Feb. 1, 1938. J. C. GIBBS 2,107,179

CLOSURE CAP

Filed June 22, 1935

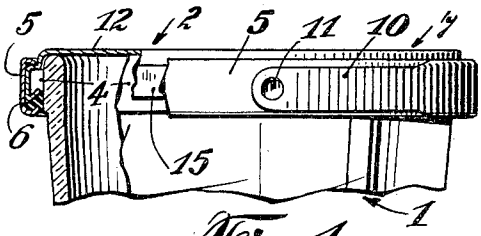


Fig. 1.

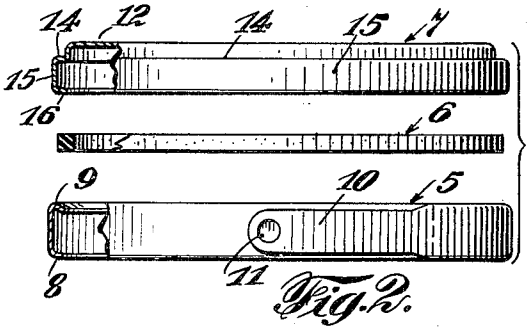


Fig. 2.

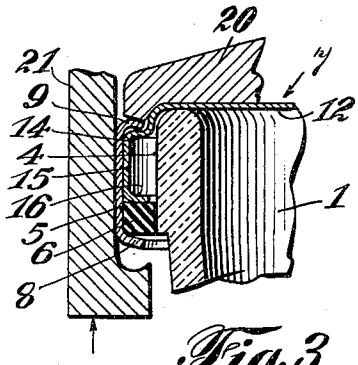


Fig. 3.

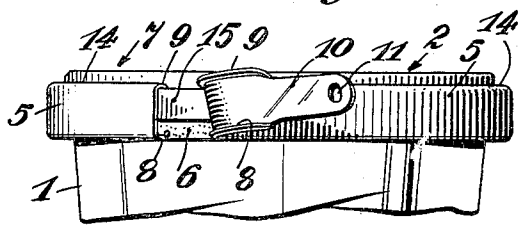


Fig. 4.

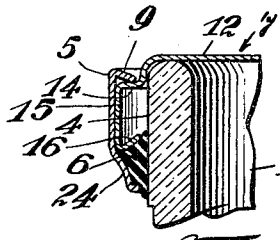


Fig. 5.

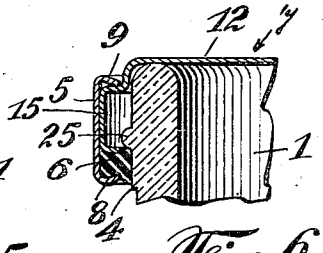


Fig. 6.

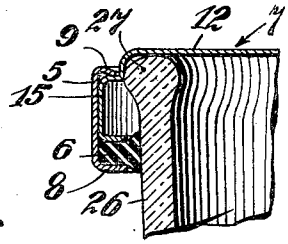


Fig. 7.

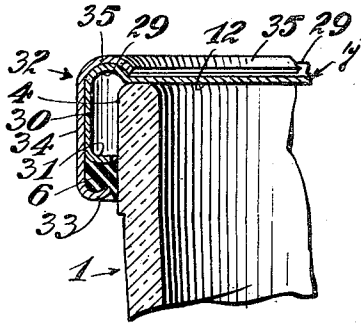


Fig. 8.

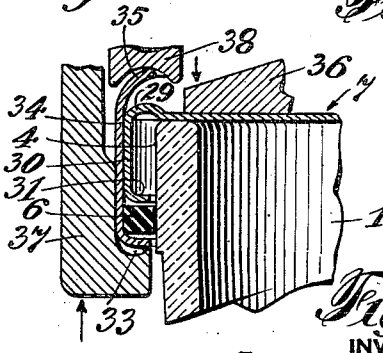


Fig. 9.

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Patented Feb. 1, 1938 2,107,179

UNITED STATES PATENT OFFICE

2,107,179

CLOSURE CAP

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Application June 22, 1935, Serial No. 27,860

12 Claims. (Cl. 215—46)

The present invention relates to the sealing art and more particularly to a band closure cap and a method of sealing to provide a sealed package.

