

[54] **METAL TEAR-OFF CAP**

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[51] Int. Cl..... **B65d 43/02**
[58] Field of Search..... 215/46 A, 42, 39

[56] **References Cited**

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[57] **ABSTRACT**

The invention relates to a metal tear-off cap, the edge of which, separable along a line of reduced strength, securely underlies the rim or ring on the neck or at the mouth of a container, a gripping tab being provided on and projecting beyond the separable edge. The cap is characterized in that the separable edge is rolled-in, in known manner, and is adapted to be pressed in beneath the rim or ring on the neck or at the mouth of the container and in that the line of reduced strength is positioned directly above the rolled-in edge and is interrupted by a cut-away portion which, together with an incision or a previously thinned tear-off zone extending from the line of reduced strength through the rolled-in edge, defines the separable edge, a separate gripping tab, locked on the cap, being secured to the tear-off end.

13 Claims, 7 Drawing Figures

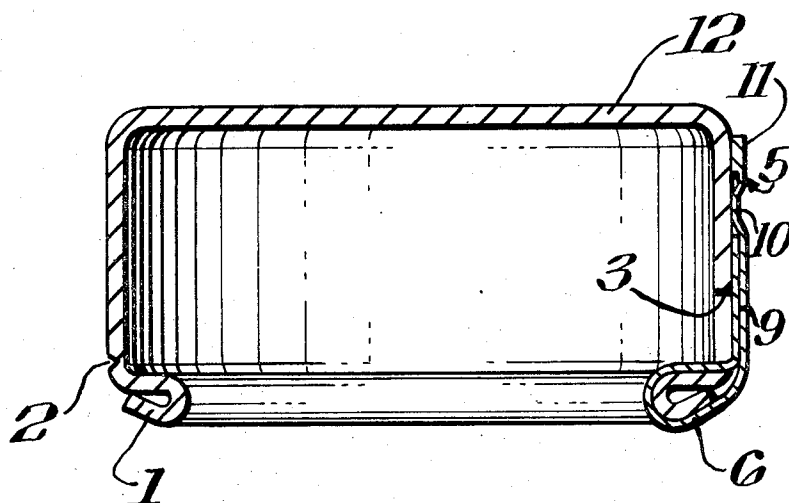


Fig. 1.

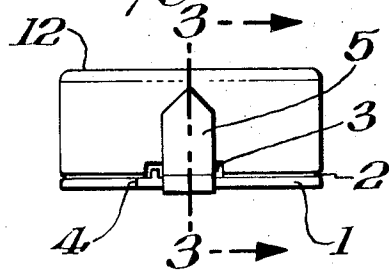


Fig. 2A.

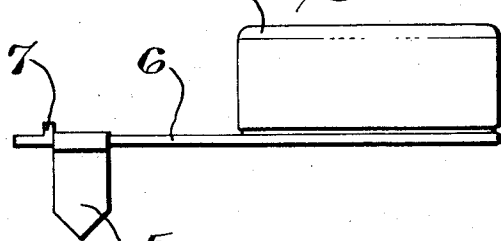


Fig. 2B.

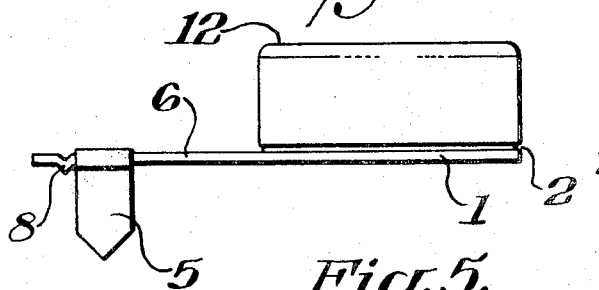


Fig. 5.

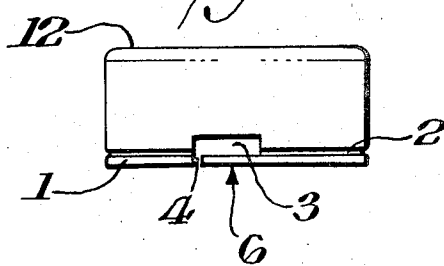


Fig. 3.

