

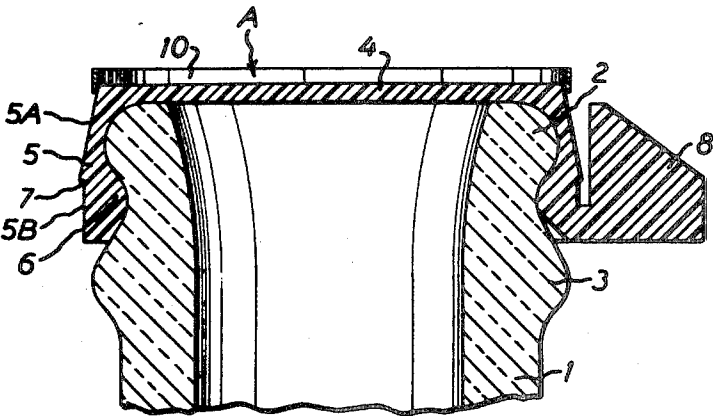
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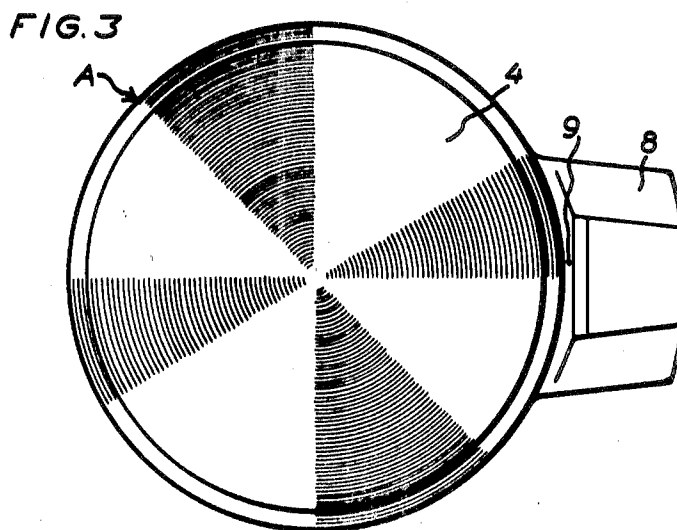
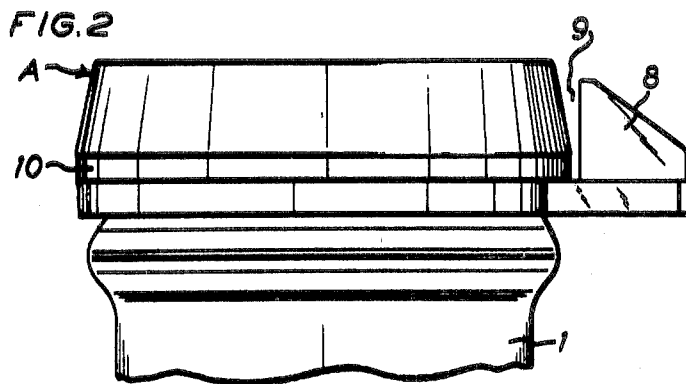
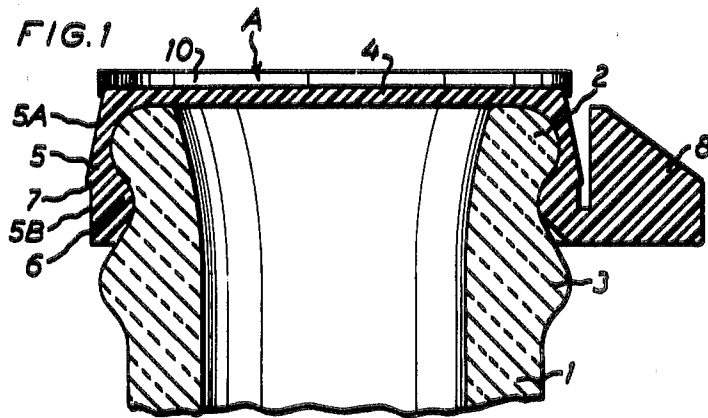
[54] **CAPS FOR BOTTLES AND CONTAINERS**  
**2 Claims, 6 Drawing Figs.**

