

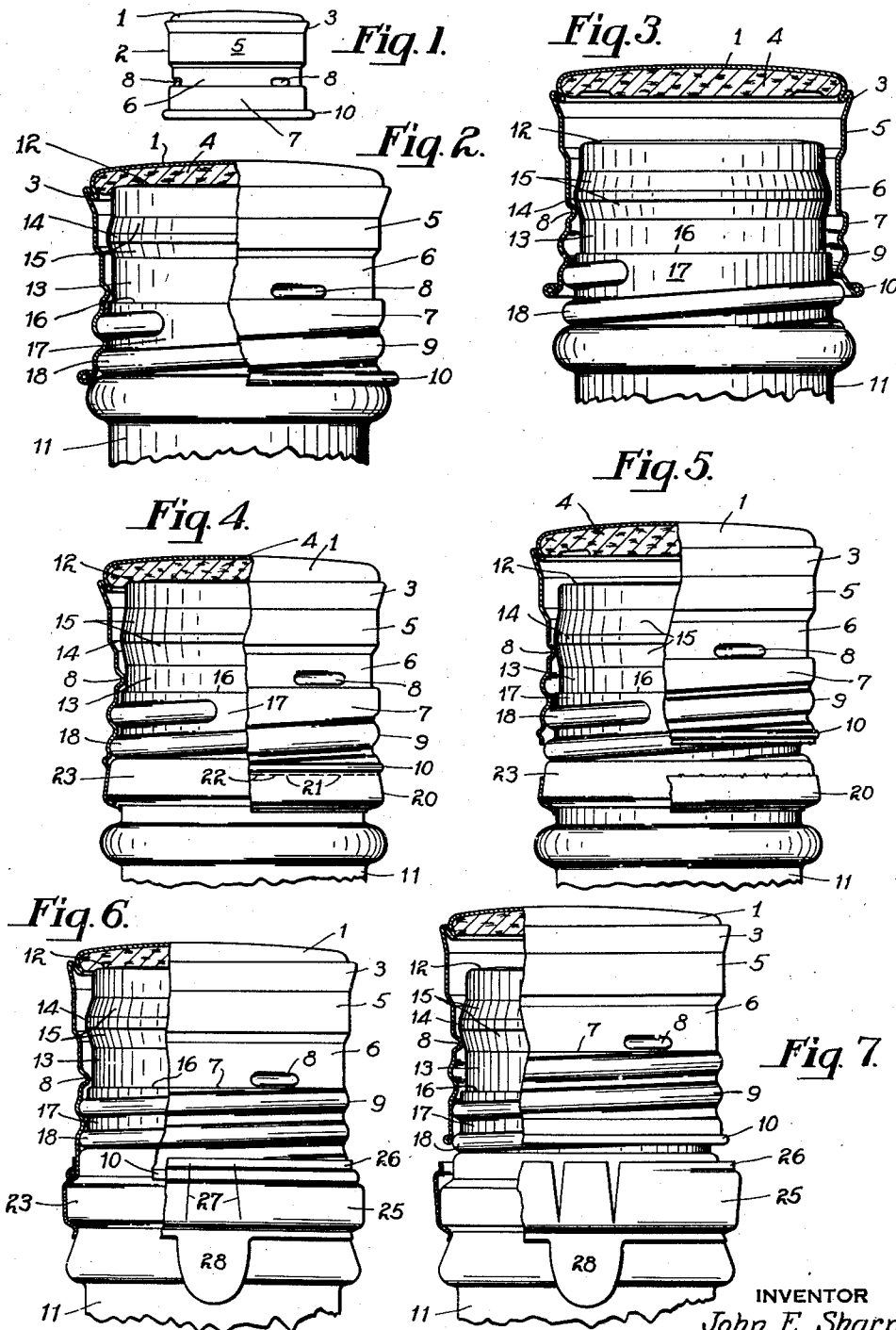
April 21, 1942.

J. E. SHARP

2,280,724

CLOSURE AND CONTAINER

Filed July 23, 1940



INVENTOR
John E. Sharp
BY
Arthur H. Schmeltz
ATTORNEY

UNITED STATES PATENT OFFICE

2,280,724

CLOSURE AND CONTAINER

John E. Sharp, New Kensington, Pa., assignor to
Aluminum Company of America, Pittsburgh,
Pa., a corporation of Pennsylvania

Application July 23, 1940, Serial No. 346,934

6 Claims. (Cl. 215—43)

This invention relates to closure caps of a replaceable nature and containers suitable for use with such closure caps.

Closure caps for containers having contents that are used or dispensed in portions from time to time are necessarily of a replaceable nature. There are various types of replaceable closure caps and the type selected for any given purpose usually depends upon the frequency of opening and closing and the speed with which such actions need to be performed. For example, in the dispensing of liquors, particularly at busy public or service bars, the closures desired are those that may be readily affixed to the bottle and may also be quickly and easily removed. Ordinary screw caps have been considered inferior for those uses requiring rapid and easy removability and replaceability of the closure, since the motions of removing and replacing such caps are both time-consuming and disruptive of the other required motions of service.

