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P. T. SCHURMAN ETAL

3,133,661

HINGED PLASTIC CLOSURE FOR CONTAINERS

Filed Oct. 15, 1962

FIG. 1.

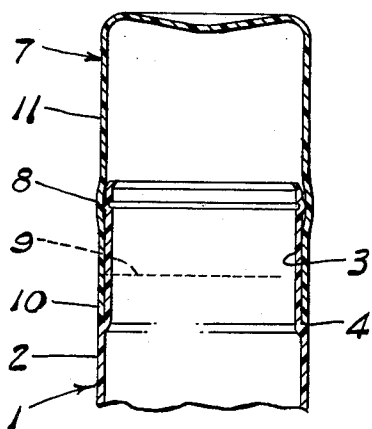


FIG. 2.

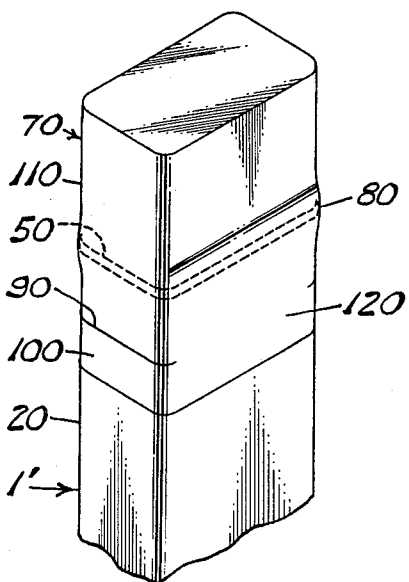
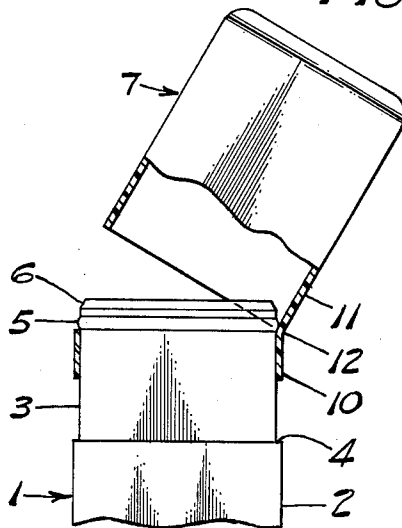


FIG. 4.

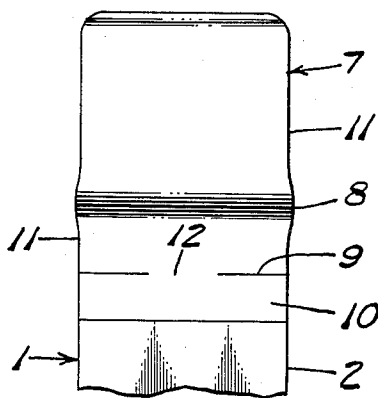


FIG. 3.

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HINGED PLASTIC CLOSURE FOR CONTAINERS
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This invention relates to a new and useful hinged plastic closure for containers of plastic material.

The primary object of our invention is to provide a thermoplastic closure and container construction wherein the closure is hinged on the container for opening and closing movement without separation therefrom while producing a tight seal therebetween and providing a closed container of smooth, substantially continuous side wall form.

Another object of our invention is to provide a hinged plastic closure and container as aforesaid, arranged for shifting of the hinge axis lengthwise of the container to facilitate opening and closing of the closure about such axis.

In one aspect thereof, a hinged plastic closure of our invention is characterized by the combination, with a container of thermoplastic material having a main body and a reduced end forming a shoulder at the juncture therebetween, the reduced end having an enlarged bead therearound in spaced relation to the shoulder, of a closure of thermoplastic material having a distensible side wall slip-fitting over the reduced end of the container, the closure side wall being distended by the container bead and being transversely partially severed to provide a collar joined to a cap by the unsevered part of the closure side wall as a hinge, the collar seating against the shoulder and the cap being distended by the bead and contracting about the reduced end of the container to seat against the collar when the closure is fully seated on the container, the collar being slideable along the container reduced end toward the bead to shift the hinge axis and thereby facilitate opening and closing movement of the closure cap thereabout.

