CHILD PROOF SAFETY PACKAGE AND FITMENT THEREFOR

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ABSTRACT

A child proof safety package including a container having a cylindrical mouth portion with an annular rim and a plurality of container locking elements spaced peripherally from each other on the outer surface of the mouth portion; a cap having an end wall with a skirt projecting therefrom and a plurality of cap locking elements on said skirt, the cap locking elements being engageable with and disengageable from the container locking elements by an axial motion followed successively by a rotative motion of the cap relative to the container, and a fitment biasing the cap against axial movement from locked engagement with the container. The fitment includes a cylindrical sealing wall sealingly engaging the inner wall of the mouth of the container, a plunger coaxial with the cylindrical sealing wall, and support means for supporting the plunger for resiliently yieldable movement in an axial direction with respect to the sealing wall. The support means includes a substantially flat end wall extending radially outwardly from one end of the plunger and an axially and radially outwardly extending side wall having its inner periphery joined integrally to the outer periphery of the end wall and its outer periphery joined to the cylindrical wall whereby the plunger exerts a biasing force between the cap and container to resiliently resist axial disengagement of the cap locking elements from the container locking elements.

14 Claims, 3 Drawing Figures
CHILD PROOF SAFETY PACKAGE AND FITMENT THEREFOR

This invention relates generally to child proof safety packages, and is particularly concerned with child proof safety packages of the type having a cap that can be applied to and removed from its container only by a combined axial and rotative motion.

In order to reduce the number of accidental poisonings resulting from young children having access to unsafe medicines, drugs, household chemicals and other products, considerable effort has been made toward developing child proof safety packaging. To fulfill the criteria of a child proof safety package, a container and cap must be constructed in such a manner that the type of manipulation required to remove the cap from the container is one that a young child is not capable of performing. While most small children are capable of unscrewing a conventional screw cap from a container, it has been found that a young child is generally incapable of manipulating a cap that is mounted on a container in such a manner that the cap must be pushed axially relative to the container and then rotated relative to the container in order to remove the cap from the container and provide access to the contents of the container. With the latter type of safety package, the cap must be pushed axially toward the container against a biasing force in order to disengage the cap from the container. See, for example, U.S. Pat. Nos. 3,344,942; 3,432,065 and 3,623,623.

When the contents of the container is liquid, an adequate seal must be maintained under a variety of conditions. The contents of the container may be a liquid medicine or the like that requires vigorous shaking before being used, or the contents may be of the type that causes a pressure buildup within the container over a period of time. Many products are contained in containers having dispensing orifices so that the material can be dispensed from the container through the orifice upon shaking of the container.

An object of this invention is to provide a child proof safety package having a fitting that can serve as a dispensing spout for the container, and which also can serve to exert a biasing force between the cap and container to resiliently urge the cap into locked engagement with the container.

A further object is to provide a molded plastic fitting for a child proof safety package, which, when used in combination with a safety cap and container, will provide a seal for the contents of the container and will also exert a biasing force between the cap and container to urge the cap into locked engagement with the container.

A further object is to provide a dispensing fitting for a child proof safety package that can be mounted in the mouth of a container in sealing engagement therewith and is formed with a dispensing spout through which the contents of the container can be dispensed at a controlled rate, and which can also serve as a biasing member to bias a safety cap into locked engagement with the container, the dispensing spout having sealing engagement with the cap when the cap is mounted on the container.

In carrying out the foregoing, and other objects, a fitting according to the present invention includes a cylindrical sealing wall for sealingly engaging the inner wall of the mouth of a container, a plunger coaxial with the cylindrical sealing wall, and a support portion for supporting the plunger for resiliently yieldable movement in an axial direction with respect to the sealing wall. The support portion includes a substantially flat end wall extending radially outwardly from one end of the plunger and an axially and radially outwardly extending side wall having its inner periphery joined integrally to the outer periphery of the end wall and its outer periphery joined integrally to the sealing wall. A plurality of ribs are spaced around the plunger, each rib having one edge joined to the end wall and another edge joined to the side wall.

The plunger may be hollow to serve as a dispensing spout with its outer discharge end being engageable with a cap when the fitting is used with a safety cap and container to bias the cap against locked engagement with the container. The fitment may be mounted in the mouth portion of a container with the outer surface of the cylindrical sealing wall in sealing engagement with the container. The container is formed with a plurality of container locking elements of the type that are engageable with and disengageable from complementary locking elements on a safety cap by combined axial and rotative motion. When a safety cap is placed on the container, the discharge end of the plunger engages a projection on the cap to resiliently bias the cap toward locked engagement with the container and seal the contents of the container against leakage through the spout.

