United States Patent [19]

Braman

[11] **3,919,901**

[45] **Nov. 18, 1975**

[54] **TOOL FOR FACILITATING REMOVAL OF SCREW-CAP BOTTLE CLOSURES**

[76] Inventor: **John R. Braman,** 7 Meadow Circle, Athens, Ga. 30025

[22] Filed: **Dec. 16, 1974**

[21] Appl. No.: **533,085**

[52] **U.S. Cl.** **81/3.4**

[51] **Int. Cl.**[2] **B67B 7/18**

[58] **Field of Search** ..... 81/3.38, 3.34, 3.4, 90 D, 81/3.1, 3.43; 215/317, 318, 251

[56] **References Cited**

UNITED STATES PATENTS

2,171,015	8/1939	Webb	215/318
2,304,532	12/1942	Boxley	215/317
2,475,948	7/1949	Cox	91/3.4
3,121,355	2/1964	Morel et al.	81/3.4 X
3,371,563	3/1968	Lallo	81/90 D
3,604,290	9/1971	Waite	81/3.4
3,812,741	5/1974	Heine	81/3.4

Primary Examiner—Al Lawrence Smith
Assistant Examiner—Roscoe V. Parker
Attorney, Agent, or Firm—Clarence A. O'Brien; Harvey B. Jacobson

[57] **ABSTRACT**

A tool for more easily removing a conventional screw-cap bottle closure from a soft drink bottle, and the like, has a resilient body member provided with a recess forming a screw-cap receiving socket. The recess has a sealing lip provided adjacent the mouth of the recess for sealingly engaging a bottle associated with the closure and preventing leakage from the closure to pass down the side of the bottle. One, or more, protuberance is advantageously formed in the recess of the body member for mating with an upper row of knurls on the closure and providing additional gripping action between the tool and the closure. The outer surface of the body member forms a torque applying surface which facilitates removal, and reapplication, of the screw-cap.

