Feb. 17, 1953 P. G. McGOWAN 2,628,735

CONTAINER CLOSURE

Filed Dec. 22, 1947

Fig. 1.

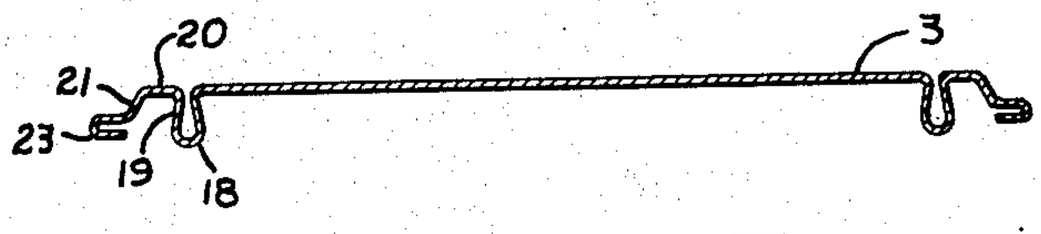


Fig. 2.

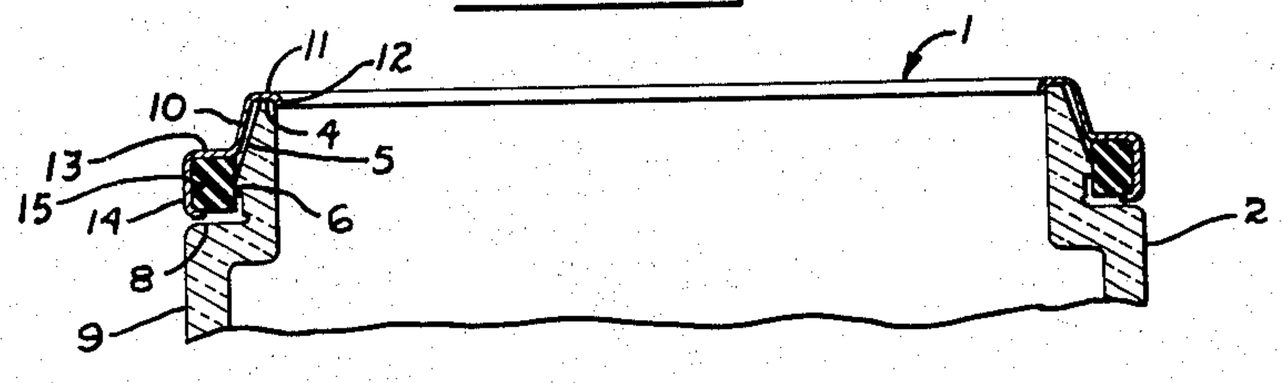


Fig. 3.

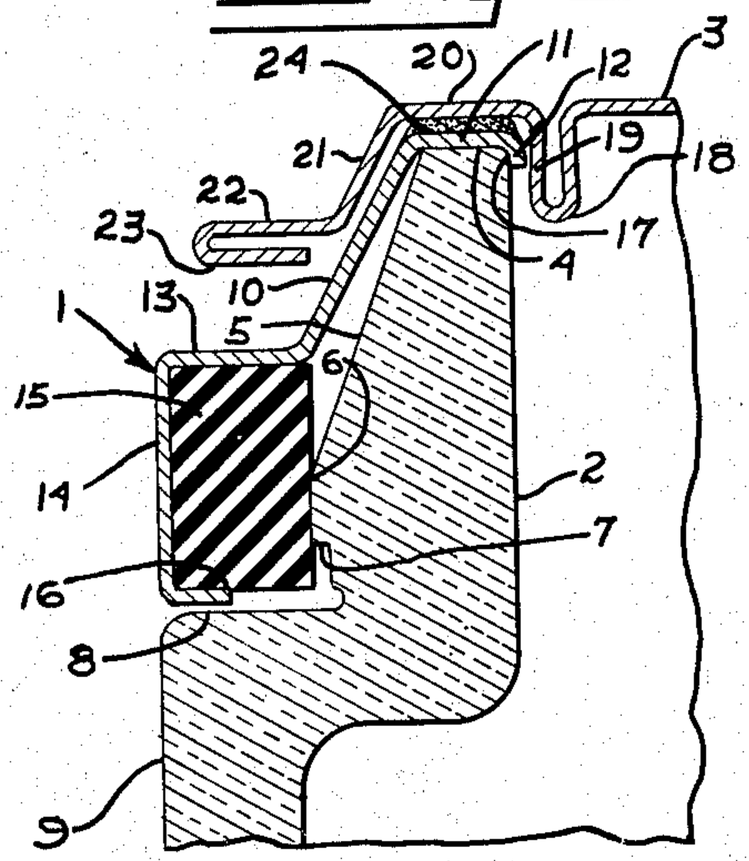


Fig. 4.

