

[54] **CHILD-RESISTANT CONTAINER ASSEMBLY AND COMPONENTS THEREOF**

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[58] Field of Search 215/9, 41, 44, 95, 97; 292/256.6; 285/362, 377, 396

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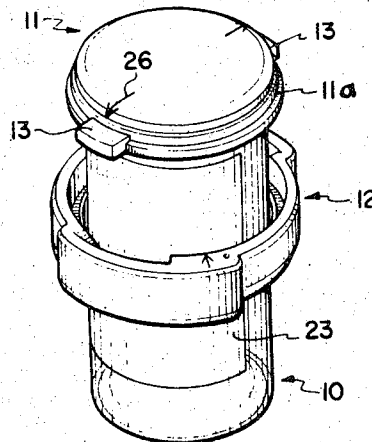
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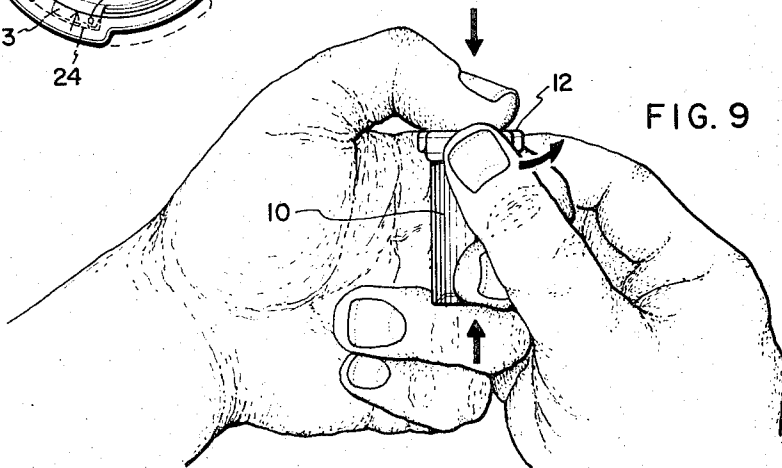
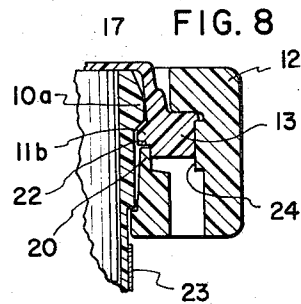
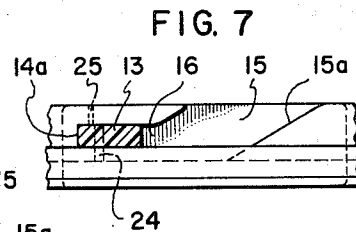
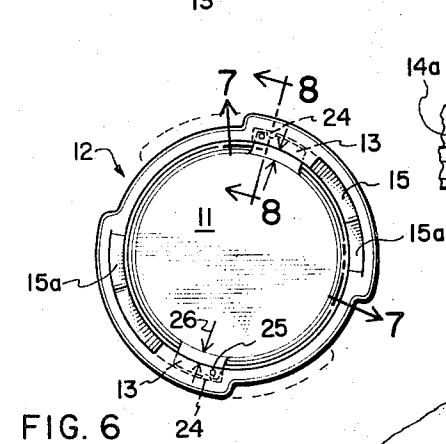
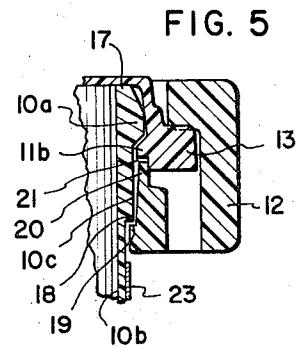
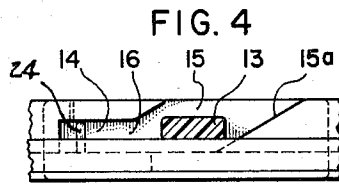
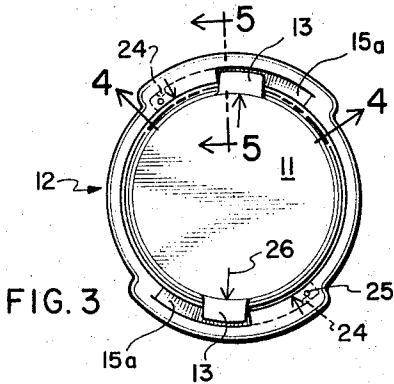
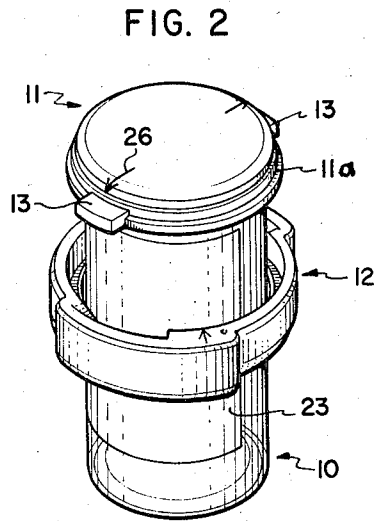
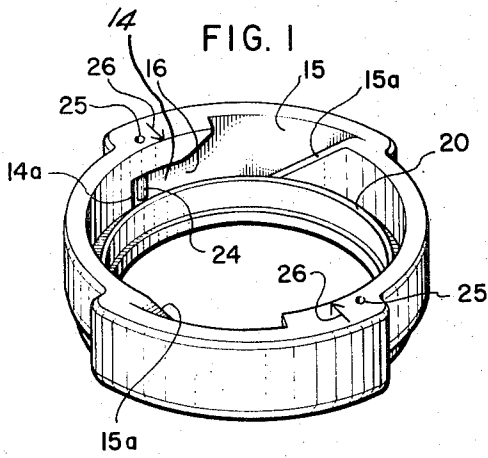
[57] **ABSTRACT**

