April 4, 1939. W. L. McNAMARA ET AL 2,153,426

SEALED PACKAGE AND PARTS THEREOF

Filed Dec. 18, 1933

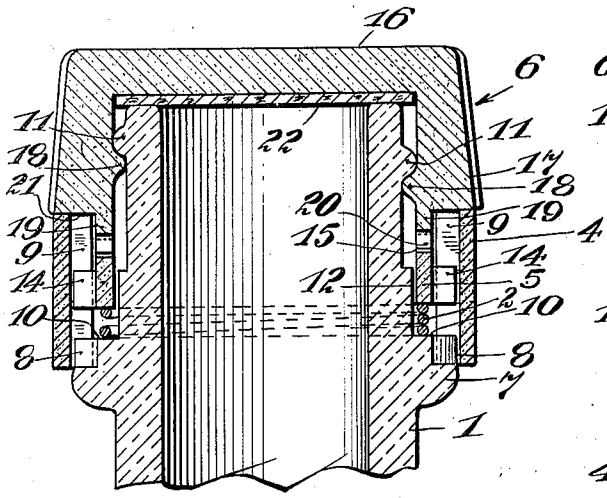


Fig. 1.

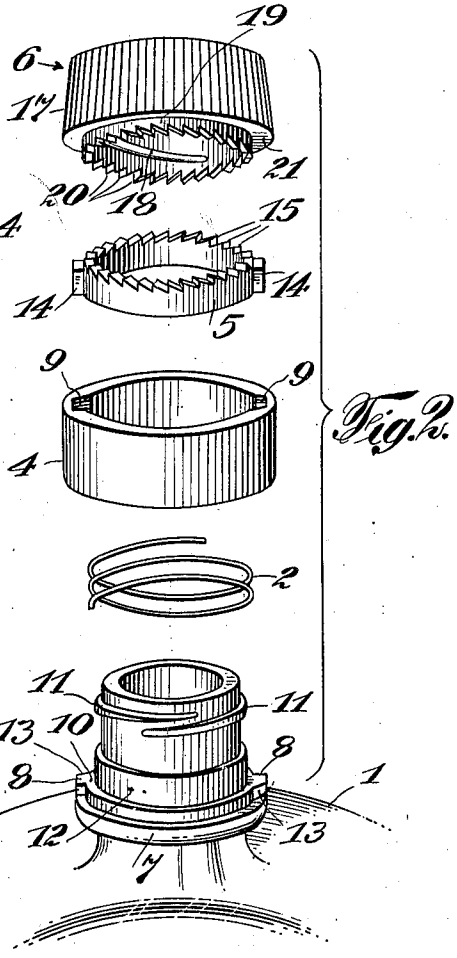


Fig. 2.

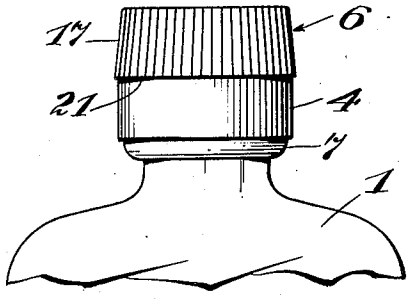


Fig. 4.

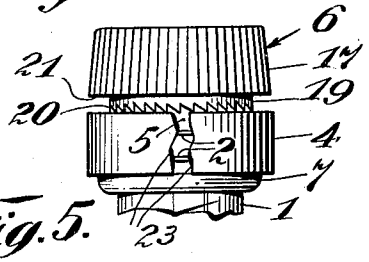


Fig. 5.

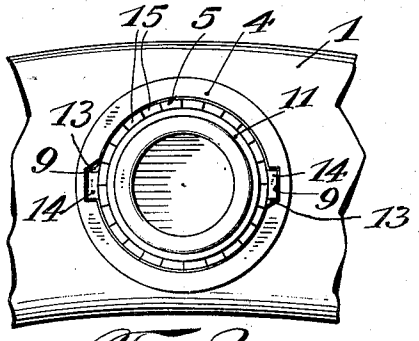


Fig. 3.

