

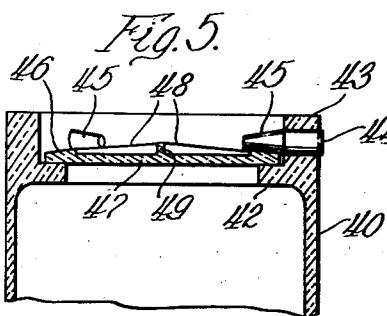
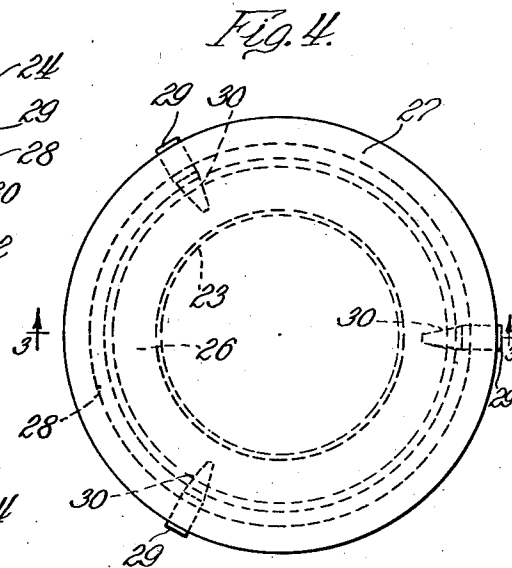
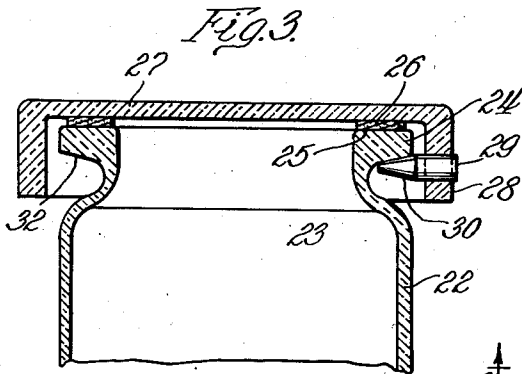
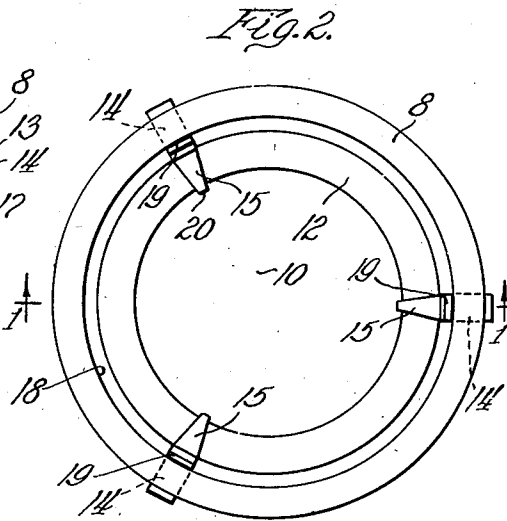
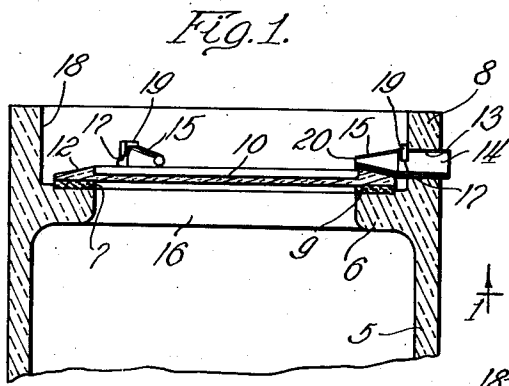
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CLOSURE

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CLOSURE

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8 Claims. (Cl. 215—38)

This invention relates to closures, and more particularly is directed to the provision of closure means for containers formed of non-metallic material, such as glass, ceramic, porcelain, or the like.

Due to the fact that metal containers are becoming increasingly difficult to obtain for a large variety of products, the present invention has for its broad concept the provision of a closure which will provide an effective seal for a container made of non-critical material, such as glass or crockery of one type or another.

The particular closure construction to which the present invention is directed is one in which no critical materials are employed, the cap or closure member itself being formed of a non-ferrous material, which may be glass, plastic, or a synthetic product, and embodies the use of a non-critical washer or sealing ring which is compressed between the lip of the container and the closure cap by means of a plurality of plastic tapered plugs engaging correspondingly tapered surfaces on the closure or container for wedging the closure into tight sealing engagement over the container opening. These plugs preferably are driven radially inwardly through suitable supporting flanges in the container or closure member, and when in engaged position, securely maintain the closure in sealed engagement on the container.

