

[54] COMBINATION LOCK SAFETY CAP

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[58] Field of Search..... 215/206, 9

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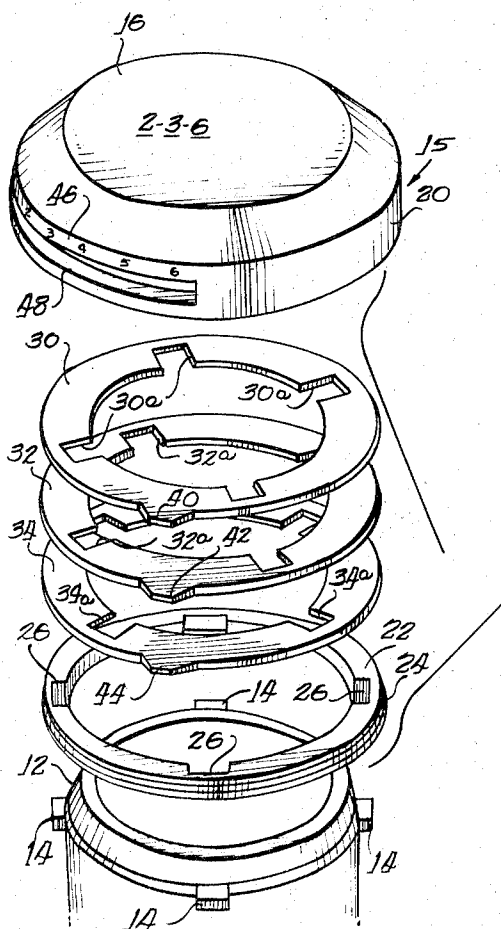
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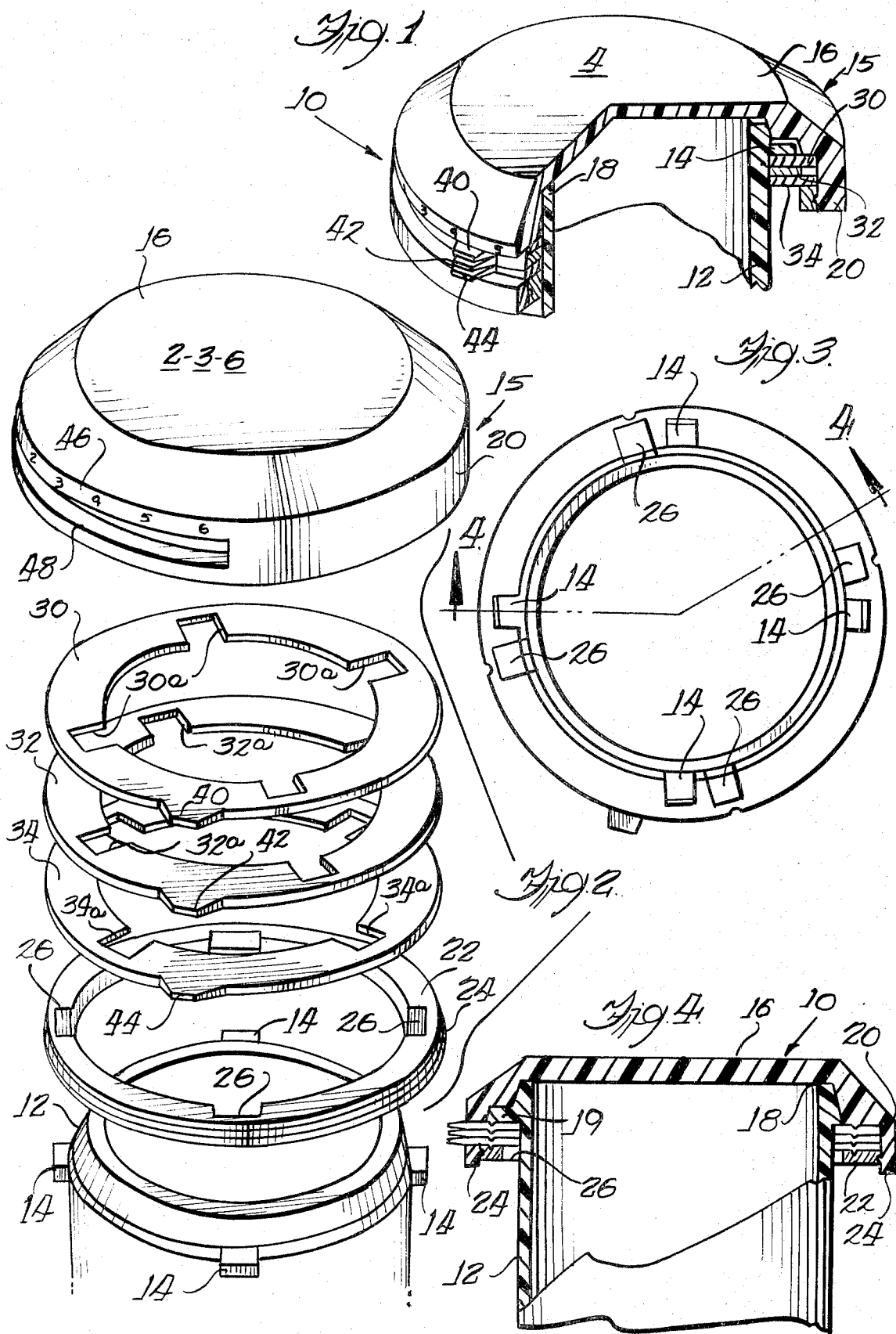
[57] ABSTRACT

