Jan. 11, 1938. J. C. WINDBIEL 2,105,023

BOTTLE CLOSURE AND DISPENSING DEVICE

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FIG.1.

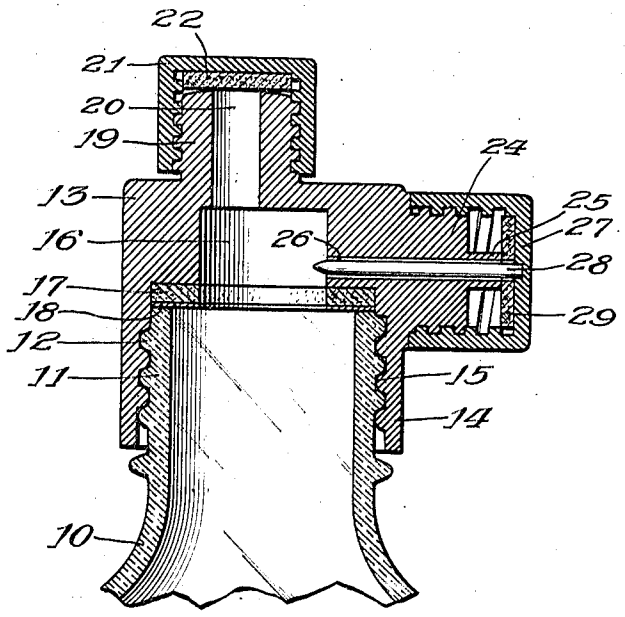
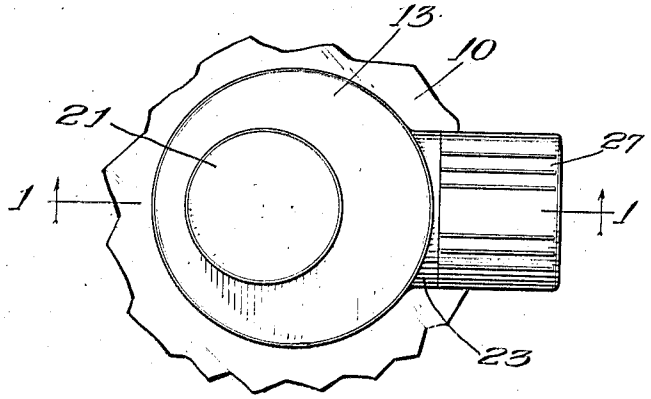


FIG.2.



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BOTTLE CLOSURE AND DISPENSING DEVICE

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3 Claims. (Cl. 221—148)

This invention relates to a bottle closure cap provided with a dispensing nozzle and manually controlled vent for regulating the speed of drop formation.

The main object of the invention is to provide a combination bottle closure cap and dropper for alternatively sealing the bottle and for dispensing the contents of the bottle without removing the closure cap, the device herein described being especially designed for dispensing oily fluids. Fluids other than oily fluids may be dispensed by the closure cap and dropper herein shown and described, by making the dropper tip and orifice of suitable sizes.

Another object is to provide means, in the combination screw cap and dropper, for forming drops of uniform and predetermined size, for controlling the speed of drop formation, and for preventing the contents from being spilled in the event the bottle is accidentally knocked over while being used.

Another object is to provide means for efficiently sealing the bottle when the contents are not being dispensed, and for dispensing the contents without the use of parts (such as rubber bulbs, etc.) which are deleteriously affected by oily preparations contained in the bottle.

The objects of the invention are attained by the combination cap and dropper herein shown and described, in which the size of the dropper tip has been carefully predetermined. The size of the tip and not the size of the orifice in the tip determines the size of the drops which will be formed by droppers adapted for the purposes herein described. To form drops of 1/40th gram, the diameter of the tip may range from .1142 to .1418 of an inch, depending on the character of the fluid being dispensed. The cap-dropper shown, designed for dispensing an oily fluid, has a dropper tip .117 inch in diameter, with an orifice measuring .067 inch in diameter. The size of the orifice controls the speed of drop formation and may vary slightly, but within certain limits, has little to do with the size of the drops, for it is on the face of the tip, defined by its periphery, that the drops are formed.

