

[54] CONTAINER CLOSURE

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[22] Filed: **June 2, 1972**

[21] Appl. No.: **258,958**

[52] U.S. Cl. **220/25**

[51] Int. Cl. **B65d 45/00**

[58] Field of Search 220/25, 24.5, 24 R; 138/98, 138/89

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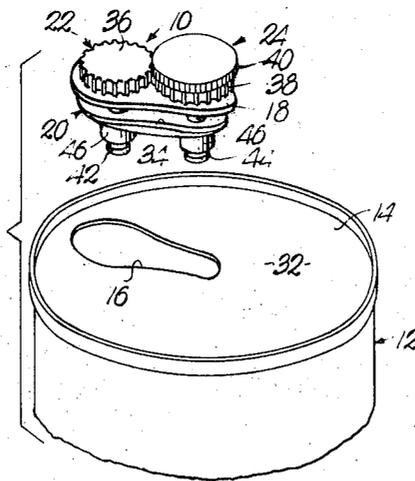
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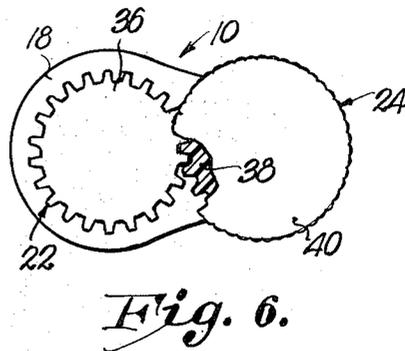
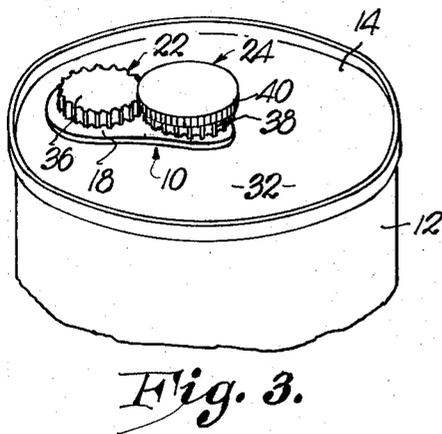
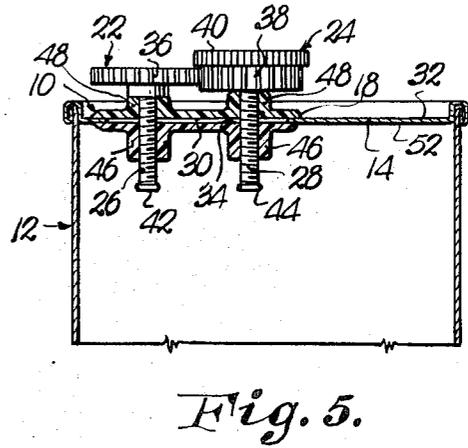
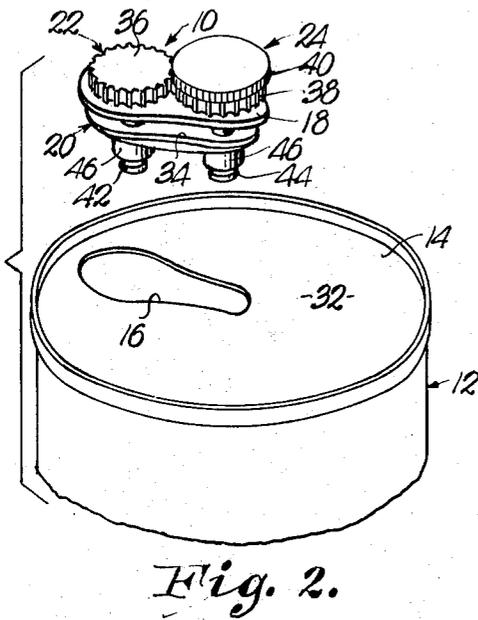
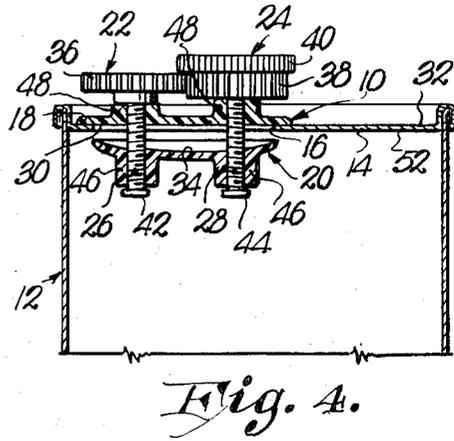
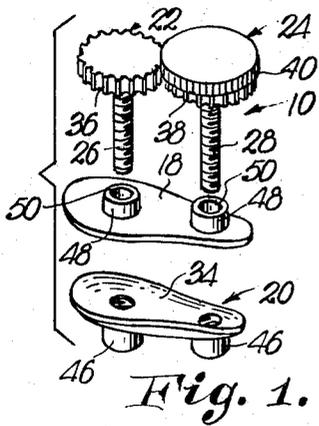
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[57] **ABSTRACT**