The embodiment of the invention disclosed herein is directed to a combination lock safety cap for containers that are particularly designated for receiving materials such as drugs or chemicals which are detrimental to human life, and which drugs and chemicals are to be prevented from getting into the hands of small chil-

dren. The combination lock safety cap is of a particular arrangement as to allow only the particular person knowing the arrangement or combination of the components of the safety cap to open the container which utilizes such caps. The container which receives the combination cap of this invention includes a neck portion formed on the container to function as an access opening for filling and removing material from the container. Radially outwardly directed tab means is formed about the exterior periphery of the neck portion, said tab means generally including four quadrant located, discrete tabs about the neck portion. A closure assembly is fashioned to fit over the neck portion and includes a plurality of rotatable lock rings held in position between a cap and retaining ring so as to freely rotate within the cap. Each of the locking rings is located radially inwardly of an integral peripheral depending flange portion associated with the cap and includes an outwardly directed tab which fits through a slot formed in the flange portion. When all of the radially outwardly directed tab portions of the locking rings are placed in alignment, or placed in predetermined locations with respect to indicia formed about the cap, a corresponding plurality of notches are aligned and placed in registry with the radially outwardly directed tabs of the neck portion to allow the closure structure to be lifted and removed from the container.

10 Claims, 4 Drawing Figures





COMBINATION LOCK SAFETY CAP

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to new and useful improvements in safety closures for containers and, more specifically, for a closure cap for containers where the contents may be drugs or chemicals and where it is desired to prevent children from removing the caps to prevent the removal of such drugs or chemicals. The device is of such construction and arrangement as only one with relative adult knowledge can manipulate the components of the device to remove the closure structure from the container to gain access to the drugs or chemicals within the container.

2. Description of the Prior Art

Heretofore devices of such construction which provide relative difficulty for entering or gaining access to containers wherein dangerous drugs or chemicals are confined provide relative difficulty to persons who are authorized or intended to gain access to such containers. These prior art containers are relatively difficult to operate in that they either require substantial amounts of force to be exerted upon the closure structure, or they require significant amount of dexterity or ingenuity on the part of the user to figure out the particular combination required to remove the closure structure. It has generally been accepted in the previous state of the art that a safety closure device is required to prevent children from gaining access to containers having harmful material therein. However, it is not an accepted rule, when providing such safety closures, to prevent the elderly or persons of physical disability from gaining access to such closures to self administer medicines which may be proscribed by physicians.

Heretofore, such prior art safety closures have been so complicated and difficult to operate so as to preclude persons, particularly those in the senior citizen class, from opening the closure to gain access to their required medication.

