



(11) **EP 2 007 652 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
06.10.2010 Bulletin 2010/40

(21) Application number: **07735525.3**

(22) Date of filing: **17.04.2007**

(51) Int Cl.:
B65D 81/32 (2006.01) **B65D 83/00** (2006.01)

(86) International application number:
PCT/IB2007/051380

(87) International publication number:
WO 2007/119223 (25.10.2007 Gazette 2007/43)

(54) **EXPANDABLE/COLLAPSABLE PACKAGE**

AUSDEHNBARER/ZUSAMMENFALLENDER VERPACKUNG

EMBALLAGE DILATABLE/COMPRESSIBLE

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR

(30) Priority: **17.04.2006 US 405046**

(43) Date of publication of application:
31.12.2008 Bulletin 2009/01

(73) Proprietor: **The Procter and Gamble Company**
Cincinnati, Ohio 45202 (US)

(72) Inventors:
• **SMITH, Scott Edward**
Cincinnati, Ohio 45247 (US)

• **FARRELL, Michael Sean**
Terrace Park, Ohio 45069 (US)

(74) Representative: **Morelle, Evelyne Charlotte**
Isabelle et al
N.V. Procter & Gamble Services Company S.A.
Temselaan 100
1853 Strombeek-Bever (BE)

(56) References cited:
EP-A- 1 110 879 WO-A-98/43882
US-A- 4 838 457 US-A- 5 615 803

EP 2 007 652 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description**FIELD OF THE INVENTION**

[0001] The present invention relates to packages for containing a product therein, and more particularly to pressurizable packages for dispensing products therefrom.

BACKGROUND OF THE INVENTION

[0002] Packages for containing a product are well known in the art. Such packages may have a dispensing nozzle or dispensing orifice to allow the product to be dispensed from the package. The dispensing nozzle or dispensing orifice may be disposed near the top of the package, although other configurations and locations are also known in the art.

[0003] Motive force for dispensing the product from the package include gaseous propellants, pumps (both manual and electric), gravity feed systems, elastic bladders, etc. Packages using propellants are particularly popular, because such packages allow for continuous dispensing at the touch of a button. Likewise, elastic bags may be filled with product to a pressure greater than atmospheric. In either case, product dispensing occurs due to the pressure differential between the product and the ambient.

[0004] Products to be contained in and dispensed from the package include almost any gaseous, liquid, or farinaceous material, compatible with the package materials and suitable for the intended use. Nonlimiting, exemplary products include, but are not limited to, perfume, medications, air treatments, such as air fresheners, insect repellents, cosmetics, cleaners, etc.

[0005] Furthermore, it may be desirable to have two or more products in the same packages. The products may be separated until combined during the dispensing process at the point of use. For example, enzymes and bleach may be separated until the point of use, to prevent undue interaction and loss of efficacy during packaging.

[0006] It may be desirable to allow the product to be visible prior to dispensing from the package. For example, this allows the user to see how much product is left before depletion and/or may simply be aesthetically pleasing.

[0007] However, packaging which allows viewing of the product before dispensing presents challenges. As the product is depleted flexible packaging may assume aesthetically undesirable configurations, leading to a less preferred package. The challenge is compounded for packaging holding plural, but separated, products. The search continues for packages which are functional aesthetically pleasing and/or economical to manufacture.

[0008] US4,838,457 (Swahl James C (US) et al) relates to a lotion blending and dispensing unit for internally combining and then discharging a composite lotion or solution which includes a cylindrical housing having a storage chamber for enclosing at least a pair of lotion

containers removably mounted on a mounting block. The block is provided with at least a pair of orifices on an annular surface having a central projection about which a selector dial rotates. The projection includes at least a pair of passageways in fixed alignment with the orifices so as to conduct lotion therethrough. A regulating disc is movably disposed on the annular surface for revolving about the projection whereby a plurality of different sized apertures may be selectively aligned between the orifices and the passageways. The disc is movable in response to rotation of the selection dial.

SUMMARY OF THE INVENTION

[0009] The invention comprises a container which expands and/or collapses in response to the addition or removal inside or outside such container. The container expands/collapses in a generally predetermined geometry or manner, due to the construction of that container. All patents and other documents cited herein are incorporated herein by reference.

BRIEF DESCRIPTION OF THE DRAWINGS**[0010]**

Fig. 1 is a vertical elevational view of a package according to the present invention.

Fig. 2 is a vertical sectional view of a variant embodiment of a package similar to that shown in

Fig. 1 and having an inner container with an inversion having longitudinal hinge lines and a central container with an inversion having circumferential hinge lines, the inversions having equally spaced hinge lines on the right-hand sides of the inversion and unequally spaced hinge lines on the left-hand sides of the inversions.

Fig. 3 is a vertical sectional view of an alternative embodiment not part of the invention, having two inner containers disposed in parallel, one inner container having an asymmetrical inversion.

Fig. 4 is a side elevational view of an exemplary inner container or central container, having weakened regions.

Fig. 5A is an enlarged fragmentary view of the distal end of the container of Fig. 4.

Fig. 5B is a fragmentary view of an alternative embodiment of a distal end of a container.

Fig. 6 is an enlarged fragmentary schematic view of an exemplary attachment for the valve cup according to the present invention

DETAILED DESCRIPTION OF THE INVENTION

[0011] Referring to Fig. 1, the invention is a package comprising plural containers. One or more containers may be disposed inside each other to yield an outer container having one or more containers therein.

[0012] If the package 10 has two containers, this arrangement yields a package 10 having an outer container 12 and an inner container 16 disposed therein. If the package 10 has three containers 12, 14, 16, this arrangement yields a package 10 having an outer container 12 with a central container 14 disposed therein and an inner container 16 disposed in the central container 14. In such an arrangement the central container 14 is disposed between the outer container 12 and the inner container 16.

[0013] The plural containers 12, 14, 16 keep different materials contained therein substantially isolated until the materials are dispensed at the point of use. During or after the dispensing process the materials may be mixed. The materials may include one or more products intended jointly or separately for one or more end uses, one or more propellants, air, water, etc.

[0014] The product(s) may comprise any dispensable substance and includes gaseous, liquid, and farinaceous particulate materials, which may be dispensed using the package 10 described and claimed herein. It is simply necessary that the product viscosity be low enough for the product to be dispensed from a package 10 having the desired pressure and dispensing characteristics.

