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(54) Reclosable packaging bag and production method thereof

(57) The present invention relates to a reclosable packaging bag (1) comprising, inside its cross and/or longitudinally sealed ends and/or inside the bag an extensible strip (4) of high plasticity appearing only after the opening of said bag, said strip having a substantially irreversible extensibility to a multiple of his original length, sufficient to enable said strip to reclose said packaging by turning it at least once around said bag.

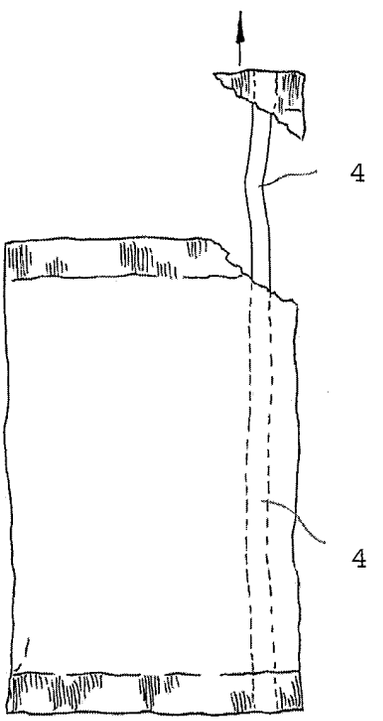


Fig. 7

EP 1 500 601 A1

Description

Field of the invention

[0001] The present invention is related to a reclosable packaging bag, usually but not exclusively, produced in a vertical and/or horizontal form, fill and seal process (VFFS/HFFS) and to a method for its production.

Background of the invention and state of the art

[0002] Sealed plastic and coated paper bags are widely used in various application fields. In general, only part of their contents are used immediately upon the initial opening. Therefore a strong request for reclosable packaging bags, in particular for frozen goods, exists.

[0003] A lot of ideas to reclose a bag have been disclosed in the literature. Well known examples by those skilled in the art are plastic zipper or pressure sensitive tape at the top open neck of a bag. Most of these known solutions suffer from cost point of vue, in particular for cheap one-way food packaging such as those produced in high capacity vertical or horizontal form, fill and seal packaging machines (VFFS/HFFS).

[0004] Herrington in US patent 4,913,560 discloses an adhesive coated plastic tape welded on the outside of a plastic bag and protected by a brittle coating material. In use, the tape is manually stretched causing the brittle coating to crack and separate, exposing the adhesive. The tape is then wrapped around the neck of the bag to close it.

[0005] Burke in the document WO 00/73162 A1 discloses a reclosable bag comprising towards its closed ends a fixed elastic strip with an extensibility sufficient to enable it to be stretched and to make a turn around the longest dimension of the bag when filled. The elastic strip is a rubber material with reversible elastomeric behaviour and low plasticity fixed outside the bag. The elastic strip can only be turned once around the reclosable bag.

Description of the figures

[0006] For the purpose of facilitating and understanding of the present invention, there is illustrated in the accompanying figures 1 to 10 and 12,13 several views of bags or parts thereof, from an inspection of which, when considered in connection with the following description, the invention and many of its advantages should be readily understood and appreciated.

[0007] Fig.1 and Fig.2 show respectively the front side and the backside of a VFFS bag with an extensible strip fixed at his ends at the inside of the bag in the cross seal area.

[0008] Fig.3 shows four-side seal VFFS bag with an extensible strip sealed at his ends at the inside of the bag in the cross seal area.

[0009] Fig.4 shows the front side of a bag with an extensible strip sealed at his ends at the inside of the bag in the cross seal area, said strip being longer than the cut-off of the bag.

[0010] Fig.5 shows same as Fig.1 with a laser perforation as opening initiation and/or as tear guide.

[0011] Fig.6 shows the opened bag with torn off piece of the bag with attached strip.

[0012] Fig.7 shows the stretching (elongation) of the extensible strip needing therefore good elongation and plasticity caracteristics.

[0013] Fig.8 shows the stretched strip rolled around the opened bag.

[0014] Fig.9 shows the elongated strip rolled around the opened bag and torn off piece of the bag under the strings of the rolled around strip.

[0015] Fig.10 shows the elongated strip rolled around "the neck" of opened bag and torn off piece of the bag under the strings of the rolled strip.

[0016] Fig.11 is a schematic representation of a VFFS packaging machine with the extensible strip fed between form shoulder/filling pipe and bag packaging material.