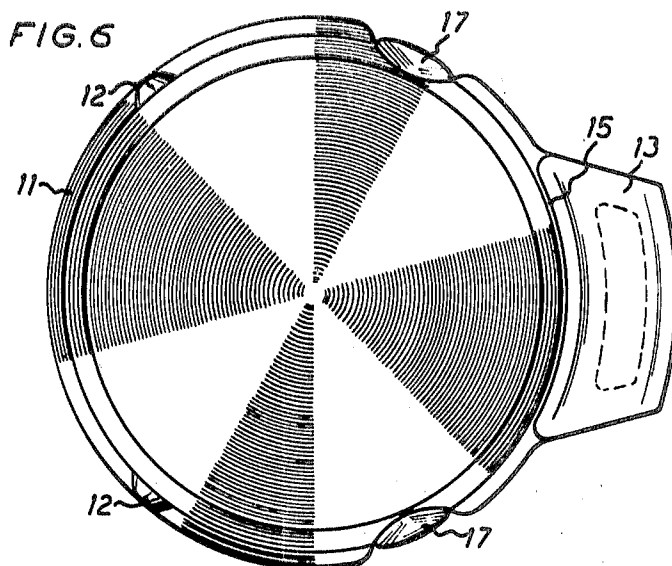
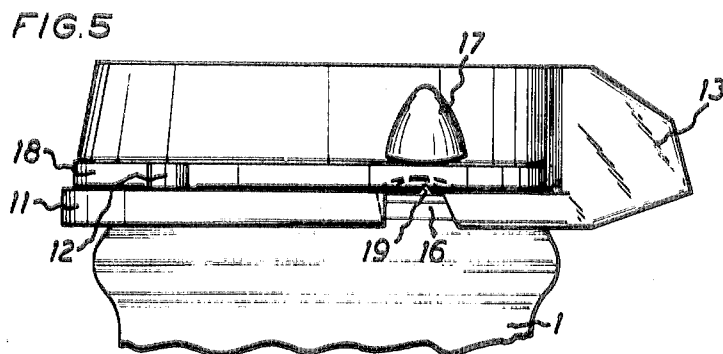
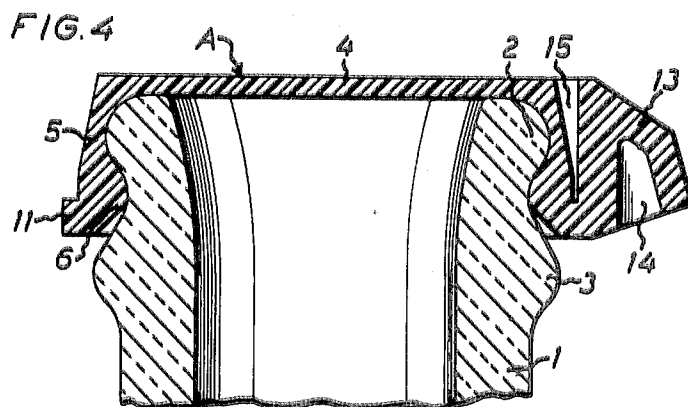
[52] U.S. Cl..... **215/41,**  
**215/45**  
[51] Int. Cl..... **B65d 41/22**  
[50] Field of Search..... **215/41, 45,**  
**46, 95; 220/60**

[56] **References Cited**  
**UNITED STATES PATENTS**  
2,665,023 1/1954 Migneault ..... 215/45  
3,532,244 10/1970 Yates ..... 215/41  
*Primary Examiner*—George T. Hall  
*Attorney*—John Lezdey

**ABSTRACT:** A cap for bottles and containers of the type having a bead at their mouths is provided with a safety ring which embraces the flange of the cap in the mounted position thereof to ensure efficient sealing of the bottle. For easy opening of the bottle the cap has a projection which extends from less than a quarter of the cap periphery and which, upon application of a lifting force against its underside, will act as a lever and cause rupturing or stretching of the safety ring, thus permitting removal of the cap without the use of tools.