[0015] The containers 12, 14, 16, may have a common discharge. The discharge may be a dispensing orifice, drain, aperture or other dispensing device, as is known in the art. A nozzle will be discussed for exemplary and illustrative purposes. The nozzle 20 may be pressed or otherwise displaced from its normally closed position to provide a flow path for material disposed in the container to the environment. For example, one suitable type of nozzle 20 is a normally closed spray orifice. Alternatively a trigger, cam, etc. may be utilized to open the flow path for product disposed inside one container to be dispensed to the environment. Suitable nozzle 20s are disclosed in US Pat Nos. 3690515 issued to Ewald, 4940170 issued to Popp-Ginsbach, 4964539 issued to Mueller, 5497911 issued to Ellion et al. and 5839623 issued to Losenno et al.

[0016] If desired, one or more of the containers may have a dip tube. The dip tube may be used to transport product from the bottom of that container to the discharge.

[0017] Examining the package 10 in more detail, one or more of the containers 12, 14, 16 may be translucent or clear. By translucent, it is meant that light can pass through the wall of the container, sufficient for a viewer to discern the presence of product therein. By clear it is meant that light can pass through the wall of the container and images discerned on the other side of the wall. In either case, having a clear container 12, 14, 16, or a translucent container 12, 14, 16, a product or container 14, 16 therein is visible from outside the package 10.

[0018] In one embodiment according to the invention the outer container 12 is clear or translucent. This allows a central container 14 or inner container 16 therein to be viewed from outside the package 10. Furthermore, any material disposed in the outer container 12 is likewise

viewable from outside the package 10.

[0019] The outer container 12 may be rigid. By rigid, it is meant that the container 12, 14, 16 does not substantially change shape or size in response to normal usage forces or depletion of the contents of the package 10. A rigid outer container 12 allows the package 10 to be conveniently shipped, stored, displayed, placed on a tabletop, etc. Furthermore, a rigid outer container 12 provides protection in the event that the package 10 is dropped, or otherwise disturbed. Suitable materials for the outer container 12 include plastic, glass, combinations thereof, etc. of any wall thickness suitable for the intended pressurization.

[0020] The inner container 16 and/or central container 14, if present, may likewise be clear or translucent. A clear or translucent central container 14 allows product therein, as well as any inner container 16 to be viewed from outside the package 10. Similarly, a clear or translucent inner container 16 allows product therein to be viewed from outside the package 10. Of course, it will be apparent that a dip tube, if present, would be visible inside any clear or translucent container 12, 14, 16, provided that any containers 12, 14 outside of that container 14, 16 are likewise clear or translucent. The dip tube, valve assembly, and/or valve cup 24, if present, may also be clear/translucent.

[0021] Materials suitable for use with the package 10 of the present invention include, but are not limited to: polypropylene (PP), polyethylene (PE), polyethylene naphthylate (PEN), polycarbonate (PC), polyamides (PA) and/or polyethylene terephthalate (PET), polyvinylchloride (PVC); and polystyrene (PS).

[0022] A transparent container 12, 14, 16 according to the invention may have a transmittance of more than 25%, more than 30%, more than 40%, or more than 50% in the visible part of the spectrum, approximately 410-800 nm. Alternatively, absorbency of container 12, 14, 16 may be measured as less than 0.6 or by having transmittance greater than 25% wherein percent transmittance equals: $(1/(10 \exp(\text{absorbency}))) \times 100 \%$. For purposes of the invention, as long as one wavelength in the visible light range has greater than 25% transmittance, the respective container 12, 14, 16 is considered to be transparent/translucent.

[0023] By clear and translucent, it is meant to include inner containers 16, central containers 14 and/or outer containers 12 which are entirely clear or translucent. The terms clear and translucent also include inner containers 16, central containers 14 and/or outer containers 12 which have clear and/or translucent regions. The clear or translucent regions may be sections of these containers, such as a top half, a bottom segment, may be windows or portals, may be striped with alternating opaque regions, etc.

[0024] The inner container 16 and/or central container 14 may be rigid or flexible. By flexible it is meant that the container 12, 14, 16 changes shape or size during ordinary use, either due to forces exerted by the user or de-

pletion of the contents. For example, a flexible container 12, 14, 16 may assume a lesser volume due to contents being dispensed therefrom. If a flexible container 12, 14, 16 is desired, suitable materials include elastomers, natural or synthetic rubber, polyolefins, polyesters, nylons, etc., or mixtures/combinations thereof, with the understanding that transparency/translucency will be provided at least in part, as desired.

[0025] Referring to Fig. 2, the inner container 16, outer container 12 and central container 14, if present, may have a common discharge. The common discharge may include a flange 22, which is juxtaposed with an opening. The opening may be a generally planar opening and disposed on the outer container 12, or the opening may be nonplanar and primarily disposed on the inner container 16 and/or central container 14.

[0026] Product may be disposed or inserted into the inner container 16, central container 14, and/or outer container 12 using a positive displacement system. One suitable positive displacement system is a volumetric piston. The volumetric piston has a linear displacement. The linear displacement inserts the product from a chamber, displacing the product from that chamber under pressure, into the desired container 14, 16, as is known in the art.

[0027] The inner container 16 may have a flow path which is coaxially disposed, in whole or in part, within the flow path of the flow path of the central container 14. The coaxial flow path may extend from the flange 22 to a point juxtaposed with a swirl chamber and comprise a conduit extending from each respective container. The outer conduit may completely or partially circumscribe the inner conduit along all or part of a common length.

[0028] The swirl chamber is a region disposed upstream of the nozzle 20. The swirl chamber may have a volume sufficient to allow intermixing of materials from the inner and central containers 14. Materials in the swirl chamber may mix and then exit through the nozzle 20 with a circumferential velocity component.

[0029] The discussion below refers to a package 10 having a valve cup 24 used in conjunction with the outer container 12. However, the invention is not so limited. The valve cup 24 may be used in conjunction with the inner container 16 or central container 14. The valve cup 24 may be used to secure a valve assembly to the outer container 12.

[0030] A valve assembly may include a movable stem or plug which opens a flow path for dispensing product from the corresponding container. Typically, metal valve cups 24 are used for pressurized packages 10 and plastic valve cups 24 are used for packages 10 which are not pressurized. However, a metal valve cup 24 is more expensive than a comparable plastic valve cup 24 and requires plastic deformation of the metal flange 22 for attachment to the outer container 12. This process requires specialized assembly machinery and may require undue assembly time and stress on the neck 26 of the outer container 12.