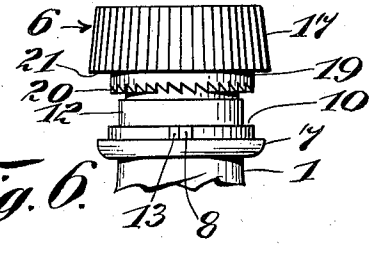


Fig. 6.

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SEALED PACKAGE AND PARTS THEREOF

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Application December 18, 1933, Serial No. 702,884

12 Claims. (Cl. 215—7)

The present invention relates to the sealing art, and more particularly to a sealing device for containers which cannot be removed without visible indications thereof.

Screw caps are very desirable for sealing bottles and the like, because of the secure seal and because of the ease of application and removal. In addition, the cap can be used as a convenient reseal during the consumption of the contents of the package. One serious objection to screw caps, as well as certain other types of caps, is that the contents of the package can be sampled, tampered with, or adulterated and thereafter sold as an original package. Furthermore, the contents can be removed and an imitation or an inferior product can be substituted without knowledge of the consumer. The package may also be refilled with a substitute after the contents have been used and sold as an original package. These frauds are frequently perpetrated upon the unsuspecting consumers, and more particularly where the packages are sold for a substantial sum. A particularly annoying situation arises in connection with bottles for spirituous liquors, where the contents are diluted in numerous instances and thereafter sold.

Packers and bottlers advertise the quality of their products and desire that the purchaser obtain their product. The consumers also want to be sure of receiving the product purchased and not an inferior product or substitute. The sale of counterfeit packages is, therefore, highly detrimental to the good will of the packer or bottler. Another serious objection to screw caps is that the caps frequently back off or become loose in shipment and subsequent handling. As a result, the contents are lost and the wrappers of adjacent packages are spoiled or other damage is sustained.

Various attempts have been made to achieve these results and to eliminate the objections of the prior art seals. In most cases, the cost of the resulting package is prohibitive and in other cases the difficulty of removal discourages the use of the cap. It has been found that consumers do not read or follow instructions as to the opening of a package; hence, a package difficult to open is not popular. In addition, the consumer demands, in most cases, a convenient reseal. Some bottlers have gone to the extent of providing an "over-all" cover cap which must be torn from the container. This increases substantially the cost of the package. Frequently the cover cap does not tear as it should, and the part remaining on the bottle, as well as the opening operation, is likely to cut or injure the person using the package.

The present invention aims to overcome the above difficulties by providing an inexpensive seal which cannot be removed without visible indications thereof, and by providing means for locking a screw cap on the container to prevent accidental backing off or loosening. The invention also aims to achieve these results without complicating the removal of the cap or requiring instructions therefor, and without impairing the reseal use of the closure.

An object of the present invention is to provide an improved closure which cannot be opened and replaced without visible indications thereof.

Another object of the invention is to provide a closure which is locked against accidental loosening thereof.

Another object of the invention is to provide an improved closure which cannot be opened and replaced without the knowledge of the consumer, and to achieve this result without impairing the utility of the closure for reseal purposes.

Another object of the invention is to provide a closure which is locked against accidental removal without impairing its utility as a reseal.

Another object of the invention is to provide an improved closure which cannot be opened and replaced without visible indications, and which permits the cap to be removed by the usual method of unscrewing.

Another object of the invention is to provide a screw cap which is locked against accidental removal and which can be removed by the usual method of unscrewing.

Another object of the invention is to provide a sealed package having a closure cap locked in position by a visible frangible member, which is automatically broken by unscrewing the cap.

Another object of the invention is to provide means for automatically locking the cap against removal.

A further object of the invention is to provide a simple, inexpensive container adapted to cooperate with the closure to accomplish the above enumerated objects and advantages.

