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(54) **Pouch and method of manufacturing the same**

Beutel und Herstellungsverfahren dafür

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(73) Proprietor: **Cryovac, Inc.**  
**Duncan, South Carolina 29334 (US)**

(72) Inventors:  
• **Capitani, Stefano**  
**20152 Milano (IT)**

• **Rizzi, Jvanohe**  
**20025 Legnano (Milan) (IT)**

(74) Representative: **Fraire, Cristina et al**  
**PGA S.r.l.**  
**Via Mascheroni, 31**  
**20145 Milano (IT)**

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## Description

**[0001]** The present invention relates to a pouch, specifically for liquid or granular products. In particular, the invention relates to an inflatable pouch.

**[0002]** The present invention also relates to a method of manufacturing said pouch.

**[0003]** Pouches are well-known in the art. They are for example used to package liquid or granular products for food and medical use.

**[0004]** A known pouch typically consists of two superimposed walls of flexible plastic material, such as polyethylene, bonded to each other, typically heat-sealed, at peripheral edges thereof, so as to form an internal space of the pouch, suitable for being filled with the product to be packaged. The pouch can be also provided with a closure spout.

**[0005]** With specific reference to products having high degradability, such as food products, there is a growing demand for extending the shelf life of these products when packaged.

**[0006]** If the pouch is not impervious to the transmission of contaminant agents, such as microorganisms, oxygen, other gases and water vapour, then the product packaged in the pouch can undergo a degradation by transmission through the walls. In particular, oxygen normally permeates the internal space along the sealed peripheral edges of the pouch.

**[0007]** Throughout the following description and the annexed claims, by "sealing" or "seal" a hermetical junction of the pouch walls, which can be made by means of heat-sealing or ultrasound sealing, or with other known methods is meant.

**[0008]** Throughout the following description and the annexed claims, reference will be specifically made to a gas (more particularly, oxygen) as a contaminant agent, while other contaminant agents which can pass through the pouch walls and degrade the product packaged therein might be considered in place or in combination with the aforementioned gas.

**[0009]** In order to extend the shelf life of the packaged product, so called aseptic and ultra clean pouches are available on the market. They are typically made of laminate materials, for example comprising one or more layers of polypropylene and a layer of aluminium or polyethylene with Deposited Silicon Oxide (PET-SiOx).

**[0010]** The aseptic and ultra clean pouches are produced in aseptic and ultra clean filling systems.

**[0011]** In particular, the aseptic filling systems provide commercial sterility, whereby no unwanted organisms will grow in the filled pouch, whereas the ultra clean filling reduces the presence of organisms to levels approaching zero, but are not designed to ensure zero contamination.

**[0012]** EP 1 242 293 discloses a packaging container made of plastic material consisting of a flat hose, which is sealed at least on one side and forms a bag-shaped container. The flat hose is surrounded by two flat film sections, which overlap the edge regions. The hose has

a filling opening and connection seams.

**[0013]** US 5,588,532 discloses an inflatable package comprising a pair of overlying inner panels defining an item-receiving zone therebetween to have the object received therein, a pair of outer panels each overlying a respective one of the inner panels to form an inflatable chamber therebetween and inflating means for at least partially inflating the inflatable chamber with a filler medium.

**[0014]** US 4,872,558 discloses a packaging system including an outer bag defining a sealed chamber therein, an inner bag defining a pocket adapted to retain an article therein and means for filling the chamber with a filling medium to substantially encapsulate and support the inner bag and article within the outer bag.

**[0015]** US 4 454 945 discloses a pouch made from two tubular films.

**[0016]** The Applicant has found that, although the laminate materials of the prior art are known as having high gas-barrier properties, pouches made of these materials have some drawbacks.

**[0017]** Firstly, being the superimposed walls typically heat-sealed, they can delaminate, i. e. the walls can partially separate from each other. As a result, ruptures or micro-perforations can generate at the sealed edges, thus causing the oxygen to enter the pouch, so deteriorating the product present therein. Further, the laminate materials are thick, this considerably increasing the manufacturing and shipment costs of the pouch, as well as the environmental impact of the pouch in that more plastic is needed for producing it and needed to be disposed at the end of its lifecycle.

**[0018]** Furthermore, when the pouch is produced in aseptic or ultra clean filling systems, it is not possible to use a printed film, because the ink is dissolved when the film enters a chemical decontamination area, e.g. it is dipped in a tank containing for example a hydrogen peroxide decontaminating liquid. In order to avoid the ink to be dissolved, expensive trap printing systems are used, thus further increasing the production costs of the pouch.

**[0019]** The present invention provides a pouch, particularly for liquid or granular products, which is suitable for increasing the gas-barrier effect at the sealed edges thereof, meanwhile making it possible to reduce the material thickness and, consequently, the manufacturing and shipment costs of the pouch. In addition the present pouch can be easily printed avoiding any problem of ink discoloration.

**[0020]** The present invention, in a first aspect thereof, relates to a pouch comprising:- an inner pouch comprising a bottom surface and opposite side walls extending upwardly from the bottom surface, said opposite side walls being associated to each other along at least one peripheral edge thereof, thereby delimiting a product-filling area; characterized in that the pouch comprises a pair of outer films, each overlying a respective one of said opposite side walls of the inner pouch, said outer films being associated to each other through a first seal

at said at least one peripheral edge of the inner pouch; and in that the outer films are further associated to each other through a second seal spaced apart from the first seal with respect to the product-filling area, thereby delimiting between said first seal and second seal at least one inflatable chamber filled with an inert gas.

**[0021]** The Applicant has surprisingly found that, owing to the provision of the inflatable chamber/s filled with an inert gas formed by the outer films, the pouch of the present invention has enhanced properties in terms of gas-barrier at the sealed edges thereof,

**[0022]** with respect to the conventional pouches. This advantageously allows the use of thinner and cheaper materials for the inner pouch as well as for the outer films, thus reducing the manufacturing and shipment costs of the pouch.

**[0023]** Throughout the following description and the annexed claims, by "associated" and "associating" a direct association between the outer films or an association between the outer films with the interposition of the associated side walls of the inner pouch is meant.

**[0024]** Throughout the following description and the annexed claims, by "gas-barrier" is meant the capability to limit to a certain extent the passage of contaminant agent. With specific reference to oxygen, the desired gas-barrier properties are achieved by a layer, seal or structure when the OTR (Oxygen Transmission Rate) evaluated at 23°C and 0% R.H. according to ASTM D-3985 is lower than 500 cm<sup>3</sup>/m<sup>2</sup>·day·atm, preferably lower than 100 cm<sup>3</sup>/m<sup>2</sup>·day·atm, more preferably lower than 50 cm<sup>3</sup>/m<sup>2</sup>·day·atm.

**[0025]** In a preferred embodiment, at the second seal, the outer films are directly associated, one inflatable chamber being defined between the outer films.

**[0026]** In a further preferred embodiment, at the second seal, the outer films are sealed at the at least one peripheral edge of the inner pouch, one inflatable chamber being defined between each outer film and the at least one peripheral edge.

**[0027]** Preferably, each of the outer film is sealed around the perimeter of a respective side wall of the inner pouch. This advantageously ensures a better matching between the inner pouch and the outer walls.

**[0028]** Preferably, the inert gas filling the at least one inflatable chamber is nitrogen. This advantageously increases the gas-barrier properties of the pouch. However, different inert gases can be used.

**[0029]** In a preferred embodiment, the inner pouch is made of a flexible plastic material, such as polyethylene.

**[0030]** Preferably, the inner pouch is made of a material with gas-barrier properties, such as a mono or multilayer film or laminate comprising one or more layers of gas-barrier resins, such as polypropylene, ethylvinyl alcohol, polyvinylidenechloride, optionally including one or more layers of non plastic material, such as aluminium or polyethylene with Deposited Silicon Oxide (PET-SiOx). This additional material advantageously further increases the gas-barrier properties of the pouch, particu-

larly in the event of an aseptic pouch.

**[0031]** In a preferred embodiment, the outer films are made of a flexible plastic material, such as polyethylene.

**[0032]** Preferably, the outer films are made of a material with gas-barrier properties, such as a mono or multilayer film or laminate comprising one or more layers of gas-barrier resins, such as polypropylene or others, optionally including one or more layers of non plastic material, such as aluminium or polyethylene with Deposited Silicon Oxide (PET-SiOx). This additional material advantageously further increases the gas-barrier properties of the pouch, particularly in the event of an aseptic pouch.

**[0033]** Preferably, at least one outer film has a printed surface. The outer printed film needs not to undergo any decontamination process but is applied externally to the aseptic inner pouch. This advantageously allows to have a printed pouch and avoids expensive trap printing systems to be used when the pouch is produced in aseptic or ultra clean filling systems, thus reducing the pouch production costs.

