

Feb. 3, 1959

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2,872,060
HOLLOW STOPPER FOR BOTTLES TUBES OR THE LIKE OR ARTIFICIAL
MATERIAL, PREFERABLY POLYETHYLENE

Filed Nov. 8, 1955

2 Sheets-Sheet 1

FIG. 1.

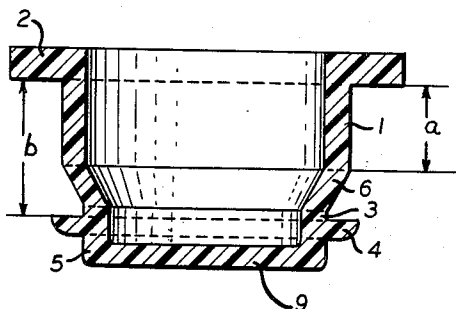


FIG. 2.

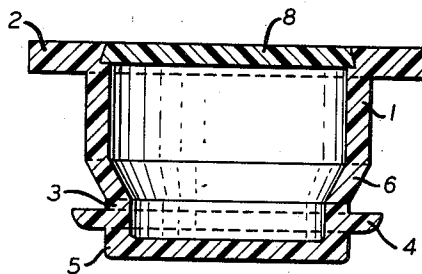


FIG. 3.

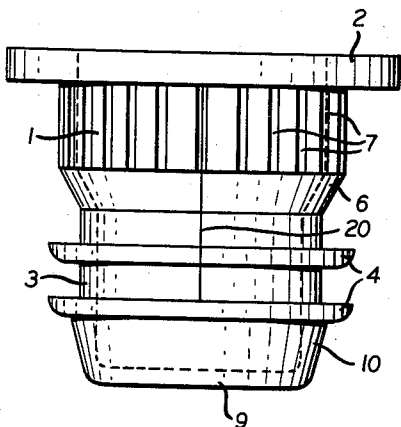
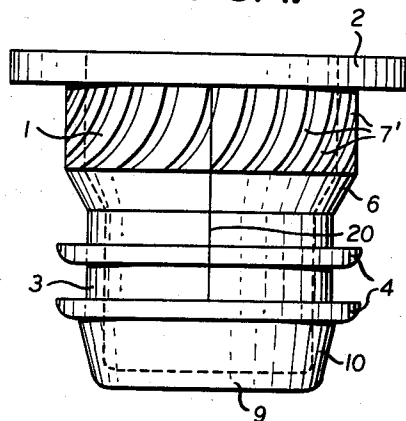


FIG. 3A.



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FIG. 4.

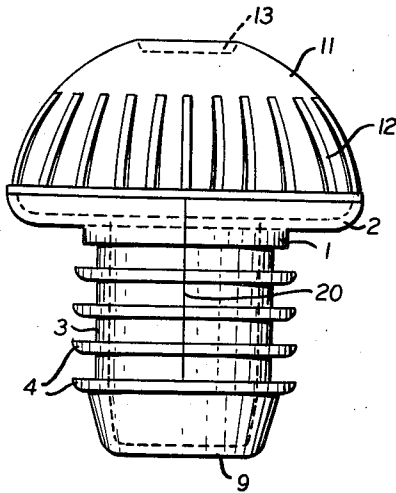


FIG. 5.

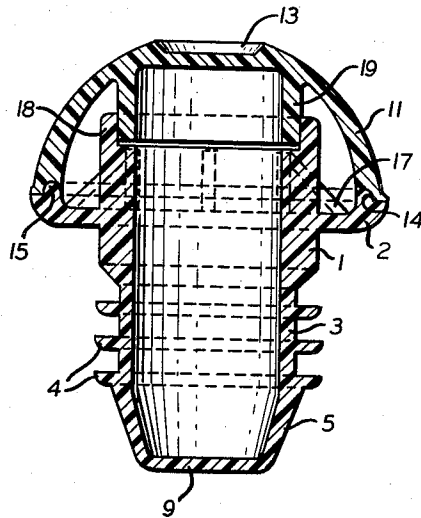


FIG. 7.