A popular type of package on the market comprises a glass container, such as a tumbler, adapted to be used as a drinking glass after the contents are removed and a closure cap sealed thereto to preserve the contents of the package. Usually, the cap has a gasket in the skirt thereof which is pressed laterally inwardly against the container to form a hermetic or vacuum seal. One of the disadvantages of such a package is that if the closure is sealed securely, it can be removed only with greatly difficulty. Removing tools do not readily engage the cap and if they do engage it, they distort the cap to such an extent that it cannot be used for resealing purposes. Packages of this type are sold in large quantities almost exclusively to housewives and it is, therefore, important that the closure can be readily removed and also can be used as a reseal or cover during the consumption of the contents. Attempts to render such closures readily removable have not been successful and packers have resorted to closures providing inferior seals which, in many instances, fail to preserve the contents of the package against spoilage.

The present invention aims to overcome the above objections by providing a closure adapted to form a secure seal which will be readily removable without distorting the cap, thereby permitting it to be used for reseal purposes. The invention also provides a simple inexpensive method of sealing the closures to containers, and further contemplates achieving these objects without material increase in the cost of the closure.

An object of the present invention is to provide a closure adapted to form a secure seal and adapted to be easily removed.

Another object of the invention is to provide a hermetic seal on a container adapted to be used as a drinking glass.

Another object of the invention is to provide a closure adapted to form a hermetic seal which may be used as a cover cap for the container during the consumption of the contents.

Another object of the invention is to provide a closure adapted to be hermetically sealed on thin tumblers and other types of containers without danger of breaking the same.

Another object of the invention is to provide an improved band closure which is adapted to form a hermetic side seal on the side wall of a container.

Another object of the invention is to provide an improved method of sealing a band closure cap to a container.

A further object of the invention is to provide a simple inexpensive method of sealing closure caps to very thin glass containers which reduces breakage of containers during the sealing operation to a minimum.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawing, forming a part of the specification, wherein

Fig. 1 is a side elevational view, partly in section, illustrating the closure sealed to a container;

Fig. 2 is an exploded elevational view, partly in section, illustrating the parts of the closure;

Fig. 3 is a fragmentary sectional view illustrating the closure being sealed to the container;

Fig. 4 is an elevational view illustrating the closure being removed from the container;

Fig. 5 is a fragmentary sectional view illustrating the closure sealed in another way to a container;

Fig. 6 is a fragmentary sectional view illustrating the closure sealed to another form of container;

Fig. 7 is a fragmentary sectional view illustrating the closure sealed to still another form of container;

Fig. 8 is a fragmentary sectional view illustrating a slightly different form of closure sealed to a container; and

Fig. 9 is a fragmentary sectional view illustrating the closure shown in Fig. 8 being sealed to the container.

Referring again to the drawing and more particularly to Figs. 1 and 2 thereof, there is shown a sealed package comprising a glass container 1 and a closure cap 2. The container here shown is in the form of a tumbler preferably having a substantially smooth rim to permit it to be used as a drinking glass after the contents of the package are dispensed. The container has a comparatively thick side wall so that it can with-

stand the rough usage to which packers' ware usually is subjected, and the upper end of the container may be provided with a substantially cylindrical sealing zone 4 adapted to have the closure sealed thereon.

The closure cap 2 preferably comprises three elements, namely, a band 5, a gasket 6 and a cover cap or disc 7, which will be described in the order named (Fig. 2). The band may be made of sheet metal and is provided with a side wall adapted to extend about the cover cap, a radially inwardly extending flange or shelf 8 at the bottom forming a support for the gasket 6, and an inturned flange 9 at the upper edge adapted to engage the top of the cover cap or disc 7. The flange 9 is preferably bent slightly downwardly at an angle of about four degrees to lock on the cover cap, but if desired may be substantially horizontal. Preferably, the free ends of the band overlap and are adapted to be secured to each other. One of the free ends of the band may be provided with a tab 10 adapted to be manually engaged to remove the band from the container and an aperture 11 may be formed in the tab to permit a pointed tool, such as an ice-pick or table fork to be inserted therein to facilitate removal of the band. If desired, the band may be in the form of a continuous strip of metal provided with suitable tabs for tearing it to remove it from the container.

