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BOTTLE CAPPING MEANS

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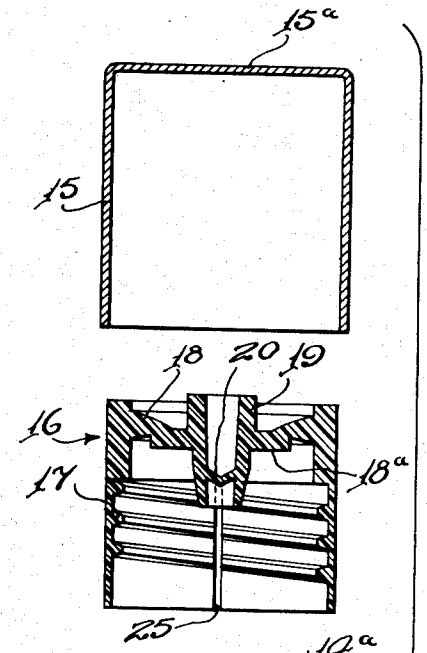


Fig. 1.

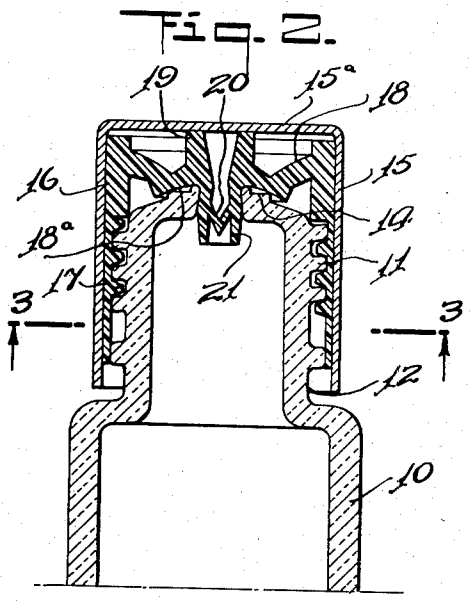


Fig. 2.

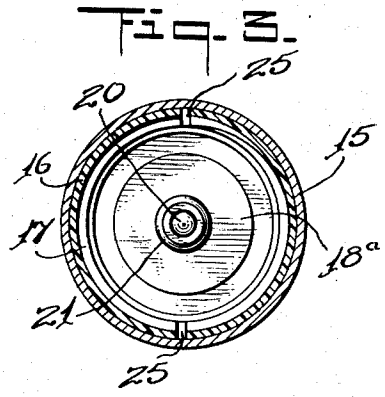


Fig. 3.

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BOTTLE CAPPING MEANS

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6 Claims. (Cl. 215—43)

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This invention relates to bottle caps and more particularly to bottle caps for perfume bottles and incorporating a plug therein so that the opening of the perfume bottle may be plugged or sealed at the same time that the cap is applied. The application is a continuation in part of my prior application Serial No. 137,721, filed January 10, 1950, now Patent No. 2,670,869.

The bottle cap of the instant application has particular advantages when applied to small perfume bottles such as are carried about in a lady's purse so that the perfume therefrom may be applied at any time convenient to the user. It is evident that in such an environment the perfume must be protected against spillage or leaking, notwithstanding any of a variety of positions into which the bottle may be thrown or agitated when it is carried about in a purse. The bottle cap must fit tightly, must provide a reliable seal and must not present undue difficulties in application to or removal from the bottle neck. The art has determined that a metallic cap most nearly meets these requirements while lending itself to decorative finishes or polishes, a characteristic which is important in this field.

A metal cap is sturdy enough to permit tight application without risking cracking whereas plastic types of caps, for example, must be unusually and undesirably thick or heavy to offer the same degree of protection.

An important element in the production of the above described bottle cap is the cost thereof. For example, the cap requires threads for screwing the cap to the bottle neck. It has been found desirable to avoid such threads in the cap material itself so as not to detract from its external appearance or add to the cost of its manufacture. It is further desirable to incorporate a seal or the like in the cap as above mentioned. The cost of assembling these elements in a composite cap is considerable, relative to the total cost of production.

With the foregoing in mind, I have devised a flexible liner which is used in combination with a thin-walled, decorative metal cap and which is not only extremely inexpensive to manufacture and assemble with the cap but further provides threads which engage with the bottle neck threads in effecting a firm closure and seal for the bottle neck opening. The plug per se takes

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the form of a hollow tube having an integral, expanding conical member therein which urges the walls of the tube against the defining walls of the bottle neck opening through lateral forces.

