

[54] **CONTAINER AND CONTAINER CLOSURE
COMBINED STRUCTURE**

[75] Inventor: **Robert E. Hazard**, North Kingston,
R.I.

[73] Assignee: **Polytop Corporation**, Slatersville,
R.I.

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[58] Field of Search 222/153, 532, 534, 536,
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218, 324, 316, 318

[56] **References Cited**

UNITED STATES PATENTS

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Primary Examiner—Robert B. Reeves

Assistant Examiner—Larry H. Martin

Attorney, Agent, or Firm—Edward O. O'Brian

[57] **ABSTRACT**

It is conventional to form a container closure so that a skirt on the closure includes a mounting means capable of being snapped over a corresponding mounting means on a container neck. Such interengaging mounting means are normally flange or bead-like structures permitting the closure to be rotated on a container neck after assembly. Such a structure may be modified to increase the difficulty of removing such a closure from such a neck by including interlocking means on the closure and on the container. Such interlocking means prevent rotation of the closure, increasing the difficulty involved in removing the closure from the container.

7 Claims, 4 Drawing Figures

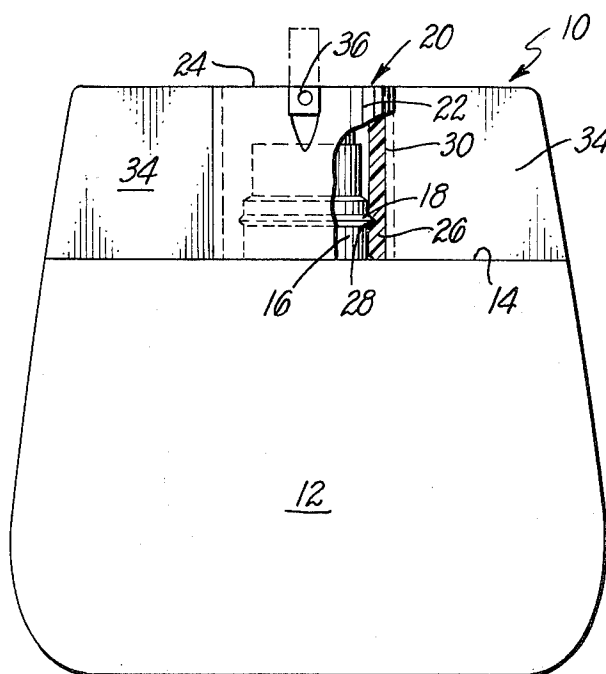


FIG. 1.

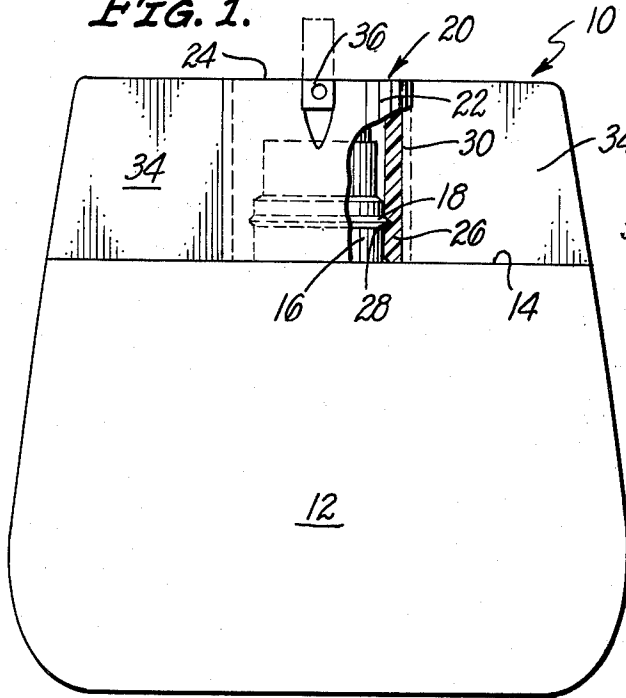


FIG. 2.

