EUROPEAN PATENT SPECIFICATION

METERING POUCH FOR DISPENSING FLOWABLE PRODUCT

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Description

TECHNICAL FIELD

The presently disclosed subject matter relates generally to a method for dispensing metered doses of a flowable product from a pouch. More particularly, the presently disclosed subject matter is directed to a method for dispensing metered doses of a flowable product from a pouch comprising a main reservoir, a dispensing reservoir, and a dividing film diaphragm containing a passageway allowing communication between the reservoirs.

BACKGROUND

Flexible packaging is increasingly becoming one of the primary forms of consumer packaging for flowable products. Packages of this kind include a wide variety of containers, from simple packages to sophisticated contoured designs that function as stand-up pouches, flat pouches, or even box shapes. Such flexible packages are economical packaging solutions that allow compact shipping to the filler, can include improved barrier or other film qualities, and are suitable for high-quality printing and finishing. In addition, flexible packaging (as compared to relatively rigid packaging, e.g., cartons) take up very little volume until after the package is filled, providing a significant storage advantage. Further, after the flexible package is emptied of its contents, it readily collapses, thereby reducing its volume to approximately that of the unfilled package, which proves to be a considerable benefit.

For many applications, the entire contents of a flexible package can be used at one time. For other applications, only a small amount of product is required for an application, such as washing detergent, bleach, fabric softener, and the like. In cases where only a small amount of the product is required, there is generally a need to measure the amount of the product to be dispensed in each application.

Commonly, users are required to utilize a package cap as the measuring device. The cap can have a built-in cup with various graduations or "fill lines" representing different fluid volumes. Where such measuring aids are not incorporated into the package itself, users utilize other means to measure the amount of flowable product necessary for a specific application. The extra time and effort needed to find and utilize a suitable measuring device presents added difficulties. The procedure of pouring the product from the package to a measuring container, and then transferring from the measuring container to an end use is a tedious and time-consuming process. In addition, because of the variations in size and shape, such sight-measuring aids can yield inaccurate and imprecise results.

There are many different containers that dispense flowable products in measured amounts, where the container holds a substantially greater amount of product relative to the dispensed amount. Many of these devices have the capacity to store, measure, and dispense fluids without the need for sight measuring. Such characteristics are desirable, especially when contact with the packaged product can be harmful, such as with poisons, bleach, etc. Typically, however, prior art devices capable of dispensing a measured volume of fluid are unduly complex in design and manufacture, are undependable, and can be expensive.

In addition, prior art embodiments of flexible packages with metering features generally comprise a package seal dividing the package into two compartments. Such pouches with a seal divider are structurally unstable, wherein the top compartment easily collapses over to one side. In addition, the seal divider causes problems with flow from one compartment of the package to the other, as very minor changes in how the package is handled can easily create a fold to block the flow of product. Further, such prior art packages are very difficult to use with one hand, especially in a vertical configuration, such as a stand-up pouch.

FR 2,699,509 discloses a method in accordance with the precharacterizing section of claim 1.

SUMMARY

The present invention provides a method of dispensing a flowable product from a pouch, the method comprising:

(a) providing a dispensing pouch comprising:

i) a main reservoir;
ii) a dispensing reservoir comprising a pouch exit to allow the flowable product to be dispensed from the pouch; and
iii) a diaphragm separating the main reservoir from the dispensing reservoir, wherein the diaphragm comprises a piece of film sealed about its circumference to the inside surface of the pouch and an opening to allow communication between the reservoirs;

(b) filling the main reservoir of said pouch with said flowable product;
(c) initiating an exit in said dispensing reservoir;
(d) characterized by either:

a. applying pressure to said main reservoir to force flowable product through the diaphragm opening into said dispensing reservoir until a measured amount of flowable product has been transferred and then applying pressure to said dispensing reservoir to force flowable product through the exit and out of the pouch; or
b. positioning said pouch to allow the flowable product to gravity-flow from said main reservoir.
through the diaphragm opening into said dispensing reservoir until a measured amount of flowable product has been transferred and then positioning said dispensing reservoir to allow the flowable product to gravity-flow through the exit and out of the pouch.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1a is a front perspective view of a prior art two-compartment metering pouch.
Figure 1b is a side perspective view of the prior art pouch of FIG. 1.
Figure 2a is a front perspective view of a prior art two-compartment metering pouch.
Figure 2b is a side perspective view of the prior art pouch of FIG. 2a.
Figure 3a is front perspective view of a pouch of the presently disclosed subject matter.
Figure 3b is a side perspective view of the pouch of FIG. 3a.
Figure 4 is a side perspective view of a pouch of the presently disclosed subject matter.
Figure 5a and 5b are front perspective views of a pouch of the presently disclosed subject matter.
Figure 6 is a front perspective view of a pouch of the presently disclosed subject matter.
Figure 7 is an enlarged fragmentary view taken of one embodiment of a pouch diaphragm.
Figure 8 is a front perspective view of a pouch of the presently disclosed subject matter.
Figure 9 is an enlarged fragmentary view of one embodiment of a pouch diaphragm.
Figures 10 and 11 are front perspective views of pouches of the presently disclosed subject matter.
Figure 12 is an enlarged fragmentary view of one embodiment of a pouch diaphragm.

DETAILED DESCRIPTION

I. General Considerations

The presently disclosed subject matter is a novel adaptation of a pouch that enables the measurement and dispensing of unit doses of flowable products. Particularly, the disclosed pouch utilizes the addition of a separate section of a film that divides the pouch into a main reservoir and a dispensing reservoir. The use of the dividing film allows the structural integrity of the pouch to remain intact. The dividing film comprises an opening that allows communication between the two reservoirs to achieve dispensing of the flowable product.

Alternative embodiments of prior art metering pouches simply use a seal across a portion of the pouch to create two separate compartments. Such embodiments create a hinge area, allowing the top compartment of the pouch to flop over, resulting in an unmanageable pouch. In addition, the hinge area is a hindrance to the flow of packaged product from the main reservoir to the dispensing reservoir.

II. Definitions

While the following terms are believed to be understood by one of ordinary skill in the art, the following definitions are set forth to facilitate explanation of the presently disclosed subject matter.

Unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly understood to one of ordinary skill in the art to which the presently disclosed subject matter pertains. Although any methods, devices, and materials similar or equivalent to those described herein can be used in the practice or testing of the presently disclosed subject matter, representative methods, device, and materials are now described.