The plug tube is substantially concentric and integral with an outer, enlarged tube, the inner annular wall of which is formed with threads for engaging the threads of the bottle neck. As will be hereinafter described, the formation of the liner is such that the plug tube is automatically inserted and forced into the bottle opening as the cap is applied thereto. The liner further provides an integral, efficient seat for the bottle neck opening so as to eliminate the expense of inserting and retaining a separate seat. The liner also provides considerable areas of frictional contact with the inner walls of the thimblelike metallic cap so as to require no inward swaging of the lip of the cap in effecting retention of the liner therein.

The invention will be further understood from the following description and drawings in which:

Fig. 1 is an exploded view, partly in cross-section, illustrating the bottle cap parts and the bottle neck to which the cap is applied.

Fig. 2 is a cross-sectional view of the applied bottle cap and bottle neck.

Fig. 3 is a cross-sectional view as taken along the lines 3—3 of Fig. 2.

The body 10 of the bottle may be either of glass or any other type of bottle or container material which may be used for liquid perfumes. It is provided with the usual external threads 11 on the bottle neck 12. Central opening 13 serves as the dispensing outlet for the perfume and it is conventionally formed on a small plateau 14 or the like, such formation being customary in order to increase the accurate disposition of the bottle opening and the surface regularity surrounding it. An annular lip 14a immediately surrounds the bottle opening 13 to better control the flow of the perfume.

A thimblelike metallic cap 15 is employed for capping the bottle 10. Cap 15 is thin-walled and is not itself provided with threads. In order to render the cap adaptable for its intended use, I provide a liner 16 which is of resilient, plastic material. For example, it has been determined that polyethylene is a satisfactory material for this purpose. It can be fabricated so as to be

resilient and is largely inert and non-absorbent so as not to be effected by the liquid in the bottle.

Liner 16 is in the general shape of a hollow tube and is formed with internal threads 17 on its inner annular wall. Threads 17 are adapted to engage bottle threads 11. Adjacent the top of liner 16 is a substantially concavo-convex transverse bridge or wall 18. The underside of wall 18 is formed with an annular boss 18*a* which is adapted to rest upon the lip 14*a* and conform to the shape of the areas surrounding the bottle neck opening when the cap is applied thereto.

Formed centrally of the liner 16 and depending downwardly so as to be concentric with the annular wall thereof is an integral hollow tube or plug 19. Plug 19 extends above and below wall 18, and since the material of the liner is resilient, the plug 19 is capable of tilting or other slight displacement relative to transverse wall 18. In this way, bottle openings which are irregular with respect to the bottle necks may nevertheless be provided with an effective seal through the action of plug 19.

Disposed approximately two-thirds down the length of plug 19 is a cone-shaped spring member 20 integrally formed with the plug and liner. The cone-shaped spring member 20 exerts an outward thrust on the adjacent inner walls of plug 19 and enhances the sealing function thereof. When the plug 19 is inserted in opening 13, the walls of opening 13 compress the barrel of the plug inwardly and, the spring member tending to resist such compression, provides a firm seal of the plug within the bottle neck opening. The leading end 21 of the plug is beveled inwardly so as to facilitate insertion thereof in the bottle opening. As illustrated, the bottom edge of plug 19 terminates approximately half way down the length of the liner 16 from the top thereof.

The outer annular wall of liner 16 is smooth. The material of which it is fabricated, however, is not slippery but has a rather soft feel, as will be known to those skilled in the art. According to the instant invention, the outer diameter of liner 16 is arranged to be substantially the same as the inner diameter of cap 15. As a result, when the liner is pushed into or otherwise assembled with the cap 15, it remains therein and exhibits a marked frictional fit rendering the liner ordinarily incapable of removal. A suggested method of assembly is to first screw the liner 16 over the threads 11 of bottle neck 12 so that the plug 19 enters into the opening 13. The cap 15 is then manually pushed over the liner 16 with as much force as is required, generally quite moderate, and it will thereafter be found that when the cap 15 is rotated in the proper direction, it will unscrew the liner from the bottle neck. In fact, at this time it is found that the cap and liner become a unit insofar as removal or application thereof is concerned. The consumer would find it quite difficult to separate the liner from the cap. It can be effected by an abnormally and strong upward pull on the cap while it is assembled with the bottle neck and without rotating the cap. Of course, this action will not be employed by a user of the perfume unless such disassociation of the cap elements was intended.