**[0034]** In a second aspect thereof, the present invention relates to a method of manufacturing a pouch comprising:

- providing an inner pouch, comprising a bottom surface and opposite side walls extending upwardly from the bottom surface, the opposite side walls being associated to each other along at least one peripheral edge thereof, thereby delimiting a product-filling area;
- feeding a pair of outer films, each of said outer films overlying a respective side wall of the inner pouch;
- associating the outer films to each other through a first seal at said at least one peripheral edge of the inner pouch;
- associating the outer films to each other through a second seal spaced apart from said first seal with respect to the product-filling area, thereby delimiting between said first seal and second seal at least one inflatable chamber ;
- inflating the at least one inflatable chamber with an inert gas; and
- sealing said at least one inflated chamber (34).

**[0035]** In a preferred embodiment of the method, associating the outer films through a second seal comprises directly associating the outer film, one inflatable chamber being defined between the outer films.

**[0036]** In a further preferred embodiment of the method, associating the outer films through a second seal comprises sealing the outer films to said at least one peripheral edge of the inner pouch, one inflatable chamber being defined between each outer film and said at

least one peripheral edge.

**[0037]** In a preferred embodiment of the method, a plurality of inner pouches are provided, said plurality of inner pouches being aligned along a feeding direction, before feeding said pair of outer films.

**[0038]** Preferably, said plurality of inner pouches (20) are connected to each other at the peripheral edge.

**[0039]** Preferably, associating the outer films to the inner pouch comprises sealing each outer films around the perimeter of a respective side wall of the inner pouch. This advantageously ensures a better matching between the inner pouch and the outer walls.

**[0040]** Preferably, associating the outer films to each other through a second seal comprises associating the outer film through a weakening line (L). This advantageously allows a desired number of pouches to be grouped without providing expensive cardboard boxes. Moreover, owing to the connection weakening lines, the grouped pouches can be easily separated by an user.

**[0041]** In a third aspect, thereof, the present invention relates to a set of pouches, each pouch being of the type discussed above, wherein at the outer films said pouches are associated to each other through respective weakening lines.

**[0042]** Further characteristics and advantages of the present invention shall become clearer from the following detailed description of preferred embodiments thereof, made with reference to the attached drawings and given for indicating and not limiting purposes. In such drawings:

- figure 1 schematically shows a perspective view of a pouch according to the present invention;
- figure 2 is a partially exploded perspective view of a first embodiment of the pouch of figure 1;
- figure 3 is a cross-sectional view, taken along the line III-III of figure 1, showing a first embodiment of the pouch of the invention;
- figure 4 is a cross-sectional view similar to that of figure 3, showing a further embodiment of the pouch of the invention;
- figure 5 is a perspective view of a group of three pouches of the invention, which are connected to each other along weakening lines enabling an easier separation by the user;
- figure 6 schematically shows a perspective view of a machine suitable for manufacturing a plurality of pouches of figure 1; and
- figures 7 to 9 show a method of manufacturing the pouch according to the invention.

**[0043]** With reference to figures 1 and 2, a pouch in accordance with the present invention is shown. Such a

pouch is globally indicated with 10 and comprises an inner pouch 20 suitable for being filled with a product to be packaged, for example a liquid or granular food product.

**[0044]** As better shown in figure 2, the inner pouch 20 comprises a bottom surface 22 and opposite side walls 24, which extend upwardly from the bottom surface 22. The opposite side walls 24 are associated to each other at selected overlying peripheral edges thereof 24a, 24b, 24c, thereby delimiting with the bottom surface 22 an area A suitable for being filled with the product to be packaged. Preferably, the opposite side walls 24 of the inner pouch 20 are heat sealed along two opposite longitudinal peripheral edges 24a, 24b and along a top transversal peripheral edge 24c.

**[0045]** Preferably, the inner pouch 20 is provided, at the upper portion thereof, with a closure spout 26.

**[0046]** Preferably, the inner pouch 20 is made of a flexible plastic material, such as polyethylene, preferably having a thickness of about 20 microns or less. More preferably, the inner pouch 20 is made of a material having gas-barrier properties, for example a laminate comprising one or more layers of gas-barrier resins, such as polypropylene, optionally including one or more layers of non plastic material, such as aluminium or polyethylene with Deposited Silicon Oxide (PET-SiOx).

**[0047]** The pouch 10 further comprises a pair of outer films 30, each overlying a respective one of the opposite side walls 24 of the inner pouch 20.

**[0048]** The outer films 30 are preferably rectangular, with the size of the outer films 30 being selected according to the size of the inner pouch 20, and have an inner surface 30a, which in use faces a respective side wall 24 of the inner pouch 20, and an outer surface 30b, opposite to the inner surface 31. Preferably, at least one of the outer films 30 has a printed surface, more preferably the outer surface 30b thereof.

**[0049]** The outer films 30 are also made of flexible plastic material, such as polyethylene. Preferably, the outer films 30 are also made of a material having barrier to oxygen properties, for example a laminate comprising one or more layers of gas-barrier resins, such as polypropylene, optionally including one or more layers of non plastic material, such as aluminium or polyethylene with Deposited Silicon Oxide (PET-SiOx).

**[0050]** With reference to figures 1 and 3, a pouch 10 according a first embodiment of the present invention is shown. In this pouch 10, the outer films 30 are associated to each other through first seals 21, 23 provided at a respective longitudinal peripheral edge 24a, 24b of the inner pouch 20. Moreover, the outer films 30 are directly associated to each other through second seals 31, 33, each substantially parallel to and spaced apart from a respective first seal 21, 23 with respect to the product-filling area A. An inflatable chamber 34 is thus delimited between the first seal 21, 23 and the second seal 31, 33. In particular, one inflatable chamber 34 is defined between the outer films 30, which is filled with an inert gas, preferably Nitrogen.

**[0051]** With reference to figures 1 and 4, a pouch 10' according to a further embodiment of the present invention is shown. In this pouch 10' the outer films 30 are also associated to each other through first seals 21, 23 provided at a respective longitudinal peripheral edge 24a, 24b of the inner pouch 20. Moreover, the outer films 30 are sealed at the peripheral longitudinal edges 24a, 24b of the inner pouch 20 through second seals 31', 33', which are substantially parallel and spaced apart from the corresponding first seals 21, 23. The longitudinal peripheral edges 24a, 24b form thus a partition wall between the outer films 30. One inflatable chamber 34' is so delimited between the first seal 21, 23 and the second seal 31', 33'. In particular, one inflatable chamber 34' is defined between each outer film 30 and the longitudinal peripheral edges 24a, 24b. The inflatable chambers 34' are filled with an inert gas, preferably Nitrogen.

**[0052]** With reference to figure 5, an assembly of a plurality of pouches 10, 10', preferably three pouches 10, 10', is illustrated. The pouches 10, 10' are associated through the outer films 30 and weakening lines L are provided between adjacent pouches at the second seals associating the outer films to each other. Each weakening line L is preferably made of a serrated seal, which advantageously enable easier separation of the pouches by the user.

**[0053]** With reference to figure 6 to 9, it is now described a method of manufacturing a pouch according to the present invention.

**[0054]** Firstly, there is provided a plurality of inner pouches 20. Each inner pouch 20 of the plurality of inner pouches 20 is obtained by using any suitable manufacturing method known in the art, as for example the one disclosed in EP 2055 638.

**[0055]** In the event of an aseptic or ultra clean pouch 10, a step of decontaminating each of the inner pouches 20 with a substance which is chemically active as a decontaminating agent is carried out, thus obtaining a plurality of aseptic or ultra clean inner pouches 20. For instance, the decontaminating agent may be a hydrogen peroxide bath.

**[0056]** The inner pouches 20 optionally decontaminated are then aligned thereby resulting equally spaced from one another along a feeding direction D. The aligned inner pouches 20 are supported, at the bottom surface 22 thereof, by a conveyor belt or, alternatively suspended by gripping means, gripping a respective inner pouch 20, for example at its closure spout 26. In the event of the manufacturing of a single pouch 10, the alignment is not provided.

**[0057]** Subsequently, the outer films 30 are provided, each fed by a respective supply roll 2 along the feeding direction D, with the inner pouch 20 first coming along the feeding direction D being arranged between the outer films 30. Preferably, each outer film 30 is made to adhere to a respective side wall 24 of the inner pouch 20, for example by means of a respective deviation roller 4 suitably provided at each side of the inner pouches 20.