It is the primary object of this invention to provide an improved screw cap that, when used with a suitable container, can be easily removed and replaced for frequent dispensing purposes. It is likewise an object of this invention to accomplish this purpose by the provision of a cap which is positively retained upon the container in either of two positions, one of which permits removal simply by axial movement and the other requires the rotation customary to the screw cap. Another object of this invention is the provision of a cap having circumferentially disposed detents and screw threads so arranged that the circumferential detents alone may serve to retain the cap or that both the detents and the screw threads together serve that purpose. A further object of this invention is the accomplishment of the foregoing objects together with the provision of a tamper-proof package. It is an additional object of this invention to provide containers that are suitably complementary to the cap of my invention to gain the desired affixation thereto.

These and other objects of my invention, together with the advantages thereof, will be better understood upon reference to the following detailed description of the accompanying drawing in which:

Fig. 1 is a view in elevation of a closure cap embodying my invention;

Fig. 2 is a view, partly in section and partly in elevation, of the cap of Fig. 1, shown in one position of affixation upon a suitable container;

Fig. 3 is a view, partly in section and partly

in elevation, of the cap of Fig. 1, shown in a second position of affixation upon the container of Fig. 2;

Fig. 4 is a view, partly in section and partly in elevation, of another embodiment of my invention;

Fig. 5 is a view, partly in section and partly in elevation, of the cap of Fig. 4, shown in a partially removed position;

Fig. 6 is a view, partly in section and partly in elevation, of a third embodiment of my invention; and

Fig. 7 is a view, partly in section and partly in elevation, of the cap of Fig. 6, shown in a partially removed position.

Referring to Figs. 1, 2, and 3, one form of closure cap of my invention comprises a cup-like, one-piece body having a closed end 1 and a continuous depending skirt 2 formed of a suitable metal such as aluminum sheet. The skirt and closed end are joined by an annular rib 3 which serves to retain a sealing liner 4 of cork or other suitable sealing material. The walls of the rib 3 are preferably pressed together and telescoped within the upper skirt portion 5 which expands to produce an appreciable downward taper. The taper improves the shape of the upper skirt portion for gripping purposes and serves to separate the taper bearing skirt portion from the adjacent container surfaces. A central portion 6 of reduced diameter joins the upper skirt portion 5 and the lower skirt portion 7. The central portion 6 is provided with at least three inwardly circumferentially disposed projections or detents 8. The lower skirt portion 7 bears a screw thread 9, and the bottom edge preferably consists of an outwardly disposed bead 10.

The container, which may have a body portion of any desired shape, has a neck 11 terminating in mouth rim 12. Extending downwardly from the mouth rim 12 is a cylindrical portion 13 that bears a continuous projection or bead 14 which has sloping shoulders 15 on either side of a peripheral cylindrical band. Joined to the cylindrical portion 13 by a shoulder 16 is another cylindrical portion 17 that has a diameter at least as great as that of the bead 14, and has raised therefrom a screw thread 18 complementary to screw thread 9 of the cap.

The cap of Figs. 1, 2, and 3 is preferably applied to the container in the condition shown in Fig. 1, that is to say with preformed detents 8, but without screw threads. It will be apparent that certain dimensions of cap and container are definitely related in order to permit appli-

cation of the cap as well as subsequent removal thereof. The inside maximum or root diameter of the lower skirt portion 7 is slightly greater than the diameter of the container in the plane of the thread 18, and the inside minimum diameter of the skirt in a plane passing through the detents 8 is slightly less than the maximum diameter of the bead 14. These dimensions, accordingly, permit the cap to pass freely over the container until the detents 8 engage the upper bead shoulder 15. Thereupon pressure is applied to the top of the cap to force it to a position in which a sealing gasket 4 is securely seated upon the mouth rim 12. To afford passage of the detents 8 over the bead 14 without permitting deformation, they must be of such number, size, and arrangement that the cap skirt can be temporarily and readily flexed out of its normal dimensions in the plane of the detents in the known manner of the so-called "snap-on" cap. The cap is then in position for the formation of the thread 9 which is preferably produced by rolling the lower skirt portion 7 in conformity with the container thread 18, the container thereby serving as the mandrel. The cap and container then have the position shown in Fig. 2 which represents the sealed condition in which the consumer receives the package. It will be appreciated, however, that the relationship of the several dimensions of the container permit the use of a completely preformed cap if one so desires, as well as a cap partially preformed.

