United States Patent

[11] 3,544,023

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[21] Appl. No. **826,233**
[22] Filed **May 20, 1969**
Continuation-in-part of Ser. No. 704,720, Feb. 12, 1968, Patent No. 3,452,894.
[73] Assignee **Sterling Seal Company, Erie, Pa., a corporation of Pennsylvania**
[45] Patented **Dec. 1, 1970**

[54] **TAMPERPROOF CLOSURE**
14 Claims, 14 Drawing Figs.

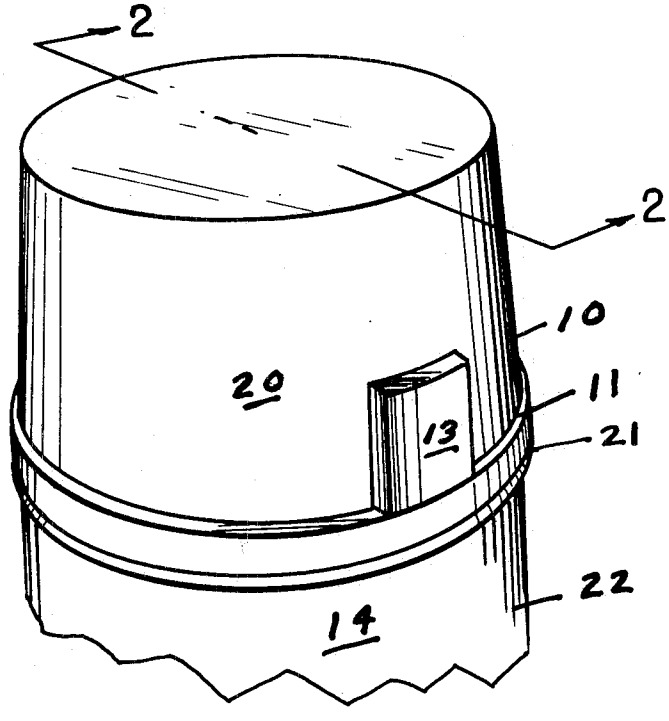
[52] **U.S. Cl.** **220/27,** 215/42, 222/182
[51] **Int. Cl.** **B65d 17/00**
[50] **Field of Search** 220/27, 54; 215/42, 46.5; 222/541, 182, 153

[56] **References Cited**
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Primary Examiner—George T. Hall
Attorney—Charles L. Lovercheck

ABSTRACT: A protective cap having tamperproof qualities suitable for use in combination with an aerosol can. The cap being of generally cup-shaped design made of relatively thin material. A shoulder around the periphery of the cap extends out over the rim of the can and a skirt extends downwardly from the outer portion of the shoulder, an inward projection within the skirt adapted to underlie the rim of an aerosol can and an upward extension of the shoulder forming a protrusion which can be readily removed thereby weakening the shoulder.