**[0058]** Subsequently, the outer films 30 are associated, for example heat-sealed, along the perimeter of the respective side wall 24. To this end, a pair of sealing frames 5 are provided, each comprising a bottom sealing plate 5a, an upper sealing plate 5b and a pair of side sealing plates 5c and 5d, which connect the bottom and upper sealing plates 5a and 5b.

**[0059]** In the event the inner pouch 20 is provided with a closure spout 26, the upper sealing plate 5b of each sealing frame 5 is provided with a respective recess 5e, preferably a semicircular recess. The recesses 5e are suitable for embracing the closure spout 26 when the sealing frames 5 are pressed against the respective side wall 24 of the inner pouch 20, as shown in greater detail in figure 5.

**[0060]** Due to this association, the outer films 30 are associated to each other through first seals 21, 23 at longitudinal peripheral edges 24a, 24b of the inner pouch.

**[0061]** At the same time, the outer films 30 are further directly associated to each other through a second seal 33 spaced apart from a respective first seal 23 with respect to the product-filling area A. To this end a pair of sealing plates 6 are provided, preferably integral with a respective sealing frame 5. An inflatable chamber 34 is therefore delimited between the outer films 30 at a longitudinal peripheral edge 24b of the inner pouch 20. Preferably, the inner pouches 20 are provided connected one to the other at the longitudinal peripheral edges 24a, 24b. In this case, the outer films 30 are further associated to each other through a second seal 33', connecting the outer films 30 to a respective longitudinal edge 24a of the inner pouch. Inflatable chambers 34' are therefore delimited between each outer film 30 and the longitudinal peripheral edge 24a.

**[0062]** Preferably, the outer films 30 are associated to each other at the second seal 31, 33, 31', 33' through respective weakening lines L (see figure 5), thereby allowing an easier separation of the pouches by the user through hand pulling. This is preferably obtained by providing the seals 33 as a serrated seal.

**[0063]** If the inner pouches 20 are provided connected one to the other at the longitudinal peripheral edges 24a, 24b, when the outer films are associated to each other at the second seal 31', 33', the longitudinal peripheral edges 24a, 24b are locally perforated such as to allow an easier separation of the pouches by the user through hand pulling.

**[0064]** The obtained second seal 33, 33' for the currently processed inner pouch 20 corresponds to the second seal 31, 31' of the following inner pouch 20.

**[0065]** The inner pouches are then moved along the feeding direction D by a pitch whose length is equal to the length of the pouch 10 to be manufactured and the process discussed above is iteratively repeated for each subsequent inner pouch 20 of said plurality of inner pouches 20.

**[0066]** As shown in greater detail in figures 8 and 9, the inflatable chambers 34, 34' thus formed are then filled

with an inert gas, preferably Nitrogen, by using a suitable filling means, for example a filling tube 8, and subsequently sealed on the upper portion thereof through a respective upper seal 35.

**[0067]** Of course, a man skilled in the art can bring numerous modifications and variants to the pouch and to the related manufacturing method described above, in order to satisfy specific and contingent requirements, all of which are however covered by the scope of protection of the present invention as defined by the following claims.

**[0068]** For example, the material of the walls of the inner pouch 20 and of the outer films 30 can be a non gas-barrier material, the gas-barrier effect at the sealed edges being anyway provided by the chamber 34 inflated with the inert gas.

## Claims

### 1. A pouch (10; 10') comprising:

- an inner pouch (20) comprising a bottom surface (22) and opposite side walls (24) extending upwardly from the bottom surface (22), said opposite side walls (24) being associated to each other along at least one peripheral edge (24a, 24b, 24c) thereof, thereby delimiting a product-filling area (A);

**characterized in that** the pouch comprises a pair of outer films (30), each overlying a respective one of said opposite side walls (24) of the inner pouch (10), said outer films (30) being associated to each other through a first seal (21, 23) at said at least one peripheral edge of the inner pouch (20); and **in that** the outer films (30) are further associated to each other through a second seal (31, 33; 31', 33') spaced apart from the first seal (21, 23) with respect to the product-filling area (A), thereby delimiting between said first seal (21, 23) and second seal (31, 33; 31', 33') at least one inflatable chamber (34, 34'), said chamber being filled with an inert gas.

2. A pouch (10; 10') according to claim 1, wherein at said second seal (31, 33) the outer films (30) are directly associated to each other, one inflatable chamber (34) being defined between the outer films (30); or wherein at said second seal (31', 33'), the outer films (30) are sealed at said at least one peripheral edge (24a, 24b) of the inner pouch (20), one inflatable chamber (34') being defined between each outer film (30) and said at least one peripheral edge (24a, 24b).

3. A pouch (10; 10') according to claim 1 or 2, wherein the opposite side walls (24) are associated to each other at selected overlying peripheral edges thereof

(24a, 24b, 24c), further wherein the opposite side walls (24) of the inner pouch (20) are heat sealed along two opposite longitudinal peripheral edges (24a, 24b) and along a top transversal peripheral edge (24c).

4. A pouch (10; 10') according to claim 1 or 2, wherein the outer films (30) are associated to each other through first seals (21, 23) provided at a respective longitudinal peripheral edge (24a, 24b) of the inner pouch (20).

5. A pouch (10; 10') according to any claims 1 to 4, wherein each of said outer films (30) is sealed around the perimeter of a respective side wall (24) of the inner pouch (20).

6. A pouch (10; 10') according to any one of the preceding claims, wherein said inert gas filling said at least one inflatable chamber (34; 34') is Nitrogen.

7. A pouch (10; 10') according to any one of the preceding claims, wherein the inner pouch (20) or the outer films (30) or both are made of a flexible plastic material; and wherein the inner pouch (20) or the outer films (30) or both are made of a material with gas-barrier properties.

8. A pouch (10; 10') according to claim 7, wherein the material with barrier to oxygen properties is a laminate comprising one or more layers of a gas-barrier resin, optionally including one or more layers of non-plastic material.

9. A pouch (10; 10') according to any one of the preceding claims, wherein at least one outer film (30) has a printed surface.

10. A method of manufacturing a pouch (10; 10') according to any one of the preceding claims, comprising:

- providing an inner pouch (20), comprising a bottom surface (22) and opposite side walls (24) extending upwardly from the bottom surface (22), the opposite side walls (24) being associated to each other along at least one peripheral edge (24a, 24b, 24c) thereof, thereby delimiting a product-filling area (A);  
- feeding a pair of outer films (30), each of said outer films (30) overlying a respective side wall (24) of the inner pouch (20);  
- associating the outer films (30) to each other through a first seal (21, 23) at said at least one peripheral edge (24a, 24b) of the inner pouch (20);  
- associating the outer films (30) to each other through a second seal (31, 33; 31', 33') spaced apart from said first seal (21, 23) with respect to

the product-filling area (A), thereby delimiting between said first seal (21, 23) and second seal (31, 33; 31', 33') at least one inflatable chamber (34; 34');

- inflating the at least one inflatable chamber (34; 34') with an inert gas; and

- sealing said at least one inflated chamber (34; 34').

11. Method according to claim 10, wherein associating the outer films (30) to each other through a second seal (31, 33) comprises directly associating the outer films to each other, one inflatable chamber (34) being defined between the outer films (30); or wherein associating the outer films (30) to each other through a second seal (31', 33') comprises sealing the outer films (30) to said at least one peripheral edge (24a, 24b) of the inner pouch (20), one inflatable chamber (34') being defined between each outer film (30) and said at least one peripheral edge (24a, 24b).
12. A method according to any one of claims 10 to 11, wherein a plurality of inner pouches (20) are provided, said plurality of inner pouches (20) being aligned along a feeding direction (D), before feeding said pair of outer films (30).
13. A method according to claim 12, wherein the outer films (30) are each fed by a respective supply roll (2) along the feeding direction (D), with the inner pouch (20) first coming along the feeding direction (D) being arranged between the outer films (30), preferably wherein each outer film (30) is made to adhere to a respective side wall (24) of the inner pouch (20) by means of a respective deviation roller (4) provided at each side of the inner pouches (20), and wherein, subsequently, the outer films (30) are heat-sealed along the perimeter of the respective side wall (24) by a pair of sealing frames (5), each comprising a bottom sealing plate (5a), an upper sealing plate (5b) and a pair of side sealing plates (5c and 5d), which connect the bottom and upper sealing plates (5a and 5b).
14. A method according to claim 12 or 13, wherein said plurality of inner pouches (20) are connected to each other at the peripheral edges (24a, 24b).
15. A method according to any one of claims 12 or 13 or 14, wherein associating the outer films to each other through a second seal (31, 33; 31', 33') comprises associating the outer films (30) through a weakening line (L).
16. A set of pouches (10; 10'), wherein each pouch (10; 10') is a pouch (10; 10') according to any of claims 1 to 11, wherein the outer films (30) of said pouches (10; 10') are associated to each other through re-

spective weakening lines (L).

