June 14, 1955 D. D. HUTTON 2,710,711

MEDICINAL APPLICATOR

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FIG. 1

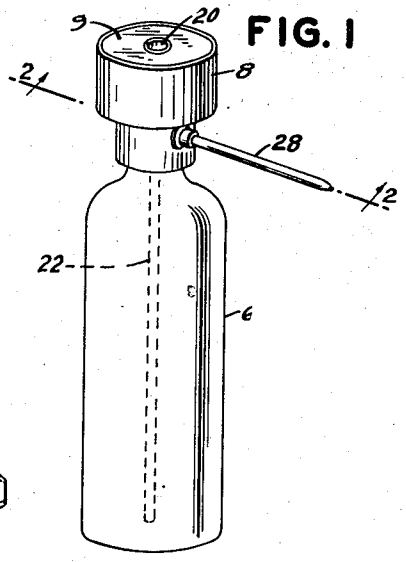



FIG. 2

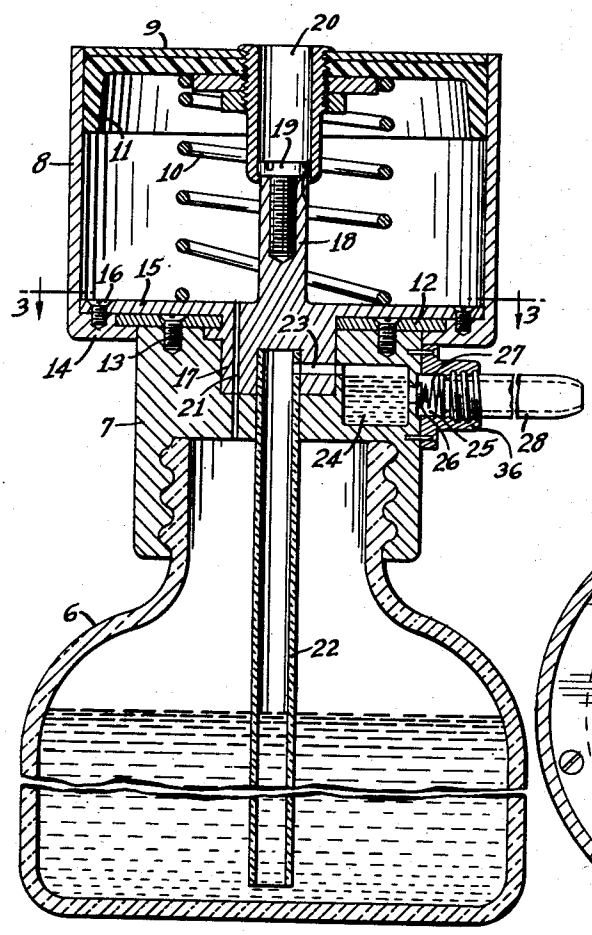



FIG. 4

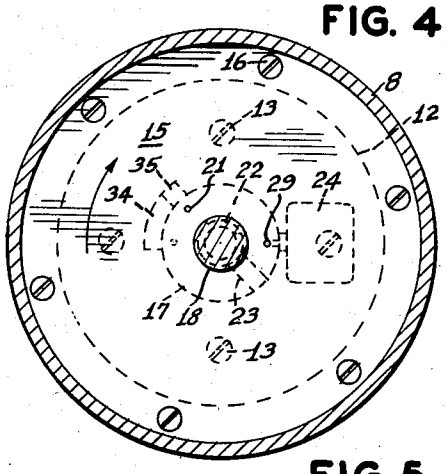



FIG. 3

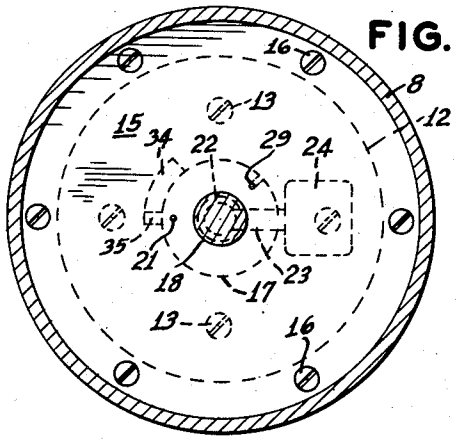
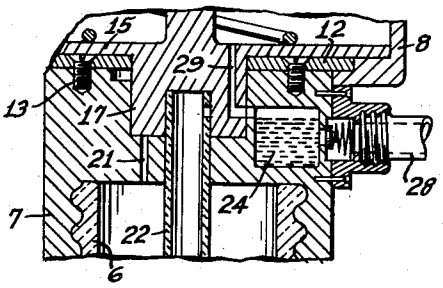



FIG. 5

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# MEDICINAL APPLICATOR

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1 Claim. (Cl. 222—400.8)

This invention relates to medicinal applicators and is directed to the provision of an applicator for administering medicinal preparations so constructed as to reduce or eliminate the chance of contagion by the transfer of a germ or virus from one person or another or to the same person at a later time.

