

Nov. 26, 1957

E. J. TOWNS

2,814,404

CLOSURE FOR BEADED CONTAINERS

Filed Dec. 2, 1953

3 Sheets-Sheet 1

FIG. 1.

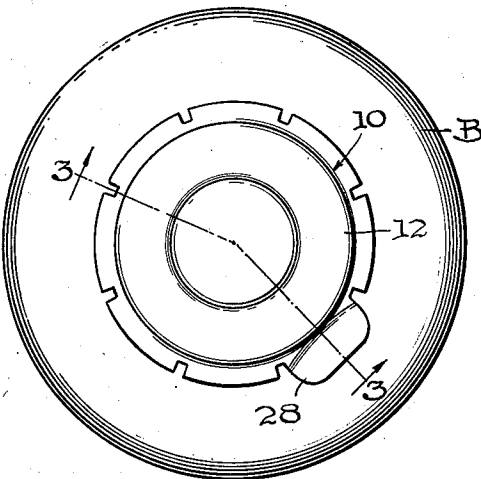
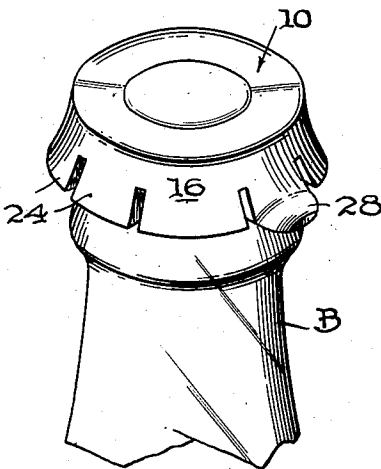


FIG. 2.

FIG. 3.

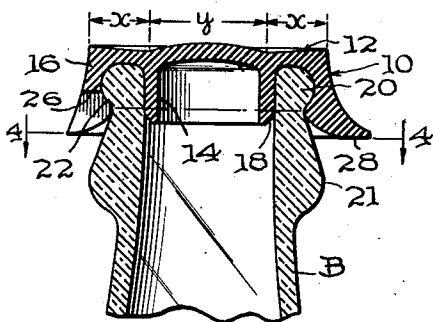


FIG. 5.

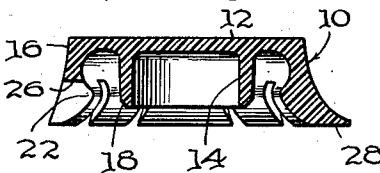


FIG. 6.

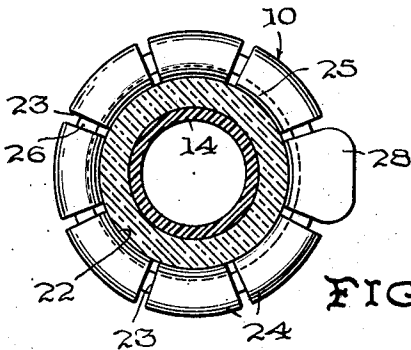
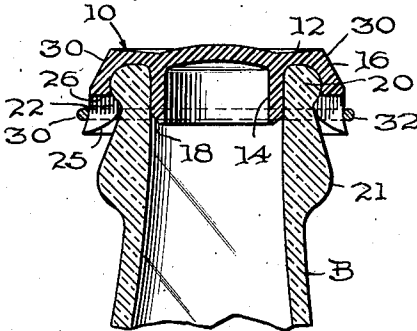


FIG. 4.

