

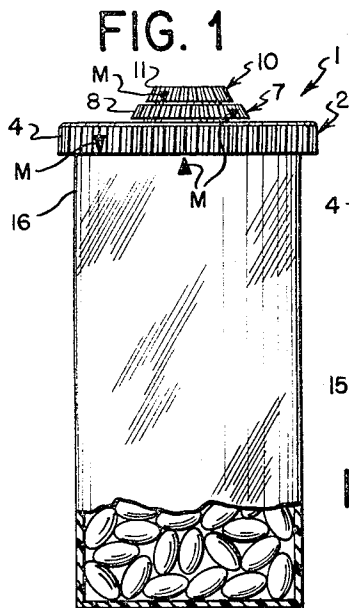
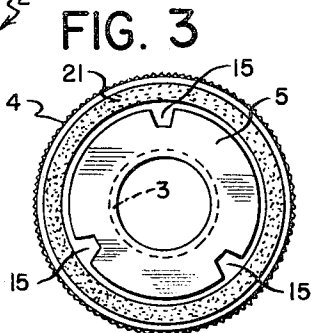
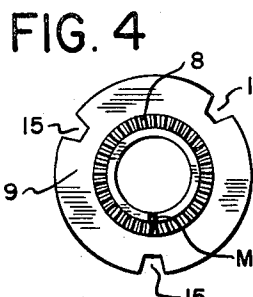
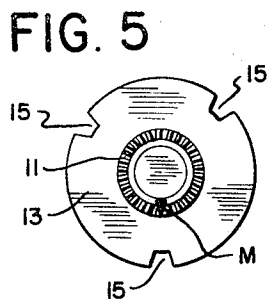
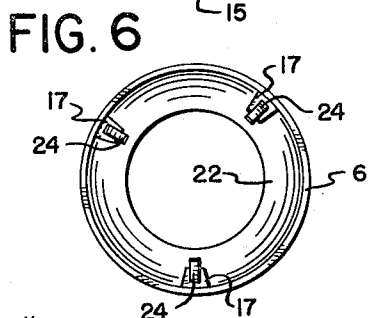
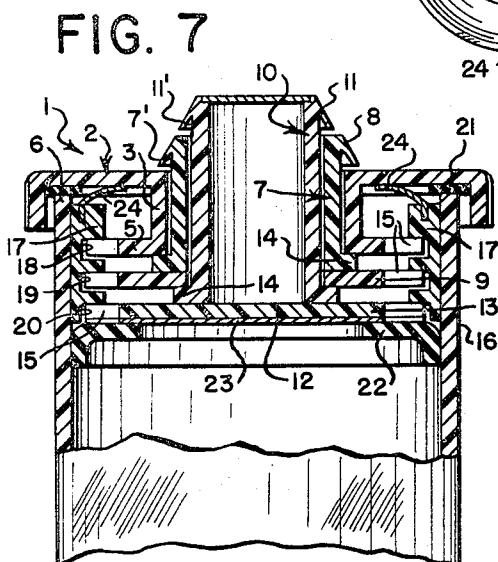
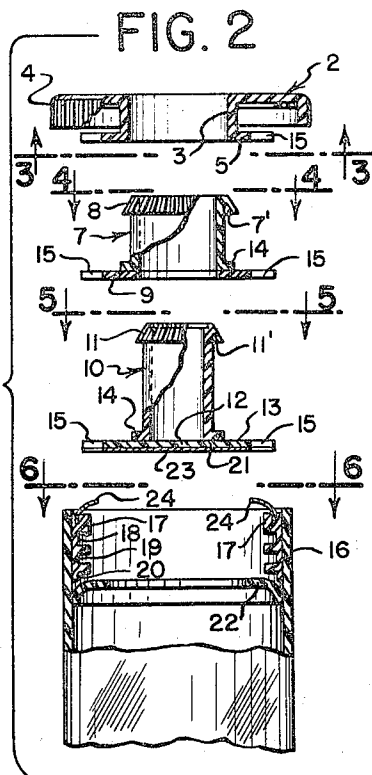
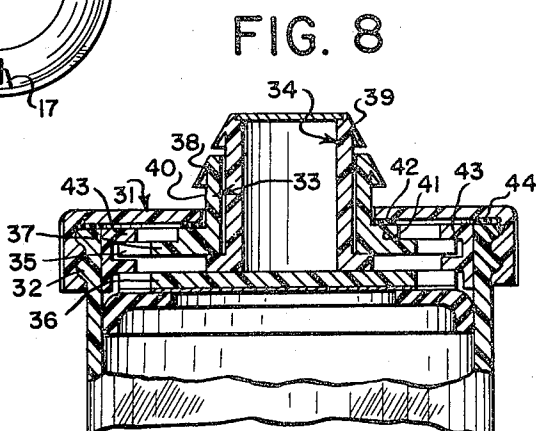
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CLOSURE LOCK

