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(54) Title: TUBE PACKAGE SYSTEM

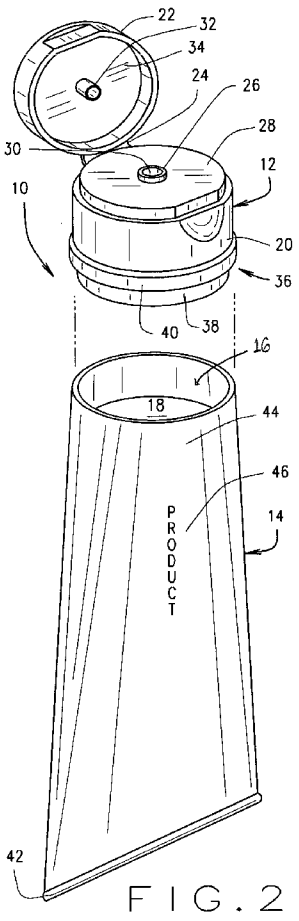


FIG. 2

(57) Abstract: A tube package system (10), includes a closure (12) attached to a body (14) that defines a reservoir (16) for retaining and dispensing product (18). The closure (12) includes a base (20) and corresponding removable lid (22) pivotally connected by a hinge (24). The body (14) has a closed first end (42) and an open second end (44) that attaches to the closure (12) with heat shrinking. Indicia (46) is pre-applied to the body (12) prior to assembly of the tube package system (10).

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TUBE PACKAGE SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is related to United States Provisional Patent Application No. 60/970,750 filed September 7, 2007 from which priority is claimed, and is hereby incorporated by reference.

BACKGROUND ART

The present invention relates generally to a product package and, more specifically, to a tube package system with a reduced number of components.

Typically, tube package systems are comprised of various extruded, laminated, and injection molded components. Extruded tube packages generally include a tube body welded or sealed to a separate shoulder neck component. A closure, such as a cap or other dispenser, removeably attaches, such as with a threaded connection, onto the shoulder neck. Alternatively, a closure is integrally molded into one end of the body, rather than being attached to the body as a secondary operation. In conventional tube packages, both extrusion and injection molding processes require a minimum body wall thickness of about .015" inches to maintain consistent manufacturing parameters and quality of product. This restriction is a major determinative in the cost of the tube package system, and in many cases is cost prohibitive. Moreover, this restriction also inhibits flexibility in package design for functionality and manufacturing issues.

Another cost prohibitive factor in the production of tube package systems is the specially compounded materials created to provide adequate barrier properties, to protect the product within the tube package from pre-mature exposure to oxygen, and to maintain the moisture and/or fragrance content in the product by limiting the migration of water vapor from the tube package. Also, the material must

possess enough flexibility to allow a user to properly squeeze the product from the finished tube package out through the closure. In addition to being expensive, conventional materials available for injection molding and extrusion make it difficult to achieve these product requirements.

Another drawback associated with conventional tube packages pertain to the application of indicia on the tube package before or after the filling process. Conventional processes for the application of indicia to tube packages are all secondary processes that utilize either labor intensive, inefficient, and expensive processes, such as silk-screening processes, which add significant costs to the finished tube package. Another conventional process, referred to as "in-mold" labeling, is also used to apply indicia to tube packages. However, the efficiency of this process is extremely limited by cavitation of the tools during the molding process, which again increases manufacturing costs. In addition, the heat sealing process typically used to crimp the end of the tube package prohibits the application of indicia to this area of the tube.

There are further drawbacks associated with conventional manufacturing processes for tube packages, such as extrusion and injection molding. For instance, high global demand for extruded products has reduced the available manufacturing capacity of manufacturers. As a result, manufacturers often can not provide adequate quantities of tube packages to fulfill a purchasers product line or, alternatively, the manufacturer charges a premium to produce the requested quantities. Moreover, conventional tube packages are difficult to manufacture using injection molding. The relative length of tube packages make finished parts difficult to extract from molds without deflecting, bending, distorting, or otherwise damaging the tube package. Also, given the nature of the size and length of the tubes, the cavitation in the injection molding process is very limited, which significantly reduces the manufacturing efficiency. These factors further increase the cost of the tube packages unnecessarily.