One of the primary objects of the present invention therefore is to provide a closure for a container embodying no critical material and secured in place without the use of threads or similar well-known securing means.

Another object of the present invention is to provide a closure for a container which is held in sealed position by means of plugs or lock members forming a wedging reaction whereby upon radial inward movement of the plugs, the closure is wedged into sealed position over the lip of the container.

Other objects and advantages of the present invention will appear more fully from the following detailed description which, taken in conjunction with the accompanying drawing, will disclose to those skilled in the art the particular construction and operation of the preferred form of the present invention.

In the drawing:

Figure 1 is a sectional view taken substantially on line 1—1 of Figure 2 showing a container embodying the closure means of the present invention;

Figure 2 is a top plan view of the construction shown in Figure 1;

Figure 3 is a sectional view of a modified form of construction taken substantially on line 3—3 of Figure 4;

Figure 4 is a top plan view of the construction shown in Figure 3; and

Figure 5 is a sectional view of a modified form of construction.

Referring now in detail to the drawing, in Figures 1 and 2 there is disclosed a container 5 provided near its upper surface with a radially inwardly extending flange or lip 6 having an annular seat 7 formed on the upper surface thereof. The container 5 extends beyond the lip 6 and is preferably thickened or reinforced thereabove to provide the cylindrical extension 8.

The seat 7 of the container is adapted to receive an annular gasket 9 formed of a fiber or similar gasket sealing material.

Preferably, the container 5 is formed of glass, crockery, or a plastic material of any desired type, and embodies no metallic material. The closure 10 is preferably of flat disc-like shape provided about its periphery with a beveled surface 12 tapering outwardly toward the annular edge of the closure. This closure may also be formed of glass, or may be formed of a molded plastic or the like.

At circumferentially spaced points in the extending flange 8 of the container, there are provided openings 13 adapted to receive plugs 14, these plugs having tapered end portions 15 having the same degree of taper as the beveled edge 12 of the closure or cap member. In operation, the plugs 14 are disposed in a position outside of the peripheral extent of the cap member 10 and the cap member 10 is placed on the gasket 9 in the conventional manner. The plugs 14 are then driven inwardly to engage the tapered surfaces 15 thereof with the beveled surface 12 of the cap member, wedging the cap member 10 firmly down upon the gasket 9 to provide a tight seal for the opening 16 of the container.

The plugs 14 are also provided with recesses 17 disposed in position such that they extend just inwardly of the inner annular surface 18 of the flange 8 when the cap has been sealed in position. These notches or recesses 17 are then adapted to receive suitable key members 19, which may be in the form of molded rectangular shaped pieces dropped into the slots 17 to hold the plugs 14 against radial outward movement. Or, if desired, the keys may be formed by dropping sealing wax or the like into slots to build

up the key member for holding the plugs against outward displacement. This forms a lock preventing opening of the container until these key members have been removed. Such removal may be accomplished by either pulling out the molded type of key or merely by driving the plug member 14 outwardly in the event the key is made of sealing wax or the like which will shear off the projecting portion of the key to allow the plugs to be moved outwardly. When moved outwardly so that the inner ends 20 of the plugs are disposed radially outwardly of the peripheral surface of the cap member 10, this member may be readily removed to open the container for removing the contents thereof.

Preferably, three such plugs are employed spaced at 120 degrees about the periphery of the flange 8, but it is to be understood that either more or less plugs may be employed, depending upon the diameter of the container and the amount of sealing pressure required.

In the form of the invention shown in Figures 3 and 4, the container 22 is provided with a neck portion 23 terminating in a radially outwardly directed lip or flange 24 having on its upper surface the seat 25 adapted to receive the gasket 26, which seats on the upper radial surface of the lip 24. A cap member which is in the form of an inverted cup-shaped member 27 has the depending peripheral flange 28 which extends about the neck 23 and lip 24 of the container. Mounted at circumferentially spaced points in the flange 28 are plug members 29 having tapered or conical inner end portions 30 adapted to have wedging engagement with the beveled or tapered under surface 32 of the lip 24 of the container. In operation after the cap member has been placed over the gasket 26, the plugs 29 are driven inwardly whereby the ends 30 thereof wedge against the beveled surface 32 to force the cap member 27 downwardly into firm engagement on the gasket 26 for sealing the container 22. This forms a very tight seal.