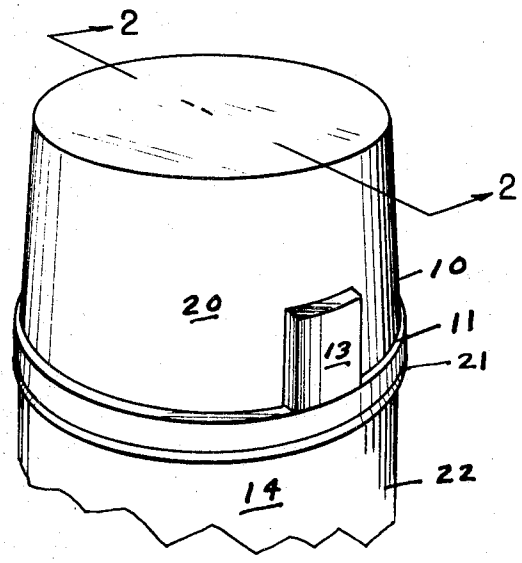


FIG. 1

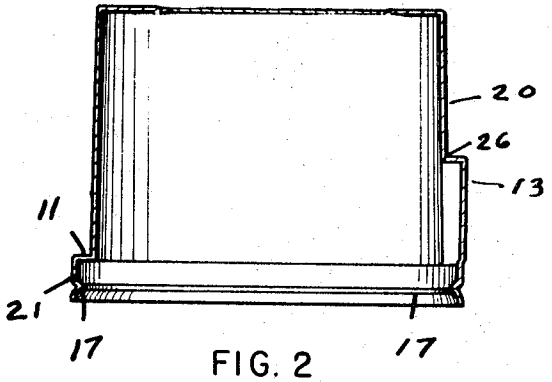


FIG. 2

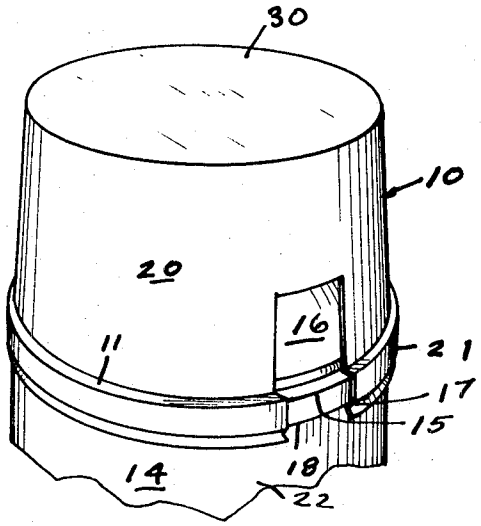


FIG. 3

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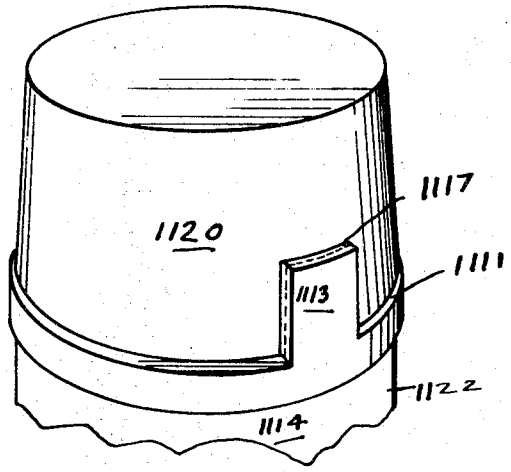