For example, one prior art type of safety locking closure provides a cylindrical neck having an annular rim adjacent the base thereof and wherein radially outwardly directed flanges are required to be pressed or manipulated as the cap was turned to facilitate removal. This required a relative amount of physical strength for depressing of the outwardly directed flanges and therefore was an inefficient type of closure for elderly and extremely weak and sickly patients.

Another type of combination locking closure for medical or chemical containers included a plurality of rings associated with the cap, each of the rings including a plurality of radially inwardly directed tab portions to be aligned with a single elongated notch or slot formed along a plurality of grooves in the neck portion of the container. Each of the rings may be provided with a plurality of numbers or letters about the periphery thereof. Alignment of these rings would allow the user to open the container. However, this type of closure required that the person clearly observe the relative position of the rings, and furthermore these rings are relatively difficult to manipulate in that they have substantially the same diameter as the exterior portion of the cap associated therewith.

Accordingly, it is a primary feature of this invention to overcome the obvious disadvantages and difficulties

associated with prior art combination lock safety caps associated with chemical or drug compounds which are to be restricted from children. Particularly, the invention disclosed herein is directed to an improved combination lock safety cap structure which enables the user thereof quickly and easily to remove the closure structure from the container without need of special dexterity or visual observation of the relative position of a plurality of locking rings.

Another feature of this invention is the provision of a plurality of rotatable lock rings having radially outwardly directed tab portions to be manually manipulated by the user thereof to align the tabs exteriorly of the closure structure thereby aligning associated notches at the interior of the structure to enable removal of the closure structure from its associated container.

Briefly, the principle on which this cap structure is based calls for the alignment of a set of slots or notches in a predetermined pattern so that specially positioned locking tabs can pass through the notches in an unobstructed manner. This is accomplished through the use of at least three individual locking rings, with each of these locking rings being equipped with a series of notches. These rings are incorporated into the container or cap. The position of these rings can be varied by movement of a protruding tab section. The locking ring is attached to the container at a position just below the rim, and this ring has a number of tabs extending radially outwardly from its surface. When the locking cap is in its normal locked position the tabs of the container are placed into the locking ring and because the slots do not correspond to the positions of the tabs, the container is effectively locked. It can be opened only if the proper alignment of the three individual locking rings is obtained. In order to facilitate this alignment process, a set of numbers is imprinted on the cap portion of the closure structure, and the appropriate position for unlocking the closure structure may be printed or otherwise indicated on the cap structure. Therefore only persons who can read or understand indicia bearing information can intelligently understand the number designations on the cap and align the exterior tabs to effect removal of the closure structure. In this manner, once the numerical combination corresponding to the appropriate slot position is known, the container can be quickly and easily removed. Because it allows for a level of safety not formerly obtainable in prior art structures the combination lock safety cap of this invention may well be adapted for use on many different types of containers wherein tamper proof characteristics for children are required.

Many other features and advantages of this invention will be more fully realized and understood from the following detailed description taken in conjunction with the accompanying drawings wherein like reference numerals throughout the various views of the drawings are intended to designate similar elements or components.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective fragmentary view of a container closure and neck portion of a container illustrating the unique combination of elements of this invention;

FIG. 2 is an exploded perspective view illustrating the plurality of discrete components associated with the construction of this invention;

FIG. 3 is a top view of the neck portion of a container illustrating the relative alignment of one of the locking rings associated with the closure structure; and

FIG. 4 is a sectional view taken substantially along Line 4—4 of FIG. 3 illustrating the position of the radially outwardly directed tab portion of the locking rings through the slot formed in the flange of the cap.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

Referring now particularly to FIG. 1 there is seen a container closure structure designated generally by reference numeral 10 which is constructed in accordance with the principles of this invention. The container closure structure 10 includes a specially configured neck portion of a container to which the closure structure is to be associated with, said neck portion being designated generally by reference numeral 12. The neck portion formed on the container includes a plurality of radially outwardly directed tab means 14 formed about the exterior periphery of the neck portion, and positioned at predetermined arcuate displacements relative to one another. In the preferred embodiment the radially outwardly directed tab means are located in respective different quadrants 90° from one another about the periphery of the neck portion. However, it will be understood that other arcuate configurations of the tab may be incorporated. For example, one, two, or three tab means may be located about the periphery of the neck portion and which tab means may be spaced apart, when three, four or more such tab means are incorporated at different arcuate distance from one another. Also, each tab may have a different radial extent than the other tabs.