Following long-standing patent law convention, the terms “a”, “an”, and the can refer to “one or more” when used in the subject specification, including the claims. Thus, for example, reference to “a pouch” (e.g., “a dispensing pouch”) includes a plurality of such pouches, and so forth.

Unless otherwise indicated, all numbers expressing quantities of components, conditions, and so forth used in the specification and claims are to be understood as being modified in all instances by the term “about”. Accordingly, unless indicated to the contrary, the numerical parameters set forth in the instant specification and attached claims are approximations that can vary depending upon the desired properties sought to be obtained by the presently disclosed subject matter.

As used herein, the term “abuse layer” refers to an outer film layer and/or an inner film layer, so long as the film layer serves to resist abrasion, puncture, and other potential causes of reduction of package integrity, as well as potential causes of reduction of package appearance quality. The abuse layer can comprise any polymer, so long as the polymer contributes to achieving an integrity goal and/or an appearance goal. In some embodiments, the abuse layer can comprise polyamide, ethylene/propylene copolymer (such as, but not limited to, nylon 6, nylon 6/6, amorphous nylon), and/or combinations thereof.

As used herein, the term “barrier” and the phrase “barrier layer”, as applied to films and/or film layers, refers to the ability of a film or film layer to serve as a barrier to gases and/or odors. Examples of polymeric materials with low oxygen transmission rates useful in such a layer can include (but are not limited to): ethylene/vinyl alcohol copolymer (EVOH), polyvinylidene dichloride (PVDC), vinylidene chloride copolymer such as vinylidene chloride/methyl acrylate copolymer, vinylidene chloride/vinyl chloride copolymer, polyamide, polyester, polyacrylonitrile (available as Barex™ resin), or...
blends thereof. Oxygen barrier materials can further comprise high aspect ratio fillers that create a tortuous path for permeation (e.g., nanocomposites). Oxygen barrier properties can be further enhanced by the incorporation of an oxygen scavenger (e.g., comprising poly(ethylene/methyl acrylate/cyclohexene methyl acrylate, with or without a transition metal catalyst). In some embodiments, metal foil, metallized substrates (e.g., metallized polyethylene terephthalate (PET), metallized polyamide, or metallized polypropylene), or coatings comprising SiOx or AlOx compounds can be used to provide low oxygen transmission to the disclosed package.

[0018] As used herein, the term "bulk layer" refers to any layer of a film that is present for the purpose of increasing the abuse-resistance, toughness, modulus, etc., of a film. In some embodiments, bulk layers can comprise polyolefin; in some embodiments, at least one member selected from the group comprising ethylene/alpha-olefin copolymer, ethylene/alpha-olefin copolymer plastomer, low density polyethylene, and linear low density polyethylene.

[0019] The term "circumference" as used herein refers to the distance around an object, and does not imply that the object must be circular.

[0020] The term "communication" as used herein refers to an opportunity or means of passage between two or more regions.

[0021] The term "diaphragm" as used herein can refer to a portion of film sealed about at least a part of its circumference or edges to the interior of a pouch, wherein the diaphragm divides the pouch into two compartments.

[0022] As used herein, the term "dispenser" refers to a structure capable of holding and dispensing a product disposed therein. As used herein, the term "dispensing" refers to the process of distributing or administering a product from a dispenser.

[0023] As used herein, the term "dispensing reservoir" refers to the region of a pouch that houses the portion of the product contained therein that is to be dispensed. That is, when multiple doses of a product are to be dispensed, the body of the product is housed in the main reservoir, and the portion to be dispensed is housed in the dispensing reservoir.

[0024] As used herein, the term "film" includes, but is not limited to, a laminate, sheet, web, coating, and/or the like, that can be used to package a product.

[0025] As used herein, the term "flowable" refers to the ability of a composition to be transported by gravity or by conventional mechanical or pneumatic pumping means from a storage vessel, such as a pouch. For example, in some embodiments, a flowable material can be a liquid.

[0026] As used herein, the term "gravity flow" refers to the movement of a product, wherein the movement is caused primarily by gravitational force.

[0027] As used herein, the term "gusset" refers to the folded-in-and-out portions that form an expandable insert in a pouch.

[0028] As used herein, the phrase "inside layer" refers to the outer layer of a multilayer film packaging a product, which is closest to the product, relative to the other layers of the multilayer film.

[0029] The term "main reservoir" as used herein refers to the region of a pouch that houses the body of the product contained therein. That is, when multiple doses of a product are to be dispensed, the body of the product is housed in the main reservoir, and the portion to be dispensed is housed in the dispensing reservoir.

[0030] As used herein, the term "metering" refers to the process of measuring out a specific amount of material.

[0031] The term "notch" as used herein refers to a space, indentation, or hollow along the edge of a material or a laminate of materials (such as, for example, a pouch edge).

[0032] The term "opaque" as used herein refers to the external appearance of a material, which can actually be translucent, but is not transparent to an optical image.

[0033] As used herein, the term "opening" refers to one or more holes, gaps, cuts, slits, and the like.

[0034] As used herein, the term "oriented" refers to a polymer-containing material that has been stretched at an elevated temperature (the orientation temperature), followed by being "set" in the stretched configuration by cooling the material while substantially retaining the stretched dimensions. Upon subsequently heating unrestrained, unannealed, oriented polymer-containing material to its orientation temperature, heat shrinkage is produced almost to the original unstretched, i.e., pre-orienteded dimensions. More particularly, the term "oriented", as used herein, can refer to oriented films, wherein the orientation can be produced in one or more of a variety of manners.

[0035] As used herein, the phrase "outside layer" refers to the outer layer of a multilayer film packaging a product, which is furthest from the product relative to the other layers of the multilayer film.

[0036] As used herein, the term "polymer" (and specific recited polymers) refers to the product of a polymerization reaction, and is inclusive of homopolymers, copolymers, terpolymers, etc.

[0037] As used herein, the term "polymerization" can be inclusive of homopolymerizations, copolymerizations, terpolymerizations, etc., and can include all types of copolymerizations such as random, graft, block, etc. In general, the polymers in the films of the presently disclosed pouches can be prepared in accordance with any suitable polymerization process, including slurry polymerization, gas phase polymerization, high pressure polymerization processes, and the like.

[0038] The term "pouch" as used herein includes a pouch, a bag, for like containers, either pre-made or made at the point of bagging.

[0039] As used herein, the term "pouch fitment" refers to a means for accessing a container (such as a pouch).
and can include, without limitation, valves, ports, port enclosure assemblies, and other means for accessing a container. Fitments provide ports for establishing fluid communication between the contents of a container and the outside environment.