[0017] Fig.12 shows a particular embodiment of the present invention wherein the opening initiation, including the extensible strip in the upper cross seal of the bag, is not identical with the opening initiation of the bag destined to remove the content of the bag.

[0018] Fig.13 shows where the opening initiation, including the extensible strip in the upper cross seal of the bag, is removed with the whole upper part of the bag while said strip and upper part remains connected to the original bag.

Aims of the invention

[0019] The aim of the present invention is to disclose a reclosable pack obtainable for example by a vertical and/or horizontal form, fill and seal process without major accommodations of the pack machinery and without a major cost increase of the final pack.

[0020] Another aim of the present invention is to disclose a packaging wherein the tearable part of the bag remains connected to the original bag after opening it to avoid waste management problems.

Summary of the invention

[0021] The present invention discloses a reclosable packaging bag comprising inside its cross and/or longitudinal sealed ends and/or inside the bag an extensible strip of high plasticity appearing only after the opening of said bag, said strip having a substantially irreversible extensibility to a multiple of its original length, sufficient to enable said strip to reclose said packaging by turning it at least once around said bag.

[0022] According to a first aspect of the present invention the strip is heat sealed and/or glued in the cross seals and/or in the longitudinal seals.

[0023] According to a second aspect of the present invention the extensible strip is heat sealed and/or glued in the cross seals at both ends of said strip.

[0024] A key advantage of the present invention is that the packaging comprises an opening initiation allowing to tear a part of the packaging and that said torn off part of said packaging is still attached to said extensible strip after opening said bag.

[0025] Another key aspect of the present invention is that the packaging comprises an opening initiation to tear a part of the packaging and that said torn off part of said packaging is a part of said extensible strip.

[0026] A particular embodiment of this invention is that the packaging comprises an opening initiation to tear out the extensible strip in the upper cross seal of the bag which is not identical with the opening initiation of the bag destined to open the bag in order to remove the content of the bag.

[0027] According to the present invention, the packaging is a plastic and/or paper bag or a combination of it.

[0028] Finally the present invention discloses a method for the production of a reclosable packaging bag characterised in that an extensible strip of high plasticity is heat sealed inside or in the seams of said bag during a vertical and/or horizontal form, fill and seal process.

Detailed description of the invention

[0029] The reclosable packaging of the present invention can be produced on common horizontal and/or vertical form, fill and seal processing machines by adding to the normal packaging material an extensible strip 4 of high plasticity running at the inside of the packaging material 1. The principle of such machinery is shown in Fig.11. Non limitative examples of packaging materials are films of polyolefins, polyesters, polyamides, PVC, polystyrene, their copolymers and blendings in mono or multilayer combinations with paper, metallized coatings, etc.

[0030] The extensible strip 4 of high plasticity is proceeded in polymers well known by those skilled in the art and related to the properties of high elongation at break values and high plasticity. The elongation percentage must be as high as possible and at least higher than 200%, and preferably higher than 400% and most preferably up to 1000%. Non limitative examples of such polymers are polyolefins and in particular homogeneously branched polyolefins obtained by metallocene catalysis exhibiting very good elongation at break values (LDPE, LLDPE, VLDPE), polyethylene and/or polypropylene copolymers and their modified versions, in particular EVA, EMA and EBA, polyurethanes, polyethers, modified polystyrene, PVC and his copolymers, etc. Depending on the size of the bag and the type of the content, an adequate choice balancing good irreversible elongation properties, thickness, eventually food related constraints, and price, must be targeted.

[0031] The extensible strip 4, is generally sealed or glued together at his both ends with the rest of the packaging material in the cross directional seal area 5 of the VFFS/HFFS bag. The possible seals for this kind of packaging are well known by those skilled in the art. Non limitative examples are cold and heat seal coatings such as hot melts, PVDC coatings, acrylic coatings (MB666 of Mobil Plastics), latex-based cold sealing coatings, etc.

[0032] Additionally, an opening initiation (3,9) such as for example a pre-cut or a laser perforation for tear guidance is made in the top of the packaging next to the position of the extensible strip 4. In that way, by opening (tearing) the package, the torn off piece 11 of this pack remains connected to the extensible strip 4 while the other end of said strip 4 is fixed on the bottom inside the pack (bottom seal) in the cross seal area 5

[0033] This is an additional advantage of the present invention, namely the tearable piece 11, usually directly thrown away by the user, is not irreversibly separated from the original bag 1 which makes the general waste problems more manageable.