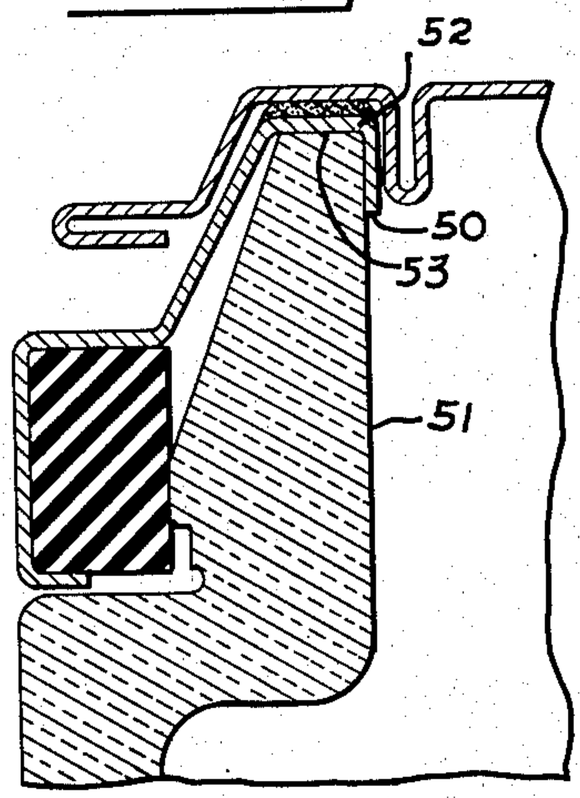
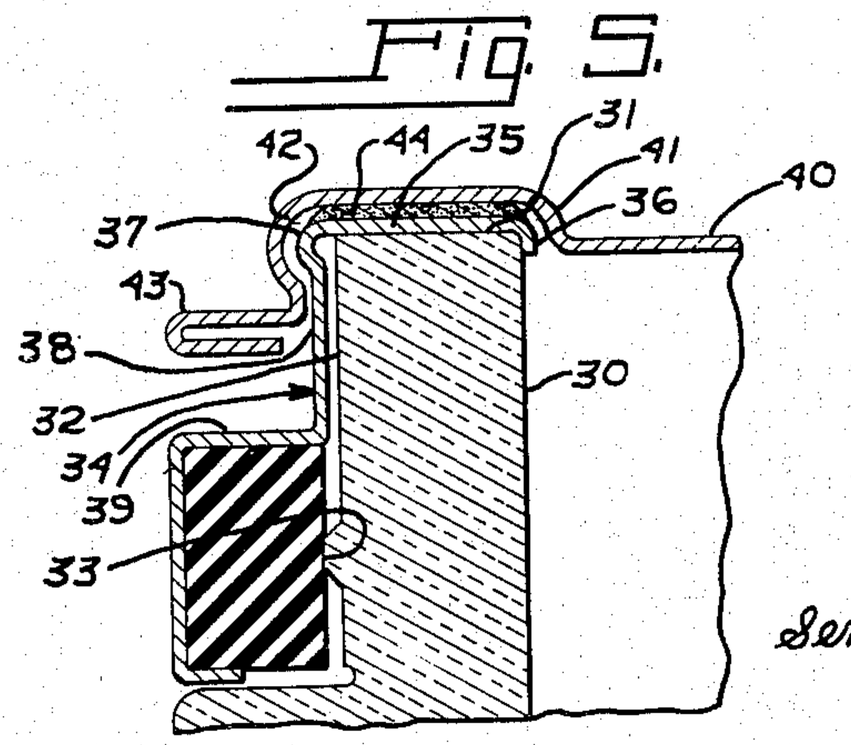


Fig. 5.



