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(54) Bag

(57) A bag (1) for use at least one wicket pin of an automatic bag filling equipment. The bag has a first side wall (2) of a film material with a wicket mounting part (4). The wicket mounting part (4) has at least one hole (5) for mounting the bag on at least one of the at least one wicket pins of the bag filling equipment. The bag (1) has a second side wall (3) with an open part (6) of an open material. The second side wall (3) is joined to the first side wall (2) such that the bag (1) has an inside and an opening (9). The second side wall (3) has a film part (7) of a film material for facilitating the automatic opening of the bag (1).

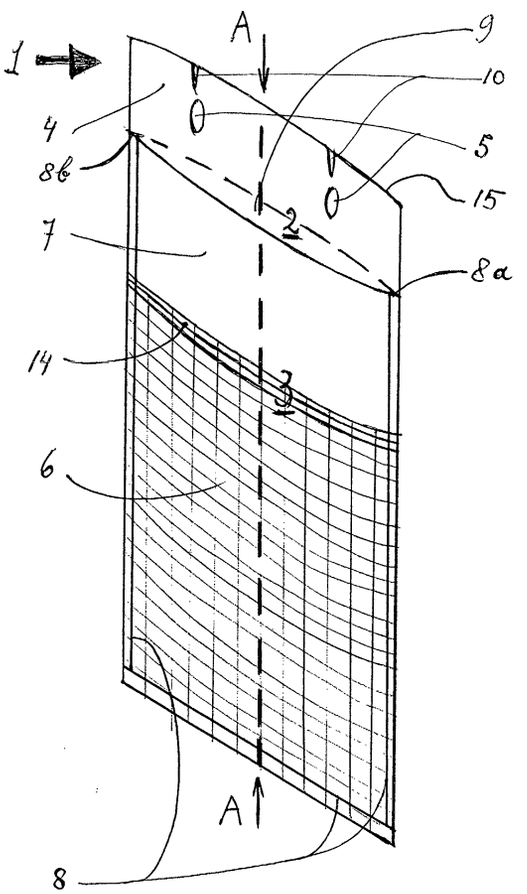

Fig. 1

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Description

[0001] The invention relates to a bag for use with at least one wicket pin of an automatic bag filling equipment, said bag at least comprising: a first side wall of a synthetic film material having a wicket mounting part with at least one hole for mounting the bag on at least one of the at least one wicket pins of the bag filling equipment; a second side wall having an open part of an open material, which second side wall is joined to said first side wall such that the bag has an inside and an opening.

[0002] From the international patent publication WO 00/23338 a rectangular bag is known having a mesh side wall formed from a synthetic resin fiber mesh and a film side wall formed from a synthetic resin film. The side walls are joined together along their vertical extent to form side edges of the bag. A bottom of the bag is formed by an extension of the film side wall, which is folded over and secured to the mesh side wall along a fold line perpendicular to the side edges. Hence, the bag is closed along all of its edges except for the edge opposite to the bottom, which edge defines the opening of the bag. The mesh side wall has an extension near the opening of the bag, which extension is a reinforcing strip of a synthetic resin film. The reinforcing strip has holes formed therein for mounting the bag on the wicket pins of the bag filling equipment.

[0003] A disadvantage of this known bag is that, when used in an automatic bag filling machine, the bag is difficult to open. The reason is that, for opening the bag, a vacuum cup of the automatic bag filling machine has to engage on side wall of the bag, while the other side wall is held in position by a stop device. However, the mesh side wall is unable to preserve suitable vacuum when seized by vacuum cups because of its breathing characteristics. Therefore, the vacuum cups can not engage satisfactorily on the mesh and hence the bag can not be opened reliably by the machine.

[0004] It is a goal of the present invention to provide a bag which, in use with an automatic bag filling machine can be opened in a reliable manner. More in general the invention aims at providing an improved bag suitable for use with an automatic bag filling machine which bag is reliable, sturdy and easy in use.