Other objects, advantages and features of the invention will become apparent from the following description taken in connection with the accompanying drawings in which:

FIG. 1 is a sectional view of a child proof safety package embodying the present invention and including a container, a fitment, and a safety cap;

FIG. 2 is a view similar to FIG. 1 illustrating the safety cap in a different position; and

FIG. 3 is a perspective exploded view of the container and fitment of the safety package of FIGS. 1 and 2.

The drawings illustrate a safety package including a container designated collectively by reference numeral 2, a safety cap designated collectively by reference numeral 4, and a fitment designated collectively by reference numeral 6.

The container 2 is formed with a cylindrical mouth portion 8 having an annular rim 10. A plurality of container locking elements 12 are spaced peripherally from each other on the outer surface of the mouth portion 8 of the container. The container locking elements 12 are of the type that are adapted to be engaged with and disengaged from complementary locking elements on the safety cap by an axial motion followed successively by a rotative motion of the cap relative to the container. This type of locking element is sometimes referred to as a bayonet locking element. The container locking elements 12 may be of the type disclosed in U.S. Pat. Nos. 3,344,942 and 3,623,623. As shown in FIG. 3, the container locking elements 12 each include a radially outwardly extending projection formed with a notch 16 between a stop portion 18 and a cam portion 14. The mouth portion 8 of the container in the illustrated embodiment projects upwardly from a radially outwardly extending shoulder 20 formed on the container.
The cap 4 is formed with an end wall 22 and a skirt 24 projecting axially from the periphery of the end wall 22 for receiving the mouth portion 8. A plurality of cap locking elements 26 are formed on the inner surface of the skirt and project radially inwardly therefrom for engagement with the container locking elements 12. The cap 4 is formed with a projection 28 extending axially from the end wall 22, the projection 28 being tapered inwardly from its junction with the end wall 22.

The fitment 6 includes a cylindrical sealing wall 30, a plunger 32 coaxial with the cylindrical sealing wall 30, and a support portion for supporting the plunger 32 for resiliently yieldable movement in an axial direction with respect to the sealing wall 30. The support portion includes a substantially flat end wall 34 extending radially outwardly from one end of the plunger 32 and an axially and radially outwardly extending, frusto-conical side wall 36 having its inner periphery joined integrally to the outer periphery of the end wall 34 and its outer periphery joined integrally to one end of the cylindrical sealing wall 30. A plurality of triangular gussets or ribs 38 are spaced from each other around the plunger 32, each of the ribs having one edge joined to the end wall 34 and another edge joined to the side wall 36. In the illustrated embodiment, the fitment includes four ribs spaced ninety degrees from each other around the plunger 32. The ribs 38 constitute reinforcing means to resist bending at the juncture between the end wall 34 and the side wall 36. The fitment 6 further includes a flange 40 projecting radially outwardly from one end of the cylindrical sealing wall 30 and overlying the rim 10 of the container.

In the illustrated embodiment, the cylindrical sealing wall 30 is received in the mouth portion 8 in press fit, sealing engagement therewith. The plunger 32 is hollow and has an inner inlet end 42 communicating with the interior of the container, and an outer, cap-engaging discharge end 44 which engages the projection 28 of the cap.

When the cap 4 is placed on the container 2, the cap locking elements 26 are first aligned with the spaces between the container locking elements 12. The cap is then pushed axially toward the container and the projection 28 engages the discharge end 44 of the hollow plunger 32. The cap may then be rotated until the cap locking elements 26 engage the cam portions 14 of the container locking elements 12. Further rotation of the cap causes the cap locking elements 26 to ride down the surface of the cam portion 14 until the cap locking elements 26 become aligned with the respective notches 16. During this movement, the support means comprising the end wall 34 and side wall 36 permit the plunger 32 to yield axially from its unstressed position shown in FIG. 1 to the position shown in FIG. 2. When the cap locking elements 26 become aligned with the notches 16, the resilient support portion 34, 36 biases the cap locking elements upwardly into the notches 16 to the position shown in FIG. 1. The ribs 38 also assist in restoring the support portion 34, 36 to its unstressed condition of FIG. 1.