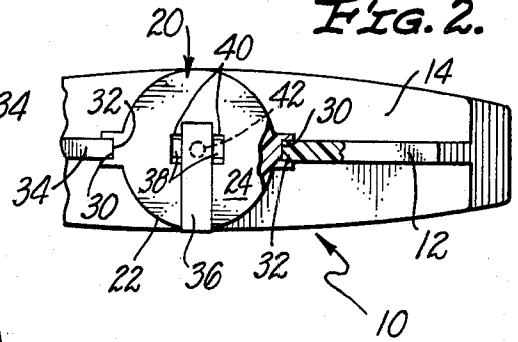


FIG. 3.

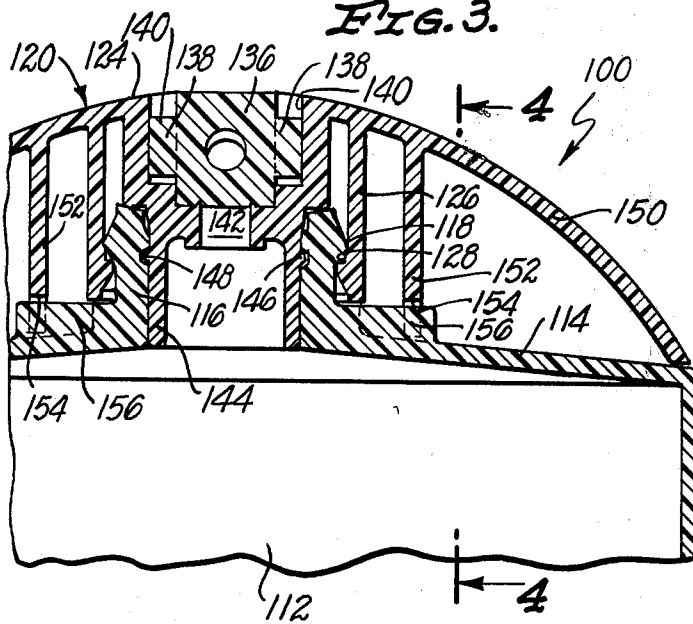
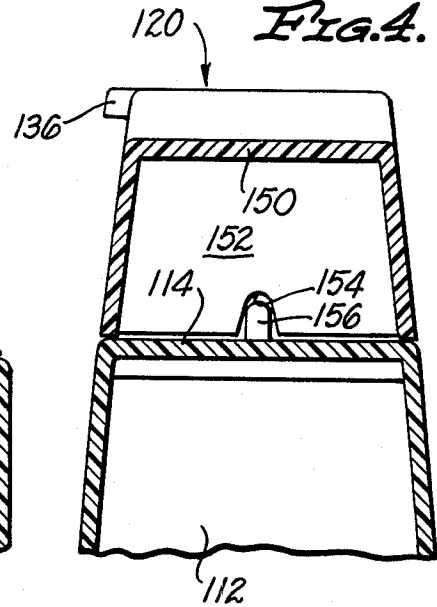


FIG. 4.



CONTAINER AND CONTAINER CLOSURE COMBINED STRUCTURE

BACKGROUND OF THE INVENTION

The invention set forth in this specification pertains to the combined structure utilizing a container and a container closure and is primarily directed to such a structure in which the container closure carries a closure member or spout capable of being moved between opened and closed positions.

The combination of a container and a container closure is of course well known. With the advent of present-day polymer materials it has been possible to form container closures at a comparatively nominal cost of materials such as certain grades of polyethylene capable of temporary deformation. This has permitted the development of many different closure structures which are adapted to be snapped on a generally cylindrical container neck. It will be recognized that such a snapping on type action involves temporary material deformation. Normally such deformation is primarily in a closure being assembled upon a container neck. However, it is possible to form containers of materials capable of being temporarily deformed so that the temporary deformation occurring during assembly will be in a container neck or in both a container neck and the closure.