To remove the cap, it is rotated to release the threads 9 and 18, as shown in Fig. 3, so that the cap is retained only by the detents 8 in cooperation with container bead 14. Complete removal is then effected by pulling the cap mouthward to cause the detents 8 to ride over the bead 14. The position of the cap shown in Fig. 3 is, accordingly, the intermediate position of closure provided to permit removal and re-application merely by non-rotative axial motion of the cap. It should be noted further with reference to Fig. 3 that the location of the detents is preferably such that a detent engages, or is in close proximity to, the lower shoulder 15 of the container bead 14 when the threads 9 and 18 are disengaged to the extent that only the lowermost portion of the thread 9 rests on the uppermost portion of the thread 18. In this manner unsightly tilting or cocking of the cap in the intermediate position is prevented.

In Figs. 4 and 5 another embodiment of the invention is shown in which the cap and container are provided with additional cooperating elements which will now be described insofar as the structure differs from that shown in Figs. 1, 2, and 3. For similar details the same reference numerals are used and no further description thereof is provided. The cap has below the bead 10 an integral depending skirt portion 20 united to the portion thereabove by relatively narrow strips 21 which are separated from each other by perforations or cuts 22. The bottom edge of the skirt band 20 is turned under an annular bead or locking ring 23 provided on the container below the thread 18. The bead 23 is preferably a continuous surface of revolution permitting slight initial rotation of the cap. The strips 21 are severed by force applied to further rotate the cap after the band 21 has been pulled tightly against the bead 23 by the initial rotation. In this manner I provide a combination of cap and container that cannot be opened

without the severed band serving as evidence of the fact.

In Figs. 6 and 7 an additional embodiment of the invention is shown, with respect to which the same reference numerals found in Figs. 1, 2, and 3 are again used to indicate like details. Accordingly, the following description is restricted to only the additional features. In this form of my invention a band 25 is suspended from the cap bead 10 by a constricted portion 26. The band is provided with several transverse perforations or cuts 27 that extend across the major portion of the band width. If desired, the band may also be provided with tabs 28. The lower edge of the band 25 is turned under the container bead 23 so that the band must be fractured or severed before the cap can be completely removed. This is accomplished by rotation of the cap to an extent that the cap bead 10 is lifted against the constricted band portion 26, and the band is fractured above the cuts 27 as shown in Fig. 7. This embodiment also provides a tamper-proof package.

Having given a full and adequate description of my invention by way of several embodiments thereof,

I claim:

1. A cup-like closure cap having a depending skirt provided with detents adapted to be sprung over a continuous container neck bead to secure the cap in an initial stage of closure, and thread-like configurations therebelow adapted to freely pass over said neck bead and to engage thread-like configurations therebelow on the container to secure the cap in a second position of sealing relationship with said container wherein said detents remain above the level of the container threads, whereby said cap may be alternatively secured to the container in either of said positions.

2. A cup-like closure cap having a flexible depending skirt provided with a plurality of circumferentially arranged detents adapted to be sprung over a continuous container neck bead of slightly greater maximum diameter than the minimum inside diameter of the cap skirt in the plane of said detents upon flexure of said skirt to secure the cap in an initial stage of closure, and thread-like configurations therebelow adapted to freely pass over said neck bead and to engage thread-like configurations therebelow on the container to secure the cap in a second position of sealing relationship with said container wherein said detents remain above the level of the container threads, whereby said cap may be alternatively secured to the container in either of said positions.

3. A cup-like closure cap having a flexible depending skirt provided with a plurality of circumferentially arranged and inwardly extending detents, and thread-like configurations therebelow, in combination with a container having near the mouth thereof a bead of slightly greater diameter than the minimum inside diameter of the cap skirt in the plane of said detents, and therebelow thread-like configurations adapted to engage those of said skirt, whereby said cap is secured in sealing relationship to said container by engagement of said thread-like configurations of said cap and container, and subsequently is held against axial movement mouthward in a more elevated position solely by said bead and detents, from which position the cap may be completely removed by a mouthward pull inducing flexure of said skirt.

4. A cup-like closure cap having a flexible depending skirt provided with a plurality of inwardly extending detents, and thread-like configurations therebelow, in combination with a container having near the mouth thereof a bead of slightly greater diameter than the minimum inside diameter of the cap skirt in the plane of said detents, and therebelow thread-like configurations adapted to engage those of said skirt, said detents being so located in said skirt that at least one cooperates with said bead to prevent substantial tilting of said cap when said cap and container threads are in contact but devoid of interlock.

5. A closure cap and container as recited in claim 3, wherein the lowermost skirt portion is

severed at intervals from the remainder of the skirt, and the container has an annular shoulder under which the edge of said skirt portion is turned, whereby said cap and container are secured against unauthorized opening, but may be separated by complete severance of said skirt portion upon rotation.

6. A closure cap and container as recited in claim 3, wherein the cap has an outwardly turned bead and a transversely weakened band secured thereto by a constricted upper edge portion, and the container has an annular shoulder under which the bottom edge of said band is turned, whereby removal of said cap requires fracture of said weakened band by rotation of said cap.

JOHN E. SHARP.