The gasket 6 preferably is made of rubber or other suitable sealing material. The gasket may be annular in shape, and substantially rectangular in cross-section so that it may be seated on the flange 8 of the band and forced radially inwardly against the side walls of the container by vertical sealing pressure as will be described hereafter.

The cover cap or disc 7 has a top portion 12 adapted to extend across the mouth of a container and a shelf 14 substantially at the outer periphery of the top portion and spaced downwardly therefrom. The shelf 14 may be substantially horizontal but if desired may be flared inwardly at an angle of about four degrees to permit the flange 9 of the band to hook thereon. A skirt 15 depends downwardly from the shelf 14 and a radially inwardly extending shelf or flange 16 is provided at the lower edge of the skirt adapted to be seated on the upper side of the gasket.

In assembling the parts of the closure, the band 5 preferably is bent into its annular shape which it is adapted to retain due to the resiliency and preformed shape of the band, the band having a circumference which is less than the circumference of the disc so that it will remain engaged with the disc during shipment. The cap or disc 7 is placed in the band so that the flange 9 hooks over the shelf 14 and the gasket is seated upon the flange 8 at the lower edge of the band to abut against the flange 16 of the cap and hold it within the band. Preferably, the cap 7 has a slightly larger diameter than the preformed diameter of the band to cause the band to resiliently grip and retain the cap therein after assembly and during shipment, although the flanges 8 and 9 of the band at the overlapping portions thereof may be pressed together, if desired, to secure the ends and to fix the band more securely in position.

A preferred method of sealing the closure is illustrated in Fig. 3 wherein the cap, gasket and band are shown telescoped over the mouth of the container so that the gasket extends about the sealing zone 4 and the top portion 12 of the cap is seated on the rim of the container. A suitable anvil or sealing head 20 may be placed on the top portion 12 and the upper flange 9 of the band to hold the cap and the band on the container. A suitable chuck or spinning tool 21 may be then applied to the lower edge of the band to press the flange 8 of the band upwardly and radially inwardly whereby the flange 8 compresses the gasket against the shelf or flange 16 of the cap. At the same time, the free ends of the band may be pressed into overlapping engagement to secure the band on the container. As the gasket is pressed or squeezed between the shelf and flange, it is forced radially inwardly against the side wall of the container to provide a secure hermetic seal. Compression of the gasket, also bends the flange 16 at the lower edge of the cap upwardly at an angle of about ten degrees and a portion of the gasket is forced between the upwardly bent flange 16 and the wall of the container to form a more effective seal. If desired, the flange 16 may be flared inwardly and upwardly at an angle of about ten degrees, but preferably is horizontal prior to being bent upwardly by compression of the gasket. It will be noted that the sealing forces are in a vertical direction and are applied to the closure in directions substantially parallel to the walls of the container. In this manner the container is not subjected to substantial sealing forces, except through the intermediation of the sealing gasket, whereby breakage of containers during the sealing operation is minimized. By hooking the flange 9 at the upper edge of the band 9 over the shelf 14 radial expansion of the band is prevented and the band is held securely on the cap. If desired, the shelf 14 and the flange 9 of the band may be flared inwardly by a suitable tool during the manufacture of the cap and band. Once the closure is applied, the gasket holds it securely on the container. A vacuum seal may be provided by carrying out the above sealing operations in a vacuum chamber or while the contents are hot.

In Fig. 4 the band is shown partially removed to illustrate how the cap may be removed from the container. Preferably, this is done by engaging the tab 10 either manually or by inserting a tool into the aperture 11 and pulling the tab away from the cap until the free ends of the band are separated and the band can be removed. The cap may then be lifted from the container and the gasket may be removed and thrown away. The disc portion of the cap thereafter may be utilized as a cover cap for closing the container while the contents thereof are being dispensed.

