June 20, 1967 S. GLASS 3,326,403

TWO-PIECE STOPPER

Filed Jan. 5, 1966

FIG. 1.

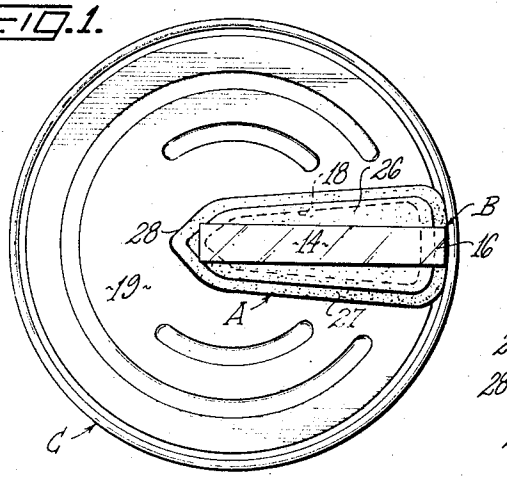


FIG. 3.

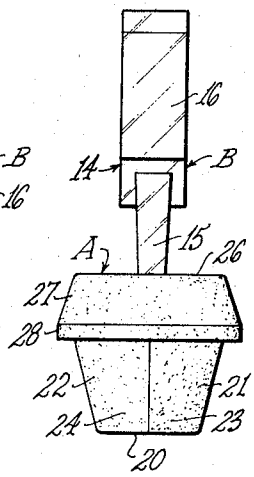


FIG. 4.

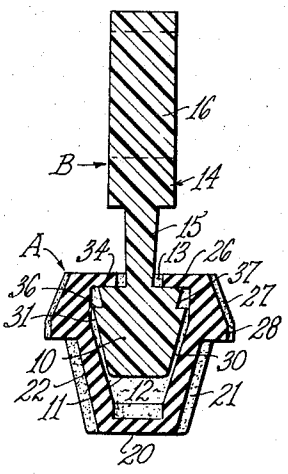


FIG. 5.

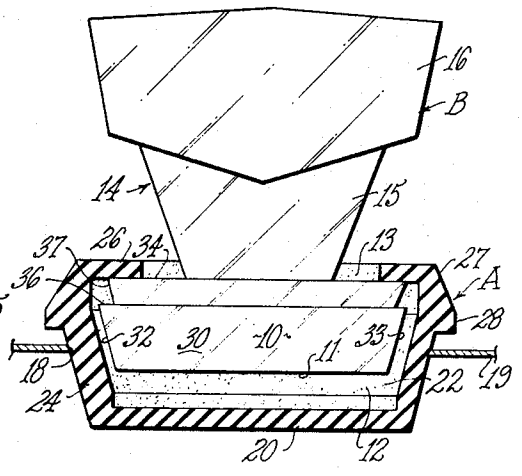


FIG. 2.

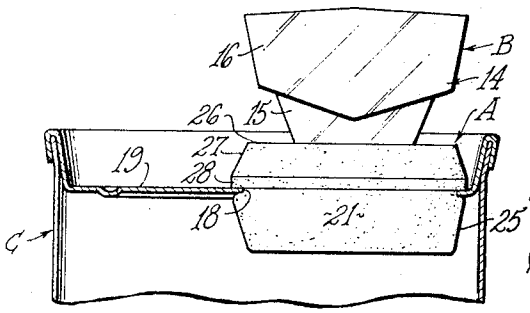


FIG. 6.

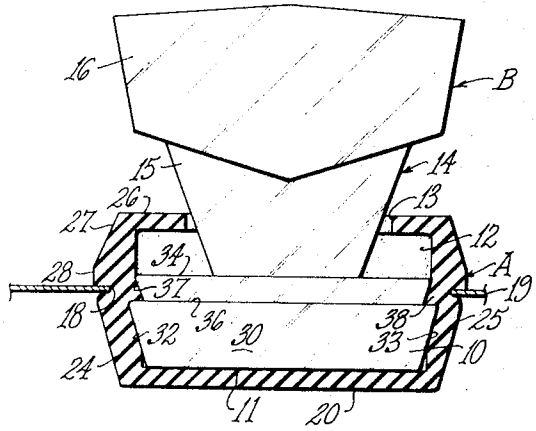
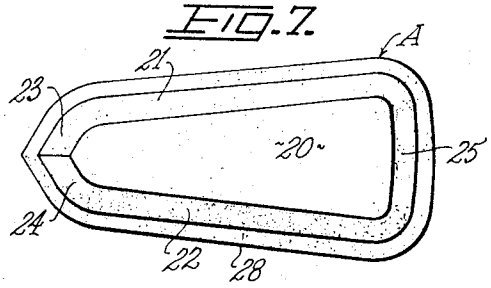


FIG. 7.



