

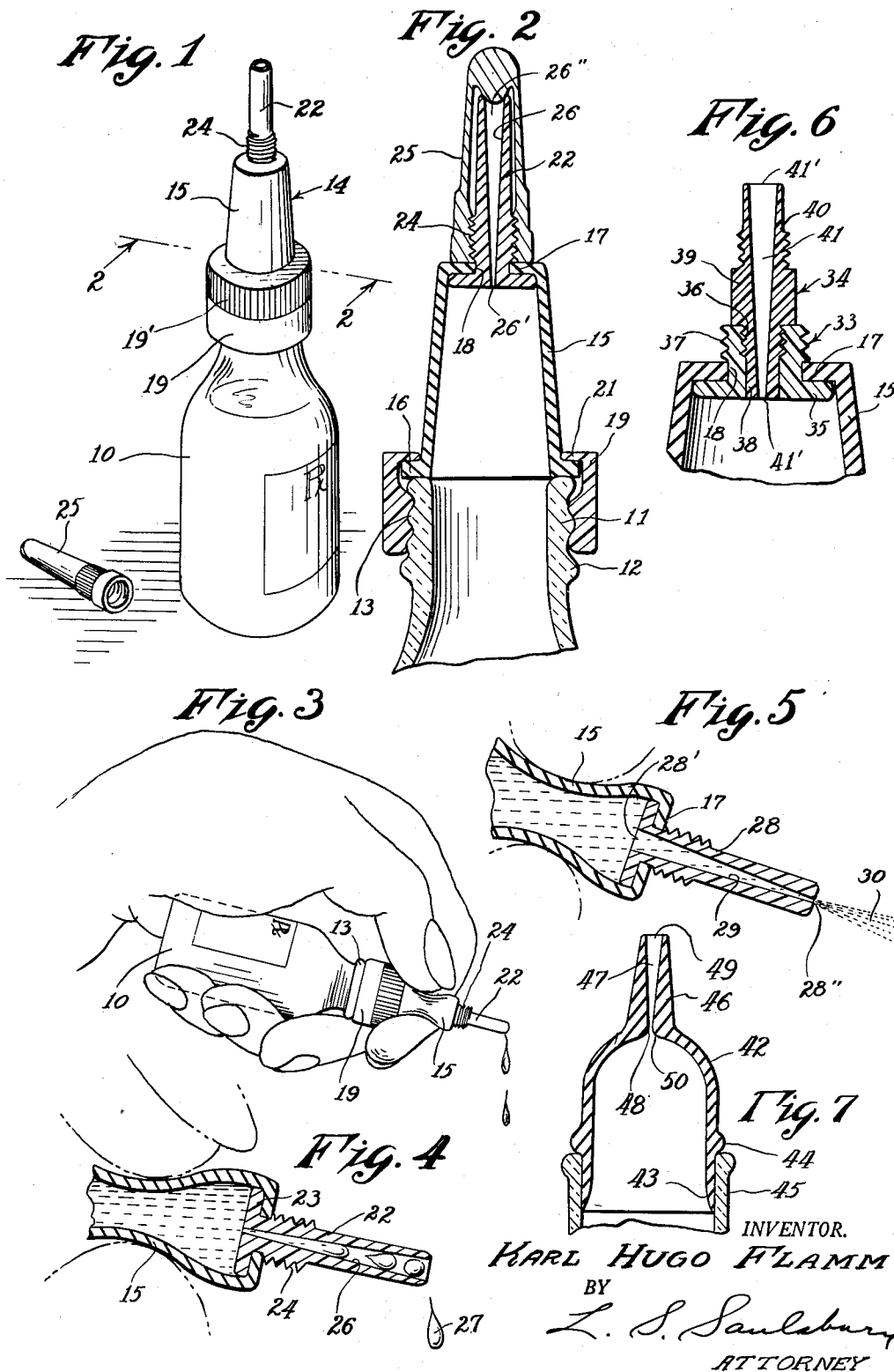
Feb. 14, 1956

K. H. FLAMM

2,734,665

DEVICE FOR DISCHARGING LIQUIDS FROM RECEPTACLES

Filed Nov. 1, 1951



1

2,734,665

DEVICE FOR DISCHARGING LIQUIDS FROM RECEPTACLES

Karl Hugo Flamm, Hesse, Germany, assignor to Charles Blue, Mineola, N. Y.