A closure for resealing an opening in a wall of a container, such as the access opening in the top wall of a beverage can, after the original flip top seal has been removed. A resilient, outer member is placed in overlying relationship to the opening and in engagement with the wall about the periphery of the opening, while a resilient, inner member having a size and configuration permitting insertion thereof through the opening and having a concave face normally disposed toward the opening, is placed in an underlying relationship to the opening and the outer member. Upon shifting of the inner member toward the outer member, through the use of a pair of thumbscrews, the inner member engages the wall about the periphery of the opening, and spreads to embrace the opening between the inner and outer members, thereby sealing the same. For removal, the inner member is shifted out of engagement with the wall at which time the inner member resumes its original size and configuration, thus enabling the inner member to be easily removed through the opening.

8 Claims, 6 Drawing Figures





CONTAINER CLOSURE

This invention relates to a reusable closure for temporarily sealing the opening in a container such as a flip-top metal can as is commonly used for soft drinks and other beverages. The manner in which an irregularly-shaped opening is provided, through the removal of a previously weakened section of the top wall of a beverage can makes it highly impractical, if not impossible, to reseal the opening by replacing the section in the event that the entire contents of the can are not consumed, but rather are to be saved for later consumption. As is particularly the case with carbonated beverages, the gas escapes during the interval of time between initial consumption and subsequent consumption to render the beverage unpalatable and undesirable.

It is, therefore, a very important object of my invention to provide a container closure for flip-top beverage containers and the like which is capable of resealing the opening formed therein when the original closure is removed.

It is another important object of the invention to provide a closure having a pair of sealing members, one of which may be easily passed through the opening and inserted into the container without any substantial deformity yet is capable of being sufficiently spread upon engagement with the container, about the periphery of the opening, to embrace the opening in cooperation with the other member.

Yet another object of the invention is to provide a closure assembly that is so constructed as to insure a complete enveloping of the opening to seal the same.

Another object of the invention is to provide a closure that may be repeatedly reused without loss of effective sealing characteristics.

Still another object of the invention is to provide a low-cost closure that may be made of relatively inexpensive materials which are compatible with high-volume production methods and processes.

In the drawing:

FIG. 1 is an exploded perspective view of a container closure made in accordance with my present invention;

FIG. 2 is a fragmentary, perspective view illustrating a container having an opening therein and an assembled closure as it would appear prior to engagement with the container.

FIG. 3 is a fragmentary, perspective view showing the closure as it would appear in engagement with the container;

FIG. 4 is a fragmentary, transverse sectional view of a container with the closure in place in the opening but not yet in sealing engagement with the opening;

FIG. 5 is a view similar to FIG. 4 showing the closure in sealing engagement with the opening; and

FIG. 6 is an enlarged, plan view of the closure with a portion thereof broken away and shown in section for clarity.