A safety latching ring, for protecting cylindrical medi-

cine vials and other containers having cylindrical mouths provided with snap-on closure caps from being opened by children, is provided with a latch chamber internally thereof for each of the usual laterally projecting tabs of the closure cap. The latch chamber has frictionally restricted entry and exit, so that, in their latched relationship, the cap and the protective latching ring freely rotate in unison relative to the vial to thereby prevent opening of the vial unless the cap is pressed tightly against the vial rim. Such pressure frictionally anchors the cap to the vial, permitting the latching ring to be rotated relative thereto for moving each tab into or out of its latching chamber. The combined pressing and turning actions necessary to release the latching ring from the vial cap are too much for children to manage. The vial cap preferably has two, three, or even more tabs symmetrically arranged and the latching ring a corresponding number of latch chambers correspondingly arranged. For added safety, the vial and vial cap are both shouldered circumferentially to mate with corresponding formations of the latching ring and prevent anchoring pressure from being transmitted from the latching ring through the cap to the vial.

13 Claims, 9 Drawing Figures





CHILD-RESISTANT CONTAINER ASSEMBLY AND COMPONENTS THEREOF

BACKGROUND OF THE INVENTION

1. Field

The invention is concerned with child-resistant containers for medicines and other substances that could be dangerous for children, and is particularly concerned with such containers that employ separate latching rings for protective purposes.

2. State of the Art

Cylindrical vials with snap-on caps are commonly employed by prescription druggists as containers for a variety of pills and other medicines sold to customers. Since these are easily opened as conventionally constructed, they pose a potential danger to children. Much effort has been expended in attempts to render such vials child-resistant by making them as difficult as possible for children to open. One approach to this is disclosed in my U.S. Pat. No. 3,581,925, issued June 1, 1971, wherein a latching ring is provided for installation on such a vial by slipping it onto the vial from the bottom thereof and by engaging the usual laterally extending tab of the cap in a latch chamber, from which it can be released only by manually operating a latch member that is difficult of access.

SUMMARY OF THE INVENTION

In accordance with the present invention, a latching ring which I believe to be superior to my previously patented ring requires no manipulation of a latch member that is difficult of access to unlatch the ring for removal thereof so as to expose the cap for removal in the usual manner. There is nothing about the operation that is difficult for an adult or mature youth, and maximum safety for children is assured. Opening of the containers is normally prevented by reason of the fact that latching ring and cap rotate freely relative to the container. It is only when the cap is pressed tightly against the rim of the container and held there while the latching ring is turned relative to both container and cap, that unlatching and removal of the cap can take place. This is easy for an adult or mature youth, but practically impossible for an infant or young child.