[0031] If a plastic valve cup 24 is utilized, the assembly

procedure can be simplified. The valve cup 24 can be inserted into or outside of the neck 26 of the outer container 12. The valve cup 24 may be joined to the container neck 26 in any suitable fluid tight or vapor tight manner, sufficient to withstand internal or external pressurization of the container. A press fit, interference fit, clearance fit may be utilized for joining the neck 26 and valve cup 24. Joining may also be accomplished by friction welding, solvent welding, high frequency welding, adhesive, or a combination thereof. If desired, in intermediate material or component may be disposed between the valve cup 24 and neck 26, so long as such material or component provides an adequate seal.

[0032] Joining may also be accomplished by having protuberances on one of the neck 26 and valve cup 24, to provide a snap fit for holding these components together. In one embodiment, the protuberances may comprise plural flanges 22 disposed in series on the inside surface or outside surface of the container neck 26, valve or a combination thereof. In one embodiment, one or more of the flanges 22 may comprise an annular ring. Plural flanges 22, such as annular rings, may be disposed in series.

[0033] The neck 26 of the container may be of any suitable size, geometry shape and/or cross-section. Thus, while a round cross section is shown the invention is not so limited. The neck 26 may be parallel to the major axis of the package 10, perpendicular thereto, or at any angle therebetween. Further the neck 26 may be concentric or eccentric with respect to the major axis of the package 10. The neck 26 has an opening dimension 32. The opening dimension 32 extends from the center of the package 10 to the center of the wall forming the neck 26.

[0034] Referring to Fig. 6, the container may further have a joining length 30. The joining length 30, is the distance, which may be taken parallel to the neck 26, over which the neck 26 and valve cup 24 may be joined together to form a seal. In one embodiment, the neck 26 may comprise a protrusion 36 and the valve cup 24 may comprise a channel 34 for receiving such protrusion 36.

[0035] Alternatively, the neck 26 may comprise the channel 34 and the valve cup 24 may comprise the protrusion 36 for being received in the channel 34. In either embodiment, the length over which the protrusion 36 is received in the channel 34 may correspond to the joining length 30. While Fig. 6 shows a particular arrangement of the inner and outer walls of the valve cup 24, channel 34 and protrusion 36, the invention is not so limited. This geometry may be transposed, so that it is inverted with respect to the major axis of the package 10.

[0036] The joining length 30 may be dependent upon the opening dimension 32. If the neck 26 is not circular, the opening dimension 32 is taken as the largest opening dimension 32 in that neck 26 of the package 10. To provide for adequate sealing against the internal and external pressurization of the containers 12, 14, 16, the package 10 may have a ratio of joining length 30 to opening

dimension 32 of at least 1, 1.25, 1.5, 1.75, 2 or 2.5.

[0037] This arrangement provides the benefit, when used with a plastic container, and/or plastic valve cup 24 that a less total material may be utilized. For example, utilizing the current system of the prior art required additional material to form the crimp. Since the crimping process utilized a metal outer container 12, forming may be difficult. However, when utilizing the plastic container and/or plastic valve cup 24 of the present invention, the above cited ratios can be advantageous.

[0038] If desired, a gasket 38 may be disposed in the channel 34. The gasket 38 may be attached to the inside surface of the channel 34 or to the inside or outside of the protrusion 36 to be received in the channel 34. The gasket 38 may comprise any soft material, such as rubber, PET, polyethylene, urethane, etc. suitable for sealing against the desired pressurization. Of course, plural gaskets 38 may be utilized in series, and disposed on any combination of surfaces of the protrusion 36 and channel 34.

[0039] If desired, the gasket(s) 38 may be integral with the plastic valve cup 24, or the plastic neck 26 of the container. The gasket(s) 38 may be molded into the valve cup 24 or neck 26 as part of the manufacturing process. Alternatively, the valve cup 24 and/or and the neck 26 of the container may be made of a soft, pliable material obviating the need for a gasket 38.

[0040] In yet another embodiment, the inner container 16, or central container 14, if present, may provide the gasket 38, or obviate the need therefor. Such an arrangement may utilize an inner container 16 or central container 14 if present, which is pliable. By pliable it is meant that the material of that container 14, 16 can conform to the shape and surface of the outer container 12. If desired, the inner container 16 or central container 14 may be sealed to the valve cup 24, a valve housing, the dip tube or to the neck 26 of the outer container 12.

[0041] Referring to Fig. 3, if desired, plural inner containers 16 may be disposed in parallel. This arrangement allows generally equivalent volumes, and therefore generally equivalent amounts of materials to be utilized and co-dispensed. However, the plural inner containers 16 disposed in parallel may be of the same or different shape, volume, position within the outer container 12, color, transparency/translucency/opacity, flow rate, and contain the same or different materials and/or propellant. Likewise the inner container 16 and central container 14 may be of the same or different shape, color, transparency/translucency/opacity, flow rate, and contain the same or different materials and/or propellant.

[0042] Of course, while two inner containers 16 are shown for illustrative purposes, the invention is not so limited. Three or more inner containers 16 may be utilized, as desired. Furthermore, one or more of the inner containers 16 disposed parallel with other inner containers 16 may be disposed inside a central container 14. Such an arrangement yields a compound system of one or more central containers 14 disposed in parallel with

other central containers 14 and each having one or more inner containers 16 therein.

[0043] If plural inner containers 16 are disposed in parallel, the inner containers 16 may discharge into a common flow path. The flow path may be annular, as shown, or may be an inverted "T" or "Y" having one leg and two branches in fluid communication with each other. Each branch of the flow path is in fluid communication with one of the inner containers 16. The leg of the flow path is in fluid communication with the swirl chamber or another downstream region of the flow path.

[0044] Referring to Fig. 4, the inner container 16, and/or central container 14 may have weakened regions 40, which provide for preferential collapse of that container upon depletion of its contents. The weakened regions 40 may comprise regions of the container having a lesser/greater wall thickness, hinge lines, different materials having a lesser/greater stiffness and/or regions having a geometry which promotes the desired collapse. Such preferential collapse helps to obtain complete depletion of the contents of that container, and also can provide an aesthetically desirable appearance as the volume of that container shrinks.