INVENTOR.
SIDNEY GLASS
BY
Howard L. Cohnson
ATTORNEY

United States Patent Office 3,326,403
Patented June 20, 1967

3,326,403

TWO-PIECE STOPPER

Sidney Glass, Beverly Hills, Calif.
(1025 N. King Road, Los Angeles, Calif. 90069)

Filed Jan. 5, 1966, Ser. No. 518,823
4 Claims. (Cl. 220—24.5)

This invention relates to a transferable, two-piece stopper or pour-closure for containers. It is one which is particularly adapted for use with cans of the type used to hold beverages which intitially have a gaseous pressure sealed in, such as cans of beer or artificially carbonated drinks known as "soda pop," etc. For this purpose there is provided an aperture-fitting, composite stopper which normally corresponds in external configuration (that is, around its horizontally disposed, engagement-perimeter) to the outline of a pre-delineated rupture-aperture, such as a radially-directed triangular opening which may be formed in the can top by a built-in pull-tab, or other edge-delineated rupture area.

When such a can is first opened, if only part of the liquid contents is immediately removed, it is usually desired to reseal the remainder for a time in such manner that the residue of gas still in the "charged" beverage will not all escape from the liquid into the now-enlarged air space within the can and thence into the atmosphere so as to leave a "flat" or "dead" drink. However, if a plain stopper is merely pressed into the pour opening, it may be blown out therefrom by the internally accumulating pressure—particularly if the can gets warmer as when taken out of an ice box. To eliminate this result, resort has been had in the past to various types of manipulative stoppers, which however tend to become both increasingly complicated as well as costly.

In the other direction, the tendency has been to provide smaller and smaller containers with the intention that they be completely emptied at one time; in other words, they contain only a single serving or drink. However, this also increases costs of fabrication, handling and storage. Such trend to smaller and smaller cans may now be restrained or stopped by use of the present stopper. Carbonated beverages or other liquids can now be canned in relatively large (liter or gallon) containers, and after being opened, their remaining partial contents can have the carbonation satisfactorily maintained for an extended period with my reusable stoppers. On the other hand, my stoppers will find considerable use even with the current "single-drink" (e.g. 11 oz.) cans; for example, a person may consume one or more entire can contents, and then take only a fraction of the liquid of a final can; the remainder he wishes to retain without it going "flat."

Accordingly the present two-piece device is particularly adapted, by simple thrust-insertion, to tightly seal and lock a newly-formed pour-aperture of a can or container so as then to withstand increasing internal pressure which would otherwise expel a plain stopper. Alternately it is readily withdrawable (and reusable) merely by way of a small degree of manual canting of one piece, which is a rigid anchor member loosely embraced by (i.e. having limited movability within) the other piece, which latter is a deformable, elastomeric, hollow sealing member in which the first member is housed like a piston or plunger, with an operating handle upstanding therefrom

The outer, deformable, hollow member has its upstanding sides externally wedge-shaped or tapered so as to be insertable loosely in the can aperture to a primary depth or support level; the internal plunger is shaped to fit loosely into the upper part of the cavity in the hollow member and is similarly externally tapered so that upon downthrust it can both push the outer member to a position of further insertion within the aperture (in most instances) and

in any event can laterally press-fit a band of deformable sidewall of the hollow member so as thereby to form a peripheral bead immediately underlying the edge of the aperture and overlying an edge-groove along the top face of the plunger which groove is then disposed below the can aperture.

The stopper is thus held in sealing position within the aperture by the laterally projected, band of deformable sidewall (of the outer, hollow member) which is grasped jointly along its opposite longitudinal lengths by the aperture edgewall (above) and by the plunger edge or groovewall (from beneath). The stopper (and aperture) in most cases being elongated and converging toward a radially-directed end, the corresponding blunt point or end of the inner plunger can by a short uptilt (effected by the outward handle) rupture or erase the sealing bead at this point, which unfolding of the bead then travels along its entire length, so that the composite stopper can readily be lifted from the aperture. Preferably the two pieces of the assembly are not completely separable so that the unit will be kept as such in transferring from one container to another. Usually the peripheral bead may be formed continuously around all three sides of a triangular aperture; however, with an elongated, narrow triangle, the presence of such bead along the two longer sides of the triangle may be adequate to lock the stopper in place. It will be apparent also that such composite stoppers are usually presized for a standard size rupture aperture. However this need not be so, and since the outer member is elastic, different size pistons may be employed therein for different size apertures; more practical however, a wedge-shaped plunger is merely put to a different depth to accommodate different size apertures.

