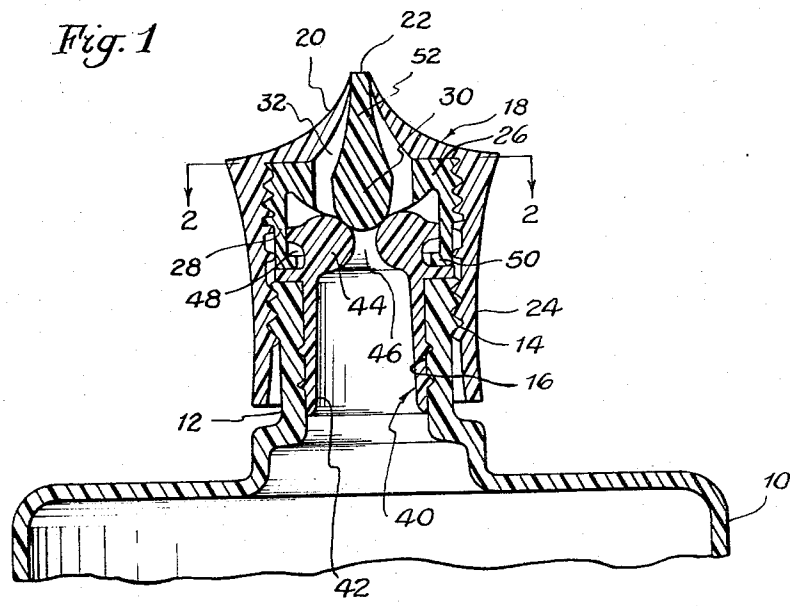
Jan. 10, 1967 N. NEUNER 3,297,212

BOTTLE CAP AND CLOSURE

Filed Jan. 21, 1965

Fig. 1



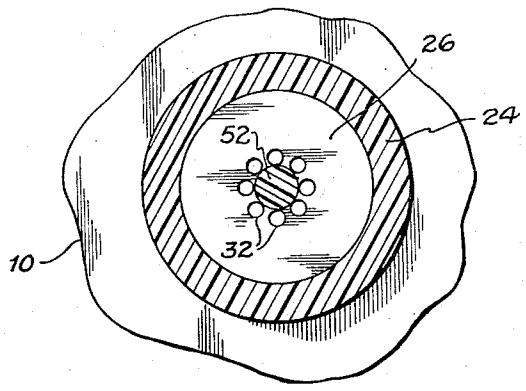


Fig. 2

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BOTTLE CAP AND CLOSURE

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This invention relates to a bottle cap and closure, and in particular to a bottle cap closure for a resilient squeeze bottle.

Conventional squeeze bottles have resilient walls and a nozzle opening in the bottle neck. The cap must be completely removed from the neck in order to expose the bottle outlet orifice. After use, the cap must be screwed on the bottle neck to prevent the accidental discharge of the bottle contents, but frequently this is not done. In smaller bottles, such as perfume bottles or flasks, there are in use caps which are only partially opened in order to discharge the bottle contents and which caps do not give a reliable closure of the bottle when they are apparently tightened.

The object of this invention is to produce a bottle cap and closure for squeeze bottles which is a completely secure and tight closure and in which the cap needs only to be slightly loosened by a turn of from about 90 to 180° in order to open the bottle neck outlet orifice enough to discharge the contents of the bottle.

The means by which the objects of the invention are obtained are described more fully with reference to the accompanying drawings in which:

FIGURE 1 is a longitudinal cross-sectional view through the bottle neck and closure; and

FIGURE 2 is a cross-sectional view taken on the line 2—2 of FIGURE 1.

All parts of the bottle and the bottle cap closure are constructed of synthetic plastics as, for example, of polyethylene and with the individual parts having sufficient pliability and/or resiliency to perform their respective functions.

The resilient wall squeeze bottle **10** has a neck **12** on which are exterior threads **14**. The interior wall of the neck also contains threads **16** for a purpose later described.

