April 28, 1959 E. ZIMMERMANN ET AL 2,884,149

CLOSURES FOR BOTTLES AND LIKE CONTAINERS

Filed Feb. 15, 1957

FIG. 1.

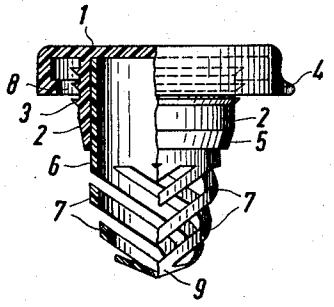


FIG. 2.

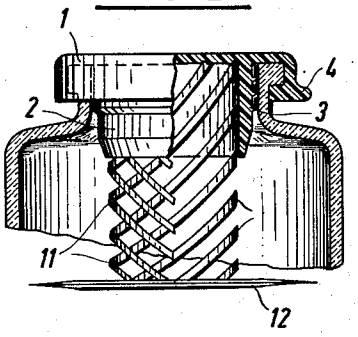


FIG. 4.

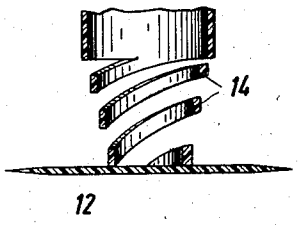


FIG. 3.

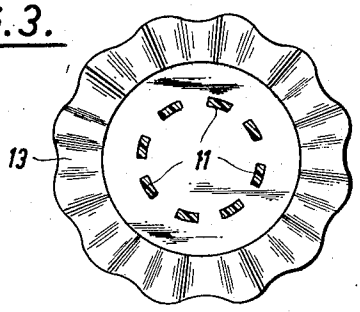
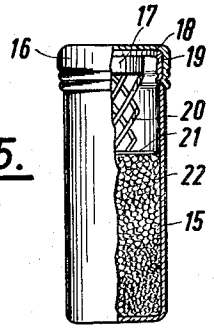


FIG. 5.



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United States Patent Office 2,884,149
Patented Apr. 28, 1959

2,884,149

CLOSURES FOR BOTTLES AND LIKE CONTAINERS

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Application February 15, 1957, Serial No. 640,537

Claims priority, application Germany February 18, 1956

3 Claims. (Cl. 215—37)

As is known, tablets, dragees etc. have the disadvantage that when they are carried in the pocket or during transport in the usual cardboard or tin boxes, glass containers etc., they rattle about and in so doing make a lot of noise and become worn. In order to prevent this or to make movement more difficult, it has hitherto been customary to hold the contents of a container by means of a cotton-wool plug, paper insert or the like. This has a disadvantage that it became difficult to remove the plug and in some cases it could only be removed with the help of a hook or the like. The plugs also were easily lost.

Closures more particularly closures made of plastic material, have recently been developed wherein means for the elastic support of the contents of the vessel, e.g. tablets, dragees, etc., are formed directly onto a stopper. The supporting means are sometimes in the form of vertical bars or feet. It has also already been proposed to form onto a hollow stopper helical extension pieces the ends of which bear against the contents of the container. The present invention is concerned with the further development of such helical supporting means. Hitherto known constructional forms of this kind have the disadvantage that the diameter of the helical portion corresponded substantially to the diameter of the stopper. As a result insertion was not possible if the bottle neck was even slightly too narrow. Furthermore the cylindrical helical portions, with small intervals between the turns, had the drawback that the individual turns bore against one another and as a result of the elastic effect was greatly limited. If the distance between turns is increased, and a short bottle neck employed, some of the contents of the bottle particularly in the case of dragees were able to penetrate into the helix and thus make the elastic effect quite impossible.

According to the present invention, a closure is so constructed, using a hollow stopper formed of elastic bars, e.g. by arranging a plate which projects laterally beyond the supporting stopper or by arranging the supporting bars of the stopper, appropriately near one another, that the contents of the container, e.g. dragees, are held back and cannot pass into the inside of the hollow stopper formed of the bars.