## CAPS FOR BOTTLES AND CONTAINERS

This invention relates to a cap for bottles and other containers of the type having a bead at their mouths, said cap comprising a safety or reinforcing ring which in the bottle closing operation is urged down over the flange of the cap bearing against the outer side of the bead at the bottle mouth, said safety and reinforcing ring lying in mounted position outside an internal annular rib of the cap which engages under the bead at the bottle mouth.

These caps suffer from the drawback that they cannot or only with difficulty be removed without the use of tools.

The invention has for its object to provide a cap which satisfies the high requirements for a gas and liquidtight seal that is a prerequisite in the production of beer and soft drinks, while still allowing easy and rapid opening of the cap without the use of tools. The cap is also meant for use as a closure after it has been opened for the first time; in repeated use, however, it does not possess an equally high degree of sealing capacity as when it was provided with the safety ring.

Characteristic of the cap according to the invention is that the flange of the cap is provided with a projection extending a fair distance outwardly from less than a quarter of the cap periphery, the inner portion of said projection being of equal or almost equal height as the cap and the lowermost portion thereof being integrally connected with the flange while the upper inner portion of the projection is separated from said flange by so narrow a gap that the safety ring can be urged down into its operative position and, by a lifting force applied to the underside of the projection, the upper inner portion thereof can be brought to bear against the flange so that said flange will form an abutment for the projection, continued application of lifting force to the projection resulting in rupture or deformation of the safety ring and subsequent removal of the cap.

The invention will be more fully described in the following, reference being had to the accompanying drawings in which:

FIG. 1 is a section of a cap and the upper part of a bottle;

FIG. 2 is a side elevation of the cap and the bottle part;

FIG. 3 is a top plan view of the cap;

FIG. 4 is a section of another embodiment of a cap mounted in position on the upper part of a bottle;

FIGS. 5 and 6 are a side elevation and a top plan view, respectively, of the cap in FIG. 4.

In the drawings, the neck of a bottle (not shown in detail) is designated 1. An external upper bead surrounding the mouth of the bottle 1 is designated 2. The bottle also has a lower bead 3. The cap comprises a disk 4 molded integrally with a downwardly directed flange 5, for instance of polyethylene. The flange at the lower end has an internal annular rib 6. The flange of the cap shown in FIGS. 1, 2 and 3 is so shaped that its outer face consists of a conical upper part and a cylindrical lower part. The largest diameter of the conical part is greater than the diameter of the cylindrical part. A shoulder 7 is formed between the said two parts to render removal of the safety ring more difficult. The cap is provided with a projection 8, the inner portion of which is almost equally high as the cap and the lowermost portion of which is in integral connection with the cap, while the upper portion of the projection 8 is separated from the flange by a narrow gap 9. In FIG. 1, a safety ring 10 is shown loosely placed on top of the cap. FIG. 2 shows the ring urged down into its operative position. The ring can be made for instance of aluminum and be cut from a tube or be made from a band joined together by soldering or welding. Characteristic of the ring is that in cross section it has the shape of a rectangle, the height of which is several times greater than its width. The ring may for instance have a height of 1.8 mm. and a thickness of 0.2 mm. When placing it in position, the ring may be caused to stretch. As a result, the ring will break almost immediately upon removal of the cap, without being first appreciably stretched. However, the ring may be stretched before it is placed on the cap. If arranged

definitively to break at the first removal of the cap, the ring by its very presence guarantees that the bottle has not been opened before. Owing to the relatively large height of the ring it is easily seen whether it is intact or not.

