

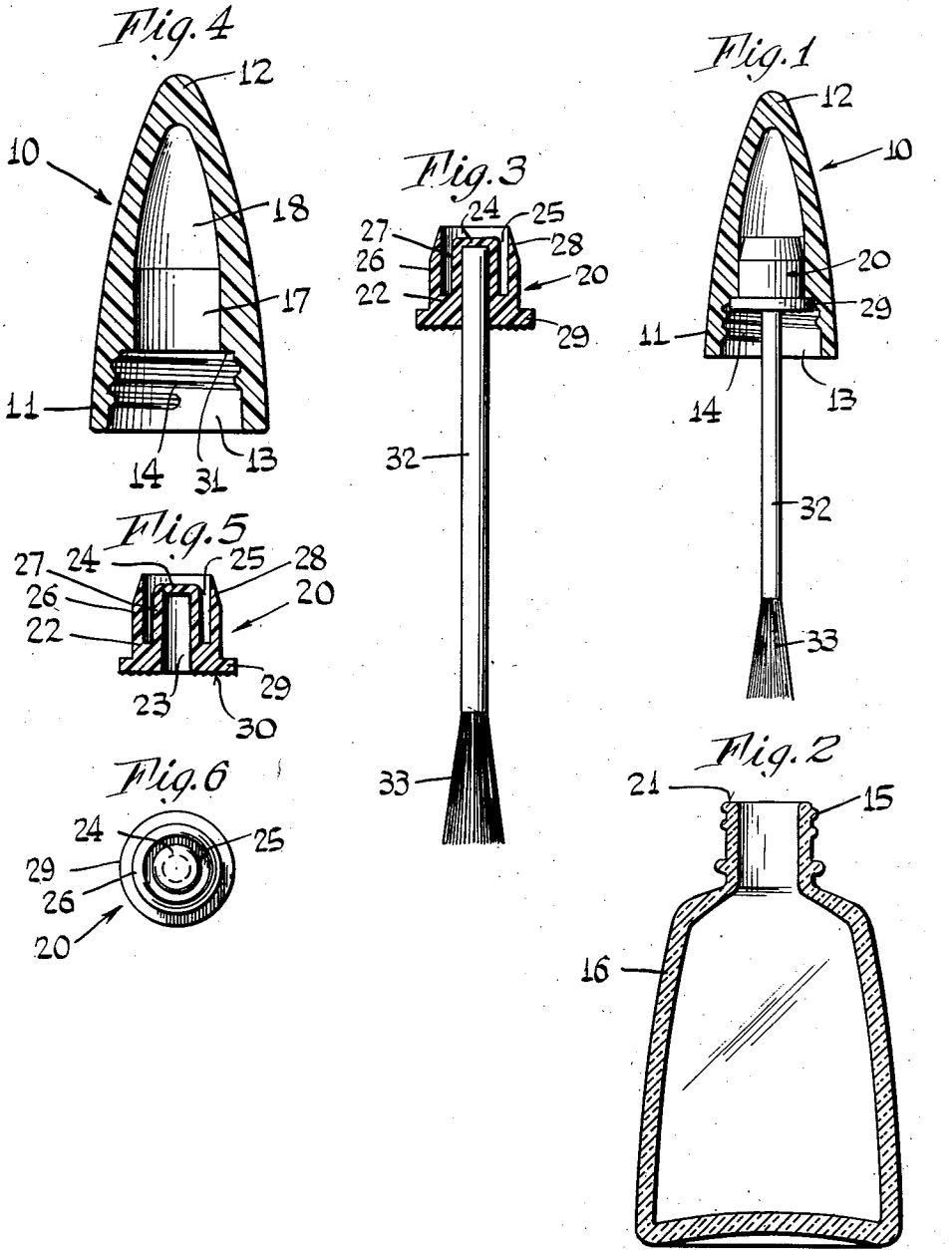
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APPLICATOR-TYPE BOTTLE CAP

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**APPLICATOR-TYPE BOTTLE CAP**

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5 Claims. (Cl. 15-140.4)

This invention relates to molded, applicator-type bottle caps, as for example those used in connection with bottles of nail polish, adhesives, medicines and the like.