[0005] The invention seeks to achieve said goal by providing a bag as described above, which according to the invention is characterised in that said second side wall has a film part of a film material for facilitating the opening of the bag. The vacuum cups of the machine can act upon the film part of the second side wall and consequently the bag filling machine is able to open the bag reliably. The film material has at least a lesser breathing capacity than the open material and preferably no breathing capacity at all, the cups will therefore provide better suction on the second side wall when engaging on the film part. Furthermore, the use of the film in the second side wall reduces the manufacturing costs of the bag because the open material is relatively expensive and in a bag according to the invention less open material is used.

[0006] Specific embodiments of the invention are set forth in the dependent claims.

[0007] Except for the abovementioned known bag, there are other known bags which can be regarded as useful for understanding the invention and its relationship to the prior art. In this respect it should be noted that from the U.S. patent publications 3 257 915 and 3 123 279 a bag is known with a first side wall of thermoplastic film and a second side wall entirely of thermoplastic net. The bag does not have a wicket mounting part. From U.S. patent publication 4 207 983 a net bag is known having strips of film secured to opposite walls thereof at its mouth. Both side walls of the bag consist entirely of net. One strip constitutes a wicketing flap, the other strip enabling automatic opening of the bag. From U.S. patent publication 2 085 365 a bag is known whose front comprises a net and whose back is for example of card board. The bag has no wicket mounting part, but it does have a flap which, however, merely serves for sealing the opening of the bag. From U.S. patent publication 3 554 368 a bag is known whose front comprises an elastomeric thermoplastic netting member and whose backing member is rigid. Also this bag has no wicket mounting part, but it does have a flap which, however, is merely used for sealing the opening of the bag. From U.S. patent publication 4 403 637 a reinforced flexible container is known comprising a mesh bag having a band of flexible material around it. The band is provided with a carrying opening. From U.S. patent publication 4 988 213 an open-ended packing bag is known made from a film tube. The bag has at its opening a removable film tab which is provided with two wicket perforations. From U.S. patent publication 5 741 076 a produce bag is known whose bottom portion is made from a net material and whose top portion is made from a sheet material. The top of one side of the bag is provided with an extended portion containing a pair of spaced holes allowing the bag to be hung. From German utility model 297 20 932 a bag is known whose front comprises a net and whose back is made of closed plastic material. The front has a reinforcing strip near the opening of the bag. Both the back and the reinforcing strip of the front are provided with holes for picking up the bag.

[0008] Further details, aspects and embodiments of the present invention will now be described by way of example with reference to the figures in the accompanying drawing, in which:

Fig. 1 schematically shows a perspective view of an example of an embodiment of a bag according to the present invention;

Fig. 2 schematically shows a cross-sectional view of the example in Fig. 1 taken along the line A-A.

Fig. 3 schematically shows a cross-sectional view similar to the cross-sectional view of Fig. 2, of a part

of another example of a bag according to the present invention;

Fig. 4 schematically shows a cross-sectional view similar to the cross-sectional view of Fig. 2, of a part of a further example of a bag according to the present invention;

Fig. 5 schematically shows, in a step of a method according to the present invention, a cross-sectional view similar to the cross-sectional view of Fig. 2, of another part of another example of a bag according to the present invention; and

Fig. 6 schematically shows a perspective view of an example, different from the example of Fig. 1, of an embodiment of a bag according to the present invention.

Fig. 7 schematically shows a cross-sectional view similar to the cross-sectional view of Fig. 2, of a part of a further example of a bag according to the present invention;

[0009] Reference is first made to Fig. 1 which shows an example of a rectangular bag 1 according to the invention. The bag 1 comprises a first rectangular side wall 2 of a film material. The example bag 1 further comprises a second rectangular side wall 3 having not only an open part 6 of an open material but also a film part 7 of a film material. Various types of film material can be used in the first side wall 2 and in the second side wall 3, for a synthetic film material such as polypropylene or polyethylene, or a biological film material such as paper In the shown example three edges of the first side wall 2 are joined to three edges of the second side wall 3 by means of three straight seams 8. The joining of the side walls 2 and 3 at the seams 8 may be done by any suitable bonding or sealing technique, such as heat, glue, sealant, or the like. The three seams 8 are connected to each other to form a U shape. Thus an inside of the bag 1 is defined. Between a first end 8a and a second end 8b of the seams 8 the first side wall 2 and the second side wall 3 are not joined. Between these ends 8a and 8b an opening 9 of the bag 1 is thus defined.

