

June 14, 1960

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2,940,107

BOTTLE STOPPLE

Filed Oct. 9, 1956

2 Sheets-Sheet 1

FIG.1.

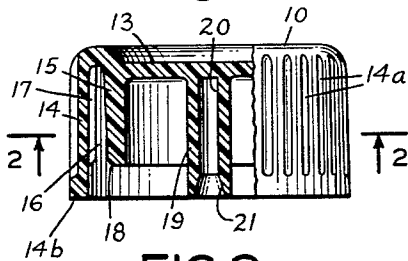


FIG.2.

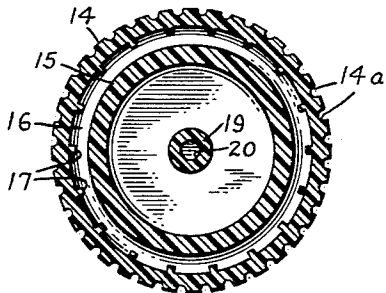


FIG.3.

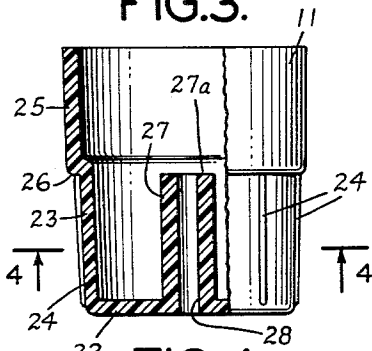


FIG.4.

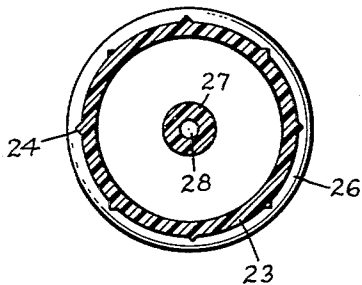


FIG.5.

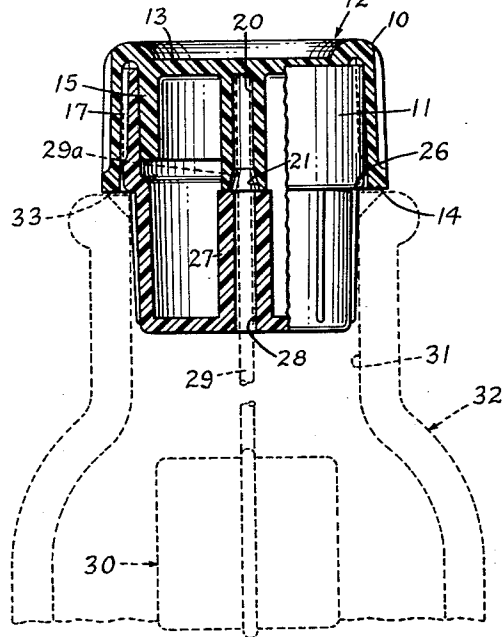
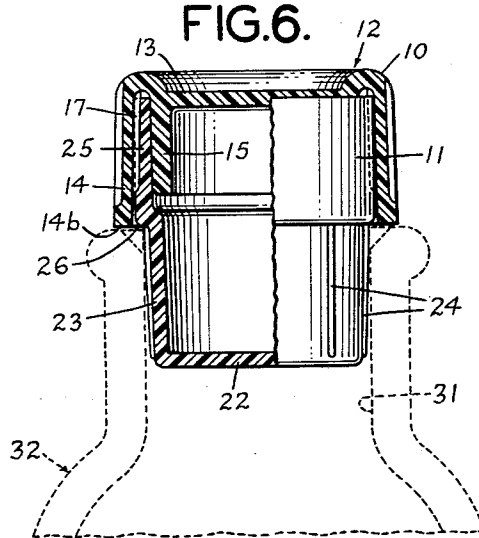


FIG.6.