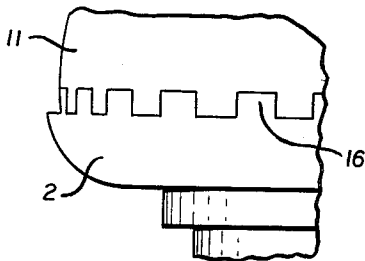
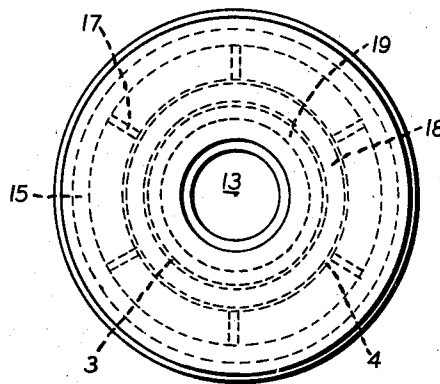


FIG. 6.



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HOLLOW STOPPER FOR BOTTLES, TUBES OR THE LIKE, OR ARTIFICIAL MATERIAL, PREFERABLY POLYETHYLENE

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Application November 8, 1955, Serial No. 545,708

19 Claims. (Cl. 215—47)

The present invention relates to a hollow stopper for bottles, tubes, or the like of artificial material, preferably polyethylene.

Hollow stoppers are known which consist substantially of a cover plate and a cylindrical core projecting from said cover plate and carrying at least one sealing ring. It has been experienced, however, that these known hollow stoppers do not provide any means for a safe guiding of the stopper into the mouth of the bottle or the like.

It is, therefore, one object of the present invention to provide a hollow stopper in which at least one of the sealing rings is formed to a piston-like guide, which guide is preferably disposed immediately below the cover plate and the length of which guide is at least half of the distance between the cover plate and the uppermost sealing ring. By this arrangement a safe position of the hollow stopper in the mouth of the bottle or the like is assured. The hollow stopper is thus safely guided in the mouth of the bottle or the like and may easily be removed. Furthermore the structure in accordance with the present invention permits also to use the stopper again as a sealing member after pouring some of the liquid from the bottle or the like.

It is another object of the present invention to provide a hollow stopper which is equipped with a piston-like guide and which has a cylindrical core carrying at least one sealing ring and in which the wall thickness of the piston-like guide and that of the cylindrical core is preferably substantially equal. In this manner a good elasticity effect of the piston-like guide is brought about in a radial direction. In order to provide sufficient stability of the stopper in a radial as well as axial direction, the lower end of the piston-like guide is of conical shape leading to the cylindrical core.

It is still another object of the present invention to provide a hollow stopper having a piston-like guide, in which the latter is equipped with grooves which are disposed either parallel or oblique to the axis of the stopper and, thereby, provide ventilating means for the space above the sealing rings.

It is yet another object of the present invention to provide a hollow stopper which is equipped with a cylindrical core carrying at least one sealing ring, but preferably a plurality of such sealing rings and in which the diameter of the cylindrical core portion disposed below the lowermost of said sealing rings has a larger diameter than the cylindrical core portion above the lowermost of said sealing rings. In this manner it is achieved that the lowermost sealing ring is somewhat stiffened and assures by all means the sealing effect.

It is also a further object of the present invention to provide a hollow stopper comprising a cylindrical core which carries a plurality of sealing rings and in which the lower end of the cylindrical cores is conically tapered downwardly in order to provide an easier insertion of the stopper into the mouth of the bottle or the like.

It is still a further object of the present invention to provide a hollow stopper which is manufactured in one

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single step of elastic material. It may be closed at its upper end in known manner or may be equipped also with a special bottom piece. Furthermore a particular plate may be provided as upper closure, which plate may consist of more rigid material than the remainder of the stopper, in order to provide a fortification to the stopper. Stamps, prints, etc. may be provided on the particular top plate.

With these and other objects in view which will become apparent in the following detailed description, the present invention will be clearly understood in connection with the accompanying drawings, in which:

Figure 1 is an axial section through a stopper;

Figure 2 is an axial section through another embodiment of the stopper;

Figure 3 is an elevation of a third embodiment of a stopper;

Figure 3a is an elevation of a third embodiment with grooves different from those shown in Fig. 3;

Figure 4 is an elevation of a stopper particularly applicable for champagne bottles;

Figure 5 is an axial section through another embodiment of the stopper applicable for champagne bottles;

Figure 6 is a top plan view of the stopper shown in Fig. 5, the top head being removed; and

Figure 7 is a fragmentary elevation of a variation provided in the stopper shown in Fig. 5.