[0034] After removing a part of the content of the bag of the present invention, the extensible strip 4 is pulled out of the pack by means of holding and pulling of the torn off piece of the pack and elongated by at least a factor 2, preferably 4 and most preferably 10. The target of this operation is to achieve an elongated strip 4, which is long enough to roll it over the opened packaging bag 1. Finally the over-rolled strip 4 can be fixed by putting the torn off piece of the bag 11 attached to said strip 4 under the strings created by rolling the strip over the packaging bag 1. In this way, the pack can be closed as described above and re-opened by untying the string.

Legend

[0035]

1. Bag
2. Cross-seal
3. Opening initiation by pre-cut
4. Extensible strip
5. Cross seal area comprising the extensible strip
6. Longitudinal seal
7. Four-side seal bag with extensible strip at the inside
8. Four-side seal area's
9. Laser perforation as opening initiation
10. Tear from opening initiation until side of bag
11. Torn off piece of the bag comprising one end of the strip
12. Filling pipe
13. Packaging material bag
14. Form shoulder
15. Longitudinal seal jaws
16. Cross seal jaws + cutting knife
17. Finished VFFS bag
18. Roll of extensible strip

19. Pre-perforation for top opening

Claims

1. Reclosable packaging bag (1) comprising inside its cross and/or longitudinal sealed ends and/or inside the bag an extensible strip (4) of high plasticity appearing only after the opening of said bag, said strip (4) having a substantially irreversible extensibility to a multiple of his original length, sufficient to enable said strip (4) to reclose said packaging by turning it at least once around said bag (1).

2. Reclosable packaging bag (1) as in claim 1 **characterised in that** said extensible strip (4) is heat sealed and/or glued in the cross seals and/or in the longitudinal seals.

3. Reclosable packaging bag (1) as in claim 1 **characterised in that** said extensible strip (4) is heat sealed and/or glued in the cross seals at both ends of said strip (4)

4. Reclosable packaging as in claim 1 **characterised in that** said packaging comprises an opening initiation (3,9) allowing to tear a part of the packaging and **in that** said torn off part (11) of said packaging is still attached to said extensible strip (4) after opening said bag (1).

5. Reclosable packaging as in claim 1 **characterised in that** said packaging comprises an opening initiation (3,9) allowing to tear a part of the packaging and **in that** said torn off part (11) of said packaging is a part of said extensible strip (4).

6. Reclosable packaging as in claim 1 **characterised in that** said packaging comprises an opening initiation (3,9) including the extensible strip (4) in the upper cross seal of the bag (1) which is not identical with the opening initiation of the bag destined to open the bag in order to remove the content of the bag.

7. Reclosable packaging as in claim 1 **characterised in that** said packaging is a plastic and/or paper bag or a combination of it.

8. Method for the production of a reclosable packaging bag (1) **characterised in that** an extensible strip (4) of high plasticity is heat sealed inside or in the seams of said bag during a vertical and/or horizontal form, fill and seal process.