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3,383,885

CLOSURE LOCK

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ABSTRACT OF THE DISCLOSURE

A closure device for an open-ended container having a safety locking means comprising a plurality of nested, concentric rotatable members having a locking means for interlocking with a locking means contained in the container.

This invention relates to a locking device and more particularly to a locking device for container closures.

A problem existing in conventional container closures has been to provide a closure which has a safety locking means to prevent inadvertent uncapping by children and others and yet is inexpensive to manufacture.

The cost of conventional combination type container locks which have been proposed for use with closures is prohibitive when applied to the usually inexpensive mass produced medicine containers. Furthermore, the conventional closure locks proposed give the container a bulky unattractive appearance which must be avoided in today's emphasis on packaging and consumer appeal.

The need for an inexpensive closure which will secure the contents of a bottle from the prying hands of children is obvious in view of the increasing number of injuries and fatalities due to the swallowing of dangerous medicines and household goods such as insecticides, lye and other cleansers. In addition, many adult injuries result from the inadvertent taking of the wrong medicines due to haste or failure to pay attention to which bottle is being used. The requirement of complying with a sequence of simple steps in order to remove the top of the container will be sufficient to draw one's attention to the specific bottle in use thereby preventing injury from taking the wrong medicine.

It is therefore an object of my invention to provide for a closure locking device which will be inexpensive to manufacture while at the same time providing a means to safely seal the contents of a container from use so long as the proper sequence of operations necessary for removing the closure is unknown.

Additional objects and advantages of the invention will be apparent during the course of the description.

Broadly, the invention comprises a container closure having a plurality of individually rotatable concentrically fitted members. Each member has a knob portion at one end and an outwardly flaring flange portion at the opposite end so that the knob portions and flange portions have a stacked appearance when the closure is assembled. Each flange portion has one or more notches in its outer periphery which cooperate with longitudinal keys located on the inside of the neck or top portion of the container. Notches in the keys permit the flange portions, once the closure is in place, to be rotated, causing the flange notches to lose alignment with the keys thereby locking the closure on the container.

Referring to the drawings in which preferred embodiments of the invention are shown;

FIG. 1 is a front view of the closure locked in place on a container;

FIG. 2 is an exploded view of the closure illustrating the several members in partial sectional views;

FIG. 3 is a bottom view of the outer member of the closure taken along line 3-3 of FIG. 2;

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FIG. 4 is a plan view of the second member of the closure taken along line 4-4 of FIG. 2;

FIG. 5 is a plan view of the innermost member of the closure taken along line 5-5 of FIG. 2;

FIG. 6 is a plan view of the opening of the container taken along line 6-6 of FIG. 2;

FIG. 7 is a sectional elevation of the closure in place prior to locking; and,

FIG. 8 is a sectional elevation of a second embodiment of the closure in place prior to locking.