8 Claims, 4 Drawing Figures

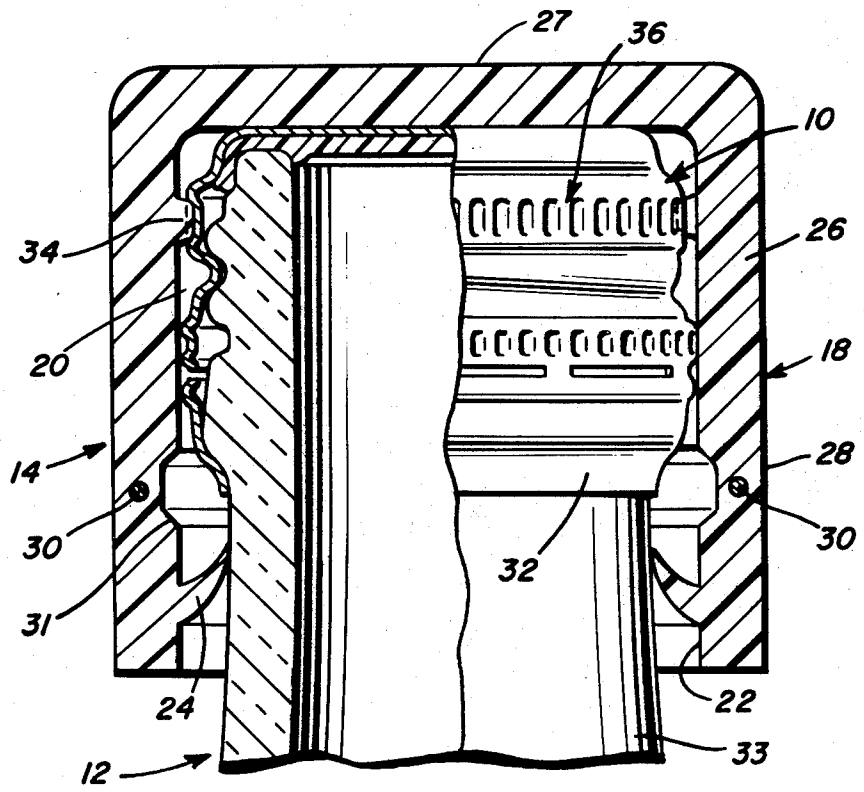


FIG. 1

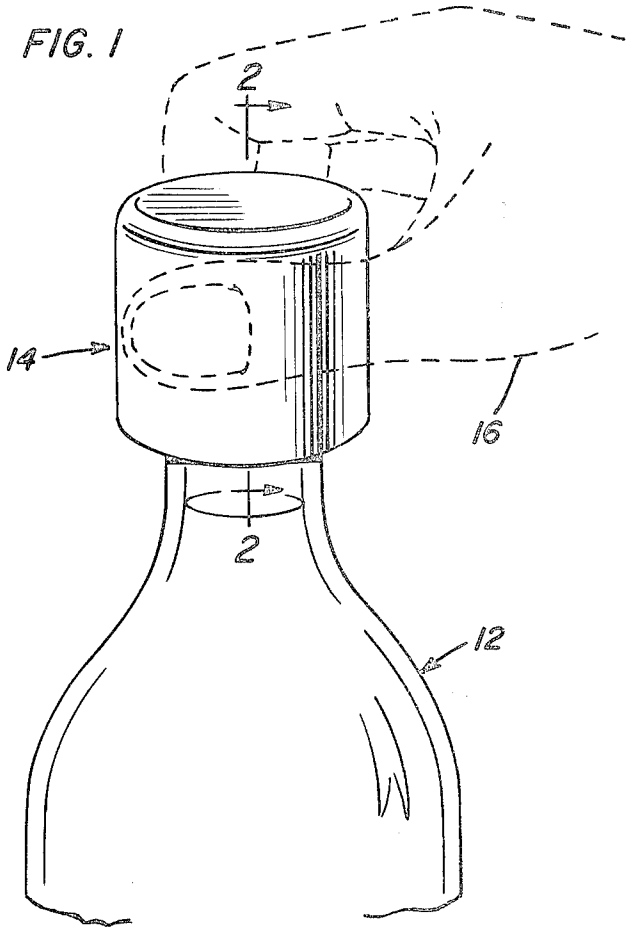


FIG. 3

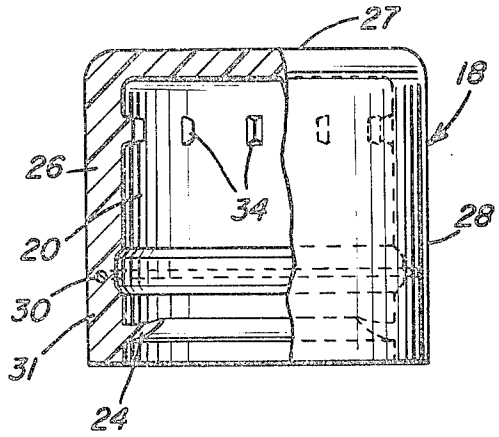


FIG. 4

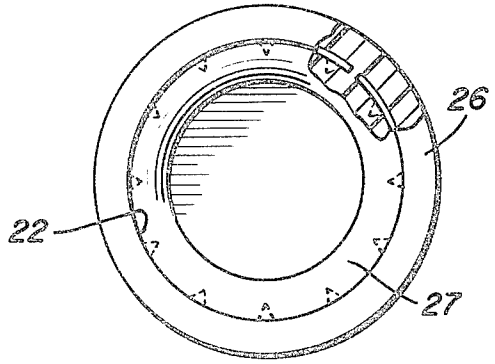
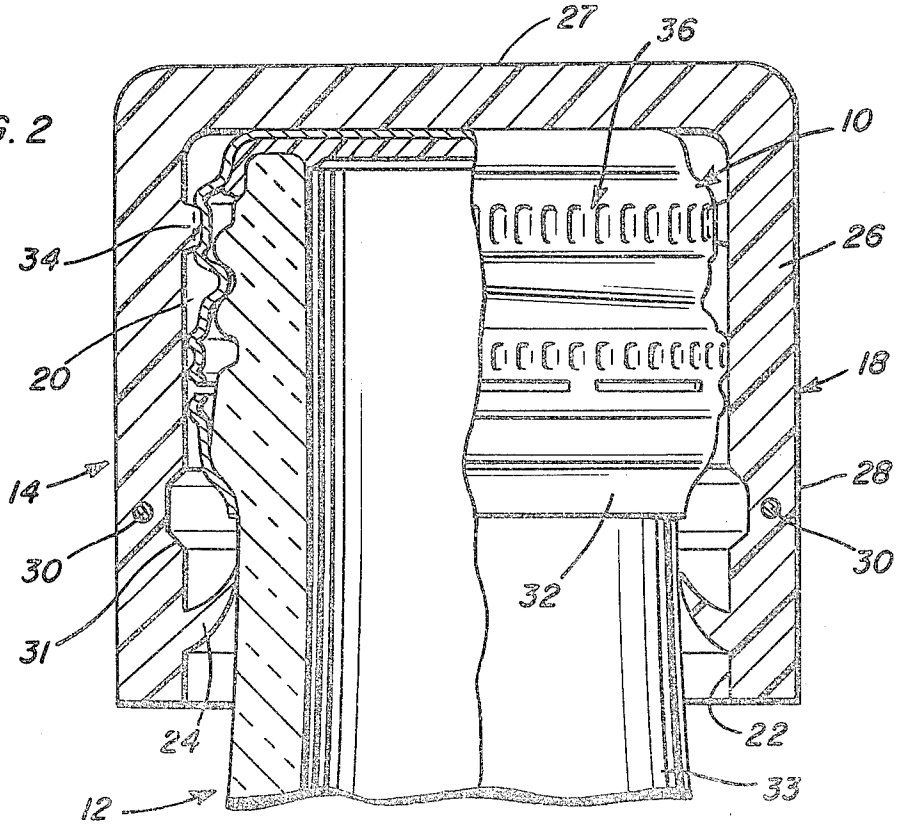


FIG. 2



TOOL FOR FACILITATING REMOVAL OF SCREW-CAP BOTTLE CLOSURES

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to a tool for more easily removing bottle caps, and particularly to a tool which facilitates removal of conventional screw-cap bottle closures, such as are conventionally employed on beverage bottles.

2. Description of the Prior Art

Soft drink bottles, and the like, are often marketed either individually or in cartons, cases, and the like, with a screw-cap closure which maintains the contents of the bottles in sealed condition under a predetermined pressure until the bottles are ready for consumption. The obvious advantages to these closures are that the consumer may remove the closure without resorting to the use of a special implement, and may reseal the bottle after the cap has been initially removed. In some instances, however, due to the cap being too tightly secured to the bottle or to incapacity of the consumer, the closure is difficult to remove without the application of a tool, such as pliers, to grip the cap and twist same. In other words, it occurs that occasionally proper torque cannot be applied by the consumer to remove the cap.