## Patentansprüche

1. Beutel (10; 10'), bestehend aus:

- einem inneren Beutel (20) mit einer Bodenfläche (22) und einander gegenüberliegenden Seitenwänden (24), die von der Bodenfläche (22) nach oben verlaufen, wobei die genannten einander gegenüber liegenden Seitenwände (24) an mindestens einer von dessen Außenkanten (24a, 24b, 24c) miteinander verbunden sind und somit einen Produktfüllbereich (A) eingrenzen;

**dadurch gekennzeichnet, dass** der Beutel ein Paar äußere Folien (30) umfasst, die jeweils über einer entsprechenden der genannten Seitenwände (24) des inneren Beutels (10) liegen, wobei die genannten äußeren Folien (30) miteinander durch eine erste Siegelnaht (21, 23) an der genannten mindestens einen Außenkante des inneren Beutels (20) verbunden sind;

und dass die äußeren Folien (30) weiterhin miteinander durch eine zweite Siegelnaht (31, 33; 31', 33') miteinander verbunden sind, die in einem Abstand von der ersten Siegelnaht (21, 23) bezogen auf den Produktfüllbereich (A) angeordnet ist, so dass zwischen der genannten ersten Siegelnaht (21, 23) und der zweiten Siegelnaht (31, 33; 31', 33') mindestens eine aufblasbare Kammer (34, 34') eingegrenzt wird, die mit einem inerten Gas gefüllt ist.

2. Beutel (10; 10') nach Anspruch 1, wobei an der genannten zweiten Siegelnaht (31, 33) die äußeren Folien (30) direkt miteinander verbunden sind, wobei eine aufblasbare Kammer (34) zwischen den äußeren Folien (30) definiert wird; oder wobei bei der genannten zweiten Siegelnaht (31', 33') die äußeren Folien (30) mit der genannten mindestens einen Außenkante (24a, 24b) des inneren Beutels (20) gesiegelt sind, wobei zwischen jeder der äußeren Folien (30) und der genannten mindestens einen Außenkante (24a, 24b) eine aufblasbare Kammer (34') definiert wird.
3. Beutel (10; 10') nach Anspruch 1 oder 2, wobei die einander gegenüberliegenden Seitenwände (24) an ausgewählten darüber liegenden Außenkanten des Beutels (24a, 24b, 24c) miteinander verbunden sind, wobei ferner die einander gegenüber liegenden Seitenwände (24) des inneren Beutels (20) entlang zwei einander gegenüber liegenden längs verlaufenden Außenkanten (24a, 24b) und entlang einer oberen quer verlaufenden Außenkante (24c) thermisch gesiegelt sind.

4. Beutel (10; 10') nach Anspruch 1 oder 2, wobei die äußeren Folien (30) miteinander durch erste Siegelnahte (21, 23) verbunden sind, die jeweils an einer längs verlaufenden Außenkante (24a, 24b) des inneren Beutels (20) bereitgestellt sind. 5
5. Beutel (10; 10') nach einem der Ansprüche 1 bis 4, wobei jede der genannten äußeren Folien (30) um den Umfang einer entsprechenden Seitenwand (24) des inneren Beutels (20) gesiegelt ist. 10
6. Beutel (10; 10') nach einem der vorstehenden Ansprüche, wobei es sich bei der genannten Füllung mit dem genannten inerten Gas bei zumindest einer aufblasbaren Kammer (34; 34') um Stickstoff handelt. 15
7. Beutel (10; 10') nach einem der vorstehenden Ansprüche, wobei der innere Beutel (20) oder die äußeren Folien (30) oder beide aus elastischem Kunststoffmaterial bestehen; und wobei der innere Beutel (20) oder die äußeren Folien (30) oder beide aus Material mit Gasbarriereeigenschaften hergestellt sind. 20
8. Beutel (10; 10') nach Anspruch 7, wobei das Material mit Sauerstoffbarriereeigenschaften ein Laminat ist, das aus einer oder mehreren Schichten eines Gasbarrierharzes besteht, das optional eine oder mehrere Schichten eines "Nicht-Kunststoffmaterials" umfasst. 25
9. Beutel (10; 10') nach einem der vorstehenden Ansprüche, wobei mindestens eine äußere Folie (30) eine bedruckte Oberfläche aufweist. 30
10. Verfahren zur Herstellung von Beutel (10; 10') nach einem der vorstehenden Ansprüche, umfassend:
  - Bereitstellung eines inneren Beutels (20) umfassend eine Bodenfläche (22) und einander gegenüberliegenden Seitenwände (24), die von der Bodenfläche (22) nach oben verlaufen, wobei die einander gegenüber liegenden Seitenwände (24) an mindestens einer ihrer Außenkanten (24a, 24b, 24c) miteinander verbunden sind und somit einen Produktfüllbereich (A) eingrenzen; 35
  - Zuführung eines Paares äußerer Folien (30), wobei jede der genannten äußeren Folien (30) über einer entsprechenden Seitenwand (24) des inneren Beutels (20) liegt; 40
  - Verbindung der äußeren Folien (30) miteinander durch eine erste Siegelnaht (21, 23) an der genannten mindestens einen Außenkante (24a, 24b) des inneren Beutels (20); 45
  - Verbindung der äußeren Folien (30) miteinander durch eine zweite Siegelnaht (31, 33; 31', 33'), die in einem Abstand von der genannten ersten Siegelnaht (21, 23) bezogen auf den Produktfüllbereich (A) angeordnet ist, so dass zwischen der genannten ersten Siegelnaht (21, 23) und der zweiten Siegelnaht (31, 33; 31', 33') mindestens eine aufblasbare Kammer (34, 34') eingegrenzt wird; 50
  - Aufblasen der mindestens einen aufblasbaren Kammer (34; 34') mit einem inerten Gas; und
  - Siegeln der mindestens einen aufblasbaren Kammer (34; 34').
11. Verfahren nach Anspruch 10, wobei die Verbindung der äußeren Folien (30) miteinander durch eine zweite Siegelnaht (31, 33) das Verbinden der äußeren Folien direkt miteinander umfasst, wobei eine aufblasbare Kammer (34) zwischen den äußeren Folien (30) definiert wird; oder wobei das Verbinden der äußeren Folien (30) miteinander durch eine zweite Siegelnaht (31', 33') das Siegeln der äußeren Folien (30) mit der genannten mindestens einen Außenkante (24a, 24b) des inneren Beutels (20) umfasst, wobei zwischen jeder der äußeren Folien (30) und der genannten mindestens einen Außenkante (24a, 24b) eine aufblasbare Kammer (34') definiert wird. 55
12. Verfahren laut einem der Ansprüche 10 bis 11, wobei zahlreiche innere Beutel (20) bereitgestellt werden, wobei die genannten zahlreichen inneren Beutel (20) entlang einer Zuführrichtung (D) in Reihe angeordnet werden, bevor das genannte Paar äußerer Folien (30) zugeführt wird.
13. Verfahren nach Anspruch 12, wobei die äußeren Folien (30) jeweils von einer entsprechenden Zuführrolle (2) entlang der Zuführrichtung (D) zugeführt werden, wobei der innere Beutel (20), der zuerst in Zuführrichtung (D) vorbeigeführt wird, zwischen den äußeren Folien (30) angeordnet ist, wobei vorzugsweise die jeweils äußere Folie (30) mittels entsprechender Ablenkrollen (4), die an beiden Seiten des inneren Beutels (20) angebracht sind, an einer entsprechenden Seitenwand (24) des inneren Beutels (20) zur Haftung gebracht wird, und wobei anschließend die äußeren Folien (30) entlang der Umfangslänge der entsprechenden Seitenwand (24) durch ein Paar Siegelrahmen (5) thermisch gesiegelt werden, die jeweils eine untere Siegelplatte (5a), eine obere Siegelplatte (5b) und ein Paar seitliche Siegelplatten (5c und 5d) umfassen, die die untere und die obere Siegelplatte (5a und 5b) miteinander verbinden.
14. Verfahren nach Anspruch 12 oder 13, wobei die genannte Vielzahl von inneren Beuteln (20) an den Außenkanten (24a, 24b) miteinander verbunden sind.



15. Verfahren nach einem der Ansprüche 12 oder 13 oder 14, wobei das Verbinden der äußeren Folien miteinander durch eine zweite Siegelnaht (31, 33; 31', 33') das Verbinden der äußeren Folien (30) durch eine schwächende Linie (L) umfasst.
16. Ein Satz Beutel (10; 10'), wobei es sich bei jedem Beutel (10; 10') um einen Beutel (10; 10') nach Anspruch 1 bis 11 handelt, wobei die äußeren Folien (30) der genannten Beutel (10; 10') miteinander durch entsprechende schwächende Linien (L) verbunden sind.