INVENTOR.
EDWARD J. TOWNS
BY
Raymond N. Matson
AGENT

Nov. 26, 1957

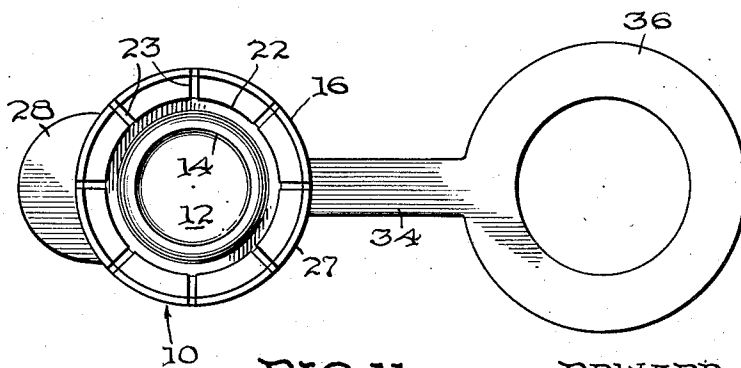
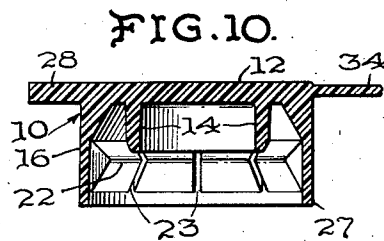
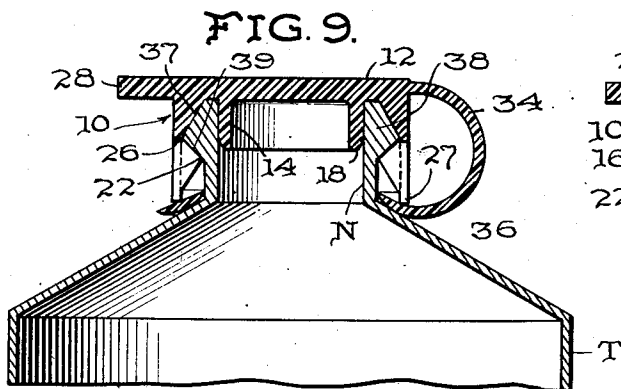
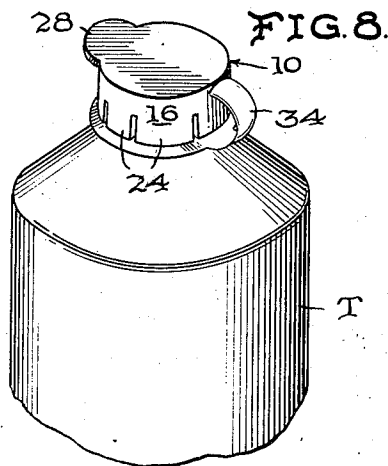
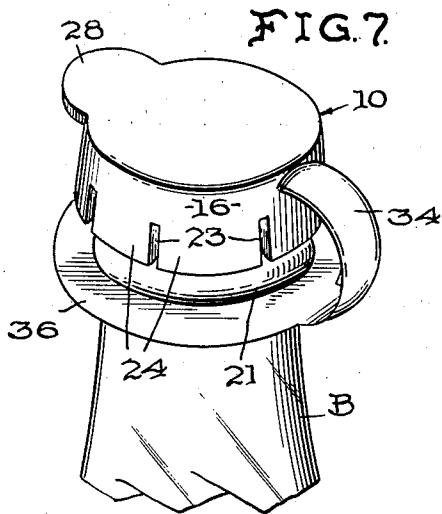
E. J. TOWNS

2,814,404

CLOSURE FOR BEADED CONTAINERS

Filed Dec. 2, 1953

3 Sheets-Sheet 2



INVENTOR.
EDWARD J. TOWNS

BY

Raymond M. Matson
AGENT

Nov. 26, 1957

E. J. TOWNS

2,814,404

CLOSURE FOR BEADED CONTAINERS

Filed Dec. 2, 1953

3 Sheets-Sheet 3

FIG. 12.

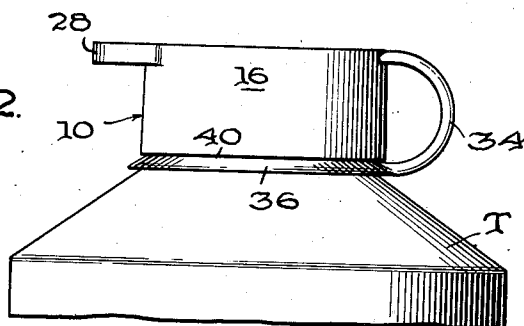


FIG. 13.

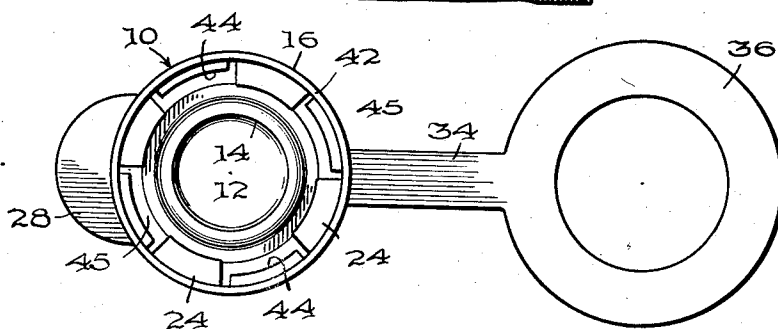


FIG. 14.