Therefore, what is needed is a more cost effective tube package system with a reduced number of components and a reduced minimum wall thickness requirement, that can be manufactured at lower cost.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings which form part of the specification:

Fig, 1 is a perspective view of a tube package system;

Fig. 2 is an exploded perspective view of the tube package system; and

Fig. 3 is a front view of the tube package system with a partial cross section.

Corresponding reference numerals indicate corresponding parts throughout the several figures of the drawings.

BEST MODES FOR CARRYING OUT THE INVENTION

The following detailed description illustrates the invention by way of example and not by way of limitation. The description clearly enables one skilled in the art to make and use the invention, describes several embodiments, adaptations, variations, alternatives, and uses of the invention, including what is presently believed to be the best mode of carrying out the invention.

As shown in Figures 1-3, an embodiment of the present invention, generally referred to as a package system 10, includes a closure 12 attached to a body 14 that defines a reservoir 16 for retaining and dispensing product 18.

The closure 12 includes a generally cylindrical base 20 and corresponding removable lid 22 pivotally connected by a hinge 24. The hinge 24 allows the lid 22 to move between a closed position (Fig. 1) to an open position (Fig. 2), effectively creating a "flip-top" closure 12. The hinge 24 is preferably provided as a unitary part of the closure 12, but can also be attached secondarily. In addition, any suitable type of hinge

can be used, including, but not limited to, a snap-action hinge, a "floppy" living film hinge, and the like.

A spout 26 extends outwardly from an upper surface 28 of the base 20 to define an outlet 30 (Fig. 2). The lid 22 defines a plug 32 extending outwardly from a lower surface 34 and being sized to couple with and seal the outlet 30, when the closure 12 is in the closed position. To aid engagement by the user for easier opening of the lid 22, the closure 12 defines corresponding reliefs 34 on the base 20 and the lid 22, which are appropriately sized to receive fingertips (Fig. 1).

The lower end of the closure 20 defines an attachment portion 36 for mating with the body 14 (Fig. 2). The attachment portion 36 is a stepped annular skirt 38 with a raised portion 40, such as a ring, or a plurality of protrusions, for receiving the body 14. However, other configurations of the attachment portion 36 can also be used, including but not limited to, skirts 38 of different shapes (i.e. rectangular, polygonal, oblong, etc.), and raised portions 40 of different shapes and textures (i.e. bumps, knurls, ridges, etc.).

The closure 12 is preferably produced by the injection molding process, but other methods of production can also be used, such as extrusion, thermoforming, or compression molding. Those skilled in the art will also recognize that other embodiments of the closure 12 can be used to accommodate different types of products and different dispensing criteria. For example, other closure embodiments can include, but are not limited to, threaded, twist-open, flip-top, push-pull, and other configurations. Also, the closure 12 is preferably made from a polymer, preferably Polypropylene, but also including, but not limited to High Density Polyethylene, Low Density Polyethylene as well as post consumer recycled versions of these materials.

The body 14 is a sleeve having a closed first end 42 and an open second end 44 that attaches to the attachment portion 36 of the closure 12 to define the reservoir 16. After filling the reservoir 16 with product 18, the second end 44 is sealed to the attachment portion 36 of the

closure 12, such as with a heat shrinking (Figs. 1-2). Other methods of sealing the second end 44 to the attachment portion 36 can also be used, including, but not limited to, heat sealing, heat staking, and the like.

Prior to assembly, indicia 46 is pre-applied to the outer surface of the body 14, preferably using an offset printing process. However, any suitable method process can be used including, but not limited to, roto-gravure, UV flexo, and flexo technologies. The body 14 can be made from a either a single layer or a multilayer film depending on the specifications of the product, which can have a minimum wall thickness as low as about .002" inches. Also, the body 14 is preferably made from a heat shrinkable polypropylene, but can also comprise other materials to meet a multitude of criteria needed for various products, such as specific barrier properties that require varying sleeve materials, thickness of said materials, multiple layers of said materials, and various applied coatings. The body 14 can also be shaped with a variety of processes including, but not limited to, heat sealing, heat staking, and heat shrinking technologies.

