United States Patent

Song

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[54] **TAMPER-PROOF OVERCAP FOR CAN**

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[52] **U.S. Cl.** .....**220/27,** 220/60, 222/153, 222/182, 222/541, 215/46 A

[51] **Int. Cl.** **B65d 17/00**

[58] **Field of Search**.....220/27, 60, 54; 215/46 A, 42; 222/182, 153, 541

[56] **References Cited**

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Primary Examiner—George T. Hall
Attorney—Darbo, Robertson & Vandenburgh

[57] **ABSTRACT**

A cup shaped plastic cover has a plurality of inwardly extending lips adjacent the open end. The upper face of these lips is substantially normal to the inner wall and the lower face tapers from the inner wall to the upper face. The lower face cams the the cap outwardly so that it easily slips over a bead on the can after which the upper face engages the bead to lock the cap against a retraction movement. At one side of the cap there is a tear strip extending upwardly from the open end and having a handle extending outwardly from its lower edge. One of the lips is on this tear strip and the remaining lips are opposite the tear strip lip and at the sides thereof. Above the tear strip are inwardly projecting horizontal reinforcing ribs.

4 Claims, 6 Drawing Figures

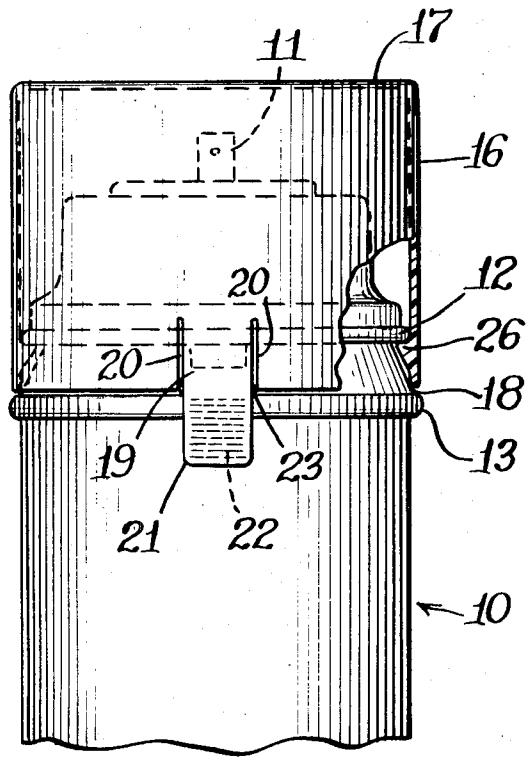


Fig. 1.

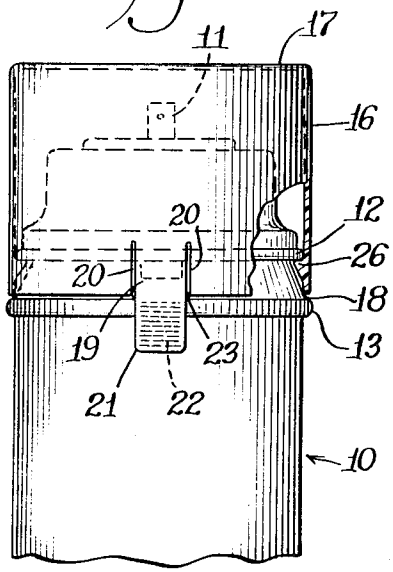


Fig. 2.

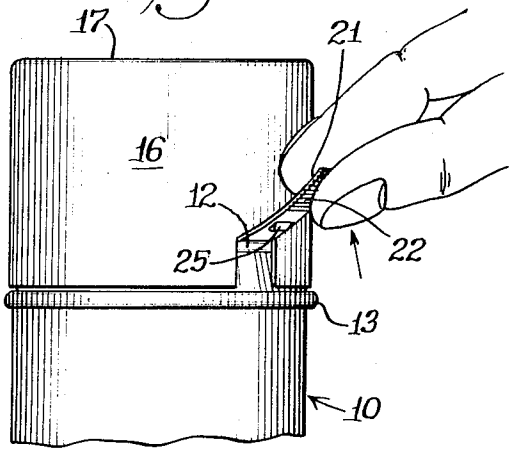


Fig. 3.

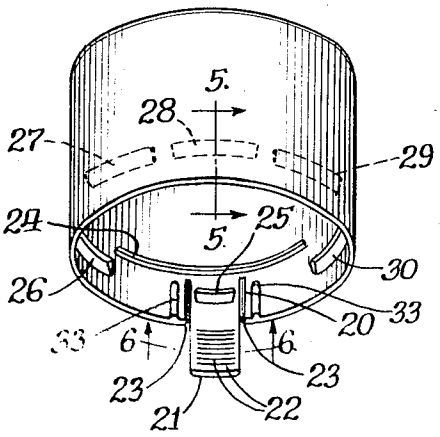


Fig. 4.