For removal of the cap member, a suitable implement can be inserted between the end of the tapered portion 30 and the neck 23 of the container to wedge the plug outwardly, or the plug 29 can be provided with a suitable flange on the outer end thereof to facilitate such removal.

In the form of the invention shown in Figure 5, the container 40 is provided with a radially inwardly directed lip 42, similar to the construction shown in Figure 1, and is provided with a thickened axially extending upper flange portion 43 which is adapted to carry the plugs 44 corresponding to the plugs 14 and 29. The plugs 44 have the inner ends thereof tapered, as indicated at 45, and are adapted to engage on a beveled surface 46 formed on the cap member 47. In this form of the invention the cap member 47 is provided with a beveled surface 46 which increases in height, as indicated at 48, intermediate the circumferentially spaced plugs 44. The cap member 47 is also provided on its upper surface with a transverse rib 49, whereby, after the cap member has been placed in position on the upper surface of the lip 42 and the plugs 44 moved inwardly into the position shown, the operator may grasp the rib 49 and rotate the cap member 47 on its seat 42, causing the higher portions 48 of the beveled edge 46 to move circumferentially under the tapered surfaces 45 of the plugs 44 to produce the desired wedging engagement. This locks the plugs 45 into position frictionally against removal, and also pro-

duces the desired sealing engagement. To remove the cap member 47, the rib 49 is again rotated to bring the low spots of the bevel edge 45 beneath the plug ends 45, thereby relieving the pressure on the plug ends so that the plugs may be pushed radially outwardly to facilitate removal of the cap member.

Preferably, the cap member 47 is formed of a plastic; whereas, the container may be glass or any similar non-critical material.

It will thus be seen that a self-locking cap member formed entirely of non-critical material is provided in each of the forms of the invention, and may be arranged for locking into position as by means of the keys 19 in Figure 1, or merely by the frictional engagement of the plugs 29 in the openings formed in the retaining flanges since, due to the camming action provided by the beveled surfaces, the plugs have a resultant component in a direction binding them in their supports.

I am aware that various other modifications of this type of closure may be made within the purview of the present disclosure, and I therefore do not intend to be limited except as defined by the scope and spirit of the appended claims.

I claim:

1. In combination, a container member having an annular lip defining the opening thereof, a closure member adapted to be disposed over said lip, an annular tapered surface on one of said members, and circumferentially spaced plugs on the other of said members movable radially inwardly and having frusto-conical inner ends for wedging action on said tapered surface to clamp said closure member on said lip.

2. The combination of claim 1 including means for locking said plugs in wedged position.

3. The combination of claim 1 wherein all of said elements are formed of non-metallic material.

4. In combination, a non-metallic cylindrical container member having an annular radially directed flange seat forming an opening into the interior of said member, a gasket seated on said flange seat, a non-metallic substantially disc-like closure member having seating engagement over said gasket and having a peripheral tapered surface, an annular flange on said container member encircling said closure member when the latter is in seated position, and radially inwardly movable plugs disposed in circumferentially spaced relation in said encircling flange having frusto-conical inner ends adapted to engage said tapered surface for wedging said closure member axially onto said seat.

5. In combination, a non-metallic substantially cylindrical container member having a neck portion and a radially outwardly directed flange terminating said neck portion, a non-metallic closure member comprising an inverted cup-shaped member having its base seated on said flange and having a depending annular skirt portion encircling said flange and neck portion, said flange having its lower annular surface tapered, radially movable plug means carried by said skirt portion and having frusto-conical inner ends engaging said tapered surface for wedging said closure member downwardly upon inward movement of said plug means.

6. The combination of claim 4 wherein said plugs are provided with slots arranged to be positioned inwardly of said encircling flange when said closure member is in seated position, and

key means engageable in said slots to prevent radial outward movement of said plugs.

7. In combination, a tubular container member having one end permanently closed and the other end open, a radially inwardly directed flange adjacent said open end, a closure member adapted to seat on said flange and having the upper peripheral surface thereof beveled radially outwardly, and plug means mounted for radial inward movement in the wall of said container member between said flange and open end, said plug means having frusto-conical inner ends adapted to have wedging engagement on said

beveled surface to press said closure member downwardly on said flange.

8. The combination of claim 7 wherein said beveled peripheral surface of said closure member increases in axial thickness at circumferentially spaced portions and decreases in axial thickness intermediate said portions, and said closure member is provided with a transverse rib to facilitate rotation of said closure member on said flange for increasing the wedging action of said plug means.

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