

Feb. 7, 1967

F. B. BUSCH ET AL

3,302,812

CONTAINER CLOSURE

Filed Aug. 23, 1965

FIG. 1

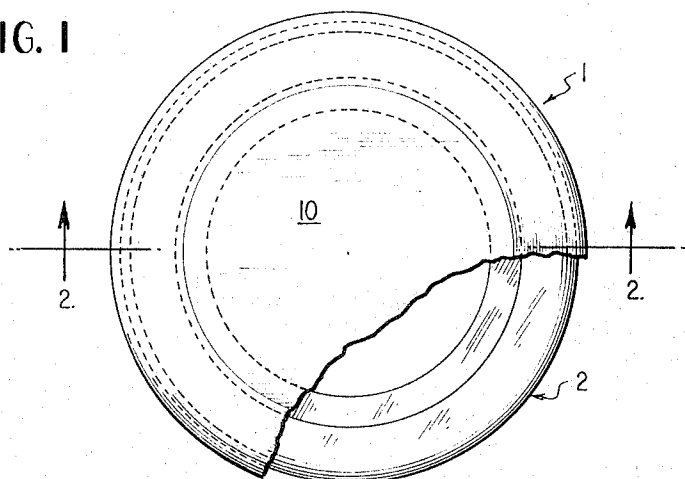


FIG. 2

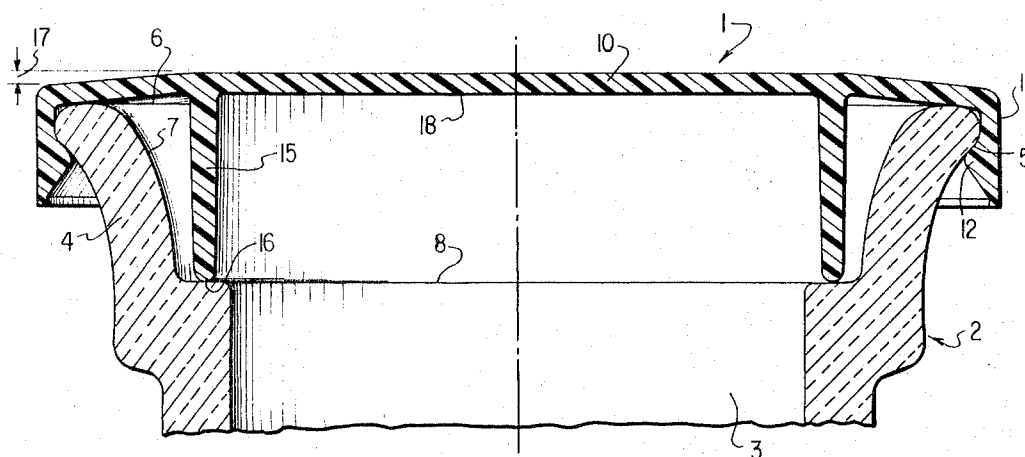
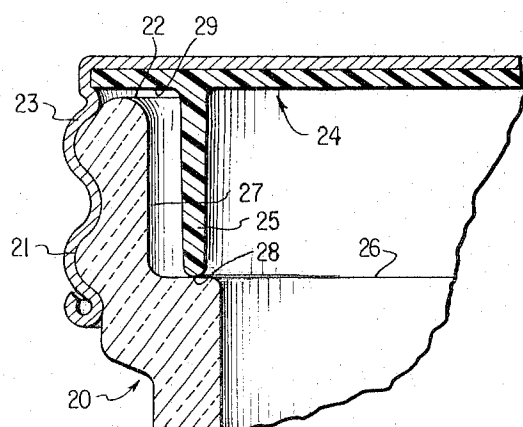


FIG. 3



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3,302,812

CONTAINER CLOSURE

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Filed Aug. 23, 1965, Ser. No. 481,618

11 Claims. (Cl. 215-40)

This invention relates to container closures, and more particularly to an improved closure for a container of the type having a recessed ledge formed on its inner surface adjacent the outlet.

Containers of the type having a recessed ledge formed adjacent their open end are well known, an example of such a container being the conventional milk bottle. Although numerous closure elements have been devised for such containers, the plug type cap, which includes a circular disc-shaped element pressed into the open end of the container to rest upon the recessed ledge, has met the most widespread acceptance. The circular disc portion of such caps have an outer diameter slightly larger than the internal diameter of the recessed portion of the container to thereby provide an interference fit to retain the closure on the container. The cylindrical disc may carry an upwardly extending portion which is formed around the open end and outer lip portion of the container or, alternatively, a second cover member may be employed to maintain the open top and outer lip portion in a clean, sanitary condition.

Plug type closures of the type described require a very accurate fit in order to maintain a seal. To assure this accurate fit, it is necessary to very carefully control the dimensions of the finished portion of the container as well as the dimension of the closure element. Further, a uniform pressure must be maintained around the container in order to maintain a seal, so that such a closure does not lend itself to use with container openings having other than a circular cross-section.