The foregoing and other objects, advantages and characterizing features of our invention will become clearly apparent from the ensuing detailed description of two presently contemplated, illustrative embodiments thereof, taken in conjunction with the accompanying drawing illustrating the same wherein like reference numerals denote like parts throughout and wherein:

FIG. 1 is a fragmentary, longitudinal sectional view of a hinged plastic closure of our invention in its fully seated position on a plastic container;

FIG. 2 is a fragmentary view thereof, partly in elevation and partly in section, illustrating the operation of the closure when it is desired to open the container;

FIG. 3 is a fragmentary, side elevational view thereof, taken at about a right angle to FIG. 1; and

FIG. 4 is a fragmentary perspective view of a flat-sided closure of our invention.

The hinged closure of our invention is made of any suitable thermoplastic material possessing sufficient elasticity to provide the desired seal with the container as more fully described hereafter. Polyethylene, polyvinyl, and elastomeric polyolefin are examples of materials suitable for the intended purpose. The closure is intended for use on a container also made of a thermoplastic material. The container can be made of the above noted materials, and polypropylene and polystyrene are further examples of materials suitable for the container.

Referring first to the embodiment of FIGS. 1-3, there is shown a hinged closure of our invention, generally designated 7, applied to the otherwise open, outer end

of a container 1. Container 1 has a main body portion 2 and a reduced diameter end portion 3 extending from main body portion 2 and forming an outwardly, upwardly facing peripheral shoulder or ledge 4 around container 1 at the juncture of end portion 3 and main body portion 2. In the illustrated embodiment, outer diameter of reduced end 3 is identical or nearly identical to the inner diameter of main body 2, whereby the width of ledge 4 is equal or substantially equal to the wall thickness of main body portion 2.

Reduced end portion 3 is provided with an enlarged, outwardly projecting, annular bead formation 5 extending completely therearound, in spaced relation to ledge 4, for distending closure member 7 as will be described. If desired, the outer end 6 of reduced end 3 can be tapered, as shown, to facilitate slip-fitting closure 7 thereon.

Closure 7 is in the form of a cap or cover having a side wall in the form of an annular skirt of substantially the same cross-sectional dimensions as main body portion 2 of container 1. That is, the inner and outer diameters of the closure side wall are identical, or nearly identical to the corresponding dimensions of container main body 2, in the illustrated embodiment. As a result, the wall thickness of the closure skirt is the same or nearly the same as the width of ledge 4, whereby the closure skirt comprises a substantially uninterrupted continuation of container main body 2. The outer diameter of reduced end portion 3 being the same or nearly the same as the inner diameter of main body 2, the closure side wall closely slip-fits about the container end 3 and is distended in passing over bead 5, as shown at 8 in FIGS. 1 and 3.

It is a particular feature of our invention that the closure 7 is hinged, to permit uncovering of the container without separating the closure therefrom. To this end, the closure side wall is transversely partially severed, as indicated at 9 in FIGS. 1 and 3, around a major portion of its periphery. The line of severing thereby defines a collar portion 10 at the outer end of closure 7, and a cap portion 11, the collar 10 and cap 11 being joined by the unsevered closure side wall portion providing a hinge as indicated at 12 (FIGS. 2 and 3).

The closure collar 10 is positioned on reduced end 3 of container 1 between ledge 4 and bead 5. While the collar 10 is slip-fitted over bead 5 when closure 7 is first assembled on the reduced end 3 of container 1, being part of the container side wall and therefore distensible for this purpose, it thereafter remains confined on the reduced end 3 between ledge 4 and bead 5 during normal use. When closure 7 is in its fully seated position on container end 3, collar 10 is seated against ledge 4 and cap 11 extends across bead 5, being distended thereby, and contracts about container end 3 in the region between bead 5 and collar 10, seating against the latter as shown in FIGS. 1 and 3.

Closure cap 11 is distended completely around its periphery by bead 5, to insure a seal sufficiently tight as to render the container water-tight so long as the container is not unduly distorted. In addition, it secures closure 7 in position on container 1. While the closure cap can readily be removed, by deliberately slipping it off the container end 3 as hereafter described, it is securely held in closed position against inadvertent or accidental displacement.

Bead 5 is spaced from ledge 4 a distance sufficient to enable the cap portion 11 to lay back and contract about the reduced end portion 3 in the region between bead 5 and ledge 4. A distance on the order of three-eighths of an inch, or more, will suffice for this purpose. The memory characteristic of the thermoplastic material causes the closure cap 11 to contract about container end 3, after passing over and being distended by bead 5. As

a result, closure cap 11 is alined with collar 10 and seats thereagainst, with the collar 10 seating against ledge 4, when the closure is in fully seated position.