To assemble, the first end 42 of the body 14 is sealed and the reservoir 16 is filled with product 18 (Fig. 2). A heat activated adhesive 48 is applied to the outer surface of the skirt 38 (Fig. 3). The second end 44 of the body 14 slides over the outer surface of the skirt 38 until an upper edge 50 abuts the raised portion 40. In this position, heat is applied to heat-shrink the body 14 until it conforms to the attachment portion 36. The heat also activates the adhesive 48, thereby, hermetically sealing the body 14 to the attachment portion 36. Once attached to the body 14, the closure 12 retains the product 18 in the reservoir 16 for the user to dispense at will. The closure 12 aids in the dispensing of the product 18 from the tube package 10. In operation, a user engages the lid 22 for movement to the open position (Fig. 2). Once opened, the user squeezes the body 14 to dispense the product 18 out of the outlet 30 of the closure 12. When displayed on store

shelves, the tube package 10 is inverted with the closure 12 serving as a support to position the tube package 10 in an upright position. However, alternate embodiments can include a support element at the first end 42 of the body 14 to position the tube package 10 in an upright position.

Changes can be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

CLAIMS:

1. A tube package for storing and dispensing product, comprising:

a closure having a resealable outlet for dispensing product and an attachment portion; and

a body having a first end attached to the attachment portion and a closed second end, wherein the body defines a reservoir for receiving the product; and

a pre-applied indicia on the body.

2. The tube package of claim 1, further comprising:

a heat activated adhesive positioned between the attachment portion and the body.

3. The tube package of claim 1, wherein the pre-applied indicia is applied with an offset printing process.

4. The tube package of claim 1, wherein the pre-applied indicia is applied prior to the attachment of the body to the closure.

5. The tube package of claim 1, wherein the attachment portion comprises:

a skirt sized to couple with the body; and

a raised portion positioned to abut with an upper edge of the body.

6. The tube package of claim 1, wherein the closure comprises:

a base defining the outlet;

a lid defining a plug sized to couple with the outlet;

a hinge pivotally connected between the base and the lid so that the moves between an open position and a closed position; and

wherein, the base, the lid, and hinge, are of unitary construction.

7. The tube package of claim 1, wherein the body attaches to the closure with a heat shrink process.

8. The tube package of claim 1, wherein the body comprises a minimum wall thickness between about .015" inches to about .002" inches.

9. The tube package of claim 1, wherein the body comprises a heat shrinkable polystyrene.

10. A method of manufacturing a tube package, comprising the steps of:

providing a closure with an outlet for dispensing a product and an attachment portion;

applying indicia to a heat shrinkable material;

forming a body from the heat shrinkable material;

sealing a lower end of the body, thereby defining a reservoir;

filling the reservoir with the product; and

attaching an upper end of the attachment portion of the closure.

11. The method of manufacturing a tube package, further comprising the step of applying indicia to a heat shrinkable material with an offset printing process

12. The method of manufacturing a tube package, further comprising the step of a sealing the upper end to the attachment portion with a heat activated adhesive positioned between the body and attachment portion.

13. The method of manufacturing a tube package, further comprising the step selecting a minimum wall thickness of the body between about .015" inches to about .002" inches.

14. A tube package system, comprising:

a base having a resealable outlet for dispensing product and an attachment portion;

a lid defining a plug sized to couple with the outlet;

a hinge pivotally connected between the base and the lid so that the moves between an open position and a closed position;

wherein, the base, the lid, and hinge, are of unitary construction;

a body having a first end attached to the attachment portion with a heat shrink process and a closed second end, wherein the body defines a reservoir for receiving the product; and

an indicia on the body, wherein indicia is applied prior to the attachment of the body to the closure.