When the cap locking elements 26 are received in the notches 16 as shown in FIG. 1, the cap cannot be rotated relative to the container due to the engagement of the cap locking elements 26 with the stop portion 18 and the edge of the cam portion 14 defining the notch 16. The cap must be pushed axially against the biasing force of the resilient support portion 34, 36 before it can be rotated in a direction to disengage the cap locking elements from the container locking elements and permit removal of the cap from the container.

Suitable materials for the fitment 6 are polypropylene, polyethylene, polystyrene, and other plastics. The cap 4 may also be molded in one piece from polypropylene, polystyrene, polyethylene and the like. The illustrated container may also be blow-molded of polyethylene, polypropylene, polyethylene, or the like, although the cap and fitment may also be used for containers made of other materials.

With the fitment 6 press fitted into the mouth of the container, when the cap is removed, the contents of the container may be dispensed through the plunger or dispensing spout 32 in controlled quantities by shaking the container.

While a specific embodiment of the invention has been disclosed in the accompanying drawings and described in the foregoing specification, it should be understood that the invention is not limited to the exact construction shown. Alterations in the construction and arrangement of parts, all falling within the scope and spirit of the invention, will be apparent to those skilled in the art.

I claim:
1. A fitment for a child proof safety package comprising: a cylindrical sealing wall for sealingly engaging the inner wall of the mouth of a container; an elongated plunger coaxial with and enclosed by said cylindrical sealing wall and having an outer cap engaging end for engaging a safety cap, and an inner end exposed to the interior of a container when said cylindrical sealing wall is engaged with the inner wall of the mouth of such container; and a support portion connecting said inner end of said plunger with said cylindrical sealing wall and permitting resilient axial yielding of said plunger with respect to said cylindrical sealing wall, said support portion including a substantially flat radially outwardly extending end wall having its inner periphery joined to said inner end of said plunger, an axially and outwardly extending side wall having its inner periphery joined to the outer periphery of said end wall and its outer periphery joined to said cylindrical sealing wall and reinforcing means joined between said end wall and side wall to resist bending at the juncture between said end wall and said side wall.

2. A fitment as claimed in claim 1 further including a flange projecting radially outwardly from said cylindrical sealing wall for overlying a container rim.

3. A fitment as claimed in claim 1 wherein said reinforcing means comprises a plurality of ribs each having one edge joined to said end wall and another edge joined to said side wall.

4. A fitment as claimed in claim 1 wherein said plunger is hollow, and the diameter of the inner end of said plunger is larger than the diameter of the outer end thereof.

5. A fitment for a child proof safety package comprising: a cylindrical sealing wall for sealingly engaging the inner wall of the mouth of a container; a flange projecting radially outwardly from one end of said cylindrical sealing wall for overlying a container rim; a hollow, elongated plunger surrounded by said sealing wall and disposed in coaxial relationship therewith, said plunger being adapted to define a dispensing spout and having an inlet end and a discharge end; and support means supporting said plunger for resiliently yieldable move-
ment in an axial direction with respect to said sealing wall, said support means including a substantially flat end wall having its inner periphery joined integrally to the inlet end of said plunger and extending radially outwardly therefrom, an axially and outwardly extending side wall having its inner periphery joined integrally to the outer periphery of said end wall and its outer periphery joined integrally to the end of said cylindrical sealing wall opposite said one end, and a plurality of ribs each having one edge joined to said end wall and another edge joined to said side wall, said ribs being spaced from each other around said plunger.

6. A child proof safety package comprising: a container having a cylindrical mouth portion with an annular rim; a fitment mounted on said container; said fitment having a cylindrical sealing wall received in said mouth portion in pressfit, sealing engagement therewith, a hollow, elongated plunger coaxial with and enclosed by said cylindrical sealing wall and defining a dispensing spout and having an inner inlet end communicative with the interior of said container and an outer cap engaging discharge end, and a support portion supporting said plunger for resiliently yieldable movement in an axial direction with respect to said sealing wall, said support portion including a substantially flat end wall having its inner periphery joined integrally to said inner end of said plunger and extending radially outwardly therefrom and an axially and outwardly extending side wall having its inner periphery joined integrally to the outer periphery of said end wall and its outer periphery joined integrally to said cylindrical sealing wall; and reinforcing means joined between said end wall and side wall to resist bending at the juncture between said end wall and side wall; and a plurality of container locking elements on said container of the type that are adapted to be engaged with and disengaged from complementary locking elements on a safety cap by an axial motion followed successively by a rotative motion.

