United States Patent [19]

Dukess

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[45] **Jan. 29, 1974**

[54] **MULTIPLE COMPARTMENT TUBE WITH RESILIENT DIVIDER**

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[52] **U.S. Cl.** **222/94,** 222/206

[51] **Int. Cl.** **B65d 35/24**

[58] **Field of Search** ..... 222/94, 107, 206, 215, 94; 220/1 S, 85 B

[56] **References Cited**

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Assistant Examiner—David A. Scherbet
Attorney, Agent, or Firm—Kenneth S. Goldfarb

[57] **ABSTRACT**

A squeezeable container in the form of a multiple compartment tube having a resilient bellows divider. One end of the bellows divider is secured to the neck and the other is crimped into the closed opposite end. The bellows have side pieces which lie flush against the inner side walls of the container so that two separate compartments are formed by the divider with the divider being deformable so as to permit variable amounts of material to be deposited in the several compartments.

1 Claim, 5 Drawing Figures

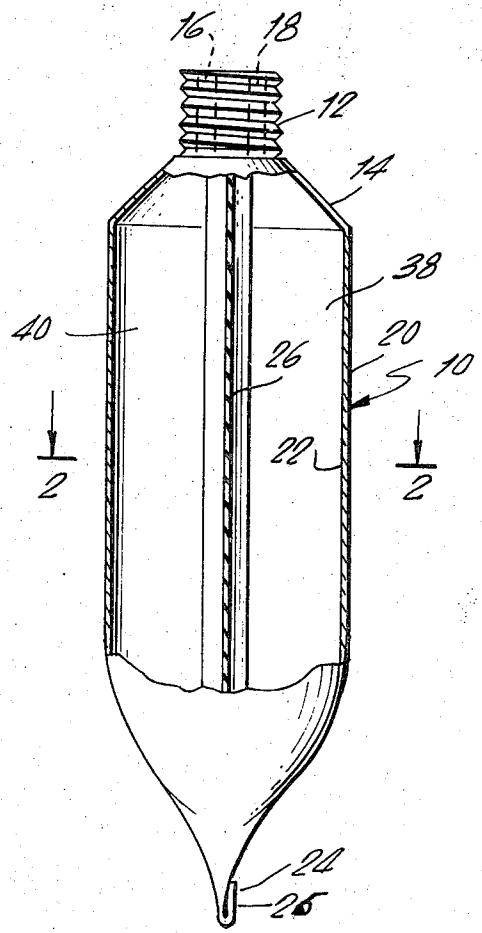
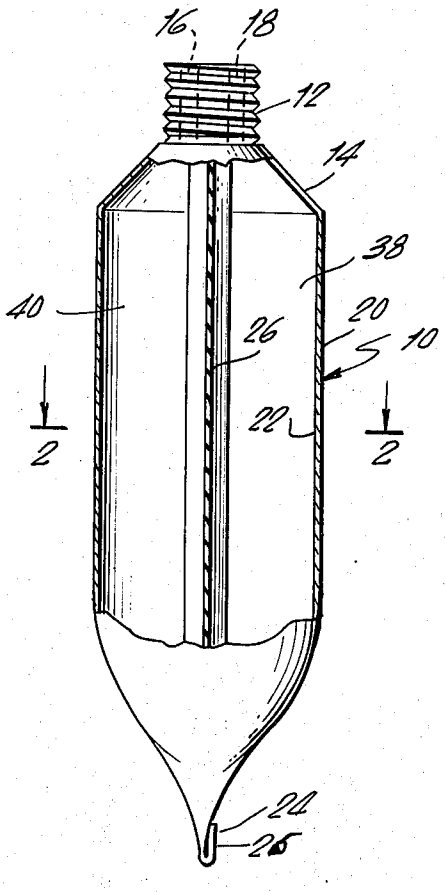


FIG. 1



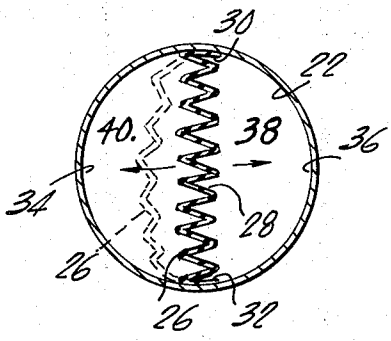
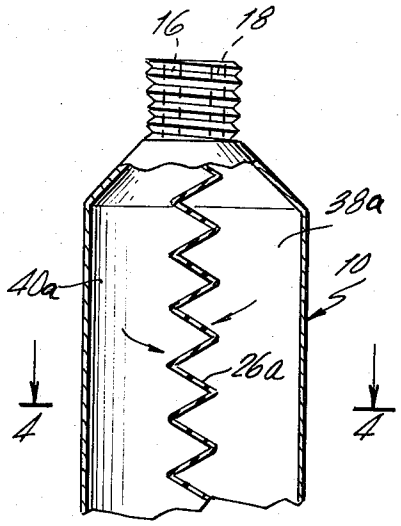


FIG. 2

FIG. 3



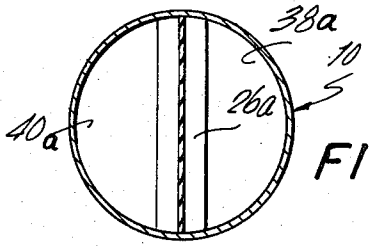


FIG. 4

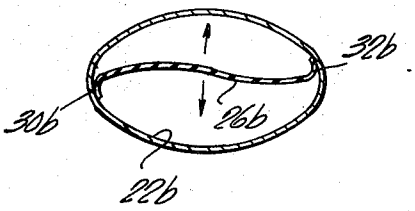


FIG. 5

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MULTIPLE COMPARTMENT TUBE WITH RESILIENT DIVIDER

This invention relates to a multiple compartment squeezeable container having a resilient divider and is an improvement upon the device disclosed in U.S. Pat. No. 3,506,157, issued Apr. 14, 1970, for "Pronged Closure Device for Multiple Compartment Squeeze Tube."