Each latching chamber for receiving a tab of the container cap has frictionally restricted entry and exit, requiring pressure to be exercised on the cap to frictionally anchor it against the rim of the container and also requiring force to be applied to the latching ring to turn it relative to the anchored cap, for both latching and unlatching of the ring.

Both the container and the cap are preferably provided with shoulders adapted to mate with corresponding shoulders of the latching ring, so that pressure exerted on the latching ring will not frictionally anchor the cap to the container and thereby defeat the safety feature of the invention.

THE DRAWING

A construction constituting the best mode presently contemplated for carrying out the invention in actual practice is illustrated in the accompanying drawing, in which:

FIG. 1 is a pictorial view of a latching ring embodying two latch chambers for application to a snap-on closure cap having two diametrically opposite tabs, the ring

being shown per se looking from above toward the inside;

FIG. 2, a similar view drawn to a reduced scale showing the latching ring being applied to a medicine vial and its snap-on closure cap, both vial and cap being fabricated with shoulders adapted to mate with corresponding shoulders of the latching ring in accordance with the invention;

FIG. 3, a top plan view of the closure cap about to be engaged by the latching ring;

FIG. 4, a fragmentary vertical section taken along the line 4—4 of FIG. 3;

FIG. 5, a fragmentary vertical section taken along the line 5—5 of FIG. 3;

FIG. 6, a view similar to that of FIG. 3, but showing the closure cap and latching ring in full latching engagement;

FIG. 7, a view similar to that of FIG. 4 but taken on the line 7—7 of FIG. 6;

FIG. 8, a view similar to that of FIG. 5, but taken on the line 8—8 of FIG. 6; and

FIG. 9, a pictorial view showing the safety-latched vial of FIGS. 6, 7, and 8 in the process of being unlatched by an adult.

DETAILED DESCRIPTION OF ILLUSTRATED EMBODIMENT

In its illustrated preferred form, the child-resistant container assembly of the invention is a medicine vial 10 having a snap-on closure cap 11 and a safety latching ring 12. All of these component items are preferably injection molded to final form from suitable thermoplastic materials commonly used for the purpose.

Vial 10 is of rigid cylindrical formation throughout with a rim 10a adapted to receive and hold snap-on cap 11, which is preferably flexible throughout and has the usual skirt 11a provided with the usual internally projecting, integral, snap ring member 11b for engaging rim 10a of the vial. Cap 11 is provided with at least one and preferably two or three laterally extending pull tabs 13 of usual formation molded integrally therewith. As illustrated, there are two of these pull tabs 13 diametrically opposed.

Safety latching ring 12 in this instance is formed for installation from the bottom of vial 10 upwardly thereof so as to closely surround closure cap 11, and has diametrically opposed latch chambers 14 and entryways 15 opening into the top of the annular body of the ring for the reception of respective tabs 13 of the closure cap. Latch chambers 14 are formed internally of the body of the ring and are open to the inner periphery thereof. In the present instance, each latch chamber is formed as a pocket having a closed end 14a. Between entryway 15 and latch chamber 14 is a frictionally restricted passageway 16 constituting at least the open entrance to such latch chamber, and, in the present instance, extending throughout the entire length of such chamber.

It can be easily realized that the extent of frictional resistance to entry of a tab 13 into the latch chamber may be as desired. Thus, frictionally restricted passageway 16 may be relatively short, with the remainder of latch chamber 14 offering no frictional resistance to movement of the received tab, or, as indicated previously, it may itself constitute most of or, as here illustrated, the entire latch chamber. Moreover, it is not necessary that the latch chambers be closed pockets.

They can be open at both ends, with both ends or the entire length providing frictional resistance to tab entry and exit. Also, depending upon the type of container or the desire to apply the latching ring from the top rather than the bottom of a vial of the type illustrated, the entryways can open into the bottom of the annular body of the latching ring instead of into the top, it being realized that this would not be nearly as secure as the form illustrated, because of the need under such circumstances to maintain the inner diameter of the ring uniform throughout, which would eliminate the seat for skirt 11a of the cap described hereinafter.