The bottle cap **18** has a cap portion **20** having a centrally positioned outlet orifice **22** and a depending skirt portion **24**. This cap contains a resilient sealing member composed of a disc portion **26** and an annular cylindrical portion **28**. This sealing member is either threaded into the cap portion or held therein by any suitable means, as by a snap ring construction. It is composed of a resilient plastic material so that the disc portion **26** is slightly flexible. A boss **30** is formed centrally of the disc portion **26** and is surrounded by holes **32**. These holes form a passageway along with the outlet orifice **22** for the discharge of the contents of the bottle. In the structure so far described, it is possible that the boss can be large enough so as to be seatable on the upper edge of the neck **16** and close the neck opening when the bottle cap is screwed tightly.

In the construction shown in the drawings, a more secure sealing construction is produced by means of a cylindrical insert **40** having a barrel or skirt **42** fastened to threads **16** in the inner wall of the neck **12** and having an enlarged ring-like portion **44** resting on the upper edge of the neck and containing an opening **46**. The boss **30** is adapted to bear upon this ring portion **44** to close the opening **46** when the cap is tightened.

In addition, the ring portion **44** has a peripherally extending groove **48** and the cylindrical portion **28** of

the sealing member has an inwardly directed annular flange **50** seated in said groove. The width of the flange is less than that of the groove so that the flange can move in the groove when the cap **18** is partially unscrewed from the neck. Due to the resilient nature of the materials used, the flange **50** can be snapped into the groove during the assembly of the elements. Mounted opposite the boss **30** on the sealing member is a conical plug **52** which is slightly smaller than the outlet orifice **22**.

In operation, when cap **18** is screwed down tightly on neck **12**, the sealing member is brought down so that the boss **30** becomes firmly seated on the ring member **44** and thus closes the opening **46**. At the same time, the flange **50** slides down in groove **48** until it rests on the lower side of the groove. Also, due to the resiliency of the disc portion **26**, the plug **52** is pushed upwardly and closes the outlet orifice **22**. This prevents the entry of dust or any other matter through the closure cap. To open the bottle, the cap needs to be turned through an angle of about 90 to 180°. This carries the resilient sealing member and the boss upwardly so as to open the opening **46**. The flange **50** travels upwardly into groove **48** until it reaches the upper side of the groove where it is stopped and this, in turn, limits the rotation of the cap **18**. The contact of the flange with the side of the groove forms a seal for preventing the bottle contents from flowing down and leaking through threads **14**. This also has the effect of exerting a downward stress on the disc portion **26** so that the disc will return to normal position and pull the plug **52** out of the outlet orifice **22**. A passageway is then formed from the interior of the bottle **10** through the opening **46**, the holes **32** and the outlet orifice **22**. The pressure on the resilient walls of the bottle **12** will cause the contents of the bottle to be ejected through outlet orifice **22**.

Having now described the means by which the objects of the invention are obtained, I claim:

1. A bottle closure comprising an exteriorly threaded bottle neck, a bottle cap having a threaded skirt portion screwed to said neck and a cap portion having a centrally positioned outlet orifice, a resilient sealing member secured within said cap and composed of a disc portion and an annular cylindrical portion, boss means on said disc portion for bearing on said neck to close the neck outlet opening, and a plurality of holes through said disc portion and surrounding said boss means for forming a passageway from said neck through said outlet orifice when said cap is partially unscrewed from said neck, a resilient insert secured to said neck and having an insert opening closable by said boss means, an annular groove in the periphery of said insert, and an inwardly turned annular flange on said cylindrical portion engaged in said groove, said flange having a thickness less than the width of said groove for being movable therein to contact a side of said groove to form a seal when said cap is partially unscrewed from said neck.

2. A closure as in claim **1**, further comprising a conical plug on said disc portion and aligned with said outlet orifice for closing said orifice when said cap is screwed tight.

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