United States Patent

Linkletter

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[54] SPOUT-TYPE SAFETY DISPENSING CAP

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[52] **U.S. Cl.**.....**222/153,** 222/532, 222/561

[51] **Int. Cl.**.....**B67d 5/32**

[58] **Field of Search**.....222/153, 512, 531, 532, 536, 222/537, 538, 555, 556, 561, 534; 221/154

[56] **References Cited**

UNITED STATES PATENTS

3,094,255	6/1963	Hunter	222/534 X
3,325,054	6/1967	Braun	222/153 X
3,542,256	11/1970	Waterman	222/536 X

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Assistant Examiner—Francis J. Bartuska
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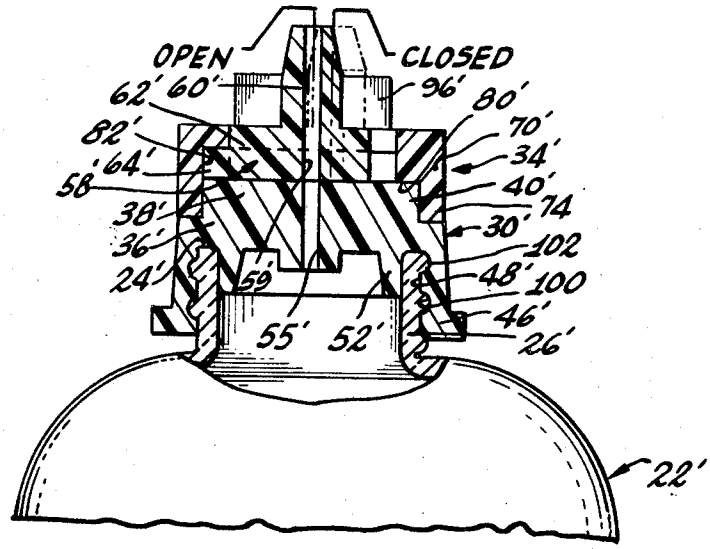
[57] **ABSTRACT**

A safety dispensing cap for liquid containers such as bottles and cans, having a spout-type dispensing valve mounted in a channel in a closure member secured to the container. The valve is movable between an open position and a closed position, and a rotatable safety ring encircles a portion of the closure member and must be precisely aligned in a preselected position relative to the valve before the valve can be moved from the closed position to the open position. In one embodiment, the valve has a base which is rotatable within the channel and in a second embodiment, the base is slidable within the channel, the base being movable in both embodiments only when a recess in the ring is properly aligned with an end abutment on the base.