## Revendications

1. Pochette (10 ; 10') comprenant :

- une pochette intérieure (20) comprenant une surface inférieure (22) et des parois latérales opposées (24) s'étendant vers le haut à partir de la surface inférieure (22), lesdites parois latérales opposées (24) étant associées les unes aux autres le long d'au moins un bord périphérique (24a, 24b, 24c) de celles-ci, délimitant ainsi une zone de remplissage de produit (A) ;

**caractérisée en ce que** la pochette comprend une paire de films extérieurs (30) recouvrant chacun l'une respective desdites parois latérales opposées (24) de la pochette intérieure (10), lesdits films extérieurs (30) étant associés les uns aux autres par un premier joint d'étanchéité (21, 23) sur ledit au moins un bord périphérique de la pochette intérieure (20) ;

**et en ce que** les films extérieurs (30) sont en outre associés les uns aux autres par un deuxième joint d'étanchéité (31, 33 ; 31', 33') espacé du premier joint d'étanchéité (21, 23) par rapport à la zone de remplissage de produit (A), délimitant ainsi au moins une chambre gonflable (34, 34') entre ledit premier joint d'étanchéité (21, 23) et ledit deuxième joint d'étanchéité (31, 33 ; 31', 33'), ladite chambre étant remplie de gaz inerte.

2. Pochette (10 ; 10') selon la revendication 1, dans laquelle, au niveau dudit deuxième joint d'étanchéité (31, 33), les films extérieurs (30) sont directement associés les uns aux autres, une chambre gonflable (34) étant définie entre les films extérieurs (30) ; ou dans laquelle, au niveau du deuxième joint d'étanchéité (31', 33'), les films extérieurs (30) sont scellés au niveau dudit au moins un bord périphérique (24a, 24b) de la pochette intérieure (20), une chambre gonflable (34') étant définie entre chaque film extérieur (30) et ledit au moins un bord périphérique (24a, 24b).

3. Pochette (10 ; 10') selon la revendication 1 ou 2, dans laquelle les parois latérales opposées (24) sont associées les unes aux autres par des bords périphériques superposés sélectionnés (24a, 24b, 24c) de celles-ci, et dans laquelle les parois latérales opposées (24) de la pochette intérieure (20) sont thermo-scellées le long de deux bords périphériques (24a, 24b) longitudinaux opposés et le long d'un bord périphérique transversal supérieur (24c).

4. Pochette (10 ; 10') selon la revendication 1 ou 2, dans laquelle les films extérieurs (30) sont associés les uns aux autres par des premiers joint d'étanchéités (21, 23) prévus sur un bord périphérique longitudinal (24a, 24b) respectif de la pochette intérieure (20).

5. Pochette (10 ; 10') selon l'une quelconque des revendications 1 à 4, dans laquelle chacun desdits films extérieurs (30) est scellé autour d'un périmètre d'une paroi latérale respective (24) de la pochette intérieure (20).

6. Pochette (10; 10') selon l'une quelconque des revendications précédentes, dans laquelle ledit gaz inerte remplissant ladite au moins une chambre gonflable (34 ; 34) est du nitrogène.

7. Pochette (10; 10') selon l'une quelconque des revendications précédentes, dans laquelle la pochette intérieure (20) ou les films extérieurs (30) ou les deux sont constitués d'une matière plastique souple ; et dans laquelle la pochette intérieure (20) ou les films extérieurs (30) ou les deux sont constitués d'un matériau avec des propriétés de barrière aux gaz.

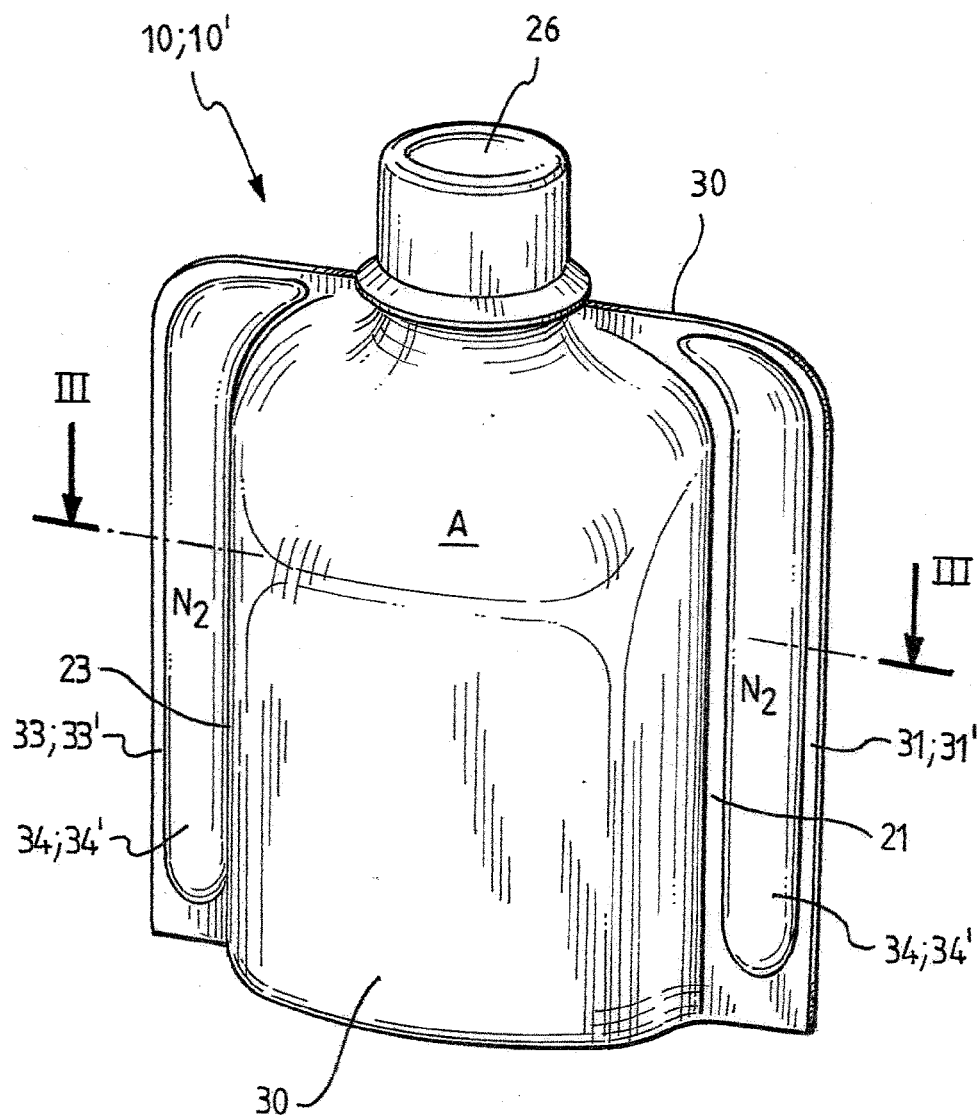
8. Pochette (10 ; 10') selon la revendication 7, dans laquelle le matériau avec des propriétés de barrière à l'oxygène est un stratifié comprenant une ou plusieurs couches de résine à effet de barrière aux gaz, comprenant facultativement une ou plusieurs couches de matière non-plastique.

9. Pochette (10; 10') selon l'une quelconque des revendications précédentes, dans laquelle au moins un film extérieur (30) présente une surface imprimée.