The closure structure 10 includes a closure assembly 15 fashioned firmly to fit the neck portion 12 of the container and prevent the drug or chemical material from being removed from the container by small children or other persons not intended to or capable of manipulating the combination of the closure structure. The closure assembly includes a cap portion 16 to fit over the neck portion and form a seal about the mouth 18 of the neck portion 12. This is best illustrated in FIG. 4 which shows the mouth 18 firmly abutting the undersurface of the cap 16 to form the seal mentioned.

An integral peripheral, depending flange portion 20 is associated with the cap 16 and has a diameter and configuration freely to fit over the radially outwardly directed tab means 14 associated with the neck portion 12. This allows the closure assembly freely to fit over, and be removed from, the container by authorized personnel. A retaining ring 22 is secured to the integral peripheral, depending flange portion 20 and forms a confining portion 16 and the flange. In the illustrated embodiment the retaining ring 22 is secured to the depending flange portion 20 by means of a snap ridge and recess combination designated generally by reference numeral 24. However, it will be understood that other suitable conventional connection means may be incorporated, as for example, adhesives, set screws or the like. Furthermore, it will be understood that the retaining ring 22 may be threaded into a threaded receptacle portion of the depending flange 20.

Associated with the retaining ring 22 is a first notch means 26 which, in turn, is arranged for substantial complete alignment with the associated radially outwardly directed tabs 14, as best illustrated in FIG. 3. When the notches 26 are pointed to be in registry with the tabs 14 the cap structure can be placed on and removed from the container, if it were not for additional locking means associated with the cap structure, which locking means are to be further described hereinbelow.

Referring now particularly to the exploded view of FIG. 2, a plurality of axially displaced and aligned locking rings 30, 32, and 34 are shown positioned between the cap 16 and the retaining ring 22, each of the locking rings includes associated notch means, referred to in the claims as second notch means, and designated generally by associated reference numerals with the suffix letter (a). For example, locking ring 30 includes four notches 30a while the locking ring 32 includes four notches 32a, and the locking ring 34 includes four notches 34a. The notches 30a, 32a, and 34a associated with the rotatable locking rings 30, 32, and 34, respectively, are oriented arcuately about the inner periphery of the locking rings to conform substantially to the arcuate displacement of the notches 26 of the retaining ring 22. Therefore when the notches 30a, 32a, and 34a are placed in substantial alignment with the notches 26 of the retaining ring 22 the entire enclosure structure 15 can be removed from the container.

To facilitate ease of alignment of the three locking rings 30, 32 and 34 there is provided radially outwardly directed positioning tab means 40, 42, and 44, respectively associated with the locking rings 30, 32 and 34. The tab positioning devices can be located in any one of a plurality of different arcuately displaced arrangements to afford the desired amount of difficulty to open the container. For example, indicia bearing means 46 may be located about the periphery of the depending flange 40 and placed above a corresponding slot 48 through which the tab means 40, 42, and 44 extend. By aligning the tabs one with the other, and with one of the desired indicia bearing characters about the slot, the notches of the locking rings and the retaining ring can be aligned with the tabs on the neck of the container to facilitate removal of the cap structure. Furthermore, the invention disclosed herein incorporates means formed on the top of the cap 16, such as the numbers "2", "3", "6" on top of the container to give an indication to the user as to where to locate the first, second and third of the tabs with respect to the indicia bearing information about the slot when these tabs are not to be aligned with one another. When all of the tabs 40, 42, and 44 are to be aligned with one another a single number may be located on top of the cap 16, as in "4" in FIG. 1, to indicate where the tabs are to be aligned in the slot.

While several specific embodiments of the present invention have been disclosed herein with relative particularity and detail, it will be understood that variations and modifications of the invention may be incorporated without departing from the spirit and scope as intended by the inventor. For example, variations as to size, shape, color and configuration may be effected without departing from the spirit and scope of the novel concepts of the claims as set forth hereinbelow.

