Aug. 13, 1968 F. E. JONES ET AL 3,396,864

SAFETY CAP STRUCTURE

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FIG. 1

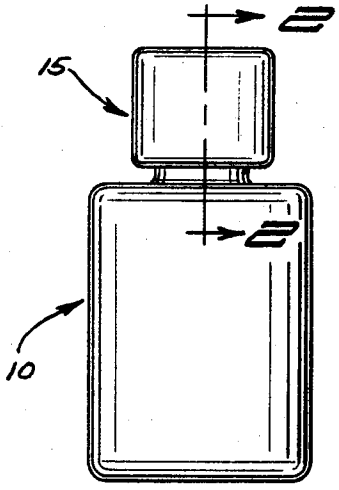


FIG. 2

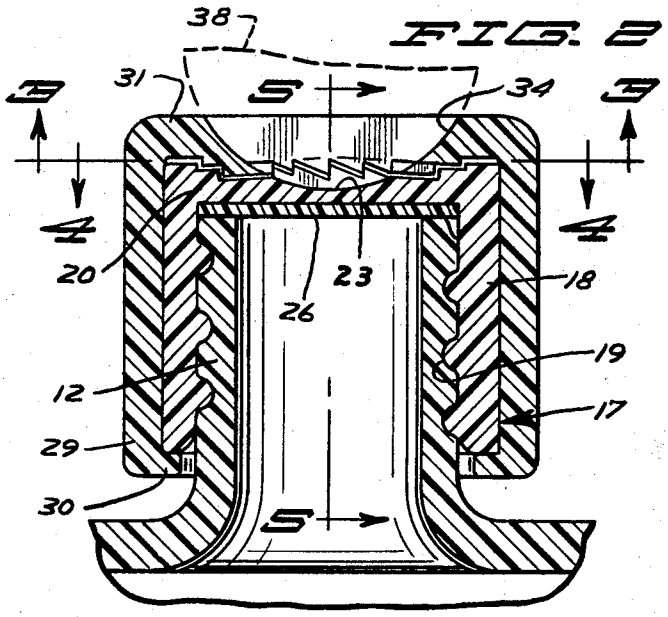


FIG. 3

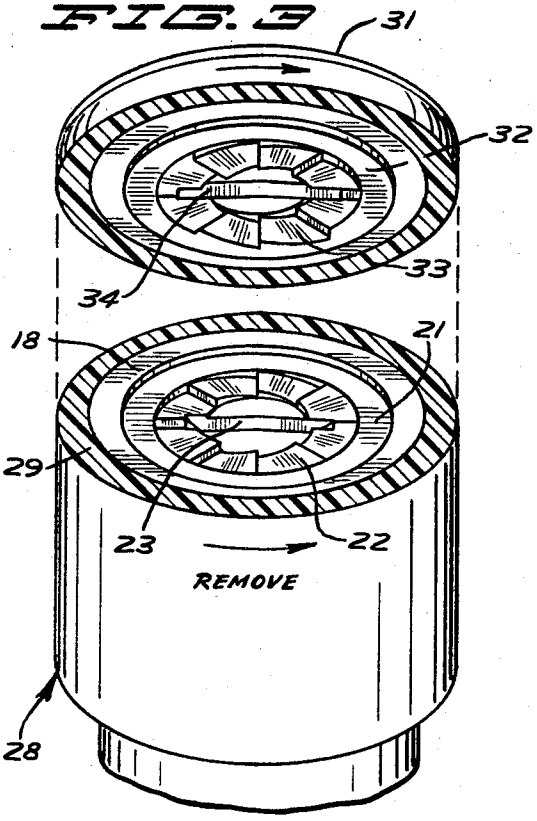


FIG. 4

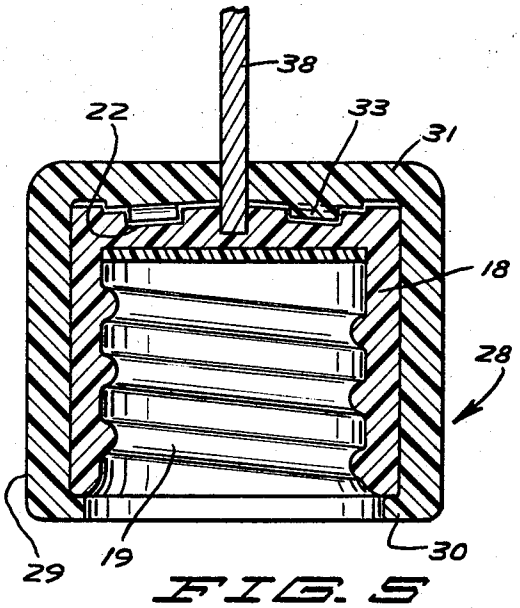


FIG. 5

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FIG. 6

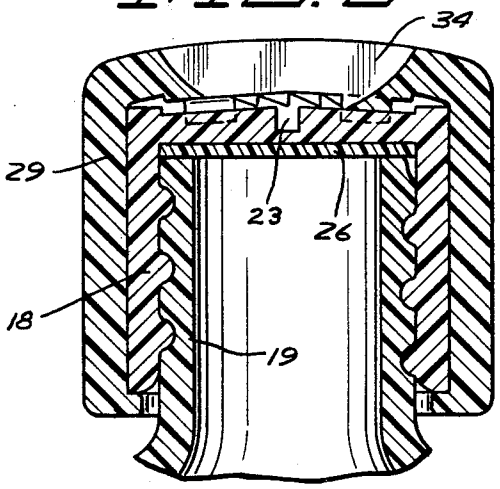
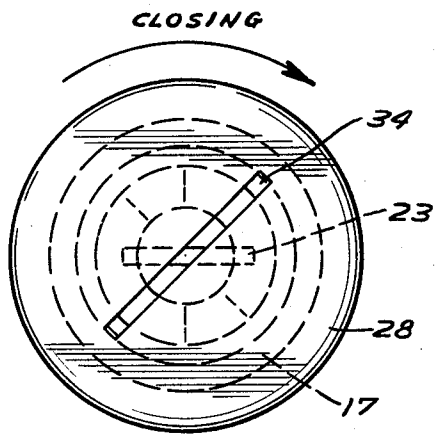


FIG. 7



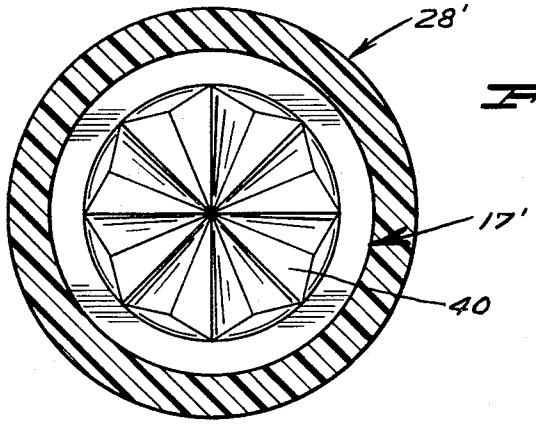


FIG. 8

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SAFETY CAP STRUCTURE

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1 Claim. (Cl. 215—9)

ABSTRACT OF THE DISCLOSURE

A safety cap for a container such as a medicine bottle consisting of an inner end and outer cap portion normally having interengagement to be threaded onto the container to cover the same and requiring the insertion of a plate member to interlock said cap portions for removal of the same from the container.

Summary of invention

The purpose of this invention is to provide a safety closure for a medicine bottle which may contain a drug either in liquid or pill or capsule form. Bottles of drugs of various kinds are normally kept in medicine cabinets of bathrooms and are readily accessible to children. It is desirable to have a bottle closure or cap which is difficult for children to remove and which will require sufficient time or effort for an adult to remove as to result in a close scrutiny of the bottle to avoid the mistake of taking the wrong bottle or container.

It is an object of this invention therefore to provide a safety closure or cap for a bottle comprising an inner and an outer cap portion which normally interengage when the outer cap portion is rotated in the direction to place the closure onto the bottle and to secure the same thereon and which normally have a slipping engagement or disengagement when the outer cap portion is rotated in a direction for removal from the bottle to uncover the same.

It is another object of this invention to provide a safety cap structure which requires the insertion of a plate member such as a small coin or an end portion of a nail file to interlock inner and outer portions of said cap for the removal of said cap from a bottle.

