

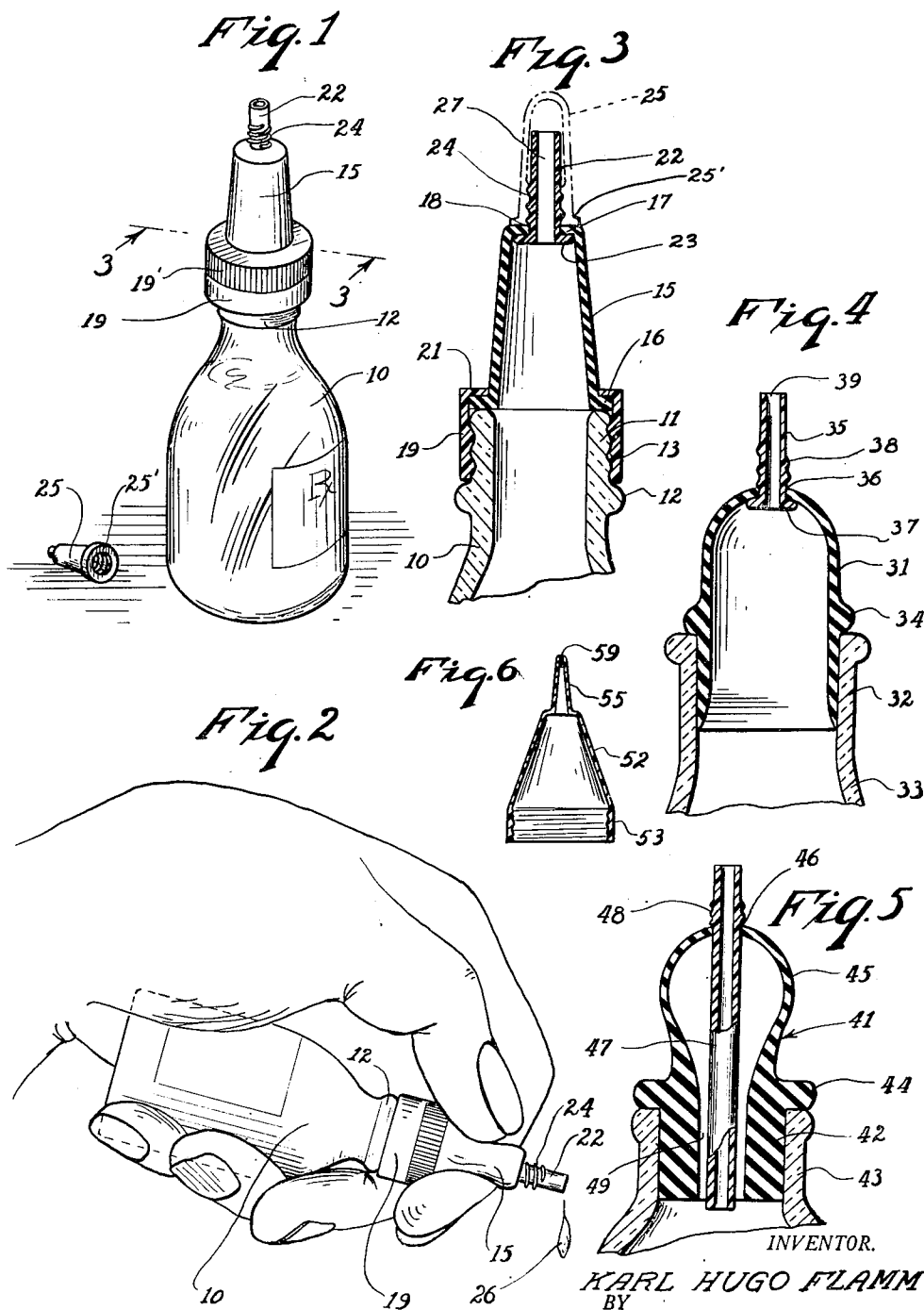
April 19, 1955

K. H. FLAMM

2,706,582

PNEUMATIC LIQUID DISCHARGER

Filed Sept. 19, 1950



INVENTOR.
KARL HUGO FLAMM
BY
L. S. Saulsbury
ATTORNEY

1

2,706,582

PNEUMATIC LIQUID DISCHARGER

Karl Hugo Flamm, Bensheim an der Bergstrasse, Germany, assignor to Charles Blue, New York, N. Y.

Application September 19, 1950, Serial No. 185,550

1 Claim. (Cl. 222—207)

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

It is an object of the present invention to provide a device for discharging liquids from receptacles which is adapted to serve as a closure for the open end of the receptacle and to keep the receptacle closed at all times and to replace the usual medicine dropper which requires the receptacle to be opened in order to gain access to it with the dropper and in order to eliminate the possibility of the contents of a receptacle being spilled while using the separable dropper.