17 Claims, 11 Drawing Figures



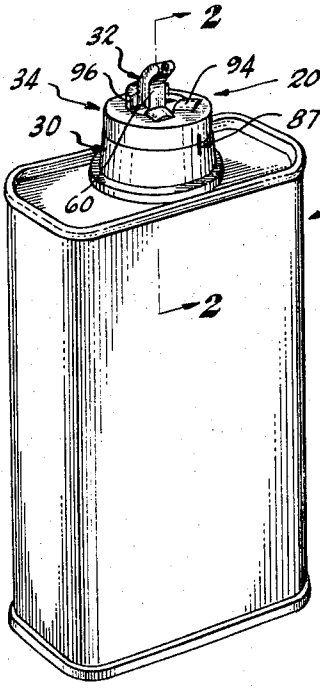


Fig. 1

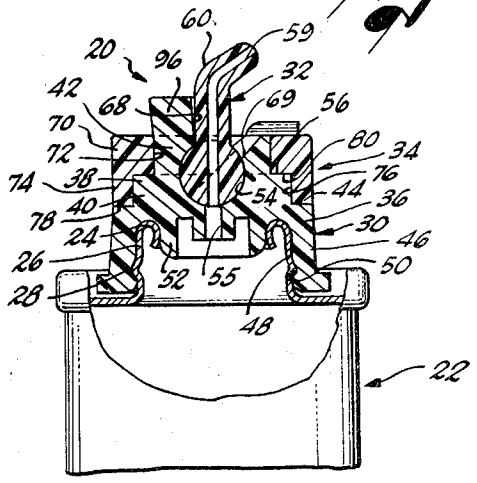


Fig. 2

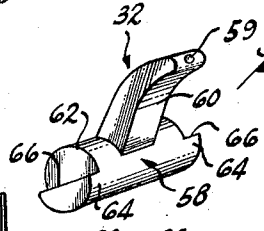


Fig. 5

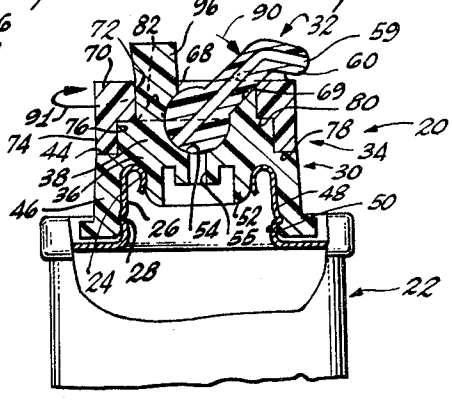


Fig. 3

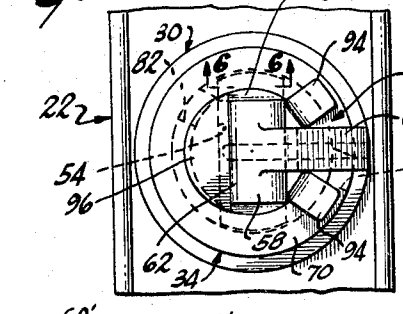


Fig. 4

Fig. 6

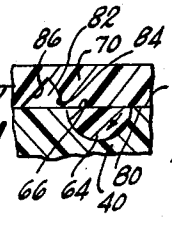


Fig. 7

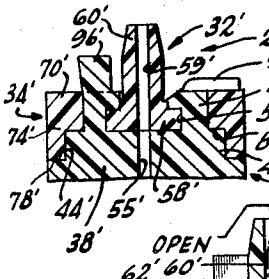


Fig. 11

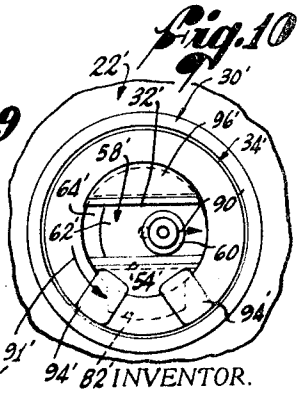


Fig. 10

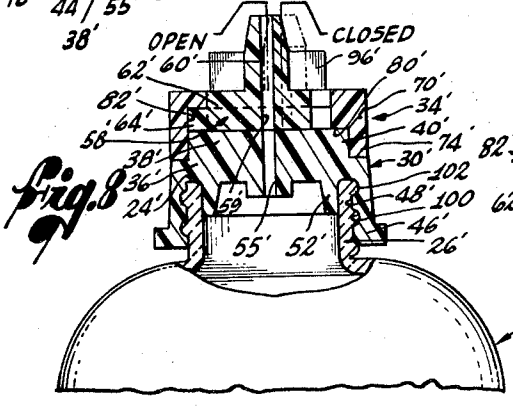


Fig. 8

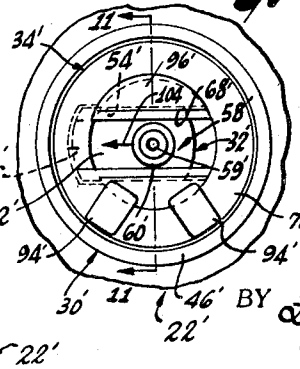


Fig. 9

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SPOUT-TYPE SAFETY DISPENSING CAP

BACKGROUND OF THE INVENTION

The present invention relates to dispensing caps for bottles and cans used to store liquids, and has particular reference to a spout-type safety cap which cannot be readily opened by a child.

It is quite common and desirable to employ spout-type dispensing caps on a variety of containers used to store many toxic, inflammable or otherwise potentially harmful liquids. Typical of such closures are those presently used on lighter fluid cans, dishwashing soap bottles, and hair coloring containers, to mention a few.

With the advent of increased interest in protecting small children from opening containers of potentially harmful substances, there has arisen a need for a more reliable, efficient and inexpensive spout-type safety dispensing cap suitable for use on a variety of types of containers. Such a closure should be capable of being opened quickly and easily by one familiar with its operation, while being difficult to open by a child or one unfamiliar with its operation.