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2 Sheets-Sheet 2

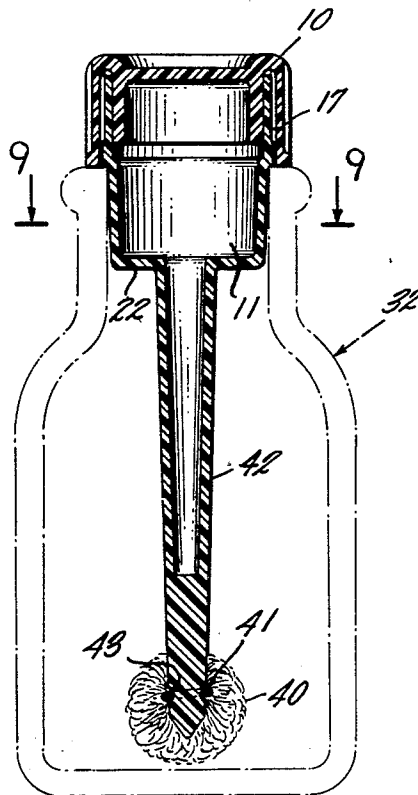
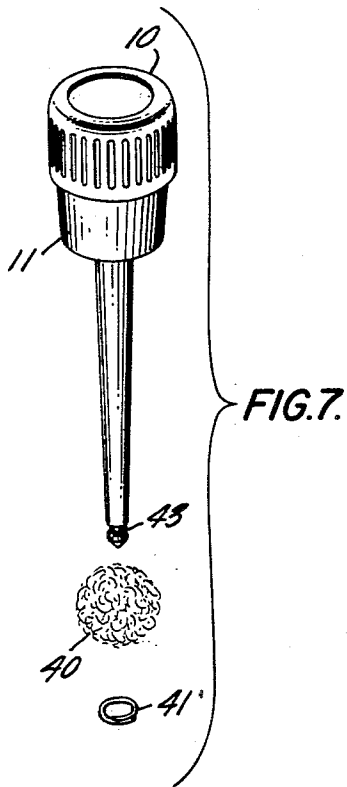


FIG. 8.

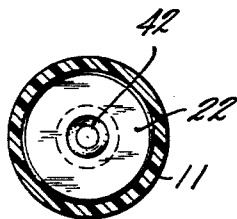


FIG. 9.

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2,940,107

BOTTLE STOPPLE

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14 Claims. (Cl. 15—140.3)

This invention relates to bottle stopples and in particular to bottle stopples composed of a plurality of separately fabricated pieces brought together in a unitary stopple assembly. The application is a continuation-in-part of my copending application, Serial No. 499,554, filed April 6, 1955 (now abandoned).

It is known that certain materials are well suited to stopple a bottle and that others are well suited for finger gripping and external exposure. The bringing together of such materials to form a unitary bottle stopple assembly efficient in all operating characteristics, conserving of fabricating materials, and economical in manufacture does not lend itself to a ready solution.

It is an object of the invention, therefore, to provide a bottle stopple of at least two separate parts adapted to be integrated in a simple assembly operation.

Other objects of the invention are to provide a bottle stopple which is substantially hollow to conserve materials, which is free of external voids and depressions in which the contents of the bottle might become lodged, and which is particularly adaptable to support an appliance such, for example, as a dauber.

In accordance with the invention, there is provided a bottle stopple having separately fabricated finger gripping and bottle engaging portions, the two being hollow. The bottle engaging portion can be of a relatively soft resilient material to effectively stopple a bottle and the finger gripping portion of a relatively hard inflexible material. Complementary frictional wall surfaces are formed on each to facilitate mating with minimum effort but which resist separation with forces of exceptional magnitude. Also, complementary bosses can be formed on the two portions to support an appliance in a mechanically efficient manner, or a shank to hold a dauber can be formed integrally with the bottle engaging portion.

Representative embodiments of the invention from which the above and other objects will be readily apparent are illustrated in the accompanying drawing in which:

Figure 1 is a side view, partly broken away in vertical section along its diameter, of the finger gripping portion of a bottle stopple;

Figure 2 is a view in horizontal section taken on the line 2—2 of Figure 1;

Figure 3 is a side view, partly in vertical section through its diameter, of the bottle engaging portion of a bottle stopple;

Figure 4 is a view in horizontal section taken on the line 4—4 of Figure 3 looking in the direction of the arrows;

Figure 5 is a side view, mostly in vertical section along its diameter, of an assembled bottle stopple made up of the components of Figures 1 and 3, with a bottle in which the stopple is inserted and an appliance which the stopple can carry being shown in broken lines;

Figure 6 is a side view mostly in vertical section along its diameter, of a bottle stopple representing a modification of that illustrated by Figures 1—5 and inserted in the neck of the bottle shown in broken lines;

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Figure 7 is a perspective exploded view of still another embodiment of the invention;

Figure 8 is a vertical cross-section view of the embodiment shown in Figure 7; and

Figure 9 is a cross-section view taken along the line 9—9 of Figure 8, looking in the direction of the arrows.

