July 6, 1948. R. KRASBERG 2,444,779

BOTTLE CAP

Filed April 6, 1946

Fig. 1.

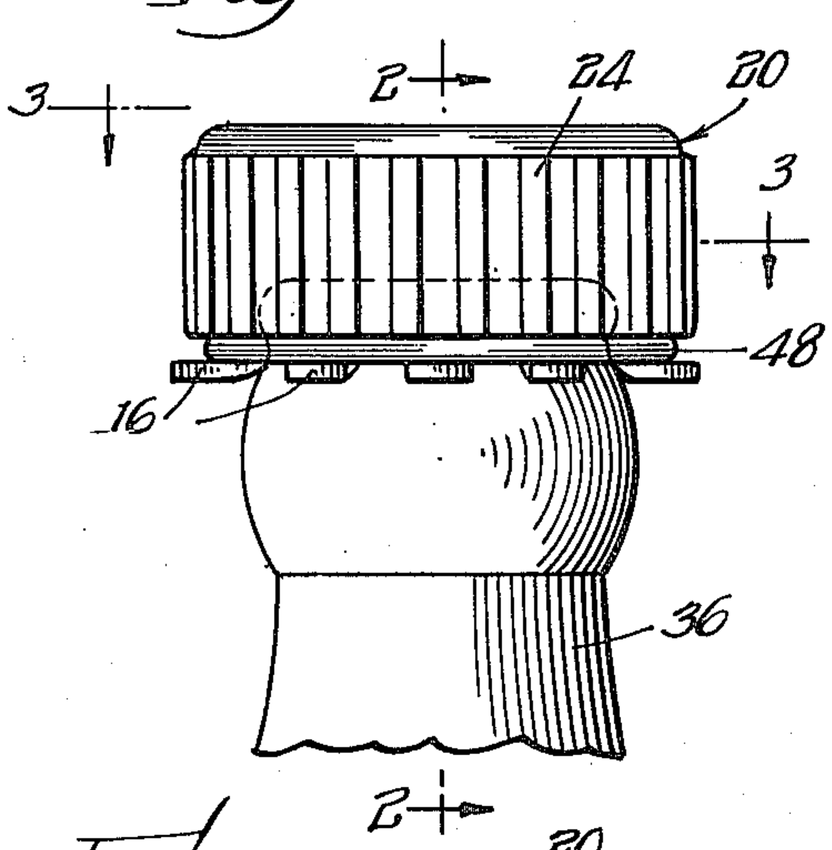


Fig. 2.

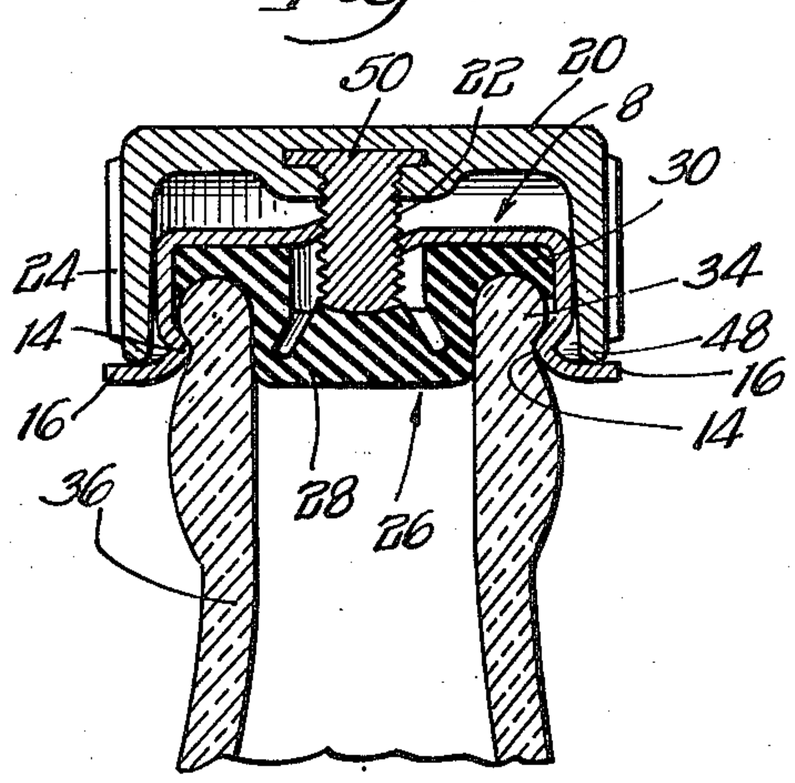


Fig. 3.