SUMMARY OF THE INVENTION

The safety dispensing cap of the present invention provides a reliable and efficient closure which cannot be readily operated by a child, yet which can be quickly and easily opened by one familiar with its operation. Further, the safety cap of the invention can be used on a wide variety of containers and is long-lasting in use and low in cost of manufacture.

The safety cap includes a closure member having a lateral channel across the top within which a movable spout-type dispensing valve is carried. A rotatable safety ring surrounds a portion of the closure member and prevents the valve from being moved from the closed position to the open position unless the ring is properly and precisely aligned in the preselected position relative to the valve.

In one embodiment, the valve has an elongated base which is slidable within the channel, and the ring includes an internal recess dimensioned to receive one end of the base. The valve is moved from the closed position to the open position by rotating the ring to align the recess with the valve and then sliding the base along the channel to move the end of the base into the recess.

In another embodiment, the valve has a generally cylindrical base carried axially within the channel and rotatable between the open and close positions. An abutment is carried by each of the ends of the base, and corresponding recesses are formed on an inner surface of the ring to receive the abutments only when the ring is rotated to properly align the recesses with the abutments. Upon alignment, the base can then be rotated to move the abutments into the recesses and thus open the valve.

The many features and advantages of the invention will become apparent from the following detailed description taken in conjunction with the accompanying drawings which illustrate, by way of example, the principles of the invention.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of one embodiment of the safety dispensing cap of the invention, shown with the dispensing valve in the open position and as applied to a conventional can-type container;

FIG. 2 is a fragmentary sectional view of the cap of FIG. 1, taken substantially along line 2—2 of FIG. 1, with a portion of the container shown partly in side elevation and partly broken away;

FIG. 3 is a view similar to FIG. 2 illustrating the dispensing valve in the closed position;

FIG. 4 is a top plan view of the cap of FIG. 3;

FIG. 5 is an isolated perspective view of the spout-type dispensing valve of the embodiment of FIG. 1;

FIG. 6 is a fragmentary sectional view taken substantially along line 6—6 of FIG. 4, with the dispensing valve in the open position;

FIG. 7 is a view similar to FIG. 6, with the dispensing valve in the closed position and the safety ring rotated to the position illustrated in FIGS. 3 and 4;

FIG. 8 is a fragmentary sectional view of another embodiment of the safety dispensing cap of the invention, as applied to a conventional bottle-type container, which is shown in side elevation but partly broken away;

FIG. 9 is a top plan view of the embodiment of FIG. 8 with the dispensing valve in the open position;

FIG. 10 is a top plan view, similar to FIG. 9, with the dispensing valve of FIG. 8 in the closed position; and

FIG. 11 is a fragmentary sectional view taken substantially along the line 11—11 of FIG. 9.

DETAILED DESCRIPTION

As illustrated in the drawings, the present invention is embodied in spout-type safety dispensing cap 20 for bottles, cans and other containers used to store liquids. In this instance, referring to the embodiment of FIGS. 1 through 7, the cap 20 is mounted on a can-type container 22 which has an open mouth 24 and a neck 26, the cap being telescoped onto the neck and held in place therein by a circumferential rib 28 formed around the neck.

In accordance with the present invention, the safety cap 20 provides more efficient and reliable closure which prevents a young child from opening the cap and dispensing the contents of the container 22, yet which can be easily and quickly opened by one familiar with its operation. The safety cap 20 is long-lasting in use, low in cost of manufacture and can be used with a wide variety of types of containers. Toward these ends, the cap 20 employs a closure member 30 overlying the container mouth 24, and a dispensing valve 32 carried by the closure member and movable between open and closed positions. A rotatable safety ring 34 encircles a portion of the closure member 30 and prevents opening of the valve 32 unless the ring has been rotated to a preselected position relative to the valve.

More specifically, as best seen in FIGS. 2 and 4, the closure member 20, which preferably is formed of molded plastic, has a lower, generally circular cap portion 36 which overlies the mouth 24 of the container 22, and a top portion 38, herein comprising two coaxial tiers 40 and 42 of successively smaller outside diameters projecting above the upper surface 44 of the cap portion. A depending skirt 46 projects downwardly from the cap portion 36 and has an inner surface 48 dimensioned to frictionally engage the outer surface of the container neck 26.

The closure member 30 is secured to the container 22 by a circumferential groove 50 formed around the inner surface 48 of the skirt 46, which mates with the neck rib 28. A ring-shaped flange 52, projecting below the underside of the cap portion 36, engages the inside of the container mouth 24 to provide a fluid-tight seal between the container 22 and the closure member 30.