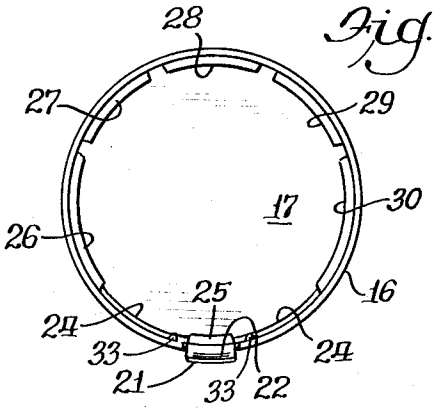


Fig. 5.

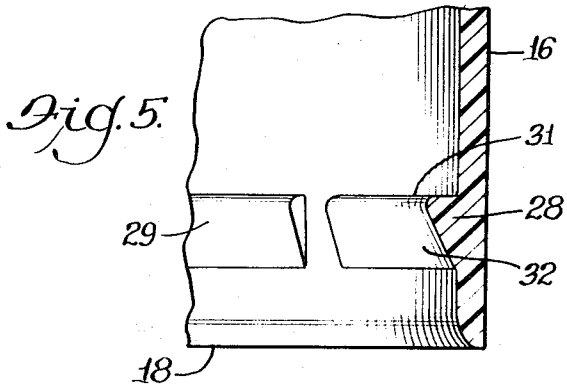
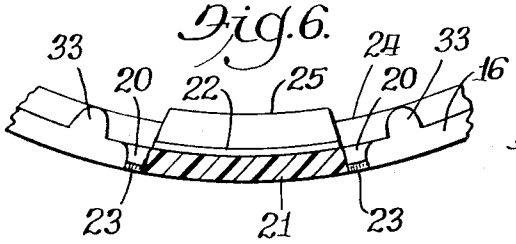


Fig. 6.



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TAMPER-PROOF OVERCAP FOR CAN

BACKGROUND AND SUMMARY OF THE INVENTION

It is conventional practice to employ a so-called "tamper-proof" overcap on items such as aerosol cans so that children or others will not play with these cans in the store and dispense at least some of the contents of the can. So far as I am aware, all of these tamper-proof caps in commercial use are formed of metal and their design is not particularly suited to the fabrication (and use) of plastic. Furthermore, quite a number of the proposals that have been made for such tamper-proof caps involve rather complicated structures.

The principal object of the present invention is to provide a construction for a tamper-proof cap which is particularly suited for plastic fabrication. The cap is the epitome of simplicity. Due to this and to the plastic fabrication techniques and material costs, it is very inexpensive to produce. It can be easily placed on a container either by a manual operation or a machine operation. When once in place, it is quite difficult to remove without breaking the "tear strip", which action would signal that the contents of the container might not be in their proper condition. This is not to say that a strong person could not remove it without breaking the tear strip, but it is to say that a child certainly could not do so.

The present invention relates to a simple and inexpensive plastic tamper-proof overcap.

DESCRIPTION OF THE DRAWINGS

FIG. **1** is an elevational view, with a portion broken away, of an embodiment of the invention on the top of an aerosol can;

FIG. **2** is a view similar to FIG. **1** illustrating the manner of removing the overcap;

FIG. **3** is a perspective view looking upwardly into the lower opening in the overcap;

FIG. **4** is a bottom view looking into the lower opening of the overcap;

FIG. **5** is an enlarged partial section as viewed at line **5—5** of FIG. **3**; and

FIG. **6** is an enlarged partial section as viewed at line **6—6** of FIG. **3**.

DESCRIPTION OF SPECIFIC EMBODIMENT

The following disclosure is offered for public dissemination in return for the grant of a patent. Although it is detailed to ensure adequacy and aid understanding, this is not intended to prejudice that purpose of a patent which is to cover each new inventive concept therein no matter how others may later disguise it by variations in form or additions or further improvements. The claims at the end hereof are intended as the chief aid toward this purpose, as it is these that meet the requirement of pointing out the parts, improvements, or combinations in which the inventive concepts are found.

FIGS. **1** and **2** illustrate the top portions of an aerosol can, generally **10**. At the top of this can is a dispenser **11** which can be suitably manipulated so as to remove the contents from the container. The can has two beads **12** and **13** vertically spaced from each other adjacent the top of the can. Such a can, plus a "tamper-proof" cap which will rest on the lower bead **13** and lock under the upper bead **12** against removal except for partial destruction, is prior art to the present invention.

The cap of the present invention is cup shaped having a cylindrical wall **16** with a closed top **17**. The cap has an open end **18**. Along one side is a tear strip **19**. This is defined by two "score" lines **20** which are areas of reduced thickness in the wall formed during the plastic molding operation. A tab **21** extends downwardly from the bottom of the tear strip to serve as a handle. To facilitate using this as a handle, there are a plurality of small ridges **22** horizontally along the tab. At the bottom ends there are notches **23** in the score lines. These facilitate commencing tearing of the plastic, as discussed in my pending application Ser. No. 839,973, filed July 8, 1969. Above the score lines is an inwardly extending rib **24**. It is circumferentially aligned.