[0040] The term "reservoir" as used herein refers to, for example, any unit containing, or capable of containing, flowable product therein. As used herein, the "main reservoir" refers to the reservoir where the flowable material is contained prior to dispensing or metering. As used herein, the "dispensing reservoir" refers to the reservoir where the flowable material is contained during and/or after metering. The dispensing reservoir can also house the flowable material prior to dispensing.

[0041] As used herein, the term "seal" refers to any seal of a first region of a film surface to a second region of a film surface, wherein the seal is formed by heating the regions to at least their respective seal initiation temperatures. The heating can be performed by any one or more of a wide variety of manners, such as using a heated bar, hot air, infrared radiation, radio frequency radiation, etc.

[0042] As used herein, the phrase "tie layer" refers to any internal film layer having the primary purpose of adhering two layers to one another. In some embodiments, tie layers can comprise a non-polar or slightly polar polymer having a polar group grafted thereon. In some embodiments, tie layers can consist of only one member selected from the group consisting of: polyolefin and modified polyolefin, e.g., ethylene-vinyl acetate copolymer, modifiedethylene-vinyl acetate copolymer, heterogeneous and homogeneous ethylene alpha olefin copolymer, and modified heterogeneous and homogeneous ethylene alpha olefin copolymer; more preferably, tie layers can comprise at least one member selected from the group consisting of anhydride grafted linear low density polyethylene, anhydride grafted low density polyethylene, homogeneous ethylene alpha olefin copolymer, and anhydride grafted ethylene-vinyl acetate copolymer.

[0043] The term "transparent" as used herein refers to materials (i.e., films) that allow at least some amount of light to pass through the materials. In some embodiments, transparent materials allow greater than 50 percent, greater than 75 percent, greater than 90 percent, greater than 95 percent, or 100 percent of the light to pass through the materials.

[0044] The term "upright" as used herein refers to the orientation of the dispensing pouch when the base or bottom seal of a pouch is in contact with or adjacent to the ground.

III. The Dispensing Pouch

III. A. Generally

[0045] The presently disclosed subject matter will now be described more fully with reference to the accompanying drawings, in which some but not all embodiments are shown. Indeed, the presently disclosed subject matter can be embodied in many different forms and should not be construed as limited to the embodiments set forth herein. Like numbers refer to like elements throughout. Furthermore, the terms "top," "bottom," "first," "second," "upper," "lower," "side," and other similar terms as used herein refer to the structures shown in the drawings and are utilized only to facilitate describing the presently disclosed subject matter.

[0046] Referring to Figures 1a and 1b, a metering pouch of the prior art is provided. As illustrated in Figures 1a and 1b, prior art pouch 1 is constructed of front film 5 and rear film 10 that are sealed together around their edges, typically by heat sealing, to form top edge 15, bottom edge 20, and side edges 25 and 30. Prior art pouch 1 is divided into top compartment 35 and bottom compartment 40 by dividing seal 45. Particularly, dividing seal 45 is created by sealing together front sheet 5 and rear sheet 10, typically by heat sealing. Passageway 50 allows communication between top compartment 35 and bottom compartment 40.

[0047] Figure 1b is a side view of the prior art pouch depicted in Figure 1a. As illustrated in Figure 1b, front film 5 and rear film 10 are sealed together to form dividing seal 45. Particularly, when front film 5 and rear film 10 are sealed together at dividing seal 45, the pouch becomes joined together at the seal site. As a result, an effective hinge is created, thereby compromising the structural integrity of prior art pouch 1. Figure 2a illustrates prior art pouch 1 wherein the package contents have been distributed into top compartment 35 and bottom compartment 40. Thus, prior art pouch 1 is effectively two pouches (i.e., top compartment 35 and bottom compartment 40) with a small conduit between the two (e.g., dividing seal 45 and passageway 50), and is geometrically unstable. In addition, dividing seal 45 can cause problems with flow from one compartment of prior art pouch 1 to the other.

[0048] Figure 2b is a side view of the pouch of Figure 2a. Although a lay flat prior art pouch is depicted in Figures 1a, 1b, 2a, and 2b, one of ordinary skill in the art would readily appreciate that the prior art pouch design depicted can apply to stand-up pouches as well.

[0049] Referring to Figures 3a and 3b, presently disclosed pouch 60 is illustrated. In some embodiments, pouch 60 can comprise a stand-up pouch, having a base for supporting the pouch in an upright position and can optionally include a gusset. Particularly, in some embodiments, the pouch can comprise gusseted reinforcement. The pouch can comprise side gussets that include a typical center fold and lower triangular region formed by the folds of each side gusset, as would be known to those of ordinary skill in the art. See, for example, U.S. Pat. Nos. 6,857,779; 7,144,159; and 6,997,858.

[0050] In Figures 3a and 3b, pouch 60 is constructed of three separate pieces of film that are sealed together;
namely, front sheet 65, rear sheet 70, and base sheet 75. One of ordinary skill in the art can appreciate that in lieu of the front sheet 65 and rear sheet 70, a single sheet of film can be folded over and sealed around its edges. One of ordinary skill in the art would also understand that pouch 60 can comprise a bottom seal instead of base sheet 75 (see, for example, bottom seal 145 of the lay flat pouch of Figure 6). Front sheet 65 and rear sheet 70 are sealed together around their edges to form top seal 80 and side seals 85 and 90. Creation of the seals can be achieved by any of a number of means well known in the art, including (but not limited to) the application of heat, pressure, and/or adhesives. Furthermore, top seal 80 and side seals 85 and 90 can be constructed in any order.

**[0051]** Base sheet 75 is secured along its outer edges to the bottom edges of front sheet 65 and rear sheet 70 at base edges 95 and 100, respectively. Thus, in the embodiment shown in Figure 3a, pouch 60 is constructed like a conventional stand-up pouch (e.g., U.S. Pat. No. 6,375,037). In some embodiments, pouch 60 can have a w-shaped base that allows the stand-up features. The “w” shape can be achieved by creating a w-shaped fold in base sheet 75, and then sealing it to the bottom of sheets 65 and 70 at base edges 95 and 100. It can also be sealed along a portion of the side edges on sheet 65 and 70.

**[0052]** Continuing with Figure 3a, pouch 60 also comprises diaphragm 105 sealed to front sheet 65 and rear sheet 70 about the diaphragm perimeter to create and divide pouch 60 into main reservoir 115 and dispensing reservoir 120. In some embodiments, diaphragm 105 can be a V-shaped piece of film sealed about its perimeter to the inside of pouch 60. The V-shape allows pouch 60 to open to its full width when filled.