Another problem with the use of the aforementioned screw-cap bottle closure is that the consumers do not replace the cap on the bottles when the contents of the bottles have been consumed. When the bottle is of the class of containers which are returned to the bottler to be refilled, the failure to replace the closure over the screw threads molded into the bottle results in damage to the threads of the bottle, with resulting increased cost to the bottler.

prior U.S. Pat. Nos. believed of interest with regard to the present invention are as follows:

2,124,873 - July 26, 1938
2,171,015 - Aug. 29, 1939
2,304,532 - Dec. 8, 1942
2,940,078 - June 27, 1961
3,223,269 - Dec. 14, 1965.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a tool which facilitates removal of conventional screw-cap bottle closures by permitting the consumer to apply greater torque to the closure.

It is another object of the present invention to provide a closure removal facilitating tool that simultaneously encourages the consumer to return the screw-cap to its closed position on an empty container prior to returning the container to the bottle litter, thus reducing damage to the threaded area of the container or vessel.

These and other objects are achieved according to the present invention by providing a tool having a body member provided with a recess forming a cap receiving socket. The recess advantageously has a mouth and a sealing lip disposed adjacent the mouth, with the latter arranged extending into the recess for sealingly engaging a bottle associated with the closure on which the tool is disposed. The body member is preferably in the form of a hollow cylinder constructed from a resilient material and having a cylindrical wall and an end wall enclosing one end of the hollow cylinder. The cylindrical wall provides an outer cylindrical surface arranged forming torque applying surface.