A closure, broadly designated by the numeral 10, is adapted to be used in conjunction with a container such as a beverage can 12 or the like, and which is of the type provided with a pull tab (not shown) for purposes of removing a previously scored and weakened section (not shown) in a top wall or lid 14 to present a generally keyhole shaped opening 16 as seen in FIG. 2. It is to be understood that the closure 10, depending on its shape, may be used with an opening of any con-

figuration and need not be limited to the keyhole shape.

The closure 10 is comprised of an outer, resilient member 18 and an inner, resilient member 20 interconnected by means of a pair of threaded devices in the form of thumbscrews 22 and 24 which are loosely received by the outer member 18 and carry the inner member 20 by means of threaded shanks 26 and 28 respectively. The members 18 and 20, as here shown, are of a configuration substantially the same as that of the opening 16. The material from which the members 18 and 20 are made should be relatively firm, but also flexible; and may be made from an inexpensive polypropylene or other similar plastic material that is suitable for high-speed mass production.

The outer member 18 is generally flat and presents a planar surface 30 that engages an outer face 32 of the lid 14 and is of an overall size somewhat larger than that of the opening 16 whereby the surface 30 engages the face 32 about the periphery of the opening 16. The inner member 20 is, for the most part, saucer-shaped to present a face 34, normally disposed toward the opening 16 and the outer member 18, that is concave when the inner member is not in engagement with the lid 14, as best illustrated in FIG. 4. Ideally, the overall size of the inner member 20 is virtually the same as that of the opening 16, although it should be pointed out that the member 20 may be slightly larger than the opening 16 and still be easily inserted therethrough without undue or harmful deformation because of its resilient nature.

The thumbscrews 22 and 24 each have a head in the form of a spur gear 36 and 38 respectively which mesh with one another. The head 38 also has a ring 40 concentric therewith and which overlies the other gear 36 in the general area of meshing of the gears 36 and 38. The threads on the shank 26 and 28 may be of the self-threading type; however, the threads on the shank 26 are reverse to those threads on the shank 28. Flanges 42 and 44 are provided on respective ends of the thumbscrews 22 and 24 opposite heads 36 and 38.

A pair of tubular bosses 46 on the inner member 20, opposite the face 34, receive respective thumbscrews 22 and 24 and provide additional contact area for the threads of shanks 26 and 28. Annular shoulders 48 on the outer member 18, opposite the surface 30, receive and support respective thumbscrews 22 and 24 and are provided with oversized holes 50 which permit the outer member 18 to be freely slidable along the thumbscrews 22 and 24 intermediate the inner member 20 and the heads 36 and 38 when the members 18 and 20 are out of sealing engagement with the lid 14.

In operation, closure 10 is initially assembled as shown in FIG. 1 by passing the outer member 18 over the shanks 26 and 28, after which the thumbscrews 22 and 24 are turned into respective bosses 46 of the inner member 20, at which time the self-tapping threads on the shanks 26 and 28 form corresponding threads in the closely fitting walls of the bosses 46. The flanges 42 and 44 are now formed by subjecting them to heat, it being understood that the thumbscrews 22 and 24 are made from a plastic material similar to that of the members 18 and 20 but which may be somewhat more rigid. The flanged ends prevent the inner member 20 from becoming disengaged from the thumbscrews, this being particularly important to prevent the inner member 20 from dropping into the can when the member 20 is

shifted out of sealing engagement with the lid 14 prior to removal of the closure 10 from the can 12.

At the time the can 12 is to be sealed, the assembled closure 10 is easily and quickly placed in embracing relationship to the opening 16 by inserting the inner member 20 into the can 12 through the opening 16 such that the outer member 18 is disposed in overlying relationship to opening 16 and the surface 30 engages the face 32 of the lid 14 while the inner member, with its concave face 34, is disposed in underlying relationship to the opening 16 as seen in FIG. 4.