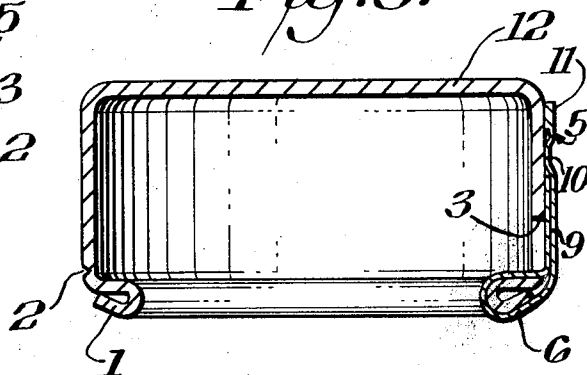


Fig. 4.

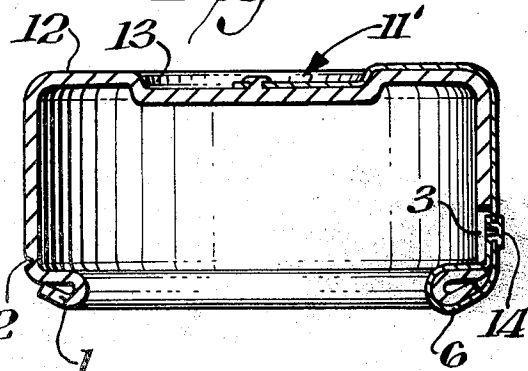
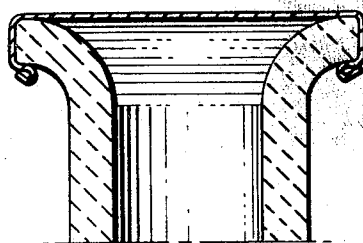


Fig. 6.



METAL TEAR-OFF CAP

BACKGROUND OF THE INVENTION

Various metal tear-off caps are known which are used for sealing bottles and other containers and which have an edge which is separable along a line of reduced strength and which, when the container is opened, is torn off by means of a gripping tab projecting beyond this edge. These known tear-off caps, into the cylindrical surface of which a screw-thread could be optionally impressed, were primarily intended to be used as safety seals, i.e. as a means for guaranteeing to the first user that the original contents of the container sealed by the cap had not been interfered with. However, they were less suitable for use as seals when the contents of the container were under pressure, since their resistance to internal pressure was limited. Furthermore, it was necessary for the cylindrical portion of the cap, including the separable edge or tear-off strip, to be of a certain depth, and this called for the use of a corresponding amount of material and also meant that these caps could only be employed for sealing such containers that had a suitably long neck with close dimensional tolerances. In addition, the tear-off strips of the known caps could not be removed in a reliable and convenient manner.

Metal tear-off caps are also known which have a rolled-in edge. However, these caps have the disadvantage of being destroyed when torn off, since it was not the rolled-in edge that was removed but a tear-off strip extending transversely across the cap.

Also known are tear-off caps in which the line of reduced strength is interrupted by a cut-away portion which, together with a previously thinned tear-away zone, defines the tear-off end of the separable edge. However, in the case of these caps too, the separable edge took the form of a wide tear-off strip, so that the depth of the caps was not small and, for their use, a corresponding length of neck was required on the containers that they were to seal. Furthermore, these caps too offered only limited resistance to internal pressure.

SUMMARY OF THE INVENTION

The problem underlying the present invention is that of providing a metal tear-off cap for sealing bottles and other containers which, while being of small depth, offers considerable resistance to internal pressure and ensures a very reliable tear-off action, while at the same time performing the function of a safety seal.

According to the invention, this problem is solved by means of a cap in which the separable edge is rolled-in in known manner and is adapted to be pressed in beneath the rim or ring on the neck or at the mouth of the container, and in that the line of reduced strength is positioned directly above the rolled-in edge and is interrupted by a cut-away portion which, together with an incision or a previously thinned tear-off zone, extending from the line of reduced strength through the rolled in edge, defines the separable edge with a separate gripping tab, locked on the cap, being secured to the tear-off end.

