SAFETY CAP OPERATED BY A KEY

Inventor: Nathan B. Lerner, Chicago, Ill.
Assignee: W. Braun Company, Chicago, Ill.
Filed: Jan. 12, 1973
Appl. No.: 323,040

U.S. Cl. 215/9, 215/41, 215/46 R
Int. Cl. A61j 1/00, B65d 55/02
Field of Search 215/9, 41, 46 R; 220/60

References Cited
UNITED STATES PATENTS

ABSTRACT
A closure cap in combination with a container in which the container is provided with a shoulder having a key slot and in which the cap is rotatably supported on the container with the bottom edge of the cap having a key slot and in which the only way to remove the cap from the container is to position the two key slots relative to each other so that a key may be inserted into said cooperating key slots and the cap may be pried off only by turning the key.

10 Claims, 7 Drawing Figures
SAFETY CAP OPERATED BY A KEY

BRIEF SUMMARY OF THE INVENTION

Due to public awareness of the ease with which closure caps may be removed from bottles or other containers, which could result in serious consequences particularly to children who gain access to the contents of the container or bottle, various types of safety caps are being provided. One of the objects of this invention is to provide a safety cap for use in conjunction with a bottle or other container and so constructed that the cap may not be removed except by the use of a key which is inserted into cooperating key slots to pry the cap from the neck of the container.

Another object of this invention is to provide a safety cap which provides an effective seal and closure for the bottle or container and wherein the cap may be continuously rotated relative to the container without causing the removal of the cap.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is an elevational view of the bottle and cap with the key slot of each cooperatively positioned in a staggered or offset relation to permit the insertion of the key for prying off the cap.

FIG. 2 is an elevational view from the side opposite that of FIG. 1.

FIG. 3 is a central cross-sectional view of the cap and the bottle.

FIG. 4 is an exploded perspective view of the cap and the bottle.

FIG. 5 is a perspective view of the cap and bottle with the key slot of each cooperatively positioned to receive the key.

FIG. 6 is an enlarged sectional view of a portion of the cap and the upper neck portion of the bottle; and

FIG. 7 is a cross-sectional view taken on line 7—7 of FIG. 5 showing the slot engaging portion of the key.

The bottle or container is generally designated at 10 and the safety cap is generally designated at 12. The bottle has an inwardly tapering body 14 provided with a top shoulder 16 and a reduced neck 18. The top edge 20 of the mouth of the neck has a horizontal portion 22 and a downwardly inclined portion 24 extending to the interior of the mouth. An exterior annular bead 26 is adjacent the top edge 20 and said annular bead curves inwardly at its lower end as at 28 and merges with the wall of the neck 18. The shoulder 16 of the bottle is provided with an upwardly facing recess which forms a key slot or keyhole 30.

The cap 12 comprises a concave-shaped top wall 32 and a depending annular skirt 34 which inclines outwardly to give the cap a truncated cone-shaped configuration. Depending from the top wall 32 into the interior of the cap is an annular sealing member 36 with the upper portion 38 thereof extending vertically and the lower portion 40 tapering and inclined inwardly. The inner wall of the skirt of the cap is provided with an annular bead 42 having a radius which is complementary to the radius of the portion 28 of the bead 26 on the neck. The bottom edge 43 of the skirt of the cap has a downwardly facing recess to provide a key slot or keyhole 44.

In order for the key to operate, the said two key slots 30 and 44 are adapted to be aligned in an offset or staggered relation, as shown in FIGS. 1 and 5, to permit the insertion of the key. The cap may also be provided with a plurality of spaced smaller false slots 46 of a lesser width than the cap key slot 44, which smaller false slots are to make it more difficult, particularly for a child, to recognize the proper key slots and their positioning relative to each other.

The key 48 is generally flat except for the front portion with is to be inserted in the two cooperating key slots. The front portion of the key is shaped to provide a flat upper portion 50 and a stepped-down or offset lower flat portion 52, the width of said portions being such that the upper portion 50 enters the key slot 44 of the cap and the lower portion 52 enters the key slot 30 of the bottle.