The identity, or substantial identity in outer diameter of the container main body 2 and the closure side wall, at the juncture therebetween, and the contraction of container cap 11 about end 3 after being distended by bead 5 causes the closure to comprise a continuation of the container main body. This provides the fully closed container with a smooth, substantially continuous outer wall, producing a pleasing appearance. The distension 9, although sufficient to provide a tight seal, blends smoothly with the adjacent side wall area and is so slight as to be barely perceptible.

When it is desired to open the container, closure cap 11 is swung about the axis of hinge 12, over bead 5. The spacing between bead 5 and collar 10, provided to permit contraction of cap 11 about end 3 after distension by bead 5, tends to interfere with such passage of cap 11 over bead 5, with increased spacing presenting increased interference. Therefore, it is a particular feature of our invention that collar 10 is slidable along the reduced end 3 to shift the hinge axis closer to bead 5. Closure cap 11 is swung about the axis of hinge 12 simultaneously with sliding of collar 10 toward bead 5 to open the container. In the cylindrical form of FIGS. 1-3, the closure 7 can be turned around and along end 3 to facilitate this action.

Thus, it is seen that our invention fully accomplishes its intended objects, and provides a hinged closure having utility on containers adapted for a wide variety of purposes. Where a flat-sided container and closure is desired, that is readily provided as illustrated in FIG. 4.

In this embodiment, container 1' has a main body 20 and a reduced end adapted to receive a closure 70 in the same manner as closure 7 is received on the reduced end 3 of container 1. Closure 70 is partially severed, along line 90, to provide a collar 100 and cap 110 hinged thereto by the unsevered portion 120, as before. With this construction, the hinged cap portion 110 slip-fits across and is distended by the peripheral bead 50 on the reduced end portion of the container, as indicated at 80, and collar 100 is slidable along the reduced end between the ledge and bead 50, to shift the hinge axis. Except for its flat-sided form, the hinged closure and associated container of FIG. 4 are identical in construction and operation with the embodiment of FIGS. 1-3.

The unsevered portion of the closure side wall comprising the hinge can be formed to provide a reduced wall thickness, thereby to facilitate the hinging action. Alternately, it can be notched, either during or after molding of the closure, for the same purpose.

Having fully disclosed and completely described our invention, and its mode of operation, what we claim as new is:

1. A hinged plastic closure for containers comprising,

in combination with a container of thermoplastic material having a main body portion and a reduced end portion forming a ledge around said container at the juncture between said portions, said reduced end portion having an outwardly projecting bead therearound in spaced relation to said ledge, a closure of thermoplastic material having a distensible side wall of substantially the same cross-sectional dimensions as said ledge slip-fitting onto said container reduced end portion, said closure side wall being transversely partially severed to define a collar portion and a cap portion joined by the unsevered portion of said side wall as a hinge, said collar portion seating against said ledge and said cap portion being distended by said bead and contracting about said reduced end portion between said collar portion and said bead when said closure is fully seated on said container, said collar portion sliding along said reduced end portion toward said bead to facilitate opening and closing movements of said cap portion about the axis of said hinge.

2. A hinged plastic closure for containers comprising, in combination with a container of thermoplastic material having a main body portion and a reduced end portion providing a ledge around said container, said ledge having a width substantially equal to the wall thickness of said main body portion at said ledge and said reduced end portion having an enlarged peripheral bead therearound in spaced relation to said ledge, a closure of thermoplastic material having a distensible side wall of substantially the same cross-sectional dimensions as said container main body portion at said ledge, said closure side wall slip-fitting onto said container reduced end portion and being transversely partially severed to provide a collar portion joined to a cap portion by the unsevered portion of said side wall as a hinge, said collar portion seating against said ledge and said cap portion being distended by said bead and contracting about said reduced end portion between said bead and said collar portion to seat against the latter when said closure is in fully seated position on said container, said collar portion being slideable along said reduced end portion to said bead to facilitate opening and closing movements of said cap portion about the axis of said hinge.

3. The combination of claim 2 wherein said container reduced end portion is tapered at the outer end thereof.

4. The combination of claim 2, wherein said container and closure are of flat side wall form.

5. The combination of claim 2, wherein said container and closure are of curved side wall form.

References Cited in the file of this patent

UNITED STATES PATENTS

2,937,781 Leach ----- May 24, 1960