[0045] The weakened regions 40 may comprise ribs, which act as hinge lines. The ribs may be generally longitudinally oriented, and disposed substantially parallel to the major axis of the package 10. This arrangement allows the diameter or other cross-sectional area of the inner container 16 and/or central container 14 to diminish as material is dispensed therefrom. Alternatively, the ribs/hinge lines may be oriented generally parallel to the cross-section of the container and a generally perpendicular to the major axis of the package 10. Alternatively, the ribs/hinge lines may be oriented on a diagonal. Of course combination of the foregoing geometries may be utilized as well.

[0046] Of course, the weakened regions 40 may be of plural orientations, extending in different directions. The weakened regions 40 may be equally or unequally circumferentially spaced around the container, and of the same or different weakness, size, longitudinal position, radial position, circumferential position, etc. Any configuration which provides for the desired collapse of the container may be suitable.

[0047] Referring to Figs. 5A - 5B, the inner container 16 and/or central container 14, if present, may define a major axis. The major axis is the direction, generally longitudinally oriented, along at the major dimension of the inner container 16, central container 14, outer container 12, or package 10. The inner container 16, central container 14, and/or outer container 12, may each define a proximal end 44 juxtaposed with the discharge and a distal end 46 remote therefrom.

[0048] The distal end 46 of the inner container 16 and/or central container 14, maybe inverted upon itself to provide an inversion 42. The inversion 42 reentrantly extends back towards the proximal end 44 of the respective container. The inversion 42 may be of generally less-

er stiffness, particularly in the direction parallel the major axis, than the balance of that container 14, 16.

[0049] In another embodiment, the central container 14 and/or inner container 16 may be telescoping upon pressurization and/or filling. This provides expansion of that container 14, 16 in the longitudinal directions, as desired.

[0050] When material is disposed in a container having an inversion 42, the inversion 42 may expand away from the proximal end 44, parallel to the major axis. After expanding parallel to the major axis, the container may expand radially relative to the major axis. Upon removal of material therefrom, the container may collapse in the opposite order. Such expansion allows material with sufficient barrier properties to be utilized for the inner container 16, and or central container 14 and expansion/collapse of such container to occur upon insertion and removal of material therefrom, respectively.

[0051] This arrangement may provide the benefit that the distal end 46 of the inner container 16, or central container 14, if present, may contact the inner surface of the outer container 12. Such contact may occur at the distal end 46 of the outer container 12, the periphery (taken in the circumferential direction), or both. Such contact provides the benefit that if the package 10 is dropped, dynamic load is transferred from the outer container 12 through the contact to the inner and/or central container (s) 14, 16. This may reduce the chance of accidental rupture of the package 10 upon dropping.

[0052] If desired, the inner container 16 and/or central container 14 may be stiffer or otherwise more resistant to pressure at the proximal end 44 of that container 14, 16. This provides the benefit that a more uniform collapse of that container 14, 16 may occur as contents are dispensed therefrom. Such increased resistance to pressure, including extrnal pressure may be accomplished by having an stiffer material, increased sectionmodulus, increased wall thickness, etc. The increased resistance to collapse may be provided as a gradient, increasing as the proximal end 44 of that container 14, 16 is approached or as one or more step functions.

[0053] Referring back to Fig. 1, the outer container 12 and/or central container 14 may contain a propellant. The propellant may be used to dispense or otherwise discharge contents from one or more central containers 14 and inner containers 16. Suitable propellants include compressible propellants, including but not limited to nitrogen, carbon dioxide, air, nitrous oxide, argon etc. and having the benefit of being inert. Suitable propellants include condensable propellants, including but not limited to fluorocarbons, hydrocarbons, hydrofluorocarbons, etc. and having the benefit of constant pressure during dispensing.

[0054] If a condensable propellant is desired, one may apply a vacuum to the volume of the outer container 12. This vacuum minimizes the pressure from the condensable propellants, preventing the pressure from becoming too great during a use of the package 10.

[0055] If a condensable or compressible propellant is desired, the propellant may be disposed in the container as a solid state of matter, such as a capsule, granules etc. The solid may rupture upon dispensing of material from the package 10, due to the decrease of the pressure which occurs during dispensing.

[0056] Additionally or alternatively, the propellant may sublime to provide the desired pressure in the outer container 12. Illustrative propellants include dry ice and acid/base combinations which generate gas. Generally cryogenic filling of the propellant may be utilized. If cryogenic filling is desired, the bottom of the respective container 12, 14, 16 may be reinforced, as necessary. If desired, the cryogenic propellant may be contained in a cup, for aesthetic purposes.

[0057] The package 10 may be charged with product as follows, although one of skill will recognize there is flexibility in the order that the illustrative steps are performed. First, the outer container 12 is provided. The outer container 12 may be filled with propellant at atmospheric pressure. The central container 14, if desired, is inserted in the outer container 12. The central container 14 is joined to the outer container 12 in fluid tight relationship, sufficient to withstand the expected pressurization of the package 10 prior to dispensing and during storage, shipment and handling.

[0058] A charge of product to be dispensed, and/or propellant, may then be inserted into the central container 14. The charge may be inserted into the central container 14 under pressure, causing it to expand. Expansion of the central container 14 decreases the available volume between the central container 14 and the outer container 12. Such decrease in the available volume pressurizes in the propellant within the outer container 12. The propellant may be held at, above or even below atmospheric pressure. Such pressurization of the propellant allows it to be useful for dispensing product from the central container 14. This operation allows for filling of the containers without the necessity of a bung hole, as is common in the art.

[0059] If desired, this process may be repeated for the inner container 16. Of course, one will recognize that product and/or propellant may be contained in any viable combination of the inner container 16, outer container 12 and the central container 14. Thus, the outer container 12 may contain the product and inner container 16 and/or central container 14 may contain product and/or propellant. Conversely, the central container 14 may contain the product and the inner and/or outer containers 12 may contain product and/or propellant.

[0060] While, a round cross-section package 10 having a generally vertically oriented major axis is illustrated, the invention is not so limited. The package 10 may be horizontally oriented, of any desired cross-section or orientation and size. The cross section may be constant or variable. The size and geometry must simply be suitable for the intended use of the material contained in the package 10. Likewise, the illustrated package 10 has the dis-

dispensing opening juxtaposed with the top of the package 10. Again, the invention is not so limited. The dispensing opening may be juxtaposed with the bottom of the package 10, as, for example, would be convenient for a gravity drain system or may be disposed at any intermediate position.