Application November 1, 1951, Serial No. 254,285

4 Claims. (Cl. 222—207)

This invention relates to a device for discharging liquids from receptacles.

This application is an improvement of my pending application, Serial No. 185,550, filed September 19, 1950, now Patent No. 2,706,582 dated April 19, 1955, and relating to a pneumatic liquid dispenser.

It is an object of the present invention to provide a device for discharging liquids from receptacles by the simple squeezing of the nipple part of the device that has a nozzle formation associated therewith and wherein the opening in the formation or the nipple part is tapered to a slight extent so that with the tapered opening having its small end in the nipple part, drops will be dispensed and wherein if the portion is so connected to the nipple part that the large end of the tapered opening is within the nipple part, a spray will be effected.

It is another object of the invention to provide a device for discharging liquids from receptacles which will serve as a closure for the open end of the receptacle to keep the receptacle closed at all times and which will also serve as a medicine dropper so that perfectly formed drops can be dispensed directly from the device and without the device having to be removed from the receptacle whereby to eliminate the possibility of the contents of the receptacle being spilled upon the receptacle being upset.

It is another object of the invention to provide a device adapted to be attached to a receptacle or bottle which contains the liquid to be dispensed and which is so constructed that by a simple squeezing operation air current and equal size drops will be dispensed from the receptacle in a manner such that these drops can be easily and correctly counted and whereby two hands will not be required to dispense the drops, as in the case of a bottle in which there is a detachable medicine dropper and wherein the drops can be guided better and with the ordinary medicine dropper by virtue of the fact that the bottle is held in the one hand and firmly and not by a bulb part on the one end of a long glass tube, as in the case of a medicine dropper when it is used.

It is another object of the invention to provide in a liquid dispensing device adapted for attachment to a receptacle and more particularly to the nozzle part thereof which is connected to the nipple part and which has a tapered opening, the nozzle part so fashioned that the tapered opening can be arranged so that its small end is within the nipple part or by a mere reversal of the same, the large end can be in the nipple part whereby the device can be adapted to discharge either drops or a spray and whereby the nozzle part is so formed as to receive a cover with a member having the tapered opening being in either position.

Other objects of the present invention are to provide a device for effecting the discharge of liquid from receptacles which enables one to hold the bottle at all times in the hand when discharging liquid and with the above objects in mind, which is of simple construction, easy to operate with a single hand, inexpensive to manufac-

2

ture, has a minimum number of parts, compact, preserves the sterility of the contents of the receptacle or bottle, sanitary and easy to clean, durable and has long life, and efficient in operation.

For other objects and for a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawing, in which:

Fig. 1 is a perspective view of a bottle having the device for dispensing the liquid therein attached thereto;

Fig. 2 is an enlarged vertical sectional view of the device and of the upper end of the bottle;

Fig. 3 is an illustrative side elevational view of the bottle being held in the hand and operated to dispense the liquid drops;

Fig. 4 is an enlarged sectional view of the device and of the nozzle arranged to dispense uniform drops of the liquid and lying in the dispensing position;

Fig. 5 is an enlarged longitudinal sectional view of the dispensing device arranged with the large end of the tapered opening lying in the nipple part so that instead of drops being dispensed, a spray will be dispensed;

Fig. 6 is an enlarged sectional view of a modified form of the invention having a reversible nozzle member, whereby the device can readily be made adaptable to either effect the dispensing of drops when in one position or of a spray when in the other position;

Fig. 7 is a vertical sectional view of a still further form of the invention wherein all portions of the device are formed of one integral piece.