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 accompanying 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 fragmentary sectional view illustrating the position of the parts when the package is sealed;

Fig. 2 is an exploded view illustrating the construction of the several parts of the package;

Fig. 3 is a fragmentary top plan view of the package before the cap is applied;

Fig. 4 is a fragmentary side elevational view showing the sealed package;

Fig. 5 is a fragmentary side elevational view showing the cap partially removed; and

Fig. 6 is a fragmentary elevational view showing the cap applied for reseal purposes.

Referring again to the drawing, the several parts of the device are shown more particularly in Fig. 2, and comprise a bottle 1, a resilient member 2, a frangible member 4 which may be in the form of a band, sleeve, collar or the like, all of which terms are intended to be synonymous when used herein, a ratchet member 5 and a screw cap 6. These will be described in the order named.

The bottle 1 may have the usual shoulder 7 and may be provided with any suitable means for interlocking with the band 4. As illustrated herein, a pair of projections 8 are provided adjacent the shoulder adapted to fit in grooves or recesses 9 in the band 4. A shoulder 10 is provided on the container adapted to seat the resilient member 2. The upper end of the container is preferably reduced slightly in size and provided with a thread 11 adapted to cooperate with the thread on the interior of the cap 6.

The resilient member 2 is illustrated herein as a coil spring formed from a suitable wire. The pressure which the spring exerts is relatively small but is sufficient to urge the ratchet member 5 upwardly. It will be understood, however, that any other suitable means for exerting resilient pressure against the ratchet member 5, when the parts are assembled, may be utilized; for example, a rubber ring may be used, or any other suitable device. The spring, or other resilient member, is adapted to telescope over the mouth of the bottle and seat upon the shoulder 10 and extend about an enlarged portion 12 on the container below the thread thereof.

The band or collar 4 is preferably formed of a frangible material, for example, a phenolic condensation product or a synthetic resin, which, while having substantial strength, breaks quite easily. Such material is brittle and, unlike glass, does not form sharp edges likely to cut or injure the hand. The grooves or recesses 9, extending axially of the band, serve a three-fold purpose. First, they are suitably sized to fit over the lugs 8 of the container and thus lock the band against rotation with respect to the container. Secondly, the grooves engage the projections 14 on the ratchet to lock it against rotation with respect to the band. Thirdly, the grooves weaken the band so that it breaks quite readily. Preferably, either the projections 8 or one side wall of each of the grooves 9, or both the projections and the grooves, are formed with a cammed surface 13, here shown on the projections 8 of the container. The purpose of this inclined or cammed surface, is to cause the projections 8 to attempt to force their way out of the grooves 9 when the cap 6 or the band 4 is rotated backwardly. This expansion is intended to break the band and to give a visible indication of the package having been tampered with. The band may have a suitable trade-mark or design embossed thereon to prevent unauthorized duplication thereof.

The ratchet member 5 preferably comprises a circular collar having ratchet teeth or projections 15 on the upper rim thereof. The projections 14 on the ratchet fit into the grooves 9, as described above, to hold the ratchet in position. The ratchet member 5 may be made of any suitable material but, as illustrated herein, it is also made of molded material such as synthetic resins. It would be obvious, however, that other types of material could be used and their uses are contemplated herein.

The closure cap 6 may be of any suitable shape. As here shown, it comprises a cover portion 16 and a depending skirt 17 with suitable screw threads 18 on the interior thereof. The inner part of the skirt is extended downwardly at 19 and is provided with ratchet projections 20 on the bottom of the extension. These ratchet projections are adapted to engage and cooperate with projections 15 on the ratchet member 5. The outer portion of the skirt may terminate in a shoulder 21 adapted to abut the upper end of a frangible sleeve or collar 4. While the closure cap may be made of various materials, the construction shown is a molded cap preferably made of a phenolic condensation product or a synthetic resin. Such caps may be molded in the form shown by stripping the caps from the molding pins before the caps have been completely cooled, the elasticity of the material before it has completely hardened or set being utilized to permit the cap to jump over the threads on the pin. A suitable liner 22, of cork or other material, may be utilized as the sealing element between the rim of the container and the cover part of the cap. Any other suitable sealing means may be utilised, for example, rubber, felt, cardboard and similar materials.

