May 11, 1937. S. A. ERASTOFF 2,079,794

BOTTLE CAP

Filed April 1, 1936

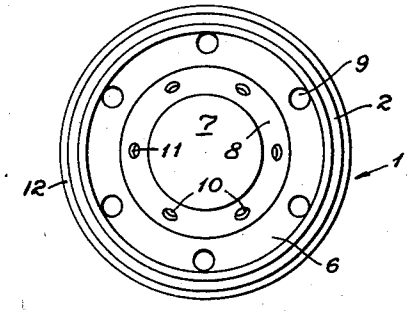


Fig. 1.

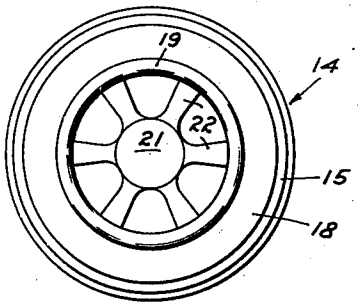


Fig. 3.

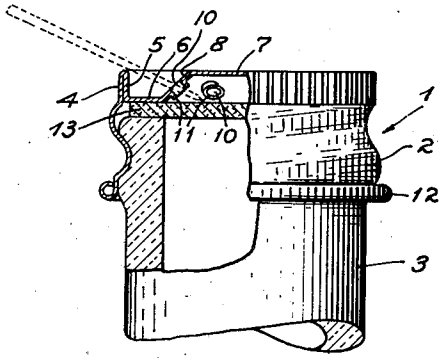


Fig. 2.

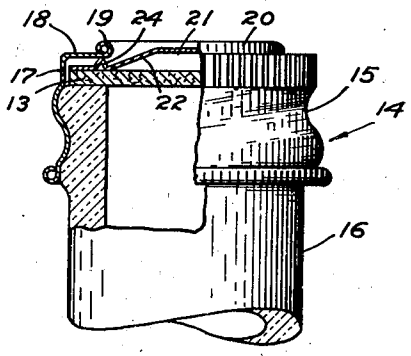


Fig. 4.

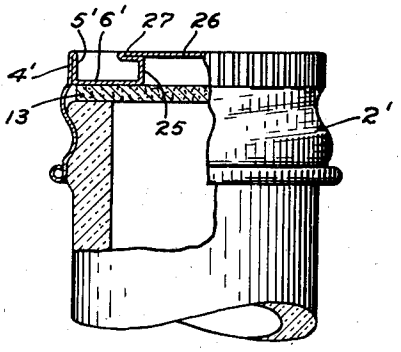


Fig. 6.

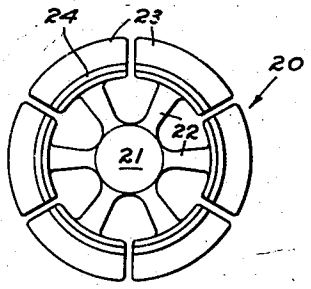


Fig. 5.

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BOTTLE CAP

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Application April 1, 1936, Serial No. 72,072

12 Claims. (Cl. 215—46)

The present invention relates to improvements in bottle caps and has particular reference to a screw cap. The principal object of the invention is to provide means in connection with a screw cap whereby the unscrewing of the cap is facilitated. While I refer in this specification to a bottle cap it is obvious that the principle involved applies to the screw cap generally whether used in connection with a bottle or tin can or any other container.

Where a screw cap is used, a liner or washer is usually interposed between the top of the bottle and the cap and the latter is screwed down so tightly that it is impossible to unscrew the cap by hand because the frictional resistance between the cap, the liner and the top of the bottle neck is so intense that it cannot be overcome by the strength of the fingers.

It is proposed in the present invention to provide means for easing and relieving the frictional resistance or pressure exerted by a tightly screwed cap so that the cap may thereafter be unscrewed without any difficulty.

Further objects and advantages of my invention will appear as the specification proceeds.

The preferred form of my invention is illustrated in the accompanying drawing in which

Figure 1 shows a top plan view of one form of my invention illustrating the principle of cap,

Figure 2 a side elevation of this cap applied to a bottle neck, a portion being shown in section,

Figure 3 a top plan view of another form of my cap,

Figure 4 a side elevation of the latter cap as applied to a bottle neck, a portion being shown in section,

Figure 5 a detail view in plan of a spider-shaped disc used in connection with the latter cap, and

Figure 6 a side elevation of another modification of my cap as applied to a bottle neck, a portion of the cap being shown in section.

