TAMPER-PROOF POISON BOTTLE CLOSURE

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Fig. 1

Fig. 2

Fig. 3

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3 Claims

ABSTRACT OF THE DISCLOSURE

The safety closure shown is adapted for use on a bottle containing poisonous drugs. An inner screw cap is shielded within the confines of a larger outer protective cap and is swivelly mounted on a journal to guard against unauthorized use. This journal has a keyhole slot for a key in the hands of an authorized user. The journal not only couples the caps, it operates concealed means between the caps and converts rotary into reciprocatory motion imparted to an unscrewing rib atop the inner cap.

This invention relates to certain new and useful improvements in a tamper-proof closure which is inexpensively designed and effectively adapted for use on the screw-threaded neck of a bottle which when in use contains poisonous medicines, dangerous drugs and the like and has to do, more particularly, with a screw-type inner cap protectedively housed or sheathed in a proportionally enlarged outer cap and wherein key controlled means between the caps reliably prevents unauthorized removal of the closure.

Countless accidents, many of which are fatal, are repeatedly traceable to unknowing children who get hold of easy-to-open drug and medicine bottles and swallow the contents. It is true, of course, that in addition to warnings and care exercised by parents and others, many patented inventions, which have to do with safety closures, have been devised with a view toward preventing unauthorized use of poisons. Despite such precautionary efforts it appears that prior art safeguarding closures have not met with widespread adaptation and use. Accordingly, the principal objective in the instant matter is to provide a closure which constitutes a unique self-contained adaptation and will serve the purposes for which it has been devised particularly in that it requires the use of a key before the screw cap can be turned and detached.

Briefly, the invention herein offered with a view toward coping with and better solving this perplexing problem comprises two basically similar caps, the smaller one of which is the inner main cap and is similar, generally speaking, to an ordinary screw cap except that the top surface of the lid portion has an integral upstanding cap turning rib and, in addition, a nut at the central portion of the rib for the stem of a screw-threaded headed fastener. This fastener serves to swivelly mount a marginally threaded collar which provides a rotary gear-like pinion. This pinion transmits rotary motion to diametrically opposite rack-equipped reciprocable slides which are slittably keyed in paired track-like guides which are properly located and fixed on the interior of the rim of the larger outer cap. This outer cap shields and conceals the inner cap as well as the pinion and paired uniquely performing rack-equipped slides which, in turn, actuate the rib-equipped inner cap and serve to twist, unscrew and remove the same. Novel key-controlled means regulates the predetermined function of (1) the outer cap and (2) the fastener.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. 1 is a view showing a fragmentary portion of a so-called poison container in bottle form having a screw-threaded neck and showing the improved self-contained tamper-proof closure with the key and other components appearing in elevation.

FIG. 2 is a view similar to FIG. 1 with the bottle appearing partly in elevation and which differs in that the key operated means (key not shown) shows the inner cap rib engaging and actuating slides or abutments engaging the rib.

FIG. 3 is a horizontal section taken on the plane of the section line 3-3 of FIG. 1 looking in the direction of the arrows.

FIG. 4 is a view in perspective of the outer cap with the key included.

And FIG. 5 is a view in perspective of the improved inner cap.

Referring first to FIGS. 1 and 2 the container is illustrated in the form of a bottle such as is commonly used to contain poisonous compounds and dangerous drugs. The bottle is shown at 8 and is provided with a neck 10 having external screw-threaded 12.

The inner cap is denoted by the numeral 14 and comprises, as usual, a disk-like lid portion 16 and a depending annular rim portion 18 which as shown in FIGS. 1 and 2 is provided with screw-threads 20 engageable with the threads 12. This cap is distinct and different in that the top surface of the lid portion 16 is provided with a cap turning rib 22 which extends across the surface and is provided at its center with a component part which is internally screw-threaded at 24 and is conveniently designated as a nut 26. This nut serves to accommodate the threaded end portion of the shank 28 of the screw-threaded headed fastener 30. This fastener 30 serves in a manner to be more specifically set forth.

