United States Patent [19]

Scuderi

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[54] **CHILD PROOF CLOSURE**

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[52] **U.S. Cl.** **215/220**

[51] **Int. Cl.**[2] **B65D 55/02**

[58] **Field of Search** 215/9, 219, 220

[56] **References Cited**

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[57] **ABSTRACT**

A child proof closure for containers having a threaded neck. A screw type cap has a first set of teeth mounted on its side the teeth being set at an angle to the axis of the cap. A drive member is loosely mounted on the cap for limited axial motion. A second set of teeth is mounted on said drive member, the teeth being angled in the same direction as the first set of teeth. When said drive member is turned in the direction to remove the cap, the interaction of said teeth lifts the drive member relative to the cap and the first and second sets of teeth disengage so that the cap cannot be removed solely by turning.

3 Claims, 5 Drawing Figures

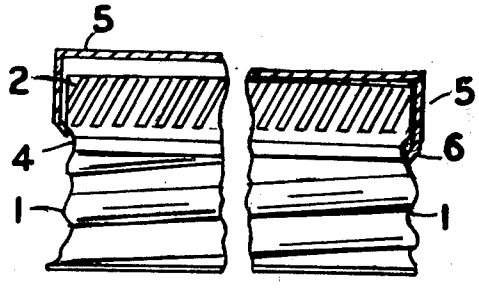
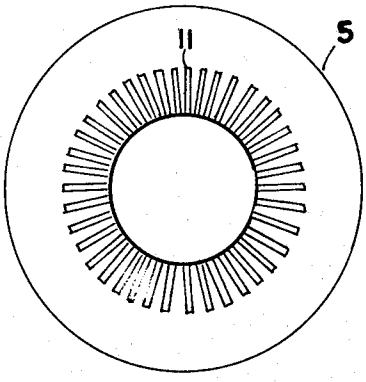


FIG 5



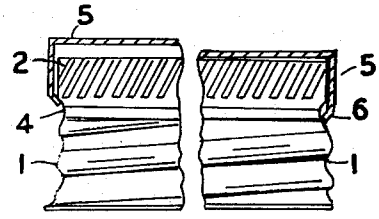


FIG 1 FIG 2

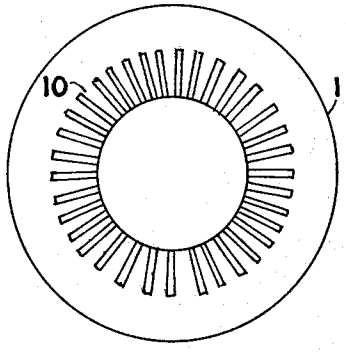


FIG 4

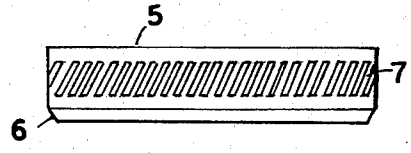


FIG 3

CHILD PROOF CLOSURE

This invention relates to child proof closures for containers containing medicines, poisons and corrosive substances or liquids.

There is a need for a closure for medicine bottles which cannot easily be opened by a child. There are a number of cases where small children have opened medicine or poison bottles and have swallowed the contents causing severe personal injury and death in some cases.

Accordingly, a principal object of the invention is to provide new and improved means for child proof closures for containers.

Another object of the invention is to provide new and improved means for child proof closures for containers of the type having a threaded neck.

Another object of the invention is to provide new and improved screw type closures for containers such as bottles which require simultaneous pressing and turning in order to unscrew the cap.

Another object of the invention is to provide a new and improved screw type cap having a drive member loosely mounted on the cap wherein both the cap and the drive member have teeth which must be engaged by firmly pressing the drive member onto the cap and simultaneously turning in order to unscrew the cap.

Another object of the invention is to provide new and improved child proof closure means for containers having a threaded neck comprising, a screw type cap, a first set of teeth on the side of said cap, said teeth being set at an angle to the axis of said cap, a drive member loosely mounted on said cap for limited axial motion, a second set of teeth on said drive member, said teeth being angled in the same direction as said first set of teeth, whereby when said drive member is turned in the direction to remove the cap, the interaction of said teeth lifts the drive member relative to the cap and the first and second sets of teeth disengage so that the cap cannot be removed solely by turning.