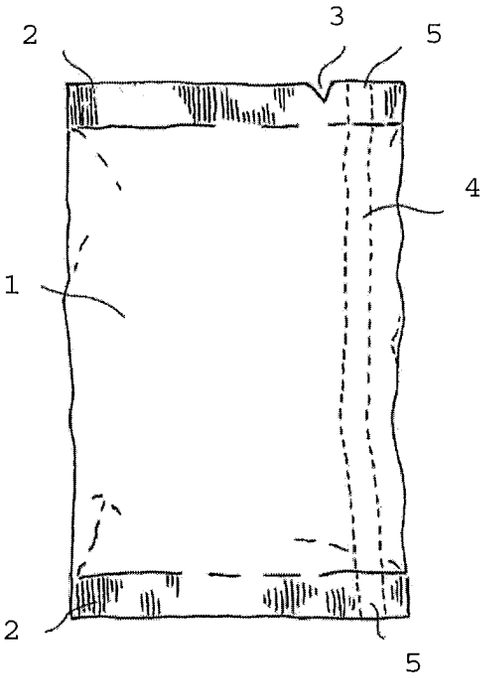


Fig. 1

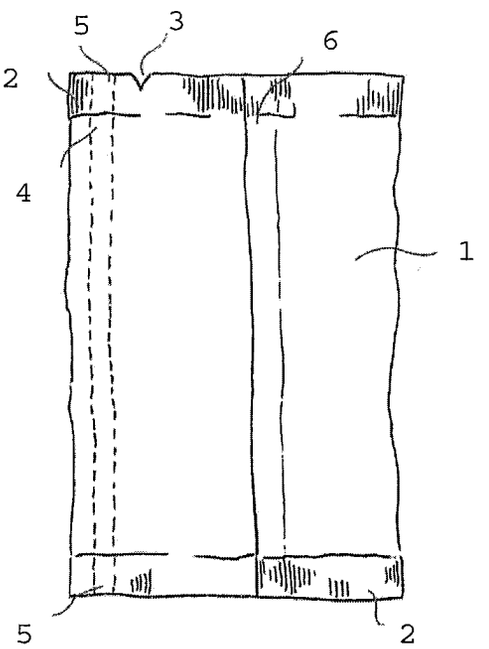


Fig. 2

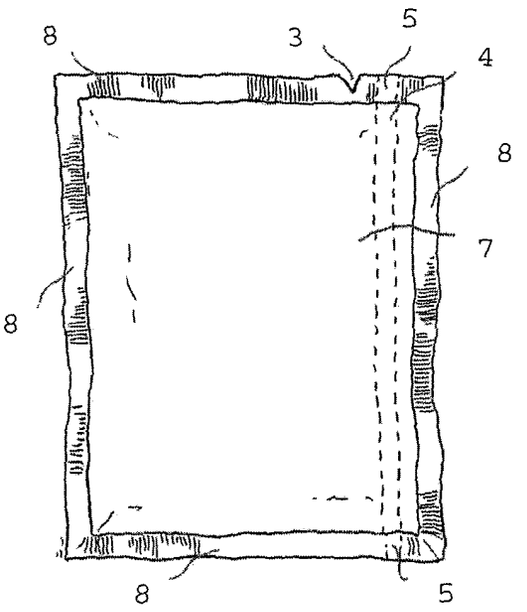


Fig. 3

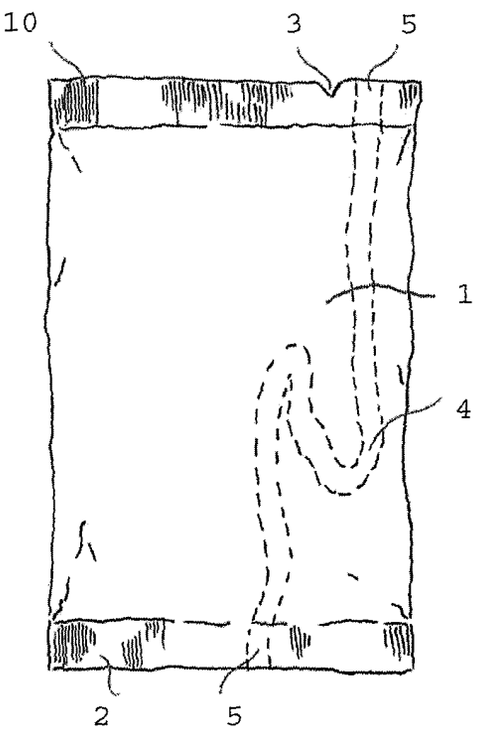


Fig. 4

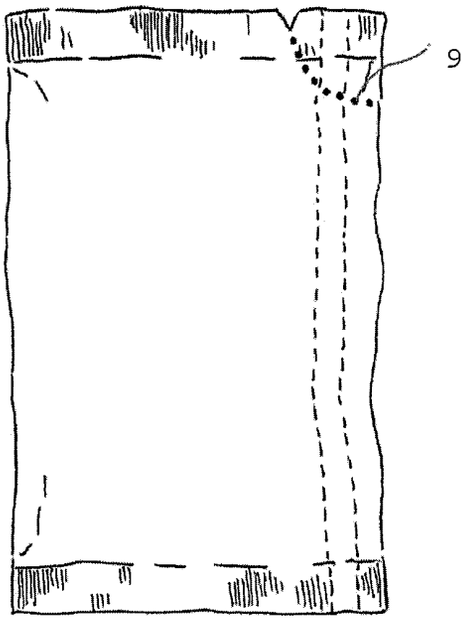


Fig. 5

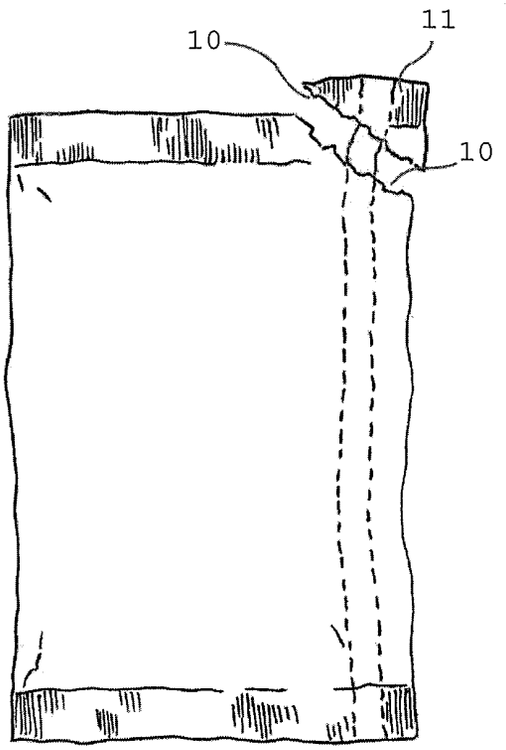


Fig. 6

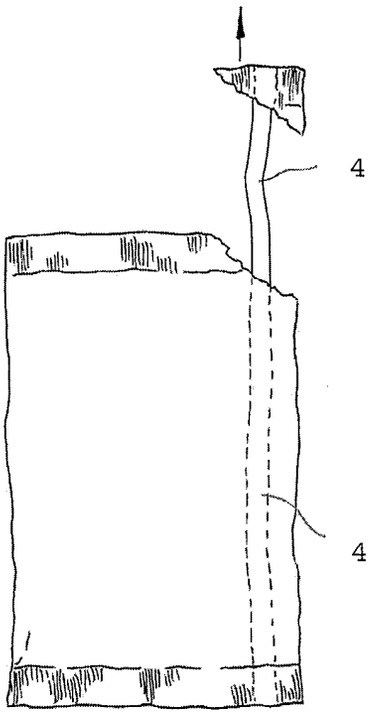


