

Aug. 17, 1965

J. B. POWERS

3,200,979

LATCHING CAP

Filed June 17, 1964

2 Sheets-Sheet 1

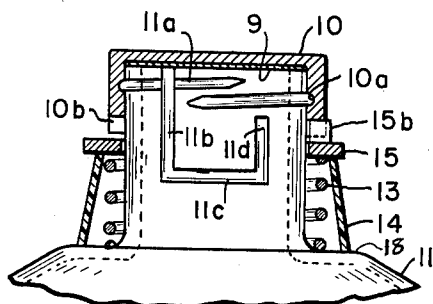


Fig. 1

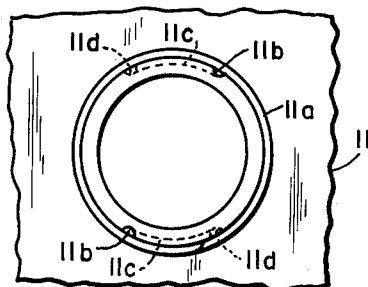


Fig. 2

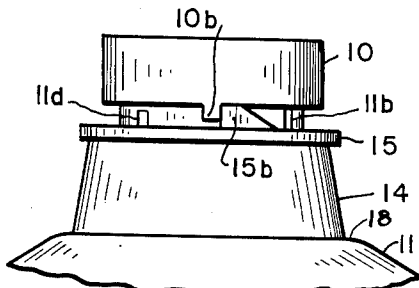


Fig. 3

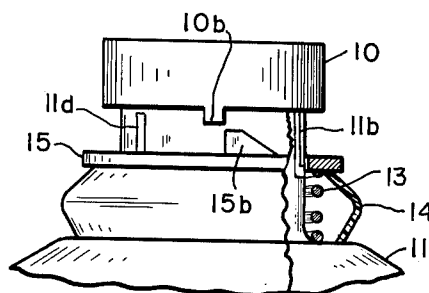


Fig. 4

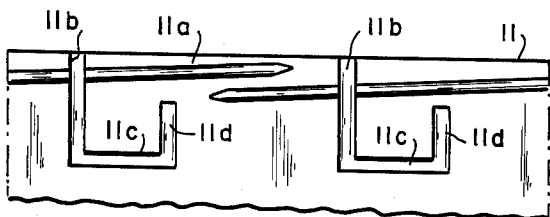


Fig. 5

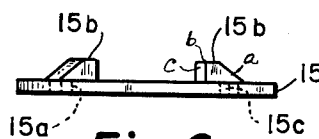


Fig. 6

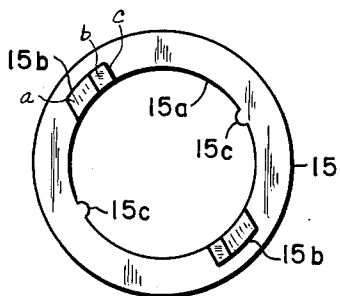


Fig. 7

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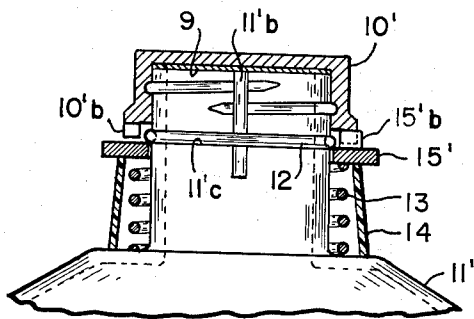