The top portion 38 forms a mounting for the dispensing valve 32 and the safety ring 34. The valve 32 is mounted in a channel 54 which has a generally circular cross-section and extends laterally across the top portion 38, and the ring 34 is supported around the top portion by a shoulder defined by the exposed upper surface 44 of the cap portion 36, and a second shoulder 56 defined by the exposed upper end surface of the lower tier 40.

Preferably, the channel 54 extends diametrically across the full width of the lower tier 40 and is centered between the two tiers 40 and 42 so that the axis of the channel lies in the plane defined by the upper end 56 of the lower tier. A dispensing opening 55 is formed through the closure member 30 and communicates between the bottom of the channel 54 and the underside of the cap portion 36.

As shown in isolated perspective in FIG. 5, the valve 32 includes an elongated base 58 which is rotatably mounted in the channel 54, and an upstanding spout 60 projecting generally radially from one side of the base intermediate the ends thereof. A dispensing passage 59 is formed through the spout 60 and extends diametrically through the base 58, the passage being alignable with the dispensing opening 55 through the closure member 20 when the valve 32 is rotated to the open position of FIG. 2.

The base 58 has a generally cylindrical central position 62 which has a length and diameter approximately equal to that of the portion of the channel 54 extending laterally across the upper tier 42, and a pair of eccentric end abutments 64, each of which has a semi-circular cross section and is of a length and radius approximately equal to that of the additional channel portion which extends laterally across the lower tier 40 beyond the upper tier. The base abutments 64 have diametrical surfaces 66 which are angularly positioned in relation to the spout 60 so that, when the valve 32 is in the closed position illustrated in FIGS. 3, 4 and 7, the diametrical surfaces will be flush with the upper end surface 56 of the lower tier 40.

The valve 32 is installed in the channel 54 by sliding the base 58 longitudinally along the channel from one end, a slot 68 being formed through the upper tier 42 to allow the spout 60 to pass laterally through the upper tier. An inclined surface 69 is formed along the forward side of the slot 68 to allow the spout 60 to assume the closed position, as illustrated in FIG. 3. Once the valve 32 has been assembled in the channel 54, the safety ring 34 is positioned over the closure member 30 and moved into place around the top portion 38.

Referring primarily to FIGS. 2 and 3, the safety ring 34 includes an upper portion 70 having an inside cylindrical surface 72 surrounding the upper tier 42, and a lower portion 74 having an inside cylindrical surface 76 surrounding the lower tier 40, the diameter of each of the inside surfaces being slightly greater than that of the corresponding tier diameter so that the ring will be freely rotatable relative to the closure member 30. The ring 34 is supported on the closure member 30 by a lower end face 78 which rests on the exposed upper surface 44 of the cap portion 36, and a downwardly facing inside surface 80 interconnecting the inside cylindrical surfaces 72 and 76 of the ring, and which rests on the exposed upper end 56 of the lower tier 40.

With the ring 34 in place around the top portion 38 and the valve 32 in the closed position, the valve is completely constrained against movement. The inside surfaces 72 and 76 of the upper and lower ring portions 70 and 74, respectively, prevent the valve from moving longitudinally within the channel 54, and the downwardly facing inside surface 80 of the ring forms an abutment surface which rests on the diametrical surfaces 66 of the base abutments 64 to prevent the base from rotating relative to the channel, the diametrical surfaces of the base abutments being flush with the upper end 56 of the lower tier 40.

To permit the valve 32 to be moved to the open position, two upwardly opening recesses 82 (see FIGS. 6 and 7) are formed in the downwardly facing inside surfaces 80 of the ring 34. The recesses 82 are dimensioned to receive one of the base abutments 64 and are angularly spaced from each other around the ring 34 so that they are simultaneously alignable with the base abutments. Each of the recesses extends across the ring the full length of the associated base abutment 64 and has a generally sector-shaped cross-section defined by an arcuate wall 84 having a curvature like that of the radius of curvature of the base 58, and an inclined wall 86 formed as a radius of the arcuate wall.

