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(54) **FLEXIBLE MULTIPLE COMPARTMENT POUCH**

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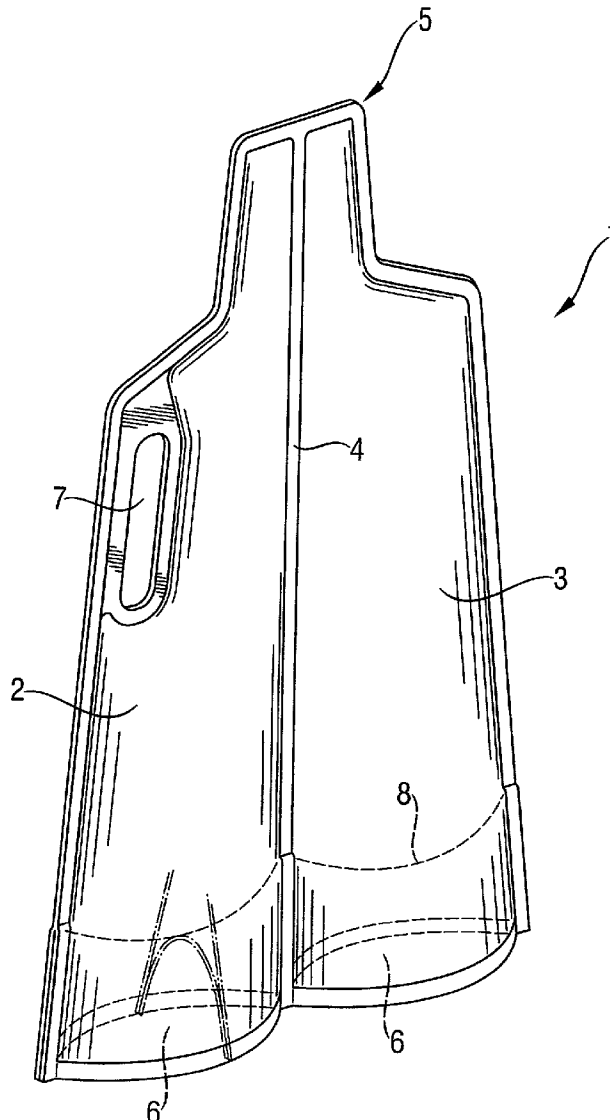
(57) **ABSTRACT**

A flexible multiple compartment pouch (1) comprising at least a first and second compartment (2, 3) wherein the first compartment (2) comprises a first liquid composition and the second compartment (3) comprises a second liquid composition and wherein the first and second liquid compositions react chemically when mixed.

(73) Assignee: **The Procter & Gamble Company**

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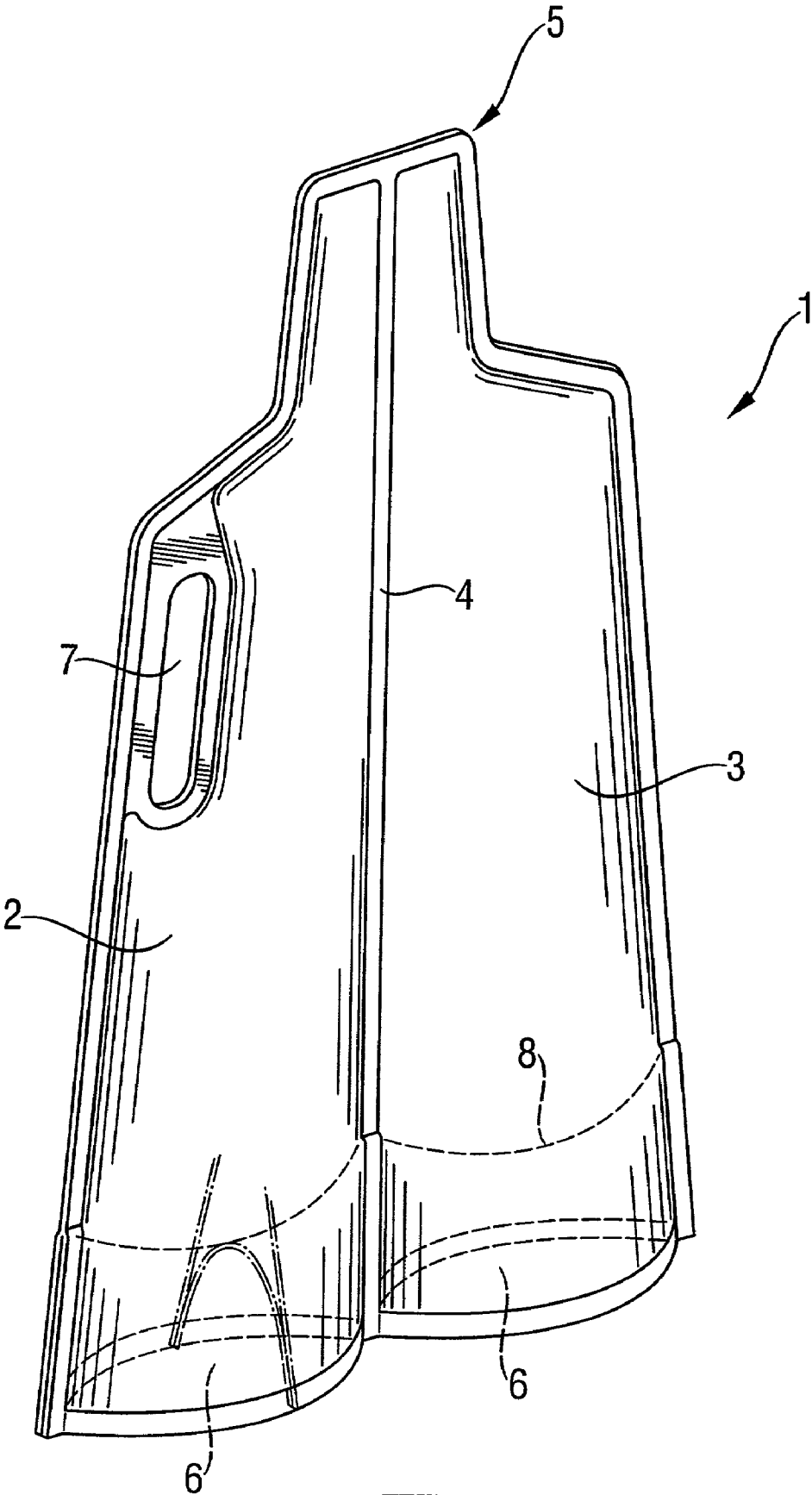