While I have shown only the preferred forms of my invention I wish to have it understood that various changes or modifications may be made within the scope of the claims hereto attached without departing from the spirit of the invention.

Referring to the drawing in detail and particularly to the form illustrated in Figures 1 and 2, it will be noted that my cap 1 is formed with a threaded flange 2 adapted to be screwed down upon the threaded neck of the bottle 3, the upper portion of which only is shown in the drawing. The top 4 of the flange, which projects above the bottle neck, is turned upon itself as shown at 5 and is joined, at its lower end, by a flat rim 6 which latter connects with a raised central portion 7 through a frusto-conical section 8. The rim 6, the raised section 7 and the frusto-conical section 8 form the top of the bottle cap.

The rim 6 is formed with a plurality of perforations 9 and the frusto-conical section is also formed with a series of perforations 10, the latter perforations being arranged in staggered relation to the former as clearly appears from Figure 1. The perforations 10 have inwardly extending flanges or burrs 11 for reinforcing the edges thereof.

The bottom edge of the flange 2 is preferably curled upon itself as shown at 12.

A liner 13 is interposed between the top of the bottle neck and the cap and this liner is of conventional construction, having preferably a soft upper face and a glazed bottom face.

When this cap is screwed down tightly upon the liner and upon the bottle neck, the rim 6 lies flat upon the liner and presses the liner upon the top of the bottle neck, and the pressure of the rim upon the liner and of the liner upon the bottle neck is so intense that it is impossible to unscrew the cap by hand and to overcome the frictional resistance offered by the tight engagement.

But in my invention the frictional resistance is eliminated by a very simple operation. The operator takes a simple prying tool, such as an ice pick, inserts the point thereof into one of the perforations 10, then bears down on the tool and using the upper edge 4 of the flange 2 as a fulcrum, exerts a lifting effect on the frusto-conical section 8 of the top of the cap whereby an adjacent section of the rim 6 is lifted away from the liner 13 and made to assume a slightly inclined position. This operation is repeated with respect to each of the perforations 10 until the entire rim 6 is lifted away from the liner 13 and the pressure is relieved. Now the cap may be unscrewed without any effort.

The perforations 9 in the rim facilitate the prying operation. Being arranged in staggered relation to the perforations 10 in the rim they tend to naturally divide the rim into a number of triangular sections corresponding to the number of the perforations 10 and in compensating for the stresses set up in the material by the prying operations. The burrs 11 on the perforations 10 reinforce the edges of the perforations and prevent tearing of the metal.

In the form shown in Figures 3 to 5 a two-piece cap is used. The outer piece 14 comprises an annular threaded flange 15 adapted for thread-

ing on the bottle neck 16 and having a top section 17 rising from the threaded portion. This top section is joined by an inwardly extending ring 18 and the inner edge of the ring is rolled as at 19 for reinforcing the same. The ring opening is of considerable size, preferably about the same size as the bottle neck opening.

In connection with the outer piece of the cap I use a spider-shaped disc 20 shown in detail in Figure 5. The disc comprises a slightly raised inner section 21, a plurality of arms 22 projecting radially therefrom and arranged at a slight angularity so as to lie in a frusto-conical plane and peripheral segments 23 projecting from the outer ends of the arms, the segments being arranged to lie in a flat plane parallel to the plane of the central section and to form a ring, except for the slight spacing between the same.

The size of the disc is such that it fits inside of the outer cap and the ring formed by the segments is substantially coextensive with the ring 18 of the outer cap and the thickness of the bottle neck material, as shown in Figure 4. The segments are uniformly indented to provide an annular ridge 24 which is preferably disposed directly underneath the rolled edge 19 of the outer cap ring 18. The liner 13 is used in the same way as previously described.

In using this form the disc is placed inside the outer cap and both are screwed down upon the liner and the bottle neck. To facilitate unscrewing the operator inserts his prying tool, such as an ice pick, between any two arms of the spider and bears down on the outer end of the tool, using the rolled edge 19 for a fulcrum, whereby the central portion of the spider-disc is raised and the two adjacent arms are drawn toward the center with the result that the segments attached to the arms are drawn from underneath the ring 18 of the outer cap. This operation is repeated until the entire disc is freed and removed from the outer piece of the cap. The latter may now be unscrewed without any difficulty.