Referring to Figures 1 and 3, there are shown, respectively, a finger gripping portion 10 and a bottle engaging portion 11 adapted to be frictionally united to form a bottle stopple 12 which can be of the plug type as illustrated by Figures 5 or 6. The finger gripping portion 10, which is generally cup-shaped opening toward the mouth of the bottle it is to stopple, includes a top portion 13 and, preferably formed integrally therewith, a tubular side wall 14, the two making up the normally exposed surfaces of the finger gripping portion of the stopple. The exposed surface of the side wall 14 can be formed with flutes 14a to facilitate finger gripping and enhance its appearance.

Disposed within the wall 14 and preferably formed integrally with the top 13 is an inner tubular wall 15, with the opposed surfaces of the two walls 14 and 15 constituting frictional side wall means defining a channel 16 which, in the event the side walls are cylindrical, will be toroidal in form. Preferably the opposing surfaces of the walls 14 and 15 are made slightly convergent looking toward the top of the stopple. A plurality of friction ribs 17 are formed on the inner surface of the wall 14, the ribs being relatively shallow and narrow and parallel to the axis of the cup-shaped finger gripping portion 10 and hence of the entire stopper assembly 12. The lower end of the tubular wall 15 can be formed with a rounded or tapered lip 18. In the event the stopple is to carry an appliance such, for example, as a dauber, applicator, or the like, there can be formed within the tubular wall 15, and preferably depending from the top 13, a boss 19 having a central bore 20 flaring outwardly at its free end 21.

The finger gripping portion 10, which can be formed in its entirety by a single pressing or die operation, is preferably formed of a relatively hard inflexible material such, for example, as polystyrene.

The bottle engaging portion 11, which is also generally cup-shaped opening, in opposition to the finger gripping portion, away from the mouth of the bottle it is to stopple, includes a base portion 22 and, extending upwardly therefrom, a tubular bottle engaging wall 23 which can be slightly divergent moving away from the base. A series of extremely thin, shallow ribs 24, aligned with the direction of insertion into the mouth of the bottle, can be formed on the exposed surface of the wall 23 to improve the frictional engagement with the bottle. Disposed upwardly of the wall 23 is friction wall means in the form of a tubular wall 25 of greater diameter than the surface 23 to form a shoulder 26 therebetween. An appliance supporting boss 27, extending upwardly from the base 22, is formed with a central or axial bore 28 to receive an appliance as described below.

The bottle engaging portion 11, which can be fabricated by a single die or pressing operation, is formed of a relatively soft and resilient material such, for example, as polyethylene.

The bottle engaging portion 11 and the finger gripping portion 10 are united by pressing the tubular friction wall 25 into the channel space 16 defined by the opposed surfaces of the walls 14 and 15, with the friction ribs 17 embedding themselves into the surface of the wall 25, which is tightly pinched at its upper end. The engagement of the friction wall means of the two portions 10 and 11 is facilitated by the relative elasticity or resilience of the material of which the wall 25 is formed relative to that of which the walls 14 and 15 are formed. Fully mated, the portions 10 and 11 have been found to resist

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separation by axially applied forces not only greatly exceeding those necessary to effect the assembly in the first place but sufficient to prevent separation under all reasonable working conditions.

When the portions 10 and 11 are fully mated, the bosses 19 and 27 come into endwise engagement, with their respective apertures 20 and 28 coming into alignment to form a long opening for receiving, for example, the shank 29 of an appliance which can take the form, for example, of a dauber 30. The fit of the shank 29 in the openings 20 and 28 is preferably a frictional fit augmented, if desired, by means of one or more barbs 29a (not shown) formed on the inserted shank portion. By causing a barb to pass beyond the free end 27a of the boss 27, which affords a shoulder at the junction with the flared end 21 of the boss 19, a positive lock against removal can be provided. When in place, the shank 29 is afforded a limited degree of play by the resilience which inheres in the boss 19, in this fashion preventing breaking of the boss. Also, the shank of the appliance can be used to augment the coupling between the portions 10 and 11, although this is not necessary in most cases.