Fig. 1

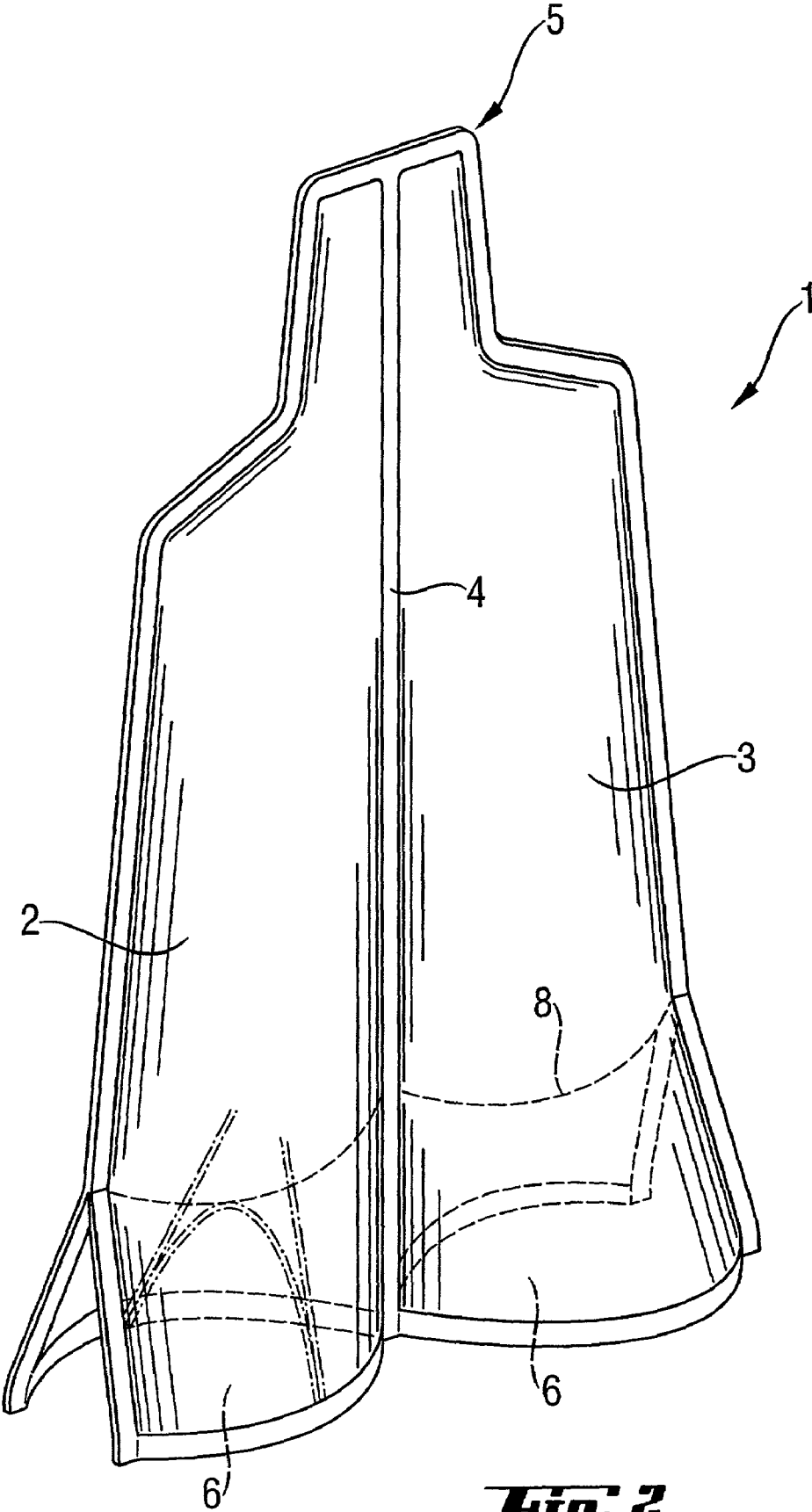


Fig. 2

Fig. 3

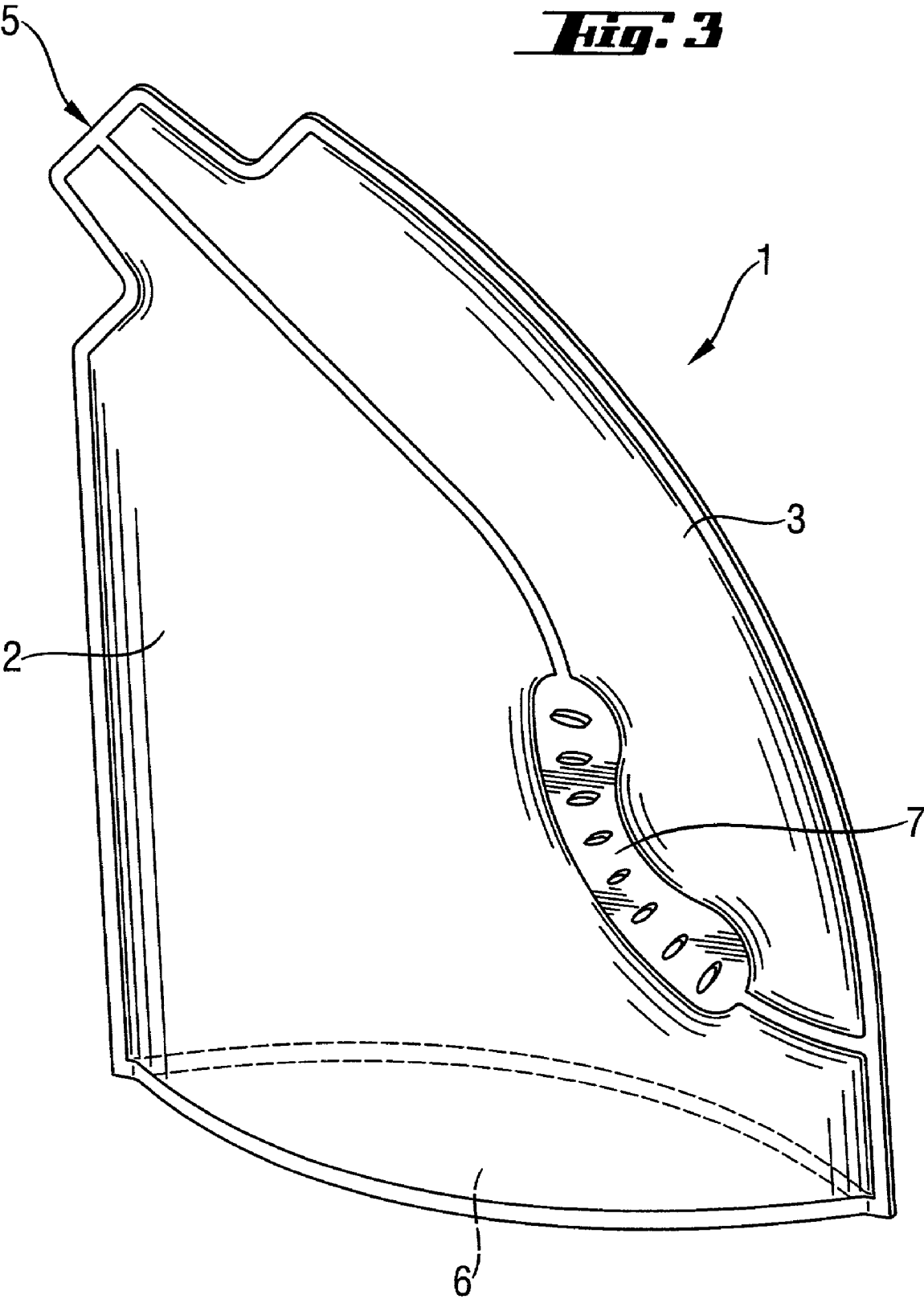


Fig. 4

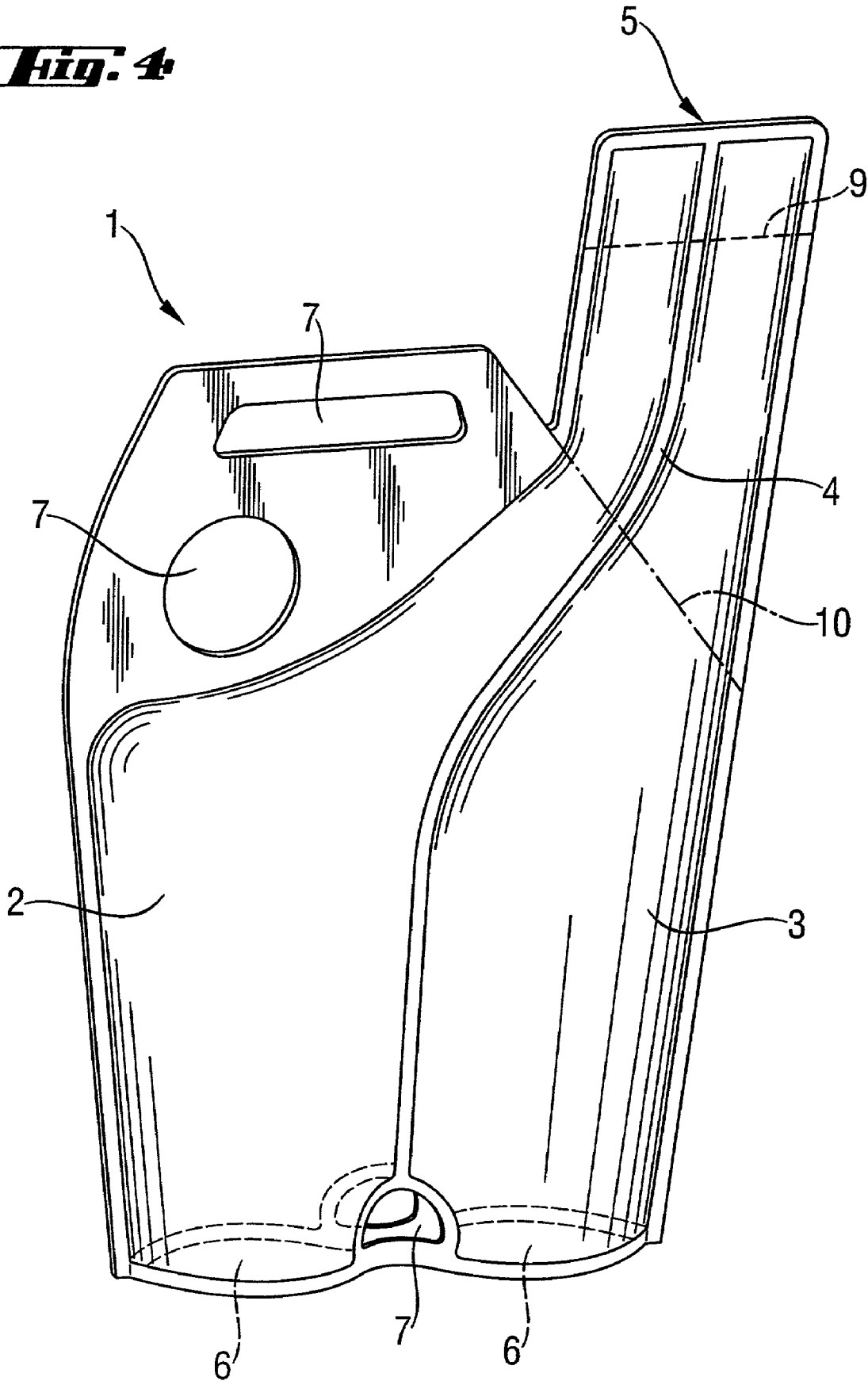