**[0053]** Figure 3b illustrates a side view of pouch 60. Particularly, Figure 3b illustrates that the structural integrity of pouch 60 is not compromised by diaphragm 105. Rather, diaphragm 105 allows the overall shape of the pouch to be maintained. Diaphragm 105 comprises opening 125, such as a hole or other passageway that can be used to allow communication between main reservoir 115 and dispensing reservoir 120. In some embodiments, opening 125 can be located on the side opposite the exit passage of the pouch where the contents are finally dispensed. However, opening 125 can be located anywhere on diaphragm 105, so long as it allows communication between the two reservoirs.

**[0054]** Opening 125 allows a measured amount of the pouch contents to flow from main reservoir 115 to dispensing reservoir 120, where the pouch contents can then be dispensed externally, as set forth in more detail herein below. Thus, the two reservoirs 115 and 120 are in fluidic communication to allow the transfer of flowable product between the two reservoirs. In some embodiments, the inter-reservoir fluidic transfer is made possible by appropriately placed stresses (such as pressure), applied to the walls of pouch 60 by, for example, the fingers of a user. Figure 4 shows fingers 130 applying pressure to fill dispensing reservoir 120 with flowable product 135.

**[0055]** Alternatively, in some embodiments, the dispensing reservoir can be filled by using the movement of the flowable product due to gravity. Particularly, the pouch can be re-oriented to a position where gravity forces the flowable product to flow from main reservoir 115 into dispensing reservoir 120. In this case, no extra pressure needs to be exerted on the sidewalls. Figure 5a illustrates that pouch 60 can be first positioned so that main reservoir 115 is positioned above dispensing reservoir 120 to allow the flowable product to be transferred from the main reservoir through opening 125 to the dispensing reservoir. Dispensing can then be achieved by using an opening means (such as, for example, scissors or the like) to create pouch exit 155 and then rotating the pouch so that the pouch exit is located at the bottom of the pouch, as illustrated in Figure 5b. Gravity will then allow the pouch contents to be transferred from dispensing reservoir 120 out of the pouch via exit 155.

**[0056]** In some embodiments, the backflow of the flowable product from dispensing reservoir 120 into main reservoir 115 can be minimized by the physical location of opening 125 between the two reservoirs. Particularly, as depicted in Figure 6, opening 125 can be located on the pouch edge opposite the discharge opening where the pouch contents exit the pouch. When the pouch is oriented so that pouch exit 155 is pointed downward, opening 125 is on the top portion of the pouch and below the line of flowable product, such that no flowable product can flow back into main reservoir 115.

**[0057]** Alternatively, in some embodiments, the backflow of flowable product from dispensing reservoir 120 into main reservoir 115 can be minimized by constructing opening 125 as a one-way valve. Particularly, opening 125 can be a one-way valve that only allows flowable product to flow from main reservoir 115 into dispensing reservoir 120. The one-way valve can be a multi-component one way valve, as is well known to those of ordinary skill in the art. However, in some embodiments, a simple one-way valve opening can be constructed by using a stretchable diaphragm material, such as (but not limited to) low density polyethylene. With such a material, the opening between reservoirs 115 and 120 can be constructed in a manner that extends the diaphragm material on both sides of the valve such that a tapered structure is created at the opening. The tapered structure can act as a simple one-way valve. Figure 7 depicts such a one-way valve.

**[0058]** Particularly, Figure 7 illustrates a one-way valve in opening 125 of diaphragm 105. Opening 125 comprises valve walls 126, which are tapered inward, facing dispensing reservoir 120. Flowable material is thus transported from main reservoir 115 through opening 125 and valve walls 126 and out valve exit 127 to dispensing reservoir 120. The tapered walls of the one-way valve minimize the movement of flowable material from dispensing reservoir 120 back into main reservoir 115.

**[0059]** The volume of dispensing reservoir 120 is de-
signed to hold a predetermined fraction of the total volume of flowable material in main reservoir 115. Thus, by filling dispensing reservoir 120, a desired dose of flowable product can be measured. Alternatively, dispensing reservoir 120 can have markings printed thereupon such that a metered dose can be measured and then dispensed. The contents of dispensing reservoir 120 are dispensed through a hole or other dispensing means to the outside environment, as set forth in more detail herein below.

III.B. Pouch Materials

[0060] Pouch 60 can be made from any suitable material, and in some embodiments can be made from a polymeric material, with a thickness of between about 0.1 and 100 mils. However, the film used to construct pouch 60 can have any total thickness desired, so long as the film provides the desired properties, e.g., optics, modulus, seal strength, etc., for the particular packaging operation in which the film is used. Further, in some embodiments (such as, for example, in stand-up pouches) the particular type of material that is utilized to make the pouch is of sufficient stiffness for enabling the pouch to remain generally upright relative to a horizontal surface when the bottom of the pouch is placed on the horizontal surface.

[0061] In some embodiments film materials suitable for use in pouch 60 can include, but are not limited to, olefin or amide polymers or copolymers. The film can be manufactured by film-forming processes known in the art (e.g., tubular or blown-film extrusion, coextrusion, extrusion coating, flat or cast film extrusion, and -the like). A combination of these processes can also be employed. Additionally, in some embodiments, the presently disclosed subject matter can be applicable to various types of machines and processes, including vertical and horizontal form-fill-seal machines and processes.

[0062] The film can be oriented or non-oriented. In some embodiments, the film can be oriented in either the machine direction (i.e., longitudinal), the transverse direction, or in both directions (i.e., biaxially oriented) in order to enhance the optics, strength, and durability of the film. If the film is oriented, it can be heat set or annealed after orientation to reduce the heat shrink attribute to a desired level or to help obtain a desired crystalline state of the film.

[0063] In some embodiments, the film can comprise one or more polymeric materials in a barrier layer to serve as a barrier to gases and/or odors. Such barrier layers can include, but are not limited to, ethylene/vinyl alcohol copolymer (EVOH), polyvinylidene dichloride (PVDC), vinylidene chloride copolymer such as vinylidene chloride/methyl acrylate copolymer, polyamide, polyester, polyacrylonitrile (available as Barex™ resin), or blends thereof. Oxygen barrier materials can further comprise high aspect ratio fillers that create a tortuous path for permeation (e.g., nanocomposites). The oxygen barrier of materials can be further enhanced by the incorporation of an oxygen scavenger.