[0010] In the shown example, the bag and its side walls are of rectangular shape and that there are three seams in a U shaped fashion. However, for a bag according to the invention many options are open with respect to these aspects, such as options comprising bags with curved edges instead of rectangular bags and with one or more curved seams instead of abovementioned three straight seams.

[0011] In the shown example, the film part 7 is a strip adjacent to the opening 9 of the bag 1. The first side wall 2 has a wicket mounting part 4 adjacent to the opening 9 of the bag 1. The part 4 is an extension of the first side wall 2 of the bag 1 and extends beyond the opening 9. The wicket mounting part 4 contains holes 5 for mounting the bag 1 on wicket pins of a bag filling equipment.

[0012] The open part 6 in the second side wall 3 of the bag 1 allows breathing of the bag 1 in order to preserve the shelf life of the produce or product with which the bag 1 can be filled. The film part 7 in the second side wall 3 of the bag 1 allows the engagement of vacuum cups of bag filling equipment for opening the bag 1. It is observed that the open part 6 and the film part 7 are joined to each other, for example with a seam 14 along a slight overlap of the edges of open part 6 and film part 7. This may be done in accordance with the bonding or sealing techniques previously described.

[0013] In this example, the wicket mounting part 4 of the first side wall 2 is locally weakened by means of slits 10 provided nearby the holes 5. In the shown example, the slits 10 extend from a free edge 15 of the wicket mounting part 4 towards the holes 5. The slits 10 facilitate the tearing of the bag 1 from the wicket pins of the bag filling machine once the bag 1 is filled. The slits may likewise extend from the holes 5 towards the edge, as is shown in fig. 6 with slits 10'.

[0014] Referring next to Fig. 2 it can be seen that, at the edge opposite to the opening 9 of the bag 1, the first side wall 2 exceeds the extent of the second side wall 3 by means of an extension 11. The extension 11 is folded back along a fold line 12 over a portion of the second side wall 3, which extension 11 is secured to the second side wall 3 with a seam 8 in accordance with the bonding or sealing techniques previously described. As is shown in Fig. 3 the enclosed portion of the second side wall 3 may extend to the fold line 12. The enclosed portion of the second side wall 3 may also extend to an edge 11a of said extension 11, as is shown in Fig. 4 and thus not reach the fold line 12.

[0015] A bag according to the invention can be used in a method according to the invention for filling bags by means of an automatic bag filling apparatus. In short such method is described as follows with reference to Fig. 5. A number of bags are hung with their wicket holes on wicket pins of an automatic bag filling machine. Hanging on the wicket pins, the respective bags are each consecutively opened by means of a vacuum cup 13 and a stop device 13a of the machine. Fig. 5 illustrates the way in which the vacuum cups 13 and the stop device 13a act upon the bag 1 of Fig. 1. In Fig. 5 a vacuum cup 13 engages on the film part 7 of the second side wall 3 of the bag 1 and the stop device 13a engages on the first side wall 2 of the bag 1. By moving the vacuum cup 13 and the stop device 13a in directions indicated by arrows B in Fig. 5 the fill opening 9 will be opened further. However, it is likewise possible to move only the vacuum cup 13 or to move only the stop device 13a. After opening, each bag 1 is kept in position by some suitable means, for instance by means of bag holder clamps. Through the opening 9 of the bag, the bag 1 is filled, for example with vegetables. The bag according to the invention may be mounted on the wicket, opened and filled while on the wicket and then removed from the wicket, for example by tearing the filled bag from the wicket pins.

[0016] After filling, the bag is transported to a bag

closing unit of the machine. For the closing unit some options are for example a tape sealer, plastic clip(s) or a metal closure.