Fig. 5

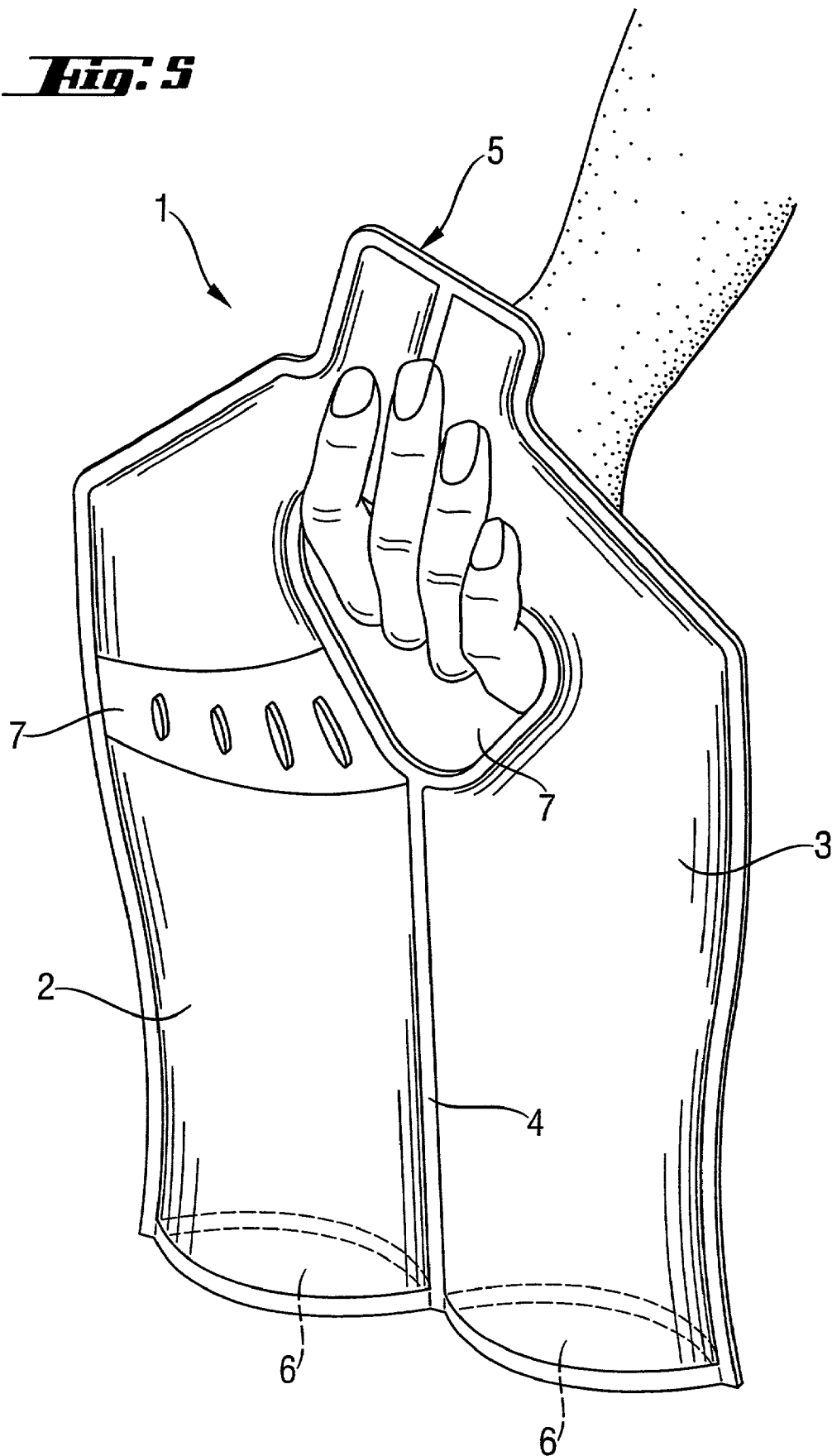


Fig. 6

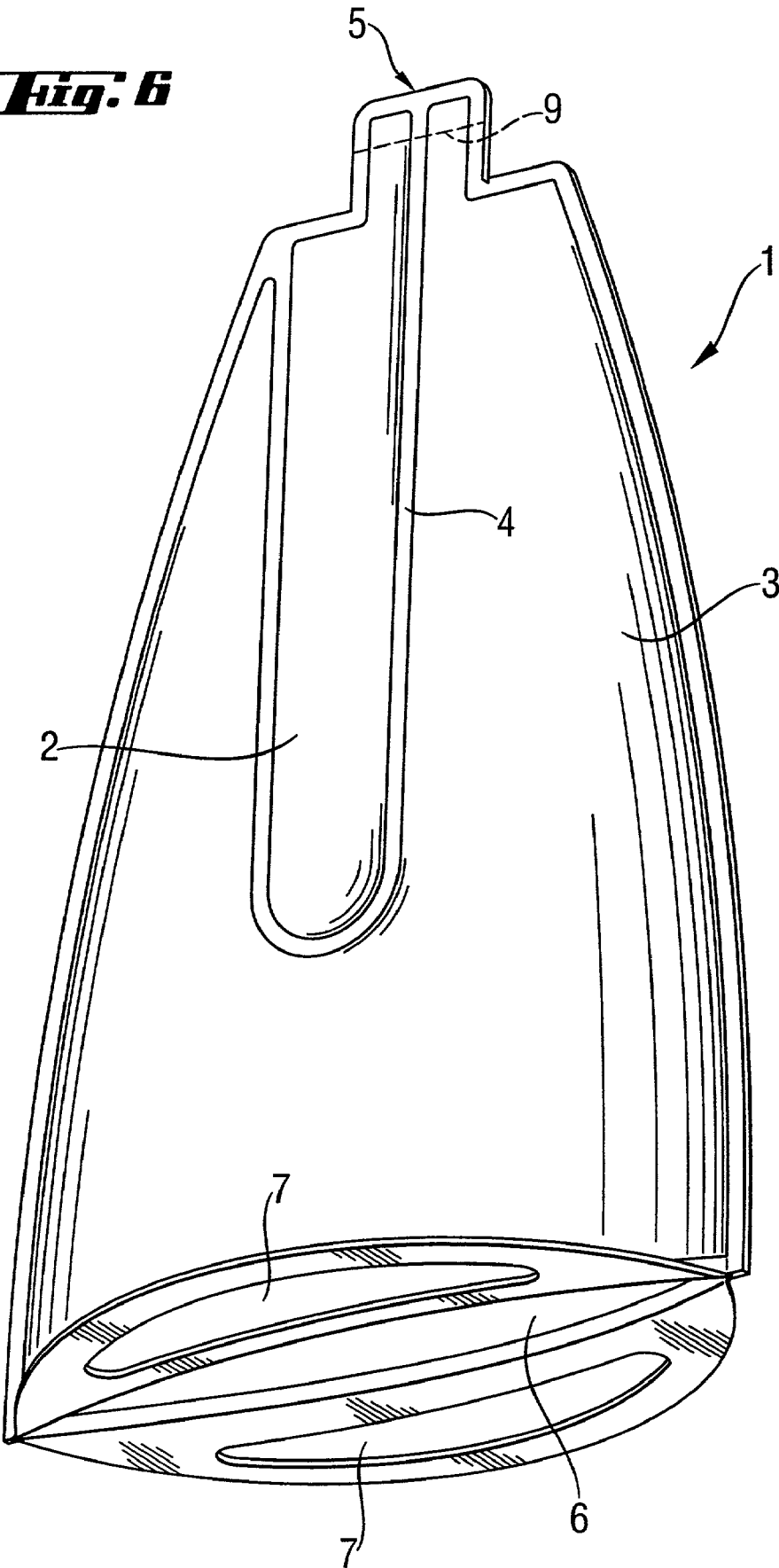
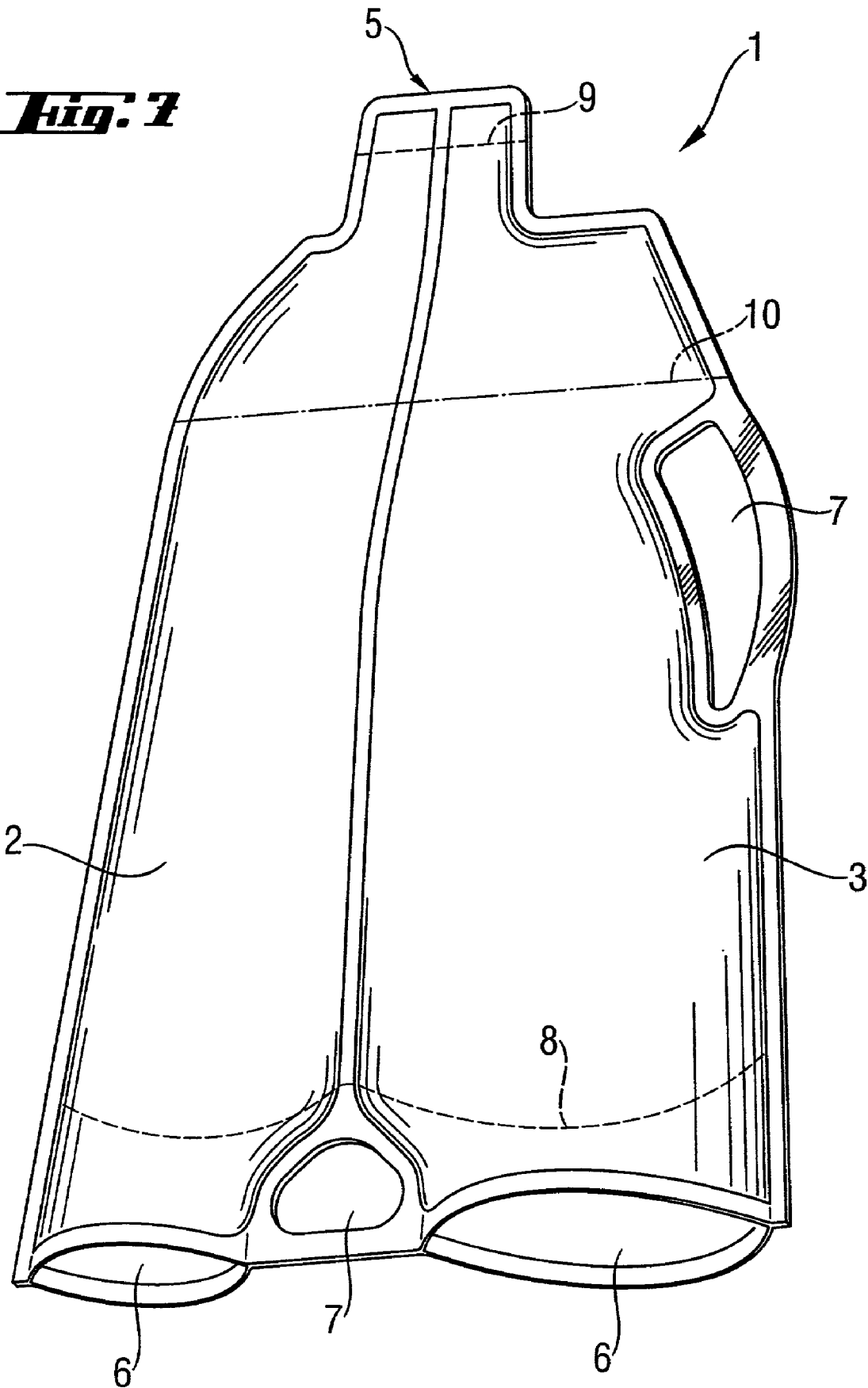