These and other objects of the invention will be apparent from the following specification and drawings of which:

FIG. **1** is a side view of an embodiment of the invention partially in section, in free position.

FIG. **2** is a side view of an embodiment of the invention partially in section, in engaged position.

FIG. **3** is a side view of the drive member of FIG. **1.**

FIG. **4** is a top view of the cap.

FIG. **5** is a top view of the drive member.

Referring to the Figures, the cap **1** is a screw type cap which is adapted to be screwed onto a container such as medicine bottles, of the type which has a threaded neck. The cap is conventional except for two features. First the cap has a plurality of teeth **2,** which are mounted on the upper side of the cap, and secondly, the cap has an annular groove **4,** one purpose of which is to loosely retain the drive member **5,** on cap **1.** The teeth **2** have an angle to the axis of the cap in the neighborhood of 45° to 60°.

The drive member **5,** has an inwardly turned lower lip **6,** which is adapted to fit into the groove **4,** so as to hold the drive member loosely on the cap. The drive member has a circle of teeth **7,** on the interior of its upper surface which are adapted to mate with the teeth **2,** of the cap **1,** when the drive member is pressed on the cap.

The teeth **7,** have an angle to the axis equal to that of the angle of the teeth **2.** The direction of the angle is chosen so that the lower edges of the teeth lead in the direction that the cap is turned to apply it. When the drive member is turned clockwise to apply the cap, then the first and second sets of teeth, **2** and **7,** lock together.

On the other hand, when the drive member is turned counter-clockwise, in the direction to remove the cap without pressing, the interaction of the teeth causes the drive member to lift away from the cap so that the teeth are not engaged but the drive member teeth slip over the cap teeth. There is sufficient play in the mounting of the drive member to accommodate this axial motion of the drive member.

The cap has a third set of teeth **10,** which form a circle on top of the cap. The drive member has a fourth set of teeth **11,** which form a similar circle on the interior of the top of the drive member.

When it is desired to remove the cap, the drive member is pressed down onto the cap and rotated counter-clockwise. The pressing will cause the first and second sets of teeth **2** and **7,** to remain in contact and will also cause contact between the third and fourth sets of teeth, **10** and **11,** so that by simultaneously pressing and turning counter-clockwise the cap can be removed. The teeth are not formed with square cross-sections but are of a curved cross-section so that a firm pressing is required to keep the teeth in contact for the purpose of removing the cap.

The drive member is mounted on the cap and the dimensions are such that the drive member is retained loosely on the cap so that it can be easily turned without turning the caps, as shown in FIG. **1.**

Therefore, a child merely turning the drive member will not unscrew the cap. The teeth are pointed or beveled with rounded edges so that a firm pressure is required to hold them into engagement when unscrewing the cap.

It is unlikely that a small child would be able to appreciate that it is necessary to press and turn simultaneously to unscrew the cap. Furthermore, since the teeth are not square, a small child would not have sufficient strength to hold the teeth in engagement while unscrewing the cap.

The cap and drive member may be made of metal or plastic. If the parts are made of metal, the teeth may be pressed in. If the parts are made of plastic, the teeth may be molded. After the drive member is assembled onto the cap, the lower lip of the drive member is turned inwardly to rest within the groove in the cap to retain the drive member loosely on the cap. When the drive member **2,** is pressed it slides down on the cap which enhances the gripping of the two sets of teeth **2** and **7.**

I claim:

1. A child proof closure for containers having a threaded neck comprising,

a screw type cap,

a first set of teeth on the side of said cap, said teeth being set at an angle to the axis of said cap,

a drive member loosely mounted on said cap for limited axial motion,

a second set of teeth on said drive member, said teeth being angled in the same direction as said first set of teeth,

whereby when said drive member is turned in the direction to remove the cap, the interaction of said

teeth lifts the drive member relative to the cap and the first and second sets of teeth disengage so that the cap cannot be removed solely by turning.

2. Apparatus as in claim **1** wherein said cap has a third circular set of teeth on its top surface and said drive member has a fourth circular set of teeth on its top surface whereby when said drive member is pressed onto said cap, said third and fourth sets of teeth engage.

3. Apparatus as in claim **1,** wherein said first and second sets of teeth are set at an angle to the axis of said cap so that the leading lower edges of the teeth are in the direction of turning said cap to apply the cap to the container.

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