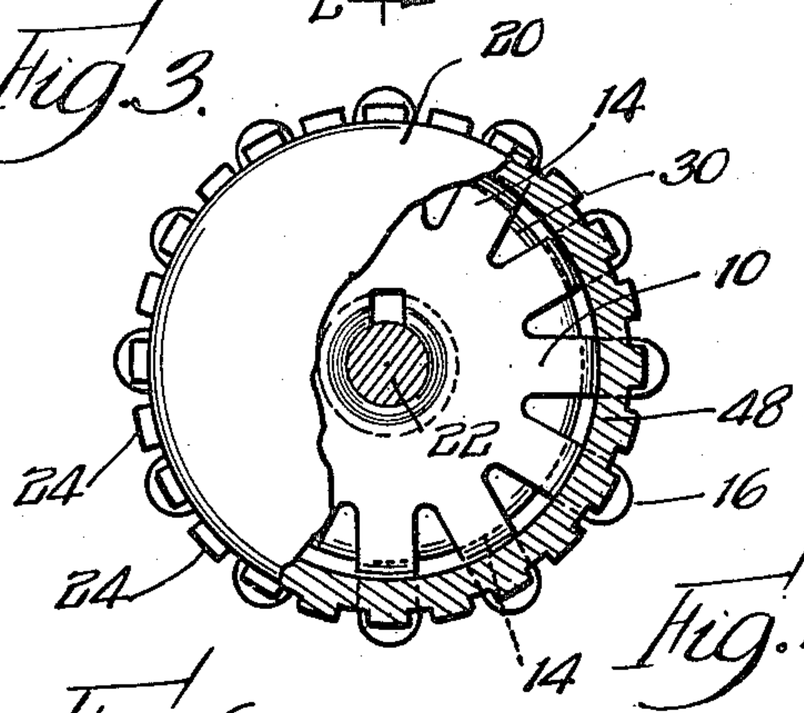


Fig. 4.

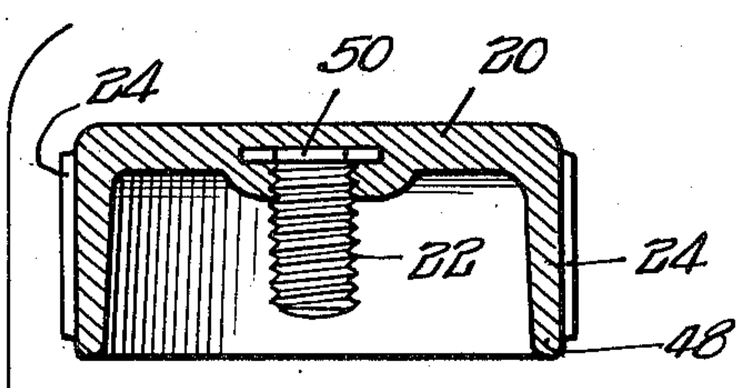


Fig. 6.

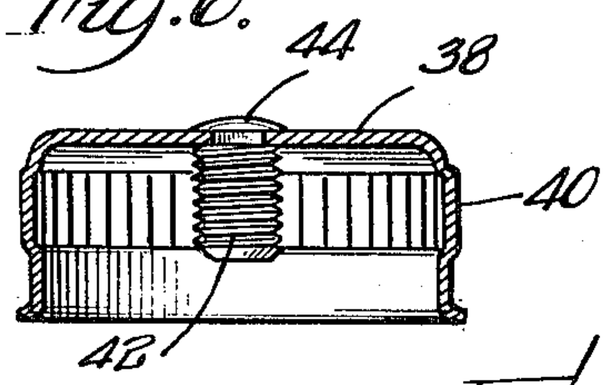


Fig. 7.