Fig. 8

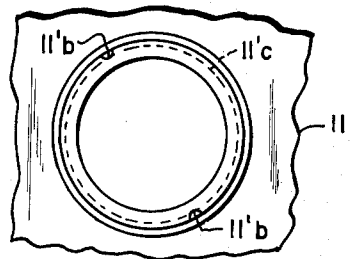


Fig. 9

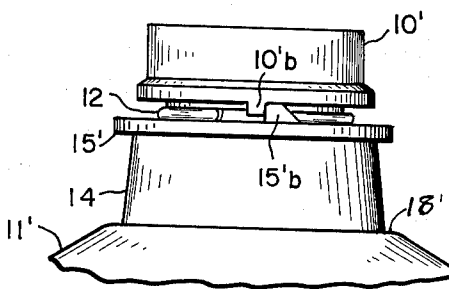


Fig. 10

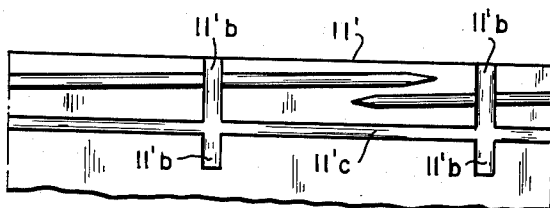


Fig. 11

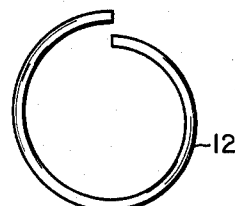


Fig. 12

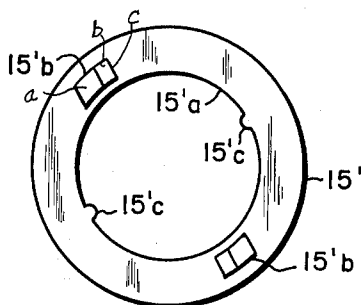


Fig. 13

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LATCHING CAP

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14 Claims. (Cl. 215-9)

This invention relates to a container or bottle closure construction having a latching or locking type of closure cap and particularly, to a latching cap or closure device for a container, bottle or the like that is latched or locked in its closed position with respect to the mouth of the container and which will require special or unlatching movement before it can be removed.

It has been an object of my invention to provide an improved safety closure for containers, bottles and the like having contents that are dangerous if not used properly or in accordance with specific instructions, which closure, will, in effect, at least give warning to a prospective user that its contents are not harmless;

Another object of my invention has been to devise a safety closure or cap for containers, bottles and the like which will require special manipulation to remove, as a safety precaution not only from the standpoint of children but also from the standpoint of adults;

A further object of my invention has been to devise a new, effective, and simplified type of safety closure construction for containers, bottles and the like;

These and other objects of my invention will appear to those skilled in the art from the drawings and the description thereof as well as the appended claims.

In the drawings, FIGURE 1 is a sectional view in elevation which is fragmental from the standpoint of a body of the container or bottle, illustrating a preferred device or construction of my invention in a sealing-latched or locked, closing-off position;

FIGURE 2 is a top plan view on the scale of and of the construction of FIGURE 1;

FIGURE 3 is a side view in elevation on the scale of and of the closure construction of FIGURE 1, showing it in the latched or safety-locked position of such figure;

FIGURE 4 is a view on the scale of and similar to FIGURE 3, but showing the closure in an unlatched position, ready for screw-out or off removal;

FIGURE 5 is a side development on the scale of FIGURES 1 to 4, inclusive, illustrating details of the construction from the standpoint of screw threads and groove or slot systems on the neck of the container;

FIGURE 6 is a side view in elevation showing details of the construction of a latching ring or washer used in the device of FIGURES 1 to 4, inclusive; and, FIGURE 7 is a top plan view of the ring of FIGURE 6;

FIGURE 8 is a vertical view in sectional elevation of a modified construction or device of my invention which employs a simplified type of groove or slot arrangement and a retaining ring for its latching ring or washer;

FIGURE 9 is a top plan view on the scale of and of the construction of FIGURE 8;

FIGURE 10 is a side view in elevation on the scale of and of the construction of FIGURES 8 and 9 and, like FIGURE 8, shows the construction in its latched or locked position;

FIGURE 11 is a side development on the scale of FIGURES 8 to 10, showing the thread and groove construction of the neck of the container;

FIGURE 12 is a top plan view of a mounting or positioning ring employed for retaining the latching ring or washer in position on the neck of the container or bottle; and

FIGURE 13 is a top plan view on the scale of FIGURES 8 to 12, inclusive, showing the latching ring or washer of the construction.