Referring to the drawings in greater detail and particularly to FIGS. 1-7, there is illustrated a self locking container closure 1 comprising three individually rotatable members 2, 7, and 10. The first or outer member 2 has a hollow tubular body 3 which in turn has an annular skirt portion 4 integral with its upper end and an annular outwardly flaring flange portion 5 integral with its opposite end. The skirt portion 4 is designed to fit over the sidewall 6 of the container and serve as a rotatable knob.

A second tubular member 7 has a knob portion 8 integral with its upper end and an outwardly flaring flange portion 9 integral with its opposite end. A third member 10, which may be either tubular or solid, has a knob portion 11 integral with its upper end and a disc portion 12 at the opposite end whose outer periphery forms a flange portion 13 similar to those integral with members 3 and 7.

Each member is individually rotatable about a common axis with its associated flange portion having a diameter slightly less than the inner diameter of the container into which the closure 1 is placed. When assembled, the members are located concentrically so that their respective flange portions are stacked, with flange 9 of member 7 being above the flange portion 13 of disc 12 and flange 5 of member 2 being above flange 9. The flanges are separated by annular lugs 14 which are formed into the upper surface of the two lower flanges 9 and 13. This spacing could likewise be accomplished by extending the two outer tubular members 3 and 7 below their respective flange so as to engage the upper surface of the flange immediately below, thereby separating the flanges by a predetermined distance.

The outer periphery of each flange has one or more notches 15 which serve as a flange unlocking means. The embodiment shown in FIGS. 3-5, has three notches evenly spaced around the periphery of each flange. These notches could be spaced at irregular intervals so long as the spacing pattern is identical on the flange portion of each member, the need for which is made clear below.

The members 2, 7, and 10 are also stacked so that each one may be individually gripped and rotated thereby rotating their associated flange portions 5, 9 and 13 respectively. The two inner members 7 and 10 may have their knob portions frusto-conical in shape with slight undercuts 7' and 10' so that during assemblage the innermost member 10 may be inserted upwardly into the next larger member 7, and member 7 may similarly be inserted upwardly into the outer member 2. During insertion the knob will be deformed by the inner walls of the tubular member into which it is inserted and which has an inner diameter slightly more than the outer diameter of the inserted knob at its widest point. As the knob of the inner member is pushed completely through the next larger member the knob will resiliently regain its original shape thereby permanently locking the respective members together to form a single self-contained closure member 1.

The above method of manufacture pertains to closures having knobs made of a semi-rigid material such as plastics. These closures, however, could be made of metal to provide a stronger lock.

The upper portion 16 of the container has one or more

longitudinal keys 17 which cooperate with the notches 15 in the flanges 5, 9 and 13. These keys may be molded into the container or be on a separate insert positioned within the upper part of the container.

The lower portion of the keys 17 have a plurality of notches 18, 19 and 20 corresponding to the number of annular flanges, which, in the disclosed embodiment, is three, and the upper horizontal surface of these notches serve as a key locking means. These key notches are separated by a distance equal to the separations between the stacked flanges.

To secure the closure to the container the members 2, 7 and 10 are rotated until the flange notches 15 are vertically aligned. The closure is then placed onto the container so that the aligned notches 15 will correspond to the longitudinal keys 17 and easily slip down into the neck of the container until the underside of the skirt portion 4 engages the upper rim 6 of the container. An annular seal 21 may be affixed to the underside of skirt 4 at the point of contact with the rim of the container to help seal the contents.

With the seal 21 contacting the rim of the container, the flanges 5, 9 and 13 will be horizontally aligned with the key notches 18, 19 and 20 respectively. Rotation of the knobs will now cause the flange notches 15 to lose alignment with the keys 17 allowing the upper surface of the flanges which act as a flange locking means to engage the upper surfaces of the notches in the keys to thus lock the closure onto the container.

When used with liquids, an annular ring 22 made of a resilient material may be located on the inside of the container below the key notch 20 so as to sealingly engage with disc 12 when in place. In the alternative, an annular protrusion molded into the container and extending radially inward beyond the depth of the flange notches 15 could be used to provide a similar seal with disc 12. In addition, a lining 23 may be affixed to disc 12 to protect the closure from the contents of the container.