Inventor

PATRICK G. McGOWAN

By

Semmes, Keegin, Robinson & Semmes

ATTORNEYS

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CONTAINER CLOSURE

Patrick G. McGowan, Fremont, Mich., assignor to Gerber Products Company, Fremont, Mich., a corporation of Michigan

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4 Claims. (Cl. 215—38)

1

This invention relates to a cap for containers and more particularly to a cap for glass or ceramic jars.

The wide use of glass containers for the processing and marketing of foods has made a safe closure member for the glass containers an absolute necessity. The closure member should, of course, tightly seal the opening of the container to prevent leakage of air therein. In addition to tightly closing the container, however, the closure member must be easily and safely removable.

The most common type of closure members ordinarily used in packaging jellies and similar foods consists of a metallic disk-like cap having its edges spun over a gasket covering the rim and part of the outer surface of the glass to seal the container. The spinning of the metallic cap over the gasket may set-up stresses which will cause the container to break when subjected to minor blows. An additional objection to the conventional closure is the difficulty encountered in removing the cap from the container. The highly compressed rubber gasket generally adheres strongly to both the cap and the container to interfere with removal of the cap.

Some caps which have been widely used consist of a base member which is swaged in position around a rim of the container. A secondary member is then provided which engages the base member to close the container. The swaging or spinning of the base member in contact with the container to produce a tight joint sets up stresses causing excessive breakage of the container either during subsequent processing or when the container is opened.

It is an object of this invention to provide a safety closure member for glass containers which will minimize fragmentation of the glass during processing and use of the container.

Another object of this invention is to provide a closure member which is held in position by a vacuum within the container and an adhesive material.

A further object of this invention is to provide a cap which may be easily removed without destroying the cap and which may be used as a cover for the container after the container has once been opened.

Still another object of this invention is to provide a closure member for a container which may be easily placed in position by downward pressure only on the container thereby avoiding forces on the lateral surface of the container.

It is also an object to provide a closure member

2

for a glass container which will serve as a guard for the glass surrounding the opening in the container.

With these and other objects in mind which will become apparent in the detailed description following, this invention resides in a metallic ring which slips over the rim of a glass container and is held in place by a compressible gasket engaging the ring and the outer wall of the container. A cap closing the opening of the container rests on the metallic ring and is held in place by adhesive between the ring and the cap and the vacuum within the container.

In the drawings:

Figure 1 is a vertical sectional view of a cap constructed according to this invention.

Figure 2 is a vertical sectional view of a ring constructed according to this invention in place around the opening of a container.

Figure 3 is an enlarged vertical sectional view of the closure member constructed according to this invention when the container is closed.

Figure 4 is also an enlarged vertical sectional view, similar to Figure 3, of a modified form of this invention.

Figure 5 is an enlarged vertical sectional view of another modified form of this invention.

The closure member of this invention consists of an annular ring, indicated generally by 1, in Figure 2 adapted to fit around the opening of a container 2. A cap 3, illustrated in Figure 1, fits within the ring 1 to close the opening of the container.

Referring to Figure 3, ring 1 is illustrated on a container 2 having a rim 4 surrounding the mouth or opening of the container. The outer walls 5 of the container 2 slope from the outer edge of rim 4 to an annular lug 6 extending around the neck of the container. Lug 6 projects from the outer surface of the container, as indicated at 7, to provide an anchor for a gasket to be described later. In most instances the container 2 will have a shoulder 8 protruding laterally below the lug 7 to the outer wall 9 of the main body of the container. Container 2 will, in most cases, be manufactured from glass, but the benefits of this invention are also realized when the container is made of other ceramic material.

A conical annular wall 10 surrounding the sloping outer wall 5 of the neck of the container 2 is a part of ring 1. A flange 11 extends inwardly from the upper end of the conical section 10 to provide a substantially horizontal surface which rests on the rim 4 of the container. A

lip 12 on the inner edge of flange 11 extends into the opening of the container and serves as a bumper for the inner edge of rim 4. Lip 12 thus prevents chipping of the edge of rim 4 as the contents are removed from the container.

A shoulder 13 projects outwardly from the lower end of conical section 10. Depending from the outer edge of shoulder 13 is a vertical wall 14 which combines with shoulder 13 to form a support for gasket 15 between the outer surface of the container 2 and the vertical wall 14 of ring 1. Vertical wall 14 may be rolled inwardly at its lower end, as indicated at 16, to form a support for the bottom of gasket 15. Wall 14 should extend to a position close enough to shoulder 8 of the container 2 to prevent insertion of kitchen implements between the lower end of the wall and the shoulder to open the container. One of the objects of this invention is to avoid use of part of the glass container 2 as a fulcrum in prying the cap from the container.