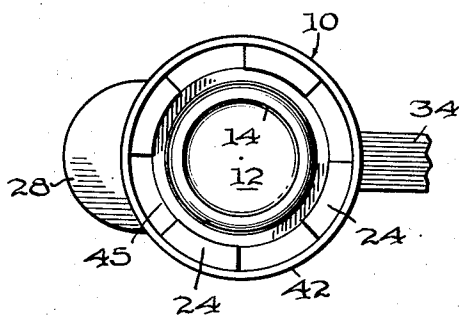
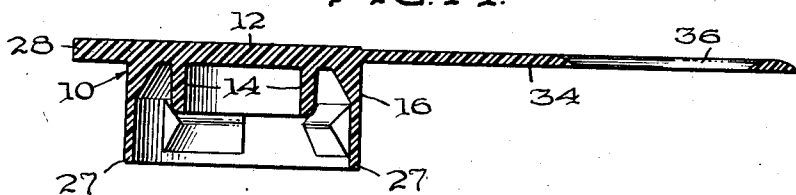


FIG. 15.

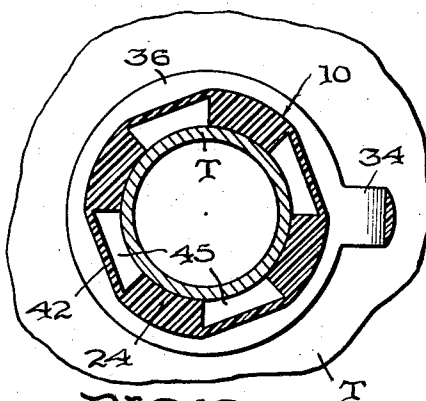


FIG. 16.

INVENTOR.
EDWARD J. TOWNS

BY

Raymond N. Matson
AGENT

1

2,814,404

CLOSURE FOR BEADED CONTAINERS

Edward J. Towns, Livingston, N. J., assignor of one-tenth to Bryant W. Griffin, Summit, N. J.

Application December 2, 1953, Serial No. 395,741

11 Claims. (Cl. 215—41)

This invention relates broadly to bottle caps and more particularly to a bottle cap forming a combined stopper and cap type closure for bottles, collapsible tubes, jars, etc.

This application is a continuation-in-part of my pending application for a Bottle Cap, Serial No. 125,070, filed November 2, 1949, now Patent #2,669,369, issued February 16, 1954.

Bottle caps of this general type are known in the art and are generally characterized by a number of inherent disadvantages which make them unpopular in use. Among these disadvantages are high initial cost, short life as an effective seal, a difficulty in application to or removal from a bottle due to characteristics of the material or type of locking means used, and poor design and construction resulting in loss of beverages, plastic materials, or gases due to leakage.

Accordingly, the chief object of the present invention is to obviate the foregoing and other disadvantages characterizing many known structures.

Another important object of the present invention is to provide a bottle or tube cap which may be readily applied to bottles, etc., manually or by conventional capping machinery, readily removed from the bottle manually, and reused indefinitely without permanent distortion of the cap or lessening the effectiveness of its sealing characteristics.

Another important object of the present invention is to provide an improved bottle or tube cap of thermoplastic material having strength, stiffness and friction characteristics which combine to form a self-reinforcing combined cap and plug type bottle or tube closure.

A further important object of the invention is to provide a bottle or tube cap having bead gripping fingers and a seal which, when in sealing position upon the neck of a bottle or tube will act to increase its grip thereupon.

A still further important object of the invention is to provide a bottle cap having a seal and bottle or tube bead engaging fingers which, when in operative position upon a bottle or tube act to increase the sealing effect.

Another important object of the present invention is to provide an improved bottle, tube, etc. cap having a securing tab formed integrally therewith which fits about the neck of the bottle or tube and is so designed that the cap may be seated or removed with only one hand in operation.

Another important object of the invention is to provide a novel tab for securing a cap on a tube in such a manner as to form an auxiliary seal between the base of the cap and the tab to prevent leakage of surplus material from a sump therefor in the cap.

Another important object of the invention is to provide a bottle or collapsible tube closure have an inner seal and

2

exterior bead gripping fingers, the fingers being enclosed or formed integrally with an outer auxiliary sealing tube which projects below and cooperates with the lower surfaces of the fingers to prevent misalignment of the sealing tube and the neck of the bottle or collapsible tube.

Another object of the invention is to provide an improved bottle or tube cap which may be readily and economically manufactured and of long effective sealing life.

Other objects and advantages of the invention will become apparent during the course of the following description.