[0064] In some embodiments, the disclosed film can comprise one or more bulk layers to increase the abuse resistance, toughness, modulus, etc., of the film. In some embodiments, the bulk layer can comprise polyolefin, including but not limited to, at least one member selected from the group consisting of ethylene-alpha-olefin copolymer, ethylene/alpha-olefin copolymer plastomer, low density polyethylene, and linear low density polyethylene.

[0065] In some embodiments, the presently disclosed film can include one or more tie layers. Such tie layers can include, but are not limited to, one or more polymers that contain mer units derived from at least one of C2-C12 alpha olefin, styrene, amide, ester, and urethane. In some embodiments, the tie layer can comprise one or more of anhydride-grafted ethylene/alpha olefin interpolymer, anhydride-grafted ethylene/ethylenically-unsaturated ester interpolymer, and anhydride-grafted ethylene/ethylenically unsaturated acid interpolymer.

[0066] In some embodiments, the film can comprise one or more abuse layers that serve to resist abrasion, puncture, and other potential causes of reduction of package integrity, as well as potential causes of reduction of package appearance quality. Particularly, the film should have the required degree of tolerance to pinching and exposure to sharp edges. Abuse layers can comprise any polymer, so long as the polymer contributes to achieving an integrity goal and/or an appearance goal. In some embodiments, the abuse layer can comprise at least one member selected from the group consisting of polyamide, ethylene/proplylene copolymer; in some embodiments, nylon 6, nylon 6/6, amorphous nylon, and ethylene/proplylene copolymer.

[0067] The polymer components used to fabricate films according to the presently disclosed subject matter can also comprise appropriate amounts of other additives normally included in such compositions. For example, slip agents (such as talc), antioxidants, fillers, dyes, pigments and dyes, radiation stabilizers, antistatic agents, elastomers, and the like can be added to the disclosed films.

[0068] There is generally no limit to the number of layers used for the film structure provided that the various functional requirements are met. Accordingly, the film can comprise 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, or 20 layers.

[0069] In some embodiments, it is envisaged that pouch 60 can be produced in various different sizes, depending on the product to be packaged. For example, a 0.29 to 4.6 litre (0.5 pint to 1 gallon) size (the dimensions of the pouch being adjusted to give the appropriate volume) can be fabricated. Thus, in some embodiments, pouch 60 can be prepared in 0.29, 0.57, 0.86, 1.14, 1.71, 2.0, 2.3, 2.6, 2.9, 3.1, 3.4, 3.7, 4.0, 4.3 or 4.6 litre (0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6, 6.5, 7, 7.5, or 8 pint (1 gallon)) sizes. Larger or smaller volumes are also con-
III.C. Diaphragm

In some embodiments, the film can accommodate printing. Figure 8 illustrates that dispensing reservoir 115 and main reservoir 120 can comprise printing on the surface of the walls of pouch 60. Such demarcations can denote a wide range of meanings and values, including but not limited to, addresses, advertising messages, call numbers, codes, company names, event commemorations, event dates, decorative art, facility names, formulas, instructions, internet addresses, logos, meaningful images, notations, promotional slogans, trademarks, and other communications. For example, in some embodiments, dispensing reservoirs 120 can be imprinted with one or more measurement lines 150. In some embodiments, numbers and/or measurement lines 150 can get increasingly large as the lines move farther away from opening 125. In some embodiments, numeric indicia can be imprinted at various intervals along the scale to facilitate quantifying the amount of flowable material present in dispensing reservoir 120. In some embodiments, at least a part of front or rear films 5 or 10 can be opaque to facilitate the reading or deciphering of any marking placed on pouch 60.

However, in some embodiments, one or both of films 5 and 10 are fully or partially transparent to allow the visual inspection of the quantity, location, and/or measurement of the flowable product in main and dispensing reservoirs 115 and 120, respectively, such that proper manipulation is possible. Visual inspection for the quality of flowable product 135 is also made possible. Further, transparent walls permit inspection to determine the degree of completeness when it is necessary to mix separated ingredients.

Those skilled in the art will understand, after a review of the presently disclosed subject matter, that the particular shape and size of pouch 60 can be selected as needed to suit the particular product to be packaged. For example, in some embodiments, pouch 60 can comprise a simple lay flat pouch, while in other embodiments, a stand-up pouch is envisioned.

The presently disclosed subject matter utilizes the addition of diaphragm 105 inside pouch 60 to create main reservoir 115 and dispensing reservoir 120. Diaphragm 105 can be constructed from a piece of film sealed to the sidewalls of pouch 60 in a manner that allows the pouch to expand to its natural shape as the pouch is filled. Particularly, diaphragm 105 is sealed around its circumference to front film 65 and rear film 70. In some embodiments, diaphragm 105 is in a V-shape to allow the expansion of pouch 60 when filled with flowable product.

In some embodiments, diaphragm 105 can be V-shaped, but not extend the entire length of pouch 60. In these embodiments, there is no need for opening 125 in diaphragm 105. Rather, diaphragm 105 can be constructed to stop short from one side and/or edge of pouch 60, such that the gap between diaphragm 105 and the side and/or edge of the pouch provides an opening through which flowable material can be transported. For example, Figure 12 illustrates gap 106 between diaphragm 105 and side seal 90. Gap 106 allows flowable product to be transported from main reservoir 115 to dispensing reservoir 120.

Diaphragm 105 can be made from any suitable material, and in some embodiments can be made from a polymeric material, with a thickness of between about 0.1 and 100 mils. However, the film used to construct diaphragm 105 can have any total thickness desired, so long as the film provides the desired properties, e.g., optics, modulus, seal strength, etc., for the particular packaging operation in which the film is used.

In some embodiments, film materials suitable for use in diaphragm 105 can include, but are not limited to, olefin or amide polymers or copolymers. The film can be manufactured by any of a wide variety of film-forming processes known in the art (e.g., tubular or blown-film extrusion, coextrusion, extrusion coating, flat or cast film extrusion, and the like). A combination of these processes can also be employed.

The film can be oriented or non-oriented. In some embodiments, the film can be oriented in either the machine direction (i.e., longitudinal), the transverse direction, or in both directions (i.e., biaxially oriented) in order to enhance the optics, strength, and durability of the film. If the film is oriented, it can be heat set or annealed after orientation to reduce the heat shrink attribute to a desired level or to help obtain a desired crystalline state of the film.