Particular attention is called to the annular ridge 24 which performs an important function. The metal of the disc has to be relatively thin and flexible to allow of the operation described and if the ridge were omitted and the outer cap screwed down tightly upon the spider-disc, the removal of the disc would not provide enough clearance to have a perceptible effect in relieving the pressure and the frictional resistance. The ridge increases the distance between the outer cap and the liner and consequently gives greater clearance when removed.

The rolled edge 19 of the outer cap is also of considerable importance since it reinforces the fulcrum on which the lifting tool turns.

The form shown in Figure 6 is similar to that shown in Figures 1 and 2 and comprises a single piece cap having the threaded flange 2', the top section 4' rising therefrom which is bent upon itself as at 5' and then bent inwardly to form the flat rim 6'. But the raised central portion is constructed differently and comprises a cylindrical section 25 which is covered by a flat section 26 joined thereto in such a manner as to form an overhang 27. In this case the tool is fulcrumed on the top 4 of the flange and its end is placed underneath the overhang so that the latter may be raised and cause the flat rim 6' to be lifted from the liner.

I claim:

1. In combination, a bottle neck having a thread thereon, a liner for covering the bottle neck, a cap adapted for screwing on the bottle neck and having a top including a rim section bearing on the rim of the liner for firmly pressing the same upon the bottle neck when the cap is screwed tight, the cap having a raised central section with perforations permitting a prying tool to exert a centerwise lifting pull on the rim section for relieving the pressure of the latter whereby the unscrewing of the cap is facilitated.

2. In combination, a bottle neck having a thread thereon, a liner for covering the bottle neck, a cap adapted for screwing on the bottle neck and having a top including a rim section bearing on the rim of the liner for firmly pressing the same upon the bottle neck when the cap is screwed tight, the cap being shaped to permit a prying tool to exert a centerwise lifting pull on the rim section for relieving the pressure of the latter whereby the unscrewing of the cap is facilitated.

3. A bottle cap comprising a top including a rim section and a threaded flange, the top being shaped to permit a prying tool to be applied for exerting centerwise lifting pull on the rim section.

4. A bottle cap comprising a top, a downwardly projecting threaded flange, an upwardly projecting flange and a raised central section with perforations therein permitting a prying tool to be inserted in the perforations and to be tilted about the upward flange for exerting lifting pull on the rim of the top.

5. A bottle cap comprising a top having a rim section and spaced holes therein, a downwardly projecting threaded flange, an upwardly projecting flange forming a continuation of the former flange and a raised central portion having holes therein arranged to permit a prying tool to be inserted therein and to be tilted about the upward flange for exerting lifting pull on the rim section.

6. A bottle cap comprising a top having a rim section and spaced holes therein, a downwardly projecting threaded flange, an upwardly projecting flange forming a continuation of the former flange and a raised central portion having holes therein arranged to permit a prying tool to be inserted therein and to be tilted about the upward flange for exerting pull on the rim section, the holes of the rim section being arranged in staggered relation to those of the central section.

7. A bottle cap comprising a ring having a threaded flange depending from the outer edge thereof and a spider inside of the flange having rim sections disposed underneath the ring.

8. A bottle cap comprising a ring having a threaded flange depending from the outer edge thereof and a spider inside of the flange having rim sections underneath the ring, the rim sections having indentations below the ring.

9. A bottle cap comprising a ring having a threaded flange depending from the outer edge thereof and a spider inside of the flange having rim sections underneath the ring, the rim sections having indentations below the ring and the ring having an inner bead to support a prying tool.

10. A bottle cap comprising a ring having a threaded flange depending from the outer edge thereof and a spider inside of the flange having rim sections disposed underneath the ring, the latter having an inner bead to support a prying tool.

11. A bottle cap comprising a flat ring having a flange arising from the outer edge and a threaded flange depending from the same edge

and a central structure on the ring having an overhang allowing a prying tool to catch thereunder and to raise the same and an adjacent ring section by using the first flange as a fulcrum.

12. A bottle cap comprising a flat ring having a flange rising from the outer edge and a threaded flange depending from the same edge and a flange rising from the inner edge having an overhang allowing a prying tool to catch thereunder and to raise the same and an adjacent ring section by using the first flange as a fulcrum.

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