Gasket 15 may be prepared from any suitable resilient material, but ordinarily rubber will be used. The gasket must be soft enough to be deformed to engage the lug 6 without exerting excessive pressure on the walls of container 2. Since the flange 11 merely rests on rim 4, gasket 15 must envelop irregularities in the surface of the container thereby preventing leakage under ring 1. Wall 14 of ring 1 and lug 6 on the outer surface of the container 2 will combine to compress the gasket 15 which in turn holds ring 1 firmly in place on the container. The force of the gasket 15 against the ring urges the lip 12 against the inner edge 17 of the rim 4 of the container to serve as a bumper guarding it against chipping.

Ring 1 may be installed on the container 2 without subjecting the container to any lateral stresses which will cause its fragmentation during the subsequent processing of the contents or opening of the container. The gasket 15 is slipped in place against the wall 14 and shoulder 13 of ring 1 before the ring is placed on the container. The ring 1, with the gasket in place, is then slipped over the end of the container until the flange 11 engages the rim 4 of the container. At this point the lug 6 will have compressed the gasket 15 to hold the ring firmly in place. It will be noted that the stresses, all of which are of a minor nature, created during the installation of the ring 1 on the container 2 are downward along the length of the container which is the direction of its greatest strength. There are no lateral stresses such as would be created by swaging the ring in place.

Cap 3 is essentially a flat disc covering the mouth of the container and resting on the flange 11 of ring 1. Ordinarily, cap 3 will be crimped as indicated at 18 immediately inside of the lip 12 to center the cap 3 in position after the container has once been opened. The outer wall 19 of the crimp 18 may bear lightly against lip 12 to hold the cap in place after the container has been opened, but the engagement of wall 19 with lip 12 is not relied upon to seal the container for protecting the contents during processing and marketing. Wall 19 and lip 12 will form a closure tight enough for ordinary use, such as storage in the ice box, of the container after it has been initially opened.

A flat section 20 of the cap rests on the flange 11 of ring 1 and has a conical section 21 extending from its outer edge along wall 10 of the ring 1. Section 21, pressing lightly against the outside of wall 10, counteracts any tendency of wall 19 to stress the container. A flange 22 protrudes outwardly from the lower end of section 21 parallel to shoulder 13 of the ring and spaced therefrom. Preferably, flange 22 is rolled to double thickness along its outer edge as indicated at 23 to remove any sharp edges which might cut the user. Flange 22 is spaced from shoulder 13 sufficiently to allow a coin or knife to be inserted therebetween for opening the container. Cap 3 will ordinarily be constructed of a light sheet of metal, such as steel. In many instances the lower, center portion covering the mouth of the container will be coated with enamel to avoid contamination of the contents of the container.

It will be noticed that cap 3 merely rests on the flange 11 covering the rim 4 of the container. A layer of sealing compound 24 is applied to the upper surface of flange 11 before cap 3 is placed thereon. The sealing compound 24 acts as an adhesive holding the cap 3 and the ring 1 together and also fills any irregularities in the cap or the ring to provide an effective closure for the container. In addition to the sealing compound 24, cap 3 is held in place by vacuum within the container. The force of the vacuum against the cap urges the cap directly against the rim 4 of the container. Here again, any stresses are directed along the length of the container which is the direction of its greatest strength.

The usual method of installing the cap is to partially evacuate the container by directing a blast of steam across its mouth and immediately placing the cap in the position indicated in Figure 3. The vacuum within the container combines with the sealing composition, which is ordinarily a rubber adhesive, to hold the cap firmly in position. If it is necessary to cook or otherwise process the contents which have been placed in the container before the cap closes the container, the cooking may be accomplished in a pressure vessel. The pressure on the outside of the container 2 will counteract any pressure developed in the container during processing and hold the cap in place. After the material in the container has been cooled sufficiently to reduce the pressure therein below atmospheric, the pressure on the outside of the container may be released. Cap 3 is then held firmly in place by the sealing composition 24 and the vacuum within the container.

When it is desired to open the container, it is merely necessary to insert some object between the flange 22 and the shoulder 13 and twist the object to force those parts apart. During the opening procedure, it is not possible to subject the container to any torque or lateral stresses. Any pressure exerted against shoulder 13 is fully cushioned by the gasket 15 before it is transmitted to the walls of the container 2.