With bottles having a wide body and a narrow neck, the supporting plate is expediently so constructed that its diameter is larger than that of the neck and contracts in the manner of a fan as it passes through the narrow neck, but when inside the bottle unfolds so that the whole cross-section or approximately the whole cross-section of the inner space is filled out and none of the contents can pass the plate. In the case of tablets, the plate bears flat against the top-most tablet and thereby prevents it from tilting. It is also advantageous to make the edge of the plate slightly corrugated, thus preparing for and assisting in the fanwise folding process. The cross-section of the plate can also narrow towards the rim in order to assist passage of the plate through the narrow neck.

Another solution consists in arranging, on a per se known annular closed hollow stopper in the form of a

closed ring, spiral projections arranged in a tapering formation and of such a shape and in such numbers as to form a beehive-shaped or paraboloid structure, wherein the turns of the spiral are so narrow that the contents of the container, e.g. dragees, cannot enter the inside of the stopper, and wherein the turns are so offset relatively to one another that they can move past one another if the stopper is subjected to axial pressure.

With such a construction, the stopper can, within wide limits, be introduced into any desired bottle opening and adapt itself to the actual diameter of the opening owing to its elastic nature. More particularly, it is suitable not only for glass tubes for tablets, but also for bottles where the neck opening is narrower than the inner diameter of the main part of the bottle. Axial resilience is so great that the stopper always bears well against the contents of the bottle within wide tolerances. In order to enable such a member to be manufactured economically, it is advantageous to manufacture the cap and the supporting means separately and to construct the latter as a trough-shaped or beehive-shaped insert member which can be fitted in self-adhering manner into the inside of a hollow stopper.

The hollow stopper is expediently formed externally with sealing ribs and comprises a cap which has a projecting rim for engaging over an outer rim of the bottle neck. The cap can be provided with a nose piece so that it can be removed relatively easily. In a modified constructional form, helical resilient supporting means are not only provided at the bottom with a projecting elastic plate which bears against the contents of the container, but at the other end the supporting means have formed thereon or glued thereon a collar-like skirt portion whose plane ring portion bears on the rim of the associated container and is pressed with a sealing action against the rim of the container when a closure cap is screwed on. The turns of the helical supporting means expediently narrow so that the projecting plate can be pressed without relatively great resistance until it bears against the collar-like skirt portion, the helical turns being accommodated within the collar. This provides a very large tolerance range for the contents of the container. The collar-like skirt portion is also so dimensioned it is held in a self-adhering manner in the associated screw cap.

In order that the invention may be readily carried into effect, a number of embodiments will now be described in detail, by way of example, with reference to the accompanying drawings, of which:

Figure 1 shows a hollow stopper with a paraboloid cage portion;

Figure 2 shows a hollow stopper formed of helically curved bars, with a laterally projecting plate;

Figure 3 is a horizontal sectional view of the stopper according to Figure 2;

Figure 4 shows a modified form of the stopper according to Figure 2, with helical turns which are slidable into one another, and

Figure 5 shows further modifications of the stopper according to Figure 2.

In the example shown in Figure 1, **1** is a cap consisting of synthetic material or the like, e.g. polyethylene, on which is formed-on the hollow stopper **2** whose outer side comprises sealing ribs **3**. The cap **2** is formed with a nose piece **4** in order that the said cap can be removed easily. The hollow stopper comprises in the downward direction a tapering rim **5**. Inserted in the interior of the hollow stopper **2** is the insert element **6** which is in the form of a trough or bag whose lower portion is formed by helical bars **7** of which a relatively large number, e.g. **6**, are provided, extending parallel to one another and being connected together at their ends by a plate-like broadened portion **9** formed at the same time as the bars are formed. The turns **7** come together conically in the

downward direction, the taper being so chosen that easy insertion is possible within the actual bottle diameter tolerances encountered, and also the turns are capable of yielding elastically sufficiently far in the axial direction. The ribs 3 of the hollow stopper, which is made of yieldable material, also ensure that the stopper has sufficient sealing action with different bottle neck internal diameters. The cap 1 also comprises a thickened rim 8 which, when the cap is mounted on the bottle neck, engages behind a corresponding rim on the bottle neck and thus makes it difficult for the cap to be removed accidentally.