Inserted in the mouth 31 of a bottle 32, the enlarged shoulder afforded by the shoulder 26 and the coplanar lower end 14b of the wall 14, overhangs the lip 33 of the bottle, thereby serving to prevent accumulation of dust or other foreign matter at the lip. The shoulder 26 may also be useful in assembling the two parts 10 and 11. For example, the wall 23 of the part 11 may be inserted within a hollow tubular tool so that the upper edge of the tool engages the shoulder 26. The tool may thus be used to drive the parts 10, 11 together without damaging the flexible member 11.

It will be understood that the assembled bottle stopple 12 is substantially hollow, thereby greatly conserving materials of fabrication, and that it at once affords optimum finger gripping and bottle engaging characteristics by virtue of the physical properties of the different materials of which the bottle engaging portion 11 and the finger engaging portion 10 are formed. Furthermore it has relatively great mechanical strength, despite the use of a simple adhesive-free union, which is sufficient for example to carry a working appliance.

It will be understood that the bottle stopple may take various forms and embodiments without departing from the scope of the invention disclosed herein. Thus, for example, referring to Figure 6 in which like parts are identified by like reference numerals, the bosses 19 and 27 of Figure 5 can be eliminated if an appliance is not needed.

Another embodiment of the invention is represented in Figures 7 to 9. In this embodiment, the parts 10 and 11 are coupled together in the manner described above in connection with Figures 1 to 6, but the dauber or swab 40 in this case is affixed by means of a wire band clamp 41 to the lower end of a shank 42 which is formed integrally with the base 22 of the part 11. To offer a greater resiliency and to save material, the shank 42 is hollow for the greater part of its length. The swab 40 is a liquid absorbant fibrous ball, such as felt, cotton, wool, etc., and it is attached to the extreme lower end of the shank 42 by the engagement of the wire band 41 with a groove 43 (see Figure 7) in the shank. The groove 43 in the shank may be pre-formed therein or it may be impressed therein by the wire band 41 at the time that the wire band is clamped to this shank. The polyethylene shank 42 is of advantage particularly in instances where the liquid in the container would oxidize or corrode a metal shank.

Also, the stopple can be used with bottles formed of a wide range of materials and having mouths of various types. The invention should not, therefore, be regarded as limited except as defined by the following claims.

I claim:

1. A bottle stopple comprising a finger gripping por-

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tion including frictional side wall means of relatively hard inflexible material defining a toroidal recessed space in one end thereof, a plurality of substantially parallel ribs formed on said frictional side wall means within the toroidal space, and a bottle engaging portion including a tubular end having frictional side wall means of relatively soft resilient material complementary to those of the finger gripping portion for slidably engaging the latter to frictionally secure the two portions together, the ribs being embedded in the said wall means of the bottle engaging portion to lock the finger gripping portion and the bottle engaging portion together.

2. A bottle stopple as set forth in claim 1 including a shank extending from one end of the bottle engaging portion and a dauber attached to the shank.

3. A bottle stopple as set forth in claim 2 wherein the bottle engaging portion includes a boss formed integrally therewith and an opening in the boss to receive the shank.

4. A bottle stopple as set forth in claim 2 wherein the shank is formed integrally with the bottle engaging portion.

5. A bottle stopple comprising a hollow cup-shaped finger gripping portion including tubular frictional side wall means of relatively hard inflexible material, a plurality of substantially parallel ribs formed on said frictional side wall means, and a hollow cup-shaped bottle engaging portion including tubular frictional side wall means of relatively soft resilient material complementary to those of the finger gripping portion for slidably engaging the latter to frictionally secure the two portions together, the relatively hard ribs being embedded in the relatively soft side wall means of the hollow cup-shaped bottle engaging portion to lock the hollow cup-shaped portions together, said two cup-shaped portions being inverted with respect to one another to form a closed hollow stopple assembly.