A plurality of lips **25** through **30** are positioned in circumferential alignment adjacent the open end **18** of the cap. One of these lips, number **25**, is positioned on the tear strip **21**. Another, number **28**, is positioned opposite the tear strip. The remainder of the lips are positioned between the lips **25** and **28** but are closer to the lip **28** than they are to lip **25**. In a typical embodiment there will be about sixty degrees between the adjacent ends of lip **26** and **30**, with lip **25** being intermediate those ends. The structure of each of the lips is best seen with respect to FIG. **5**. The lips each have an upper face **31** which is substantially normal to the inner face of wall **16**. They also have a lower face **32** which extends at an angle to the wall **16**, that is, tapers from the distal end of upper face **31** downwardly and outwardly to meet the wall **16**.

As will be apparent to those skilled in the art, these caps can be formed by conventional plastic molding operation. The actual embodiments produced are made of medium density polyethylene having a tensile strength of from 2,000 to 3,500 PSI. After the can is filled, the cap is placed over the top of the can where the lips rest on top of bead **12**. Then, with a moderate downwardly force, the cap is pushed against the bead. The lower faces **32** of the lips cam the wall **16** outwardly so that the lips slip below the bead to the position illustrated in FIGS. **1** and **2**. Here the upper face **31** fits under the bead **12** and locks the cap in place. Since the face **31** is approximately normal to wall **16**, there is nothing to cam the wall **16** outwardly should one try to pull the overcap away the can in the reverse of the movement employed in applying the cap to the can.

This locking takes place substantially all about the circumference of the wall **16** so long as the tear strip remains in place. If it is desired to remove the overcap, the handle **21** is grasped with the fingers and pulled upwardly, as illustrated in FIG. **2**. The notches **23** facilitate starting a tear of the plastic along the score lines **20**. When the tear strip has been moved to the position illustrated in FIG. **2**, there is a substantial gap in the circumferential locking that had been achieved by the ribs fitting under the bead **12**; that is, there is nothing in the way of locking between the adjacent ends of lips **26** and **30**. Furthermore, the circumferential strength of the wall **16**, adjacent open end **18**, has been weakened by the opening where the tear strip was. This combination of factors makes it relatively

easy to now remove the overcap from the can **10**. However, the overcap still can be replaced and will stay in place against moderate dislodgment forces because of the fact that there are still substantial areas of lip engaged under bead **12**.

The principal purpose of the rib **24** is to provide a reinforcement at the tear strip area during molding when the cap is pulled out of the core of the mold. The lips around the circumference of the wall **16** prevent the wall sections from stretching at the lip locations. Without rib **24**, the wall area between the adjacent ends of lips **26** and **30** will stretch excessively with the likelihood of damaging tear strips **23**. Rib **24** provides a reinforcement in this area so that wall **16** stretches uniformly about its circumference when the cap is removed from the mold. The two vertical ribs **33** adjacent to the scores **23** are also provided to stop excessive stretching of the wall section between ribs **33**. This also aids in preserving the scores, during molding, as ribs **33** fit in the core of mold and the core prevents side movement of the wall between the ribs **33**.

I claim:

1. A "tamper-proof" cover for a container having an outwardly projecting circumferential bead, said cover comprising: an inverted cup shaped member molded from plastic and having an open lower end and a closed upper end and an inner wall defining an internal opening of a diameter approximately equal to the external diameter of the bead, two lines at which the plastic is substantially thinner than it is in the remainder of the cap and defining a tear strip extending along one side of the cup from the open end toward the closed end and a handle at the lower end of the tear strip, said handle projecting from the tear strip at the distal end thereof, notches where said two lines meet the open end, circumferentially positioned reinforcing rib means integral with the wall, above the level of the top of said lines, longer than the distance between the lines, and extending inwardly from the inner wall, second means integral with the wall defining locking lips aligned circumferentially about the inside of the cup above the open end thereof, said lips having an upper face substantially normal to said inner wall and a lower face tapering from the distal end of the upper face downwardly and toward said inner wall adjacent said open end, one of said lips being on said tear strip, the remainder of the lips being positioned opposite said one lip and at either side of said one lip and spaced therefrom, whereby said cover may be pushed down over said bead and the lower face will cam the cover outwardly over the bead and after the upper face passes the bead it will lock under the bead and prevent a reverse movement until after the tear strip is separated outwardly thereupon disengaging said one lip from the bead.

2. A cover as set forth in claim **1**, wherein the remainder of the lips comprise at least three lips, one of the three being across from the tear strip and the other two at opposite sides thereof.

3. A cover as set forth in claim **1**, including a pair of integral ribs respectively spaced at opposite sides of said tear strip and positioned generally parallel to said lines.

4. A cover as set forth in claim **2**, wherein said other two are closer to said one of the three than they are to the lip on the tear strip.

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