May 7, 1929. L. R. N. CARVALHO 1,712,102

CLOSURE DEVICE FOR BOTTLES AND OTHER CONTAINERS

Filed Feb. 7, 1927

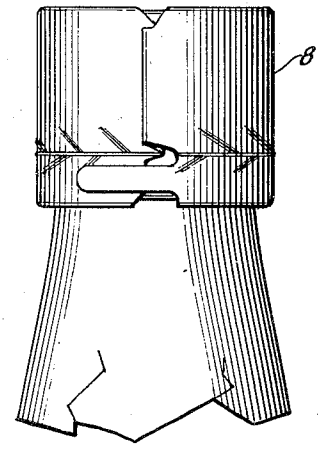


Fig. 1.

Fig. 2.

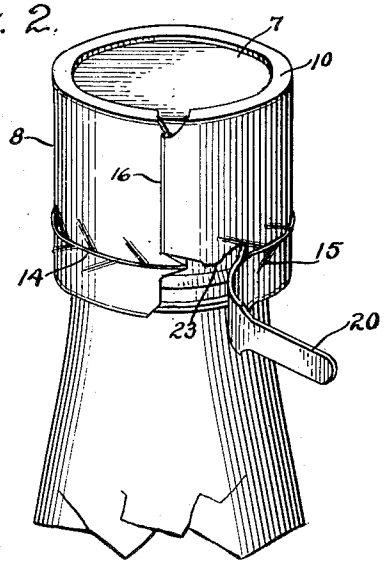
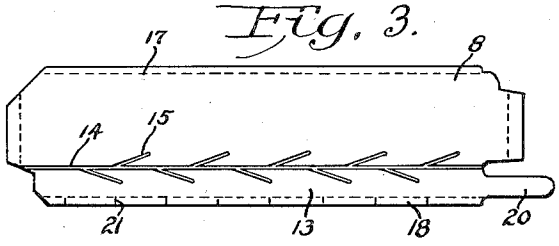


Fig. 3.



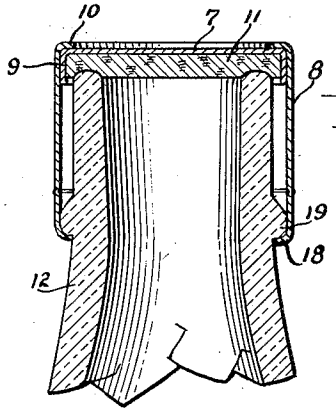
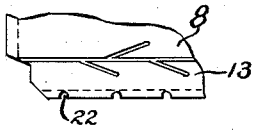


Fig. 4.

Fig. 5.



Leslie R. N. Carvalho,
Inventor
by J. F. Rule,
Atty.

Patented May 7, 1929. 1,712,102

UNITED STATES PATENT OFFICE.

LESLIE R. N. CARVALHO, OF TOLEDO, OHIO, ASSIGNOR TO THE CLOSURE SERVICE COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO.

CLOSURE DEVICE FOR BOTTLES AND OTHER CONTAINERS.

Application filed February 7, 1927. Serial No. 166,309.

My invention relates to caps or closure devices for bottles and other containers and is particularly adapted for use with a cap of the type comprising a removable circumferential strip forming the lower portion of the skirt or flange of the cap.

An object of the invention is to provide means for facilitating the tearing off of the removable strip.

Other objects of the invention and the precise nature thereof will appear hereinafter.

In the accompanying drawings:

Figure 1 is an elevation of a bottle cap constructed in accordance with the present invention and also shows a portion of the bottle to which the cap is applied.

Figure 2 is a perspective view showing the bottle cap and bottle, the removable strip being torn off for a certain distance.

Figure 3 is a view of the interior surface of the flat sheet metal piece from which the skirt portion of the cap is formed.

Figure 4 is a sectional elevation of the cap and the bottle to which it is applied.

Figure 5 is a fragmentary view showing a modification.

The bottle cap herein shown comprises a circular top or cover piece 7 and a flange or skirt portion 8, said top and flange being made from separate pieces of sheet metal. The top or button 7 is formed with a circumferential flange portion 9 and may be frictionally held in the skirt portion 8, the latter being formed with a top circumferential flange 10 bent inward to form an abutment for the button 7. A gasket 11 of cork or other suitable material may be interposed between the cap and the lip of the container 12 to which said cap is applied.

The skirt 8 of the cap is stamped from a flat sheet of metal, the stamping being of the shape shown in Figure 3. A horizontal score line 14 is cut in the metal, preferably on its inner face to provide a rip strip 13 removably attached to the body of the skirt along said score line. Diagonal branch scores 15 are arranged at intervals along the main score line 14, being preferably arranged alternately on opposite sides of the main score line, for the purpose hereinafter pointed out. The skirt 8 is curved to cylindrical form and its ends interconnected to form a vertical seam 16. The upper edge is bent inward along the dotted line 17 (Fig. 3) to form the flange 10. The cap is completed by assembling the button 7, skirt 8 and gasket 11.

When the cap has been applied to the container 12, it is sealed thereon by bending or spinning the lower edge portion or margin 18 inwardly beneath the annular shoulder 19 formed on the container. To remove the cap from the container, the rip strip 13 is first removed by grasping the finger piece 20 and tearing along the circumferential score line 14.