Fig. 7



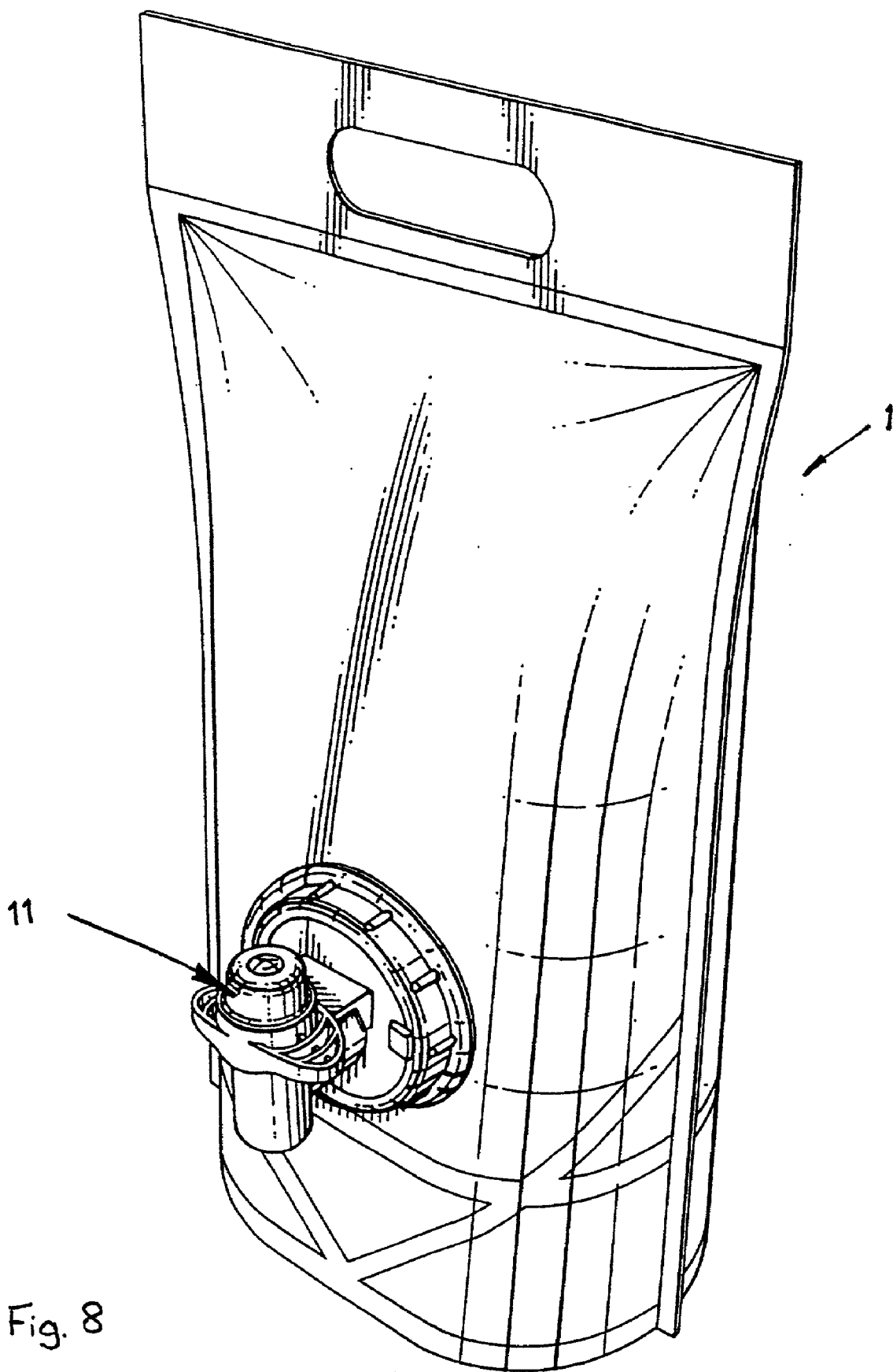


Fig. 8

FLEXIBLE MULTIPLE COMPARTMENT POUCH

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority under 35 U.S.C. §119(a) to European Application Serial No. 01870049.2, filed Mar. 15, 2001 (Attorney Docket No. CM2511F); and European Application Serial No. 01870157.3, filed Jul. 11, 2001 (Attorney Docket No. CM2511FM);

TECHNICAL FIELD

[0002] The present invention relates to flexible multiple compartment pouches used for storing liquid compositions, preferably for storing liquids for domestic use such as, for example, laundry and household cleaning liquids, bleaches, shampoos and other personal care products.

BACKGROUND

[0003] Many consumer products, for example cleaning products, are sold in relatively rigid plastic bottles which are durable and generally designed to be thrown away after use, or alternatively to be refilled. Such durable bottles, usually containing one free flowing composition, are well known in the art. However, consumer products have increased in complexity and there has been considerable interest in durable containers that comprise two or more separate compositions. WO-A-00/61712, published on Oct. 19, 2000, discloses multiple component cleaning compositions contained within a multiple compartment durable container suitable for storing and dispensing the separate compositions. Frequently, the two or more compositions are incompatible with one another and must be kept separate during storage in order to prevent decomposition or loss of performance. One such multiple compartment durable container capable of comprising two or more free flowing compositions is the subject of co-pending patent application WO-A-01/85595, published on Nov. 15, 2001. The multiple compartment durable containers can be used to deliver products for a wide range of applications including laundry cleaning compositions, household cleaning compositions such as hard surface cleaners, toilet bowl cleaners, dish washing liquids, bleaches, shampoos and other personal care products such as shower gels.

[0004] For clarity of description, this specification will refer to containers that are suitable for being refilled and then reused on repeated occasions as 'durable'. Each separate volume within the durable container capable of containing a composition will be referred to as a 'compartment'. The term "liquid" herein includes viscous liquids such as pastes and gels.

[0005] As consumers have become more environmentally aware, the need to minimise the amount of waste packaging has arisen. This need has been satisfied by providing the consumer with a flexible and disposable container, comprising the desired composition, which can be used either as a stand-alone alternative to a durable container, or can be used to refill the original durable container. Flexible single compartment pouches, suitable for refilling single compartment durable containers, that can be easily discarded after use and that result in minimum waste packaging are described in EP-A-0 626 319, published on Nov. 30, 1994.

[0006] A disadvantage associated with flexible pouches is that their flexibility and lack of rigidity often renders them inconvenient for consumers to store and use. In addition to the problems with storage, retailers and advertisers are faced with the difficulty of displaying the pouch in an aesthetically pleasing manner. They are not able to stack and display the pouch with maximum visual effect because they cannot predict what shape and orientation the pouch will adopt once placed on the shelf. Furthermore if the flexible pouch is to be repeatedly used (rather than being designed for single use and then discarded, such as with a refill pack) then the consumer expects the pouch to be self-standing.