Claims

1. A package (10), comprising:

an outer container (12);
 an inner container (16) disposed therein;
 a central container (14) disposed between said outer container (12) and said inner container (16), said inner container (16) and said central container (14) being visible from outside said package (10); and
 a common discharge from said central container (14) and said inner container (16), wherein in a first material disposed in said inner container (16) and a second material disposed in said central container (14) can be isolated from one another until dispensing of both said materials simultaneously occurs, **characterized in that** each of said inner container (16) and said central container (14) collapses in a predetermined pattern upon removal of product therefrom.

2. A package (10) according to claim 1 **characterized in that** at least one of said inner container (16) and said central container (14) is pleated.

3. A package (10) according to claim 2 **characterized in that** at least some of said pleats are unequally spaced from each other.

4. A package (10) according to any of the preceding claims **characterized in that** at least one of said inner container (16) and said central container (14) comprises regions of relatively greater and relatively lesser stiffness.

5. A container according to claim 4, **characterized in that** said at least one of said inner container (16) and said central container (14) comprises three regions, a first, region of a relatively greater stiffness, a second region of ii relatively lesser stiffness, and a third region having a stiffness intermediate said stiffness of said first region and of said second region.

6. A package (10) according to claims 4 or 5 **characterized in that** said inner container (16) has a first wall thickness near the proximal end and a second wall thickness near the distal end, **characterized by** said first thickness being greater than said second

thickness.

7. A package (10) according to any of the preceding claims wherein each of said inner container (16) and said central container (14) has a proximal end joinable to said outer container (12) and a distal end remote therefrom, said distal end of at least one of said inner container (16) or said outer container (12) being inverted upon itself, **characterized in that** said inversion expands parallel to the major axis upon the addition of material to that said container.

8. A package (10) according to any of the preceding claims **characterized in that** at least one of said inner container (16) and said central container (14) first expands parallel to the major axis, then expands radially outward relative to said longitudinal axis upon insertion of material therein.

9. A package (10) according to any of the preceding claims wherein at least one of said inner container (16) and said central container (14) has a major axis therethrough, **characterized in that** said inner container (16) or said central container (14) retracts principally in the direction parallel to said major axis upon removal of material therefrom.

Patentansprüche

1. Verpackung (10), umfassend:

einen Außenbehälter (12),
 einen darin angeordneten Innenbehälter (16),
 einen mittleren Behälter (14), der zwischen dem Außenbehälter (12) und dem Innenbehälter (16) angeordnet ist, wobei der Innenbehälter (16) und der mittlere Behälter (14) von außerhalb der Verpackung (10) sichtbar sind, und
 einen gemeinsamen Auslass aus dem mittleren Behälter (14) und dem Innenbehälter (16), wobei ein erstes Material, das in dem Innenbehälter (16) angeordnet ist, und ein zweites Material, das in dem mittleren Behälter (14) angeordnet ist, voneinander getrennt sein können, bis die gleichzeitige Abgabe der beiden Materialien erfolgt, **dadurch gekennzeichnet, dass** sich der Innenbehälter (16) und der mittlere Behälter (14) jeweils in einem vorbestimmten Muster zusammenfalten, wenn das Produkt daraus entfernt wird.

2. Verpackung (10) nach Anspruch 1, **dadurch gekennzeichnet, dass** der Innenbehälter (16) und/oder der mittlere Behälter (14) gefaltet ist.

3. Verpackung (10) nach Anspruch 2, **dadurch gekennzeichnet, dass** mindestens ein Ende der Fälte-

lungen ungleich voneinander beabstandet sind.

4. Verpackung (10) nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Innenbehälter (16) und/oder der mittlere Behälter (14) Bereiche mit verhältnismäßig höherer und verhältnismäßig geringerer Steifigkeit umfasst. 5
5. Behälter nach Anspruch 4, **dadurch gekennzeichnet, dass** der Innenbehälter (16) und/oder der mittlere Behälter (14) drei Bereiche umfasst, einen ersten Bereich mit verhältnismäßig höherer Steifigkeit, einen zweiten Bereich mit verhältnismäßig geringerer Steifigkeit und einen dritten Bereich mit einer Steifigkeit zwischen der Steifigkeit des ersten Bereichs und des zweiten Bereichs. 10 15
6. Verpackung (10) nach den Ansprüchen 4 oder 5, **dadurch gekennzeichnet, dass** der Innenbehälter (16) eine erste Wanddicke nahe dem proximalen Ende und eine zweite Wanddicke nahe dem distalen Ende besitzt, **dadurch gekennzeichnet, dass** die erste Dicke größer ist als die zweite Dicke. 20
7. Verpackung (10) nach einem der vorstehenden Ansprüche, wobei der Innenbehälter (16) und der mittlere Behälter (14) jeweils ein proximales Ende, das mit dem Außenbehälter (12) verbindbar ist, und ein davon entferntes distales Ende besitzen, wobei das distale Ende des Innenbehälters (16) und/oder des Außenbehälters (12) auf sich selbst umgestülpt ist, **dadurch gekennzeichnet, dass** sich die Umstülpung bei der Zugabe von Material zu dem Behälter parallel zur Hauptachse ausdehnt. 25 30
8. Verpackung (10) nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** sich der Innenbehälter (16) und/oder der mittlere Behälter (14) zuerst parallel zur Hauptachse ausdehnt und dann radial nach außen relativ zur Längsachse ausdehnt, wenn Material darin eingebracht wird. 35 40
9. Verpackung (10) nach einem der vorstehenden Ansprüche, wobei der Innenbehälter (16) und/oder der mittlere Behälter (14) eine **dadurch** verlaufende Hauptachse aufweist, **dadurch gekennzeichnet, dass** sich der Innenbehälter (16) oder der mittlere Behälter (14) hauptsächlich in die Richtung parallel zu der Hauptachse zusammenzieht, wenn Material daraus entnommen wird. 45 50

Revendications

1. Conditionnement (10), comprenant : 55
 - un récipient externe (12) ;
 - un récipient interne (16) disposé dedans ;

un récipient central (14) disposé entre ledit récipient externe (12) et ledit récipient interne (16), ledit récipient interne (16) et ledit récipient central (14) étant visibles depuis l'extérieur dudit conditionnement (10) ; et

un écoulement commun à partir dudit récipient central (14) et dudit récipient interne (16), dans lequel un premier matériau disposé dans ledit récipient interne (16) et un deuxième matériau disposé dans ledit récipient central (14) peuvent être isolés l'un de l'autre jusqu'à ce qu'une distribution de l'un et l'autre desdits matériaux se produise simultanément, **caractérisé en ce que** chacun dudit récipient interne (16) et dudit récipient central (14) s'écrase dans un motif prédéterminé lors du retrait du produit de ceux-ci.