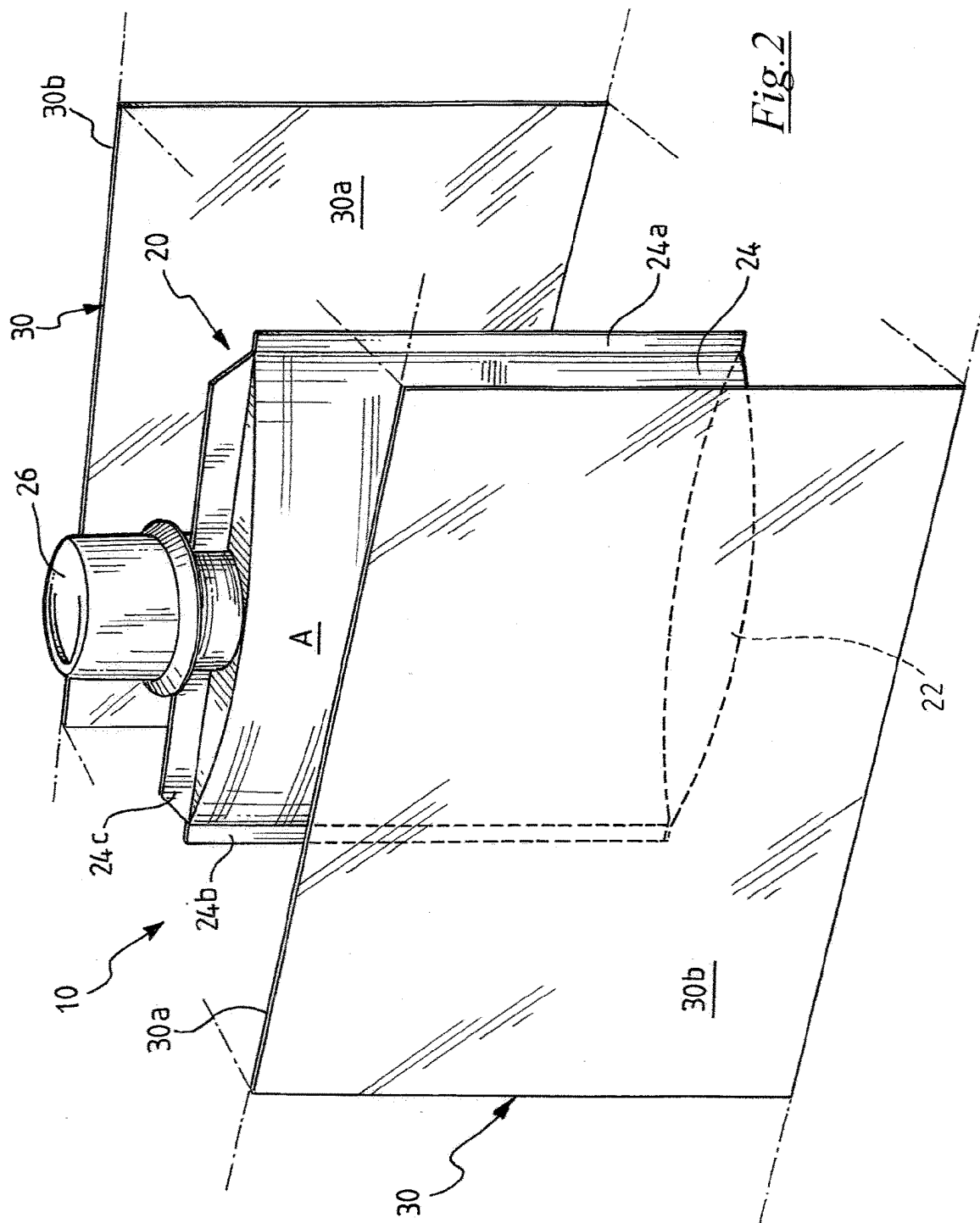
10. Procédé pour la fabrication d'une pochette (10 ; 10') selon l'une quelconque des revendications précédentes, comprenant :

- la mise à disposition d'une pochette intérieure (20), comprenant une surface inférieure (22) et des parois latérales opposées (24) s'étendant vers le haut à partir de la surface inférieure (22), les parois latérales opposées (24) étant associées les unes aux autres le long d'au moins un bord périphérique (24a, 24b, 24c) de celles-ci,

- délimitant ainsi une zone de remplissage de produit (A) ;
- l'alimentation d'une paire de films extérieurs (30), chacun desdits films extérieurs (30) recouvrant une paroi latérale respective (24) de la pochette intérieure (20) ;
  - l'association des films extérieurs (30) les uns aux autres par un premier joint d'étanchéité (21, 23) au niveau dudit au moins un bord périphérique (24a, 24b) de la pochette intérieure (20) ;
  - l'association des films extérieurs (30) les uns aux autres par un deuxième joint d'étanchéité (31, 33 ; 31', 33') espacé dudit premier joint d'étanchéité (21, 23) par rapport à la zone de remplissage de produit (A), délimitant ainsi au moins une chambre gonflable (34 ; 34') entre ledit premier joint d'étanchéité (21, 23) et ledit deuxième joint d'étanchéité (31, 33 ; 31', 33') ;
  - le gonflage de l'au moins une chambre gonflable (34 ; 34') avec un gaz inerte ; et
  - le scellage de ladite au moins une chambre gonflable (34 ; 34').
- 11.** Procédé selon la revendication 10, dans lequel l'association des films extérieurs (30) les uns aux autres par un deuxième joint d'étanchéité (31, 33) comprend l'association directe des films extérieurs les uns aux autres, une chambre gonflable (34) étant définie entre les films extérieurs (30) ; ou dans lequel l'association des films extérieurs (30) les uns aux autres par un deuxième joint d'étanchéité (31', 33') comprend le scellage des films extérieurs (30) sur ledit au moins un bord périphérique (24a, 24b) de la pochette intérieure (20), une chambre gonflable (34') étant définie entre chaque film extérieur (30) et ledit au moins un bord périphérique (24a, 24b).
- 12.** Procédé selon l'une quelconque des revendications 10 à 11, dans lequel il est prévu une pluralité de pochettes intérieures (20), ladite pluralité de pochettes intérieures (20) étant alignée le long d'une direction d'alimentation (D) avant l'alimentation de ladite paire de films extérieurs (30).
- 13.** Procédé selon la revendication 12, dans lequel les films extérieurs (30) sont alimentés chacun par un cylindre d'alimentation (2) respectif le long de la direction d'alimentation (D), où la pochette intérieure (20) venant en premier le long de la direction d'alimentation (D) est agencée entre les films extérieurs (30), dans lequel chaque film extérieur (30) est de préférence conçu pour adhérer à une paroi latérale respective (24) de la pochette intérieure (20) au moyen d'un cylindre de déviation respectif (4) prévu de chaque côté des pochettes intérieures (20), et dans lequel, par conséquent, les films extérieurs (30) sont thermo-scellés le long du périmètre de la paroi latérale respective (24) par une paire de cadres
- d'étanchéité (5) comprenant chacun une plaque d'étanchéité inférieure (5a), une plaque d'étanchéité supérieure (5b) et une paire de plaques d'étanchéité latérales (5c et 5d) reliant les plaques d'étanchéité inférieure et supérieure (5a et 5b).
- 14.** Procédé selon la revendication 12 ou 13, dans lequel ladite pluralité de pochettes intérieures (20) sont reliées les unes aux autres au niveau des bords périphériques (24a, 24b).
- 15.** Procédé selon l'une quelconque des revendications 12 ou 13 ou 14, dans lequel l'association des films extérieurs les uns aux autres par un deuxième joint d'étanchéité (31, 33 ; 31', 33') comprend l'association des films extérieurs (30) par une ligne d'affaiblissement (L).
- 16.** Ensemble de pochettes (10 ; 10'), dans lequel chaque pochette (10 ; 10') est une pochette (10 ; 10') selon l'une quelconque des revendications 1 à 11, dans lequel les films extérieurs (30) desdites pochettes (10 ; 10') sont associés les uns aux autres par des lignes d'affaiblissement respectives (L).