It has been found in practice that the inturned flange portion 18 along the lower edge of the removable strip, stiffens the strip to such an extent that it interferes with the easy tearing off thereof. This stiffening of the strip also has a tendency to interfere with the accurate tearing of the strip along the score line, or, in other words, tends to cause the tear to run away from the score line. As a result, the strip 13 may either be broken in two before being completely removed, or the tear may run into the body portion of the skirt above the horizontal score line, thus mutilating the cap. In order to overcome the tendency of the flange 18 to interfere with the easy and complete removal of the strip 13, a series of vertical scores 21 are arranged at short intervals along the strip, said scores extending from the lower edge of the strip for a short distance, preferably across the inturned lower edge portion of the skirt 18. By providing these scores or weakened portions 21 at short intervals along the removable strip, the stiffness or resistance to the tearing off of the strip, due to the flange 18, is practically overcome, so that the strip is easily torn away. On the other hand, the scores 21 do not weaken or reduce the effectiveness of the flange 18 as a means for securing the cap on the container. Ordinarily in tearing off the strip, it will break at each of the score lines 21. In Figure 5, is shown a modification in which notches 22 are cut in the strip 13 instead of score lines 21.

In removing the strip 13, it will ordinarily separate along the score line 14 and under some conditions the line of severance may depart from the score line. For example, it may tear upward away from the score line, as indicated at 23 (Fig. 2) until a diagonal score 15 is reached which will then serve to direct the line of tear back to the main score line 14. Any departure in the line of tear from the straight line 14 will frequently be

in a downward direction, so that without the diagonal scores 15, a portion of the strip 13 might be torn away from the remaining portion without unsealing the cap. Diagonal scores 15 below the score line are sufficient to prevent this tearing away of only a portion of the strip. On the other hand, the greater stiffness of the lower margin of the removable strip 13, due to the flange 18, will sometimes have a tendency to cause line of severance to run upward from the main score line 14. I prefer, therefore, to arrange the diagonal scores both above and below the main score line.

Modifications may be resorted to within the spirit and scope of my invention.

What I claim is:

1. A closure cap comprising a top portion and a depending skirt portion, the skirt portion including a removable strip extending circumferentially of the cap, said strip having a lower inturned margin extending lengthwise of the strip to secure the cap to a container, said margin having its structure weakened at intervals lengthwise thereof by which the flexibility of the strip is increased, said weakened portions being confined to said inturned margin and terminating short of the main body portion of the strip.

2. A closure cap comprising a top portion and a depending skirt portion, the skirt portion including a removable strip extending circumferentially of the cap, said strip having a lower inturned margin extending lengthwise of the strip to secure the cap to a container, said margin having transverse scores at short intervals lengthwise thereof.

3. A closure cap for a container comprising a top portion and a depending cylindrical skirt portion, said skirt portion having a main score line extending circumferentially thereof and providing a removable strip forming the lower portion of the skirt, said skirt having a series of diagonal scores arranged at intervals along the main score line and merging into said main score line, whereby to prevent upward transverse tearing of the skirt portion above the score line.

4. The combination of a container and a closure cap therefor, said cap comprising a top cover portion and a depending skirt portion, said container being formed with a circumferential shoulder spaced below its upper end, said skirt having its lower margin inturned to engage beneath said shoulder and secure the cap to the container, said skirt having a weakened line extending circumferentially thereof a short distance above said shoulder to provide a removable strip, and means arranged at short intervals along the lower margin of the strip to increase its flexibility and facilitate the removal of the strip without substantially decreasing the holding strength of said margin.

5. The combination of a container and a closure cap therefor, said cap comprising a top portion and a depending skirt, the lower portion of said skirt consisting of a removable strip extending circumferentially of the container, said container having a circumferential shoulder, the lower margin of said removable strip being inturned beneath the shoulder for holding the cap on the container, and means for reducing the resistance of said inturned margin to the flexing of said strip in the process of removing it from the skirt while retaining substantially the full holding strength of said margin.

6. A closure cap comprising a horizontal top portion and a vertically depending cylindrical skirt portion, the latter having a score line extending circumferentially thereof to provide a removable strip forming the lower portion of said cylindrical skirt, said strip having a lower inturned holding margin extending lengthwise thereof for engagement with a holding surface on a container, said margin having an unbroken outer edge extending substantially the entire length of the strip, said margin being formed with transverse scores at short intervals lengthwise thereof by which the flexibility of the removable strip is increased without substantially decreasing the holding strength of said margin.

7. A closure cap for a container comprising a top portion and a depending cylindrical skirt portion, said skirt portion having a main score line extending circumferentially thereof and providing a removable strip forming the lower portion of the skirt, said skirt having two series of diagonal scores respectively above and below the main score line, each of said series comprising scores arranged at short intervals along the main score line, and merging into said main score line.

8. A closure cap for a container comprising a top portion and a depending cylindrical skirt portion, said skirt portion having a main score line extending circumferentially thereof and providing a removable strip forming the lower portion of the skirt, said skirt having two series of diagonal scores respectively above and below the main score line, each of said series comprising scores arranged at short intervals along the main score line, and merging into said main score line, said removable strip having a finger piece formed at one end thereof and determining the direction in which the severance of said strip advances, said diagonal scores converging toward and into the main score line in the direction in which said severance advances.

9. A closure cap comprising a circular top portion or button, a depending skirt portion thereon, the latter having a score line extending circumferentially thereof to provide a removable attaching strip at the lower end of said skirt, and two series of diagonal score

lines respectively above and below the circumferential score line, said diagonal score lines merging into the main score line.

10. A closure cap for a container comprising a top portion and a depending cylindrical skirt portion, said skirt portion having a main score line extending circumferentially thereof and providing a removable strip forming the lower portion of the skirt, said skirt having a series of diagonal scores above the main score line and arranged at intervals therealong, said diagonal scores extending downward to and merging into the main score line.

Signed at Toledo, in the county of Lucas and State of Ohio, this 1st day of February, 1927.

LESLIE R. N. CARVALHO.