Since, in the case of the tear-off cap of the present invention, the bent-over and separable lower edge is rolled-in, its strength is greatly increased as a result of the work-hardening and it ensures considerable resistance to internal pressure on the part of the cap. Since, on the otherhand, this rolled-in edge is only of small

depth, the overall depth of material used for the cap is reduced, so that the cap can also be used for such bottles and other containers that have only a narrow rim with a portion of reduced diameter. Such containers are particularly easy to produce, since the parts of the mouth in which close dimensional tolerances are required are located directly below the sealing rim at the opening. It is at this point that, for example, the glass of the container can be most readily shaped to close dimensional tolerances. With the tear-off cap of the invention, it is even possible to seal containers that are of uniform wall-thickness along their necks and in which the mouth is simply formed by bending the material outwards at right angles over a small radius.

Because of the high strength of the rolled-in edge, the cap can be torn off in a very reliable manner, said edge acting as a tear-off strip. Reliable and convenient removal of the separable edge is also promoted by the separate gripping tab and the manner in which it is arranged.

THE DRAWINGS

FIG. 1 is a side view of a tear-off cap in accordance with the invention;

FIGS. 2A and 2B are side views of tear-off caps with the lower edge partially torn off;

FIG. 3 is a section on the line 3-3 through the tear-off cap of FIG. 1;

FIG. 4 is a corresponding section through a tear-off cap of another form;

FIG. 5 is a side view of a further form of tear-off cap, the gripping tab having been omitted from the drawing; and

FIG. 6 is a section through a special container neck sealed by a tear-off cap in accordance with the invention.

DETAILED DESCRIPTION

Each tear-off cap has a separable edge 1 which is rolled-in by known methods and which also acts as a tear-off strip and a safety strip. By means of this edge 1, which may be turned over outwardly or inwardly and does not require to be fully rolled-in, the cap is secured to the neck of the container when edge 1 is closed up, and the container is sealed in such a way that any initial unauthorized opening of the container can be detected. A line 2 of reduced strength is positioned directly above the rolled-in edge 1. The expression "directly above" is here also intended to include the location of the line 2 at a distance of about 1 to 1.5 mm away from the edge 1. Above the edge 1 and the line 2 of reduced strength that helps define it, a screw-thread, not shown, can be provided in known manner in the cylindrical surface of the cap, this screw-thread being used for resealing purposes.

The line 2 of reduced strength, which is positioned above the rolled-in edge 1 and along which the edge can be torn off, is interrupted by the cut-away portion 3. This cut-away portion 3, which may be constituted for example by a punched-out rectangle or a perforation formed by means of a mandrel, combines with the tear-off zone 4 to define the tear-off end 6 of the separable edge 1, and serves to secure the separate gripping tab 5 locked on the cap.

The tear-off zone 4 is constituted by an incision or a previously thinned line which extends from the line 2 of reduced strength through the separable edge 1. This

tear-off zone 4 is preferably offset laterally from the cut-away portion 3, as shown in FIG. 1. However, it may also be immediately contiguous with the cut-away portion 3 as shown in FIG. 5.

The gripping tab 5 may be made of plastic material, fabric or metal, and particularly of a light metal such as aluminum. A colored material is particularly advantageous so that the gripping tab can be readily seen.

In a preferred embodiment of the invention, the gripping tab 5 is made from a strip which is coated with an adhesive on one side and which advantageously consists of a plastic tape having a thickened edge. Referring to FIG. 3 an adhesive strip of this kind is inserted by one of its ends through the cut-away portion 3. The longer end of the adhesive strip passes round the rolled-in edge 1, is then bonded over a short length 9 to the shorter end of the strip and is stuck to the cap over a further short length 10. The outer end 11 of the adhesive strip is folded over and bonded to form a free tab which can be easily gripped at any time. However, the parts 10 and 11, particularly in the case of shallow caps, may also be laid on the top face 12 of the cap. In such arrangement, recess can be formed in the top face 12 so that the free end 11 does not project.