FIG. 4

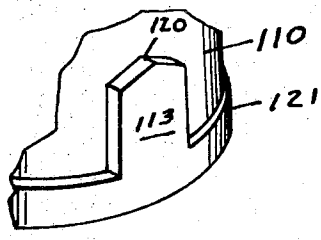


FIG. 5

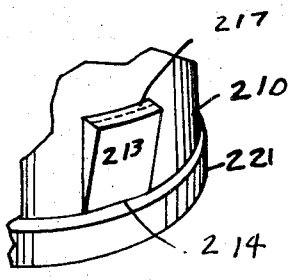


FIG. 6

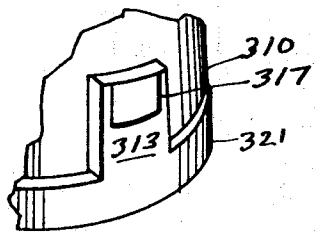


FIG. 7

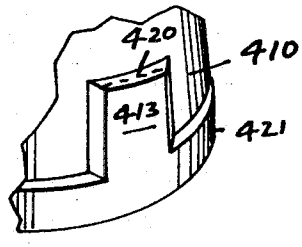


FIG. 8

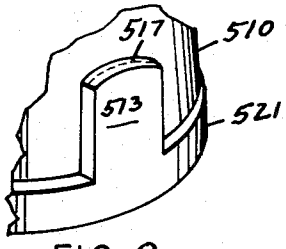


FIG. 9

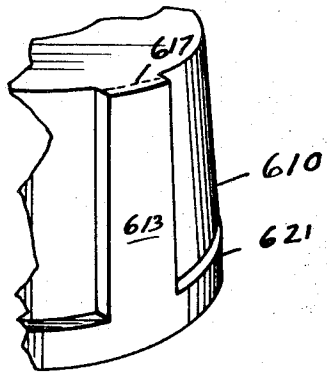


FIG. 10

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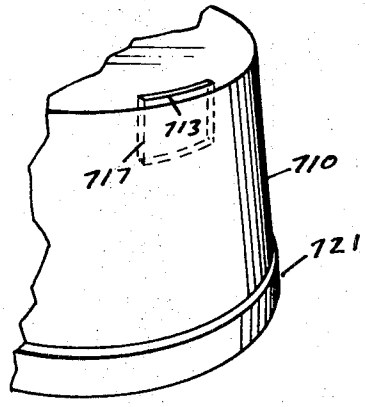


FIG. 11

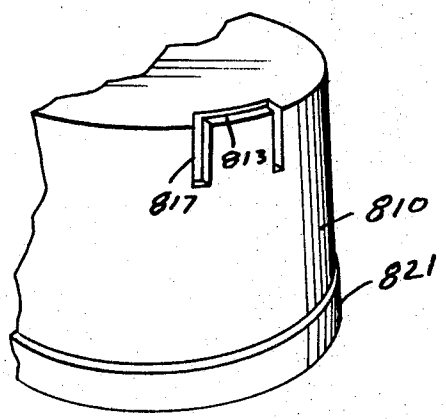


FIG. 12

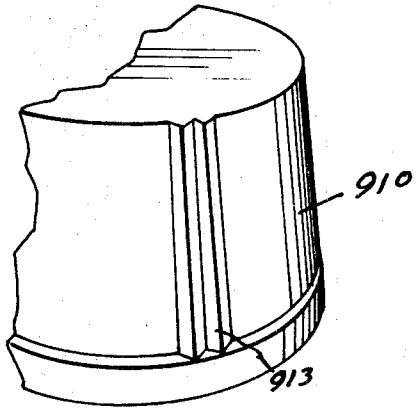


FIG. 13

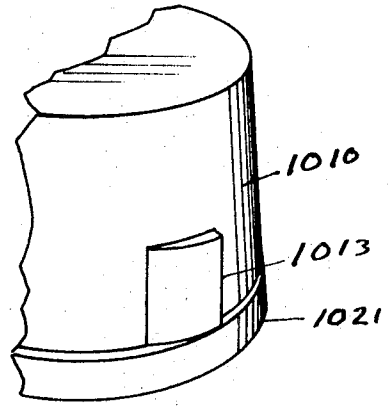


FIG. 14

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TAMPERPROOF CLOSURE

STATEMENT OF THE INVENTION

This invention relates to caps and, more particularly, to tamperproof caps especially suited for use on aerosol cans.

CROSS-REFERENCE TO OTHER APPLICATIONS

This application is a Continuation-in-part of U.S. Pat. application, Ser. No. 704,720,filed Feb. 12, 1968, now U.S. Pat. No. 3,452,894.

OBJECTS OF THE INVENTION

It is an object of the invention to provide an improved cap for an aerosol can.

Another object of the invention is to provide a cap for an aerosol can that is simple in construction, economical to manufacture, and simple and efficient to use.

Another object of the invention is to provide a tamperproof cap for an aerosol can.

Still another object of the invention is to supply a reusable closure even after the pull tab has been removed.

Another object is to provide a number of pull tabs spaced around the cap to give stacking ridges to seat on to restrict nesting of closures when in stacks.

Still another object is to provide a cover having a removable tab which may be removed and to provide visual proof of removability of the cap.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is an isometric view of a cap according to the invention.

FIG. 2 is a longitudinal cross-sectional view of the cap taken on line 2–2 of FIG. 1.

FIG. 3 is a view of the cap shown in FIGS. 1 and 2 with the tab removed.

FIG. 4 is a view of a cap having another embodiment of the tab according to the invention.