Taking up now the complementary outer cap this is denoted generally by the numeral 32 and is larger than and complementary to the inner main cap 14 and is differentiated as the protective auxiliary cap. It comprises a disk-like lid portion 34 provided with a suitable depending skirt-like rim 36 which is amply deep to house and enclose the inner main cap 14 when the two caps are interrelated or assembled as shown in FIGS. 1 to 3. The central or axial portion of the lid portion 34 is provided with a hole of a prescribed diameter and whose lip or edge portion is convexly rounded as denoted at 37. This hole serves to accommodate a component part which is conveniently designated here as a key actuated and assembling journal 38. The journal constitutes a cylindrically hub-like member which is provided between its upper and lower ends with an encircling groove 40 to accommodate the lip 37 and to provide a free swivelling connection between the outer cap 32 and the complementary assembling journal 38. The projecting upper end portion 42 is provided with a keyhole slot 44 which is of a shape to accommodate the shank 46 of the special purpose key 48. The key is also provided with an appropriate fingergrip 50. It will be understood in this connection that the key 48 is designed and adapted for use only by an authorized person usually an adult who should keep the key in an available place and know how to use it.

The mechanism or means within the container comprises the available space between the lid portions 16 and 34 of the caps is shown in detail in FIGS. 1 to 3. A first component part is here designated as a disk-like collar 52. This collar is of the cross-sectional thickness and diameter shown in FIG. 1 in particular and has an axial bore 54 and also a counterebore 56. The bore 54 serves to accommodate the shank 28 of the headed fastener and the head of the fastener is seated in the counterebore. It
should be noted that the threaded shank of the fastener bottoms in the screw-threaded socket 24 of the nut before the head binds on the shoulder at the bottom of the counterbore thereby connecting the threads with an inner cap while at the same time permitting it to swivel freely. The lower cylindrical portion of the journal is fitted telescopically and retentively in the counterbore so that when the key 48 is inserted and the journal is turned a turning motion is imparted to the collar. The peripheral portions of the journal is provided with threads and the inner collar, for sake of distinction, is referred to as a rotary-motion transmitting pinion. The threads on the pinion are meshed with companion threads or teeth 58 which are provided on the ribs carried by the block-like slides 60. The ribs are designated as racks and thus a simple rack and pinion action in attainment. The block-like slides 60 also constitute actuators or abutments and are reciprocable in paired tracks 62 (FIG. 3) which are carried by the interior surface of the out cap and provide guideways for the blocks. These blocks are also referred to as projectable and retractable and are shown in their released retracted positions in FIG. 1 and in their projective and unscrewing positions in FIG. 2.

In use and as is evident, the inner and outer caps 14 and 32, respectively, are shown in normal relation in FIG. 1 at which time the projectable and retractable rib-ribbing inner cap actuating slides 60 are retracted. It follows too that the outer cap 32 is free to swivel around the grooved journal 38 and rotating the same has no effect on the motion transmitting means between the two caps. Any effort by an unauthorized person (a child or an unawary elderly person for example) would result in a waste of time and energy. An authorized person having the key 48 in hand need only to insert the key in the key-hole 42, hold the outer cap 32 against the inner cap 14, and turn the key in the proper direction. Having done so, the rack and pinion means (58 and 52) comes into play. Accordingly, the actuating abutments ride down and assume the position shown in FIG. 2, whereby the inner ribbed cap 14 can be unscrewed and removed. Whoever possesses the key and knows what to do can achieve the end result desired. On the other hand, the closure in the hands of an unauthorized person stays put.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new and as follows:

1. A tamper-proof closure for a poison or dangerous drug container, a neck-equipped bottle for example, said closure being openable only by an authorized person provided with a prescribed key and comprising, in combination, an inner screw-type main cap capable of being screwed on said neck in a customary manner, said cap being structurally unique in that the lid portion thereof is spanned by an upstanding cross-rib by way of which the cap can be twisted and thus unscrewed, an outer auxiliary companion cap also embodying a lid portion having a deep depending annular rim encompassing the rim of said main cap, said lid portion being spaced vertically and parallel to the lid portion of said main cap, key controlled means assembling and connecting the respective lid portions together and permitting the outer auxiliary cap to swivel freely without turning the main cap, and reciprocable means confined in the space between said caps capable of rotation being spaced vertically to said cap, said reciprocable means embodying normally retracted projectable and retractable cap-turning abutments which when cooperatively projected in a predetermined manner serve to abut said cross-rib, said abutments being capable of turning through an orbital path, whereby to act on the rib and unscrew said inner cap.

2. The closure defined in claim 1, and wherein said key controlled means embodies a hub-like collar which is sandwiched between the respective lid portions of said inner and outer caps, said collar having means at its axial center separably and swivelly joined to an axial portion of the lid portion of said inner cap.