The purpose of latch chambers 14 is to confine the respective tabs 13 against unlatching rotation of latching ring 12 relative to closure cap 11 and vial 10 (or vice versa) unless and until closure cap 11 is pressed downwardly against the top surface 17 of rim 10a of the vials sufficiently forcefully, usually by the thumb of the hand holding the vial, see FIG. 9, to frictionally anchor such cap on such rim of the vial while the required relative rotation is being effected. This is too much for young children, who are to be protected from the danger of unsupervised consumption of the contents of the vial, to carry out by or among themselves. Without this described manipulation, closure cap 11 will rotate freely in unison with latching ring 12 and will merely turn idly relative to the vial (or vice versa).

It should be understood that the same combined downward pressure on closure cap 11 and forceful rotation are necessary to latch the safety latching ring in protective position following authorized dispensing of contents from the vial.

It is desirable that protection be afforded against possible anchoring of cap to container by pressure exercised other than as described above, whereby the container might be opened by random manipulations of even small children. For this purpose and as optional features of the invention, a set of mating shoulders may be provided between container mouth and latching ring and a set of mating shoulders may also be provided between closure cap and latching ring.

In the illustrated embodiment, vial 10 is preferably externally shouldered, as at 18, FIG. 5, below but adjacent to rim 10a by making the remainder 10b of the depth of the container slightly less in diameter than the portion 10c thereof. In turn, the annular body of latching ring 12 is correspondingly shouldered internally around its lower interior rim, as at 19, for mating abutment against shoulder 18 of the vial. This prevents possible frictional anchorage between cap and vial by pressure on the latching ring from below.

Also, latching ring 12 is preferably less in internal diameter around its lower portion than around its upper portion and is advantageously provided with an upstanding internal collar 20, FIGS. 1, 5, and 8, serving as an annular shoulder that provides a bearing seat for the skirt 11a of closure cap 11, and such cap 11 is provided with a corresponding annular groove 21, FIG. 5, around the lower interior circumference of skirt 11a for receiving collar 20 and for defining an overhanging shoulder 22, FIG. 8, for mating abutment against the shoulder provided by collar 20. This prevents possible frictional anchorage between cap and vial when latching ring 12 is pulled downwardly. Collar 20 is advantageously slightly tapered, as illustrated in somewhat exaggerated manner, to provide for free and easy installation of the latching ring.

It should be noted that the making of the lower portion 10b of the vial 10 slightly less in diameter than the upper portion 10c thereof effects the further purpose of providing space for application to the vial of the usual prescription label 23, without interfering with installation and removal of the latching ring relative to the vial.

Entryways 15 in latching ring 12 should be at least as long as tabs 13 of closure cap 11 are wide, to insure ease of operation. Advantageously they are longer, as illustrated, and terminate in ramps 15a to facilitate separation between latching ring and closure cap.

It is desirable to provide detents near the closed ends of the respective latch chambers 16, as, for example, the internal projections 24, see particularly FIGS. 1, 4, and 8, which provide additional frictional gripping of tabs 13 as they are forced deeply into the respective receiving pockets. In order to be sure that this additional latching feature is fully utilized upon any installation of latching ring over closure cap, it is desirable to provide means for visually indicating full entry of the tabs into the respective latch chambers. Such means may take the form of peepholes 25 in the latching ring or of indicating marks, such as the arrows 26, on the closure cap and latching ring, or both may be employed as in the present embodiment. Alternatively or additionally, a detent 24 may be located adjacent to the entry mouth of each latch chamber or mutually spaced detents may be located along the length of each latch chamber, or any of the defining walls thereof, either to provide the required frictional restrictions or to supplement it. Normally, as in the form illustrated, the frictional resistance of passageway 16 will be provided by making its height somewhat less than the height of the tab 13 to be received and one or more detents 24 will merely supplement the latching action of such frictional restriction.

Whereas there is here specifically illustrated and described a specific construction presently contemplated as the best mode of carrying out the invention, it should be understood that various changes may be made without departing from the inventive concepts defined by the claims that here follow.