It has further been found that if the outer annular wall of liner 16 is provided with longitudinal slits 25, its adherence to the cap 15 is improved. This is probably because any discrepancy between the outer diameter of the liner 16 and the inner diameter of the cap 15 may be compensated for by the action of such slits. No claim to these slits is made in the instant application.

It will be observed from Fig. 1 that the top edge of the plug 19 is slightly higher than the corresponding edge of the outer tube. As a consequence, when the composite cap is tightened on the bottle neck, the planar ceiling 15*a* of the cap presses downwardly on the tube or plug 19 so as to urge it downwardly into the bottle opening as illustrated in Fig. 2. The concavo-convex nature of wall 18 cooperates in this action by similarly urging the plug or tube downwardly or at any rate maintains its downward disposition as the liner is screwed forcefully down on the bottle neck. It will be noted in Fig. 2 that the walls of the tube or plug 19 adjacent the rim of the conical member 20 are urged inwardly so that the angle of the cone is rendered more acute relative to its normal angle illustrated in Fig. 1. This indicates the sealing effect of the conical member 20.

It will be evident from the above that I have devised a combination bottle seal and thread providing liner which may be used together with a decorative metallic cap and which provides a highly effective seal even during transport of the bottle. Assembly of the cap and liner may be effected manually at the same time that the bottle is finally capped as will be evident. Each time that the user removes and then re-applies the cap, the plug will restore the sealing function of the composite bottle cap. It will be further understood that whereas I have described my invention as being directed to perfume bottle caps, it may serve similar objectives with various other types of bottles.

What is claimed is:

1. A bottle sealing device comprising a thin-walled, metallic, hollow cap having a ceiling and an annular depending wall, said cap ceiling being planar, a liner of resilient plastic material secured within said cap, said liner being tubular and having internal threads formed on the inner wall thereof, a transverse wall across said liner and internally thereof and adjacent the top of the liner, an elongated plug formed centrally of said transverse wall and extending longitudinally so that it is concentric with said liner, said plug extending above and below said transverse wall, and contacting said planar cap ceiling, said plug being substantially hollow, and a conical, resilient member disposed within said hollow plug and having its rim integral with the inner wall of said plug so as to exert an outward thrust upon said plug inner wall in response to a compressive force thereon.

2. A bottle sealing device according to claim 1 and wherein said cap, liner and plug are all circular and substantially concentric when assembled, the outer diameter of said liner being equal to the inner diameter of said cap and having a frictional engagement therewith when the liner and cap are assembled.

3. A bottle sealing device according to claim 2 and wherein said transverse wall is substantially concavo-convex with the concavity on its upper face.

4. A bottle sealing device according to claim 2 and wherein the top edge of said plug is higher than the top edge of said liner and the bottom edge of said plug extends approximately half way down the length of the liner from the top thereof.

5. A liner for use with a bottle cap, said liner

being of resilient plastic material and being substantially tubular and hollow, and having internal threads formed on the inner annular wall thereof, a transverse wall across said liner and adjacent the top thereof, a central, hollow plug formed centrally of said transverse wall and extending longitudinally so that it is concentric with the annular wall of said liner, and a conical, resilient member disposed within said hollow plug and having its rim integral with the inner wall of said plug so as to exert an outward thrust upon said plug inner wall in response to a compressive force thereon, said transverse wall being formed internally of said liner, said plug extending above said transverse wall and above the top edge of the liner and depending downwardly approximately half way down the length of the liner from the top thereof.

6. A liner according to claim 5 and wherein said transverse wall is concavo-convex with the concavity thereof on its upper face.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
55,438	Fox	June 5, 1866
1,413,703	Biehn	Apr. 25, 1922
1,702,182	Van Vlijman	Feb. 12, 1929
1,724,346	Ford	Aug. 13, 1929
2,262,021	Lockwood	Nov. 11, 1941
2,266,270	Roth	Dec. 16, 1941
2,325,309	De Swart	July 27, 1943
2,416,069	Scott	Feb. 18, 1947
2,526,622	Martin	Oct. 24, 1950

FOREIGN PATENTS

Number	Country	Date
492,200	Great Britain	Sept. 16, 1938
558,998	Great Britain	Jan. 31, 1944