3. The closure defined in claim 1, and wherein said key controlled means embodies a hub-like collar which is sandwiched between the respective lid portions of said inner and outer caps, said collar having means at its axial center separably and swivelly joined to an axial portion of the lid portion of said inner cap, said last-named means including an axially located upstanding multipurpose journal which is axially fixed to said collar and is provided in an upper exposed end with a keyhole designed to fitingly receive an authorized key, said journal having an encircling groove providing a headed neck, the central axial part of the lip portion of said outer cap having a journal accommodating hole having a convexly rounded edge conformingly seated in said groove in a manner to swivelly couple said outer cap to said collar and consequently to said inner cap.

4. The closure defined in and according to claim 3, and wherein said collar is disk-like in plan and is of a diameter that its outer peripheral edge is spaced concentrically from the rim of said outer cap and is provided with encircling screw threads whereby to provide a rotary pinion, said abutments being slidingly mounted on the interior surface of the rim of said outer cap and being provided with toothed reciprocable ribs with which the threads on said collar are operatively engaged, said interior surface being provided at diametrically opposite portions with spaced guides providing guideways, said abutments comprising shoe-like blocks defining guides which are keyed slidingly in their respective guideways, said ribs being integral component portions of said blocks and constituting toothed tracks and said pinion serving to actuate the rack and, in so doing, sliding said blocks toward or from said cross-rib for engagement therewith or disengagement therefrom, as desired.

5. The closure defined in and according to claim 3, and wherein said collar is disk-like in plan and is of a diameter that its outer peripheral edge is spaced concentrically from the rim of said outer cap and is provided with encircling screw threads whereby to provide a rotary pinion, said abutments being slidingly mounted on the interior surface of the rim of said outer cap and being provided with toothed reciprocable ribs with which the threads on said collar are operatively engaged, said interior surface being provided at diametrically opposite portions with spaced guides providing guideways, said abutments comprising shoe-like blocks defining guides which are keyed slidingly in their respective guideways, said ribs being integral component portions of said blocks and constituting toothed tracks and said pinion serving to actuate the rack and, in so doing, sliding said blocks toward or from said cross-rib for engagement therewith or disengagement therefrom, as desired.

6. For use on a screw-threaded neck of a poisonous medicine and drug bottle, a substantially tamper-proof safety-type self-contained closure comprising, in combination, a main inner screw cap designed and adapted to be screwed on said neck, said cap embodying a disk-like lid portion and a screw-threaded rim portion, the top of said lid portion having an upstanding cross-rib capable of imparting rotation to said cap, said rib being provided at its axial center with a screw-threaded socket providing a nut, a nut-like collar parallel with and spaced slightly above said rib, said collar having an axial bore and a complemental counterbore, a bolt having a head clampingly seated in said counterbore and a threaded shank passing through said bore and screwed into said nut and swivelably mounting above and below said rib, the outer peripheral edge of said collar having encircling threads and constituting a rotatable pinion, an outer auxiliary cap complemental to said inner cap and likewise embodying a disk-like lid portion overlying the top of said collar and a relatively deep depending annular rim encompassing the rim of said collar, said collar having means at its interior with paired guide tracks defining diametrically opposite guideways, shiftable abutments slidable in said guideways, said abutments being projectable and retractable, normally retracted within the confines of said outer cap and capable of being projected and operatively engaged with said cross-rib, said abutments having op-
posed parallel toothed ribs providing companion racks, the threads on said pinion being operatively in mesh with the teeth on said racks so that turning the pinion functions to project and retract the abutments, and assembling means operatively joining the lid portion of said outer cap with said collar.

7. The combination defined in and according to claim 6, and wherein said last-named means comprises an axially located upstanding hub-like journal having an inner end telescoping into and fixed in said counterbore, said journal having a circumferentially grooved outer end defining and providing a headed outer cap assembly neck, the lid portion of said outer cap having an axially located hole, said headed neck extending outwardly through and beyond said hole, the edge of said hole being convexly rounded and cooperatively seated in said groove, whereby to swivelly retain said outer cap.

8. The combination defined in claim 7, and wherein the outer end portion of said journal is provided with a readily accessible keyhole slot.

References Cited

UNITED STATES PATENTS

GEORGE T. HALL, Primary Examiner.

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