Referring now to the drawings, and in particular to Figs. 1 to 3, the stopper comprises a cylindrical core 1 which constitutes a piston-like guide and is disposed below the cover plate 2. The piston-like guide 1 is continued to form a cylindrical member 3 which carries one or more flange-like ring members 4 upon its periphery. The ring members have a top face disposed in a plane perpendicular to the longitudinal axis of said stopper and a bottom face curving upwardly towards said top face in outward radial direction in order to taper off said ring member outwardly. Due to the fact that the ring members are weakened at their outer periphery, the weakened portions are bent upwardly upon insertion of the stopper into the bottle and the weakened portions engage the inner face of the bottle neck, thereby not only rendering a good seal, but also preventing involuntary removal of the stopper in case of an overpressure in the bottle, as in champagne bottles. A cylindrical portion 5 is disposed below the lowermost of the sealing rings 4 and has a larger diameter than the portion disposed above the lowermost sealing ring 4.

The piston-like guide 1 leads to the cylindrical portion 3 over a conically shaped portion 6. Preferably such arrangement is made that the length *a* of the piston-like guide 1 amounts to at least one-half of the distance *b* between the cover plate 2 and the uppermost sealing ring 4 (Fig. 1). In this manner a safe guidance of the stopper is achieved in the mouth of the bottle or the like, the stopper cannot slant and also cannot twist.

The piston-like guide may be equipped with grooves 7 (Fig. 3), which grooves 7 may be disposed parallel to the longitudinal axis of the stopper, but also may be inclined thereto, as for instance, helical grooves 7' (Fig. 3a), and the like. The grooves 7 permit ventilation of the space above the sealing rings 4 during introduction of the stopper into the mouth of the bottle or the like. On the other hand, during removal of the stopper this space is brought into communication with outside air, so that no under pressure may occur, which makes the removal of the stopper more difficult. The grooves 7 are in such situations of particular importance, where in the interest of complete sterilization the bottles are filled up to the upper margin of their mouth before sealing the same. The liquid which is removed during insertion of the stopper can easily escape through the grooves 7.

The stopper may also be closed by a bottom plate 9, as clearly demonstrated in Figs. 1, 2, 3 and 5 to 7. Finally, there is also the possibility to provide a set plate 8 in a stopper open at its upper end.

In the embodiment disclosed in Figs. 5 to 7, the cover plate 2 is likewise of hollow form. A hollow cover head 11 is seated on its upper edge, the latter being equipped with ribs 12 in order to fortify the cover head and also increase the possibility of gripping the same. The hollow cover head 11 may be welded to the cover plate 2 or bottom members may be tightly fitted into each other. The formation of the tool for forming of the stopper is arranged preferably in such manner that the lower portion 10 of the stopper and the lowermost sealing ring 4 are seamless while the portion of the stopper disposed above the lowermost sealing ring 4 has necessarily a seam 20. Only in this manner is it possible to bring about an absolutely safe sealing due to the necessary strength of the lowermost sealing ring 4.

The hollow cover head 11 may be equipped with a recess 13. A holding member properly bent, as well known in its use for closing for champagne bottles, extends into the recess 13. This brings about the advantage that the well known abutting plate which is normally welded to the holding member may be dispensed with. The mounting of the holding member and its proper support at the right point is achieved by means of said recess 13.

The hollow cover plate 2 and the hollow cover head 11 may be equipped with a cylindrical projection 18 and 19, respectively, which are joined telescopically and, thereby securing the position of the cover head 11.

The welding together of the cover head 11 and the cover plate 2 may be arranged at the outer periphery of both members. In order to make sure that the cover head 11 assumes an exactly central position, a groove 14 may be provided on the cover head 11 and an annular projection 15 on the cover plate 2 (Fig. 6). The hollow cover head 11 and the cover plate 2 may, however, also be welded together within the range of the cylindrical projections 18 and 19. In order to prevent relative rotation between said two members, teeth formations 16 may be arranged at their outer periphery (Fig. 8).

It has been established by exhaustive tests that the hollow stopper arranged in accordance with the present invention is particularly suitable for the sealing of wine bottles and bottles containing sparkling liquids, as champagne bottles and the like.