Heretofore it has been the practice, in the producing of molded applicator-type caps, to make the cap and the support means for the applicator support all of one piece, the support means comprising essentially a thick body section of the cap, which has a central recess or bore in which the shank of the applicator is inserted and supported. To seal the contents of the bottle, in these prior caps, a liner was provided in the form of an annulus which was disposed within the cap against the recessed thick body section thereof and adapted to sealingly engage the lip of the bottle. For the sake of appearance and ornamentation, these applicator caps were of elongated shape, in the form of a bulbous cone with an ogival outline. This cap shape enhanced the appearance of the product and gave it a modern styling.

The prior molded cap construction as set forth above has a number of drawbacks and disadvantages. The cap body is characterized by wall sections of nonuniform thickness, some of the sections at and adjacent the apex of the cap being of very appreciable mass. This is wasteful of molding material, and also entails an appreciably longer curing time, greatly slowing up the molding cycle. Moreover, the thick wall sections result in gases being trapped, causing a defective molded piece and a high percentage of rejects. The above factors all have the effect of undesirably increasing the cost of producing the cap.

Moreover, with the prior applicator caps it was often found that the sealing liners would become dislodged from the cap body either during shipping of the caps or removal of the cap from the bottle, and that the applicators would also become loose and dislodged, particularly during use. In addition, the ogival or tapered shape of the cap body was such as to make it extremely difficult if not impossible to automatically hopper the bodies and insert the applicators therein by machinery.

The present invention obviates the above disadvantages and drawbacks of this prior applicator cap construction, and one object of the invention is to provide a novel and improved molded applicator cap, wherein the wall sections of the molded pieces are generally uniform in thickness and are relatively thin, thereby reducing the amount of molding material and the curing time which is required, and eliminating the likelihood of trapped gases which cause imperfections in the molded pieces and consequent rejects.

Another object of the invention is to provide an improved applicator cap in accordance with the above, wherein the sealing liner is securely retained in the cap body and prevented from inadvertently dropping or falling out.

Still another object of the invention is to provide an improved applicator cap as above set forth, wherein the applicator is at all times securely retained in the cap against inadvertent dislodgment.

A still further object of the invention is to provide an improved, combined sealing means and applicator support which is so constructed and arranged that it may be automatically hopped and automatically assembled to the applicator, by machinery.

A feature of the invention resides in the provision of a novel and improved sealing and applicator support

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member and applicator, together with a screw cap, which are so arranged that the assembled applicator and sealing and support member may be first applied to the bottle, and thereafter the cap screwed on the bottle to cause final assembly of all of said parts.

Other features and advantages will hereinafter appear. In the accompanying drawings:

Figure 1 is an axial sectional view of the improved, assembled applicator cap of the invention.

Figure 2 is an axial sectional view of a bottle with which the cap of Fig. 1 may be used.

Figure 3 is an axial sectional view of a subassembly of applicator, cap sealing liner and applicator support.

Figure 4 is an axial sectional view, enlarged, of the cap body.

Figure 5 is an axial sectional view, enlarged, of the sealing and applicator support member.

Figure 6 is an end or top view of the member of Fig. 5.

Referring first to Figs. 1 and 4, the improved applicator-type cap of the present invention comprises a one-piece molded cap body 10 of elongate configuration, with a large end 11 and a small or pointed end 12. The cap body 10 may have an ogival outline, so as to be substantially of bulbous, conical shape, as shown. At the large diameter end 11 the cap body 10 has a mouth 13 provided with internal screw threads 14 by which it may be screwed onto the threaded neck 15 of a container or bottle 16.