In Fig. 5 the closure is shown sealed to the container in a slightly different manner. A chuck or sealing head is utilized to hold the cap and band downwardly on the container while a rolling or spinning tool or sealing chuck is applied to press the lower flange 8 of the band upwardly and inwardly to reform the lower portion of the band into a bead 24 adapted to compress the gasket 6 against the container. By compressing the gasket in this manner, a very tight seal is formed because the gasket is pressed radially inwardly substantially throughout the entire height thereof.

In Fig. 6 another form of container is shown having a cylindrical sealing zone provided with a radially outwardly extending rib or bead 25 under which the gasket may be compressed to lock it

against accidental upward movement and to hold the cap more securely on the container. In this manner the closure is locked against accidental removal which might be caused by pressure created in the package during processing and the like.

In Fig. 7 there is shown a tumbler **26** having a substantially thin side wall provided at its upper end, here shown with a smooth reinforced edge or bead **27**. If desired, the beaded edge may be omitted since a secure seal may be formed with an ordinary straight edge. Such tumblers are popular because they are light in weight thus saving freight when shipped and due to their thinness are more desirable to be used as drinking glasses after the contents are dispensed. The bead **27**, in addition to providing a smooth drinking edge, may be utilized as an abutment under which the gasket of the closure may be locked to hold the cap more securely on the container. The closure shown herein is particularly adapted for thin wall containers because the seal is formed by applying vertical forces and the tendency to crush the containers during the sealing operation is minimized. Also, the closure can be readily removed without tools or pry-off ledges or other projections on the containers which diminish their reuse value.

In Fig. 8 another form of closure is shown wherein the cover cap or disc **7** has a top portion provided with a raised arcuate annular rib **29** at its outer periphery and a skirt **30** depending downwardly from the rib. A flange **31** is provided at the lower edge of the skirt adapted to engage a gasket **6** seated in a band **32**. The band has an inwardly extending flange **33** at its lower edge and a skirt **34** of substantial width having a portion **35** at its upper edge adapted to be folded over the rib **29** of the cap. The rib **29** is adapted to act as a shelf for retaining the flange of the band.

In assembling the above described closure, the gasket is seated on the flange **33** of the band and the cap is placed in the band. The closure is then sealed by placing it on a container and utilizing an anvil **36** to hold down the cover cap while a suitable tool **37** is utilized to pull up the band by engaging the flange **33** and a chuck or spinning tool **38** is applied to fold the upper portion **35** of the band over the rib **29** of the cap. In this manner the height of the band is decreased and the gasket is compressed between the flange **33** and the flange **31** to force it inwardly against the container and form a seal.

It will be seen that the present invention provides an improved closure adapted to be sealed on containers by simple inexpensive machinery to form a hermetically sealed package. The closure is adapted to form a hermetic seal or a vacuum seal, if desired, and is adapted for thin walled containers since it can be sealed and is readily removable without subjecting the container to substantial strains. The parts of the closure can be made rapidly and inexpensively and can be readily assembled for shipment. Also, the package is easily opened by removing the band and the disc portion of the cap may be used as a reseal or cover during the consumption of the contents.

As various changes may be made in the form, construction and arrangement of the parts herein without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim:

1. As an article of manufacture, a closure cap comprising a disc member having a depending skirt provided at its lower edge with an inturned flange, a gasket beneath said flange, and a band member extending about said disc and gasket having an inwardly extending flange at its lower edge extending beneath said gasket.

2. As an article of manufacture, a closure cap comprising a disc member having a depending skirt provided at its lower edge with an inwardly extending flange, a gasket beneath said flange having a smaller internal diameter than said flange, and a band member extending about said disc and gasket, said band having an inwardly extending flange at its lower edge extending beneath said gasket and having an inwardly and downwardly flared upper portion adapted to engage said disc member.

3. As an article of manufacture, a closure cap comprising a disc member having a depending skirt provided at its lower edge with an inwardly extending flange and a downwardly and inwardly flared shelf at the top thereof, a gasket beneath said flange, and a band member extending about said disc and gasket, said band having an inwardly extending flange at its lower edge extending beneath said gasket and having an inwardly and downwardly flared upper portion adapted to engage the shelf at the top of said disc member.