Fig. 7

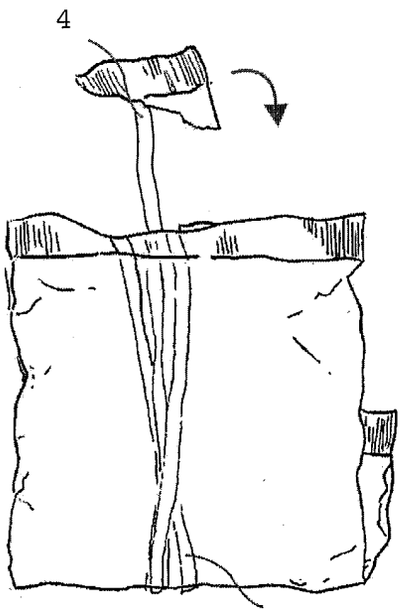


Fig. 8

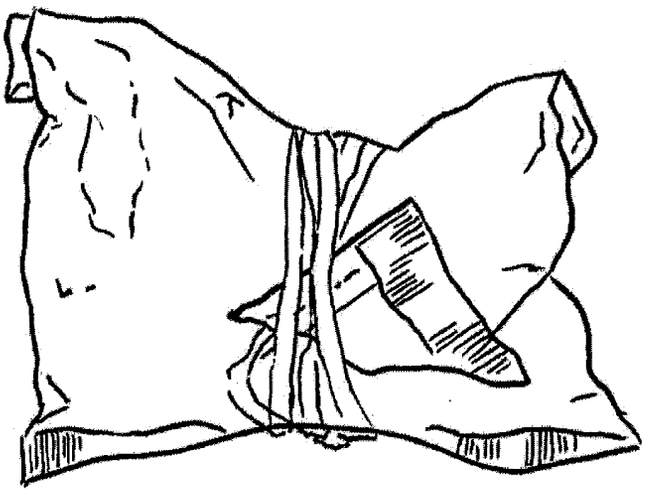


Fig. 9

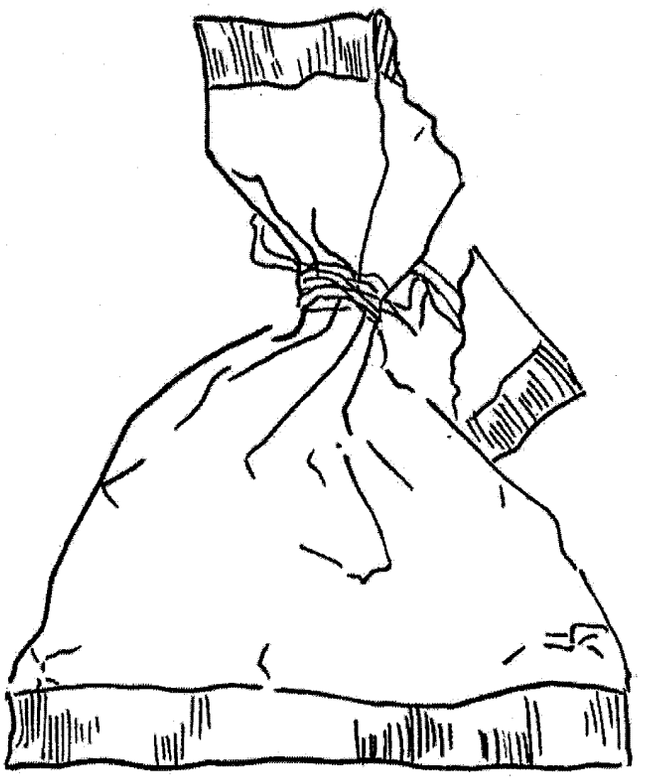


Fig. 10

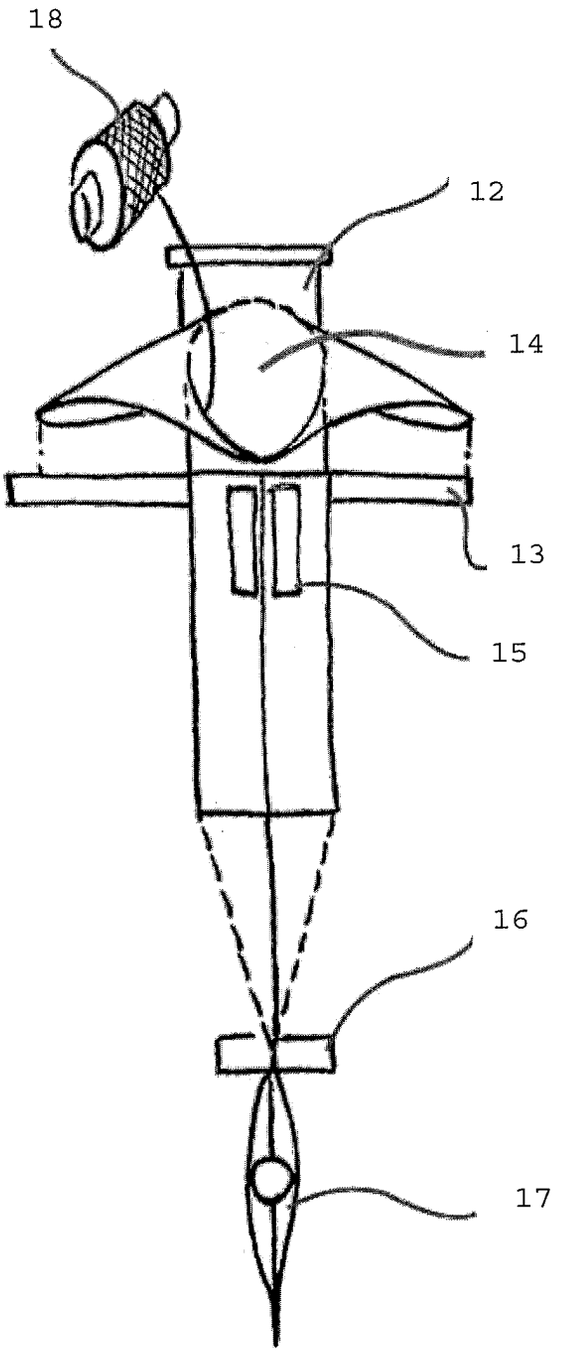


Fig. 11

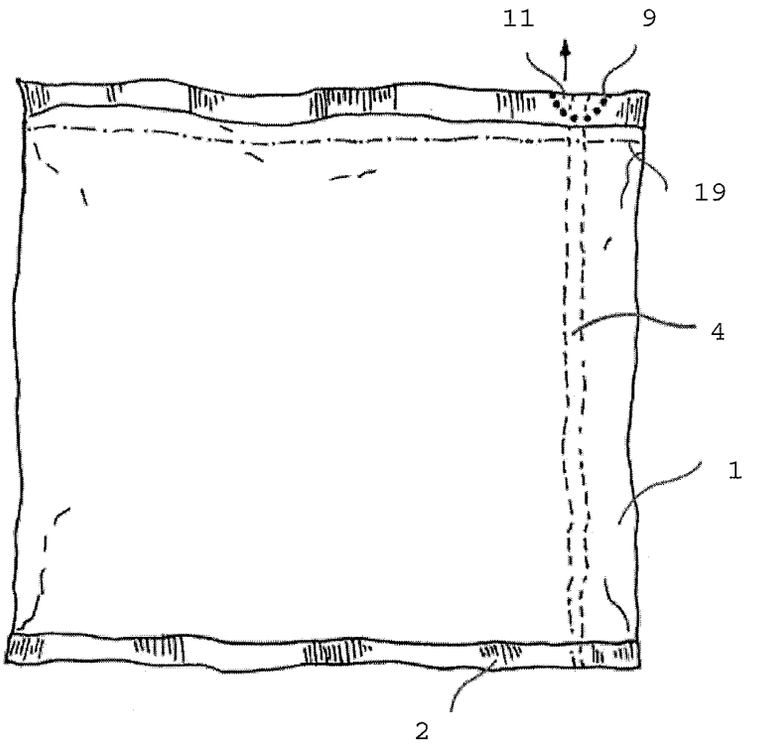


Fig. 12

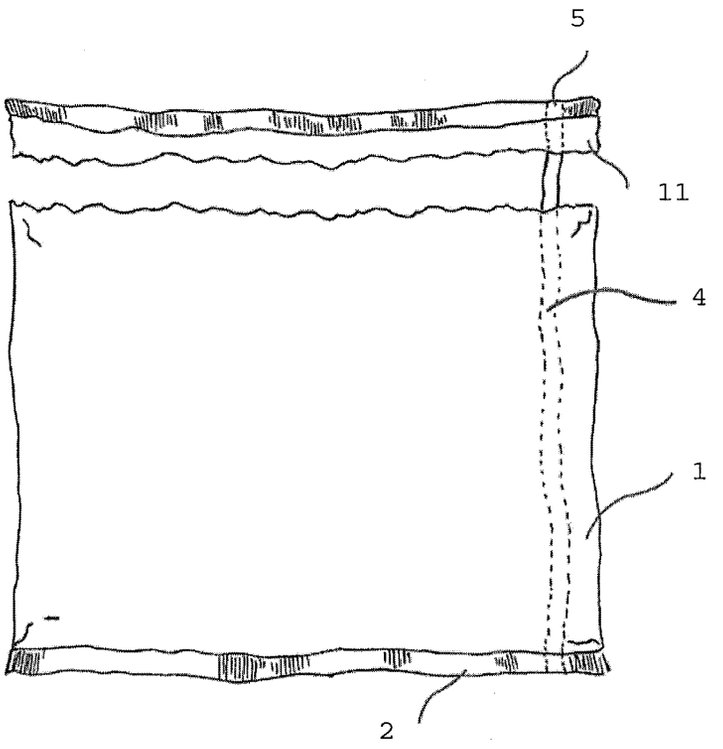


Fig. 13

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 44 7198

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	GB 2 347 137 A (WORELL) 30 August 2000 (2000-08-30)	1-3,7,8	B65D33/16
A	* page 3, line 7 - page 7, line 1; figures * ---	4-6	
D,A	US 4 913 560 A (HERRINGTO) 3 April 1990 (1990-04-03) * the whole document * ---	1	
A	WO 00 73162 A (INNOVATIVE EVASTICS) 7 December 2000 (2000-12-07) * claim 1; figures 1,2 * ---	1	
A	FR 2 403 946 A (MELITTA-WERKE) 20 April 1979 (1979-04-20) * claim 1; figures * -----	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	11 December 2003	Newell, P

CATEGORY OF CITED DOCUMENTS

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