In some embodiments, diaphragm 105 can comprise one or more polymeric materials in a barrier layer, bulk layer, tie layer, abuse layer, or the like.

There is generally no limit to the number of layers used for the film structure of diaphragm 105 provided that the various functional requirements are met. Accordingly, the film can comprise 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, or 20 layers.

As set forth hereinabove in more detail, diaphragm 105 can comprise one or more openings 125 that allow communication between the main reservoir and the dispensing reservoir. Particularly, in some embodiments, opening 125 allows a flowable product to be transported from the main reservoir to the dispensing reservoir.

Opening 125 can be made using methods known to those of ordinary skill in the art. For example, in some embodiments, opening 125 can be made by simply preparing a hole or other opening (i.e., a slit, slash, or the like) in diaphragm 105. In some embodiments, a tapered punch can be used to stretch the diaphragm ma-
terial as the opening is made to create a section of diaphragm film extending into dispensing reservoir 120. In some embodiments, a one-way valve is created, as set forth in more detail herein above.

III.D. Dispensing

[0082] Figure 9 illustrates notch 140 located at one end of pouch 60. In some embodiments, notch 140 can be positioned on an opposite side, relative to opening 125. For example, in some embodiments, notch 140 can be positioned adjacent to pouch edge 85 and opening 125 can be positioned in the diaphragm, adjacent to opposing pouch edge 90. However, notch 140 can be positioned at any location on dispensing reservoir 120. A user can tear pouch 60 at notch 140 with a downwardly transverse force applied to the notch to tear pouch 60 to create an exit to dispense all or a portion of the flowable product located in dispensing reservoir 120.

[0083] Thus, in some embodiments, a metered dose of flowable material can be dispensed from dispensing reservoir 120 by tearing off a corner of the pouch along a row of perforations beginning at notch 140. In some embodiments, a pouch exit can be created by a tear, a perforated tear, a fitment, a pour spout, or combinations thereof. Dispensing can then be accomplished by compressing dispensing reservoir 120 to force the flowable product located therein through the passage created by tearing the corner of the pouch, as illustrated in Figure 10. Alternatively, as discussed in more detail herein above, dispensing can be achieved by utilizing gravity to allow flowable material to move from main reservoir 115 into dispensing reservoir 120, and/or from dispensing reservoir 120 out of the pouch exit. See, for example, Figures 5a and 5b.

[0084] In some embodiments, pouch 60 can be associated with a spout and/or fitment to facilitate dispensing of the flowable product. Particularly, a fitment can be sealed within pouch 60 in dispensing reservoir 120 using means well known to those of ordinary skill in the art. Figure 11 depicts fitment 146 sealed to one corner of dispensing reservoir 120. Thus, in use, a user can squeeze or use gravity to facilitate the movement of flowable product from main reservoir 115 to dispensing reservoir 120. Once a desired amount of flowable material has been transferred to the dispensing reservoir, a user can unplug fitment 146 and manipulate the dispensing reservoir or allow gravity to dispense the flowable product from the pouch. Spouts or fitments suitable with the disclosed pouch can encompass a wide variety of such elements and are well known to those of ordinary skill in the art. For example, in some embodiments, a spout/fitment can be recessed or located inward from the pouch seal line. In some embodiments, a screw-on cap type fitment can be used.

IV. Methods of Using the Disclosed Pouch

[0085] As mentioned hereinafore, main reservoir 115 can act as a reservoir of flowable material that constitutes plural doses to be dispersed over a period of time. By applying pressure to the main reservoir, flowable material 135 is pushed through opening 125 into dispensing reservoir 120. The amount of flowable product to be transferred from main reservoir 115 to dispensing reservoir 120 can be easily controlled by the amount of pressure applied by the user and can be gauged by eye given the transparency of at least part of one wall of pouch 60. In addition, users can use measuring lines or other indicia printed on dispensing reservoir 120 to determine the amount of flowable product 135 in the dispensing reservoir.

[0086] In some embodiments, an exit tear can first be created in the dispensing reservoir walls starting at notch 140. The tear forms the dispersal exit for the measured dose of flowable material from dispensing reservoir 120. Next, while flowable product is being transferred to dispensing reservoir 120, the pouch can be rotated such that opening 125 is facing downward, as depicted in Figure 10. Rotating pouch 60 on its side with the opening facing downward allows the user to easily fill dispensing reservoir 120 with the flowable product. Once a desired amount of flowable product has been transferred to the dispensing reservoir, dispensing can be accomplished by rotating the pouch toward exit 155, and stripping the dispensing chamber’s measured dose of flowable product toward and out of exit 155. Thus, dispensing reservoir 120 performs the role of holding the measured flowable material transfer from main reservoir 115. In addition, dispensing reservoir 120 acts as a dispensing structure that cleanly, accurately, and with little or no waste, deposits the dose into a hand or other holding device.

[0087] The interior surfaces of the walls of dispensing reservoir 120 can retain a thin film of flowable material at the area of the exit 155. The thin residue weakly holds the walls together, by adhesion and/or the dynamics that govern such films. By holding the walls together, only a minute surface area is exposed to evaporation in the area of the tear, such that there is little loss of flowable material at the film/atmosphere interface. The interface edge surface retreats between the walls to a point where the retreat stops, where the atmospheric boundary becomes so saturated with evaporated fluid and lack of atmospheric circulation that for all purposes a seal is formed preventing further loss. Thus, dispensing reservoir 120 can function as a dispensing valve means, a form of film seal, specifically designed to control the loss of flowable material from the pouch by retarding evaporation and leakage.

V. Flowable Products

[0088] The presently used dispensing system can be used with a wide variety of flowable products, including
but not limited to, food items, beverage items, and personal care items. Food products suitable for use with the presently disclosed subject matter can include edible products, such as catsup, chutneys, coffee and other food or beverage extracts, cream, dairy products, dips, essential oils, flavorings, foods, frostings, fruit spreads, glazes, horseradish, jams, jellies, marinades, mayonnaise, mustard, nutritional supplements, oils, preserves, pudding, relish, salad dressings, salsa, sauces (such as hot and pepper sauces, teriyaki sauce, dessert sauces, pesto sauces, pasta sauces, soy sauce, barbeque sauces, sweet and sour sauces, hot, or grilling sauces), seasoning blends, syrups, vinegars, vinaigrettes, or any other types of flowable food items.