Other objects and advantages of the invention will become apparent from the following description of a presently preferred embodiment of the invention, detailed by way of example in the accompanying drawings wherein—

FIGURE 1 is a top plan view of a beverage can showing my two-piece stopper lodged securely in a pouring aperture from which a pull-tab type, metal closure has first been removed in opening the can.

FIGURE 2 is a vertical sectional view through the apertured top of the can, showing the mounted stopper in longitudinal elevation.

FIGURE 3 is an end elevational view of the stopper alone, as seen in the direction of the arrow of FIGURE 1.

FIGURE 4 is a transverse vertical sectional view of the stopper of FIGURE 3.

FIGURE 5 is a longitudinal vertical sectional view taken through the hollow outer member with its contained inner member seen in elevation, the outer member located loosely at its initial depth of insertion within the can aperture.

FIGURE 6 is a similar view to that of FIGURE 5 but showing both pieces moved down to sealing position within the can aperture similar to FIGURE 2.

FIGURE 7 is a bottom plan view of the hollow, deformable outer member by itself.

My two-piece stopper consists essentially of an outer, hollow, closed-bottom, open-top, deformable sealing member A, formed of natural or synthetic elastomeric material, and an inner, rigid piston or anchor member B, having a body **10** loosely disposed for limited vertical movability within the cavity **12** of the outer member A, and having an upstanding handle portion **14** which projects through the top entrance **13** of the cavity. The handle is formed with a longitudinally directed shaft **15** which is topped by a somewhat thicker and longer tab **16** having opposite flat sides to allow it to be easily grasped by a user between a finger and thumb.

The horizontal outline of the composite stopper here

llustrated corresponds in shape and dimension to that of in elongated, radially directed, pie-slice aperture **18** preformed or delineated in the top wall **19** of a sheet metal or similar can C and rupture-opened as by a pull-tab. Such stopper is sized to be insertable easily, partway into the aperture, as shown in FIGURE 5. Thus it is particularly advantageous to provide such two-piece stoppers of standard size corresponding to uniform-size can apertures so that the stoppers are readily transferrable from one can to another. However, openings of different sizes and/or shapes may be supplied with stoppers of like dimensions.

The deformable sealing member A is formed with a flat bottom **20** and upwardly diverging side walls **21, 22**. An angularly disposed pair of upslanted, front walls **23, 24** span a smaller transverse distance than that of the rear cross wall **25** so that the several walls which inclose the cavity **12** jointly define a generally cuneiform shape which is also wedge-shaped or tapered vertically upward-diverging.

A peripheral shoulder **28** provides a limit means for insertion of the outer member A into an aperture **18**. Above the shoulder, a generally flat, top wall **26** extends inward from mutually inslanted side walls **27** so as to complete an enclosure except for the medial aperture **13** through which the shaft **15** projects. Within the cavity **12**, the anchor body **10** has a flat bottom **11** and slanted side **30, 31** and end **32, 33** walls generally conforming to the internal configuration and dimensions of the lower portion of the cavity **12**. Alternately, when located in the upper portion of the cavity, the body or plunger **10** is spaced from all of the side walls with its flat top or face **34** disposed to register with the underface of the deformable top wall **26**. By transiently spreading apart the edges of the opening **13**, the body **10** can be inserted and withdrawn from the cavity **12**, as required for instance upon its initial assembly.

The anchor body **10**, about its upper margin has its sides inset to form a peripheral anchor ledge **36**, the upstanding walls of which are also upwardly diverging or tapered. Accordingly when the inner member B is dropped axially or down in the cavity **12**, further downthrust thereupon will take the outer sealing member A from the loose position of FIGURE 5 to the tight or sealed position of FIGURE 6. That is, the ledge **36** then will be below the level of the can wall **19** which now abuts against the outer shoulder **28**. Horizontally-directed inward pressure of the embracing edges of the can aperture **18** compresses inward the deformable side walls **21, 22, 23, 24** and **25** so as therewith to compactly fill the peripheral anchor groove **37** which is formed by the inset ledge **36**. Accordingly this peripheral anchorage bulge or bead **38**, temporarily shaped from the deformable side walls of outer member A, is thus locked tightly along opposite vertical sides—above by the aperture edge **18** and below by the ledge **36**, thus forming an air tight seal which persists against accumulated internal pressure. When later it is desired to remove the stopper, one need only tilt upward the body **10** on its longitudinal axis, as by raising the left end in FIGURE 6 so as to force the ledge **36** up above the can edge **18**. The entire inner member B can then be raised easily to the position of FIGURE 5; raising it further, draws both the inner member B together with the outer member A completely out of the aperture **18** without having the two pieces completely separated. The two-piece assembly can accordingly be easily replaced in the aperture of another (or the same) can as may be required. In addition, either of the two pieces can be replaced in the assembly if desired.

