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REUSABLE SEAL

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Fig. 1.

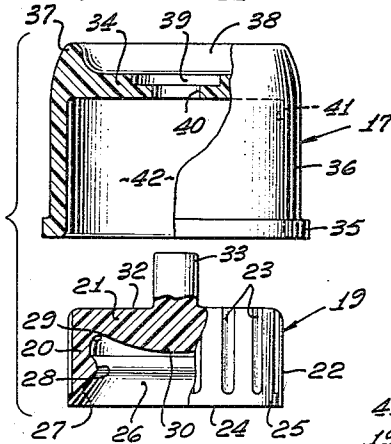


Fig. 2.

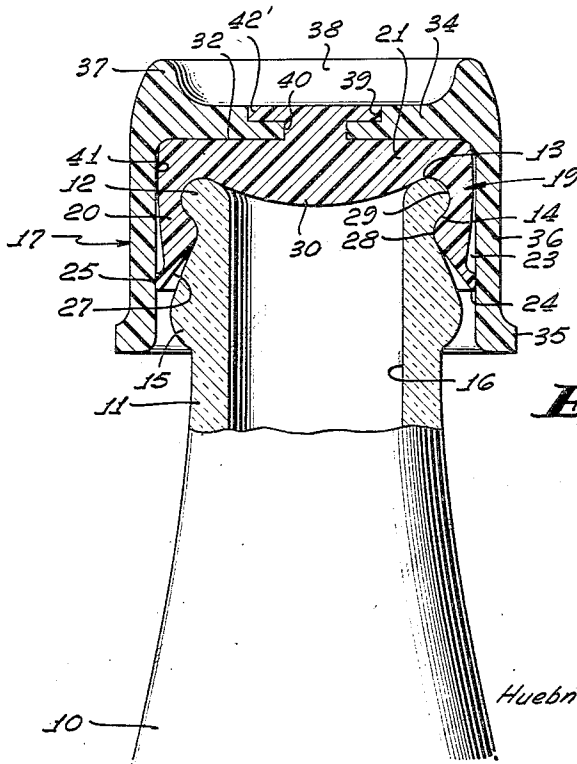
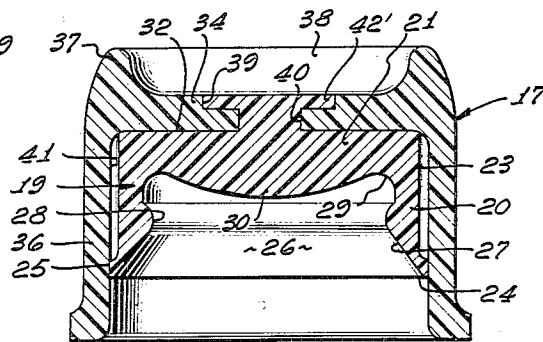


Fig. 3.

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REUSABLE SEAL

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4 Claims. (Cl. 215—40)

The invention relates to bottle closures and has particular reference to a reusable closure by means of which the contents and particularly carbonated contents of beverage bottles can be effectively sealed after they have been opened and a portion of the contents used.

A great many attempts have been made in recent years to provide an effective reusable closure. Many of these attempts have resulted in sundry patents which are characterized by some special mechanism to add extra pressure to the seal to be certain that there is no leakage of the gaseous charge of the carbonated beverage in the bottle. The sale of millions of bottles of carbonated soft drinks and beer have dictated the type of bottle in conventional use, namely, one wherein the rim is provided with a rounded bead and these beads, regardless of the origin of the bottle, are of uniform shape, size and dimension so that conventional crowns can be used interchangeably on bottles of any manufacture. To the same end when reusable closures are provided, they must be so constructed that they can be applied to the uniformly set pattern of bottles of this general nature.

The carbonated contents of beverage bottles is of such nature that the gas is not easy to hold except with a very effective seal. One hundred pounds pressure per square inch is generally considered about the minimum which can be depended upon to prevent the contents from going stale. In the case of use of a closure on a half empty bottle it is even more imperative that the bottle be well sealed because some of the gaseous pressure will be relieved into the empty portion of the bottle. Attempts in the past have usually resulted in some form of seal which, if it is easily applied, fails to keep the contents from going stale. Plugs and tight-fitting plastic caps are in this category. More attempts have been made to provide some special pressure applicator, either as a screw-on or screw-over type but apparatus of this kind have necessitated just enough of extra mechanical motion to render them unpopular even though their sealing ability is in excess of the reusable caps which are more quickly applied. In those few instances where an easily applicable cap has been productive of an effective seal, the structure has been sufficiently complicated to make the closure somewhat expensive and has also been one which has been prone to wear out unless manipulated precisely in accordance with recommended instructions.

It is therefore among the objects of the invention to provide a new and improved reusable closure which is extremely simple in its structure and design and which can be applied to a bottle with a single motion and removed therefrom with a comparable single motion.

Another object of the invention is to provide a new and improved reusable closure which is simplified to a high degree in order to render it inexpensive to manufacture and also which is so designed and constructed that it effects a positive seal for a virtually indefinite time.

