship of the stopper to the container wall, whereby accidental spilling of liquid from the container is prevented.

In accomplishing the above and other objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein—

Fig. 1 is a sectional view of an atomizer embodying the novel features of the present invention.

Fig. 2 is an enlarged sectional view, in its axial plane, of the stopper as applied to the air port of the container wall.

Fig. 3 is a cross section on line 3—3 in Fig. 2.

Referring more in detail to the drawings—

1 designates a flask, or container, here shown to be of globular form, in which a relatively small volume of the liquid to be atomized is adapted to be contained as indicated in Fig. 1. The container, preferably, is made of plastic, because of the constructional advantages of this material as well as its chemical inactivity, and its convenience in

use. In the present instance, the container is somewhat of spherical form, but might be of other forms without departing from the spirit of the invention. At one side, the container has a radially directed, tubular neck 2 of substantial diameter, open at its outer end and forming an outlet, or discharge passage 3 for an easy outflow of the vapor or atomized liquid along with the stream of atomizing air, as presently will be understood.

Opening into the container at a point diametrically opposite the entrance into the neck 2 is an air supply tube 4 that is connected at its outer end, through the mediacy of a flexible rubber tube 5, with a rubber bulb 6 of the well known type adapted to be hand compressed to cause the delivery of air under pressure into the container through the tube 4. At the inside of the container, the air tube 4 merges into a nozzle 8. The nozzle is tapered toward its discharge end, is axially in alignment with the discharge tube 2, and terminates substantially at the center of the bulb-like end portion of the globular container.

Depending from the nozzle, at a location near the inner end thereof, is a bracket or arm 9 which is fixed to and supports a short length of capillary tube 10. This tube is open, and is supported with its lower end close to the bottom wall of the container, so that it may be immersed in the supply of liquid, and with its upper end close to and directly in the path of discharge of air from the inner end of the nozzle, thus to cause liquid to be drawn up through the tube and picked up by the stream of air as delivered from the nozzle toward and into the neck passage 3.

For the atomization of the liquid that is delivered into the air stream from tube 10, I have provided a baffle 12 comprising a small glass plate supported at an incline and directly in the path of the stream of air as delivered from the nozzle 8 across the upper end of the liquid supply tube 10. The air stream, after passing across the upper end of the tube 10, and picking up the liquid supplied thereby, impinges against the surface of the baffle with the result that the liquid is caused to be finely atomized and deflected therefrom in a fan-like spray, appearing as a fog in the container to be carried out through the neck 2 with the outflow of air.

In order that spilling of the liquid from the container through the spout or neck will not result from accidentally tipping the device to an improper position of use, or by accidental misplacement of the device, I have provided the tubular neck, at its discharge end, with an in-turned annular flange 15 forming an annular catch channel 16 of such size as to retain all of the liquid that may ordinarily be retained in the container at any one time.

To facilitate the discharge of the atomized liquid through the tubular neck passage, the container is formed at a location in its wall back of the nozzle with a breather port, or air inlet port 17. This port is surrounded by an outwardly directed, tubular flange 18. Fitted rotatably in the tubular flange 18 is a stopper 21 comprising a tubular body which is open at its inner end and closed at its outer end. The inner end portion of the tubular body extends substantially beyond the inner wall surface of the container, as noted in Fig. 2, and the tubular body fits, in a close, leak-tight joint, within the flange. Formed in the flange 18, at opposite sides of opening 17, are openings 25, shown in Fig. 3,

and likewise, formed in the tubular body of the stopper are openings 26 that, by rotatable adjustment of the stopper, may be moved into and from registration with the openings 25, thus to admit air flow into the container through the air port 17 or to cut off the inflow and close the port, when such is desired.

With the device so constructed, and so equipped with the liquid retaining means, it will be understood that regardless of position of the device, no liquid can be spilled or poured out except by removal of the stopper. This insures against accidental loss of medicine and is a great advantage to use of the device by bed-ridden persons.

When it is desired to cleanse the container, the stopper is removed, water or other washing solution is applied therein, and can be completely drained off through the opening 17, thus avoiding waste of time for drying out and avoiding dilution of medicine by liquid retained in the container after cleaning.

I have herein shown the container to be of globular shape, but this is not to be construed as being the only shape to which the invention might be applied. It is anticipated that the container might be globular, cylindrical, a flattened flask, or of other shapes. Therefore, it is not the intent that the claims should in any way be restricted to shape so long as it is not inconsistent with the objects of the invention or use of the device. Neither is it the intent that the means for atomization of liquid be limited to any particular devices.

Having thus described my invention, what I claim as new therein and desire to secure by Letters Patent is:

An atomizer of the character described comprising a closed container of substantial volume for containing a comparatively small volume of liquid for atomization, and having an open, tubular discharge neck projecting therefrom at one side and having an air inlet port in the wall at another side, means for the atomization of liquid drawn from the supply in the container and its discharge through the said tubular neck; said neck being formed at its outer end with an in-turned, annular flange forming an annular, liquid retaining channel, and said air-inlet port being surrounded by a tubular flange terminating flush with the inside of the container wall and extended outwardly from the wall; said flange having a side opening; a tubular stopper removably fitted in the said tubular flange and rotatably adjustable therein and having its outer end closed, and its inner end open and extended substantially into the container beyond the container wall, and there being a side wall opening in the stopper adapted to be registered with the flange opening for admittance of air into the container without removal of the stopper.

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