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In carrying out my invention, I employ a closure or cap 10 for the mouth of a container body or bottle 11 which is adapted to be turned, for example, in a clockwise direction along threading of the neck of the container to screw it down and seal-off the contents of the container from the atmosphere and to prevent leakage when the container is tilted or upset. I also employ a latching ring or washer 15 which is removably-retained on and is normally urged longitudinally, vertically-upwardly or outwardly towards the upper end or mouth of the neck of the container 11 by a coiled tension spring 13, so as to latch-engage or lock with the cap 10 when the latter is screwed-down to its closing-off or sealing position.

Referring particularly to FIGURES 1 to 7, inclusive, I have illustrated a closure cap 10 of a suitable material, such as metal or a resin, which is relatively rigid in construction, is of cup-shape, with a closed-off top wall or end and an open bottom wall or end. Internal or female threads 10a of the cap 10 are adapted to engage complementary projecting or male threads 11a about the neck of the container 11 for screwing the cap on and off of the container. As shown particularly in FIGURE 1, a sealing washer 9 of suitable material, such as a resin, treated paper, etc., is adapted to seat within the upper or closed-off end wall of the cap 10 to directly engage upper mouth edges of the neck of the container 11 and seal-off its contents when the cap is tightened-down by screwing it on the neck. It will be noted that the threads 10a and 11a are relatively wide and of a type such as to facilitate quick and efficient screwing-off and on action of the cap 10.

A latching or locking ring or washer or relatively flat annulus or ring element 15, preferably of a rigid nature and of a suitable material, such as resin or metal, is adapted to be mounted over the neck of the bottle 11. In this connection, the washer or ring 15 is shown provided with a pair of oppositely-positioned slide-guide ribs or lugs 15c (see FIGURE 7) that project radially-inwardly from its inner peripheral edge or diameter 15a for movement along cooperating groove systems of the neck of the bottle 11. As shown particularly in FIGURES 1 and 5, the neck of the bottle 11 has a pair of similar, opposed groove systems. Each system consists of a longitudinally, vertically or axially-extending entry groove portion 11b which is open to the upper end of the neck or mouth of the container 11 and which extends downwardly along the neck below the threads 11a and is connected at its closed bottom end by a back end of a transverse or cross guide groove portion 11c to a lower closed end of a relatively short-length, position-retaining or positioning groove portion 11d that extends parallel with the portion 11b, but is closed at its upper end or towards the open end or mouth of the container 11.

It will be apparent that the latch ring or washer 15 can be inserted on the neck of the bottle 11 by aligning its lugs 15c with the groove portions 11b and then pressing it downwardly by the application of two fingers of the hand at opposite positions adjacent the lugs, upon its planar upper face, until it has moved into alignment with the groove portions 11c, at which time, it may be turned or partially rotated counterclockwise about a quarter of a turn along the guide groove portions 11c until its lugs 15c enter the positioning groove portions 11d. At this time, the washer 15 may be released and will then be retained in an operating position within upper ends of the groove portions 11d by upward force exerted by a spiral or coiled tension spring 13, whose upper end abuts the lower planar side of the washer 15 and whose lower end abuts an upper face or shoulder 18 of the body of the container 11, adjacent to the base of its neck. The shoulder 18 connects the neck to the body of the con-

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tainer and has a side-projecting positioning with respect to the neck.

As particularly illustrated in FIGURES 3 and 4, the closure or cap 10 has a pair of oppositely-positioned downwardly-projecting latching lugs or projections 10b, shown of rectangular shape. The lugs 10b may project from the edges of the side skirt of the cap 10, in order to, when the cap is screwed-down to its sealing-off or closing position, ride up over backwardly-sloped faces a of a pair of diametrically-opposed latching cams 15b that project upwardly from an upper face of the washer 15. When the cap 10 has been screwed-down sufficiently, the lugs 10b will ride along upwardly-sloped faces or edges a of the cams 15b and press-down on opposite sides of the washer 15 and thus, partially depress or compress the spring 13 downwardly or inwardly. However, when the latch lugs to projections 10b pass horizontal faces b of the cams 15b, then the washer 15 is forced upwardly or outwardly by the spring 13 to the latching position shown in FIGURE 3. At this time, the lugs 10b engage vertical abutments c of the cams 15b.