2. Conditionnement (10) selon la revendication 1, **caractérisé en ce qu'**au moins l'un parmi ledit récipient interne (16) et ledit récipient central (14) est plissé.
3. Conditionnement (10) selon la revendication 2, **caractérisé en ce qu'**au moins certains desdits plissages sont espacés de façon inégale l'un de l'autre.
4. Conditionnement (10) selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'**au moins l'un parmi ledit récipient interne (16) et ledit récipient central (14) comprend des régions de rigidité relativement plus grande et relativement plus petite.
5. Récipient selon la revendication 4, **caractérisé en ce que** ledit au moins l'un parmi ledit récipient interne (16) et ledit récipient central (14) comprend trois régions, une première région de rigidité relativement plus grande, une deuxième région d'une rigidité relativement moindre, et une troisième région ayant une rigidité intermédiaire entre ladite rigidité de ladite première région et de ladite deuxième région.
6. Conditionnement (10) selon les revendications 4 ou 5, **caractérisé en ce que** ledit récipient interne (16) a une première épaisseur de paroi près de l'extrémité proximale et une deuxième épaisseur de paroi près de l'extrémité distale, **caractérisé en ce que** ladite première épaisseur est supérieure à ladite deuxième épaisseur.
7. Conditionnement (10) selon l'une quelconque des revendications précédentes, dans lequel chacun dudit récipient interne (16) et dudit récipient central (14) a une extrémité proximale pouvant être jointe audit récipient externe (12) et une extrémité distale éloignée de celle-ci, ladite extrémité distale d'au moins un dudit récipient interne (16) ou dudit récipient externe (12) étant inversée sur elle-même, **caractéri-**

sé en ce que ladite inversion subit une expansion parallèle au grand axe lors de l'addition de matériau audit récipient.

8. Conditionnement (10) selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'**au moins l'un parmi ledit récipient interne (16) et ledit récipient central (14) subit d'abord une expansion parallèle au grand axe, puis subit une expansion en sens radial vers l'extérieur par rapport audit axe longitudinal lors de l'insertion de matériau dedans. 5
10
9. Conditionnement (10) selon l'une quelconque des revendications précédentes, dans lequel au moins l'un parmi ledit récipient interne (16) et ledit récipient central (14) a un grand axe à travers celui-ci, **caractérisé en ce que** ledit récipient interne (16) ou ledit récipient central (14) se rétracte principalement dans la direction parallèle audit grand axe lors du retrait de matériau de celui-ci. 15
20