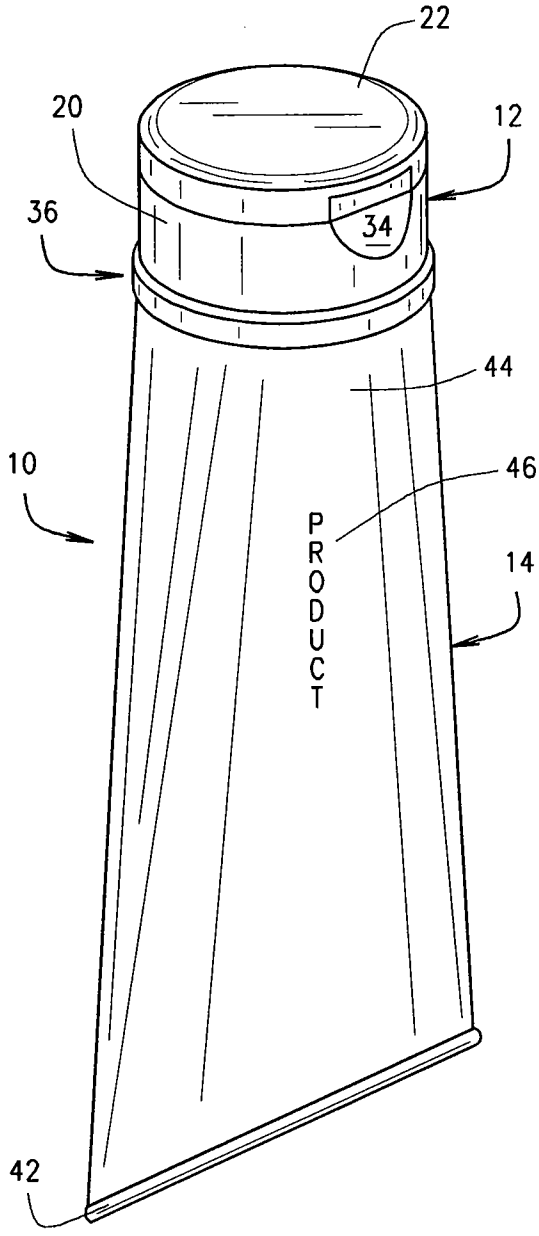

22
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12
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PRODUCT
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FIG. 1