[0007] It is an object of the present invention to provide a multiple compartment container suitable for simultaneously dispensing doses of liquid compositions, wherein the liquid compositions start to react chemically with one another after having been dispensed and mixed together. This serves the purpose of providing a visible signal to the consumer that the components of the composition are active.

[0008] It is a further object of the present invention to provide a multiple compartment container which contains more than one composition and which is also lightweight in comparison to a durable container, and which consequently results in less waste packaging.

[0009] It is a further object of the present invention to provide a lightweight multiple compartment container capable of standing upright unassisted for greater ease of storage use by the consumer as well as easier and more aesthetically pleasing displaying in the retail premises.

SUMMARY OF THE INVENTION

[0010] According to the present invention there is provided a flexible multiple compartment pouch comprising at least a first and second compartment wherein the first compartment comprises a first liquid composition and the second compartment comprises a second liquid composition and wherein the first and second liquid compositions are incompatible and react chemically when mixed.

DESCRIPTION OF THE DRAWINGS

[0011] The invention will now be described by way of example and with reference to the accompanying drawings:

[0012] **FIG. 1:** A perspective view of a gusseted based, side-by-side dual compartment pouch with a handle as a gripping means

[0013] **FIG. 2:** A perspective view of a gusseted based, side-by-side dual compartment pouch with no gripping means.

[0014] **FIG. 3:** A perspective view of a gusseted based, side-by-side dual compartment pouch with a gripping means made of rubbery material.

[0015] **FIG. 4:** A perspective view of a gusseted based, side-by-side dual compartment pouch with handles as gripping means and an off-centered dispensing outlet.

[0016] **FIG. 5:** A perspective view of a gusseted based, side-by-side dual compartment pouch with a gripping means made of rubbery material and a handle located in the center of the pouch.

[0017] FIG. 6: A perspective view of a gusseted based, dual compartment pouch with 2 handles as gripping means located at the bottom of the gusset and wherein one compartment is located inside the other compartment.

[0018] FIG. 7: A perspective view of a gusseted based, side-by-side dual compartment pouch with handles as gripping means, one located on the side and another located at the bottom of the pouch.

[0019] FIG. 8: A perspective view of a gusseted based, side-by-side dual compartment pouch with a press-tap.

DETAILED DESCRIPTION OF THE DRAWINGS

[0020] The present invention provides a flexible multiple compartment pouch, comprising at least as many compartments as the number of separate compositions contained therein. The flexible multiple compartment pouch according to the present invention preferably comprises from one to ten compartments, more preferably two, three, four or five compartments, and most preferably two compartments.

[0021] FIGS. 1 to 5 illustrate preferred embodiments, wherein the pouch **1** comprises adjacent compartments **2, 3**. The compartments **2, 3** are defined by side walls and are mutually separated by a permanent seal **4**. By 'permanent' it is meant herein a seal that is no more easily ruptured than the other seals around the perimeter of the side walls of the pouch.

[0022] In order to provide the convenience of a free-standing package, the flexible multiple compartment pouch of the present invention preferably comprises at least one gusset **6**. The gusseted flexible multiple compartment pouches are more convenient to store in the home and to display in the retail premises. The gusset **6** may be situated anywhere in the flexible multiple compartment pouch. A pouch **1** comprising a gusset **6** at the base can stand upright when substantially full of liquid so that the label and contents information can be clearly displayed and storage is more convenient. An example of the pouch **1** can be made by superimposing two sheets of film, folding an additional sheet of film, the gusset **6**, in half and inserting the folded edge between the two superimposed sheets to form a "W". The two superimposed sheets are then sealed to one another around their edges except where the gusset **6** prevents the sheets from meeting. In these areas the superimposed sheets are sealed to the edge of the gusset **6** with which they are in contact. The pouch illustrated in **FIG. 1** is made with two gussets **6** by such a process. Sealing methods that are common knowledge to those skilled in the art are heat sealing, ultrasonic sealing, pressure sealing or induction sealing which are described in more detail below.

[0023] The flexible multiple compartment pouch **1**, of the present invention can be made from any suitable material. Preferably the side walls defining the compartments **2, 3** of the pouch are made from sealable films. Preferred sealable films include those made from plastics, polymers, laminated materials and mixtures thereof. A sealable material as described herein is a material which is capable of adhering to the same or another material through a sealing process. Sealing may be using any suitable technique known in the art, more preferably heat sealing, ultrasonic sealing, glue sealing, pressure sealing, induction sealing and mixtures thereof. Heat sealing encompasses heating the films to the

point where they both melt and form a connection and then allow to cool. Induction sealing is a similar technique to heat sealing but requires the film to contain a metal layer e.g. aluminium. The metal layer is heated by applying a strong magnetic field, which then causes the sealing film to melt and form a connection. Ultrasonic sealing requires localised high frequency vibration of the two films to create heat which then melts the films a before. Glue sealing is simply where glue is added to the film to stick the two sheets of film together. Importantly, the material from which the pouch is made and the seals described above should be impermeable and stable with regards to the compositions stored in the compartment. With regards to the latter point, it may be preferable to use a laminated film including a barrier layer. A barrier layer is defined as a sheet of material which protects the physical or chemical stability of the composition stored in the compartment. Examples of suitable layer materials may be selected from anything that prevents or reduces for example the ingress of external elements e.g. water, gases, the egress of internal compounds (e.g. the composition), light. Preferred examples of such barrier layers include aluminium, ethyl vinyl alcohol, nylon and mixtures thereof.

[0024] In a preferred aspect the sealable film is 20 to 500 micrometers thick, more preferably 70 to 300 micrometers and most preferably 90 to 150 micrometers thick. More preferably the pouch is made from plastic, more preferably plastics selected from the group consisting of polyethylene, polypropylene, polyethylene terephthalate, ethyl vinyl alcohol and mixtures thereof.

[0025] In another preferred embodiment the pouch may comprise an aesthetic layer, which for example may trap inks and thus would be suitable for displaying usage instructions and other trade dress features, for examples brand names. Alternatively the sealable or barrier layer may provide this function and the aesthetic layer, where present, may be a transparent layer suitable for protecting the sealable layer. Preferably the aesthetic layer is made from polyethylene terephthalate. Most preferably the sealable film of the compartments of the pouch is made from polyethylene and the aesthetic layer is made from polyethylene terephthalate. More preferably the polyethylene film is 50 to 130 micrometers thick and the polyethylene terephthalate film is 6 to 20 micrometers thick.

[0026] FIG. 6 illustrates an alternative embodiment of the present invention having at least one compartment substantially enclosed within an outer compartment. This embodiment can be made by placing one or more compartments substantially within an outer compartment and sealing around the perimeter of the outermost compartment.

[0027] It is also envisaged that pouches according to the present invention may comprise a plurality of separate flexible compartments which are held together by an internal means or an external means. The internal means could be adhesive applied between the compartments in order to connect them at least one point, for example the outlets. An example of an external means could be an adhesive sleeve which is substantially wrapped around the compartments in order to hold them together.

[0028] In a highly preferred embodiment each compartment of the pouch may be provided with an outlet **5**. The outlet **5** may be fitted with a single outlet device which

preferably prevents mixture of the compositions therein. Such an outlet device may be an opening and closing valve, for example a tap or press-tap; or the single outlet device may be a connection device which, by virtue of its configuration, bridges between the pouch and a durable container, so that the durable container may be easily refilled from the pouch and each composition flows into the correct compartment without mixing. Alternatively each separate compartment 2, 3 may be provided with an outlet so that the two or more outlets 5 are adjacent to one another. To enable repeated use, but to prevent spillage, such outlets 5 may be provided with a simple closure, such as a screw cap or "flip-top" cap.

[0029] In FIGS. 6 and 7 it is shown how the outlet from each compartment may be made by cutting away a section of the edge of the pouch 5. A tearing line or a cutting line 9 can be indicated on the pouch. Alternatively the section 5 can be cut away to open outlets from all compartments.

[0030] In embodiments of FIGS. 1 to 7, the compartments of the pouch may be emptied via the outlets 5 by applying pressure to the exterior of the pouch by, for example, squeezing. More preferably the pouch is emptied by simply inverting it and allowing the contents to flow out under gravity. Regardless of which method is used, the outlets 5 for each composition will preferably dispense the separate compositions in close proximity to one another without any mixing occurring prior to exiting the multiple compartment pouch 1.

[0031] FIGS. 1 and 3 to 7 also illustrate alternative gripping means 7. By 'gripping means' it is meant that some means is provided to give the consumer a more secure grip even if the surface of the pouch becomes slippery. Examples of 'gripping means' include handles, areas of high friction material, or rigid sections. The gripping means 7 may be positioned anywhere on the pouch 1, preferably adjacent to an edge of the pouch, most preferably adjacent to the edge of the pouch furthest from the outlets 5. A suitable gripping means 7 can be made by cutting one or more approximately circular rings into the pouch and removing the center of the rings to form one or more holes into which the consumer can place their fingers and gain an improved grip. Alternatively, the flexible pouch may comprise a gripping means 7 made from different materials and may be attached by any methods including adhesive and heat bonding.