An instance which is typical of those presenting the danger of contagion which this invention aims to reduce or eliminate, is presented in connection with medicinal preparations in liquid form which are applied by injecting a small amount of the preparation into the nostril, mouth or ear. A common practice is to supply such a liquid preparation in a bottle which is accompanied with a small applicator in the form of a glass tube contracted at one end and at the other end provided with a rubber bulb. The small end of this glass tube is projected into the liquid in the bottle whereupon the rubber bulb is collapsed and as it expands it draws a charge of the liquid up into the tube. Then the small end of the tube is inserted in the nostril, mouth or ear and the bulb is collapsed to inject the liquid into the nostril. This may be repeated various times, the small end of the tube being again inserted in the liquid after each application. If a germ of virus is deposited on or in the tube while it is projected into the nostril, mouth or ear, it may, in a later insertion of the end of the tube into the liquid in the bottle, be transferred to that liquid and on a still later use of the applicator by that same person or another, the germ or virus may be administered to the patient in this latter use of the applicator.

This invention aims to provide an applicator for this and other similar uses which is of such a construction that this danger of transfer of a germ or virus is eliminated. A distinctive feature of the applicator is that the element of it which is inserted into the human body, the nostril for instance, is never inserted into the medicinal preparation. Instead, another element of the applicator which is never inserted into the human body extends into the liquid preparation and is employed to withdraw a charge therefrom and this charge is later administrated to the body through an outlet element suitably constructed to adapt it for its purpose.

The construction of the applicator whereby this desirable end is attained may vary over a wide range. In one form it may include a collapsible element in the form of a bellows which may be contracted and expanded to draw a charge from the container of the liquid preparation and transfer it to a suitable chamber and means are provided whereby the charge of liquid in this chamber may be transferred to the human body, to the nostril for instance, through a suitable outlet device connected to the chamber and constructed to facilitate application of its outlet end to the appropriate portion of the human body. Thus there is never any occasion for inserting the outlet device in the liquid in the container because a dosage of the medicinal preparation is drawn out of the body of the liquid and moved to a discharge point by means provided for that purpose which does not include the outlet element. This outlet element could be provided with an enlargement which would suffice to prevent insertion of the element into the container for the liquid, but that is made unnecessary by elimination of a purpose served by so inserting it.



A construction which may be employed and which is typical of those embodying the invention is illustrated in the accompanying drawing in which Fig. 1 is a perspective view of a container in the form of a bottle having my improved form of applicator applied thereto; Fig. 2 is a vertical cross-sectional view of the container and applicator; Figs. 3 and 4 are transverse cross-sections on the line 3—3 of Fig. 2, showing two positions of the parts; and Fig. 5 is a detail sectional view corresponding to Fig. 2 and showing the parts in the other one of their two positions.

Referring to these drawings, the medicinal preparation to be applied is a liquid in a container 6 in the form of a bottle having a contracted neck at its upper end provided with a thread. The applicator has a similarly shaped opening at its lower end to receive the contracted neck of the container 6 and threaded on its interior wall to facilitate mounting it substantially air-tight upon the neck of the bottle.

The applicator includes a body 7 on which is mounted a bellows element including a cylinder 8 and a piston 9 which may be depressed within the cylinder 8 against the pressure of a spring 10. The piston 9 may be provided with a gasket 11 for maintaining a substantially air-tight connection with the wall of the cylinder 8.

The body 7 has an annulus 12 secured thereon by screws 13. The outer edge of this annulus projects beyond the edge of the body 7 and overlaps the inturned edge 14 of the cylinder 8. Within the cylinder is an annular plate 15 resting upon the annulus 12 and projecting beyond its edge and secured to the cylinder by screws 16.

The annular plate 15 has an integral circular extension 17 extending downward into a circular cavity in the upper face of the body 7 and opposite this downward extension 17 there is an upward extension 18 which receives a screw 19 at its upper end. The piston 9 has a tubular member 20 secured to it at its center, the arrangement being such that, when the piston 9 is depressed, this tubular member 20 slides down the head of the screw 19 to maintain a substantially air-tight connection at that point.