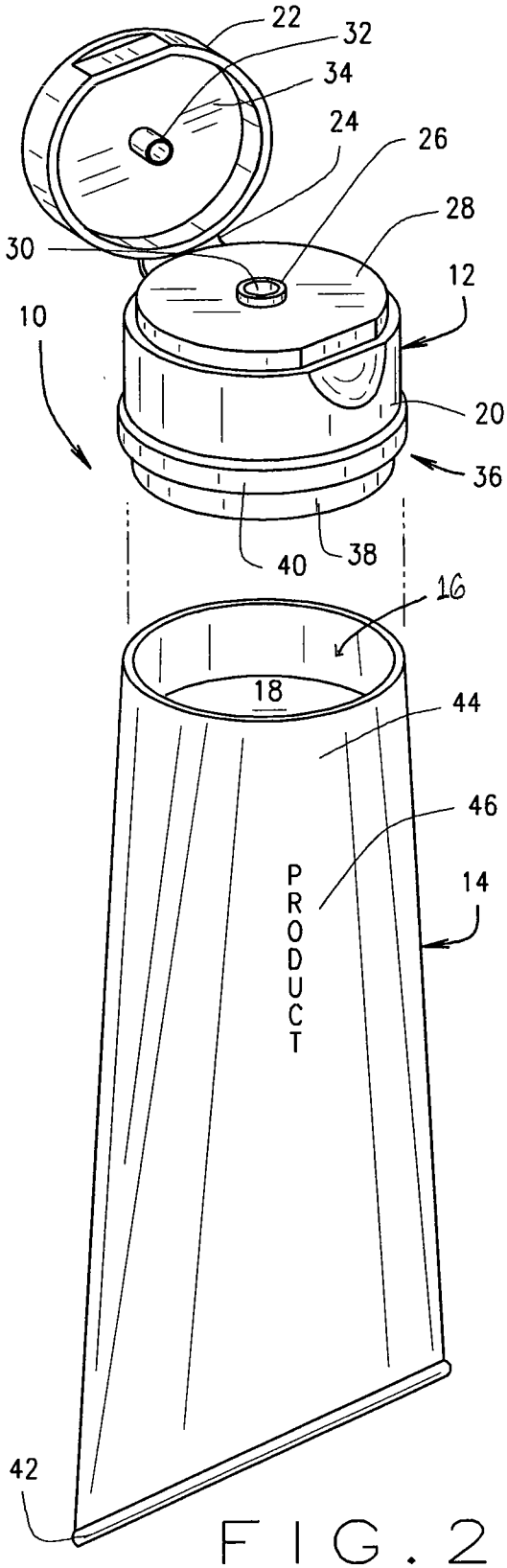

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PRODUCT
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FIG. 2

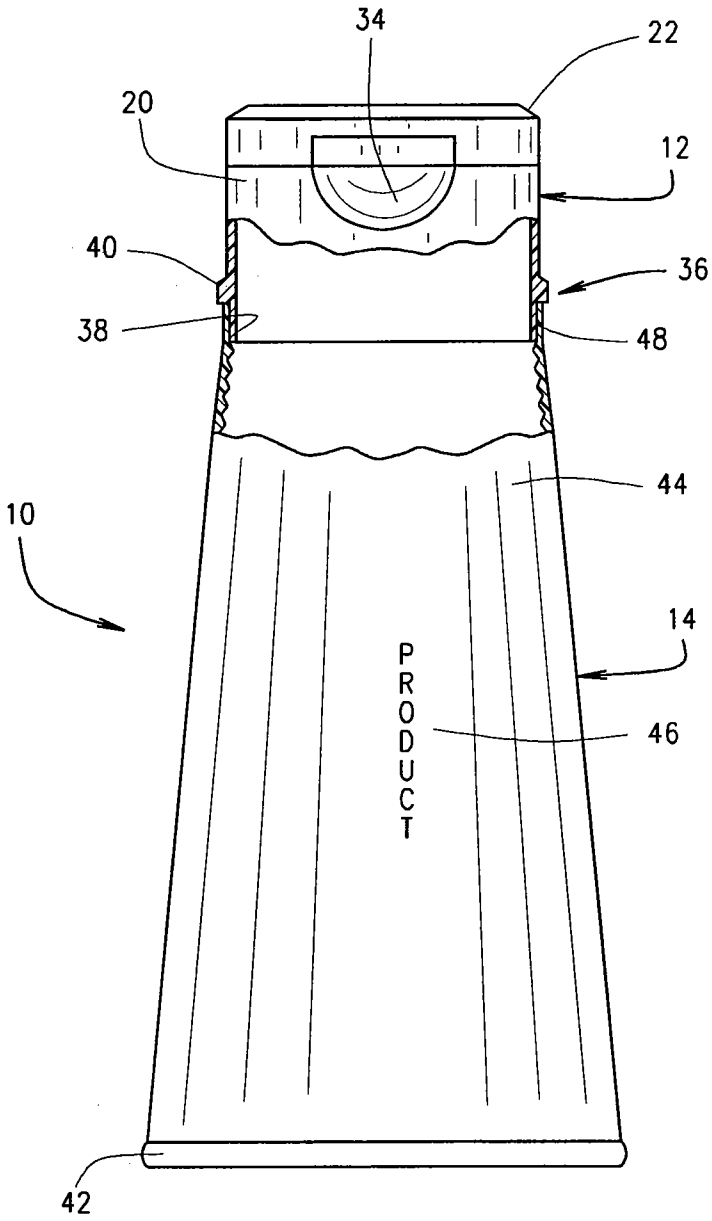


FIG. 3