Still another object of the invention is to provide a new and improved two-piece reusable closure wherein the inner portion is of resilient material to enable it to adapt

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itself to the bead on a bottle and wherein an exterior portion is considerably more inflexible and accordingly useful in confining the interior sealing portion in its sealed position, the invention also contemplating an express ease of application and removal which consists of no more than a pressing on of the closure to apply it and a lifting off of the closure to release it.

Further included among the objects of the invention is to provide a new and improved simple compact seal which substantially minimizes the extra head room needed when the bottle is equipped with the seal and which also provides a specially formed sealing portion which can be forced into intimate contact around a considerable area of the bead on the neck of a bottle and there compressed to an extent sufficient to seal the gaseous contents with a high degree of effectiveness.

With these and other objects in view, the invention consists in the construction, arrangement and combination of the various parts of the device whereby the objects contemplated are attained, as hereinafter set forth, pointed out in the appended claims and illustrated in the accompanying drawings.

In the drawings:

Figure 1 is an exploded view of the parts of the device prior to assembly and partially broken away to show the construction.

Figure 2 is a longitudinal sectional view of the assembled device prior to application to the beaded neck of a bottle.

Figure 3 is a longitudinal sectional view similar to Figure 2 but showing the device in use applied to a conventional carbonated beverage bottle.

Carbonated beverage bottles to which the reusable closure of the invention is applicable consists of a bottle 10 having a neck 11 at the upper end of which is a rounded bead 12, an upper rounded edge 13 of which acts as a sealing rim and an undercut portion 14 of which acts as a means of mechanical retention for either a permanent or a reusable closure. Around the neck is also provided an enlarged portion 15 which adds a degree of thickness to the neck and the bottle. An interior opening 16 is as a rule somewhat cylindrical along the upper portion of the neck, gradually opening out as the neck widens out.

The reusable closure of the invention which is especially adapted to effectively seal the neck of a bottle so designed and constructed consists essentially of two parts, these being illustrated in preassembled form in Figure 1. The two parts consist in the main of an outer cap 17 of substantially rigid material and an inner liner or resilient seal 19 which forms the actual contact with the neck of the bottle.

The liner 19 is constructed of a homogeneous resilient material and has an annular side wall 20 and a bottom 21. The exterior 22 of the side wall is substantially cylindrical and is provided with a series of equally spaced axially extending recesses 23 which extend downwardly from the bottom to a position spaced a short distance from a rim 24. A circumferential rib 25 in effect closes the lower ends of the recesses and is of the same diameter as the cylindrical exterior wall 22.

Inside the liner is a pocket 26 formed in part of a rather sharply outwardly flared frusto-conical part 27 at the base of which is an inwardly rounded integral ring 28 shaped substantially to conform with the undercut portion 14 of the bead of a bottle. Above the ring is a rounded annular concave portion 29 which is adapted to fit over the bead 12 of the bottle and may preferably be made initially with its circumference slightly smaller than the circumference of the bead so that a snug fit will be assured. A convex downwardly extending portion 30 assists in formation of a part of the annular con-

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cave recess 29 and aids materially in the ultimate sealing of the bottle.

On the outside of the bottom 21 is provided with a flat surface 32 at the center of which is an axial projection 23.

The rigid cap has an annular outwardly extending rim 35, a cylindrical wall 36, and a partition 37 forming a bottom of somewhat greater thickness than the wall 36. A rounded upwardly extending rim 37 forms an edge around the partition within which is a wide and relatively deep central wall 38 at the center of which is a depression 39 in axial alignment with an aperture 40. Constructed in this fashion the cap is strong and rigid without necessitating the employment of an extra amount of material. A cylindrical wall surface 41 together with the partition 36 forms a pocket 42 for reception of the liner 19. The size of the cylindrical wall surface 41 is such that the flat exterior surface 22 of the latter slides snugly though freely into the pocket 42. When the liner is assembled with the cap 17, the axial projection 33 extends through the aperture 40 and can be heat sealed or otherwise processed so as to assume a rivet-like shape 42' as illustrated in Figures 2 and 3. Mounted and secured in this fashion the two parts act as a unit.

In initially assembled form the devices have the relative positions illustrated in Figure 2. When the closure is to be applied to the neck of a bottle, it is pressed on either in an axially straight direction with the axis of the neck of a bottle or cocked at a slight angle, however the operator chooses to press the closure into place. The conically shaped portion 27 assists in sliding the closure into its proper position even though it may not be applied directly downwardly. While the downward pressure is being applied the annular ring 28 expands slightly to allow the liner to pass the bead 12 of the bottle. By reason of the fact that the recesses 23 are numerous and spaced about the circumference of the liner, the material of the liner is permitted to expand to an amount sufficient to allow easy and ready application of the liner over the bead. After application in this fashion there is a slight expansion of the portion of the liner immediately surrounding the bead 12 which is likewise permitted by presence of the recesses 23. An undue degree of expansion, however, is prevented by the rigid surrounding material of the cap 17. The relationship of the wall surface 41 of the pocket 42 and the depth of the recesses and size of the cylindrical outer wall 22 while not critical must have such a relationship that the wall 36 of the cap will form a backing and support for the wall of the liner when it is expanded. It is also desirable to so construct the depth of the recesses 23 that there remains some portion of the recesses not completely pressed against the wall surface 41 so that when the cap is removed and the ring 28 forced outwardly as it hangs over the bead a slight additional expansion will be permitted in order to permit ready and easy removal of the closure from the neck of a bottle. Removal may be either in a straight-line direction away from the bottle or tilted in some fashion as a person might naturally tilt a closure in forcing it loose.