Therefore, it is a principal object of this invention to provide a closure for a container of the type having a recessed ledge adjacent its outlet, which closure forms a primary seal with said ledge.

Another object is to provide such a closure which forms a secondary seal with the open end portion of the container.

Another object is to provide a closure for such a container which does not require radial contact with the interior of the container to provide a seal.

Another object is to provide such a closure which includes an annular skirt projecting into the open end of the container to form a seal with the recessed ledge.

In the attainment of the foregoing and other objects an important feature of my invention resides in providing a closure molded from a resilient plastic material and including a substantially planar end panel having a size and shape substantially conforming to the open end of the container. The end panel is provided with a peripheral skirt having a bead formed on its inner surface in position to snap over a bead formed around the outside of the container to retain the closure on the container with the end panel engaging the open top of the container. A second skirt is formed on the end panel in inwardly spaced relation to the peripheral skirt in position to extend into the open end of the container and engage the ledge formed thereon, with the length of the second skirt being slightly greater than the distance from the ledge to the end of the container so that the ring will bear firmly on the ledge to form a primary seal. Preferably the length of the second skirt is such as to slightly dome the end panel when the closure is installed on the container to thereby cause the bead on the peripheral skirt to be drawn into tighter engagement with the bead around the outer surface of the container.

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Other objects and advantages of the invention will become apparent from the following specification, taken with the drawings in which:

FIG. 1 is a top plan view of a closure according to the present invention installed on the container, with parts of the closure broken away to more clearly disclose other parts;

FIG. 2 is a sectional view taken on line 2-2 of FIG. 1; and,

FIG. 3 is a fragmentary sectional view similar to FIG. 2 showing an alternate embodiment of the invention.

Referring now to the drawings in detail, a closure according to the present invention, illustrated generally by the reference numeral 1, is shown installed on a container indicated generally by the reference numeral 2. In the embodiment of the invention illustrated in FIG. 2, the container is shown as being a conventional glass milk bottle having a hollow cylindrical neck portion 3 terminating in an enlarged open end portion 4 and having an annular bead 5 extending around the outer surface thereof adjacent open top 6. The enlarged end portion 4 is formed with an enlarged coaxial recess extending from the open end 6, to provide side walls 7 of a diameter larger than the hollow neck portion 3, and terminates in a substantially horizontal ledge 8 parallel to and spaced a fixed distance below the top surface of open end 6.

Closure fitment 1 includes an end panel 10 having a size and shape substantially conforming to the size and shape of the open end of the container, as shown in FIG. 1, and an integrally molded downwardly depending skirt 11 formed with an annular bead 12 on its inner surface. Bead 12 is spaced below panel 10 in position to snap over the annular bead 5 when the closure is installed on the container, as illustrated in FIG. 2.

A second annular skirt 15 is integrally molded with end panel 10 and depends downwardly therefrom in inwardly spaced relation to peripheral skirt 11. Skirt 15 is positioned on panel 10 to depend into the enlarged recessed portion of container 2, in inwardly spaced relation to the side wall 7 thereof, to engage horizontal ledge 8 when the closure is installed on the container. Preferably the length of the second skirt 15 is slightly greater than the fixed distance between the open end portion 6 and ledge 8 so that, when the closure is installed on the container, the lower edge 16 of skirt 15 will be maintained in firm engagement with ledge 8 to provide a primary seal therebetween.

The closure is integrally molded from a slightly resilient plastic material so that end panel 10 will be domed slightly, as illustrated at 17, as a result of the second skirt 15 bearing on ledge 8. This doming action of end panel 10 causes the peripheral skirt 11 to be drawn inwardly to cause a more firm engagement between beads 12 and 5 to thereby maintain a secondary seal between the under surface 18 of panel 10 and the top surface 6 of the container.

In the embodiment shown in FIG. 3, container 20 is shown as having screw threads 21 formed around its outer surface adjacent the open end 22. The closure includes a threaded metallic cap member 23 of conventional construction and having a molded plastic insert 24 fitted therein. An annular skirt 25 is integrally molded with the insert 24 and depends downwardly therefrom in inwardly spaced relation to the threaded skirt portion of metallic cap member 23 to engage horizontal ledge 26 and form a primary seal therewith at a point spaced inwardly from the side walls 27 of the recessed portion of the container finish. The skirt 25 is slightly longer than the distance from the open end 22 of the container and the ledge 26 so that, when the lower edge 28 of skirt 25 makes initial contact with ledge 26, the under surface 29 of the insert 24 is spaced slightly above the open top 22 of the container. However, upon further turning of lid 23 in a direction to tighten the closure on the container, skirt 25

will be compressed to form a positive primary seal with ledge 26 and a secondary seal by the engagement of the open top 22 of the container 20 with the under surface 29 of the insert 24.