We claim:

1. A latching ring for a container having a cylindrical mouth with a rim formed to receive a snap-on closure cap that has at least one laterally extending tab, said latching ring comprising an annular body adapted to closely surround the closure cap of such a container; a latch chamber formed internally of said body and open to the inner periphery thereof for receiving said tab; an entryway in said body for receiving said tab when the latching ring is applied to the closure cap; a frictionally restricted passageway extending circumferentially in said body for receiving said tab from said entryway and for frictionally restricting rotation of said ring relative to said cap, said latching ring and closure cap being normally freely rotatable together on and with respect to the cylindrical mouth of the container, whereby the closure cap will normally move in unison with the latching ring when the latter is rotated relative to the container but is adapted for frictional anchorage to the rim of the container by means of pressure applied thereto, so that turning of said ring relative to the so-anchored closure cap will force said tab to enter into or to exit from said latch chamber.

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2. A latching ring in accordance with claim 1, wherein there is a plurality of sets of latch chambers, entryways, and restricted passageways arranged symmetrically about the circumferential extent of the annular body.

3. A latching ring in accordance with claim 1, wherein each latch chamber is open at one end and closed at the opposite end.

4. A latching ring in accordance with claim 3, wherein a detent for the received tab of the closure cap is located adjacent the closed end of the latch chamber.

5. A latching ring in accordance with claim 3, wherein the annular body is provided with means for visually indicating full entry of the tab of the closure cap into the latch chamber.

6. A latching ring in accordance with claim 5, wherein the indicating means is a peephole extending through the annular body from the upper surface thereof to the interior of the latch chamber adjacent to the closed end of said chamber.

7. A latching ring in accordance with claim 1, wherein the frictionally restricted passageway extends throughout substantially the entire length of the latch chamber.

8. A latching ring in accordance with claim 1, wherein the annular body is shouldered internally around its lower interior rim for abutment against a mating shoulder of the cylindrical mouth of the container.

9. A child-resistant container assembly, comprising a container having a cylindrical mouth with a rim formed to receive a snap-on closure cap; a snap-on closure cap adapted to fit over said mouth and to seat on said rim thereof, said cap having at least one laterally extending tab; and a latching ring in accordance with claim 1 adapted to fit over and around said cap and to receive said tab in latching cooperation therewith.

10. A child-resistant container assembly in accordance with claim 9, wherein the cylindrical mouth of the container is shouldered below the closure-cap-receiving rim to mate with a corresponding shoulder of the latching ring, said latching ring having a corresponding shoulder formed internally thereof around its lower interior rim for abutment against the shouldered portion of the cylindrical mouth of the container.

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11. A child-resistant container assembly in accordance with claim 10, wherein the container is a medicine vial of cylindrical formation having substantially uniform diameter throughout its length from bottom to shouldered position thereof, so that latching ring can be installed from the bottom of the vial upwardly thereon and so that a label can be accommodated below said shouldered portion without interfering with said latching ring.

12. A child-resistant container assembly in accordance with claim 9, wherein the closure cap is provided with an annular groove around the lower interior rim of its snap-on skirt to provide an overhanging shoulder; and the latching ring is provided with an upstanding collar internally thereof serving as an annular shoulder for reception by said groove and providing a bearing seat for said closure cap.

13. A latching ring for a container having a cylindrical mouth with a rim formed to receive a snap-on closure cap that has at least one laterally extending tab, said latching ring comprising an annular body adapted to closely surround the closure cap of such a container; a latch chamber formed internally of said body and open to the inner periphery thereof for receiving said tab; an entryway in said body for receiving said tab when the latching ring is applied to the closure cap; a frictionally restricted passageway in said body for said tab, said passageway leading from said entryway into said latch chamber, said body being freely rotatable on the cylindrical mouth of the container, whereby the closure cap will normally move in unison with the latching ring when the latter is rotated relative to the rim of the container by means of pressure applied thereto, so that turning of said ring relative to the so-anchored closure cap will force said tab to enter into or to exit from said latch chamber; said annular body having an upstanding collar internally thereof, providing an annular shoulder as a bearing seat for a container closure cap having a skirt that is provided with an annular groove around the lower interior circumference thereof to receive said collar and to provide an overhanging shoulder for mating with said shoulder of the collar.

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