Such temporary deformation during assembly of a container and a container closure normally involves annular flanges, beads of the like being snapped over one another. The assembly of closures using this type of mounting mechanism may be facilitated through the use of sloping walls permitting gradual deformation as an axial or lineal force is applied to the top of the closure so as to force it down over a container neck. Normally flanges or beads as indicated are constructed in a more or less latch-type manner so as to discourage or make it comparatively difficult to pull a closure of the type indicated off of a container. This type of structure utilizing interengaging mounting means on a closure and on a container is often used commercially but is considered to have several major drawbacks.

One of these pertains to the ease by which a closure container assembly as indicated may be disassembled. Although such disassembly is relatively difficult, it is not considered that it is difficult enough to normally avoid undesired removal of a closure as indicated from a container designed to be used with such a closure. Normally such disassembly can be accomplished by applying a combination of a twisting, rotary force with an axial or linearly directed force to the closure as the container is held stationary. Such a combination of forces produces what may be considered as a camming type of action which will cause the closure in the combination indicated to be gradually released from a container as there is gradual material deformation.

The other drawback which is considered significant with the combination of a container and a container closure utilizing interengaging mounting means pertains to the indexing of the closure relative to the container. Manufacturers normally desire to have dispensing closures indexed with respect to a container in a specified manner for aesthetic reasons. In connection with this it is noted that aesthetics are quite important in the sale of container closures. With certain container closure combinations the indexing of a dispensing clo-

sure in a precise manner relative to the container may be critical in promoting the use of the dispensing closure. In some applications it is considered that such indexing may be related to producing a structure having desirable child resistant characteristics. With structures as indicated because of the interengaging mounting means permitting rotation there has always been a danger that a closure might not be indexed during assembly relative to a closure in a desired manner or might be rotated after it is assembled.

SUMMARY OF THE INVENTION

It is believed that it will be apparent from the preceding that there is a need for improvement in the field of container and container closure structures which utilize interengaging mounting means adapted to be snapped together during assembly as a result of temporary material deformation. A broad objective of this invention is to fulfill this need by providing container and container structures which are used together and which include interlocking means accomplishing an indexing function and preventing container-closure rotation after assembly. A further object of the present invention is to provide a container-container closure combination which is not significantly expensive to manufacture and use. A still further objective of the present invention is to provide a combination of a container and a container closure in which the closure is held in such a manner that it is extremely difficult to remove it from the container.

In accordance with this invention these and various related objectives are achieved in the combination of a container having an extending, hollow, generally cylindrical neck and a container closure having a cap and a closure member, at least one of which is formed of a material capable of temporary deformation, said cap including a dependent, generally cylindrical skirt located concentrically with said neck, said cap having an opening extending therethrough, said closure member being movably mounted on said cap so as to be capable of being moved between open and closed positions, said opening being closed off when said closure member is in said closed position and being open when said closure member is in said open position, said neck and said skirt including interengaging mounting means securing said neck to said skirt against linear movement along said neck away from said container, said mounting means permitting said closure to be assembled on said neck through temporary material deformation and to be rotated on said neck, by the improvement which comprises: interlocking means extending between said cap and said container for preventing rotary movement of said skirt relative to said neck, said interlocking means serving to prevent a force being applied to said closure so as to remove said closure from said container by a rotary action.

BRIEF DESCRIPTION OF THE DRAWINGS

Inherently a summary such as the preceding is incapable of fully and completely indicating all aspects of the invention such as the invention set forth in this specification. Further details of the invention and various advantages of it are best explained with reference to the accompanying drawing in which:

FIG. 1 is a front elevational view of a presently preferred embodiment of form of a container and a container closure combined structure in accordance with

this invention, this view being partially broken away to reveal certain constructional details;

FIG. 2 is a top plan view of the combined structure shown in FIG. 1, this view also being partially broken away to reveal certain constructional details;

FIG. 3 is a cross-sectional view of a modified container and container closure combined structure in accordance with this invention; and

FIG. 4 is a cross-sectional view taken at line 4—4 of FIG. 3.