While we have disclosed several embodiments of the present invention, it is to be understood that these embodiments are given by example only and not in a limiting sense, the scope of the present invention being determined by the objects and the claims.

We claim:

1. A hollow stopper for bottles, tubes, and the like of an elastic artificial material, comprising a hollow cylindrical member carrying integrally therewith at least one flange-like ring member surrounding peripherally said hollow cylindrical member, said ring member having a top face disposed in a plane perpendicular to the longitudinal axis of said stopper and a bottom face curving upwardly towards said top face in outward radial direction, in order to taper off said ring member outwardly, a piston-like guide disposed at the upper end and integrally connected with said cylindrical member and engaging the inner face of the neck portion of said bottles, the said piston-like guide having a smaller diameter than said ring member but a greater diameter than said cylindrical member, a flange disposed on top and integral with said piston-like guide, a special cover plate for the said flange, a bottom plate integrally disposed at the bottom of said cylindrical member, and said flange-like ring member being seamless in order to provide a secure closure.

2. The hollow stopper, as set forth in claim 1, wherein the length of said piston-like guide is at least one-half of

the distance between said flange and the uppermost of said flange-like rings.

3. The hollow stopper, as set forth in claim 1, wherein the said piston-like guide has a wall of a thickness substantially equal with that of said cylindrical member.

4. The hollow stopper, as set forth in claim 1, which includes a conically shaped tapered down portion between said piston-like guide and said cylindrical member.

5. The stopper, as set forth in claim 1, wherein the said piston-like guide is equipped with grooves disposed substantially in longitudinal direction.

6. The hollow stopper, as set forth in claim 5, wherein said grooves of said piston-like guide are disposed parallel to the longitudinal axis of the said stopper.

7. The hollow stopper, as set forth in claim 5, wherein said grooves of said piston-like guide are disposed inclined to the longitudinal axis of said stopper.

8. The hollow stopper, as set forth in claim 1, wherein the portion of said cylindrical member disposed below the lowermost of said flange-like ring-members is conically tapered down at its outside face.

9. The hollow stopper, as set forth in claim 1, wherein each pair of adjacent flange-like ring-members is spaced apart a distance sufficient to permit bending of each of the said ring-members without interference with its adjacent ring-member.

10. The hollow stopper, as set forth in claim 1, wherein said cover plate is hollow and forms a cover head covering said flange.

11. The hollow stopper, as set forth in claim 10, wherein said hollow cover head is welded to said flange.

12. The hollow stopper, as set forth in claim 10, wherein said hollow cover head is set into said flange.

13. The hollow stopper, as set forth in claim 10, wherein said hollow cover head has ribs at its outer periphery.

14. The hollow stopper, as set forth in claim 10, wherein said hollow cover head has a recess at its top.

15. The hollow stopper, as set forth in claim 10, wherein said hollow cover head and said flange are welded together at their periphery.

16. The hollow stopper, as set forth in claim 10, in which the said hollow cover head and the said flange have at their periphery complementary teeth formations engaging each other, in order to prevent rotation of said cover head relative to said flange.

17. The hollow stopper, as set forth in claim 10, wherein said flange has an upwardly directed cylindrical projection and said hollow cover head has a downwardly directed cylindrical projection, the said cylindrical projections engaging each other telescopically.

18. The hollow stopper, as set forth in claim 17, in which the said hollow cover head and the said flange are welded together at their respective cylindrical projections.

19. A hollow stopper for bottles, tubes, and the like of an elastic artificial material, comprising a hollow cylindrical member carrying integrally therewith a plurality of flange-like ring members surrounding peripherally said hollow cylindrical member, said ring members having a top face disposed in a plane perpendicular to the longitudinal axis of said stopper and a bottom face curving upwardly towards said top face in outward radial direction, in order to taper off said ring members outwardly, a piston-like guide disposed at the upper end and integrally connected with said cylindrical member, and adapted to engage the inner face of the neck portion of said bottles, the said piston-like guide having a smaller diameter than said ring members but a greater diameter than said cylindrical member, a flange disposed on top and integral with said piston-like guide, a special cover plate for the said flange, a bottom plate integrally disposed at the bottom of said cylindrical member, and the lowermost of said flange-like ring members being seamless in order to provide a secure closure.

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