It is another object of the present invention to provide a device attached to a receptacle which contains the liquid to be dispensed and so constructed that by simple squeezing operations accurate and equal size drops will be dispensed from the receptacle and wherein such drops can be easily and correctly counted and wherein at the same time the receptacle or bottle having the closure rests firmly in the hand and wherein the drops can be guided by virtue of the bottle being in the hand better than with the standard medicine dropper where the grasping of the same is had only upon the bulb part on the end of a long glass tube.

Other objects of the present invention are to provide a device for effecting the discharge of liquid from receptacles enabling one to hold the bottle at all times in the hand while drops of the liquid are being dispensed, which is of simple construction, easy to operate with a single hand, inexpensive to manufacture, has a minimum number of parts, durable and has long life, compact, preserves the sterility of the contents of the receptacle or bottle, need not be removed to effect a larger flow of the liquid than that of a drop 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 of the present invention attached thereto.

Fig. 2 is a side elevational view of the bottle with the device in a position to dispense drops of the liquid one at a time and illustrating by the hand how the operation is effected.

Fig. 3 is a vertical sectional view of the device and of the bottle and as viewed on line 3—3 of Fig. 1.

Fig. 4 is a vertical sectional view of a modified form of the invention wherein the device has a different shape and fits the bottle in a different manner.

Fig. 5 is a vertical sectional view of a still further form of the invention utilizing a long dispensing tube and a bulb shaped flexible wall.

Fig. 6 is a sectional view of a modified form of the invention.

Referring now particularly to Figs. 1 to 3, 10 represents a receptacle such as a bottle which has a threaded neck portion 11 and an annular shoulder 12 lying below threads 13. The device, embodying the features of the present invention, is adapted for securement to the threaded neck portion 11 of the bottle. This device comprises a conical shaped member of flexible material, as indicated at 15, which has an outwardly extending bottom flange 16 and an inwardly extending top portion 17 with a hole 18 therein. By means of a rigid coupling member 19, the flexible member 15, by means of its flange, is made secure to the bottle. This member 19 has a radially inwardly extending flange 21 on its upper

2

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 upper end of the neck portion as the coupling member 19 is tightened downwardly over the threads 13. The coupling member 19 may come to rest immediately above the annular shoulder 12 on the neck portion. The coupling member 19 may be serrated, as indicated at 19', to provide a good grip upon the coupling member being tightened upon the neck portion of the bottle.

Extending through the opening 18 in the top of the member 10 is a small nozzle of plastic or other rigid material that is indicated at 22. This nozzle member is held against outward displacement from the top 17 of the member 15 by a flange 23 on its lower end. It also has threads 24 to effect the securement of an internally threaded cap 25 thereupon when the discharging device is not in use and the contents of the bottle are to be retained in an air-tight manner within the bottle. The cap has a flange 25' which will engage with the top 17 of the flexible member to provide good sealing engagement therewith and to render the device air tight.

If the receptacle or bottle 10 is turned to a position as shown in Fig. 2, liquid will enter the conical member 15. By a slight squeeze on the walls of the member 15, a drop 26 of the liquid can be dispensed from the nozzle 22. The nozzle 22 has a through opening 27 through which the liquid passes. The air in the bottle, as the bottle is inverted, will collect in the upturned bottom end thereof and will normally prevent the outward passage of the liquid contents. By squeezing action upon the flexible member 15, the liquid lying at the inner end of the nozzle 22 will be forced through the opening 27 of the nozzle and the air at the upturned bottom end of the bottle will be slightly compressed by the inward displacement of the body of the liquid. It will be seen that the bottle is held firmly in the hand and that the nozzle 22 can be directed with ease to a location where the drop 26 is to be dispensed. The usual 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. With each squeeze, a liquid drop leaves the nozzle.

In Fig. 4 there is shown a different form of the invention wherein a bulb member 31 is adapted to fit internally of a neck portion 32 of a bottle 33. This flexible bulb shaped member has a stop shoulder of annular shape extending externally therearound, as indicated at 34, for engagement with the upper end of the neck portion 32. This bulb member 31 can be squeezed and upon doing so air may pass into the bottle 33 through a narrow circular opening between nozzle tube 35 and the flexible closure 31. This opening is indicated at 36. The nozzle tube 35 has a flange 37 at its lower end to prevent the outward displacement of the tube from the flexible member 31 and through opening 36. This tube 35 also has threads 38 by which a cap, similar to that shown at 25 in Figs. 1 and 3, can be secured to effect sealing engagement with the upper end of the flexible closure member 31. This form of the invention is used in the same manner as the above described form and is tilted and squeezed as illustrated in Fig. 2. The nozzle 35 has opening 39 through which the liquid will pass.