The structures illustrated in the drawing are two different embodiments of structures involving or utilizing the essentially intangible principles or features of the invention set forth in the appended claims. These principles or features can readily be adapted for use in a wide variety of differently appearing and differently constructed combined structures through the use or exercise of routine engineering skill in the closure field.

DETAILED DESCRIPTION

In FIG. 1 of the drawing there is shown a combined structure 10 utilizing a generally flat polyethylene or similar container 12 having a generally flat top 14 from which there extends a conventional container neck 16. This neck 16 is of a generally cylindrical type and includes an outwardly extending annular flange or bead 18. In the structure 10 the container 12 is utilized with a dispensing closure 20 of a known type. This dispensing closure 20 is preferably constructed as described in the Wilson, et al. U.S. Pat. No. 2,793,795 and in various patents which have subsequently issued. The entire disclosure of this Wilson et al. patent is incorporated herein by reference in the interest of brevity.

This closure 20 has a cap 22 having a generally flat top 24 from which there extends a dependent annular skirt 26 which is located concentrically around the neck 16 so as to fit close against the exterior of this neck 16. Within the interior of this skirt 26 there is located an internal groove 28 which is dimensioned so as to conform to the shape of the flange or bead 18. This flange 18 and the groove 28 constitute what may be regarded as "interengaging mounting means" securing the closure 20 against linear movement along the length of the neck 16 away from the container 12.

In the structure 10 such "interengaging mounting means" also serve to seal the closure 20 relative to the neck 16 so that there can be no leakage between these two parts. A variety of different known specific flange, bead and/or groove structures can be utilized in connection with the closure 20 and the neck 16 so as to form a seal between these two parts and/or so as to serve to mount or hold the closure 20 on the neck 16. Normally such means are of a "circular" character since it is simplest from a manufacturing standpoint to form molds which are of a cylindrical or circular character. Thus, in the structure 10 the flange 18 and the groove 28 are of a "circular" character in that they are located in a plane transverse to the axis of the neck 16 so as to extend in a circular path around the axis of the neck 16. With this type of structure both the mounting means and the sealing means used—regardless whether they are separated or combined as illustrated—permit rotation of the closure 20 upon the neck 16.

Within the structure 10 on the exterior of the skirt 26 there are located linear parallel indexing grooves 30 which extend parallel to the vertical axis of the neck 16 along the length of the skirt 26. These grooves 30 con-

tain the edges 32 of upstanding ears 34 leading upwardly from the top 14 in such a manner as to lock the closure 20 against rotation. This combination of the grooves 30 and the ears 34 may be regarded as "interlocking indexing means" in that they serve several functions.

One of these is to hold the closure 20 so that the cap 22 is in such an orientation that a dispensing spout 36 is always located so as to be pointed to one side of the container 12 so that it can be conveniently actuated. This spout 36 is mounted by trunions 38 on it being snapped into bearing openings 40 in the cap 22 in such a manner that the spout 36 can be rotated between a closed position as shown in which an opening 42 through the cap 22 is closed off and an open position in which the interior of the spout 36 is in communication with this opening 42.

While this indexing is important the interlocking means described also holds the closure 20 so that it cannot be rotated. As a consequence of this it is impossible to twist this closure 20 while pulling on it so as to gradually "cam" the flange 18 out of the groove 28 in disassembling the closure 20 from the container 12. As a consequence of this it becomes exceedingly difficult to remove the closure 20. It is considered best to make the top 14 of such width as to completely extend across the bottom of the skirt 26 so as to prevent an axial or pushing force from being exerted on the closure 20 as it is disassembled. This also increases the difficulty of disassembling the structure 10.