It will thus be apparent that the cap 10 cannot now be removed by merely turning it, for example, counter-clockwise with respect to the neck of the container 11. It also cannot be removed if one side of the washer 15 is merely pressed-down so as to release one of its latching cams 15b. That is, downward pressure must be accomplished simultaneously at opposite positions on the upper face of the washer 15 to depress both of its latching cams 15b, in order to release the latching lugs 10b of the cap 10. As shown in FIGURE 4, when this is accomplished, the cap 10 can then be turned or screwed upwardly or outwardly to remove it from the container. The washer 15, although it is removable from the pair of groove systems, is retained in its operating position within the groove portions 11d until it is desired to, for example, cleanse or wash the container. The removal is accomplished by pressing-down on both sides of the washer 15 to compress the spring 13 and bring the lugs 15a into alignment with the groove portions 11c, and then turning the washer backwardly or clockwise along the portions 11c until they are in alignment with entry groove portions 11b.

To improve the appearance of the construction, I have also shown an annular, sleeve-like, flexible or resilient skirt or collar 14 which is adapted to extend between the underface of the latching washer 15 and the shoulder 18 of the body of the container 11. The shoulder 18 extends outwardly from the neck of the bottle and may, as shown, be substantially at right angles or perpendicular thereto. The skirt or collar 14 normally, when the spring 13 has fully moved the washer 15 to its position of FIGURES 1 and 2, to the upper ends of the groove portions 11d, is of open, somewhat circular-shape corresponding to a segment of a cone. When pressed downwardly by a downward pressure of the washer 15, as shown in FIGURE 4, then the skirt or collar 14 is adapted to flex outwardly or be distorted. The skirt 14 may be of any suitable material, such as rubber or flexible resin, and may be employed with decals, etc., to indicate directions, contents of the container, etc.

Although I have shown a preferred embodiment of my invention in FIGURES 1 to 7, inclusive, I have disclosed another embodiment thereof in FIGURES 8 to 13. In this latter construction, cap 10' is slightly outwardly offset adjacent its bottom edges and its pair of latching lugs 10'b, so as to clear a split, flexible or outwardly expansible positioning ring 12 which is employed to retain latching washer 15' in its operating position on the neck of the container 11. In this construction, the spring 13 and the skirt 14 may be identical with the corresponding parts of the first-described embodiment. Also, the ring or washer 15' has inwardly-projecting guide lugs 15'c at opposite positions on its inner periphery 15'a and a pair of latching cams 15'b that are similar to the

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construction shown in FIGURE 7. However, in this embodiment, the neck of the container 11' is only provided with a simplified groove system that has a pair of axially or longitudinally-extending, opposed entry groove portions 11'b which are open at their upper ends, adjacent the mouth of the container 11' and are closed at their bottom ends. The grooves 11'b permit the latching washer 15'b to be moved downwardly along the neck of the container until its lugs 15'c strike their closed or bottom ends. At this time, the split ring 12, for example, of spring-like metal material, is then moved downwardly in an expanded relation over the neck of the container 11', and snapped to a position within a circular groove portion 11'c. In this position, the ring 12 abuts the upper face of the latching washer 15' to hold it in its operating position on the neck of the container 11'. Normally, the spring 13 will flexibly-press the latching ring or washer 15' into abutment with the position-retaining ring 12. The latching of the cap 10' and its release is effected in the same manner as described in connection with the previous embodiment of the invention.

Briefly, I employ a latching ring or washer which has offset portions that cooperate with complementary offset portions of the neck of the container to guide the latching ring into and out of an operating relation or positioning on the neck, and that control the releasing or unlatching action of the latching ring with respect to the closure cap when the ring is pressed downwardly against the upward urging of the spring. These offset portions serve to guide the latching ring during its movement. The offset or groove system of the neck also serves to retain the latching ring in its operative relation or positioning on the neck.

It will be apparent to those skilled in the art that the invention is not restricted to specific details employed in illustrating its principles, and that various modifications and changes may be made as to the illustrated constructions without departing from its spirit and scope.