To prevent the gripping tab 5 from sliding off the end 6 of the edge 1 when the latter is torn off, the tear-off end 6 as shown in FIG. 2A, is preferably provided with a nose 7 at a point in front of the gripping tab 5, which nose can be stamped cut at the same time as the cut-away portion 3. Referring to FIG. 2B the same object can also be achieved if the tear-off end 6 has an outwardly or upwardly extending retaining pip 8 close to the gripping tab 5. This retaining pip may also be located at the center of a gripping tab made of adhesive strip, particularly when a reinforcing filament extends through the middle of the adhesive strip, which filament is secured in the retaining pip.

In a further embodiment of the invention, the gripping tab 5 is made of a plastic film or metal foil which is looped and welded or riveted up in the cut-away portion 3. FIG. 4 shows an arrangement of this kind in which the gripping tab 5 is made of metal, preferably a light metal, and is secured in a recess 13 in the top face 12. The gripping tab can be secured in any known manner, for example by the outer end 11 being shaped to form an eye which is held by a stud-like device in the recess 13 on the top face 12. In this arrangement, the gripping tab 5 is folded over and riveted up at the point 14 in the cut-away portion 3.

After the container has been sealed, the line 2 of reduced strength preferably lies below the rim or ring on the neck or at the mouth of the container. Thus, after the lower edge 1 has been torn off, the cap can be used again as a removable push-on seal to prevent dust from penetrating into the container. This is very desirable when, for example, the container is used for accommodating baby food. The slightly inwardly curved edge of the reusable push-on cap remaining after the strip 1 has been torn off then snaps into the complementary portion of reduced diameter below the rim or ring on the neck or at the mouth of the container, when the latter is closed again.

FIG. 6 shows that apart from it being possible to use the tear-off cap of the invention for sealing normal containers having at least a rim at the neck and optionally a screw-thread in addition, the cap can also be em-

ployed for sealing containers having necks of uniform wall-thickness and mouths which are simply bent outwards at right angles at the top.

As used in the claims the term flange is intended to refer to either the ring or rim on the discharge end (i.e. neck or mouth) of the container.

What is claimed is:

1. In a metal tear-off cap having an edge which is separable along a line of reduced strength for securely underlying the flange at the discharge end of the container, the cap having a gripping tab provided on and projecting beyond the separable edge, the improvement being said separable edge is of rolled-in construction for being pressed in beneath the container flange, said line of reduced strength being positioned directly above said rolled-in edge, a tear-off end being provided on said separable edge, said tear-off end being defined by a cut-away portion at said line of reduced strength above said tear-off end and connected to a tear-off zone along said tear-off edge through said rolled-in edge, and a separate gripping tab locked on said cap and secured to said tear-off end.

2. A tear-off cap according to claim 1, characterized in that said tear-off end has a nose at a point in front of said gripping tab.

3. A tear-off cap according to claim 1, characterized in that said tear-off end has an outwardly extending retaining pip close to the gripping tab.

4. A tear-off cap according to claim 1, characterized in that said tear-off zone extending from said line of reduced strength through said rolled-in edge is offset laterally from said cut-away portion.

5. A tear-off cap according to claim 1, characterized in that said gripping tab is made of a strip coated with adhesive on one side.

6. A tear-off cap according to claim 5, characterized in that the adhesive strip is made from a plastic tape having a thickened edge.

7. A tear-off cap according to claim 5 characterized in that said adhesive strip passes through said cut-away portion and around said rolled-in edge and above said rolled-in edge, said strip having two adhesive faces which are first joined together over a short distance, an adhesive face then being bonded to said cap over a short distance, and the end of said strip then being folded and its faces stuck together.

8. A tear-off cap according to claim 7, characterized in that the portion of the adhesive strip connected to said cap is located on the top face of said cap.

9. A tear-off cap according to claim 1, characterized in that the gripping tab is made of a film which is folded over and secured in the cut-away portion.

10. A tear-off cap according to claim 1, characterized in that said gripping tab is made of metal and is secured in a recess in the top face of said cap.

11. A tear-off cap according to claim 1, characterized in that the line of reduced strength is located beneath the flange after the discharge end of the container has been sealed.

12. A tear-off cap according to claim 1, characterized in that said tear-off zone being severed from said edge.

13. A tear-off cap according to claim 1, characterized in that said tear-off zone being a thinned section connected to said edge.

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