*Fig. 1*



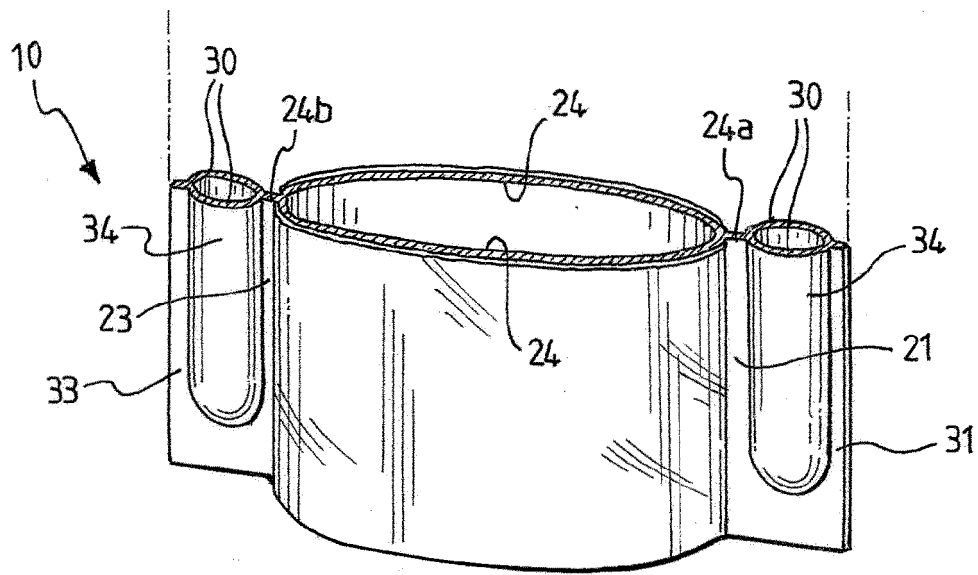


Fig. 3

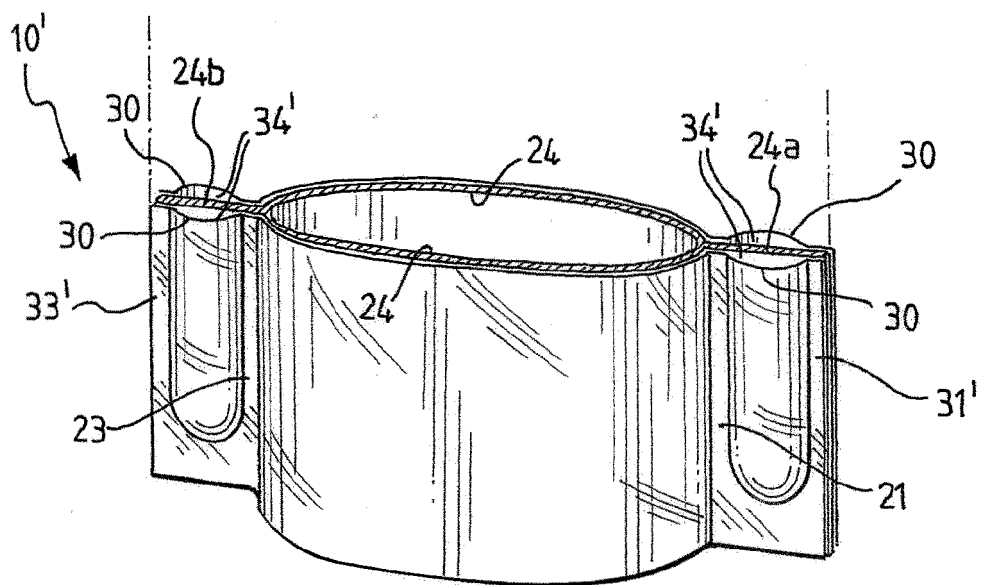


Fig. 4

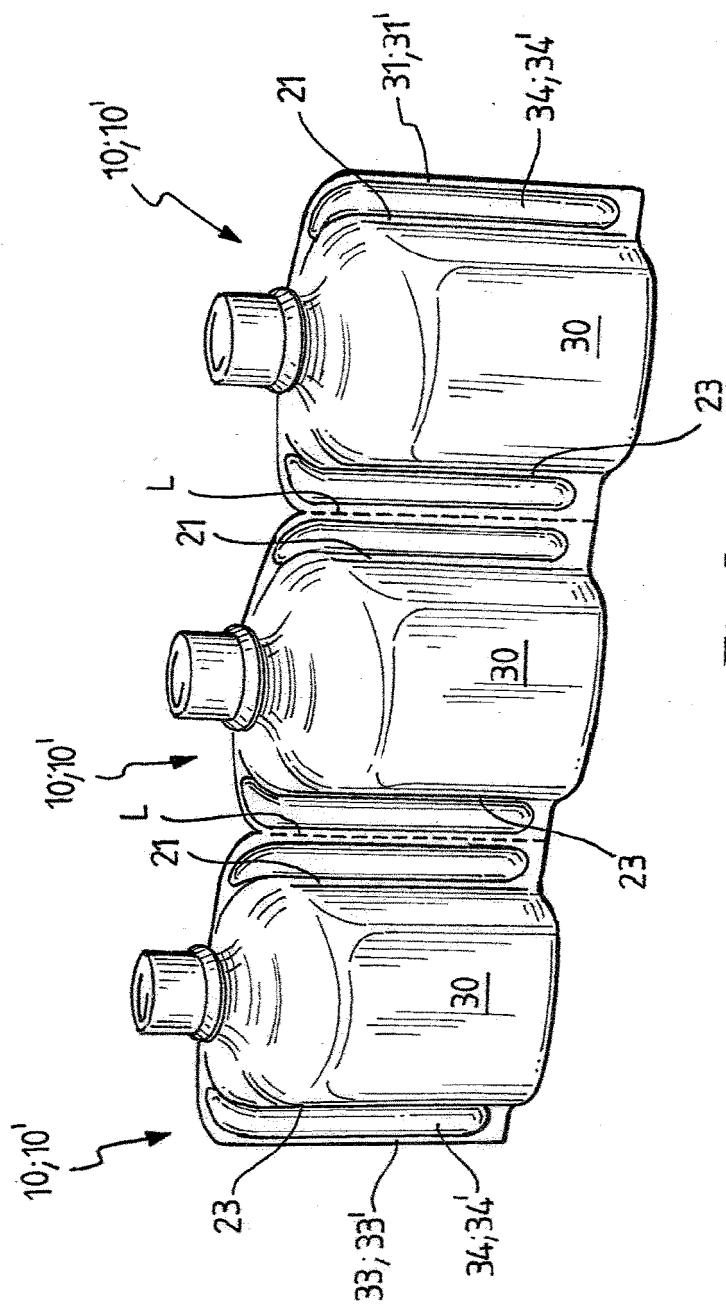
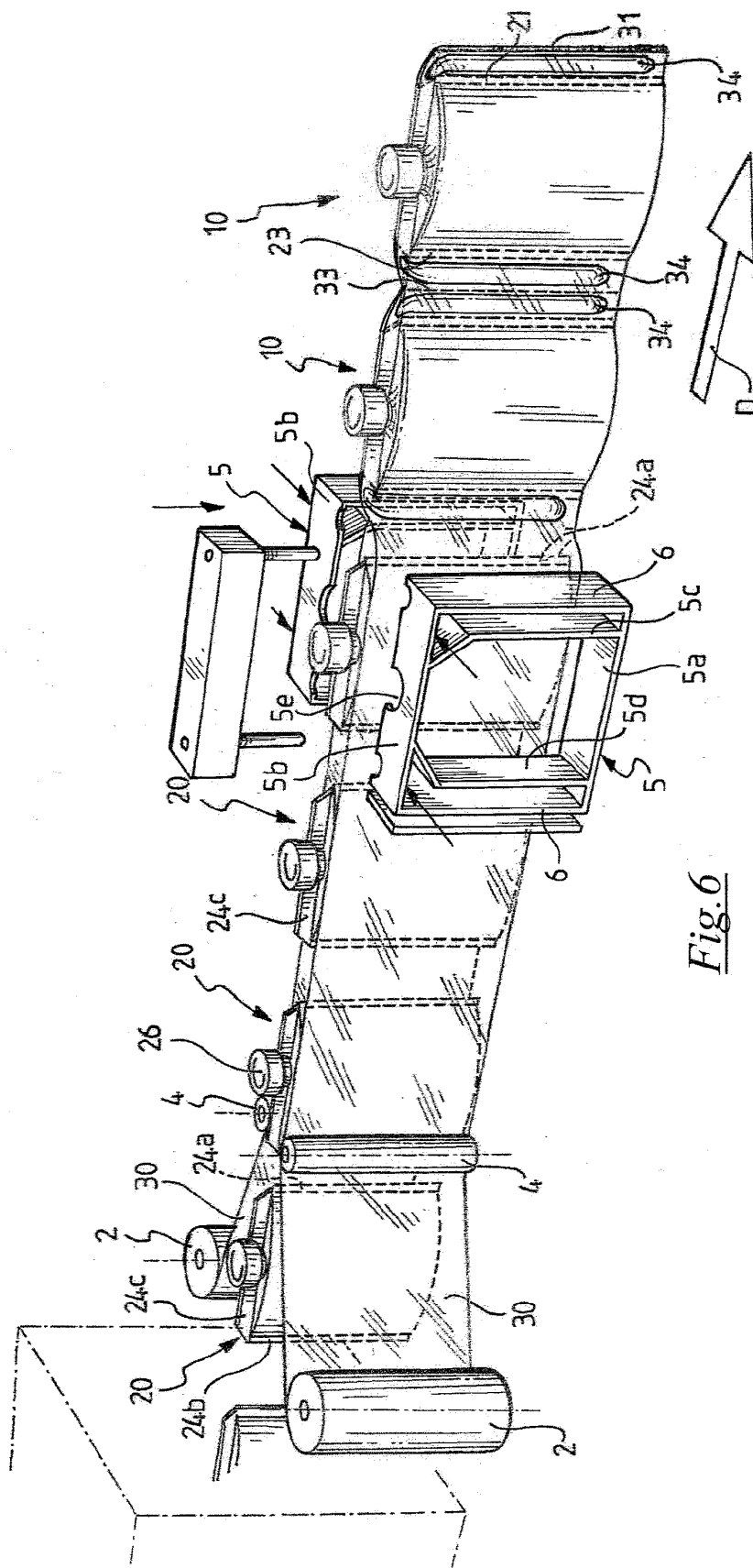