Multiple compartment tubes have been produced in the past having various types of dividers or more than one divider for forming a plurality of compartments in the tubes. However, there has been no provision in the past for allowing a tube to have either variable amounts of material stored in the separate compartments or the same amounts stored therein. Some material, including hair dyes, require different amounts of material in the form of a pigment and a peroxide so that when it is desired to store both in a single squeezeable container it is necessary to provide for compartments of different sizes. Further, heretofore each special size compartment of the tube must be separately filled which required particularly positioning the tube for filling.

The present invention overcomes the disadvantages of the prior art multiple compartment squeezeable tubes by providing for a construction adaptable to many varied uses and including a resilient bellows divider which is disposed in a manner so as to permit for filling one of the compartments, for example, to an amount substantially twice the amount of material in the other compartment, either compartment being capable of being filled to the greater extent, with the added advantage that the resilient divider provides means for aiding the more rapid dispensing of material from the compartment which is filled to the greater extent.

The concept of this invention features the use of a resilient bellows divider which is secured to the neck and crimped to the closed base end of the tube with strip members on the sides of the bellows which lie flush with the inner side walls of the squeezeable tube and which strip members may be sealed to the side walls or resiliently held thereagainst.

Still further objects and features of this invention reside in the provision of a multiple compartment squeezeable container which is capable of being manufactured out of various types of synthetic plastic materials, which is capable of use for storing in a convenient manner two or more ingredients which should be mixed only after they have been dispensed from the squeezeable container, which is capable of being inexpensively mass produced, yet which is simple in construction and attractive in appearance, being of the external shape and configuration as the well-known squeezeable tube.

These, together with the various ancillary objects and features of the present invention, which will become apparent as the following description proceeds, are attained by this multiple compartment tube with resilient divider, preferred embodiments of which are illustrated in the accompanying drawing, by way of example only, wherein:

FIG. 1 is a longitudinal sectional view of a multiple compartment squeezeable container constructed in accordance with the concepts of the present invention;

FIG. 2 is a transverse sectional view, taken along the plane of line 2—2 in FIG. 1;

FIG. 3 is a view similar to FIG. 1 of a modified form of the invention;

FIG. 4 is a transverse sectional view, taken along the plane of line 4—4 in FIG. 3; and,

FIG. 5 is a view similar to FIG. 2, but showing a modified form of the invention.

With continuing reference to the accompanying drawing, wherein like reference numerals designate similar parts throughout the various views, reference numeral 10 generally designates a squeezeable tube or container in the form of a body having a neck 12 and provided with a shoulder portion 14 joining the body 10 to the neck 12. The neck 12 is preferably bonded to the shoulder portion 14 and includes bores 16 and 18. The body 10 includes an outer wall portion 20 having an inner surface 22. The end 25 opposite the neck is closed preferably by crimping as at 24 or may be heat sealed or sonically welded or otherwise formed into a closed end.

A divider 26 is disposed in the body 10 and is crimped at the closed end 24 so as to be fixedly held in place. The upper end of the divider 26 is preferably bonded or otherwise secured to the neck 12 or may be held against the neck 12 by being held in position by the crimped end 24. As can be seen best in FIG. 2, the divider 26 is in the form of a bellows having convolutions 28 and terminating side members 30 and 32 which are arcuate and which conform closely to the contours of the inner surface portions 34 and 36 of the inner surface 22. The side members 30 and 32 provide for a tight frictional fit and preferably need not be heat sealed to the body 10 but are resiliently held in tight sealing engagement with the inner side wall 22 by the action of the convolutions 28. Alternatively, if it is desired, the side members 30 and 32 may be heat sealed or sonic welded to the body 10.

In use, when it is desired to fill the compartment 38 with more materials as, for example, substantially twice as much material as the compartment 40, this may be easily accomplished because the bellows will resiliently stretch from the position as shown in dotted lines to the position as shown in phantom lines. An unusually advantageous effect is obtained due to the fact that the stretching of the bellows 26 provides for pressure to be continuously exerted in compartment 38 thereby causing such to be dispensed at a greater rate when the squeezeable tube is compressed for feeding material.

FIGS. 3 and 4 show a modified form of the invention in which the bellows 26*a* extends normal to the bellows 26 of the type shown in FIG. 1 to divide the container into compartments 38a and 40a.

In FIG. 5, the bellows 26*b* is generally of an S configuration with the side members 30*b* and 32*b* conforming to the shape of the inner surfaces 22*b*.

A latitude of modification, substitution and change is intended in the foregoing disclosure, and in some instances, some features of the invention may be employed without a corresponding use of other features.

I claim:

1. A squeezable container comprising a tubular body having a neck at one end provided with outlet bores, a divider in said body dividing ssaid body into a plurality of compartments communicating with said bores, the opposite end of said tube from said neck being crimped, said divider having a resilient bellows running the length of said body for permitting said compartments to be variably filled, said bellows including arcu-

ate side member running the length of said bellows at each side of said bellows and closely conforming to contour to said tubular body and extending substantially normal to said bellows, said body having inner side walls, said side members being slidable relative to said body and being resiliently held in tight sealing engagement flush against diametrically opposed portions of the inner side walls of said body by said bellows.

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