In the drawings I have disclosed several embodiments of my invention. In these showings:

Figure 1 is a perspective view of the bottle cap comprising the present invention in operative position upon a bottle;

Figure 2 is a top plan view thereof;

Figure 3 is a central vertical sectional view thereof;

Figure 4 is a bottom plan view of the bottle cap;

Figure 5 is a central vertical sectional view of the bottle cap in its unstressed condition when not in operative position upon a bottle;

Figure 6 is a central vertical sectional view of another form of the invention in operative and locked position upon a bottle;

Figure 7 is a perspective view of a bottle cap similar to Figure 1 showing its securing tab operatively positioned about the bottle neck;

Figure 8 is a view similar to Figure 7 showing the cap operatively positioned on a tube upon which it is retained by the securing tab;

Figure 9 is a central vertical sectional view of the tube cap of Figure 8 illustrating the cooperation of the holding fingers with the tapered bead of the tube;

Figure 10 is a central vertical sectional view of a modified form of the cap showing the skin closing the side slits of the cap and projecting therebelow for guiding purposes;

Figure 11 is a bottom plan view of the cap and securing tab disclosed in Figure 10;

Figure 12 is a side elevational view of the cap of Figures 10 and 11 showing it in operative position on a collapsible tube, etc. with the skirt of the cap in sealing engagement with the surface of the securing tab;

Figure 13 is a bottom plan view of a modified form of the cap shown in Figure 11;

Figure 14 is a central vertical sectional view of a further modification of the cap of Figure 11;

Figure 15 is a bottom plan view thereof; and

Figure 16 is horizontal sectional view thereof showing the rectangular distortion of the cap as its gripping fingers are spread by the bead of a tube or bottle as the cap is placed on or removed from its operative sealing position.

Referring to the drawings, numeral 10 designates the bottle cap as a whole which is entirely of plastic material and may be molded in a die by compression or injection molding. I have determined that solid ethylene polymer, when molded into the structure to be described, is particularly well adapted for the purpose in that it combines strength and substantial stiffness with resilience, resumes its original shape after temporary distortion, and having a lower coefficient of friction, for example, than rubber, it may readily be snapped on or off a bottle neck. Accordingly, my bottle cap is preferably formed of solid ethylene polymer or other thermo plastic having substantially the same characteristics.

The plastic cap 10 comprises a thin flat top 12, a depending open-ended sealing tube 14 formed centrally of and integral therewith, and a depending bead-engaging annular skirt 16. The tube 14 tapers slightly toward its open end which is beveled as at 18 to facilitate its insertion in a bottle, and its circumference adjacent the top 12 is slightly larger than the mouth of the bottle to be capped thereby.

The outer surface of the skirt 16 flares downwardly and outwardly from the top 12 while the inner surface conforms to the shape of the neck of the bottle B and its annular bead 20. It is to be noted that the space between the tube 14 and the skirt 16 is slightly smaller than the beaded neck of the bottle when the cap is not positioned thereon (Figure 5) so that when the cap is in operative position upon a bottle (Figure 3), the tube 14 is radially compressed and the skirt flexed radially outwardly as will be more fully described.

The cap 10 is retained upon the bottle neck by the inwardly directed annular bead 22 of the skirt 16 which is permitted to flex sufficiently for removal of the cap by the provision of a plurality of circumferentially spaced slits 23 which thus form the bead 22 into a plurality of substantially stiff but sufficiently resilient fingers 24 for engagement under the bottle bead 20. The bottom surfaces of the fingers 24 curve inwardly and upwardly as at 25 to assist in centering the cap upon the bottle neck. It is to be noted that the fingers 24 terminate as at 26 at a point below the major diameter of the bottle bead 20 so that removal of the cap requires a slight flexing or distortion of the solid portion of the skirt 16.

In order that the removal of the cap 10 may be readily effected, one of the fingers 24 is thickened and extended outwardly so as to form a removal tab 28. As will be apparent, upward pressure of the thumb on the bottom of the tab will displace the cap from the bottle.

In the use of the cap 10 for the resealing of beverage bottles, etc., the cap is positioned over and on the bottle mouth where it is more or less automatically centered by the upward and inwardly curving bottom surfaces 25 of the resilient fingers 24. Downward pressure upon the cap now causes the beveled end 18 of the sealing tube to enter the mouth of the bottle B which it closely fits. The slight taper of the outer surface of the tube 14 effects a pressure tight seal between the sides adjacent the top 12 and the inner surface of the bottle neck. As the tube 14 is pressed into sealing engagement with the bottle mouth, the bead 22 on the fingers 24 is snapped over the bead 20 on the bottle neck to retain the cap thereon with a grip well in excess of that which is necessary to withstand the maximum gaseous and/or liquid pressure which the bottle can stand without shattering.