More specifically it is an object of this invention to provide a safety cap or closure member comprising an inner and an outer cap portion, the outer cap portion being adapted to rotate freely about said inner cap portion, said cap portions being constructed to normally lock by interengagement when the outer cap portion is rotated in a direction for the inner cap portion to be threaded onto a bottle to cover the same and said outer cap portion having no locking engagement with said inner cap portion when it is rotated in a direction for removal from said bottle.

With reference to the previous objects, it is another object to respectively provide said cap portions with slots adapted to be aligned and to receive a plate-like member therein to hold said cap portions in locking engagement for their removal from a bottle to uncover the same.

These and other objects and advantages of the invention will be set forth in the following description made in connection with the accompanying drawings in which like reference characters refer to similar parts throughout the several views and in which:

FIG. 1 is a view in elevation on a reduced scale;

FIG. 2 is a broken view in vertical section taken on line 2—2 of FIG. 1 as indicated;

FIGS. 3 and 4 show a broken exploded view in perspective as taken on lines 3—3 and 4—4 of FIG. 2 in the respective directions indicated;

FIG. 5 is a view in vertical section taken on line 5—5 of FIG. 2 as indicated;

FIG. 6 is a broken view in vertical section similar to FIG. 5;

FIG. 7 is a top plan view on a somewhat reduced scale with dotted lines showing portions thereof; and

FIG. 8 is a view in horizontal section showing a modified portion of the device.

Description of a preferred embodiment

Referring to the drawings, a container **10** is indicated in the form of a bottle which is representative of bottles conventionally used to contain pills or drugs of various kinds. Said bottle has an externally threaded neck portion **12** of reduced diameter forming an inlet or opening for the bottle.

A closure or cap member **15** is provided which comprises an inner cap portion **17** and an outer cap portion **28**.