The construction of the liner and the proportions and configurations as herein disclosed is such as to provide an effective sealing pressure against the undercut portion of the bead. Moreover, by providing the downwardly convex portion 30 as illustrated there is provided a considerable sealing area around the bead both on the inner and outer sides so that once applied between pressure exerted on the underside of the bead and pressure exerted downwardly on the upper side of the bead the gaseous contents of the bottle are effectively sealed. The resilient character of the liner, however, is such that it makes possible a very handy and easy application and removal of the composite closure. Moreover, by having the wall 36 of the rigid cap slightly longer than the wall of the liner, the composite closure can more easily

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find its proper position over the neck of the bottle and under those circumstances as noted wherein the rim 24 of the sealer is rather narrow, the liner can be quickly and effectively started over the bead to its proper sealed position.

There has accordingly been shown and described herein a very simple removable closure which can be constructed of no more than two separate parts, the configurations of which, however, cooperate to make a positive and effective seal, easily applied and easily removed.

While I have herein shown and described my invention in what I have conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of my invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A reusable closure for containers having rounded beads at the openings thereof comprising a homogeneous sealer of resilient material having a chamber adapted to fit over the head of the container, said chamber having an inwardly convex bottom, a ring on the inside wall of the chamber spaced from the edge of the convex bottom whereby to form an annular recess of diameter smaller than the diameter of the bead of the container and adapted to snugly receive said bead, said chamber being flared outwardly from the ring toward a rim larger in circumference than the outermost circumference of said bead, a cylindrical exterior wall on said sealer having axially extending circumferentially spaced recesses therein, said recesses being adapted to expand circumferentially whereby to accommodate said resilient material when applied to a container, and an exterior cap of stiff material having a cylindrical walled pocket snugly engaging the portions of said exterior wall intermediate said recesses and extending beyond said rim.

2. A reusable closure for containers having rounded beads at the openings thereof comprising a homogeneous sealer of resilient material having a chamber adapted to fit over the head of the container, said chamber having an inwardly convex bottom, a rounded ring on the inside wall of the chamber spaced from the edge of the convex bottom whereby to form an annular recess of diameter smaller than the diameter of the bead of the container and adapted to snugly receive said bead, said chamber being flared outwardly from the ring toward a rim larger in circumference than the outermost circumference of said bead, a cylindrical exterior wall on said sealer having axially extending circumferentially spaced recesses therein, said recesses being adapted to expand circumferentially whereby to accommodate said resilient material when applied to a container, and an exterior cap of stiff material having a cylindrical walled pocket snugly engaging an outside corner of the sealer and portions of said exterior wall intermediate said recesses and extending beyond said rim, said sealer having a continuous circumferential rib blocking ends of said recesses adjacent the rim.

3. A reusable closure for narrow necked beverage bottles having an outwardly beaded edge and a rounded sealing rim thereon, said closure comprising a cap of rigid material having a cylindrical smooth-walled pocket and a bottom partition for the pocket, the exterior of said partition being depressed to form a well and having an upstanding rounded rim at the circumference, and an interior liner of resilient material comprising a cylindrical exterior wall adapted to slide snugly into said pocket to a position against the partition, a bottom for said liner having an inwardly extending convex interior adapted at the edge thereof to engage the inner portion of the sealing rim of the bottle, an inwardly extending continuous integral ring rounded to the shape of the underside of the bead on the bottle, the interior of said liner being flared

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sharply outwardly from the ring to a rim thereof, and means forming a substantially centrally located connection between the cap and the liner whereby to hold said cap and liner together when the closure is removed from the bottle.

4. A reusable closure for narrow necked beverage bottles having an outwardly beaded edge and a rounded sealing rim thereon, said closure comprising a cap of rigid material having a cylindrical smooth-walled pocket and a bottom partition for the pocket flat on the inside and having an aperture therethrough, the exterior of said partition being depressed to form a well and having an upstanding rounded rim at the circumference, and means forming a central depression in the outside face of said partition surrounding said aperture, and an interior liner of homogeneous resilient material comprising a cylindrical exterior wall of lesser height than the pocket and adapted to slide snugly into said pocket to a position against the partition, said exterior wall having spaced axially extending recesses therein and a continuous circumferential

rib blocking said recesses at a rim of the wall, a bottom for said liner having a flat exterior and an inwardly extending convex interior adapted at the edge thereof to engage the inner portion of the sealing rim of the bottle, an inwardly extending continuous integral ring rounded to the shape of the underside of the bead on the bottle, the interior of said liner being flared sharply outwardly from the ring to a rim thereof, and an axial projection on the outside of the bottom extending through said aperture and filling the depression whereby to anchor the liner in the cap.

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