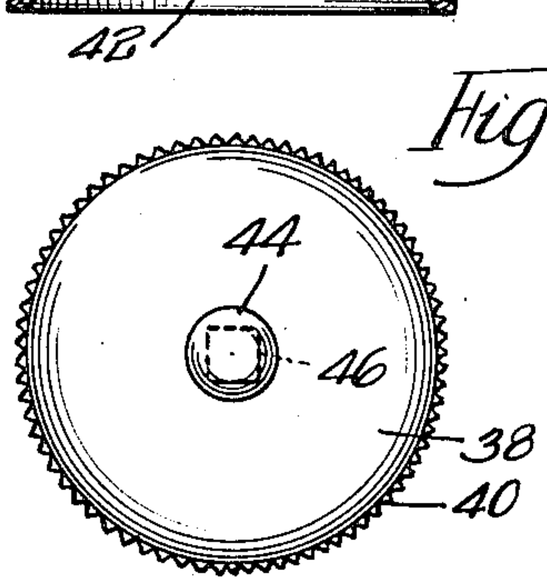
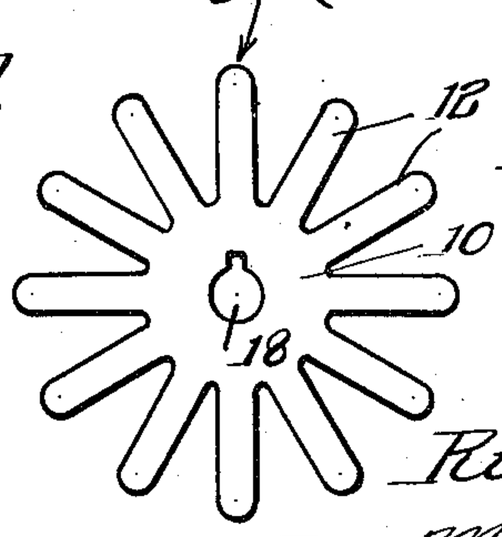


Fig. 5.



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BOTTLE CAP

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6 Claims. (Cl. 215—45)

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This invention relates to closure caps and more particularly to an improved readily removable, reusable effective seal for the mouths of bottles, jars and other containers.

The closure caps of the prior art of the type of which this invention is an improvement provide seals for the mouths of bottles and the like in which the sealing force is largely a function of the resiliency of spring fingers. In the sealing of vessels containing carbonated fluids in which superatmospheric pressures exist, it has been found that the seal is not sufficiently effective when pressures within the container reach higher levels.

One object of this invention is to provide a closure cap which will maintain a tight and efficient seal adapted to withstand superatmospheric pressures.

Another object of this invention is to provide an improved closure cap for sealing bottles and the like which is readily removable and which when in sealing position will maintain an efficient seal.

A further object of this invention is to provide an improved closure cap of simple, economical and efficient construction which may be repeatedly used to effectively seal bottles and the like.

A further object of this invention is to provide a removable, reusable improved closure cap in which the degree of sealing may be rapidly, conveniently and easily increased.

Other and further objects of this invention will appear from the following description.

In the accompanying drawings which form a part of the instant specification and which are to be read in conjunction therewith and in which like reference numerals are used to indicate like parts in the various views:

Figure 1 is an elevation of the improved closure cap of this invention shown in sealing position on a bottle;

Figure 2 is a sectional view taken on the line 2—2 of Figure 1;

Figure 3 is a sectional view taken on the line 3—3 of Figure 1;

Figure 4 is an exploded sectional view of the improved closure cap of this invention;

Figure 5 is a plan view of a blank from which one element of the assembly is made;

Figure 6 is a sectional view of a modified form of one of the elements of the closure cap; and

Figure 7 is a top plan view of the element shown in Figure 6.