An important feature of this combined plug and cap type bottle cap construction resides in its self reinforcing characteristics. When in sealing position upon a bottle the cap is in a stressed condition (Figure 3) as contrasted with its unstressed position as shown in Figure 5. In the sealing position, the bottle neck and bead 20 forces the skirt 16 and its gripping fingers 24 radially outward as stated, and about the top of the bottle as a fulcrum tending to urge the tube 14 more tightly against the inner side of the mouth of the bottle. This also forces the outer annular surface of the cap 12 to incline downwardly and radially inward as indicated at X. The tube 14 is further more tightly seated due to its taper so that a leak proof seal for gas or liquid is thus effected.

At the same time, the radial compression of the sides of the tube 14 causes the central portion of the cap 12, indicated at Y, to bow up into a crown which stresses are dissipated throughout the cap and, in turn, tend to force the skirt 16 and its fingers 24 more tightly against the bottle neck. It will be noted that these forces and the sealing action of the tube 14 are increased by liquid or gaseous pressure acting within the tube 14.

Thus a perfect seal is effected by the tube 14 which is

retained in position by the skirt and its fingers 24, the tube and skirt each functioning to assist the function of each other due to the stresses set up by their design. Due to the stiffness of the plastic and its low coefficient of friction with glass, the cap is readily removed by upward pressure of the thumb on the tab 28 whereupon it returns to the unstressed condition shown in Figure 5.

A slightly modified form of the invention is disclosed in Figure 6 wherein the junction of the top 12 and skirt 16 has been beveled as at 30 to facilitate the positioning of a locking ring 32 about the cap. In all other respects, this embodiment is identical with the embodiment shown in Figures 1-5 inclusive which is adapted for the resealing of bottles, etc., after the original and conventional crown cap has been removed. The cap and locking ring shown in Figure 6 is particularly intended to be used in connection with the original bottling and capping of beverages as it cannot be accidentally displaced in transit although it may also be used subsequent thereto for recapping and locking.

In its use, the locking ring 32 may, manually or by capping machinery, be readily positioned over the cap 10 due to the beveled surfaces 30 and moved downwardly into firm engagement with the surface of the flared skirt fingers 24. Due to the relatively soft nature of the surface of the solid ethylene polymer of which the cap is made, the ring 32 is self seating therein and will retain its locking position until it is physically forced upwardly.

It is to be noted that the ring 32 does not force the fingers 24 into engagement with the bead 20, but merely locks them in this position. Removal of the ring permits the fingers to flex outwardly when the tab 28 is pushed upwardly to remove the cap.

Another modified form of the invention is disclosed in Figure 7 wherein the tab 28 extends radially outward from the top of the cap instead of being integral with one of the skirt fingers 24. To prevent misplacing of the cap 10 when not in sealing position on a bottle, it is provided with a securing tab 34 formed integrally therewith and also extending radially therefrom diametrically opposite the removal tab 28.

The securing tab 34 terminates in a loop or eyelet portion 36 which is adapted to be placed over the neck of a bottle B to a position below and engaging the neck shoulder 21 over which it is stretched. When it is desired to dispense materials from the bottle B, the cap 10 is displaced by upward pressure on the tab 28 whereupon the natural resilience of the material of the tab 34 will swing the cap away from the mouth of the bottle. The cap is thereafter replaced by pressing it back into sealing position with the palm of the hand or merely a thumb.

The cap is readily adapted for use as the closure for a collapsible tube T containing plastic materials as shown in Figures 8 and 9. The tube T is provided with a double or reverse taper 38 adjacent the outer end of its neck instead of a bead 20. It has been found that the angle of these tapers—approximately 25 degrees and 45 degrees (as indicated respectively at 37 and 39) with respect to the longitudinal axis of the tube—affords better results than the bead from a standpoint of ready positioning of the cap 10 upon the bead, holding power of the skirt fingers 24, and ready removal of the cap for the dispensing of the contents of the tube T. The surfaces 37 and 39 are substantially planar although actually gently arcuate.