Referring now particularly to Figs. 1 to 4, 10 represents a receptacle, such as a bottle, which has a threaded neck portion 11 and an annular shoulder 12 lying below the threads 13. The device, as indicated generally at 14, embodying the features of the present invention, is adapted for securement to the threaded neck portion 11 of the bottle 10. This device comprises a conical shape nipple-like member of flexible material, as indicated at 15, which has an outwardly extending bottom flange 16 and an inwardly extending top portion 17 having a hole 18 therein. By means of a rigid coupling member 19, the flexible member 15 is attached by its flange 16 to the threaded end of the bottle. This rigid coupling member 19 has a radially inwardly extending flange 21 on its upper end thereof which overlies the flange 16 of the conical shaped flexible member 15 and the flange 16 is brought into tight sealing engagement with the end of the neck portion 11 as the coupling member 19 is tightened downwardly over the threads of the threaded portion 13 of the bottle. The coupling member 19 may come to rest immediately above the annular shoulder 12 on the neck portion 11. The coupling member 19 is serrated as indicated at 19' to provide a good grip upon the coupling member being tightened upon or loosened from the neck portion of the bottle.

Extending through the hole 18 in the top portion 17 of the flexible member 15 is a small nozzle of plastic or other rigid material as indicated at 22. This nozzle is held against outward displacement from the top portion 17 by a flange 23 on its lower end. It also has threads 24 to effect the securement thereto of an internally threaded cap 25 when the discharging device is not in use and the contents of the bottle is to be retained in an airtight manner therewithin. The lower end of the cap 25 when screwed down tightly will make good sealing engagement with the top portion 17 of the member 15.

The nozzle 22 has a small tapered opening 26 which at the inner end as indicated at 26' is about one-half of a millimeter in diameter and at its outer end as indicated at 26'' about three millimeters in diameter. The size of the opening at 26' is accordingly such that very little

liquid can, if any, be lost and thus to effect a flow of such liquid compressing or squeezing of the flexible member 15 must be effected to start the liquid through this small end 26' of the tapered opening 26. Within this opening 26, the liquid will naturally adhere by friction and when the liquid has become sufficiently great in quantity and weight, it will quickly leave the opening in the form of a drop, as shown in Fig. 4, at 27. The size of the drop will depend upon the specific gravity of the liquid and its adhering characteristic upon the inner wall surface of the tapered opening 26. It will also depend upon the viscosity of the liquid being dispensed. The drops will always be uniform and will be controlled by the amount of squeeze on the flexible member 15.

As the bottle is upturned as shown in Figs. 3 and 4, the air in the bottle will collect in the upturned bottom end thereof and by a squeezing action of the flexible member 15 this air will be compressed sufficiently enough to exert pressure upon the liquid and to cause it to start through the small end 26' of the opening 26. Once this flow has been started, the continuation thereof will take place until the air has become stabilized. If further drops are desired, the flexible member will again be squeezed.

It will be seen that the bottle is held firmly in the one hand while this is being effected. It is not necessary to remove any part from the device other than the cap 25 and the drops can accordingly be easily guided to their point of application. It is well known that the medicine dropper is difficult to handle by means of its flexible bulb in order to aim the end of the dropper upon the location where the liquid drops are to be dispensed.

Referring now particularly to Fig. 5, wherein a nozzle 28 is provided with a tapered opening 29 of the same shape and having the ends of the same diameter as the opening 26 in the nozzle 22, but with the large end of the opening as indicated at 28' being within the nipple, or flexible member 30 while the small end is on the outer end of the nozzle as indicated at 28''. Thus, by the same squeezing action of the flexible member 15, a spray as indicated at 30 will be projected.

In Fig. 6, there is shown a still further form of the invention wherein the nozzle means is formed of two parts 34 and 33, which can be coupled together in a manner to effect either atomizing action, when connected together in one way, or when connected together in another way to effect the dispensing of drops. The part 33 has a flange 35 and internal and external threads 36 and 37. Adapted to fit the part 35 and the thread 36 is a threaded shank 38 extending from an intermediate portion 39 of the part 34 and on opposite side of intermediate portion 39 is a threaded shank 40. Either one of these threaded shanks will fit the interior of the part 33.