In the embodiment shown in FIGS. 4-6 the flange has an enlarged portion 11 with associated upwardly directed supports 12 serving to retain the major portion of the safety ring after it has been broken. In this embodiment, the projection 13 is designed in another manner than in the preceding Figures, although having the same characteristic features as the earlier described projection, viz broadly the same height as the cap, its lowermost portion integrally connected to the flange, its uppermost inner portion separated from the flange by a narrow gap. The projection may be recessed at 14 for material saving purposes. At the lower edge the flange has two cutouts 16 which are equidistantly spaced from the projection 13. Seen in top plan view the cutouts lie at angles of approximately 65° with respect to the axis of the projection. Above each cutout 16 the flange has a boss 17.

In FIG. 5, an aluminum ring 18 is shown in mounted position on the cap. At the lower edge the ring on each side has a notch 19 for facilitating rupture of the ring. The cutouts 16 have been provided in order that upon removal the cap shall be heavily stretched and bent immediately above said cutouts. The bosses serve the purpose of preventing that the ring slips upwardly precisely at this point, upon removal of the cap. By the provision of a thin but high safety ring having notches to facilitate rupture thereof, it is gained that the rupture will take place successively from below in an upward direction, and that rupturing the ring will require a considerably smaller force than if the ring would rupture over its entire cross section at one and the same time.

When it is desired to remove the cap the bottle neck is grasped with one hand and the projection is forced upwardly with the thumb. Another way of removing the cap is to place the thumb on the upper side of the cap and the index finger below the projection and to effect a lifting movement with the index finger. Since the cap must be made from a soft material and since a much larger force is required for removing—without the use of tools—a cap which is equipped with a safety ring, than an ordinary multiuse closure cap, the projection must be of such a shape that its inner portion is of substantial height and that, when a lifting force is applied to the underside of the projection, the uppermost inner portion thereof can be brought to bear against the flange whereby said flange will form an abutment for the projection. With the use of a thin and high safety ring the gap between the projection and the flange can be narrow. This will restrict the upward bending of the projection and facilitate removal of the cap.

When the projection is bent upwardly the safety ring is firmly clamped between the projection and the flange and is prevented from creeping upwardly. If rupture of the safety ring occurs only at one point or if the ring is permanently deformed without rupturing, the entire ring can be retained in the narrow gap. If it is intended that the ring should rupture at two points, as is shown in FIG. 5, the smaller portion of the ring can be retained in the gap.

The cap described is very easily and rapidly removed without the use of tools. Since the safety ring need not first be broken or removed to permit removal of the cap, one does not risk ruining one's nails and since the projection is of soft plastic material there is no risk of cutting oneself. The fact that the additional projection need not increase the material of the cap by more than approximately 15 percent and the very simple shape of the safety ring ensure that the cap can be manufactured at low cost, which obviously is of great importance considering the enormous number of caps produced each year.

What I claim and desire by Letters Patent is:

1. A cap for bottles and other containers of the type having a bead at their mouths, said cap comprising a safety or reinforcing ring which in the bottle closing operation is urged down over the flange of the cap bearing against the outer side

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of the bead at the bottle mouth, said safety and reinforcing ring lying in mounted position outside an internal annular rib of the cap which engages under the bead at the bottle mouth, wherein the flange of the cap is provided with a projection extending a fair distance outwardly from less than a quarter of the cap periphery, the inner portion of said projection being of equal or almost equal height as the cap and the lowermost portion thereof being integrally connected with the flange while the upper inner portion of the projection is separated from said flange by so narrow a gap that the safety ring can be urged down into its operative position and, by a lifting force applied to the underside of the projection, the upper inner portion

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thereof can be brought to bear against the flange so that said flange will form an abutment for the projection, continued application of lifting force to the projection resulting in rupture or deformation of the safety ring and subsequent removal of the cap.

2. A cap as claimed in claim 1, wherein the flange of the cap at the underside has a cutout on each side of and equidistantly spaced from the projection, and at the underside and opposite the cutouts the safety ring has notches for facilitating rupture thereof.

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