Fig. 5



*Fig. 6*

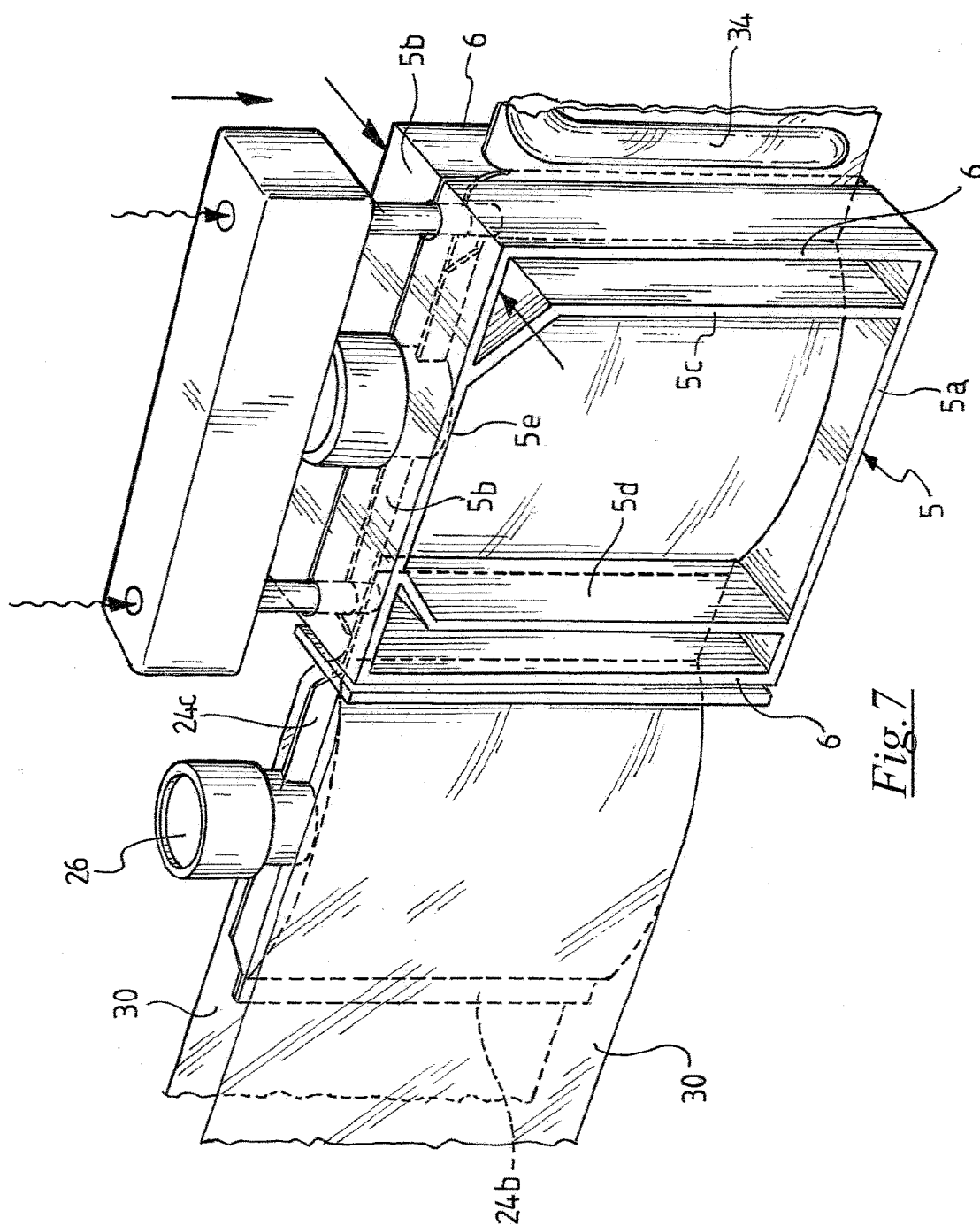
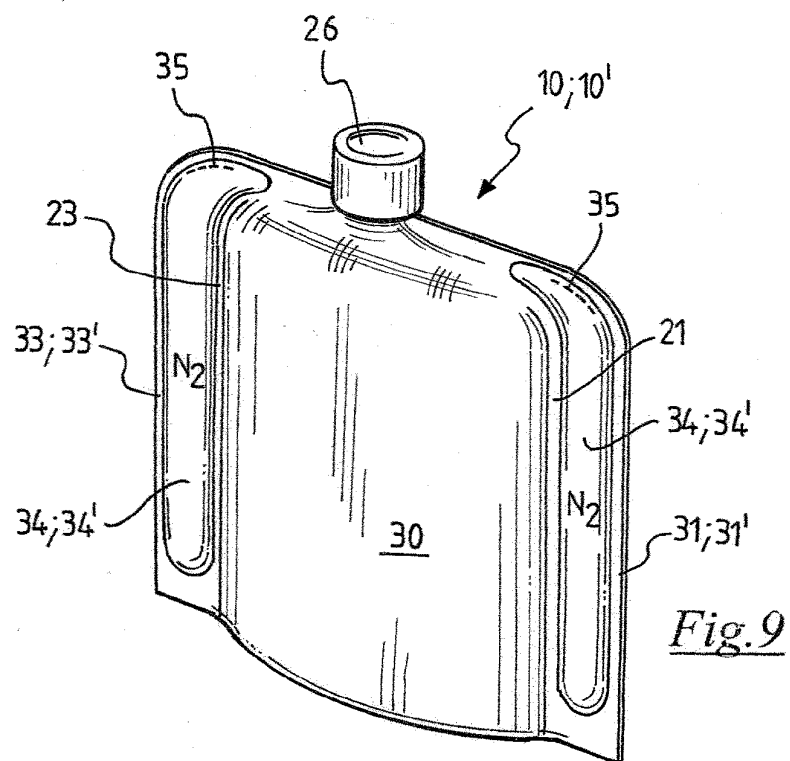
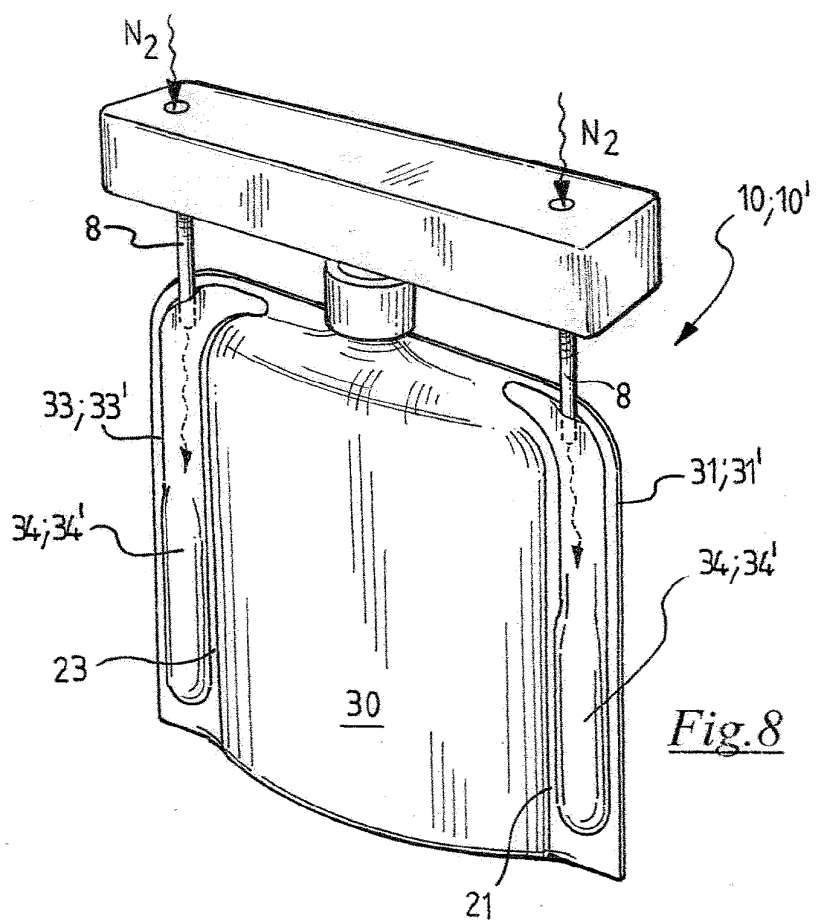


Fig. 7





**REFERENCES CITED IN THE DESCRIPTION**

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