4. As an article of manufacture, a closure cap comprising a disc member having a cover portion and a depending skirt provided at its lower edge with an inwardly extending flange, a gasket beneath the flange at the lower edge of said skirt, and a band member extending about said disc and gasket having an inturned flange engaging the outer edge of said disc at the upper portion of said skirt and having an inwardly extending flange at its lower edge for supporting the gasket and adapted to be pressed inwardly and upwardly to seal the closure cap to a container.

5. As an article of manufacture, a closure cap comprising a cover cap having a depending skirt, provided at its lower edge with an inwardly turned flange, an annular gasket beneath said flange, and a band member extending about said cover cap and gasket, said band member having an inwardly extending flange at its lower edge for supporting said gasket and having a side wall of greater width than the combined width of said gasket and said depending skirt of said cover cap whereby the upper portion of said side wall is adapted to be bent radially inwardly over the top of said cover cap to seal the closure to a container.

6. As an article of manufacture, a closure comprising a cover cap having a top portion provided with an upwardly extending annular rib substantially at its outer periphery, and having a depending skirt provided at its lower edge with an inwardly projecting flange, an overlapping band extending about said cap having an inwardly turned flange at its lower edge and an upstanding portion at its upper edge adapted to be folded over said annular rib, and a gasket in said band between said flanges.

7. A sealed package comprising, in combination, a container, a cover cap having a top portion and a depending skirt spaced away from the side wall of the container and provided at its lower edge with an inwardly extending flange

portion, an annular band having a flange at its upper edge engaging said cover cap substantially at the upper end thereof and having a flange at its lower edge extending beneath said flange portion of said cap, and an annular gasket compressed between said flange at the lower edge of said band and said flange portion of said cap and being wedged upwardly between the inner edge of said flange portion and the wall of the container to seal said cap on said container.

8. A sealed package comprising, in combination, a container having a side wall, a cover cap on said container having a cover portion provided with a shelf at the outer periphery thereof and having a depending skirt provided at its lower edge with an inwardly extending flange, a gasket beneath said flange, and a band extending about said cap, said band having a flange at the upper edge thereof engaging the shelf of said cover cap and having a flange at the lower edge extending beneath said gasket and positioned to press said gasket against said flange of said cap to force said gasket inwardly and upwardly against the side wall of said container to seal said cap thereto.

9. A sealed package comprising, in combination, a container, a cover cap having a top portion, a shelf adjacent the outer periphery of said top portion and a depending skirt provided at its lower edge with an inwardly and upwardly extending flange portion, an annular band having a flange at its upper edge engaging the shelf of said cover cap and having a second flange at its lower edge extending beneath said flange portion of said cover cap, an annular gasket compressed between said flange at the lower edge of said band and said flange portion of said cover cap to wedge a portion of said gasket between said upwardly extending flange portion and the container to seal said cap on said container.

10. A sealed package comprising, in combination, a container, a cover cap having a top portion provided at its outer periphery with an upwardly extending annular rib and having a depending skirt provided with an inwardly turned flange at its lower edge, a band member extending about said cap, said band member having a flange at its upper edge telescoped over said annular rib and having a flange at its lower edge extending inwardly beneath said cap flange, and a gasket compressed between said cap flange and the lower flange of said band to seal the container.

11. A sealed package comprising, in combination, a container, a disc member having a cover portion and a depending skirt with an inwardly extending flange at its lower edge, a gasket beneath said flange at the lower edge of said skirt, and a band member extending about said disc and gasket having an inturned flange engaging the outer edge of said disc substantially at the upper portion of said skirt and having an inwardly extending flange at its lower edge forcing said gasket upwardly against said flange at the lower edge of said skirt and inwardly against the container to form a seal.

12. A sealed package comprising, in combination, a container having an outwardly extending bead at substantially the upper end thereof, a disc member having a cover portion and a depending skirt with an inwardly extending flange at the bottom thereof, a gasket beneath said flange at the bottom of said skirt and beneath said bead on said container, and a band member extending about said disc and gasket having an inturned flange engaging the outer edge of said disc substantially at the upper portion of said skirt and having an inwardly extending flange at its lower edge forcing said gasket upwardly against said flange at the bottom of said skirt and inwardly against the container to form a seal beneath said bead.

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