7. A child proof safety package as claimed in claim 6 further including a safety cap having an end wall, a peripheral skirt projecting from said end wall for receiving said mouth portion, a plurality of cap locking elements spaced peripherally from each other on the inner surface of said skirt, said cap locking elements being complementary with said container locking elements and engageable with and disengageable from said container locking elements by an axial motion followed successively by a rotative motion of the cap relative to said container, said cap engaging discharge end of said plunger being engageable with said cap when the cap and container locking elements are engaged to exert a biasing force in an axial direction between the cap and container to resiliently resist disengagement of said cap locking elements from said container locking elements.

8. A child proof safety package as claimed in claim 6 wherein said reinforcing means comprises a plurality of ribs each having one edge joined to said end wall and another edge joined to said side wall, said ribs being spaced from each other around said plunger.

9. A child proof safety package as claimed in claim 8 further including a safety cap having an end wall, a peripheral skirt projecting from said end wall for receiving said mouth portion, a plurality of cap locking elements spaced peripherally from each other on the inner surface of said skirt, said cap locking elements being complementary with said container locking elements and engageable with and disengageable from said container locking elements by an axial motion followed successively by a rotative motion of the cap relative to said container, said cap engaging discharge end of said plunger being engageable with said cap when the cap and container locking elements are engaged to exert a biasing force in an axial direction between the cap and container to resiliently resist disengagement of said cap locking elements from said container locking elements.

10. A child proof safety package as claimed in claim 9 further including a flange projecting radially outwardly from said cylindrical sealing wall and overlying said container rim.

11. A child proof safety package comprising: a container having a cylindrical mouth portion with an annular rim and a plurality of container locking elements spaced peripherally from each other on the outer surface of said mouth portion; a cap having an end wall with a skirt projecting therefrom and a plurality of cap locking elements on said skirt; said cap locking elements being engageable with and disengageable from said container locking elements by an axial motion followed successively by a rotative motion of said cap relative to said container, and a fitment biasing said cap against axial movement from locked engagement with said container, said fitment including a cylindrical sealing wall sealingly engaging the inner wall of the mouth of said container, an elongated plunger coaxial with and enclosed by said cylindrical sealing wall, and support means for supporting said plunger for resiliently yieldable movement in an axial direction with respect to said sealing wall, said plunger having an outer cap engaging end and an inner end, said inner end being integral with said support means such that the plunger projects axially from said support means, said support means including a substantially flat end wall extending radially outwardly from said inner end of said plunger and an axially and radially outwardly extending side wall having its inner periphery joined integrally to the outer periphery of said end wall and its outer periphery joined to said cylindrical wall, and reinforcing means joined between said end wall and said side wall to resist bending at the juncture between said end wall and side wall, whereby said plunger exerts a biasing force between said cap and container to resiliently resist axial disengagement of said cap locking elements from said container locking elements.

12. A child proof safety package as claimed in claim 11 wherein said reinforcing means comprises a plurality of ribs each having one edge joined to said end wall and another edge joined to said side wall, said ribs being spaced from each other around said plunger.

13. A child proof safety package as claimed in claim 11 further including a flange projecting radially outwardly from said cylindrical sealing wall and overlying said container rim.

14. A child proof safety package comprising: a container having a cylindrical mouth portion with an annular rim and a plurality of container locking elements spaced peripherally from each other on the outer surface of said mouth portion; a cap having an end wall with a skirt projecting therefrom and a plurality of cap locking elements on said skirt; said cap locking elements being engageable with and disengageable from said container locking elements by an axial motion fol-
allowed successively by a rotative motion of said cap relative to said container; and a fitment mounted in the cylindrical mouth portion of said container, said fitment including a cylindrical sealing wall sealingly engaging the inner wall of the mouth of the container, an elongated plunger coaxial with and enclosed by said cylindrical sealing wall, and support means for supporting said plunger for resiliently yieldable movement in an axial direction with respect to said sealing wall, said plunger having an outer cap engaging end and an inner end located inwardly of the container with respect to said outer end, said inner end being integral with said support means such that the plunger projects axially from said support means, said support means extending radially from the periphery of the inner end of said plunger to the cylindrical sealing wall at the end of the cylindrical sealing wall remote from the open end of the mouth portion; plunger engaging means on said cap engageable with said plunger at its outer end when said cap is applied to said container, said plunger being forced axially inwardly of said container against the resilient force of said support means to a retracted position by said plunger engaging means as said cap is moved axially toward said container to engage and disengage said locking elements, said plunger being resiliently urged by said support means to extend from said retracted position to urge said cap toward axial separation from said container when said plunger is engaged by said plunger engaging means.

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