To remove the closure and open the container the flange notches must be realigned with the keys. This may be accomplished by aligning markers drawn on each of the knobs with a corresponding mark drawn on the container, or, numbers may be placed on the periphery of each of the knob portions requiring the vertical alignment of the numbers in a prearranged sequence with a mark on the container. Instead of a mark on the container another set of numbers could be used thereby requiring the alignment of four numbers before the closure member would be properly positioned for removal.

To facilitate removal of the closure once the members are correctly aligned, upwardly projecting leaf springs 24 are attached to the upper end of each of the keys 17. When the closure is in place the spring will be deflected downward engaging the under side of member 2. By means of this spring bias the several members will be prevented from rattling and also tend to pop up when the correct alignment of the members is achieved.

Referring to FIG. 8, a second embodiment of the invention shows a closure having an outer member 31 which is internally threaded and adapted to be screwed onto external threads 32 on the end of the container.

The member 32 has an annular opening through which members 33 and 34 protrude. These inner members in turn have flange portions 35 and 36 with notches 37 and knob portions 38 and 39. Members 33 and 34 function similar to members 7 and 10 in FIG. 7.

A cut out portion 40 on member 33 provides a seat 41 adapted to engage an annular seal 42 which is positioned on the underside of the inner diameter of member 31.

When it is desired to close the container, the two inner members 33 and 34 are first locked into place by aligning the notches 37 with the keys 43 and then causing the flange notches to lose alignment with the keys as described in connection with the first embodiment.

Once the inner members are locked in place the outer member 31 may be screwed onto the end of the container

so that seal 44 engages the upper rim of the container and seal 42 engages shoulder 41.

In removing the closure, the outer member 31 is first unscrewed and then the inner members 33 and 34 are properly aligned and removed as described in connection with the first embodiment.

It is to be understood that the form of my invention, herewith shown and described, is to be taken as preferred examples of the same, and that various changes in the shape, size and arrangement of the parts may be resorted to, without departing from the spirit of my invention, or the scope of the subjoined claims. For example, instead of the flanges showing notches as shown, it is obvious that they could have protrusions which could engage an annular key member having vertically extending grooves therein to provide the unlocking feature for its closure and radial grooves to provide the locking surfaces.

I claim:

1. A closure device for closing an open-ended container having at least one vertically extending key member positioned on the inner side wall thereof with the key member having a plurality of key locking means thereon; said closure device comprising,

(A) an innermost rotatable member with

(1) a vertically extending knob portion having a flexible radially outwardly extending skirt thereon,

(2) a radially outwardly extending flange portion adapted to hermetically seal the open end of said container, and

(3) flange locking means on said flange adapted to interlock with a key locking means, and

(B) at least one outer member concentric with and rotatable with respect to said innermost rotatable member wherein said outer member has

(1) a vertically extending knob portion having a bore diameter therein smaller than the diameter of radially outwardly extending skirt of an inner rotatable member whereby an outer member may be slipped over the flexible skirt of an inner member to permanently join the two members, and

(2) an outwardly extending flange portion having flange locking means thereon adapted to interlock with a key locking means;

said closure locking on and hermetically sealing said container when all of said flange locking means are out of alignment with the key locking means and said closure being unlocked with respect to said container when all of said flange locking means are in alignment with said key locking means.

2. A closure device according to claim 1 wherein said flange unlocking means comprises a notch adapted to align with a notch in the key member.

3. A closure device according to claim 1 wherein an outermost member is internally threaded and adapted to be screwed onto the end of the container.

4. A closure device according to claim 1 wherein the flanges of said concentric members are stacked vertically.

5. A closure device according to claim 4 wherein the flange of the innermost concentric member is positioned below the remainder of said flanges and wherein the flange of the outermost concentric member is positioned above the remainder of the flanges.

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