FIG. 5 is a view of a cap having another embodiment of the tab according to the invention.

FIG. 6 is a view of a cap having another of the tab according to the invention.

FIG. 7 is a view of a cap having another embodiment of the tab according to the invention.

FIG. 8 is a view of a cap having another embodiment of the tab according to the invention.

FIG. 9 is a view of a cap having another embodiment of the tab according to the invention.

FIG. 10 is a view of a cap having another embodiment of the tab according to the invention.

FIG. 11 is a view of a cap having another embodiment of the tab according to the invention.

FIG. 12 is a view of a cap having another embodiment of the tab according to the invention.

FIG. 13 is a view of a cap having another embodiment of the tab according to the invention.

FIG. 14 is a view of a cap having another embodiment of the invention.

DETAILED DESCRIPTION OF THE DRAWINGS

The invention disclosed involves a cup-shaped cap **10** which has a cylindrical sidewall **20** which terminates in an outwardly extending shoulder **11** which is adapted to rest on a seam **15** of an aerosol can **22**. The aerosol can has generally cylindrical sidewalls **14** which terminate in a seam **15** which presents a downwardly facing shoulder **18**. The seam extends entirely around the can in a conventional manner. The breast **16** of the can is attached to the sidewalls **14**. The breast will usually have a valve in the top of it and the cap forms a protection for the valve and prevents unauthorized tampering.

The cap likewise has a top **30** and a bead **17** formed in the skirt **21** which underlies the shoulder **18** of the can when the cap is in place on the can. The bead could be in the form of spaced lugs.

The cap would normally be made of a relatively thin thermoformable plastic material but could be made of thin metal or any other suitable material, preferably polystyrene.

When the cap is snapped in place, as shown in FIGS. **1**, **3** and **4**, the cap cannot be readily removed without damaging the cap. In order to make the cap easily removable, the tab **13** is provided which has an outside surface that is generally parallel and an upward continuation of the skirt **21** is attached to the cap wall **20** by the shoulder **11**. The tab **13** will be slotted, scored, fractured, or otherwise weakened at **26** so that a user can insert his thumbnail or a suitable tool behind the tab and break the tab off the cap as shown in FIG. **3**, thereby breaking off a section of the shoulder **11** and skirt **21** so that the cap can be readily removed from the can.

When the upper end of the raised tab portion is pulled downward, the natural orientation of the material enables the operator to tear off the lower bead, thus releasing the closure from the can.

In the embodiment of the invention shown in FIG. **4**, a cap **1120** is shown supported on a can **1122** having sidewalls **1114**. A tab **1113** is supported above the shoulder **1111** which is fixed integral to the can. The cap will have a bead, such as bead **17** in FIGS. **1** through **3**, for holding it onto the can. The tab **1113** will have a scored line **1117** extending up along the sides and across the top of the tab as shown at **1117**.

In the embodiment of the invention shown in FIG. **5**, the tab **113** has a top with converging edges that come together at **120** at an apex. This apex makes it possible for a user to break the tab loose with his fingernail or a sharp instrument.

In the embodiment of the invention shown in FIG. **6**, the cap **210** is shown having a skirt **221** with a tab **213** which is wedge-shaped and terminates adjacent the inner periphery of the cap at **214**. The tab is scored across its top at **217** to make it easy to start it to break loose.

In the embodiment of the invention shown in FIG. **7**, the cap **310** is shown having a tab **313**. It is scored at a line **317** so that the user may break this scored part and insert the tip of his finger and pull down the top portion and push in on the bottom part of the tab as he pulls out, thereby easily ripping the skirt **321**.

In the embodiment of the invention shown in FIG. **8**, the cap **410** is shown with a tab **413** supported above the skirt **421**. The sides of the tab are tapered toward each other as shown and the tab is scored at **420** across its top to facilitate initiating the breaking loose of the tab, and subsequently the skirt **421**.