When the cap is applied to the neck of the bottle by snapping it thereon, the interfitting relationship can best be seen in FIGS. 3 and 6. The top edge 20 at the mouth of the neck is confined between the inner annular sealing ring 36 and the annular bead 42 on the skirt of the cap and the neck bead 26 engages the inner wall and the bead 42 of the cap, with the radiuses of the beads in contact with each other. The inclined surface 24 of the top edge of the neck will make a sealing contact with the adjacent undersurface 32' of the end wall 32 of the cap. As can best be seen in FIG. 6, the undersurface 32' is tangential to the inclined surface 24.

The annular sealing ring 36 extends into the mouth of the neck to effect a perfect seal so that liquid or other material contained in the bottle or container cannot seep through between the inner ring and the neck.

The bottom edge 43 of the skirt of the cap is contiguous to the shoulder 16 of the bottle and the space therebetween is so insignificant that it would be impossible to insert a coin or an instrument therebetween for the purpose of improperly prying off the cap. The cap may be rotated relative to the bottle without the possibility of removal of the cap from the bottle. The height of the cap is such that a child could not grasp it for the purpose of prying it off.

It is only when the two key slots 30 and 44 are positioned in a staggered relationship, as shown in FIGS. 1 and 5, wherein the cap key slot is in staggered or offset relation to the bottle key slot that the key may be inserted in both said key slots and when so inserted the key is manually turned or twisted so that the cap is prised off from the neck of the container. Both the cap and container are made of a polyethylene material so that when the key is inserted and turned there is sufficient pliability in the skirt of the cap as well as in the neck of the bottle to permit flexing so that the cap is prised from the neck. The exterior surface of the skirt of the cap is provided with serrations or ribs 54 and the bottom of said ribs terminate as at 56, short of the bottom edge 43 of the skirt, as can best be seen in FIG. 3.

What is claimed is:

1. In combination a container and a closure cap therefor, said container having a key slot, a cap rotatably supported on said container to close the mouth of said container, said cap having a top wall and an annular skirt, said skirt having a key slot in the bottom edge thereof, said cap, key slot and container key slot adapted when cooperatively arranged to receive a key
3,828,959

so that by turning the key the cap is pried from the container.

2. A structure as set forth in claim 1 in which the container has a shoulder with the container key slot formed in said shoulder.

3. A structure as set forth in claim 1 in which the cap is rotated relative to the container so that when the cap key slot is positioned in an offset or staggered relationship to the container key slot, the key which has a complementary offset key slot engaging portion can be inserted into said key slots.

4. A structure as set forth in claim 1 in which the container is a bottle which has a reduced neck and in which the body of the bottle has a shoulder with the bottle key slot in said shoulder.

5. A structure as set forth in claim 2 in which the bottom edge of the skirt and the shoulder are juxtapositioned so that it is impossible to insert any tool for prying off the cap and the only means for prying off said cap is by means of said key when the key slots are properly positioned.

6. A structure as set forth in claim 2 in which the cap is made of polyethylene material and in which when the key is inserted and turned the skirt of the cap will be sufficiently distorted to permit prying off of said cap.

7. A structure as set forth in claim 1 in which the container is a bottle and in which the cap is provided with an inner annular sealing ring which engages the inside of the neck of the bottle adjacent the mouth thereof.

8. A structure as set forth in claim 7 in which the bottle is provided with an outer annular bead adjacent the mouth thereof and in which the cap is provided with an annular bead positioned below the top of the cap, which cap annular bead is positioned contiguous to the bottle annular bead so that the cap may be rotated with respect to the bottle without removing the cap from said bottle.

9. A structure as set forth in claim 8 in which the cap is provided with a concave top wall with the underside thereof having a curved radius and in which the top edge of the bottle has an inner inclined surface which is tangentially engaged by the curved radius of the cap and in which the lower portion of the sealing ring is tapered and inclines inwardly.

10. A structure as set forth in claim 9 in which the bottle and cap are each formed of a polyethylene plastic material.

* * * * *