Referring to Figure 5 a modified form of the invention is illustrated in which a container 30 has a rim 31 surrounding its mouth. In this form of the invention the outer wall 32 of the container is vertical with the exception of a lug 33 similar to lug 6 in Figure 3. A ring, indicated generally by 34, having a flange 35 fitting against the rim 31 with a lip 36 engaging the inner corner of the rim fits over the upper end of the container. Along the outer edge of flange 35 is an annular bead 37 which joins the flange 35 with a vertical section 38 of the ring 34. A shoulder 39 extends laterally from the lower end of the section 38 similar to shoulder 13 in Figure 3.

A disc-like cap 40 covers the opening of the

container and rests on the flange 35 of ring 34. Cap 40 has a shoulder 41 which engages the lip 36 around the inner edge of flange 35. Cap 40 is rolled around its outer edge to form a concave surface 42 which engages bead 37. A flange 43 extends laterally from the lower end of the curved surface to facilitate removal of the cap.

The bead 37 and concave surface 42 of the structure illustrated in Figure 5 combine to hold the cap 40 in place after the container has been opened. Shoulder 41 of cap 40, by bearing against lip 36 will overcome any force exerted on bead 37 by surface 42; consequently, a structure illustrated in Figure 5 does not set-up any lateral stresses in the container 30. In some instances it may be desirable to provide a bead similar to bead 37 and a concave surface similar to surface 42 on the closure members illustrated in Figures 3 and 5 of the drawings. This structure is particularly desirable on large containers where all of the contents won't be used at one time. Leakage between cap 40 and ring 34 is prevented by sealing composition 44 on the upper surface of flange 35. The structure illustrated in Figure 5, like the structure illustrated in Figure 3, relies on the vacuum within the container and the sealing composition to hold the cap in place.

Figure 4 illustrates a modification of this invention similar to Figure 3 with the exception that the lip 50, corresponding to lip 12 in Figure 3, extends well into the mouth of the container 51. This form of the invention is especially suitable for large glass containers which might have the inner edge 52 of the rim 53 chipped as the contents are scraped from the container.

A safety closure member for glass containers has been described herein. The closure member may be installed without setting up stresses in the container which may cause its fragmentation when subjected to heat or pressure during processing of the contents. The closure member is held tightly in place without bearing against the lateral walls of the container. Moreover, the cap forming part of the closure member may be easily removed without exerting appreciable torque or pressure on the container.

The closure member comprising this invention has been described herein with reference to specific details of a particular structure. It is to be understood that the scope of this invention is not limited to those specific details, but is limited only by the appended claims.

I claim:

1. In combination with a glass, ceramic, etc. container having a mouth surrounded by a rim and a shoulder adjacent thereto; a reusable closure member comprising a ring including a flange covering the rim, said ring including a shoulder having a side extending toward and terminating closely adjacent the container shoulder to prevent the insertion of a tool therebetween, a gasket compressed between the container and said ring for frictionally securing the latter in position on the sides of the container, a cap closing the mouth of the container and including an outer flange terminating adjacent to but spaced from said ring shoulder to permit the insertion of a closure-removing tool therebetween, and adhesive means sealing said cap to said ring flange.

2. The combination recited in claim 1 wherein complementary bead portions are formed in the outer portion of said ring flange and the adjacent portion of said cap to form a snap connection therebetween for reuse of said cap.

3. The combination recited in claim 1 wherein an annular crimp is formed in said cap, and said ring flange includes a lip covering a portion of the inner wall of the container to receive the crimp and center the cap.

4. In combination with a glass, ceramic, etc. container having a mouth surrounded by a rim and a shoulder adjacent thereto; a reusable closure member comprising a ring including a flange covering the rim, said ring including a shoulder having a side extending toward and terminating closely adjacent the container shoulder to prevent the insertion of a tool therebetween, a gasket compressed between the container and said ring for frictionally securing the latter in position on the sides of the container, a cap closing the mouth of the container and including an outer flange terminating adjacent to but spaced from said ring shoulder to permit the insertion of a closure-removing tool therebetween, and adhesive means sealing said cap to said ring flange, said ring and said gasket being slidable over the rim into operative position against the container shoulder.

PATRICK G. McGOWAN.

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