While the parts herein may be assembled in any desired way, one convenient way is to drop the coiled spring 2 over the end of the container so that it rests on the shoulder 10 about the enlarged portion 12, thereafter the collar or sleeve 4 may be telescoped over both the spring and the end of the container and the grooves 9 made to register with the projections 8 so that the bottom of the collar rests upon the shoulder 7 of the container. Thereafter, the ratchet member 5 may be dropped over the end of the container and the projections 14 may be placed into the grooves 9 on the interior of the frangible collar or sleeve 4; preferably the spring 2 is not sufficiently large to force the ratchet member 5 out of the collar, but permits it to rest in the upper part thereof with the projections 14 in registry with the grooves 9. The cap 6 is then screwed upon the container in the usual manner. The ratchet projections 20 engage the projections 15 on the ratchet member 5 and the rotation of the cap is continued with the usual ratchet sound until the cap is screwed home. In this position, the bottom of the skirt of the cap 21 abuts the upper end of the collar 4. The ratchet teeth 20 on the cap extend sufficiently far down into the collar member 4 to prevent one from using a pin or other instrument to pry into the cap and push down the ratchet so that the cap can be removed without breaking the collar 4. The assembly of the parts is

shown in section in Fig. 1 and in elevation in Fig. 4.

In removing the cap, one takes the package in the usual manner and unscrews the cap 6. It is immaterial whether the person grips just the skirt of the cap 6, or the entire cap and band 4. In either case, backward rotation of the cap or the band will cause the band to attempt to ride over the projections 8 on the container, and the outward pressure at the projections 8 causes the band to break, as shown more particularly in Fig. 5. After the band breaks, the cap proper 6 may be rotated either alone or together with the broken band 4, and the cap removed. After removal of the cap, the band 4 and spring 2 and ratchet member 5 are preferably removed from the neck of the bottle and thereafter the cap 6 is utilized as an ordinary screw cap for reseal purposes, as shown more particularly in Fig. 6. It will be noted in Fig. 6 that the removal of the parts, excepting the cap, is very noticeable and the consumer will immediately know that such a package has been tampered with. In fact, the consumer learns to listen for the cracking noise of the frangible collar, and also enjoys breaking the collar. A break 23 in the collar, as shown in Fig. 5 is readily noticeable and prevents any attempt being made to pass such a package as an original package. In addition to being tamper-proof, the cap is locked in position so that it cannot become loose during shipment and handling, which is an important feature.

It will be seen that the present invention provides a sealing device in which the several parts may be readily and inexpensively manufactured and easily assembled. The closure cap is applied in the same manner as any ordinary closure cap and is likewise removed as a screw cap is removed. No directions are necessary for the consumer in opening the package. In addition, the cap is locked against loosening during shipment or improper removal by persons desiring to tamper with the contents. The frangible band 4 is readily broken without materially increasing the turning effort necessary to remove the cap. The material of the band prevents cutting the hands or otherwise injuring the person removing the cap. The band 4 may be, if desired, given a contrasting color. For example, the cap may be black, the band red, or any desired colors may be utilized, since a synthetic resin may be made in almost any color. To further assure the customer that the package is genuine, both the band and the cap may be embossed with the packer's trade-mark or any other decoration desired. Such embossment on the band may be stripped from the mold, as described above with respect to the closure cap.

As various changes may be made in the material used, dimensions, relative proportion and the construction of the several parts described herein without departing from the spirit and scope of the invention and without sacrificing its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limited sense, as the scope of the invention is to be coextensive with the scope of the claims.

Having thus described our invention, we claim:

1. In a device of the class described, the combination of a frangible member adapted to lock with the neck of a container, and a ratchet member adapted to lock with said frangible member.

2. In a device of the class described, the combination of a container having a projection thereon, a closure cap secured to said container and having projections thereon, a member having means associated therewith adapted to lock with said projections on the closure cap, and a frangible member adapted to lock with said first member and with said projection on the container to prevent the removal of the cap without rupture of said frangible member.