In the embodiment of the invention shown in FIG. **9**, the cap **510** has a tab **513** with a scored line across its arched top at **517**. The user can insert his finger through this arched top and thereby break loose the tab **513** and thereby rip the skirt **521**.

In the embodiment of the invention shown in FIG. **10**, the tab **613** extends flush with the skirt **621** and extends upwardly flush with the top of the cap **610**. A scored line **617** is formed in the upper part of the tab which is part of the arc forming the boundary of the cap top. Through this scored line, an operator can insert his finger and rip the tab and, therefore, the skirt **621**.

In the embodiment of the invention shown in FIG. **11**, a cap **710** has a skirt **721** and a top with a slot **713** formed in it. the user insert his finger through the slot and, therefore, rip the cap down along the scored lines **717**.

In the embodiment of the invention shown in FIG. **12**, a cap **810** has a skirt **821** and a slot **817** formed in the side to define a tab **813**. The operator can insert his finger into the slot **817** and spring the tab **813** outward and rip the side of the cap down through the skirt **821** thereby loosening the cap. In the embodiment of the invention shown in FIG. **13**, the cap **910** has a slot **913** formed in it so that a sharp instrument, such as a knife, can be inserted to break the cap and, therefore, loosen it from the rim of the can.

In the embodiment of the invention shown in FIG. **14**, a cap **1010** is shown and has the tab **1013** which is tapered from one

side toward the other, that is, it is thicker at one side than the other. This shape of tab assists in orienting the cap in production and for secondary operation such as printing.

We claim:

1. A suitable for use with an aerosol can comprising a cup-shaped cap having a closed end:
- said cap having generally cylindrical sidewalls terminating in an outwardly directed shoulder extending around said cap;
- said cap having an open end adapted to rest on the upper edge of a can;
- said cap having a downwardly directed skirt;
- a scored line in said cylindrical sidewall spaced from said open end and adapted to function as a starting point for a tear-out whereby a tab can be torn from said skirt;
- said cap being made from a relatively thin material;
- a skirt extending downward from said shoulder forming a collar and being generally parallel to said cylindrical sidewall;
- and an inwardly extending bead formed in said skirt;
- said bead being adapted to underlie the chime of an aerosol can whereby said cap is held in position on said can;
- a raised tab portion formed in said cap sidewall, adjacent said open end;
- said tab being substantially a continuation of said skirt and extending upward from said shoulder; and
- said tab being an integral part of said cap and having a weakened portion whereby said tab may be removed thereby tearing off a section of said sidewall including said collar and bead.

2. The cap recited in claim 1 wherein said cap is made from an integral piece of thermoformable material.

3. The cap recited in claim 1 wherein an outwardly directed shoulder extends entirely around said cap.

4. The cap recited in claim 2 wherein said sidewall extends downward from said shoulder forming a collar and is generally parallel to said cylindrical sidewall.

5. The cap recited in claim 4 wherein said tab is substantially a continuation of said collar.

6. The cap recited in claim 1 wherein said cap is disposed on an aerosol can,
- said can having a cylindrical sidewall terminating at its upper part in a chime,
- said chime extends outwardly beyond said cylindrical sidewall and presents a downwardly facing shoulder, and
- said bead is adapted to snap under said shoulder.

7. The cap recited in claim 1 wherein said cap is disposed on a said aerosol can.

8. The cap recited in claim 1 wherein said tab has two spaced sides extending outward generally radially from said cap, and an outside surface generally concentric to said sidewalls.

9. The cap recited in claim 8 wherein said tab terminates at its top in a flat end.

10. The tab recited in claim 8 wherein said tab terminates at its top in an arcuate surface.

11. The cap recited in claim 1 wherein said tab has a generally flat top and terminates at its lower end at said cap surface.

12. The cap recited in claim 9 wherein said tab top end terminates flush with the top of said cap.

13. The cap recited in claim 1 wherein the upper end of said top has two flat surfaces joining each other in an apron. 14. The cap and can combination recited in claim 1 wherein said upper end of said tab terminates flush with the closed end of said cap.