Beverages suitable for use with the presently disclosed subject matter can include, but are not limited to, carbonated beverages including soft drinks, coffee drinks, energy drinks, fruit and vegetable juices, hot chocolate, milk and other dairy beverages, sports beverages, tea, water, wine and other alcoholic beverages, and other type of flowable natural and/or artificial flavored beverages.

The presently disclosed subject matter can also be used with a wide variety of personal care products, including but not limited to, body oils, body washes, bubble bath, cleaning products (including oils, floor cleaners, carpet cleaners, furniture cleaners, appliance cleaners, disinfectants, gels, glass cleanser, detergents, liniments, pastes, polishes, stain removers, allergen removers, sanitizing systems), colorants, conditioners, creams, deodorants, fabric conditioners, fabric softeners, hairdressings, hair treatments, hand soaps, insect repellants, laundry products, lotions, lubricants, medications, mineral solutions, moisturizers, mouthwashes, ointments, petroleum jellies, pharmaceuticals salves, shampoos, shaving creams, soaps, sunscreens, and any other types of flowable personal care items.

Thus, the presently disclosed subject matter can be used for dispensing flowable products including low viscosity fluids (e.g., juice and other beverages), high viscosity fluids (e.g., condiments and sauces), and the like. Non-food products such as fertilizers, motor oil and engine additives, wet cosmetics, medications, and the like can also be beneficially packaged and dispensed in the presently disclosed system. One of ordinary skill in the art can appreciate that the above list is not exhaustive, and the presently disclosed system and methods can be used in packaging applications not listed herein above.

VI. Advantages of the Disclosed System

The presently disclosed system can be used to economically package and dispense a wide range of flowable materials. Pouch 60 provides an easy indicator to the end user (based on pre-learned methods of opening tear seals and the like) as to how the contents of the pouch can be accessed. In some embodiments, graphics on pouch 60 can also help the user to correctly apply the flowable material onto a desired object by providing a visual indicator as to the precise location of the exit orifice of the pouch.

The disclosed pouch can also be manufactured economically, thereby allowing producers to offer product to end users with a more significant price reduction compared to those pouches and systems that have been available in the past.

Currently, flexible pouches are only rarely used for home dispensing of products, such as fabric softeners, cooking oils, etc. These pouches typically have a pump or spout that is time consuming to use and most often is located at the bottom of the package and must be placed at the edge of the counter to dispense the product. The presently disclosed pouch allows accurate dispensing of the product at a height convenient to the end user. In addition, the dispensing opening will not have to be located over the edge of a counter and is not required to be associated with a pump or spout.

In addition, the system allows the end user to make the best use of limited storage space by allowing for the stacking of the pouches. In comparison, most liquid or pumpable end user products that are dispensed over time are contained in bottles. The bottles are heavy (adding to freight costs during distribution), not stackable, and have limited label area for graphics.

An advantage of the presently disclosed system is that no manual refilling of the packaged product is necessary. When a pouch is empty, it can be discarded and a new pouch filled with flowable product can then be used.

The dispensing pouch can be purchased fully assembled and ready to use, thereby entitling a user to use the pouch without first having to assemble part of a container. Moreover, the pouch can be filled using an automated filling unit, and can be easily collapsed and disposed of when empty.

Furthermore, the disclosed pouch provides a metering device to a pouch for very little added cost. The pouch overcomes limitations in previously seen configurations by overcoming the loss of structural rigidity and metering flow efficiency as have been seen in previous metering pouches created by simply having a seal between two reservoirs.

Claims

1. A method of dispensing a flowable product from a pouch, the method comprising:

   (a) providing a dispensing pouch (60) comprising:

   i) a main reservoir (115);

   ii) a dispensing reservoir (120) comprising a pouch exit (155) to allow the flowable product to be dispensed from the pouch
(60); and
iii) a diaphragm (105) separating the main reservoir (115) from the dispensing reservoir (120), wherein the diaphragm (105) comprises a piece of film sealed about its circumference to the inside surface of the pouch and an opening (125) to allow communication between the reservoirs (115, 120);

(b) filling the main reservoir (115) of said pouch (60) with said flowable product;
(c) initiating an exit in said dispensing reservoir (120);
(d) characterized by either:

a. applying pressure to said main reservoir (115) to force flowable product through the diaphragm opening (125) into said dispensing reservoir (120) until a measured amount of flowable product has been transferred and then applying pressure to said dispensing reservoir (120) to force flowable product through the exit (155) and out of the pouch (60); or
b. positioning said pouch to allow the flowable product to gravity-flow from said main reservoir (115) through the diaphragm opening (125) into said dispensing reservoir (120) until a measured amount of flowable product has been transferred and then positioning said dispensing reservoir (120) to allow the flowable product to gravity-flow through the exit (155) and out of the pouch (60).

2. The method of claim 1, wherein at least one of said main reservoir (115) or dispensing reservoir (120) is fully or partially transparent.

3. The method of claim 1, wherein said dispensing reservoir (120) is demarcated to accommodate metered dispensing.

4. The method of claim 3, wherein at least one surface of said main reservoir (115) or said dispensing reservoir (120) is opaque to facilitate reading or deciphering of said demarcations.

5. The method of claim 1, wherein said dispensing reservoir (120) comprises a notch (140) to facilitate opening of the pouch (60).

6. The method of claim 1, wherein said pouch (60) comprises a stand-up pouch, having a base for supporting the pouch in an upright position.

7. The method of claim 6, wherein said stand-up pouch comprises a w-shaped base.

8. The method of claim 6, wherein said stand-up pouch comprises gusseted reinforcement.

9. The method of claim 1, wherein said opening (125) is selected from the group comprising: a one-way valve, a hole, a slit, or combinations thereof.

10. The method of claim 1, wherein said opening (125) comprises a gap between the diaphragm (105) and one edge of said pouch (60).

11. The method of claim 1, wherein said pouch exit (155) comprises a tear, a perforated tear, a fitment, a pour spout, or combinations thereof.