Disposed inwardly of the mouth portion 13 of the body 10 is a straight bore 17 of appreciable length, and disposed inwardly of the bore 17 is a conical bore 18, also of appreciable length and extending to an interior point closely adjacent the upper extremity or tip 12 of the body.

In accordance with the present invention, the cap body 10 as above set forth is so constituted and proportioned that its walls are of substantially uniform thickness and are devoid of any relatively thick portions which might be wasteful of material, or require a lengthy curing time, or tend to trap gas which would cause an imperfect molded piece and a high percentage of rejects. From a consideration of Fig. 4 it will be readily appreciated that all of the wall sections of the cap body 10 are relatively thin and so arranged that the body may be readily, economically molded. The amount of raw material which is required is a minimum, considering the desired ogival shape or configuration; also, the molding cycle is relatively fast, and the quality of the molded article is desirably high, with few if any rejects. The body 10 may be molded of various rigid thermosetting plastic or thermoplastic substances, as for example urea formaldehyde, phenol, polystyrene, etc.

Further, according to the invention, a novel sealing and applicator support member 20 is provided, adapted to be press fitted in the straight bore 17 of the body 10 and to support an applicator, and also adapted to engage the lip 21 of the bottle 16 to effectively seal the latter. Referring to Figs. 3 and 5, the member 20 comprises a plug-like body 22 having in one end a deep central recess 23 extending almost to the other end of the body and terminating at a transverse wall 24. The said other end of the body 22 has a deep annular recess 25 forming outer peripheral walls 26 and inner walls 27 which are spaced from each other by the recess 25. The peripheral walls 26 terminate, at the other end of the body 22, in a taper 28. The body 22 also has an external annular flange 29 providing an enlarged-diameter sealing face 30 surrounding the central recess 23. The body 22 is of flexible plastic material such as polyethylene or the like, by which it is readily deformable, and the outside diameter of the body measured across the outer walls 26 is slightly larger than the internal diameter of the bore 17 of the cap body 10.

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As seen in Figs. 1 and 4, the cap 10 has an internal annular shoulder 31 disposed at the junction of the bore 17 and the mouth 13, and the bodies 10 and 22 are so arranged that the latter may be press fitted into the bore 17 of the body 10 to bring the flange 29 in engagement with the shoulder 31. In Figs. 1 and 3 an applicator in the form of a brush is shown, comprising a shank 32 having at one end bristles 33. The shank 32 is slightly larger in diameter than the bore 23 of the body 22 and is adapted to be press fitted into said bore whereby it will be supported on the cap 10 in operative position when the member 20 is assembled to the cap.

By the use of polyethylene or like plastic to form the member 20 it may be readily press fitted to both the shank 32 of the applicator and the rigid cap body 10, and will securely retain the applicator on the cap and prevent inadvertent dislodgment therefrom, since both of the press fits are extremely effective during use and do not depend on rigid adherence to strict tolerances in the dimensions of the parts. Also, due to the yieldable and deformable nature of the polyethylene, the external flange 29 of the member 20 will provide an effective seal by its engagement with the lip 21 of the bottle 16 when the applicator cap is screwed on tightly. The sealing face 30 of the member 20 may further have concentric annular ribs, thereby to provide a still more effective seal.

A preferred way of assembling the applicator cap and bottle is as follows. The shank 32 of the applicator brush is first press fitted into the sealing member 20, and then the brush with the attached member is inserted in the bottle 16. The cap 10 is then applied to the bottle, pressing it over and around the member 20 and turning it to engage the mating screw threads and to tighten the cap securely on the bottle. Such assembly procedure has been found to be extremely quick and effective, and upon subsequent removal of the applicator cap, the cap body 10, sealing body 20 and applicator 32, 33 will always remain in assembled relation.

The above preferred mode of assembly may in part be carried out by machines, with the cap of this invention, since the brush 32, 33 and the member 20 may be readily hopped and assembled to each other automatically.

In the prior construction of applicator cap, the applicator was press fitted directly to the cap body which had the same configuration as the body 10, and it was not possible to readily hopper such a body and automatically assemble the applicator to it by machinery.