In Fig. 5 there is shown a still further form of the invention and according to this form of the invention the closure member 41 having a thick bottom portion 42 is fitted into the open end or neck portion 43 of the bottle. A flange 44 on the member 41 will rest upon the upper end of the bottle. The member 41 has a flexible and depressable ball or bulb portion 45 which can be squeezed to effect the dispensing of the liquid one drop at a time. The upper end of the bulb portion 45 has an opening 46 through which extends a long dispensing tube 47 having threads 48 thereon for the securement thereto of a cap. This tube 47 can be of any desired length and can extend either as shown to the bottom end of the member 41 or to a greater extent into the bottle depending to the extent which it is desired to tilt the bottle in order to effect the dispensing of a drop of the liquid. The tube 47 could also extend from a different direction from the bulb portion 45, but it is found that the axial

3

position is best. As the ball or bulb portion 45 is squeezed, air will pass downwardly through the portion 42 and more particularly to a large opening 49 therein in which the tube 47 is suspended. On release of the bulb portion some air passes therinto through the opening 46 in the upper end thereof between the wall of this opening and the outer surface of the tube 47.

Two different ways are shown by which the device can be attached to the upper end of a bottle. One way is by means of a coupling member 19, as shown in Figs. 1 and 3, and another way is by fitting the same internally into the upper end of the neck portion of the bottle, as shown in Figs. 4 and 5. The closure may also be secured in the same manner in which a nipple is pulled over a baby's milk bottle. In some instances the tube and nozzle can be formed as an integral part of the closure member although it is well to have a rigid nozzle portion to be certain that this opening is not closed by the squeezing action of the flexible member. The squeezing of the bulb portion forces air into the bottle in measured quantities and allows only a drop of the liquid to be dispensed at a time by virtue of the vacuum or space in the bottle being only slightly placed under pressure of a small charge of air.

It should be apparent that there has been provided a device for dispensing liquid one drop at a time that does not require the removal of a stopper from a bottle and the use of the standard medicine dropper which is unsatisfactory when attempting to locate the drops and which leaves the bottle when the stopper has been removed therefrom free for easy spilling of the contents.

It should be understood, however, that the parts as shown in Fig. 1 including the nozzle 22, the flexible member 15 and the coupling member 19 can be made of one entire piece varying in thickness and in hardness, as may be required. This is true of the other forms of the invention. A good material is one which is semi-flexible yet can be squeezed or depressed to obtain the desired action of dropping the contents in measured drops.

The device may also have a nozzle that is flexible for the purpose of using the device as a spray which is tapered and points to an extremely narrow opening at the end of the same. With the nozzle portion so tapered, atomization can be effected. In Fig. 6, there

4

is shown an integral device having a narrowed or tapered nozzle portion 51 connected to the end of a flexible integral portion 52. On the lower end of the integral portion 52 is a coupling portion 53. With the small hole, as indicated at 54, an atomizing action can be effected. By squeezing the flexible portion 52 a spray will be extended from the opening 54.

It will be seen that this device is cheap and safe. The contents of the bottle can be easily kept clean and sterile.

While various changes may be made in the detail construction, it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claim.

I claim:

A device for dispensing liquid from a receptacle one drop at a time comprising a closure member adapted to be secured to the neck opening of a receptacle and having a rubber bulb adapted to be flexed or squeezed, said bulb having an end portion with a central hole therein, a discharge tube extending through the central hole in the end portion and having a retaining flange engaging with the inner face of the end portion, said discharge tube having a shank portion projecting from the end portion of the bulb with thread formations thereon and a cap having internal threads engaging with the thread formations of the shank portion of the discharge tube and a flange engageable with the outer face of the bulb end portion, which when tightened, serves to cooperate with the retaining flange of the discharge tube to seal off the end portion and the discharge tube and to prevent leakage of the liquid from the receptacle.

References Cited in the file of this patent

UNITED STATES PATENTS

446,202	Brown	Feb. 10, 1891
487,088	Cooley	Nov. 29, 1892
732,689	Liftchild	June 30, 1903
879,951	Elias	Feb. 25, 1908
2,431,192	Munson	Nov. 18, 1947
2,450,225	Bernarbo	Sept. 28, 1948

FOREIGN PATENTS

829,092	France	Mar. 7, 1938
---------	--------	--------------