Preferably, the recesses 82 are located on the same side of a diametrical line across the ring 34, the inclined walls 86 each originating at a point on the diametrical line and extending upwardly into the ring upper portion 70 from the downwardly facing inside surface 80. With this arrangement, the valve 32 is movable to the open position only when the ring 34 is in one precisely aligned position relative to the eccentric base abutment 64, indicia 87 (see FIG. 1) herein being provided on the ring and outer surfaces of the skirt 46 of the closure member 30 to indicate when the precise alignment has been achieved.

When the recesses 82 are properly aligned with the base abutments 64, the base 58 can be rotated by manually raising the spout 60 from the inclined closed position of FIG. 3, to the vertical, open position of FIG. 2. During rotation of the valve 32 to the open position, the base abutments 64 move into the recesses 82, as shown by the arrow 88 of FIG. 6, and the dispensing passage 59 through the valve is aligned with the dispensing opening 55 through the closure member 30.

Upon completion of a dispensing operation, the valve 32 is returned to the closed position to block off the dispensing opening 55 by rotating the spout 60 to the inclined position, as indicated by the arrow 90 of FIG. 3. This moves the base abutments 64 out of the recesses 82 and frees the ring 34 for rotation about the closure member 30 (see arrows 91 and 92 of FIGS. 3 and 7, respectively) to move the recesses out of alignment with the base abutments and prevent the valve 32 from being reopened until the ring is again properly aligned with the base abutments.

While any suitable means may be used to hold the ring 34 on the closure member 30, herein a pair of originally upstanding tabs 94 on the top of the upper tier 42 are bent over the top of the ring by applying heat and pressure. The tabs 94, one spaced on either side of the inclined forward edge 69, loosely hold the ring 34 against the upper surfaces 44 and 56 of the cap portion 36 and lower tier 40, respectively. An arcuate post 96 projects upwardly from the top of the upper tier 42 opposite the tabs 94 and has a small radial flair to further restrain the ring 34 from being moved axially relative to the closure member 30. The post 96 also functions as a stop to prevent the spout 60 from being moved beyond the vertical, open position, this being desirable to prevent possible damage to the ring 34 by the base abutments 64 should excessive pressure be applied to the spout when in the open position.

An alternative embodiment 20' of the safety cap of the invention is illustrated in FIGS. 8 through 11, with similar parts to those of the embodiment of FIGS. 1 through 7 being designated by corresponding primed reference numerals. The major distinction between this embodiment and that of FIGS. 1 through 7 is that the dispensing valve 32' of FIGS. 8 through 11 is slidable relative to the lateral channel 54', rather than being rotatable as in FIGS. 1 through 7.

Referring primarily to FIGS. 8 and 11, the closure member 30' is shown mounted on a bottle-type container 22', the depending skirt 46' having threads 100 formed on the inner surface 48' to mate with corresponding threads 102 on the container neck 26'. The channel 54' extends laterally across the top portion 38' of the closure member 30' and in this instance has an inverted generally T-shaped cross-section preferably extending only through the upper tier 42'.

The base 58' of the valve 32' is dimensioned to fit slidably within the channel 54', and has only one end abutment 64', herein extending to the left in FIGS. 8 through 10 from the central portion 62'. The length of the base 58' is approximately equal to that of the channel 54' so that when the valve 32' is in the closed position, as shown in FIG. 10 and by the phantom lines of FIG. 8, the safety ring 34' completely constrains the base against movement along the channel.

The ring 34' has a single recess 82' formed in the downwardly facing inside surface 80' for receiving the base abutment 64' when the recess is aligned with the abutment, the recess being rectangular in cross-section and herein extending radially into the ring a distance approximately equal to the length of the base abutment, as best seen in FIG. 9. The spout 60' is offset from the center of the base 58' so that when the valve 32' is in the open position of FIGS. 8 and 9 with the base abutment 64' in the recess 82', the dispensing passage 59' is aligned with the dispensing opening 55' through the closure member 30'.

As should be evident, the operation of the embodiment of FIGS. 8 through 11 is substantially like that of the embodi-

ment of FIGS. 1 through 7, the valve 32' being moved to the open position by properly aligning the recess 82' with the base abutment 64' and then sliding the valve along the channel 54' as indicated by the arrow 104 of FIG. 9. Upon completion of the dispensing operation, the spout 60' is manually moved in the direction of the arrow 90' of FIG. 10 to close the valve 32' and block off the dispensing opening 55'. The ring 34' is then rotatable to misalign the recess 82' with the base abutment 64', and the inside surface 72' of the upper ring portion 70' forms an abutment surface which prevents reopening of the valve until the ring is again properly aligned with the base abutment.