Said inner cap portion **17** comprises a cylindrical body portion **18** being internally threaded as at **19** to be threaded onto said neck portion **12**. Said inner cap portion has an upper end portion **20** having a plurality of ratchet ramps or upwardly inclined steps **22** circularly disposed upon the upper surface portion thereof. Referring to FIG. 4, said ramp portions are shown inclined upwardly to the right. An annular step **21** is formed about said ratchet ramps and is somewhat recessed as respect to the upper end of the side wall **18**, as shown in FIG. 3.

Extending diametrically of said ratchet ramp portions **22** and somewhat short of the full width thereof and recessed within said upper end portion **20** is a channel or groove **23**.

Seated on the inner surface of said upper end portion **20** is a sealing disk **26**.

Formed to be disposed over said inner cap portion **17** is an outer cap portion **28** having a cylindrical body portion comprising a side wall **29** having an annular inwardly angled flange portion **30** underlying the bottom edge portion of the side wall **18**. Said outer cap portion has an upper end wall **31** having circularly disposed ratchet ramps or steps **33** formed onto the inner surface thereof centrally thereof to be in a superposed relation with respect to the ratchet ramps **22** and to have oppositely inclined ramps or steps with respect thereto, as shown in the composite exploded view of FIGS. 3 and 4. Encircling said ramp portion is a flat annular step **32** projecting sufficiently to be seated into said annular recessed step **21**. Said ratchet ramps **33** are constructed to mate with and engage the ratchet ramps **22** when rotated clockwise or to the right with reference to said FIGS. 3 and 4.

Said upper end portion will be sufficiently flexible to yield when said upper cap portion is rotated counterclockwise and the ratchet ramps **33** slip over said ratchet ramps **22**.

Extending through said upper end cap portion **31** diametrically thereof partially thereacross and circular in longitudinal section is a slot **34**. Said inner and outer cap portions may be rotatably positioned to bring said slot **34** into alignment with said groove **23**.

A plate member **38** which may be a disk of some kind, such as a coin or the handle end of a flat nail file, may be inserted into said slot and said groove to effect a locking engagement between said inner and outer cap portions.

Operation

The operation of the safety cap structure described appears to be quite clear from the description and drawings.

The outer cap portion is rotatably locked onto the inner cap portion by the underlying flange **30**.

When the outer cap portion is turned clockwise to fasten the cap structure onto the bottle, the ratchet ramps engage and the cap portions have a locking engagement or interengagement. When the outer cap por-

tion is rotated counter clockwise in the direction to remove the cap structure or closure from the bottle, there will be no locking engagement between the cap portions but rather disengagement or a slipping engagement as the ratchet ramps **33** slip over the ratchet ramps **22**. Here, the slot and groove must be aligned and a plate member disposed therein to effect locking engagement for removal of the closure member from the bottle.

A child would be unlikely to open a bottle with respect to a closure member requiring more than just rotation for its removal. Hence the closure member herein described is regarded as embodying a distinct safety feature in guarding drugs and pills from ready access to children. Even an adult will scrutinize a bottle more carefully than otherwise when as much effort is required to remove a closure member as is indicated here.

Modification

FIG. 8 indicates a modification only with respect to the ramp structure and the use of a slot and groove. The outer cap portion **28'** and the inner cap portion **17'** will be otherwise identical to said cap portion **28** and **17**.

In substitution for the ratchet ramps **22** and **33** is a substantially grooved radially corrugated circular surface portion **40** having rib portions here shown to be triangular in cross section and inclined upwardly outwardly. Only one surface is shown here which may be regarded as the upper facing surface portion of the inner cap portion **17'**. The adjacent and facing surface portion of the outer cap portion **28'** will be identical and is not shown.

Locking engagement will be effected here by the exertion of sufficient pressure onto the outer cap portion **28'**. It is believed that it will be difficult for a child to maintain sufficient pressure for locking engagement long enough to effect removal of the closure member.

Thus it is seen that we have provided a simply constructed yet effective closure member for a medicine bottle to provide adequate protection against the removal of the closure member by a child.

What is claimed is:

1. A safety cap structure for a bottle having an externally threaded neck portion having in combination,

an inner cap internally threaded to be removably secured onto said neck portion,

a recessed annular step spaced inwardly radially of the perimeter of the upper surface of said inner cap,

a plurality of ratchet ramps circularly disposed within said annular step,

a groove diametrical of said ratchet ramps,

an outer cap disposed over said inner cap overlying its top and side wall portions and having an inwardly extending flange underlying the bottom edge portion of the side wall of said inner cap,

an annular step projecting from the inner end surface of said outer cap spaced inwardly radially from the perimeter thereof in register with said annular step of said inner cap,

a plurality of ratchet ramps circularly disposed within said annular step of said outer cap and projecting therefrom in register with said first mentioned ratchet ramps having locking engagement therewith in a direction to screw said inner cap onto said neck portion,

a slot diametrical of the upper end portion of said outer cap for registry with said groove by rotation of said outer cap, and

means disposed through said slot into said groove locking said outer and inner caps for rotation and removal of said inner cap from said neck portion.

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DONALD F. NORTON, *Primary Examiner.*