With the present improved applicator cap there is no likelihood of the sealing liner comprising the member 20 being inadvertently dislodged from the cap body 10 during use of the applicator because of the effective press fit and the nature of the polyethylene plastic. Also, if the cap body 10 and member 20 are to be supplied to a customer as an assembled unit, there would be no likelihood of inadvertent dislodgment of the member from the cap body during shipment or other use, as has been experienced with prior applicator cap assemblies.

It will be appreciated that the cap body 10 is economical in the use of raw materials, may be economically molded with a relatively short curing time, and will have a desirable uniformity of quality with a minimum of rejects, since there is little likelihood of gas being trapped to cause a faulty molded piece. The structure as provided by this invention does not involve additional parts, since in the prior applicator cap three parts were involved, namely the cap body, the sealing insert, and the applicator. The structure of this invention involves the same number of parts but they may be more economically produced and assembled, and are more reliable and effective in their operation.

Variations and modifications may be made within the scope of the claims and portions of the improvements may be used without others.

I claim:

1. A combined bottle cap, sealing liner and applicator

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support comprising a rigid cup-shaped cap body of molded plastic all the walls of which are of relatively thin section to provide for quick curing, said body having a mouth portion adapted to be applied around and removably attached to the neck of a bottle, and having a bore of appreciable length, disposed inwardly of said mouth portion; and a molded elongate sealing plug of readily deformable plastic fitted to and held in the said bore of the body, said plug having at one end an annular portion adapted to abut and seal against the lip of the bottle and a centrally disposed closed bottom recess for receiving and holding the shank of an applicator which is to be carried in the bottle, the other end of the plug having an annular cavity surrounding said centrally disposed recess to provide added resilience to the plug.

2. The invention as defined in claim 1 in which the cap body has an internal annular shoulder portion disposed between the mouth portion and bore, in which the plug has an external annular flange which engages and is backed up by said shoulder portion, and in which the said cavity is disposed at least in part, radially inward of said shoulder portion.

3. A combined bottle-sealing cap and applicator comprising a rigid cup-shaped cap body of molded plastic all the walls of which are of relatively thin section to provide for quick curing, said body having a mouth portion adapted to be applied around and removably attached to the neck of a bottle, and having a bore of appreciable length, disposed inwardly of said mouth portion; a molded elongate plug of readily deformable plastic having an exterior wall portion fitted to and held in the said bore of the body, said plug having an annular portion adapted to abut and seal against the lip of the bottle, and a centrally disposed closed bottom recess; and an applicator having a shank extending into said recess, said shank being thereby supported by the plug for storage of the applicator in the bottle or for use with the cap body serving as a handle, said plug having a deep annular cavity concentric with said recess and opening at the inner end of the plug, and the bottom wall of the cavity constituting a continuation of said annular portion and joining said mounting portion and exterior wall portions.

4. The invention as defined in claim 3 in which the plug is molded of polyethylene, and is press fitted in the cap body, and in which the applicator shank is press fitted in the plug.

5. A combined bottle-sealing cap and applicator comprising a rigid, cup-shaped cap body of molded plastic all the walls of which are of relatively thin section to provide for quick curing, said body having a mouth portion adapted to be applied around and removably attached to the neck of a bottle, and having a bore of appreciable length, disposed inwardly of said mouth portion; a molded elongate plug of readily-deformable plastic having an outwardly-exposed, circumferentially-extending, relatively-thin, deformable and yieldable wall portion fitted to and held in the said bore of the body, said plug having at one end an annular portion adapted to abut and seal against the lip of the bottle and an applicator, including a shank, attached to said annular portion, said applicator being supported thereby for storage in the bottle or for use with the cap body serving as a handle, said plug having a deep cavity at its other end, defined by the said circumferentially-extending wall portion, the bottom wall of said cavity constituting a continuation of said annular portion and joining said shank to said circumferentially-extending wall portion.

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