The recess is advantageously provided with a substantially annular relieved portion communicating with the recess and disposed adjacent to the mouth of the recess and the sealing lip. A ring constructed from a suitable rigid material, such as a metal, may be disposed in the body member in association with the relieved portion for cooperating with the relieved portion to not only permit a vertical pilfer proof bridge conventionally provided on bottle closures from flaring out, but to prevent a consumer from collapsing the flared vertical pilfer proof bridge when same has been flared outwardly.

Another advantageous feature according to the present invention is the provision of at least one proturbance formed on the body member and arranged extending into the recess of the body member at a point spaced from the mouth of the recess for mating with a row of knurls conventionally furnished on screw-cap bottle closures for providing additional grip between the body member and the screw-cap.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a fragmentary, perspective view showing a cap removal tool according to the present invention arranged on a bottle.

FIG. **2** is a fragmentary, sectional view taken generally along the line **2—2** of FIG. **1.**

FIG. **3** is a side elevational view, partly cut away and in section, showing the tool of FIGS. **1** and **2.**

FIG. **4** is a bottom plan view, partly cut away and in section, showing the tool of FIG. **3.**

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now more particularly to FIGS. **1** and **2** of the drawings, a conventional screw-cap bottle closure is shown as sealingly closing a bottle **12** which may be a conventional soft-drink bottle, and the like. Closure **10** may be of the type disclosed generally in U.S. Pat. No. 3,303,955, issued Feb. 14, **1967,** and of the type marketed by "Alcoa" under the designations "28mm TSPP" and "38mm TSPP". Such closures are usually manufactured from aluminum, and the like, and are in common usage on beverage bottles. Further, these closures are frequently provided with what is known as a "pilfer-proof vertical bridge" which flares outwardly when the closure is initially removed from its associaated bottle. A tool **14,** according to the present invention, is shown arranged over closure **10** in order to facilitate the application of torque thereto as by a hand **16** belonging to a consumer of the beverage in the bottle.

Tool **14** includes a body member **18** provided with a recess **20** forming a socket for receiving closure **10.** Recess **20** has a mouth **22,** and a sealing lip **24** is provided on body member **18** immediately adjacent mouth **22** and is arranged extending into recess **20** for sealingly engaging the neck portion of bottle **12** and preventing leakage that may pass by a previously opened closure **10** from continuing on down the side of bottle **12.** This

is, of course, best seen in FIG. 2.

Body member 18 is advantageously in the form of the illustrated cylinder constructed from a suitable, known resilient material and having a cylindrical wall 26 and an end wall 27 enclosing one open end formed by the wall 26. The latter provides an outer cylindrical surface 28 arranged forming a torque applying surface grippable by a hand 16. Body member 18 may be constructed from, for example, a suitable synthetic rubber, such as that designated Buna N, or a similar nitrile rubber.

As can be appreciated from the above description and from the drawings, a consumer in possession of a tool according to the present invention may simply press same down and over a troublesome closure 10 and, by reason of the larger diameter of the tool and the gripping character of the rubberlike material from which it is fabricated, more easily remove the closure from the bottle. The closure, of course, comes off inside the tool according to the invention. Assuming that the consumer, after removing a closure from a bottle, empties all the contents from the bottle and wishes to remove the original closure from the tool so as to reuse the tool with other closures, the closure must be rethreaded onto the threads molded into the bottle in order to effectively accomplish removal of the tool from the closure. Once back in place, the combination of the threads on the bottle and those on the closure provide sufficient resistance to permit the tool to be cocked over in a sideways fashion and pulled off the closure, and accordingly off the bottle. Quite naturally, this procedure leaves an empty bottle with the closure thereof properly back in place, not necessarily to seal the bottle, but to protect the threaded portion of the bottle from damage during subsequent handling by the consumer, retailer, bottler, and other parties.

Referring now to FIGS. 3 and 4 of the drawings, in addition to FIG. 2, it will be seen that sealing lip 24 has a cross-section substantially in the shape of a wedge. More specifically, the lip 24 converges to a point as it extends from body member 18. In this manner, an efficient seal in conjunction with bottle 12 can be readily and repeatedly maintained.