In FIGS. 3 and 4 of the drawing there is shown a modified structure 100 which is in many respects quite similar to the structure 10. In the interest of brevity those parts of the structure 100 which are identical or essentially identical to corresponding parts of the structure 10 are not separately identified herein and are designated in the remainder of this specification by the numbers previously used to designate such parts preceded by the numeral 1.

In the structure 100 the cap 122 differs from the cap 22 previously described by including an internal plug 144 which fits closely within the neck 116. Additional interengaging means constituted by a flange 146 on this plug 144 fitting within an internal groove 148 are used in the cap 122. This cap 122 also utilizes an enlarged dome-like extension 150 to the top 124. This extension 150 extends substantially to the edges of the top 114. It also carries internal reinforcing walls 152 which extend downwardly adjacent to the top 114. These walls 152 have bottom notches 154 which straddle small ridges 156 located on the top 114. These notches 154 and ridges 156 constitute interlocking means serving the same function as the grooves 30 and the ears 34 in the structure 10.

It is believed that it will be apparent from a careful consideration of the preceding that a number of structures can be developed for preventing a closure from being twisted upon a container so as to prevent the undesired removal of the closure from the container. Within the broad purview of the invention it is considered that a non-cylindrical closure skirt can be used with a correspondingly shaped non-cylindrical container neck. With construction of this type the non-cylindrical configurations of the closure skirt and the container neck serve as interlocking means to prevent rotation or twisting such as is necessary to prevent the closure from being twisted off of the neck.

It is considered, however, that the principal utility of the present invention is with container skirts and container necks having a generally cylindrical configuration and formed so as to include means for forming a seal between these parts which is operative, even as the closure is rotated upon the neck. Such closures are formed from dies which are relatively inexpensive to manufacture by lathe or similar type operations. Many such closures are of course known and used. The addition to such closures of interlocking means as described is a rather simple matter which makes it possible to achieve the objectives of the invention.

I claim:

1. The combination of a container having an extending, hollow neck and a container closure having a cap and a closure member at least one of which is formed of a material capable of temporary deformation, said cap including a dependent skirt located concentrically with said neck, said cap having an opening extending therethrough, said closure member being a spout and being mounted on said cap so as to be capable of being moved between opened and closed positions, said opening being closed off when said closure member is in said closed position, and being opened when said closure member is in said open position, said neck and said skirt including interengaging mounting means securing said neck to said skirt against linear movement along said neck away from said container, said mounting means permitting said closure to be assembled on said neck through temporary internal deformation and to be rotated on said neck, in which the improvement comprises:

cooperating interlocking means on said cap and said container which fit within one another as said cap is moved in the direction of the vertical axis of said neck for preventing any rotary movement of said skirt relative to said neck,

said interlocking means serving to maintain said cap in one orientation with respect to said container so

that said spout will be located on said cap in one orientation with respect to said container.

2. The combination claimed in claim 1 wherein: said container closure is a dispensing closure, and said closure member rotatably mounted on said cap.

3. The combination claimed in claim 1 wherein: said container has a top adjacent to said neck, said skirt fitting against said top and being covered thereby so as to prevent an axial force from being applied to said container closure to remove said container closure from said container.

4. The combination claimed in claim 1 wherein: said container closure is a dispensing closure, said closure member rotatably mounted on said cap, and

said container has a top adjacent to said neck.

5. The combination claimed in claim 1 wherein: said interlocking means on said cap comprise parallel grooves on said skirt extending the length of said skirt, and

said interlocking means on said container comprise ears extending into said grooves.

6. The combination claimed in claim 1 wherein: said interlocking means on said cap comprise notches located on said cap and said interlocking means on said container comprise projections on said container, said projections fitting into said notches, said cap covering said interlocking means.

7. The combination claimed in claim 6 wherein: said container closure is a dispensing closure, said closure member rotatably mounted on said cap, and

said container has a top adjacent to said neck, said skirt fitting against said top and being covered thereby so as to prevent an axial force from being applied to said container closure to remove said container closure from said container.

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