From the above, it is seen that we have provided an improved closure member for use with a container of the type having a recessed ledge formed on its inner surface adjacent the open end and which provides a primary seal as a result of axial pressure between the closure and the recessed ledge. Since the closure does not depend on an interference fit between an external surface of the closure and an internal surface of the container, the closure can readily be adapted for use with containers having various cross-sectional shapes. Since the closure is integrally molded from a resilient plastic material, the usual close manufacturing tolerances are not required in order to maintain the seal. Further, the closure may be employed with containers formed from various materials including glass, molded plastic, or the like, and may be repeatedly removed and reinstalled on the container without damage to the sealing surface.

While we have disclosed preferred embodiments of our invention, we wish it understood that we do not intend to be restricted solely thereto, and that we do not intend to include all embodiments thereof which would be apparent to one skilled in the art and which come within the spirit and scope of our invention.

We claim:

1. In combination, a container having a neck portion terminating in an open end, an enlarged coaxial recess formed in said neck portion extending from said open end and terminating in a substantially flat horizontal ledge at a fixed distance from said open end, means formed on the outer periphery of said neck for engaging and releasably retaining a closure fitment, said closure fitment including a substantially planar end panel having a size and shape generally conforming to the size and shape of said open end of said neck, a peripheral skirt depending downwardly from the outer edge of said end panel, means on the inner surface of said peripheral skirt for engaging said closure retaining means for releasably retaining said closure fitment on said open end, and a second skirt integrally formed from the same homogeneous mass of material with said end panel, said second skirt being tubular in shape and depending downwardly from said end panel in inwardly spaced relation to said peripheral skirt in position to engage said ledge when said closure is installed on said container, said second skirt being positioned on said end panel to depend into said coaxial recess in inwardly spaced relation to the side walls thereof along the full length of said recess.

2. The invention according to claim 1 wherein the length of said second skirt is slightly greater than said fixed distance, said end panel and said ledge cooperating to apply an axial compressive load to said second skirt when said closure is installed on said container to thereby maintain a seal between said second skirt and said ledge.

3. The invention according to claim 2 wherein said second skirt is formed from a resilient plastic material to permit limited resiliently resisted shortening of said skirt as a result of said compressive load.

4. The invention according to claim 2 wherein said end panel is formed from a resilient plastic material and is deflected upwardly by said axial compressive load in said second skirt.

5. The invention according to claim 1 wherein said peripheral skirt is integrally formed on said end panel.

6. In combination, a container having a neck portion terminating in an open end, an enlarged coaxial recess formed in said neck portion extending from said open end and terminating in a substantially flat horizontal ledge at a fixed distance from said open end, an outwardly extending bead formed on the outer periphery of said neck and spaced from said open end for engaging and releasably retaining a resilient plastic closure fitment, said closure

fitment including a substantially planar end panel having a size and shape generally conforming to the size and shape of said open end of said neck, a peripheral skirt integrally formed on and depending downwardly from the outer edge of said end panel, an inwardly extending bead formed on the inner surface of said peripheral skirt for snapping over and engaging said outwardly extending bead on said neck to releasably retain said closure on said container with said end panel engaging said open end, and a second skirt integrally formed from the same homogeneous mass of material with said end panel, said second skirt being tubular in shape and depending downwardly from said end panel in inwardly spaced relation to said peripheral skirt, said second skirt being located on said end panel in position to project into said open end in inwardly spaced relation to the side walls of said coaxial recess along the entire length thereof and engage said ledge and cooperate therewith to form a seal when said closure is installed on said container.

7. The invention according to claim 6 wherein the length of said second skirt is slightly greater than said fixed distance, said end panel and said ledge cooperate to apply an axial compressive load to said second skirt when said closure is installed on said container to thereby maintain a seal between said second skirt and said ledge.

8. The invention according to claim 7 wherein said end panel is deflected upwardly by the compressive load in said second skirt to thereby cause the bead on said peripheral skirt to be drawn inwardly to more firmly engage the bead on said neck.

9. The invention according to claim 6 wherein said neck portion of said container and said peripheral and second skirts on said closure have a circular cross-section.

10. A resilient molded closure fitment for a container having a neck portion terminating in an open end, an enlarged coaxial recess formed in said neck portion extending from said open end and terminating in a substantially flat horizontal ledge at a fixed distance from said open end, and means formed on the outer periphery of said neck for engaging and releasably retaining a closure fitment, said closure fitment comprising a substantially planar end panel having a size and shape generally conforming to the size and shape of the open end of the container neck, a peripheral skirt integrally formed on and depending downwardly from the outer edge of said end panel, means on the inner surface of said peripheral skirt for engaging the closure retaining means on the container for releasably retaining said end panel in engagement with the open end of the container, and a second skirt integrally formed from the same homogeneous mass of material with said end panel, said second skirt being tubular in shape and depending downwardly from said end panel in inwardly spaced relation to said peripheral skirt in position to engage and form a seal with the horizontal ledge in the container neck when said closure is installed on the container, said second skirt being positioned on said end panel to depend into the coaxial recess of the container in inwardly spaced coaxial relation thereto along the full length of the side walls thereof.

11. The invention according to claim 10 wherein the length of said second skirt is greater than the fixed distance between the open end and the horizontal ledge of the container.

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