A ring 30, which is advantageously constructed from a rigid materal such as steel wire, is disposed in body member 18 adjacent to mouth 22 and lip 24. This ring 30 regidifies body member 18 in the vicinity of a relieved portion 31 provided on body member 18 adjacent ring 30 and in communication with recess 20. As can best be seen from FIGS. 2 and 3 of the drawings, relief portion 31 is substantially annular in configuration and provides relief within body member 18 for permitting the pilfer-proof vertical bridge 32 of closure 10 to flare outwardly when closure 10 is initially removed from bottle 12, and because of the rigidifying effect of ring 30 to prevent a consumer from collapsing bridge 32 once same has been flared outwardly.

Another advantageous feature is the provision of a proturbance 34 formed on the body member 18 and arranged extending into recess 20 of the body member at a point spaced from the mouth 22 of the recess for mating with an upper circumferential row 36 of knurls as are standard on conventional screwcap bottle closures, such as those referred to above. The provision of this proturbance 34 acts to provide additional grip between body member 18 and closure 10 in order to assure that the closure will be twisted by a twisting movement of the body member. As can best be seen from FIGS. 3 and 4, it is preferable to provide a plurality of proturbances 34 arranged in a row that generally matches row 36 incorporated into the closure 10.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention

What is claimed as new is as follows:

1. A tool for facilitating removal of a conventional screw-cap bottle closure, comprising a body member provided with a recess forming a socket for receiving the closure, and including means for gripping the closure the recess having a mouth arranged for permitting reception of a closure in the recess said body having a sealing lip arranged immediately adjacent the mouth thereof for sealingly engaging the bottle associated with the closure and preventing leakage down an outer surface of the bottle.

2. A structure as defined in claim 1, wherein the body member is in the form of a hollow cylinder constructed from a resilient material and having a cylindrical wall and an end wall enclosing one open end formed by the cylindrical wall, the cylindrical wall providing an outer cylindrical surface arranged forming a torque applying surface.

3. A structure as defined in claim 2, wherein a ring constructed from a rigid material is disposed in the body member adjacent the mouth thereof, and the body member is provided with a relieved portion arranged in communication with the recess, the relieved portion being associated with the ring for permitting the flaring out of a pilfer-proof vertical bridge on the closure when same is removed from a bottle, and preventing a consumer from collapsing the vertical bridge once same has been so flared.

4. A structure as defined in claim 3, wherein at least one proturbance is formed on the body member and is arranged extending into the recess of the body member at a point in the recess spaced from the mouth of the recess for mating with an upper row of knurls arranged on the conventional screw-cap bottle closure and providing a positive gripping force between the body member and the closure.

5. A structure as defined in claim 1, wherein at least one proturbance is formed on the body member and is arranged extending into the recess of the body member at a point in the recess spaced from the mouth of the recess for mating with an upper row of knurls arranged on the conventional screw-cap bottle closure and providing a positive gripping force between the body member and the closure.

6. In combination with a conventional screw-cap bottle closure and an associated bottle, a tool for facilitating removal of the screw-cap, the tool comprising, a body member provided with a recess forming a socket for receiving the closure, and including means for gripping the closure the closure arranged in the socket, the recess having a mouth, a relieved portion provided on the body member adjacent the mouth thereof and arranged in communication with the recess for permiting a pilfer-proof vertical bridge provided on the closure to flare outwardly into the relieved portion, and a sealing lip provided on the body member immediately adjacent the mouth of the recess, between the mouth of the recess and the relieved portion, and arranged extending

into the recess and in engagement with the bottle for sealing the body member relative to the bottle.

7. A structure as defined in claim **6,** wherein the body member is in the form of a hollow cylinder constructed from a resilient material and having a cylindrical wall and an end wall enclosing one open end formed by the cylindrical wall, the cylindrical wall providing an outer cylindrical surface arranged forming a torque applying surface.

8. A structure as defined in claim **6,** wherein the closure is provided with a circumferential row of knurls, and at least one proturbance is formed on the body member and arranged extending into the recess of the body member at a point in the recess spaced from the mouth of the recess for mating with the row of knurls provided on the closure for permitting the body member to positively engage the closure.

* * * * *