The inner face of the skirt 16 conforms with the angular taper or bead 38 and the function and operation of the cap is the same as in the previously described forms. It will be noted that the length of the neck of the tube is equal to the height of the cap 10 plus the thickness of the loop 36. That is the loop 36 engages the base of the tube neck N and the base of the cap when in sealing position on the tube T, engages the loop 36. The loop has a flat upper surface (Figure 9) and this acts as

an auxiliary seal for the cap and prevents the entrance of dust, etc. Being in stretched condition when on the tube neck N, the flat surface of the loop 36 will be outwardly and somewhat downwardly inclined as shown. The base of the cap when in sealing position further inclines the surface of the loop so that it is maintained in tension thereagainst.

It will be readily apparent—if for example, the plastic material in the tube is toothpaste—that the tube T may be held in one hand, the cap 10 flipped back with the thumb, and toothpaste squeezed onto a brush. Thereafter the cap may be swung back into sealing position by the same thumb whereby a very handy one handed dispensing is thus effected.

An important feature of the invention is disclosed in Figures 7-16 inclusive wherein the upward angle of the bottom surfaces of the fingers 24 is approximately 25 degrees so that these surfaces are parallel with the surfaces 37. This angle may vary from 20 to 30 degrees and acts to ensure perfect alignment of the cap when placed on the mouth of the tube neck N, thus avoiding damage to the sealing tube 14 when the cap is pressed into sealing position; the tapered surfaces of the fingers and the angular bead 39 automatically and perfectly aligning the cap and neck.

As shown at 27, the outer edge of each finger 24 has a depending skirt portion which engages and guides the maximum diameter portion of the angular bead during seating of the cap to further ensure perfect alignment thereof with the neck N.

It sometimes occurs that plastic material projects from the mouth of the tube T after the desired amount has been expelled as a result of involuntary squeezing of the tube after use, or by the holding portions of the apparatus for originally placing the caps and securing tabs upon the tubes. In such situation, the surplus plastic material will be caught inside the cap 10 and, when the latter is moved to sealing position, will be forced down through the cap and out the slits 23. This unsightly extrusion between the skirt fingers 24 is undesirable not only from an appearance standpoint but from a standpoint of cleanliness.

As seen in Figures 10-12 inclusive, the skirt 16 of the cap 10 has been modified so as to close the radially outer end of the slits 23. It will be noted that the slits 23 thus terminate short of the periphery of the skirt 16 (Figure 11) so that in effect, the fingers 24 are surrounded by a thin skin 42. Two important results are thereby obtained.

The unsightly extrusion of plastic material mentioned above is eliminated as the slits are closed and the bottom of the cap forms an auxiliary seal with the top surface of the loop 36. Any material that slips through the seal 40 (Figure 12) before the cap is fully seated may, of course, be readily wiped away. Secondly, the cap 10 is strengthened by the unslit skin portion 42 of the skirt 16 without overly stiffening the fingers 24 which still readily perform their function.

A further modification of the invention is disclosed in Figure 13 wherein approximately the inner half of alternate skirt fingers is omitted during molding of the cap as indicated at 44. As a result, the cap 10 so formed is retained on the tube by the engagement of only half (four shown) of the skirt fingers 24 with the angular bead 38. The cap itself maintains adequate resilience and the strength inherent in the full and half size skirt fingers. The cut away portions of the skirt fingers form a plurality of sumps 45 which catch any surplus material ejected inadvertently and eliminates much of the surplus material which may otherwise slip past the seal 40 before the cap is fully seated.

Another and preferred embodiment of the invention is disclosed in Figures 14-16 inclusive wherein all of the alternate skirt fingers are omitted so as to leave only half the bead gripping fingers 24 all connected by the skin

42 or unslit lower portion of the skirt 16. The advantages of this form of the invention over other forms comprise adequate bead gripping power of the remaining skirt fingers, an increase in the sump capacity, and a maximum of resilience for the temporary distortion necessary in attaching or removing the tube cap accompanied by adequate strength present in the fingers 24 and in the skin 42, a saving in the plastic material used being thus effected.

The manner of distortion of the cap 10 during use of the cap to and from sealing position is illustrated in Figure 16 wherein the use of four gripping fingers 24 is shown. It will be noted that the flexibility of this construction results in a generally rectangular transverse distortion of the cap as shown by the stretched and hence flattened skin portions 42, the external configuration of the gripping fingers 24 remaining arcuate.

It will now be appreciated that the present invention provides a highly improved closure for bottles, jars, etc., which may be economically manufactured, is strong and tough yet sufficiently resilient and which combines highly effective sealing and position-retaining structure so as to be self-reinforcing while being readily applicable to or removable from bottles.