[0032] The volume of the separate compartments of the pouch will clearly depend on the volume of each compartment in the durable container to be refilled. Pouches according to the present invention may comprise compartments of identical volumes, of similar volumes and of substantially different volumes. A preferred embodiment according to the present invention comprises at least a first and second compartment comprising a first and a second composition whereby the ratio of volumes of the first and second compositions are preferably between 1:1 and 1:20, more preferably between 1:1 and 1:10 and most preferably between 1:1 and 1:4. In domestic applications, for reasons of convenience and ease of handling, the total volume of all the compartments of the pouch will generally be between 0.1 to 5 liters. For industrial and agricultural applications the total volume of the compartments may be up to 100 liters.

[0033] In FIG. 8 the flexible dual compartment pouch is a stand-alone pouch 1 which is provided with a press-tap 11

for dispensing the first and second compositions. The pouch is intended to be used repeatedly over a long time period, such as a period of several weeks, to dispense product each time it is needed. It is highly desirable that at each dispensing the ratio of the first and second compositions should be constant, and should remain constant from the first dose to the last dose when the pouch is completely empty. The pouch dimensions need to be carefully designed in order to achieve this objective, especially if the first and second compositions have different rheologies, for example the first composition may be Newtonian, and the second composition may be non-Newtonian. Design criteria are described in detail in WO-A-01/85595, published on Nov. 15, 2001 which is incorporated herein by reference.

[0034] In one particular embodiment of the present invention a first compartment 2 contains an aqueous liquid detergent composition and a second compartment 3 contains a liquid fabric care composition. Components of suitable aqueous liquid detergent and liquid fabric care composition are described in more detail below.

[0035] In another embodiment of the present invention the first compartment 2 contains an aqueous liquid detergent composition and a second compartment 3 contains a liquid bleaching composition. Components of suitable aqueous liquid detergent and liquid bleaching composition are described in more detail below.

[0036] Aqueous Liquid Detergent Composition

[0037] The aqueous liquid detergent compositions of the present invention preferably comprise an effervescent component, one or more surfactants and one or more suitable cleaning adjunct materials.

[0038] Examples of suitable components of aqueous liquid detergent compositions include, but are not limited to: surfactants, builders, bleaches, bleach activators, bleach catalysts, enzymes, enzyme stabilizing systems, chelants, optical brighteners, soil release polymers, dye transfer inhibiting agents, dispersants, suds suppressors, dyes, perfumes, colorants, filler salts, hydrotropes, photoactivators, fluorescers, dye transfer inhibition agents, fabric conditioners, fabric softening agents, hydrolyzable surfactants, preservatives, anti-oxidants, anti-shrinkage agents, anti-wrinkle agents, germicides, fungicides, color speckles, silvercare, anti-tarnish and/or anti-corrosion agents, alkalinity sources, solubilizing agents, carriers, processing aids, pigments and pH control agents as described in U.S. Pat. Nos. 5,705,464, 5,710,115, 5,698,504, 5,695,679, 5,686,014 and 5,646,101, all of which are incorporated herein by reference.

[0039] When the aqueous liquid detergent compositions of the present invention are formulated as compositions suitable for use in a laundry machine washing method, the compositions of the present invention preferably contain both a surfactant and a builder compound and additionally one or more cleaning adjunct materials preferably selected from organic polymeric compounds, bleaching agents, additional enzymes, suds suppressors, dispersants, lime-soap dispersants, soil suspension and anti-redeposition agents and corrosion inhibitors. Laundry compositions can also contain softening agents, as additional cleaning adjunct materials.

[0040] Fabric Care Composition

[0041] The fabric care composition herein will comprise a fabric care active selected from the group consisting of (I)

fabric softeners, (II) textile color care agents, (note that optical brighteners are not included in this component as they are treated as fabric cleaning agents for the purposes of the present invention), (III) textile property modifiers, from which textile odor modifiers are specifically excluded, (IV) textile odor modifiers, (V) fabric care actives other than (I)-(IV), and (VI) mixtures thereof. The essential fabric care active of the fabric care composition is preferably present at a level of from about 0.001% to about 80%, more preferably from about 0.1 % to about 40% by weight of the fabric care composition.

[0042] Preferably the fabric care composition comprises at least one of the fabric softeners (I), and wherein the fabric softeners are selected from the group consisting of: (A) organic fabric softeners, (B) inorganic fabric softeners, e.g., clays, preferably hectorite clays, and (C) mixtures thereof and/or hybrid organic-inorganic fabric softeners. When present in one or more compositions of the articles of the present invention, fabric softeners are used in an amount between about 1% and about 30% by weight of the compositions.

[0043] One preferred group of fabric softeners for use as the fabric care active are organic fabric softeners (A), and wherein the organic fabric softener is selected from the group consisting of: (i) quaternary nitrogen-containing organic fabric softeners free from ester and/or amide moieties such as are disclosed in WO-A-00/24851 beginning on page 61; (ii) quaternary nitrogen-containing organic fabric softeners comprising ester and/or amide and/or olefinically unsaturated moieties, preferably quaternary nitrogen-containing organic fabric softeners comprising ester moieties, such as are described in WO-A-00/24851 beginning on page 62; (iii) quaternary-nitrogen-free organic fabric softeners, such as are described in WO-A-00/2485 1, beginning on page 74; and (iv) mixtures thereof. Notably, the type (ii) organic fabric softeners described above are generally preferred over the type (i) organic fabric softeners. WO-A-00/24851 is incorporated herein by reference.

[0044] Preferred inorganic fabric softeners for use in the articles of the present invention are clays, preferably hectorite clays, and the inorganic fabric softeners disclosed in WO-A-97/04065 beginning on page 5. Hybrid organic-inorganic fabric softeners, such as organo-modified clays, that may be used to advantage in the articles of the present invention include organosilicones softeners amongst other materials. WO-A-97/04065 is incorporated herein by reference.

[0045] A preferred group of fabric care actives are textile color care agents (II) selected from the group consisting of dye fixatives, dye transfer inhibitors, color maintenance agents, whiteness enhancers, anti-fading agents including bleach scavengers and/or antioxidants, color appearance restoration agents of non-chelant types (e.g., Carezyme®), brightness restoration agents e.g., antiencrustation agents, UV protection agents for fabrics, sun fade inhibitors, anti-fading agents, and mixtures thereof. Such materials are well known to those skilled in the art and descriptions thereof are common in the patent literature such as found in U.S. Pat. Nos. 6,107,270 and 6,020,302, incorporated herein by reference, which are commonly assigned to The Procter and Gamble Company. "Textile color care agents" as used herein refers to materials that provide a color care benefit to

laundered fabrics primarily by preserving the existing fabric colors and preventing their degradation. "Textile color care agents" should not be understood to refer to optical brighteners or other cleaning agents as described above. Textile color care agents are not intended to provide a general detergent effect such as is typical of bleaches and surfactants. Suitable are the following polymeric dye transfer inhibiting agents: polyamine N-oxide polymers, copolymers of N-vinylpyrrolidone and N-vinylimidazole, polyvinylpyrrolidone polymers, polyvinylloxazolidones and polyvinylimidazoles or mixtures thereof such as described in for example EP-A-262,897; EP-A-256,696; EP 635 565, EP 635 567; U.S. Pat. Nos. 5,804,543 and 5,912,221, all of which are incorporated herein by reference. When present in one or more compositions of the articles of the present invention, textile color care agents are used in an amount between about 0.1% and about 10% by weight of the compositions.

[0046] Another preferred group of fabric care actives are textile property modifiers (III) selected from the group consisting of fabric bodying agents, fabric drape and form control agents, fabric smoothness agents, static control agents other than fabric softeners inherently possessing static control ability, fabric wrinkle control and/or ironing aid agents, fabric integrity agents, fabric anti-abrasion agents, fabric anti-wear agents, humectants and/or lubricants, pill removal agents, insect repellents, mite control agents, non-bleaching fabric sanitizers, e.g., fabric substantive antibacterials and/or antiviral agents and/or antifungals, flame retardants and mixtures thereof. "Textile property modifiers" specifically excludes odor modifiers which are treated separately herein. When present in one or more compositions of the articles of the present invention, textile property modifiers are used in an amount between about 0.1% and about 10% by weight of the compositions. Preferred are silicone polymers, especially polydimethylsiloxanes and their functionalised derivatives as described in WO97/31997, WO97/31998, WO00/71806, WO00/71807 and WO97/32917, all of which are incorporated herein by reference, and the cationic siloxane polymers such as the polydimethylsiloxane polymers comprising at least one quaternised nitrogen atom as described in WO99/32539. Preferred class of cationic silicone polymers are those comprising one or more polysiloxane units, preferably polydimethylsiloxane units of formula $-(CH_3)_2SiO)_n-$ having a degree of polymerization, n, of from 50 to 200 and organosilicon-free units comprising at least one diquaternary unit as described on pages 10-17 of co-pending patent application U.S. Ser. No. 60/268174, filed on Feb. 12, 2001 by The Procter & Gamble Company. Preferred cationic silicone is those of Structure 2b on pages 13, line 22 to page 15 line 18 in such patent application U.S. Ser. No. 60/268174 as filed. More preferred is the cationic silicone described in example 1 having Structure 2, R^1 =methyl, R^2 =(CH_2)₃, X = $CH_2CHOHCH_2$, cationic divalent moiety ii(a) with R^4 , R^5 , R^6 , R^7 all methyl and Z^1 is (CH_2)₆. A=50% acetate, 50% laurate, weight basis; polyalkyleneoxide moiety (iii) of Structure 2 is $NHCH(CH_3)CH_2O(C_2H_4O)_{38}(C_3H_6O)_6CH_2CH(CH_3)NH$; cationic monovalent moiety iv(a) of Structure 2 has R^{12} , R^{13} and R^{14} all methyl; a=0; b=1; c=150; d=0; m=2. Also preferred are polyamide-polyamine materials that comprise epichlorohydrin adduct of polyamide-polyamines which are the reaction products of diethylenetriamine and adipic acid (WO98/29530).