What I claim is:

1. A latching cap device for closing-off the mouth portion of the threaded neck of a container which comprises, a cup-shaped cap body having internal threading for cooperating with the threaded neck of the container to removably-secure said cap body in position over the mouth portion, a latching ring of relatively rigid construction adapted to be positioned on the threaded neck, said latching ring and the threaded neck having cooperating portions to independently of said cap body latch-retain said latching ring in an operating position on and against outward movement off said threaded neck, said cap body and said latching ring having projecting latching lug and latching cam means for cooperative engagement when said cap body is screwed-down on the threaded neck, spring means adapted to be positioned about the threaded neck to normally urge said latching ring into latching engagement with said cap body, and said spring means being compressible by downward pressure exerted on said latching ring to release said latching lug and cam means for cooperative engagement, so that said cap body may be screwed-off the threaded neck of the container.

2. A latching cap device as defined in claim 1 wherein said latching lug and cam means has cooperating oppositely-positioned pairs of lugs and cams, whereby said latching ring has to be pressed downwardly at opposite points to release said latching lug and cam means from cooperative engagement.

3. A latching cap device as defined in claim 1 wherein said cooperating portions for latch-retaining said latching ring in position comprise lugs projecting radially-inwardly from said latching ring and cooperating offset groove portions in the threaded neck of the container.

4. A latching cap device as defined in claim 1 wherein said cooperating portions for latch-retaining said latch-

ing ring in position comprise a flexible split ring and a groove portion in the threaded neck.

5. A latching cap device as defined in claim 1 wherein a flexible collar is adapted to extend about said spring means along the threaded neck to enclose said spring means.

6. A latching cap device as defined in claim 1 wherein, said latching ring is of washer-like shape having relatively flat upper and lower faces, said latching cam means has a pair of cams projecting upwardly from the upper face of said latching ring, each of said cams has an upwardly-sloped forward edge and a back abutment edge; said latching lug means has a pair of oppositely-positioned lugs projecting downwardly from said cap body that, when said cap body is screwed-down on the threaded neck, ride up over the upwardly-sloped edges of said pair of latching cams and into latching-engagement with the back abutment edges thereof; and said latching lugs are released from latching-engagement with the back abutment edges of said latching cams by simultaneous downward pressure at opposite positions on the upper face of said washer against the resiliency of said spring means.

7. An improved container closure construction which comprises, a container body having a neck surmounted by an open mouth, said neck being connected by an outwardly-projecting shoulder portion to said container body, said neck being of substantially cylindrical shape and having threads therealong extending from the mouth portion towards said shoulder portion, a groove system open from the mouth and extending downwardly along said neck and the threading thereon towards said shoulder portion, a cup-shaped closure cap having internal threads therein for cooperative engagement with the threads of said neck to close-off the open mouth thereof, a ring-like latching element of relative rigid construction having a sufficient internal diameter for downward movement over said neck and having radially-inwardly-projecting guide lug portions adapted to slide along said groove system, so that said closure ring may be moved downwardly on said neck into an operating relation thereon, said latching ring and said neck having cooperating means to independently of said closure cap latch-retain said latching ring in its operating relation on and against outward movement off said neck, spring means positioned on said neck and cooperating with the shoulder portion of said container body and with an under side of said latching ring for normally resiliently-urging said latching ring upwardly in its operating relation on said neck as limited by said cooperating means, said latching ring and said cap body having cooperating latching portions that latch-engagement with respect to each other when said cap body is screwed-down on said neck, and said latching ring being adapted to be pushed downwardly along said neck from an upper latch-engaging position with said cap to a lower position against the resiliency of said spring means to disengage said cooperating latching portions with respect to each other, so that said cap body may be screwed upwardly-off said neck.

8. An improved container closure construction as defined in claim 7 wherein said cooperating means comprises said guide lugs and a portion of said groove system.

9. An improved container closure construction as defined in claim 7 wherein said cooperating means comprises, split ring means adapted to fit over said neck, and a groove portion about said neck within which said split ring is adapted to be positioned to engage an upper surface of said latching ring.