6. A bottle stopple comprising a hollow cup-shaped finger gripping portion including tubular frictional side wall means of relatively hard inflexible material, a hollow cup-shaped bottle engaging portion including tubular frictional side wall means of relatively soft resilient material complementary to those of the finger gripping portion for slidably engaging the latter to frictionally secure the two portions together, said two cup-shaped portions being inverted with respect to one another to form a closed hollow stopple assembly, and an appliance supporting boss within the side wall means of the finger gripping portion extending toward the bottle engaging portion, a complementary boss within the side wall means of the bottle engaging portion extending toward the finger engaging portion, the two bosses being brought into alignment to receive a common appliance support when the two portions of the stopple are frictionally engaged.

7. A bottle stopple comprising a finger gripping portion including frictional side wall means of relatively hard, inflexible material, and comprising a pair of coaxial inwardly extending tubular walls of different diameter, the opposed surfaces of which define a toroidal space, an inwardly extending appliance supporting boss within the tubular walls of the finger gripping portion, a bottle engaging portion including frictional wall means of relatively soft material and comprising an outwardly extending tubular portion slidably received in the toroidal space to frictionally secure the two portions together, and an outwardly extending appliance supporting boss within the tubular wall of the bottle engaging portion, the two bosses being brought into alignment when the two portions of the stopple are frictionally engaged.

8. A bottle stopple comprising a finger gripping portion including frictional side wall means of relatively hard inflexible material and comprising a pair of coaxial inwardly extending tubular walls of different diameter, the opposed surfaces of which define a toroidal space, a plurality of substantially parallel ribs formed on at least

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one of said opposed surfaces, said ribs being relatively thin and substantially parallel to the common axis of said tubular walls, and a bottle engaging portion including frictional wall means of relatively soft resilient material and comprising an outwardly extending tubular portion 5 slidably received in the toroidal space to frictionally secure the two portions together, the relatively hard ribs of the finger gripping portion becoming embedded in the relatively soft tubular portion to lock the said tubular portion within the toroidal space.

9. A bottle stopple as set forth in claim 8 including a plurality of slightly raised ribs in the exposed surface of the lower tubular wall of the bottle engaging portion in substantial alignment with the direction of insertion of the stopple in a bottle and adapted to engage the neck of the bottle. 10

10. A bottle stopple as set forth in claim 8 including a base at the lower end of the lower tubular wall of the bottle engaging portion and an upwardly extending resilient appliance supporting boss carried by the base. 15

11. A bottle stopple as set forth in claim 10 including a rigid downwardly extending appliance supporting boss carried by the finger gripping portion in alignment with the resilient boss of the bottle engaging portion. 20

12. A bottle stopple as set forth in claim 11 including an appliance having a shank supported by the bottle stopple, said aligned bosses having aligned axial bores formed therein to receive a shank of an appliance, the bore of the boss carried by the finger gripping portion being enlarged at the point of abutment with the boss of the bottle engaging portion to form a shoulder, said shank being disposed in the bores of both bosses. 25

13. A bottle stopple comprising a finger gripping portion made of a relatively hard inflexible material, one end of said finger gripping portion having a toroidal recessed space defined therein between a pair of oppositely 30

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disposed, spatially separated walls, a bottle engaging portion made of a relatively soft resilient material, said bottle engaging portion having a tubular end which is adapted to be force fitted into said toroidal recessed space so that the inner and outer surfaces thereof are in frictional contact with said oppositely disposed walls defining the toroidal space, and a plurality of thin, longitudinally disposed ribs formed integrally on at least one of said walls defining the toroidal recessed space, said ribs biting into the corresponding adjacent wall of the bottle engaging portion when the tubular end thereof is force fitted into said toroidal space so as to wedge lock the bottle engaging portion securely to the finger gripping portion, to prevent them from becoming separated or from twisting relatively to each other when the bottle stopple is removed from the bottle. 15

14. A bottle stopple as set forth in claim 13 including means defining a shoulder around the outer periphery of said bottle engaging portion, said shoulder being disposed remotely from both ends of the bottle engaging portion and intermediate the end adapted to be forced into the bottle and the portion of the open end which is accommodated within the toroidal recessed space in the finger gripping portion. 20

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 2,940,107

June 14, 1960

Con F. Sterling

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 6, line 35, list of References Cited, under FOREIGN PATENTS, the single citation should appear as shown below instead of as in the patent:

803,505 France----- July 6, 1936

Signed and sealed this 15th day of November 1960.

(SEAL)

Attest:

KARL H. AXLINE
Attesting Officer

ROBERT C. WATSON
Commissioner of Patents