Patentansprüche

1. Verfahren zur Abgabe eines fließfähigen Produkts aus einem Beutel, wobei bei dem Verfahren:

(a) ein Abgabebeutel (60) bereitgestellt wird, der aufweist:

i) ein Hauptreservoir (115),
ii) ein Abgabereservoir (120) einschließlich eines Beutelausgangs (155), um es zu erlauben, dass das fließfähige Produkt aus dem Beutel (60) abgegeben wird, und
iii) eine Membran (105), die das Hauptreservoir (115) von dem Abgabereservoir (120) abtrennt, wobei die Membran (105) ein Stück Folie, das um seinen Umfang an der inneren Oberfläche des Beutels abgedichtet befestigt ist, und eine Öffnung (125) umfasst, um Kommunikation zwischen den Reservoirs (115, 120) zu erlauben,

(b) das Hauptreservoir (115) des Beutels (60) mit dem fließfähigen Produkt gefüllt wird,
(c) ein Ausgang in dem Abgabereservoir (120) vorbereitet wird,
(d) dadurch gekennzeichnet, dass entweder

a. Druck auf das Hauptreservoir (115) ausgeübt wird, um fließfähiges Produkt durch die Membranöffnung (125) in das Abgabereservoir (120) zu drücken, bis eine abgemessene Menge des fließfähigen Produkts übergeleitet ist, und dann Druck auf das Abgabereservoir (120) ausgeübt wird, um das fließfähige Produkt durch den Ausgang (155) und aus dem Beutel (60) herauszudrücken, oder
b. der Beutel so positioniert wird, dass das fließfähige Produkt durch Schwerkraftwir-
kung aus dem Hauptreservoir (115) durch die Membranöffnung (125) in das Abgabereservoir (120) fließt, bis eine abgemessene Menge von fließfähigem Produkt übergeleitet ist, und dann das Abgabereservoir (120) so positioniert wird, um es zu erlauben, dass das fließfähige Produkt durch Schwerkraftwirkung durch den Ausgang (155) und aus dem Beutel (60) herausfließt.

2. Verfahren nach Anspruch 1, wobei wenigstens eines von dem Hauptreservoir (115) und dem Abgabereservoir (120) vollständig oder teilweise transparent ist.

3. Verfahren nach Anspruch 1, wobei das Abgabereservoir (120) mit Markierungen versehen ist, um abgemessene Abgabe zu ermöglichen.

4. Verfahren nach Anspruch 3, wobei wenigstens eine Oberfläche des Hauptreservoirs (115) oder des Abgabereservoirs (120) opak ist, um das Ablesen oder Entziffern der Markierungen zu erleichtern.

5. Verfahren nach Anspruch 1, wobei das Abgabereservoir (120) eine Einkerbung (140) aufweist, um das Öffnen des Beutels (60) zu erleichtern.

6. Verfahren nach Anspruch 1, wobei der Beutel (60) einen aufrechtstehenden Beutel mit einer Basis zum Unterstützen des Beutels in einer aufrechten Stellung umfasst.

7. Verfahren nach Anspruch 6, wobei der Standbeutel eine W-förmige Basis umfasst.

8. Verfahren nach Anspruch 6, wobei der Standbeutel eine mit Falten versehende Verstärkung umfasst.

9. Verfahren nach Anspruch 1, wobei die Öffnung (125) aus der Gruppe ausgewählt ist, die umfasst: ein Einwegventil, ein Loch, einen Schlitz oder Kombinationen daraus.

10. Verfahren nach Anspruch 1, wobei die Öffnung (125) eine Lücke zwischen der Membran (105) und einer Kante des Beutels (60) umfasst.

11. Verfahren nach Anspruch 1, wobei der Beutelausgang (155) eine Reißlinie, eine perforierte Reißlinie, eine Zusatsausstattung, eine Gießtülle oder Kombinationen daraus aufweist.

Revendications

1. Procédé pour distribuer un produit fluide contenu dans une poche, le procédé comportant :

(a) l’installation d’une poche de distribution (60) comprenant :

i) un réservoir principal (115) ;

ii) un réservoir de distribution (120) possédant une sortie (155) de poche pour permettre au produit fluide contenu dans la poche (60) d’être distribué ; et

iii) une membrane (105) séparant le réservoir principal (115) du réservoir de distribution (120), la membrane (105) comprenant un morceau de film dont le pourtour est scellé sur la surface intérieure de la poche et une ouverture (125) pour permettre une communication entre les réservoirs (115 ; 120) ;

(b) le remplissage du réservoir (115) de ladite poche (60) avec ledit produit fluide ;

(c) l’amorçage d’une sortie dans ledit réservoir de distribution (120) ;

(d) caractérisé soit

a. par l’application d’une pression sur ledit réservoir principal (115) pour expulser du produit fluide par l’ouverture (125) de la membrane dans ledit réservoir de distribution (120) jusqu’à ce qu’une quantité dosée du produit fluide ait été transférée, puis par l’application d’une pression sur ledit réservoir de distribution (120) pour expulser du produit fluide hors de la poche (60) par la sortie (155) ; soit

b. par la disposition de ladite poche pour permettre au produit fluide de passer par gravité, via l’ouverture (125) de la membrane, dudit réservoir principal (115) audit réservoir de distribution (120) jusqu’à ce qu’une quantité dosée de produit fluide ait été transférée, puis par la disposition dudit réservoir de distribution (120) de façon à permettre au produit fluide de sortir de la poche (60) par gravité via la sortie (155).

2. Procédé selon la revendication 1, dans lequel au moins un desdits réservoir principal (115) et réservoir de distribution (120) est entièrement ou partiellement transparent.

3. Procédé selon la revendication 1, dans lequel ledit réservoir de distribution (120) porte des inscriptions pour permettre la distribution d’une dose.

4. Procédé selon la revendication 3, dans lequel au moins une surface dudit réservoir principal (115) ou dudit réservoir de distribution (120) est opaque pour faciliter la lecture ou le déchiffrage desdites inscriptions.
5. Procédé selon la revendication 1, dans lequel ledit réservoir de distribution (120) comprend un cran (140) pour faciliter l’ouverture de la poche (60).

6. Procédé selon la revendication 1, dans lequel ladite poche (60) comprend une poche à fond plat, ayant une base pour supporter la poche en position debout.

7. Procédé selon la revendication 6, dans lequel ladite poche à fond plat comprend une base en forme de w.

8. Procédé selon la revendication 6, dans lequel ladite poche à fond plat comprend un renfort à soufflet.

9. Procédé selon la revendication 1, dans lequel ladite ouverture (125) est choisie parmi une valve unidirectionnelle, un trou, une fente ou des combinaisons de ceux-ci.

10. Procédé selon la revendication 1, dans lequel ladite ouverture (125) comprend un intervalle entre la membrane (105) et un bord de ladite poche (60).

11. Procédé selon la revendication 1, dans lequel ladite sortie (155) de la poche comprend une partie à déchirer, une partie perforée à déchirée, un accessoire à monter, un bec verseur ou des combinaisons de ceux-ci.
REFERENCES CITED IN THE DESCRIPTION

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