A small opening or duct 21 is provided extending vertically through the portion 17 of the annular member 15 and also through the body 7, the two parts of this duct being in alignment when the parts are in the positions illustrated in Fig. 2. As will be noted, the whole of the bellows structure 8 may be rotated through a limited range so as to carry the two parts of the duct 21 out of alignment with each other, a condition which is illustrated in Fig. 5.

At the center of the body 7 is a circular opening and this opening is extended into the portion 17 of the member 15 and a tube 22 has its upper end extending through this central opening in body 7 and into the cavity in the part 17 and it is fastened to the part 17 at its upper end. This tube extends downwardly to a point close to the bottom of the container. In the side wall of the tube 22 within the member 17 a passage 23 is formed leading horizontally through the tube and through the member 17.

Within the body 7 is a chamber 24 and there is an opening from this chamber to the inner wall of the member 17 which constitutes an extension of the passage 23 when the parts are in the positions illustrated

in Fig. 2. At the outer side of the chamber 24 there is a passage leading to a cavity 25 in a tubular attachment 36 secured to the wall of the body 7 by screws as shown and within this cavity is a check-valve 26 held by a light spring 27 against the wall of body 7. Also, the attachment 36 is provided with a thread to receive the threaded end of the applying element 28 which is a tube projecting laterally and having its end contracted as shown in Fig. 1.

The passage 23 from tube 22 to chamber 24 is open when the duct 21 is open, as is shown in Fig. 2. When the bellows element is rotated to close the duct 21 as above described, the passage 23 is also closed and this rotational movement of the bellows structure also opens a passage 29 (Fig. 5) from the interior of the bellows downwardly through the member 17 and laterally to the chamber 24. Fig. 2 illustrates one position of the parts and Fig. 5 the other position at the end of the rotational movement whereby the ducts 21 and 23 are closed and the passage 29 opened.

With the applicator thus constructed and the container 6 provided with a liquid as indicated, the piston 9 may be depressed against the tension spring 10, forcing air through the duct 21 and into the container and applying pressure to the liquid therein to force it up through tube 22 and through passage 23 and into the chamber 24. When the piston is released, it is returned by the spring 10 whereupon the bellows structure may be rotated. This rotational movement causes closure of the ducts 21 and 23 as is indicated in Fig. 5 and also brings the two parts of the passage 29 into alignment whereby connected is established from the interior of the bellows to the top of the chamber 24. Then the piston 19 may be depressed again, forcing air from the bellows through the duct 29 and applying pressure to the charge of liquid in the chamber 24 so as to expel that charge from the chamber to the tubular applicator 28, the liquid lifting the check-valve 26 from its seat to permit it to pass.

It will be noted that the medicinal preparation is applied to the human body through the tubular applicator element 28 which is inserted in the body, the nostril for instance, and that this applicator element 28 is never inserted in the liquid in the container. The tubular element 28 may be detachably mounted as is indicated, and, when the applicator is not in use, it may be detached and may remain detached for convenience until the instrument is to be used again. But in no event is it inserted in the medicinal preparation and the construction of the applicator guards against this. Thus the applicator may be used repeatedly and may be used from time to time by different persons without danger of picking up an element of contagion on or in the applicator tube 28 and transferring it thereafter to the medicinal preparation in the container, with resultant later use of the medicinal preparation on the theory that it will be a beneficent effect when in fact it may cause the very condition it is supposed to cure.



The rotational movement of the bellows may be limited in any suitable manner. Thus a sector-shaped space 34, may be provided in the interior wall of body 7 to receive a pin 35 projecting radially from the part 17 of annular plate 15. In Figs. 3 and 4, this pin is shown at opposite ends of the space 34 where it arrests rotational movement of the bellows in its operative positions. With the bellows at an intermediate point in its range of movement, the passages 21 and 29, and hence the container 6, are closed and markings upon the body 7 and cylinder 8 may serve to show when the three positions of the bellows on body 7 have been reached.

I claim:

A medicinal applicator adapted to be mounted upon the open end of a container for a liquid and having a body formed for application to said end of the container and a tube projecting from the body for immersion in the liquid in the container, a pneumatic pumping mechanism mounted on the body for limited rotational movement thereon, said body having a chamber formed therein and also a plurality of passages therein, one for connecting the interior of said mechanism to the interior of the container, one for connecting the interior of said mechanism to the chamber, one for connecting the chamber to the said tube, and one for connecting the chamber to the exterior of the applicator, the first three of said four passages being controlled by the position of the said movable pumping mechanism upon the body to open communication from the interior of the container to the interior of said mechanism and to said chamber or to close the said connections and open communication from the interior of said mechanism to the said chamber, and a tubular member connected to the outlet passage from said chamber.

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