From the foregoing, it will be appreciated that the safety cap of the invention is effective to prevent opening of the dispensing valve unless the safety ring has been precisely and properly positioned relative to the valve, this requiring some specific knowledge of the operation of the safety cap. Thus, a small child will not be able to readily open the valve and gain access to the contents of the container.

The safety cap, which herein is illustrated as being entirely formed of plastic, can be formed from many materials or combinations of materials such as glass, hard rubber or metal, depending upon the specific requirements of such a cap. Similarly, although only one dispensing opening and one dispensing passage have been illustrated, it will be appreciated that a multiplicity of such dispensing openings or passages can be used and that the valve can employ one or more spouts of a wide variety of shapes and sizes.

While a particular form of the invention has been illustrated and described, it will be apparent that various modifications can be made without departing from the spirit and scope of the invention.

I claim:

1. A safety dispensing cap for a container having an open mouth, said safety cap comprising:

a closure member comprising a cap portion for overlying the container mouth, a generally cylindrical top portion projecting above said cap portion and having a channel extending laterally thereacross, and a dispensing opening through said closure member for communicating between the container mouth and said channel;

a dispensing valve in said channel and movable therein between open and closed positions, said valve having a dispensing passage therethrough which communicates with said dispensing opening when said valve is in said open position, and is out of communication with said opening when said valve is in said closed position;

and a safety ring freely rotatable relative to and encircling a portion of said closure member and having an inside surface with at least one recess therein adjacent said top portion, said recess being alignable with, and dimensioned to receive a portion of, said valve whereby said valve can be moved from said closed position to said open position only by first aligning said ring carried recess with said valve portion and then moving said valve portion into said recess.

2. A safety dispensing cap as defined in claim 1 wherein said valve comprises:

a spout upstanding from the side of an elongated base disposed in said channel, said base being movable relative to said channel between said closed position and said open position, and said dispensing passage extending through said base and said spout.

3. A safety dispensing cap as defined in claim 2 wherein:

said base is slidable along said channel, and one end of said base includes an abutment which extends along said channel to form said valve portion received by said ring recess when said ring is rotated to align said recess with said valve portion and said base is moved along said channel.

4. A safety dispensing cap as defined in claim 2 wherein:

said base is rotatable relative to said channel, and at least one end of said base includes an abutment which forms said valve portion received by said ring recess when said ring is rotated to align said recess with said valve portion and said base is rotated within said channel.

5. A safety dispensing cap as defined in claim 1 wherein:

said channel has a generally circular cross-section;

and said valve comprises a spout upstanding from the side of a generally cylindrical base co-axially disposed in said channel, said base being movable relative to said channel between said closed position and said open position, and said dispensing passage extends through said spout and diametrically through said base.

6. A safety dispensing cap as defined in claim 5 wherein:

said base is rotatable within said channel and includes at least one eccentric end abutment having a generally semi-circular cross-section;

and said recess is dimensioned and arranged to receive said abutment upon alignment of said recess with said abutment and rotation of said base within said channel from said closed position to said open position.

7. A safety dispensing cap as defined in claim 6 wherein:

said base includes two eccentric end abutments, one extending from each end of said base;

and said ring has two recesses spaced around said ring inside surface and alignable one with each of said end abutments.

8. A safety dispensing cap as defined in claim 7 wherein:

said top portion comprises two generally cylindrical tiers of successively smaller diameter projecting co-axially above said cap portion, the axis of said channel being centered between said two tiers and lying along a diameter thereof;

and said ring circumferentially surrounds the lower of said two tiers and a portion of the upper tier, said inside surface being a downwardly facing surface overlying the exposed upper end of said lower tier.

9. A safety dispensing cap for a container having a mouth and a neck, said safety cap comprising:

a closure member comprising a cap portion overlying the container mouth, a depending skirt projecting below said cap portion and engaging the container neck, a generally cylindrical top portion projecting above said cap portion and having a generally cylindrical channel extending thereacross, and a dispensing opening communicating between said channel and the container mouth;

a dispensing valve carried by said closure member, said valve having a generally cylindrical base rotatably received in said channel and including a pair of eccentric end abutments extending along said channel and having a generally semi-circular cross-section, and a dispensing passage through said valve, said dispensing passage extending diametrically through said base and communicating with said dispensing opening when said valve is in an open position and being out of communication with said dispensing opening when said valve is in a closed position;

and a rotatable safety ring encircling said top portion, said ring having an inside surface carrying a pair of spaced recesses each dimensioned to receive a portion of said base abutments, said recesses being alignable with one of said abutments whereby upon alignment, said base can be rotated to move said abutment portions into said recesses thereby opening said valve.