In general, this invention contemplates the provision of a gripping member having a skirt

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composed of resilient fingers adapted to embrace the mouth lip or bead of a container which is to be sealed. The fingered skirt carries a resilient sealing member made of rubber, composition, cork, plastic material or the like. A cap is threadedly carried by the gripping member and is mounted for movement longitudinally of the axis of the assembly. The longitudinal movement is adapted to press the ends of the resilient fingers and the central portion of the resilient sealing member downwardly to effect a tight seal.

More particularly, referring now to the drawings, a gripping member indicated generally by the reference numeral 8 is formed with a central disc portion 10 and a skirt formed of a plurality of depending resilient fingers 12. The gripping member 8 is formed of the blank shown in Figure 7 by any suitable method as by stamping with forming dies. The metal of which the gripping member 8 is formed has sufficient resiliency so that the fingers 12 act as a plurality of springs. Each of the fingers is formed with an inwardly directed portion 14 and terminates with an outwardly directed flange portion 16. The disc portion 10 is provided with a central aperture 18 having a periphery formed along the locus of a screw thread. A cap 20 carries a centrally secured threaded member 22 which is rigidly mounted upon the cap for rotation therewith in any suitable manner. The periphery of the cap is formed with a plurality of friction ribs 24. The threaded member 22 is adapted to engage the threaded aperture 18 so that relative rotation between the gripping member 8 and the cap 20 will result in a longitudinal movement between the cap and the member 8. The sealing member proper of rubber or the like is indicated generally by the reference numeral 26. It is formed with a centrally thickened portion 28 and an upper peripheral flange 30. The centrally thickened portion 28 is formed with a reentrant portion 32 adapted to receive the lower end of the threaded member 22 as can readily be seen by reference to Figure 2. The flange 30 is adapted to seat on the lip or bead 34 of the container being sealed, such as bottle 36. The sealing member is preferably made out of rubber though it may be made out of any suitable resilient compressible substance such as cork or the like.

A modified form of cap member 38 is shown in Figure 6 in which the cap is formed of sheet metal or the like with a serrated periphery 40 and carrying a centrally positioned threaded member 42 secured to the cap by forming the upper portion

thereof into a rivet head 44. The upper end of the member 42 is squared at 46 to prevent relative rotation between the threaded member 42 and the cap 38.

In use, the cap 20 is rotated relative to the gripping member 8 so that the annular flange 48 of the cap is spaced from the finger flanges 16. This permits the fingers 12 to flex outwardly. The sealing member 26 is carried underneath the disc portion 10 of the gripping member 8, the inwardly directed portions 14 normally retaining the sealing member 26 in position. The assembly is then placed over the top of the container to be sealed and pressed downwardly. The spring fingers 12 flex outwardly permitting the inwardly directed portions 14 to snap over the lip 34 of the bottle being sealed. The rubber is sufficiently compressible to effect some sealing. The seal, however, is not sufficiently tight to resist pressure which would be generated within the vessel 36 as would be the case in event it contained carbonated beverages or the like. The cap 20 is then rotated. The threaded member 22 has its upper portion 50 in the form of a hexagon or the like and seated in the cap 20. Accordingly, rotation of the cap 20 will rotate the threaded member 22. As the threaded member moves downwardly in the internally threaded aperture 18, its lower portion will contact the central thickened portion 28 of the sealing member 26 thrusting it downwardly and increasing the effectiveness of the seal. At the same time the annular flange 48 will contact the flanges 16 of the spring fingers 12 forcing the flanges downwardly. The downward movement of the flanges 16 will create a component of force inwardly, thrusting the inwardly directed portions 14 of the fingers 12 more strongly against the bead 34 of the bottle being sealed. This action increases the clamping force holding the flange 30 of the sealing member 26 between the gripping member 8 and the surface of the bottle 36 on which the sealing member 26 rests.