[0047] Other preferred fabric care actives are textile odor modifiers (IV) selected from the group consisting of perfumes, (preferably pro-perfumes: a preferred pro-perfume useful herein is described in columns 7-14 of U.S. Pat. No. 5,378,468; and/or substantive perfumes and/or perfumes combined with perfume carriers), odor enhancers, malodor control agents as cyclodextrins (as described on pages 9 to 12 of WO96/04940) and mixtures thereof. When present in one or more compositions of the articles of the present invention, textile odor modifiers are used in an amount between about 0.1% and about 10% by weight of the compositions. U.S. Pat. No. 5,378,468 and WO96/04940 are incorporated herein by reference.

[0048] Specific examples of fabric care actives are the preferred anti-shrinkage agents, anti-wrinkle agents, soil release polymers, fabric softening agents and fabric conditioning agents selected from the group consisting of oligosaccharides, especially mixtures of oligosaccharides, especially isomaltoligosaccharides (IMO) (including mixtures, the individual components of the mixtures, substituted versions thereof, derivatised versions thereof, and mixtures thereof. Further examples can be found in WO 00/24851 especially on pages 8-9. Especially preferred for fabric softening, and anti wrinkle are diester quaternary ammonium compounds such as 1,2-di(acyloxy)-3-trimethylammonio propane chloride. Further examples are provided in WO 00/24851 pages 61-75.

[0049] The fabric care compositions according to the present invention preferably comprise an effervescent component as described in more detail below.

[0050] Bleaching Composition

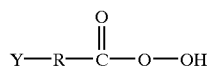
[0051] The bleaching compositions of the present invention can comprise a bleaching system as described above. Preferably, the bleaching composition will comprise a pre-formed peroxy carboxylic acid, a suspending agent, a chelant and an effervescent component. The effervescent component is preferably an acid or peroxide.

[0052] Pre-formed Peroxy Carboxylic Acid

[0053] The bleaching compositions of the present invention preferably comprise a pre-formed peroxycarboxylic acid (hereinafter referred to as a "peracid"). Any suitable peracid compound known in the art can be used herein.

[0054] The preformed peracid compound as used herein is any convenient compound which is stable and which under consumer use conditions provides an effective amount of peracid anion. The preformed peracid compound preferably is selected from the group consisting of percarboxylic acids and salts, percarbonic acids and salts, perimidic acids and salts, peroxy monosulfuric acids and salts, and mixtures thereof.

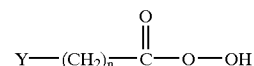
[0055] One class of suitable organic peroxycarboxylic acids have the general formula:



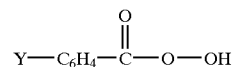
[0056] wherein R is an alkylene or substituted alkylene group containing from 1 to about 22 carbon atoms or a

phenylene or substituted phenylene group, and Y is hydrogen, halogen, alkyl, aryl, $-\text{C}(\text{O})\text{OH}$ or $-\text{C}(\text{O})\text{OOH}$.

[0057] Organic peroxyacids suitable for use in the present invention can contain either one or two peroxy groups and can be either aliphatic or aromatic. When the organic peroxycarboxylic acid is aliphatic, the unsubstituted acid has the general formula:



[0058] where Y can be, for example, H, CH_3 , CH_2Cl , $\text{C}(\text{O})\text{OH}$, or $\text{C}(\text{O})\text{OOH}$; and n is an integer from 1 to 20. When the organic peroxycarboxylic acid is aromatic, the unsubstituted acid has the general formula:



[0059] wherein Y can be, for example, hydrogen, alkyl, alkylhalogen, halogen, $\text{C}(\text{O})\text{OH}$ or $\text{C}(\text{O})\text{OOH}$.

[0060] Typical monoperoxy acids useful herein include alkyl and aryl peroxyacids such as:

[0061] (i) peroxybenzoic acid and ring-substituted peroxybenzoic acid, e.g. peroxy-a-naphthoic acid, monoperoxyphthalic acid (magnesium salt hexahydrate), and o-carboxybenzamidoperoxyhexanoic acid (sodium salt);

[0062] (ii) aliphatic, substituted aliphatic and arylalkyl monoperoxy acids, e.g. peroxy lauric acid, peroxystearic acid, N-nonanoylaminoperoxy caproic acid (NAPCA), N,N-(3-octylsuccinoyl)aminoperoxy caproic acid (SAPA) and N,N-phthaloylaminoperoxy caproic acid (PAP);

[0063] (iii) amidoperoxyacids, e.g. monononylamide of either peroxysuccinic acid (NAPSA) or of peroxyadipic acid (NAPAA).

[0064] Typical diperoxyacids useful herein include alkyl diperoxyacids and aryl diperoxyacids, such as:

[0065] (iv) 1,12-diperoxydodecanedioic acid;

[0066] (v) 1,9-diperoxyazelaic acid;

[0067] (vi) diperoxybrassylic acid; diperoxysebacic acid and diperoxyisophthalic acid;

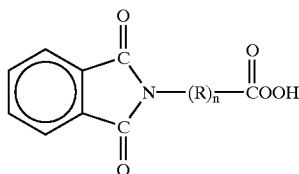
[0068] (vii) 2-decyldiperoxybutane-1,4-dioic acid;

[0069] (viii) 4,4'-sulfonylbisperoxybenzoic acid.

[0070] Such bleaching agents are disclosed in U.S. Pat. Nos. 4,483,781, Hartman, issued Nov. 20, 1984, 4,634,551 to Bums et al., European Patent Application 0,133,354, Banks et al. published Feb. 20, 1985, and 4,412,934, Chung et al. issued Nov. 1, 1983. Sources also include 6-nonylamino-6-oxoperoxy caproic acid as described in 4,634,551, issued Jan. 6, 1987 to Bums et al. Persulfate compounds such as for example OXONE, manufactured commercially

by E. I. DuPont de Nemours of Wilmington, Del. can also be employed as a suitable source of peroxymonosulfuric acid.

[0071] Particularly preferred peracid compounds are those having the formula:



[0072] wherein R is C_{1-4} alkyl and n is an integer of from 1 to 5. A particularly preferred peracid has the formula where R is CH_2 and n is 5 i.e., phthaloylamino peroxy caproic acid (PAP) as described in U.S. Pat. Nos. 5,487,818, 5,310,934, 5,246,620, 5,279,757 and 5,132,431. PAP is available from Ausimont SpA under the tradename Euroco. The peracids used herein preferably have a solubility in aqueous liquid compositions measured at 20° C. of from about 10 ppm to about 1500 ppm, more preferably from about 50 ppm to about 1000 ppm, most preferably from about 50 ppm to about 800 ppm, solubility being measured at 20° C. In a particularly preferred embodiment of the present invention the peracid has mean average particle size of less than 100 micrometers, more preferably less than 80 micrometers, even more preferably less than 60 micrometers. Most preferably, when the peracid is PAP, it has a mean average particle size of between about 20 and about 50 micrometers. The peracid is preferably present at a level of from about 0.1% to about 40%, more preferably from about 0.1% to about 25%, even more preferably from about 1% to about 10%, most preferably from about 2% to about 4%.

[0073] Suspending Agents

[0074] The composition of the present invention may preferably comprise, especially when the composition contains a solid particulate such as a peracid, a suspending agent. A suspending agent is an ingredient which is specifically added to the composition of the present invention to suspend a solid particulate ingredient of the composition.

[0075] Suitable suspending agents are those known in the art. Examples of suspending agents include gum-type polymers (e.g. xanthan gum), polyvinyl alcohol and derivatives thereof, cellulose and derivatives thereof and polycarboxylate polymers including, but not limited to: tamarind gum (preferably consisting of xyloglucan polymers), guar gum, locust bean gum (preferably consisting of galactomannan polymers), and other industrial gums and polymers, which include, but are not limited to, Tara, Fenugreek, Aloe, Chia, Flaxseed, Psyllium seed, quince seed, xanthan, gellan, welan, rhamnan, dextran, curdlan, pullulan, scleroglucan, schizophyllan, chitin, hydroxyalkyl cellulose, arabinan (preferably from sugar beets), de-branched arabinan (preferably from sugar beets), arabinoxylan (preferably from rye and wheat flour), galactan (preferably from lupin and potatoes), pectic galactan (preferably from potatoes), galactomannan (preferably from carob, and including both low and high viscosities), glucomannan, lichenan (preferably from icelandic moss), mannan (preferably from ivory nuts),

pachyman, rhamnogalacturonan, acacia gum, agar, alginates, carrageenan, chitosan, clavan, hyaluronic acid, heparin, inulin, cellodextrins, carboxymethylcellulose (CMC), dextrans, dextrans, ethylhydroxyethylcellulose (EHEC), guar, hydroxyethylcellulose (HEC), hydroxypropylcellulose (HPC), hydroxybutylcellulose (HBC), karaya, larch, methylcellulose (MC), tamarind, scleroglucan, xanthan, carboxymethylhydroxyethylcellulose (CMHEC), methoxypropyl methyl cellulose (MPMC), hexylcarboxymethyl cellulose, C_{12} - C_{20} alkyl carboxymethylcellulose, methylhydroxyethylcellulose (MHEC), methylhydroxypropylcellulose (MHPC), hydroxyethylmethylcellulose (HEMC), hydroxypropylmethylcellulose (HPMC), hydroxybutylmethylcellulose (HBMC) and mixtures thereof. In a particularly preferred embodiment of the present invention, the suspending agent is selected from a gum-type polymer or a polycarboxylate polymer.