10. A safety dispensing cap as defined in claim 9 wherein:

said top portion comprises two generally cylindrical tiers of successively smaller diameter co-axially projecting above said cap portion, the lower of said tiers having an upper end surface which defines a support shoulder for said safety ring;

said base has a length substantially equal to that of the channel, the length of said abutments each extending the width of said support shoulder;

and said inside surface is a downwardly facing surface overlying said support shoulder, said recesses extending upwardly from said downwardly facing surface whereby rotation of said base moves said abutment portions upwardly into said recesses.

11. A safety dispensing closure as defined in claim 10 wherein:

said dispensing valve further includes a spout upstanding from the side of said base, said dispensing passage extending through said spout;

and said recesses are aligned across said ring to lie on the same side of a ring diameter thereby to allow alignment of said recesses with said abutments only when said ring is in one preselected angular position relative to said valve.

12. A safety dispensing cap for a container having a mouth and a neck, said safety cap comprising:

a closure member comprising a cap portion overlying the container mouth, a depending skirt projecting below said cap portion and engaging the container neck, a generally cylindrical top portion projecting above said cap portion and having a channel projecting thereacross, and a dispensing opening communicating between said channel and the container mouth;

a dispensing valve carried by said closure member and movable relative thereto between open and closed portions, said valve having an elongated base slidably received in said channel and including an abutment extending from one end thereof, and a dispensing passage through said base communicating with said dispensing opening when said valve is in said open position and out of communication with said dispensing opening when said valve is in said closed position;

and a rotatable safety ring encircling said top portion, said ring having an inside surface carrying a recess dimensioned to receive said base abutment, said recess being alignable with said abutment whereby upon alignment said base can be moved along said channel to move said abutment into said recess thereby opening said valve.

13. A safety dispensing cap for a container having an open mouth, said safety cap comprising:

a closure for overlying the mouth of the container and having an opening for communicating through said closure with the interior of the container;

a dispensing valve mounted on said closure and movable relative thereto between open and closed portions, said valve having a dispensing passage communicating with said opening in said open position and out of communication with said opening in said closed position;

a safety ring mounted on said closure around said dispensing valve, said ring being freely rotatable relative to said closure and selectively movable into and out of a preselected angular position relative to said dispensing valve preparatory to movement of the latter from said closed position to said open position;

and means on said safety ring and dispensing valve cooperating to hold the latter in said closed position when said ring is out of said preselected position and to release the dispensing valve to permit independent movement to said open position when said ring is in said preselected position.

14. A safety dispensing cap as defined in claim 13 wherein:

said dispensing valve has a base rotatably supported on said closure, and a spout projecting laterally from one side of said base for tilting between said open and closed positions accompanied by rotation of said base relative to said closure;

and in which said means include a first abutment eccentrically mounted on one end of said base, and a second abutment surface on said safety ring positioned to block eccentric movement of said first abutment and rotation of said base to said open position when said ring is out of said preselected position, and to permit eccentric movement of said first abutment and rotation of said base to said open position when said ring is in said preselected position.

15. A safety dispensing cap as defined in claim 14 wherein:

said base is generally cylindrical and said first abutment extends axially of said one end, said abutment having a generally semi-circular cross section;

and said second abutment surface has at least one recess therein for permitting said eccentric movement of said first abutment.

16. A safety dispensing cap as defined in claim 13 wherein:

said dispensing valve is supported on said closure for transverse sliding thereon between said open and closed positions;

and said means include an abutment surface on said safety ring positioned to block sliding movement of said valve to said open position when said ring is out of said preselected position.

17. A safety dispensing cap as defined in claim 16 wherein:

said dispensing valve has an elongated base slidably supported on said closure, and a spout projecting laterally from one side of said base;

and said means further include an abutment projecting from one end of said base and engaged by said abutment surface to block said sliding movement, and at least one recess is formed in said abutment surface to permit said sliding movement when said ring is in said preselected position.

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