A tapered opening of the same dimension as above described extends through the part 34. This tapered opening is indicated at 41 and has a small port 41' at one end and large port 41'' at the other end. It will be understood that this part 34 can be used either one way or the other by simply threading the different shank portions 38 and 40 into the part 33. The part 33 is secured to flexible member 15 and more particularly to the top portion 17 thereof by extending through opening 13 in the top portion. The external thread of the member 33 can be used to secure cap 25 over the nozzle means. Whenever these devices are used, the cap 25 is always removed. The small hole in the nozzle will prevent any leakage should the bottle become inverted when the cap 25 has been removed. No appreciable amount of leakage can be effected through the small end of the tapered opening. The cap 25 has sealing engagement with the top portion 17 of the flexible member 15 and will, when the bottle is not in use, prevent positively any leakage.

In Fig. 7, there is shown a modified form of the invention wherein all portions of the device are included in one integral piece. It will be understood by making

the device of one piece that the same action can be effected. The main body portion 42 is formed of a flexible material which is more thin and more flexible than an attaching portion 43 having a rib 44 extending about the same and serving as a stop shoulder for the securement of the device to the open upper end 45 of a bottle.

Extending upwardly from the body portion 42 is a nozzle portion 46 having a relatively more thick wall than the body portion wall and a tapered opening 47 small at its lower end as indicated at 48 and large at its upper end as indicated at 49. Just below the small opening 48 is a flared mouth surface 50 for receiving and directing the liquid to the small end 48 of the tapered opening 47. By having the nozzle wall being thick, the shape of the tapered opening therein will be retained while the squeezing action is effected upon the relatively more thin wall of the main body 42. This device can be formed of rubber, but it will be understood that it may also be formed of plastic of a variety that returns to its original shape after being squeezed and released. The operation of this nozzle device, shown in Fig. 7, is the same as with the other devices previously described.

It should now be apparent that there has been provided a dispensing device for bottles which can be operated by the same hand that lifts the bottle and whereby upon a simple squeezing of the nipple part a uniform drop may be dispensed or a spray can be effected depending upon the location of the small end of the tapered opening of the nozzle means. It will also be seen that this device is of simple construction, inexpensive to manufacture, and that at all times the contents of the bottle can be easily kept clean and sterile and that there is little chance of loss of the liquid upon the bottle being turned or upset.

While various changes may be made in the detailed construction, it shall be understood that such changes shall be within the spirit and scope of the appended claims.

What is claimed is:

1. A device for dispensing liquid from a receptacle comprising a hollow member of flexible material adapted to be squeezed, means for connecting the hollow member to a receptacle so that the hollow member may project therefrom and be in communication with the interior thereof, said hollow member having a small hole therein, a relatively rigid nozzle having a flange on its inner end and a shank extending through the small hole of the hollow member and the opening within the nozzle being of uniformly tapered formation having its small end communicating with the hollow member and on the flanged end of the nozzle.

2. A device for dispensing liquid from a receptacle one drop at a time as defined in claim 1, and the shank portion of said nozzle having threads thereon and a cap adapted to extend over the shank of the nozzle and engaging with said threads and adapted to be tightened upon the hollow flexible member to effect sealing engagement of the nozzle with the hollow member.

3. A device for dispensing liquid from a receptacle, comprising a hollow flexible member adapted to be squeezed and adapted for connection with a receptacle, said hollow member having a small hole extending through the wall thereof, nozzle means extending through the small hole in the wall and comprising an attaching member and a member having a tapered opening therein, said latter member having an intermediate portion and two threaded shank portions, the tapered opening extending from one end of said member to the other and through both of the shank portions and the intermediate portion, said attaching member for the nozzle means being threaded to receive the shank portions of the member having the tapered opening therein, one shank portion, at a time, whereby the member having the tapered opening therein can be inverted to dispense liquid either a drop at a time or with spraying action.

4. A device for dispensing liquid from a receptacle as defined in claim 3 and said attaching member having external threads and a flange, said flange engaging with the inner wall of the hollow member and an internally threaded cap operable upon the threads of the attaching member to sealingly hold the hollow member upon the flange and to thereby prevent leakage of liquid from the nozzle means when the receptacle is not in use.

537,111
2,165,604
2,531,525
2,600,978

References Cited in the file of this patent

UNITED STATES PATENTS

Henderson	-----	Apr. 9, 1895
Abel	-----	July 11, 1939
Oakes	-----	Nov. 28, 1950
Demarco	-----	June 17, 1952