3. In a device of the class described, the combination of a container having a projection thereon, a rupturable collar adapted to lock with said projection, to prevent rotation thereof with respect to the container, a closure cap secured to the container above said collar, and means for locking said closure cap to said frangible collar to prevent removal of the closure cap without rupture of said collar.

4. In a device of the class described, the combination of a container, a frangible collar adapted to engage and lock with said container, a ratchet member operatively locked to said collar, resilient means for urging said ratchet member upwardly, and a closure cap having projections thereon adapted to engage and lock with said ratchet member to prevent removal of the cap without breakage of said collar.

5. In a device of the class described, the combination of a glass container having projections thereon, a frangible collar molded of a synthetic resin adapted to lock with the projections on the said container, a ratchet member having means thereon adapted to lock with said collar, resilient means for urging said ratchet member upwardly, and a closure cap attached to the upper end of said container having projections thereon adapted to lock with said ratchet member to prevent removal of the cap without rupture of the frangible collar.

6. In a device of the class described, the combination of a container having a projection thereon and having external screw means, a preformed rupturable member adapted to fit over the end of the container and having a portion thereon adapted to lock with said projection on the container to prevent more than a predetermined amount of rotation thereof with respect to the container without causing said portion to ride over said projection and rupture said rupturable member, a screw closure cap secured to the external screw means on said container, and means for locking said closure cap to said rupturable member to prevent removal of said closure cap from the container without rupture of said rupturable member.

7. In a device of the class described, the combination of a container having an external projection on the side thereof and having external screw means, a preformed rupturable member formed of frangible material adapted to fit about the neck of the container, and a recess adapted to lock with said projection on the side of the container to prevent more than a predetermined amount of rotation thereof with respect to the container without said projection engaging a side of said recess and rupturing said rupturable member, a screw closure cap secured to the external screw means on said container, and means for locking said closure cap to said rupturable member to prevent removal of said closure cap from the container without rupture of said rupturable member.

8. In a container closure means, the combination of an internally threaded closure adapted to engage an external thread on a container and to

close the container opening, an externally visible preformed readily breakable indicator member structurally separate from the closure and adapted to be freely assembled with the container without substantial change in size or shape, means connecting the indicator member directly with the closure to prevent removal of the closure from the container while the indicator member remains unbroken, and a concealed means for normally causing the outward breaking of the side portion of the indicator member upon substantial rotative movement thereof relative to the container.

9. As an article of manufacture, for use with a container having a neck portion with a projection thereon and with closure means for the container, comprising a preformed frangible indicator band molded of a synthetic resin compound and adapted to fit about the neck of the container without substantial change in size or shape, and a projection integral with said band and extending transversely thereof adapted to engage and lock with the projection on the container to prevent relative rotation of the band with respect to the container without rupturing the band.

10. In a device for use with a container having a neck portion with a projection thereon and with closure means for the container, the combination of a frangible annular member molded of a synthetic resin compound, said frangible member being structurally separate from the closure means and being adapted to extend about the neck of a container adjacent the bottom of the closure cap and to lock with the neck of the container to prevent rotation with respect thereto, and a ratchet member adapted to lock with said frangible member.

11. In a device of the class described, the combination of a container and a projection thereon, and a frangible collar adapted to lock with said projection to prevent rotation thereof with respect to the container, a screw closure cap secured to the screw means on the container above said collar, and ratchet means for locking said closure cap to said frangible collar to prevent removal of the closure cap without rupture of said collar.

12. In a container closure means, the combination of an internally threaded closure adapted to engage an external thread on a container and to close the container opening, an externally visible preformed readily breakable indicator member structurally separate from the closure and adapted to be freely assembled with the container without substantial change in size or shape, means comprising a ratchet member connecting the indicator member directly with the closure to prevent removal of the closure from the container while the indicator member remains unbroken, and means for normally causing the outward breaking of the side portion of the indicator member upon substantial rotative movement thereof relative to the container.

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