It will be clear to those skilled in the art that various changes of construction and operation may be made within the present inventive concept, having in mind the substitution of functional equivalents within the ability of one skilled in the art, and therefor this disclosure is not to be limited by the precise details shown in the drawings and particularly described in the specification by way of

example, but it is my intention to hereafter claim the invention broadly aside from the limitations inherent in the prior art.

I claim:

1. A two-piece stopper adapted selectively to seal a container aperture of generally similar size and shape, comprising in combination:

a hollow outer member having an externally projecting peripheral shoulder and formed with closed bottom and laterally deformable side walls externally tapered divergingly-outward so as to be easily insertable partway into a similar-shaped aperture to a first position at which the member is loosely supported in the aperture, and a second position where said shoulder abutingly overlies said aperture and at which the hollow outer member may be subsequently located by forcible inthrust, whereby a surrounding band of the deformable sidewall thus forced within the aperture by said inthrust is transversely press-fit to form a peripheral sealing bead immediately beneath the aperture,

a second member having a rigid, correspondingly tapered, body reciprocably housed within said hollow first member with externally operable handle means, said body being of a size (when thus housed) which is adapted to be retained loosely within the outer portion of the hollow member and from there to pass through said aperture when said first member is located at the first position, and upon inthrust of said body to position the hollow member at said second position and thereby to laterally deform said band of sidewall to form by press-fit said peripheral bead immediately beneath the aperture, which body is formed with an inset peripheral ledge adjacent its outer end which upon said inthrust is located beneath said aperture and frictionally overlaid by the peripheral bead held jointly by and between the underside of the aperture and said body ledge, which sealing registration may subsequently be ruptured and the stopper removed from the aperture by way of the handle means canting said body within the hollow outer member so as to unseat and unfold the bead outward from the ledge and aperture.

2. The stopper of the preceding claim **1** wherein said stopper is essentially triangular shaped and thus adapted to fit a correspondingly-shaped puncture-aperture, and said peripheral bead is formed along at least two sides of said triangle.

3. The stopper of the preceding claim **1** wherein both said hollow outer member and the inner second member are generally elongated-triangular shape and adapted to form said peripheral bead along all sides thereof, said second member terminating at one end in a relatively blunt point which is thus adapted to initiate the rupture of the sealing bead upon canting said second member within the hollow outer member in removing the stopper from the aperture.

4. A two-piece stopper adapted selectively to seal a container aperture of generally similar size and shape, comprising in combination:

an elongated outer member having a peripheral shoulder adapted to frictionally and transversely overlie the edge of said aperture and being formed with an internal cavity characterized beneath the level of said shoulder by side walls which are laterally deformable and stretchable axially (relative to said aperture) which side walls are internally and externally tapered divergingly outward,

a rigid member loosely contained in said cavity and axially movable between lower and upper positions therein without canting, said member having a body of similar size and taper to the lower portion of said cavity where it is snugly receivable, said body being of less height than said cavity and of less peripheral

size than the upper portion of the cavity where it is loosely receivable,

whereby when the rigid member is retained in the upper portion of the cavity, the outer member may be partway inserted easily into said aperture to rest at a level below that of said shoulder, and then by thrust depression of the rigid member within said cavity to and against the floor of the cavity, the outer member may be pressed down into shoulder-engagement with the edge of said aperture and said side walls may then be further stretched axially by such pressure, whereby upon release of pressure on said rigid member and axial retraction of the sidewall, a band of sidewall material immediately beneath said aperture deforms laterally to form a peripheral sealing band outwardly frictionally underlying said aperture and inwardly frictionally overlying the top edge of said rigid member, which sealing bead may be dispersed for removal of the stopper by canting said rigid member from its lower position in the cavity.

References Cited

UNITED STATES PATENTS

2,444,779	7/1948	Krasberg.	
2,841,307	7/1958	Yoder.	
3,244,309	4/1966	Brown	220—24.5

THERON E. CONDON, *Primary Examiner.*

J. B. MARBERT, *Assistant Examiner.*