It will be seen that the objects of the invention have been accomplished. There is provided a simple, efficient improved closure cap which is adapted to seal containers such as bottles or the like effectively and simply in a manner to withstand considerable internal pressure such as would be the case when sealing vessels containing carbonated beverages. The degree of sealing can be simply increased by rotation of the cap member 20 relative to the gripping member 8. The member 8 rests against the flexible sealing member 26 with sufficient friction so that no relative motion between the member 8 and the member 26 will take place. Similarly, there is sufficient friction between the sealing flange 30 and the lip of the vessel being sealed to prevent relative rotation between the cap 20 of the member 8. Since the member 26 is resilient and has enough thickness, the compression of the member by the action which has been described will cause the rubber of the sealing member to flow, accommodating any irregularities in the sealing surface and presenting a gas-tight efficient seal. The pitch of the threads on the threaded member 22 is such that a comparatively short amplitude of rotation will complete the seal. The closure member is readily removable by rotation of the cap member in the opposite direction. This raises the annular flange 48 and the threaded member 22. In raised position, the tension placed upon the sealing member 26 by the threaded member 22 is relieved and the clamping action is reduced. Furthermore, the spring fingers are freed to move outwardly when the annular flange 48 is moved to a position clear of them. The closure assembly can then readily be removed. The sealing member 26 itself may be removed from its fingered housing simply and washed from time to time. The construction has only four simple parts which may be economically manufactured. While the closure member has been illustrated in place on a bottle it is to be understood it may be used for sealing any container provided with a mouth having a beaded portion such as is common in the art. Due to the fact that the sealing action is not dependent upon the resiliency of the fingers, there is no lessening of sealing efficiency with continued use as is the case with the devices of the prior art. The fingered portion of the gripping member 8 need be only sufficiently resilient to hold the closure member in place to permit the rotation of the cap.

It will be understood that many changes may be made in details without departing from the spirit of this invention, and this is contemplated by and is within the scope of the claims. It is therefore to be understood that this invention is not to be limited to the specific details shown and described.

Having thus described the invention, what is claimed is:

1. A readily removable closure cap assembly adapted to seal a container having an opening formed with a peripheral bead including in combination a gripping member having a plurality of depending fingers, each of said fingers being formed with an intermediate inwardly directed portion adapted to underlie the bead of the container being sealed and an outwardly directed flange, a resilient sealing member surrounded by said fingers and adapted to seat on said bead, a cap having a depending flange, a threaded stud member carried by said cap and adapted to rotate therewith, said gripping member having an aperture with the periphery thereof formed into a helix and adapted to receive said stud member whereby upon relative rotation between said cap and said gripping member the flange of said cap member will thrust the flange of each of said fingers of said gripping member downwardly to increase the sealing force exerted upon said sealing member.

2. A readily removable closure assembly adapted to seal a container having an opening formed with a beaded periphery including in combination a gripping member having a plurality of spaced depending resilient fingers, each of said fingers having an inwardly directed portion and an outwardly directed flange, a resilient sealing member comprising a central portion and an annular flange positioned beneath said gripping member and adapted to seat upon the beaded periphery of said container, a cap member formed with a depending flange, a threaded member carried by said cap member centrally thereof for rotation therewith, said gripping member being formed with an internally threaded central aperature, said threaded member threadedly engaging said central aperture and adapted to contact the central portion of said sealing member, the construction being such that upon relative rotation between said gripping member and said cap member said cap flange will contact the outwardly directed flange of each of said fingers to thrust them downwardly and said threaded member will contact said sealing member to

thrust it downwardly adjacent its central portion whereby to increase the sealing action.

3. A closure assembly as in claim 2 in which said sealing member is formed with a thickened central portion.

4. A closure assembly as in claim 2 in which said cap member is formed with an external antifriction surface.

5. A closure assembly as in claim 2 in which said gripping member is formed of a sheet of resilient metal.

6. A closure assembly as in claim 2 in which said cap member is stamped out of a sheet of metal.

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The following references are of record in the file of this patent:

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