CONTAINER FOR KEEPING LIQUIDS IN SEPARATE CONDITION AND COMMINGLING AND DISPENSING THE SAME

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ABSTRACT
A container of the plastic "squeeze bottle" type having two compartments which are in communication through a reduced neck portion or restriction which is closed by a tubular stem on a screw cap when the bottle is closed thereby to keep two liquid components separated until they are to be commingled at the time of dispensing. When the liquids are to be dispensed, the cap is removed and reversed to open the reduced neck portion to allow the liquids to become commingled, whereupon the resultant mixture may be dispensed through the stem of the cap by squeezing the container.

7 Claims, 3 Drawing Figures
CONTAINER FOR KEEPING LIQUIDS IN SEPARATE CONDITION AND COMMINGLING AND DISPENSING THE SAME

BACKGROUND OF THE INVENTION

In the dispensing of numerous products which are made up of two liquid components to be kept separate and commingled immediately before use, it is customary to place each component in a separate container from which it is removed in the proportion in which it is to be used with the other component, and mixed therewith at the time of use. The preparation of two component mixtures in this manner is a messy and uncertain procedure, due to the difficulty of properly proportioning the components for mixing and the difficulty of thoroughly commingling the same, as well as dispensing the mixture when formed.

Such products as plastic cements and coating in which two separately packaged components are mixed prior to use are particularly difficult to handle, because of the necessity of accurately proportioning the amounts of each component to be mixed and the fact that the components must be quickly and thoroughly commingled for use and promptly applied before setting up or curing the mixture which, when set up, can no longer be dispensed.

Other products which are supplied in separate components, such as hair treating compositions and the like, contain material which reacts chemically when commingled so that the mixture must be freshly prepared for each occasion, since the mixture is subject to rapid deterioration. In the treatment of hair for the coloring of the same, for example, it is customary to make use of certain dyes or tinting materials in solution and to mix such material with an activating solution, such as a solution of hydrogen peroxide immediately before application to the hair. For this purpose, the dye solution and hydrogen peroxide solution are kept in separate containers, making it necessary that the two liquids be poured into another container in the exact proportions for use and mixed together before applying to the hair. Such procedure not only requires the exercise of considerable judgment in the proportioning of the components, but also a thorough mixing of the same, and is frequently wasteful and untidy.

The present invention provides a container in which two liquid components to be mixed may be kept separate, and may be commingled at the time the mixture is needed for use and wherein the components may be accurately proportioned in the amounts to be mixed.

SUMMARY OF THE INVENTION

Briefly described, the container of the invention may take the form of a plastic bottle of the "squeeze bottle" type having two compartments which are connected in communication by a reduced neck portion or restriction which may be closed by a tubular stem on the screw cap of the bottle. The screw cap is designed to be removed and reversed to allow the stem of the cap to be used as a dispensing nozzle when the components are commingled.

The components are loaded into the compartments with the stem closing the reduced neck portion, so that the components are kept separately until the time of dispensing, at which time the cap is removed, withdrawing the stem from the reduced neck and allowing the components to commingle, the cap being then reversed and replaced with the stem extending outwardly from the bottle to serve as a dispensing nozzle.

The container is designed to permit the introduction of the two components into the compartments at one operation.

BRIEF DESCRIPTION OF THE VIEWS OF THE DRAWINGS

FIG. 1 is a vertical, central, cross sectional view of a preferred form of the container of the invention showing the same in its closed or non-dispensing condition;

FIG. 2 is a view similar to that of FIG. 1 showing the container in its opened or dispensing condition; and,

FIG. 3 is a fragmentary view similar to that of FIG. 1 illustrating a somewhat modified form of the invention and showing the same in its closed condition.

DETAILED DESCRIPTION OF A PARTICULAR EMBODIMENT OF THE INVENTION

The container of the invention, as illustrated herein, may take the form of a bottlelike structure generally designated 10 of the plastic "squeeze bottle" type, having an upper end, externally threaded neck 12, and formed mediate its length with a reduced neck portion 14 forming a restriction of substantially smaller diameter than the general diameter of the container, forming an upper compartment 16 and a lower compartment 18 which are in communication through the reduced neck portion.

The compartments 16 and 18 may be of any desired size, selected to receive the liquids which are to be maintained separate, in the proportions in which they are to be commingled immediately before dispensing of the resulting mixture.

The container is provided with a cap 20 having an internally threaded recess 21, adapted to be screwed on the threaded neck 12 to close the upper end outlet 22 of the container, which cap is formed with a central, elongated, tubular closure member or stem 24 having an externally enlarged portion 26 formed thereon in longitudinally spaced relation to the threaded portion of the cap and which is formed with an external annular groove 28. The stem 24 has a tapered, nozzlelike end portion 30 extending beyond the enlargement 26.