In the drawing:—

Fig. 1 is an enlarged vertical sectional view of a bottle closure cap with dispensing nozzle and manually controlled vent, embodying my invention, the same being shown in position on a bottle, partly broken away, the section being indicated by the line 1—1 of Fig. 2.

Fig. 2 is a plan view of the device shown in Fig. 1.

In that embodiment of my invention shown in the drawing, the bottle or other container 10 is provided with a neck 11 externally screw threaded at 12. The closure cap comprises a thickened top 13 and skirt portion 14, internally screw threaded at 15 for engaging the threads 12. The cap is preferably made of molded material, but may be made of metal or other suitable substance. The thick top 13 is centrally recessed to form an open bottom, cylindrical chamber 16 in the upper portion of the cap above the upper edge of the neck 11 of the bottle. The washer 17 fits within the skirt 14 of the cap and adjacent the lower surface of a shoulder formed in the top 13 outwardly of said chamber 16, A washer 18 of tinfoil preferably protects the washer 17, said washers forming a tight seal between the neck 11 of the bottle and the cap.

The top 13 of the cap is provided with an air vent, preferably in the form of a stud 19, externally screw threaded, having a vertical vent 20 communicating with the chamber 16 and with the atmosphere when the cap 21 is removed. The cap 21 is screw threaded internally for engagement with the stud 19, and a gasket 22 provides a tight seal for the vent when the cap 21 is in place.

At one side of the cap, opposite the chamber 16, is a boss 23 having a flat, vertically disposed annular face from which projects a screw threaded stud 24 terminating in a dropper tip 25 of reduced diameter. A passageway 26 extends from the chamber 16 through the thickened top 13 of the cap and through said boss 23, stud 24 and dropper tip 25. The combined length of the stud 24 and tip 25 is preferably equal to the length of the air vent stud 19, and the diameters of said screw threaded studs 19 and 24 are also preferably the same, so that identical caps may be used for closing the vent 20 and passageway 26.

The cap on the stud 24 is indicated at 27 and preferably it is provided with a pin 28 for keeping clean the passageway 26 through which the contents of the bottle are dispensed. A gasket 29 in the cap 27 makes a tight fit between the dropper tip 25 and the cap.

The diameter of the dropper tip 25, in the present embodiment, is .117 inch, and the diameter of the orifice 26 is .067 inch. The air vent 20 in the present embodiment has a diameter of .136 inch. When dispensing oily products such as fish liver oils this dropper tip will form uniform drops of 1/40th gram, and at a rate at

which they can be counted conveniently and which is not undesirably slow.

The construction described utilizes a vacuum principle to adjust the head pressure on the body of the fluid so that the pressure remains constant regardless of the size of the bottle or the amount of liquid in the bottle.

The combination cap and dropper, properly screwed to the bottle 10, is leak-proof when the caps 21 and 27 are in place and the contents will not spill when the openings 20 and 26 are uncapped. The liquid will not spill out of the vent 20 because the vacuum in the bottle is not released fast enough by the small orifice 26, and will not spill out of the dropper orifice 26 because of the resistance provided by the walls of this small passage.

Changes may be made in details of construction without departing from the scope of my invention and I do not intend to be limited to the exact form shown and described, except as set forth in the appended claims.

I claim:—

1. A dropper for a container comprising a container cap, a stud adjacent to one side of the cap extending from the upper end thereof and having a small open vent orifice therethrough which is above the liquid surface in the container and cap while in dispensing position, a stud extending laterally from the other side of the cap, a tip having a specified plane area extending from said stud so as to form drops of material in the container of a specified size when it is extended downwardly so as to be below the liquid level in a dispensing position, and said stud and tip having an orifice therethrough of a size to permit a restricted flow of fluid therethrough to control the rapidity of the drops.

2. A dropper for a container in accordance with claim 1 in which the studs on the end and side of the container cap are provided with removable closure sealing caps.

3. A dropper for a container in accordance with claim 1, wherein the tip area is .117 inch in diameter and the orifice is .067 inch in diameter so as to produce drops of 1/40th gram for an oily fluid having a certain viscosity.

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