25

30

35

40

45

50

55

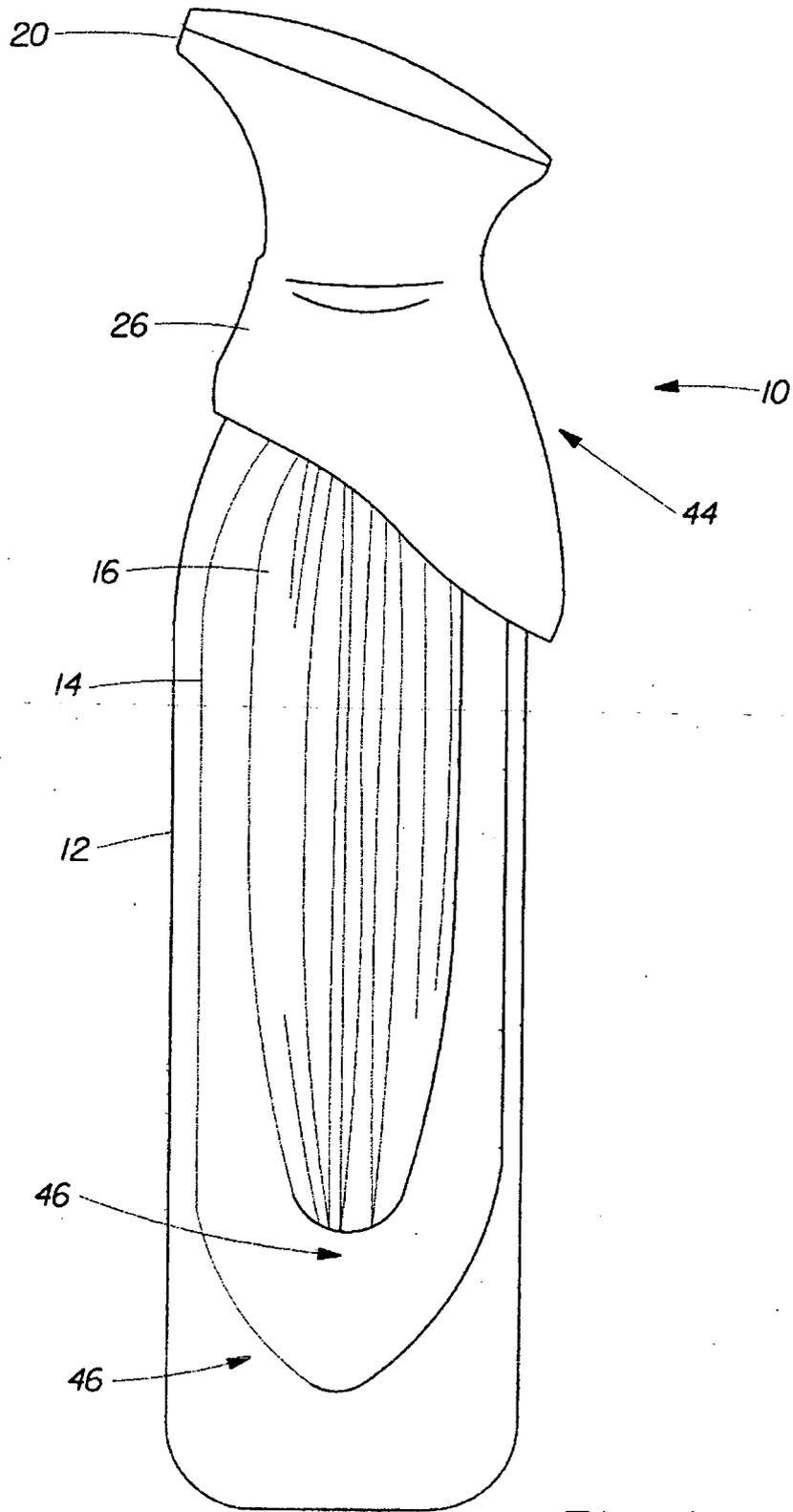


Fig. 1

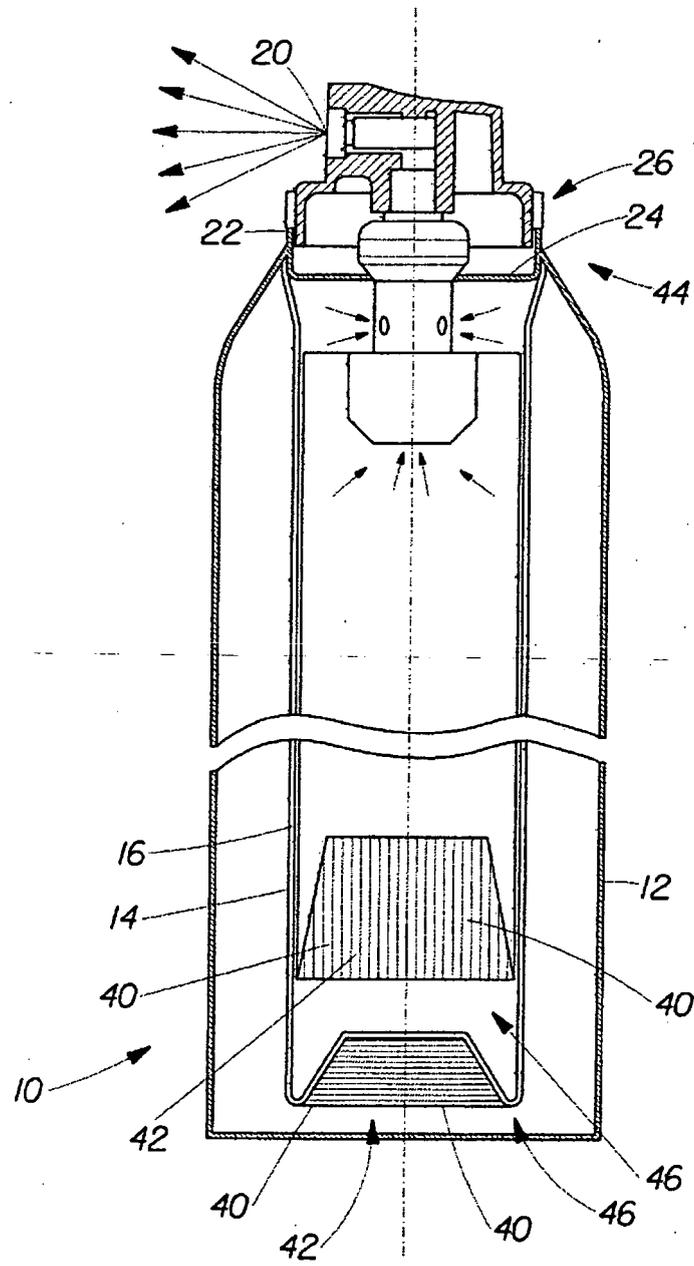


Fig. 2

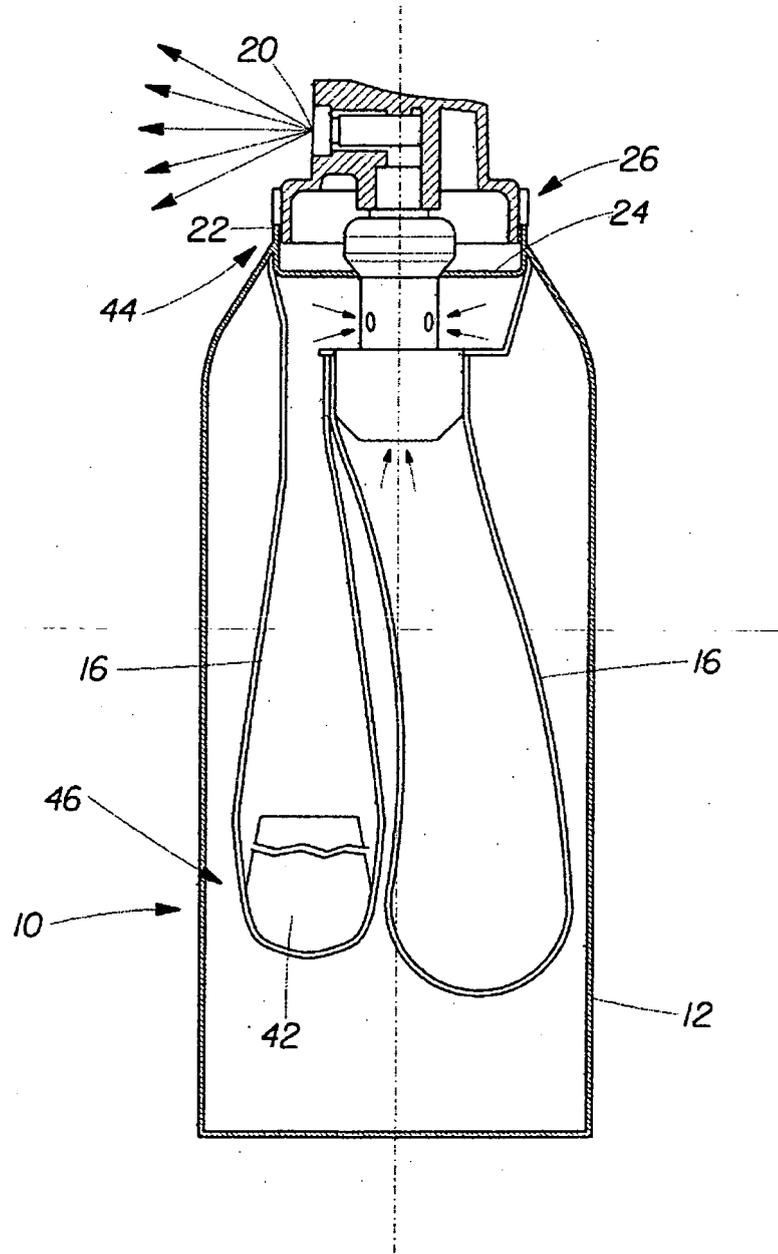


Fig. 3

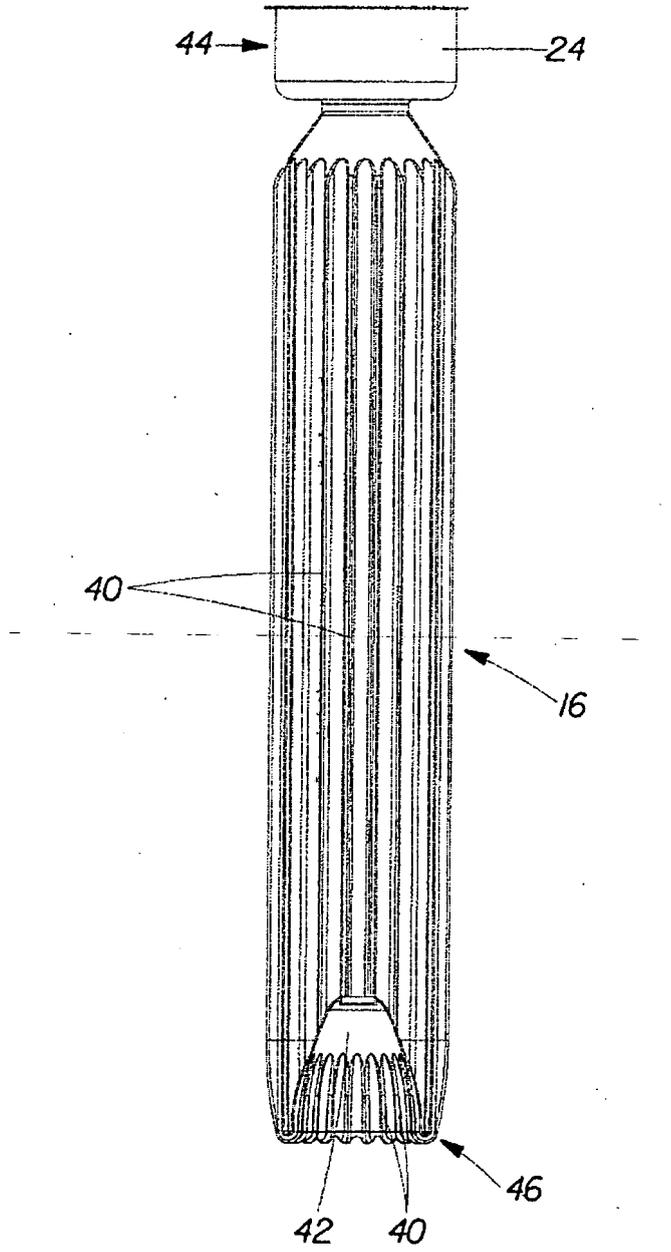


Fig. 4

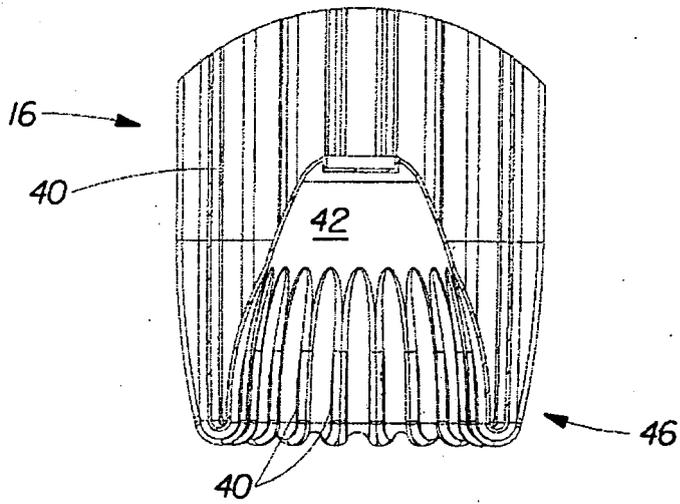


Fig. 5A

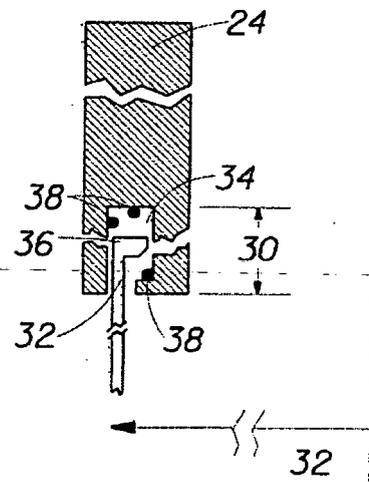