10. An improved container construction as defined in claim 7 wherein, said groove system comprises a pair of longitudinal entry groove portions open to and extending downwardly along said neck, transverse groove portions connected at their back ends to lower ends of said entry groove portions, and relatively short-length longitudinal positioning groove portions extending upwardly along

said neck and connected to front ends of said transverse groove portions; said guide lugs of said latching ring are adapted to move downwardly along said entry groove portions to the lower ends thereof, along said transverse groove portions, and upwardly along said positioning groove portions by pushing said latching ring inwardly against the resiliency of said spring means along said entry groove portions, turning said latching ring along said transverse groove portions, and then moving said latching ring means upwardly along said positioning groove portions under expansion force exerted by said spring means.

11. An improved container closure construction which comprises, a container body having a substantially cylindrical neck surmounted by an open mouth and a side-projecting shoulder adjacent said body, a closure cap of cup-like shape having internal threads on its inner wall, external threads on said neck for cooperative engagement with the threads of said cap for removably-securing said cap on said neck to close-off the open mouth, a latching ring of relatively rigid construction for movement upwardly and downwardly on said neck, said cap and said latching ring having cooperating latching lug and cam portions to latch-engage with each other when said cap is screwed on said neck, said latching ring and said neck having cooperating offset portions to guide said latching ring downwardly and upwardly on said neck into and out of an operating positioning on said neck and to independently of said closure cap latch-retain said latching ring in its operating positioning on and against upward movement off said neck, a spring operatively-positioned to extend between said shoulder and said latching ring to normally urge said latching ring upwardly on said neck, and said latching ring being movable downwardly on said neck at its operative positioning thereon against the resiliency of said spring to release said cooperating latching lug and cam portions from latch-engagement with each other, whereby said cap may be screwed-off said neck.

12. An improved container closure construction as defined in claim 11 wherein said cooperating offset portions have portions on opposite sides of said neck and said latching ring that require a two-point application of downward force on said latching ring to release the latching-engagement of said lug and cam portions with each other.

13. An improved container closure construction which comprises, a container body having a substantially cylindrical neck surmounted by an open mouth and a side-projecting shoulder between said neck and said body, a closure cap body of cup-like shape having internal threads along its inner wall, external threads about said neck extending downwardly from the open mouth thereof for cooperative engagement with the threads of said cap body for removably-securing said cap body on said neck to close-off the open mouth, said cap body having a pair of oppositely-positioned downwardly-projecting latching lugs, said neck having a pair of oppositely-positioned groove systems thereon; each of said systems comprising, a longitudinal entry groove portion open from the open mouth and extending along said neck downwardly beyond said external threads, a cross-extending groove portion projecting from its back end about a quarter of a turn from the end of said entry groove portion, and a relatively shorter length longitudinal positioning groove portion projecting upwardly from the front end of said transverse groove portion and slightly above a lower termination of said external threads, a latching washer having an inner diameter of sufficient size to move over said neck and said external threads, said washer having a pair of oppositely-positioned radially-inwardly-projecting guide lugs for cooperative sliding movement along said opposed groove systems for moving said latching washer into and out of an operating position within said positioning groove portions, a spiral tension spring operatively-positioned about said neck with its upper end in

abutment with a lower face of said latching washer and its lower end in abutment with said side-projecting shoulder for normally urging said latching washer upwardly along said neck as limited by said groove systems, said latching washer having a pair of oppositely-positioned upwardly-projecting latching cams on its upper face for engagement with said latching lugs of said cap body when said cap body is screwed-down on said neck; said latching cams having upwardly-sloped forward faces over which said latching lugs are adapted to ride against the resiliency of said spring, and having back latching ledge faces which are adapted to latch-engage with said latching lugs under the upward urging of said spring means to retain said cap body on said neck, and said latching washer being adapted to be pressed-downwardly adjacent said guide lugs against the resiliency of said spring to

move said latching cams out of engagement with said latching lugs, whereby said cap body may be screwed-off said neck.

14. An improved container closure construction as defined in claim 13 wherein a flexible collar is positioned about said spring to extend between said latching washer and said shoulder to enclose said spring.

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FRANKLIN T. GARRETT, *Primary Examiner*.

GEORGE O. RALSTON, *Examiner*.