The stem 24 is of such length, and the enlargement 26 thereon is so positioned, as to be located within the restriction of the neck portion 24 when the container is in the closed condition shown in FIG. 1, and, suitable seal forming means such as an O-ring 32 is disposed in the groove 28 to form a fluid tight seal between the stem and the internal surface of the container in the reduced neck portion to prevent liquids in the upper and lower compartments 16 and 18 from becoming commingled when the container is in its non-dispensing condition, with the cap 20 screwed onto the neck 12.

The cap 20 has a second internally threaded recess 34 by which the cap may be screwed onto the neck 12 when the cap has been removed and inverted, as seen in FIG. 2, to place the container in its open, dispensing condition. The cap has a closure 36, which may take the form of a plastic cover extending over the open end of the recess 34, as seen in FIG. 1, to close the cap, and which may be removed when the container is to be opened.

The passageway 38 of the tubular stem 24 is in communication with the interior of the recess 34 of the cap 20 and is provided with a check valve 40 disposed in an internal enlargement 42 therein to close the stem against the backflow of fluid into the container therethrough when the container is in the dispensing condition of FIG. 2.

The cap 20 also has a filling recess 44 opening into the recessed end 21 of the cap and which is in communication with the recess 34 thereof through an opening 46, and the recess 44 is filled with a plug 48 of seal forming material, such as rubber, plastic, or the like.

In making use of the container of the invention, constructed as described above, the two different liquids may be introduced into the compartments at one operation by the use of pipes or hollow needles, one of which may be inserted through the soft plug 48 into the upper chamber 18, while the other is inserted into the passageway 38 of the stem 24, the cover 36 being removed and the cap being in place in the closed condition of the container shown in FIG. 1.

When the needle is removed from the plug 48, the hole in the plug will be closed due to the self-sealing quality of the plug. The cover 36 may then be placed in position to close the container.

When it is desired to commingle the liquids thus maintained separately, the cover 36 is removed and the cap 20 unscrewed
to allow the withdrawal of the stem 24 from the reduced neck portion 14, the cap being then reversed and screwed onto the neck 12 with the stem extending outwardly from the container as seen in FIG. 2. The two components in the compartments of the container will then be commingled and by squeezing the same, the resulting mixture may be dispensed through the passageway 38 of the stem.

A somewhat modified form of the invention is illustrated in FIG. 3, wherein the stem 24' of the cap has an enlargement 26' which fits into the reduced neck portion 14' of the container, and the reduced neck portion is formed with internal annular flanges or fins 50 which are flexible and through which the central opening is of a size smaller than the external diameter of the enlargement, whereby the flanges will be flexed into sealing engagement with the external surface of the enlargement when the stem is inserted through the reduced neck.

In other respects, the container of FIG. 3 is constructed and used as is the form of the invention illustrated in FIGS. 1 and 2.

It will thus be apparent that the invention, constructed as described above, provides a two compartment container in which two liquid components to be mixed may be maintained in separate condition and having means for allowing the commingling of the components when the mixture is desired for use and whereby the mixture may be conveniently dispensed.

Having thus clearly shown and described the invention, what is claimed as new and desired to secure by Letters Patent is:

1. A storage and dispensing container comprising:
   a hollow body formed with upper and lower compartments separated by a portion of reduced diameter forming a restricted passage between said compartments, said hollow body having an opening at one end opening into one of the compartments;
   a reversible cap assembly releasably attached to said opening preventing commingled flow through said opening and an alternative position for permitting commingled flow through said opening;
   said cap assembly having an elongate portion extending through said restricted passage;
   an enlargement on said elongate portion sized to contact against and seal within said restricted passage; and,
   a removable cover on said cap assembly closing said cap assembl when said cap assembly is releasably attached to said opening for preventing flow through said opening.

2. The invention of claim 1 wherein said cap assembly is threaded and said opening is cooperatively threaded permitting reversal of said cap assembly, and further including;
   a passage through said elongate portion of such length as to extend from said opening into the more remote of said compartments;
   said cap assembly having a second passage therethrough extending to the less remote of said compartments;
   said first and second passages providing ingress to said compartments permitting introduction of two fluids to said compartments after said cap assembly is in the position preventing flow through said opening.

3. The invention of claim 1 wherein said enlargement has an O-ring seal means on the exterior thereof.

4. The invention of claim 1 wherein said cap assembly includes:
   a cylindrical body having threads at both ends thereof;
   a centrally positioned elongate portion which has a hollow passage;
   a transverse member closing said cylindrical body and connected to said elongate portion;
   a second passage through said transverse member;
   a check valve in one of said passages;
   one of said passages being of sufficient length to communicate with the more remote of said compartments and the other communicating with the remaining compartment; and,
   said cover closing both of said passages in the vicinity of said transverse member.

5. The invention of claim 4 including in the passage having the check valve, an enlarged portion in the passage;
   a valve member;
   a spring; and,
   a shoulder defined by the enlargement and said spring forcing said valve member thereagainst.

6. The invention of claim 4 wherein said enlargement includes an O-ring seal means on its exterior.

7. The invention of claim 4 wherein said enlargement extends into at least one flexible annular flange having a central opening of a size smaller than the external diameter of said enlargement, and said flange is formed of a yieldable material.

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