[0076] Chelants

[0077] Chelants are preferably formulated within the bleaching composition but can be as well formulated within the aqueous liquid detergent or in both compositions. Suitable are one or more copper and/or nickel chelating agents ("chelators"), such as diethylenetriaminepentaacetic acid (DTPA) or ethylenediamine- N,N' -disuccinic acid (EDDS). Water-soluble chelating agents can be selected from the group consisting of amino carboxylates, amino phosphonates, polyfunctionally-substituted aromatic chelating agents and mixtures thereof, all as hereinafter defined and all preferably in their acidic form. Amino carboxylates useful as chelating agents herein include ethylenediaminetetraacetic acid (EDTA), N -hydroxyethylethylenediaminetriacetates, nitrilotri-acetates (NTA), ethylenediamine tetrapropionates, ethylenediamine- N,N' -diglutamates, 2-hydroxypropylenediamine- N,N' -disuccinates, triethylenetetraaminehexacetates, di-ethylenetriaminepenta acetates (DTPA) and ethanoldiglycines, including their water-soluble salts such as the alkali metal, ammonium, and substituted ammonium salts thereof and mixtures thereof. Amino phosphonates are also suitable and can include ethylenediaminetetrakis (methylenephosphonates), diethylenetriamine- N,N,N',N',N'' -pentakis-(methane phosphonate) (DTMP) and 1-hydroxyethane-1,1-diphosphonate (HEDP). Preferred chelating agents useful herein include those described in U.S. Pat. No. 5,686,376 to Rusche, et al., issued Nov. 11, 1997 included herein by reference in its entirety. Chelants are usually present at a range of from about 0.001% to about 10% by weight of the composition. Preferably in the bleaching composition, the chelant is present at a level of from 1% to 10%, more preferably from 5%-8% by weight of the composition. Chelants may also be used to advantage in the fabric care compositions of the present invention as well.

[0078] Effervescent System

[0079] Preferred flexible multiple compartment pouches according to the present invention comprise effervescent systems. The effervescent systems preferably comprise two components contained in separate compartments of the pouch. Suitable effervescent systems are described in WO 01/00765, on pages 4 to 7

[0080] In a preferred embodiment the effervescent system comprises an acidic component, for example citric acid, and an alkaline component, for example sodium carbonate or bicarbonate. In another preferred embodiment the efferves-

cent system comprises a peroxide reducing enzyme, for example catalase, and a source of peroxide, for example hydrogen peroxide. One of the compositions is formulated with the first effervescent component and another composition is formulated with the second effervescent component so that the two components promote a chemical reaction when mixed. A fizzing liquid and or a foam can be produced in this way.

Example 1

[0081] A dual compartment pouch having at least a first and a second compartment which may separately comprise an aqueous liquid detergent composition and a bleaching composition as follows.

First Compartment	% By Weight
C13-15 2.5-Ethoxy, Alkyl sulphate	14.2
HLAS	4.37
C12-14 Alkyl dimethylamine oxide	1.10
C13-15 Alkyl alcohol, 9-ethoxylated	2.18
Citric acid	2.80
C12-18 fatty acid	5.00
Protease	1.20
Amylase	0.18
Catalase	0.25
Boric acid	2.28
CaC12	0.068
Ethoxlatedtetraethlenepentimine	0.55
Ethoxylated polyethyleneimine	1.09
Diethylene triamine peracetic acid	0.27
Brightener-49	0.125
Ethanol	4.00
1,2-propanediol/Glycerine	6.73
Monoethanolamine	0.40
NaOH	3.80
Silicone suds suppressor	0.06
Perfume	0.66
Water	Balance
Second Compartment	
PAP (70% Slurry),	17.30
Citric acid	2.00
Xanthan gum	0.46
Sulphonated ethoxylated polyterphthalic	0.80
Hydrogen Peroxide	2.00
Trimethyl benzoic acid	0.20
NaOH	0.47
Water	Balance

[0082] When the first and second components are mixed, the catalyse promotes the degradation of the hydrogen peroxide giving off oxygen and causing the resulting mixture to fizz.

Example 2

[0083] A dual compartment pouch having at least a first and a second compartment which may separately comprise a composition with fabric care actives and an aqueous liquid detergent composition as follows. The different cleaning agents are divided over the 2 compartments for better chemical and physical stability.

First Compartment: Aqueous liquid composition	
C45 alcohol 7-ethoxylate	14
C12-alkyl dimethylamine N-oxide	3.5
Citric acid	3
Polyethylenimine (MW 600), 20 ethoxylate	1.2
Ethoxylated tetraethylene pentamine	0.6
Catalase enzyme	0.6
Amylase enzyme	0.12
Protease enzyme	0.03
Cyclohexanedimethanol	2.0
Boric acid	2.0
Propandiol	7.2

-continued

Hydrogenated castor oil	0.75
Monoethanolamine	To pH 8.0
Perfume/minors	2.5
Water	balance
Second Compartment: Fabric care composition	
C45 alcohol 7-ethoxylate	17
C12-alkyl dimethylamine N-oxide	2.5
Hydroxyethane diphosphonic acid	0.3
Triethanolamine dicanoylester, quaternized, methylsulfate salt	11
Hydrogen peroxide	2.7

-continued

Cyclohexanedimethanol	9.5
Sulphuric acid	to pH 3.0
Perfume/minors	0.1
Water	Balance

What is claimed is:

- 1. A flexible multiple compartment pouch (1) comprising at least a first (2) and second (3) compartment and at least one gusset (6).
- 2. A flexible multiple compartment pouch according to claim 1 comprising at least a first and second compartment wherein the first compartment comprises a first composition and the second compartment comprises a second composition and wherein the first and second compositions are incompatible.
- 3. A flexible multiple compartment pouch according to claim 1, comprising at least one gripping means (7).
- 4. A flexible multiple compartment pouch comprising at least a first and second compartment wherein the first compartment comprises a first composition and the second compartment comprises a second composition and wherein the first and second compositions are incompatible.
- 5. A flexible multiple compartment pouch according to claim 4 comprising at least one gripping means.
- 6. A flexible multiple compartment pouch according to claim 4 comprising at least one gusset.
- 7. A flexible multiple compartment pouch comprising at least a first and second compartment and at least one gripping means.
- 8. A flexible multiple compartment pouch according to claim 7 comprising at least one gusset.
- 9. A flexible multiple compartment pouch according to claim 7 wherein the first compartment comprises a first composition and the second compartment comprises a second composition and wherein the first and second compositions are incompatible.
- 10. A flexible multiple compartment pouch according to claim 4 where the second and optionally additional compartments are substantially enclosed within the first.
- 11. A flexible multiple compartment pouch according to claim 4 where the separate compartments (2), (3) are adjacent to one another and separated by a permanent seal (4).

12. A flexible multiple compartment pouch according to claim 1 where each separate compartment is provided with an outlet and said outlets converge at a single outlet device without allowing the mixing of compositions contained therein.

13. A flexible multiple compartment pouch according to claim 1 where each separate compartment is provided with an outlet and said outlets are adjacent to one another.

14. A flexible multiple compartment pouch according to claim 13 wherein the outlet from each compartment will converge to a connection device which bridges between the pouch and durable container

15. A flexible multiple compartment pouch according to claim 3 wherein the gripping means comprises a handle.

16. A flexible multiple compartment pouch according to claim 3 wherein a gripping means is at the opposite edge of the pouch to the outlets.

17. A flexible multiple compartment pouch according to claim 1 wherein the gusset is situated at the opposite edge of the pouch to the outlets.

18. A flexible multiple compartment pouch according to claim 1 wherein the first compartment comprises an aqueous liquid detergent and the second comprises a fabric care composition.

19. A flexible multiple compartment pouch according to claim 1 wherein the first compartment comprises an aqueous liquid detergent and the second comprises a bleaching composition.

20. A flexible multiple compartment pouch according to claim 1 further comprising a sealable film and an aesthetic layer.

21. A method of refilling a multiple compartment durable container with a multiple compartment pouch according to claim 13, comprising the steps:

- a. preparing the durable container for receipt of composition, and
- b. preparing the outlets from the multiple compartment pouch, then
- c. adding the compositions to the compartments of the durable container.

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