Having thus described the invention, what is claimed is:

1. A container closure structure and container used in conjunction therewith, comprising:

- a container for receiving a given quantity of material to be restricted from use by small children;
- a neck portion formed on said container to function as an access opening for filling said container and for removing said material therethrough;

radially outwardly directed tab means formed about the exterior periphery of said neck portion;

- a closure assembly fashioned firmly to fit said neck portion to seal the container and prevent said material from being removed from said container, said closure assembly including;

a cap to fit over said neck portion and form a seal about the mouth of said neck portion;

an integral peripheral depending flange portion associated with said cap, said integral peripheral depending flange portion having a dimension and configuration freely to fit over said radially outwardly directed tab means of said neck portion;

a retainer means formed about the inner peripheral portion of said integral peripheral depending flange portion, said retainer means extending inwardly a distance to underly said tab means of said neck portion when said closure assembly is in position on said container;

first notch means formed on said retaining means, said first notch means being sized and configured to accept said tab means when said closure assembly is positioned over said neck portion;

locking means associated with said closure assembly, said locking means being movably secured between said cap and said retaining means;

second notch means formed in said locking means, said second notch means being sized and configured to accept tab means when said closure assembly is positioned over said neck portion; and

positioning means associated with said locking means to enable manual relative movement of said locking means with respect to said retaining means and said cap means, to allow alignment of said first and second notch means of said retaining means and said locking means, respectively, for easy application and removal of said closure assembly from said neck portion, whereby misalignment of said first and second notch means prevents inadvertent removal of said closure assembly from said neck portion.

2. In the container closure structure and container as set forth in claim 1 wherein said radially outwardly directed tab means formed about the exterior periphery of said neck portion are located at a given distance below the mouth opening of said neck portion.

3. In the container closure structure and container as set forth in claim 2 wherein said radially outwardly directed tab means includes a plurality of discrete tabs extending radially outwardly of said neck portion, each of said discrete tabs having an extent different than other ones of said discrete tabs.

4. In the container closure structure and container as set forth in claim 3, wherein said plurality of discrete tabs are four in number and each located substantially at right angles to one another.

5. In the container closure structure and container as set forth in claim 4 wherein said neck portion formed on said container is round in configuration, said radially outwardly directed tab means being formed at different quadrant locations about said round neck portion, and wherein said cap is round in configuration and said locking means includes locking ring means associated therewith rotatably to move within said cap to align its associated notch means with said tabs for removal of said closure structure.

6. In the container closure structure and container as set forth in claim 1 wherein said locking means includes a rotatably secured locking ring means positioned between said cap and said retaining flange, said retaining flange being circular in configuration to fit about a circular configured neck portion, and wherein said locking means is rotated to align said notch means with said tabs for removal of the closure structure.

7. In the container closure structure and container as set forth in claim 6 wherein said locking ring means includes a plurality of independent axially displaced locking rings, each of said locking rings including notches to be aligned with said tab means to facilitate removal of said closure structure from said neck portion.

8. In the container closure structure and container as set forth in claim 7 further including positioning means associated with each one of said plurality of independent locking rings, said positioning means including radially outwardly directed tab portions to be aligned one with another to give a visual indication at exterior of said closure structure that the interior radially disposed notches are aligned to accept said radially outwardly tab portions of said neck portion for removal of said closure structure.

9. In the container closure structure and container as set forth in claim 8 further including a slot formed in said flange depending from said cap, said slot having an arcuate extent about the periphery of said cap to limit the arcuate travel of said radially outwardly directed tab portions associated with said plurality of locking means.

10. In the container closure structure and container as set forth in claim 9 further including indicia bearing portions associated with said slot about the periphery of said cap so as to enable the user of said container closure structure and container visually to align said radially outwardly directed tabs of said locking means, and then position said aligned radially outwardly directed tab portions in registry with one of said indicia bearing means so as to provide alignment of the said associated notches of said locking means with the radially outwardly directed tabs of said neck portion to facilitate removal of said closure structure from said neck portion.

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