Furthermore, the combination of the surface of the retaining tab with the base of the cap to form an auxiliary seal, the use of a skin or closed slits in combination with the flexible gripping fingers for the tube angular bead, the angular bead per se, and the spacing of the fingers all combine with the unique cap structure to form a superb and novel closure for bottles, tubes, jars, etc. with an indefinitely extended life, this being insured by the aligning function of the bottom of the fingers and the skirt portions 27 which project therebelow.

The term "container" as used in the specification and claims is intended to include any receptacle having a bead on its neck or susceptible of having a bead formed thereon with which the gripping fingers of the described cap may cooperate to retain the cap in sealing position upon the container.

It is to be understood that the forms of my invention herewith shown and described are to be taken as preferred examples of the same and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoining claims.

I claim:

1. A closure of plastic material having the stiffness and resilience characteristics of polyethylene and adapted to be applied to containers having a neck bead comprising a top having a centrally positioned tapered tube depending therefrom for sealing engagement with the inner sides of a container mouth, and a skirt depending from said top and including a plurality of gripping fingers conforming with and engaging the lower portion of said bead, said fingers being closely spaced by slits formed in said skirt vertically at spaced points about its circumference to points adjacent the maximum diameter of the bead whereby the solid portion of said skirt engages the upper and maximum diameter portion of said bead, the spacing of said tube and skirt being less than the thickness of the container neck and bead whereby while positioned on a container, said tube and said skirt act thereagainst to increase their sealing and gripping actions respectively, the bottom surfaces of said fingers being below said tube and parallel to the portions of said cap which conform to the upper surface of said bead to effect alignment before contact of said tube and mouth when positioning said cap on said container.

2. A closure as recited in claim 1 wherein the bottom edge of said skirt depends below said fingers to alignably engage the major diameter of said bead.

3. A closure as recited in claim 1 wherein said bead comprises upper and lower substantially plane intersect-

ing surfaces inclined at 25 and 45 degrees respectively with respect to the longitudinal axis of the cap.

4. A closure of plastic material having the stiffness and resilience characteristics of polyethylene and adapted to be applied to containers having a neck bead comprising a top having a centrally positioned tapered tube depending therefrom for sealing engagement with the inner sides of a container mouth, and a skirt depending from said top and including a plurality of gripping fingers conforming with and engaging the lower portion of said bead, said fingers being closely spaced by slits formed in said skirt vertically at spaced points about its circumference to points adjacent the maximum diameter of the bead whereby the solid portion of said skirt engages the upper and maximum diameter portion of said bead, the spacing of said tube and skirt being less than the thickness of the container neck and bead whereby while positioned on a container, said tube and said skirt act thereagainst to increase their sealing and gripping actions respectively, the bottom surfaces of said fingers being below said tube and the bottom edge of said skirt depending below said fingers to effect alignment before contact of said tube and mouth when positioning said cap on said container.

5. A closure of plastic material having the stiffness and resilience characteristics of polyethylene and adapted to be applied to bottles having a neck bead comprising a top having a centrally positioned tapered tube depending therefrom for sealing engagement with the inner sides of a container mouth, and a skirt depending from said top and including a plurality of gripping fingers conforming with and engaging the lower portion of said bead, said fingers being closely spaced by slits formed in said skirt vertically at spaced points about its circumference to points adjacent the maximum diameter of the bead whereby the unslit portion of said skirt engages the upper and maximum diameter portion of said bead, the spacing of said tube and skirt being less than the thickness of a container neck and bead whereby while positioned on a container, whereby said tube and said skirt act thereagainst to increase their sealing and gripping actions respectively, said bead comprising substantially plane upper and lower intersecting surfaces inclined at 25 and 45 degrees respectively with respect to the longitudinal axis of the cap, the bottom surfaces of said fingers being below said tube to prevent contact of the latter with said neck before alignment therewith.

6. A closure of plastic material having the stiffness and resilience characteristics of polyethylene and adapted to be applied to containers having a neck bead comprising a top having a centrally positioned tapered tube depending therefrom for sealing engagement with the inner sides of a container mouth, and a skirt depending from said top and including a plurality of gripping fingers conforming with and engaging the lower portion of said bead, said fingers being closely spaced by slits formed in said skirt vertically at spaced points about its circumference to points adjacent the maximum diameter of the bead whereby the solid portion of said skirt engages the upper and maximum diameter portion of said bead, the spacing of said tube and skirt being less than the thickness of a container neck and bead whereby while positioned on a container, said tube and said skirt act thereagainst to increase their sealing and gripping actions respectively, said slits terminating short of the outer surface of the skirt to form reinforcing skin thereby, the bottom surfaces of said fingers being below said tube to prevent contact of the latter with said neck before alignment therewith.