Fig. 6

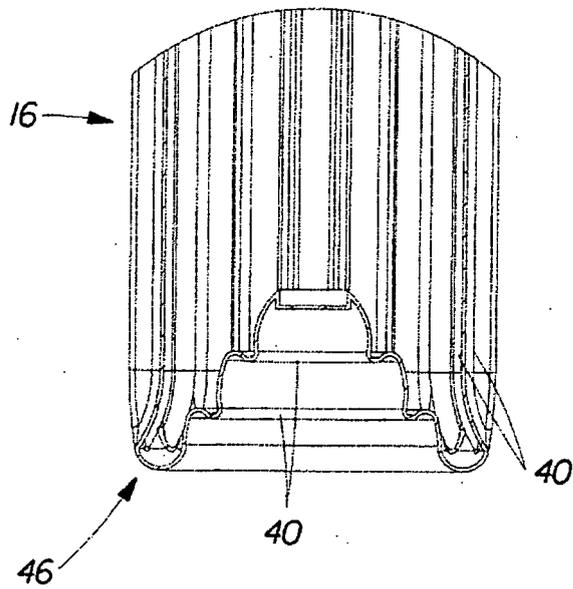


Fig. 5B

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 4838457 A, Swahl James C **[0008]**
- US 3690515 A, Ewald **[0015]**
- US 4940170 A, Popp-Ginsbach **[0015]**
- US 4964539 A, Mueller **[0015]**
- US 5497911 A, Ellion **[0015]**
- US 5839623 A, Losenno **[0015]**