The ring 40 is then grasped so that the thumbscrew 24 may be turned and, in so doing, also turn the adjacent thumbscrew 22 by virtue of the intermeshing gears to cause the inner member 20 to be uniformly and evenly shifted toward the outer member 18 and the lid 14. The ring 40 not only provides an adequate gripping surface for the user but also serves to keep the two spur gears 36 and 38 in lateral alignment during the use thereof. Upon engagement of the member 20 with an inner face 52 of the lid 14, the initially concave face 34 spreads outwardly into a flattened condition as seen in FIG. 5 whereby the members 18 and 20 embrace the opening 16 in sealing engagement with the lid 14. The concavity of the inner member 20 is desirable in that this permits easy insertion of the member 20 through the opening 16 yet, because of the resiliency of the material making up the member 20, the same is spreadable to an overall size to sufficiently engage the surface 52 of the wall 14 around the periphery of the opening 16 to insure a complete and tight seal, thereby preserving the contents of the can 12.

The removal of the closure 10 from the can 12 is a simple matter of turning the thumbscrew 24 in an opposite direction to remove the face 34 of the inner member 20 from engagement with the face 52 of the lid 14, at which time the member 20 returns to its original configuration having a concave face 34. This resumption of the original configuration also makes it possible to remove the closure 10 from the can 12 without damage to the inner member 20 as the latter is passed through the opening 16 with little or no deformation thereof. It is to be noted that because of the resilient nature of the material making up the members 18 and 20, and the fact that the inner member 20 is not subjected to severe deformation during the removal of the closure 10, that the same may be repeatedly used without appreciable loss of sealing capability.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A closure for sealing an opening in a wall of a container, said closure comprising:

an outer member normally disposed in overlying relationship to said opening and engageable with said wall about the periphery of said opening;

a saucer-shaped inner member normally disposed in underlying relationship to said opening and selectively engageable with said wall opposite said outer member,

said inner member being constructed of a semi-rigid material and having size and configuration relative to said opening to permit insertion thereof into said container through said opening; and

means operably interconnecting said members for shifting the inner member toward said outer member and said wall and holding said member in said shifted relationship,

said inner member being spreadable upon engagement with said wall about the periphery of said opening such that said inner member is transformed from said saucer-shape to a flattened condition whereby said members embrace and thereby seal said opening.

2. A closure as claimed in claim 1, wherein said inner member has a concave face normally disposed toward said opening and said outer member when said inner member is not in engagement with said wall.

3. A closure as claimed in claim 1, wherein said outer member is constructed of a yieldable, semi-rigid material and presents a generally planar surface normally in engagement with said wall.

4. A closure as claimed in claim 1 wherein said inner member is normally of a size slightly larger than that of said opening, said material being yieldable to permit said insertion of the inner member through said opening.

5. A closure for sealing an opening in a wall of a container, said closure comprising:

an outer member normally disposed in overlying relationship to said opening and engageable with said wall about the periphery of said opening;

an inner member normally disposed in underlying relationship to said opening and selectively engageable with said wall opposite said outer member, said inner member being of a size and configuration relative to said opening to permit insertion thereof into said container through said opening; and

means operably interconnecting said members for shifting the inner member toward said outer member and said wall and holding said member in said shifted relationship,

said inner member being spreadable upon engagement with said wall about the periphery of said opening whereby said members embrace and thereby seal said opening,

said inner member having a concave face normally disposed toward said opening and said outer member when said inner member is not in engagement with said wall,

said inner member being of resilient material, said inner member being essentially flat when said member is in sealing engagement with said wall, said interconnecting means being in the form of a pair of thumbscrews, one of which is provided with reverse threads,

said thumbscrews each having a head in the form of a spur gear,

said gears meshing with one another whereby the turning of one of said thumbscrews results in a corresponding turning of the other of said thumbscrews in an opposite direction.

6. A closure as claimed in claim 5, wherein said outer member is freely slidable along said thumbscrews intermediate said inner member and said heads when said members are out of sealing engagement with said opening.

7. A closure as claimed in claim 5, wherein the head of said one thumbscrew includes a ring concentric with said head and overlying said other thumbscrew in the general area of meshing of said gears for normally maintaining the gears in lateral alignment.

8. A closure as claimed in claim 7, wherein each thumbscrew is provided with a radially flanged end opposite that of said head.

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