7. A closure as recited in claim 6 wherein a portion of alternate gripping fingers is omitted adjacent the neck to form a sump for surplus material between each of the remaining portions, the neck, and adjacent fingers.

8. A closure as recited in claim 6 wherein alternate gripping fingers are omitted from said skirt to increase

its flexibility and form a laterally closed sump for surplus material between said skin, said neck, and adjacent fingers.

9. A closure of plastic material having the stiffness and resilience characteristics of polyethylene and adapted to be applied to containers having a neck bead comprising a top having a centrally positioned tapered tube depending therefrom for sealing engagement with the inner sides of a bottle mouth, and a skirt depending from said top and including a plurality of gripping fingers conforming with and engaging the lower portion of said bead, said fingers being closely spaced by slits formed in said skirt vertically at spaced points about its circumference to points adjacent the maximum diameter of the bead whereby the solid portion of said skirt engages the upper and maximum diameter portion of said bead, the spacing of said tube and skirt being less than the thickness of a bottle neck and bead whereby while positioned on a bottle, said tube and said skirt act thereagainst to increase their sealing and gripping actions respectively, the alternate gripping fingers being omitted from said skirt to increase its flexibility, the bottom edge of said skirt depending below said fingers to effect alignment of said tube and mouth when positioning said cap on said container, the bottom surfaces of said fingers being below said tube to prevent contact of the latter with said neck before alignment therewith.

10. A closure of plastic material having the stiffness and resilience characteristics of polyethylene and adapted to be applied to containers having a neck bead comprising a top having a centrally positioned tapered tube depending therefrom for sealing engagement with the inner sides of a container mouth, a flared skirt depending from said top and including a plurality of gripping fingers conforming with and engaging the lower portion of said bead, said fingers being closely spaced by slits formed in said skirt vertically at spaced points about its circumference to points adjacent the maximum diameter of the bead whereby the solid portion of said skirt engages the upper and maximum diameter portion of said bead, the spacing of said tube and skirt being less than the thickness of a container neck and bead whereby while positioned on a container, said tube and said skirt act thereagainst to increase their sealing and gripping actions respectively, and a securing tab formed integrally with and projecting from said cap and terminating in a loop adapted to encircle the neck of the container, said slits terminating short of the outer surface of said skirt to form a reinforcing skin thereby, a portion of alternate gripping fingers being omitted adjacent said neck to form a sump for surplus material between each of the remaining portions, the neck, and adjacent fingers, the bottom edge of said skirt engaging the upper surface of said loop to close the bottom of said sump, the bottom surfaces of said fingers being below said tube to prevent contact of the latter with said neck before alignment therewith.

11. A closure of plastic material having the stiffness and resilience characteristics of polyethylene and adapted to be applied to containers having a neck bead comprising a top having a centrally positioned tapered tube depending therefrom for sealing engagement with the inner sides of a container mouth, a flared skirt depending from said top and including a plurality of gripping fingers conforming with and engaging the lower portion of said bead, said fingers being closely spaced by slits formed in said skirt vertically at spaced points about its circumference to points adjacent the maximum diameter of the bead whereby the solid portion of said skirt engages the upper and maximum diameter portion of said bead, the spacing of said tube and skirt being less than the thickness of a container neck and bead whereby while positioned on a container, said tube and said skirt act thereagainst to increase their sealing and gripping actions respectively, and a securing tab formed integrally with and projecting from said cap and terminating in a loop adapted to encircle the neck of the container, said slits terminating short of the outer surface of said skirt to form a re-

inforcing skin thereby, alternate gripping fingers being omitted from said skirt to form a radially closed sump between said skin, said neck, adjacent fingers, the bottom edge of said skirt engaging the upper surface of said loop to close the bottom of said sump the bottom surfaces of said fingers being below said tube to prevent contact of the latter with said neck before alignment therewith.

5

References Cited in the file of this patent

UNITED STATES PATENTS

10

1,158,622 Blakeslee ----- Nov. 2, 1915

1,924,242

2,109,805

2,168,822

2,587,327

2,669,369

662,500

Kaye ----- Aug. 29, 1933

Stewart ----- Mar. 1, 1938

Fink ----- Aug. 8, 1939

Jesnig ----- Feb. 26, 1952

Towns ----- Feb. 16, 1954

FOREIGN PATENTS

Great Britain ----- Dec. 5, 1951