The closure is quite simple to use, the stopper is merely inserted in the bottle neck and the rim 8 is locked in position by pressing on the cap 1. Opening is effected by acting upon the nose piece 4. By such a closure, which combines the advantages of the helical supporting means with those of the beehive-shaped form, it is possible both to support satisfactorily any desired contents in the form of tablets, dragees, etc., and also to substantially cover tolerances in the internal diameter of the bottle neck, whilst at the same time a maximum length of resilient movement in the axial sense is made possible.

In the example shown in Figure 2, a bottle 10 with a wide body and narrow neck is used. The resilient part of the stopper consists of helically wound bars 11 which are formed-on or glued-on to the roof of the hollow stopper, leaving a certain clearance from the wall of the said stopper, and in this case the bars extend cylindrically and at wide intervals from one another. Axial resilience is comparatively high with such a stopper which has wide intervals between turns, but at the same time there is an increased danger that some of the contents of the container will penetrate from the side into the inside of the stopper and thus prevent it from yielding elastically. In order to prevent this, there is arranged at the lower end of the helical stopper a plate 12 which projects laterally beyond the stopper and which is so constructed that it can be inserted through the narrow neck, and opened out inside the bottle to fill out the whole of or nearly the whole of the cross-section of the inside of the bottle. Therefore such a stopper is very elastic and also does not allow the stopper and the contents of the bottle to be caught on one another. As will be seen from Figure 3, the outer rim 13 of the plate can be slightly corrugated, in order to facilitate the collapse of the plate in a manner of a fan when the said plate is passed through the bottle neck. As Figure 2 indicates, the cross-section of the plate tapers towards the edge for the same reason.

Figure 4 shows another modification of the stopper, which represents a combination of the construction according to Figure 1 and Figure 2, since in this modification the helical bars 14 narrow in diameter towards the end in such a way that the turns fit into one another

when they are moved axially, and a plate 12 is also provided which projects laterally beyond the stopper and fills the cross-section of the inside of the bottle or the like. With this construction, a particularly great tolerance coverage is provided in the axial direction, whilst at the same time the contents of the bottle can be supported when they are at their fullest extent.

Figure 5 illustrates a further modified constructional form. In this example a dragee tube 15, e.g. of aluminum or glass, is provided, which is closed at the top by a threaded cap 16. Held in the cap 16 in self-adhering manner is a collar 17 or the like which is made of synthetic material (polyethylene or the like) and the plate rim 18 of the said collar is held fast in the cap and is pressed on to the sharp rim 19 of the tube 15 when the cap 16 is screwed on. In this way an air-tight closure is achieved. Formed-on or glued onto the collar 7 are helical bars 20 which at the lower ends of the narrowing turns are connected to a likewise formed-on or glued-on supporting plate 21. Since the portion formed by the turns narrows in diameter, the plate 21 can be displaced unhindered in resilient fashion over a large range, until it finally bears against the collar 17. The helical bars 20 are allowed sufficient room within the collar 17. Owing to the great distance over which the plate 21 can travel elastically, this supporting closure is particularly suitable for holding a large range of contents of the container 22.

What we claim is:

1. A closure for a dragee bottle or like container for rigid contents, said closure comprising a hollow elastic stopper having helically extending supporting bars spaced apart from each other sufficiently to prevent the entry of dragees therebetween, and a supporting plate at one end of said helical bars extending laterally beyond the latter and having its laterally extending portion resiliently collapsible for entry through the narrow neck of a bottle and automatic opening inside the bottle to cover substantially the entire cross section of the inside of the bottle.

2. A closure according to claim 1, said supporting plate having a cross-sectional thickness tapering toward its peripheral edge to define the resilient collapsibility thereof.

3. A closure according to claim 1, in combination with a collarlike skirt portion on the upper part of said stopper, said collarlike skirt portion being adapted for bearing engagement with the rim of a container and adapted to be sealed thereagainst by a screw cap.

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