[0017] In the closing unit, the first side wall 2 and the second side wall 3, near the opening 9, are being joined and secured to each other. Finally, after the filled and joined bag is torn of the wicket pins, parts of the side walls 2 and 3 beyond the joint may be cut off. This joining and cutting off is easier and more reliable in case the relevant parts of side wall 2 and side wall 3 are both of film material than in case the relevant part of side wall 2 is of film material while the corresponding part of side wall 3 is of an open material. Moreover, joining two film parts results in more strength and elasticity of the joint than joining a film part with an open part, especially when the film parts are of a synthetic film material. Therefore those embodiments of the invention, in which the film part 7 in the second side wall 3 is located near the opening 9 of the bag, have additional advantages related to ease and reliability of closing and cutting off the bag, as well as to strength and elasticity of the closure-joint of the bag. Another additional advantage of said embodiments is that, since the film has less thickness than the open material, a larger number of bags can be hung together on the wicket, which increases the efficiency of the bag filling method.

[0018] Fig. 6 shows an example of an embodiment in which the film part 7 is located at a different position in the second side wall 3 of the bag 1. That is, the film part 7 is located such that between the opening 9 and the film part 7 there is a first open part 6^1, while between the bottom of the bag and the film part 7 there is a second open part 6^2. Such embodiment is suitable for instance for bag filling machines in which the vacuum cups 13 that are meant for engaging on the second side wall 3 of the bag 1, will seize this second side wall 3 somewhere approximately in the middle between bottom and opening of the bag 1.

[0019] The bag shown in Fig. 7 has more than one, in the example three fold lines 12a-12c along which the extension 11 of the film material of the first side wall 2 is folded. Thus, the extension has a number of overlapping layers of film material, in the example layers 11a-11c and the extension has a harmonica-like shape. The second side wall partly extends between the layers 11b and 11c. Use of more than one layers with a harmonica shape increases the volume of the bag inside. Furthermore, such a shape increases the stability of the bag and allows the bag to stand upright.

[0020] Having described the invention, however, many modifications thereto will become apparent to those skilled within the art without deviation from the invention as defined by the scope of the appended claims. In particular the position of the film part in the combined open-film side wall may be different. Furthermore, various types of open material may be used, for example an open non-woven material such as a cross-laminated open fabric known in the art as Cross Laminated Airy Fabric (CLAF) from ANCI. is a suitable material. The open material may also be a knitted, woven or extruded material or net.

Claims

1. A bag for use with at least one wicket pin of an automatic bag filling equipment, said bag at least comprising:

a first side wall of a film material having
a wicket mounting part with at least one hole for mounting the bag on
at least one of the at least one wicket pins of the bag filling equipment; a second side wall, having
an open part of an open material
which second side wall is joined to said first side wall such that the bag has an inside and an opening

characterised in that
said second side wall has a film part of a film material for facilitating the automatic opening of the bag.

2. A bag as claimed in claim 1, wherein the film part of the second side wall is a strip shaped part located near the opening of the bag.

3. A bag as claimed in claim 1 or claim 2, wherein said wicket mounting part of the first side wall has at least one local weakening near at least one hole.

4. A bag as claimed in any one of the preceding claims, wherein the first and second side walls are secured to each other without folding overlap.

5. A bag as claimed in any one of the preceding claims, wherein the first side wall has an extension, which extension is folded along at least one fold line to overlap and enclose a portion of the second side wall, said extension being secured to the second side wall.

6. A bag as claimed in claim 5, wherein said extension is folded along at least two fold lines, such that at least three layers of film material overlap each other.

7. A bag as claimed in claim 5 or 6, wherein said overlapped and enclosed portion of the second side wall extends to at least one of said fold lines.

8. A bag as claimed in claim 5 or 6, wherein said overlapped and enclosed portion of the second side wall extends to an edge of said extension.

9. A bag as claimed in any one of the preceding claims, wherein the film material is a synthetic material, such as polypropylene or polyethylene.

10. A bag as claimed in any one of the preceding claims, wherein the open material is a cross-laminated open fabric.

12. A bag as claimed in any one of the preceding claims, wherein the open material is selected from a group comprising: knitted, woven and extruded open materials.

13. A bag as claimed in any one of the preceding claims, wherein the open part of the second side wall has a larger surface area than the film part of the second side wall.

14. A method for filling and closing a bag as claimed in any one of claims 1-13, the method comprising:

hanging the bag on a wicket mounting part;
opening the bag with a means engaging on the first side wall of the bag and a suction means engaging on the film part of the second side wall of the bag; filling the bag through the opening of the bag; and
closing the bag.

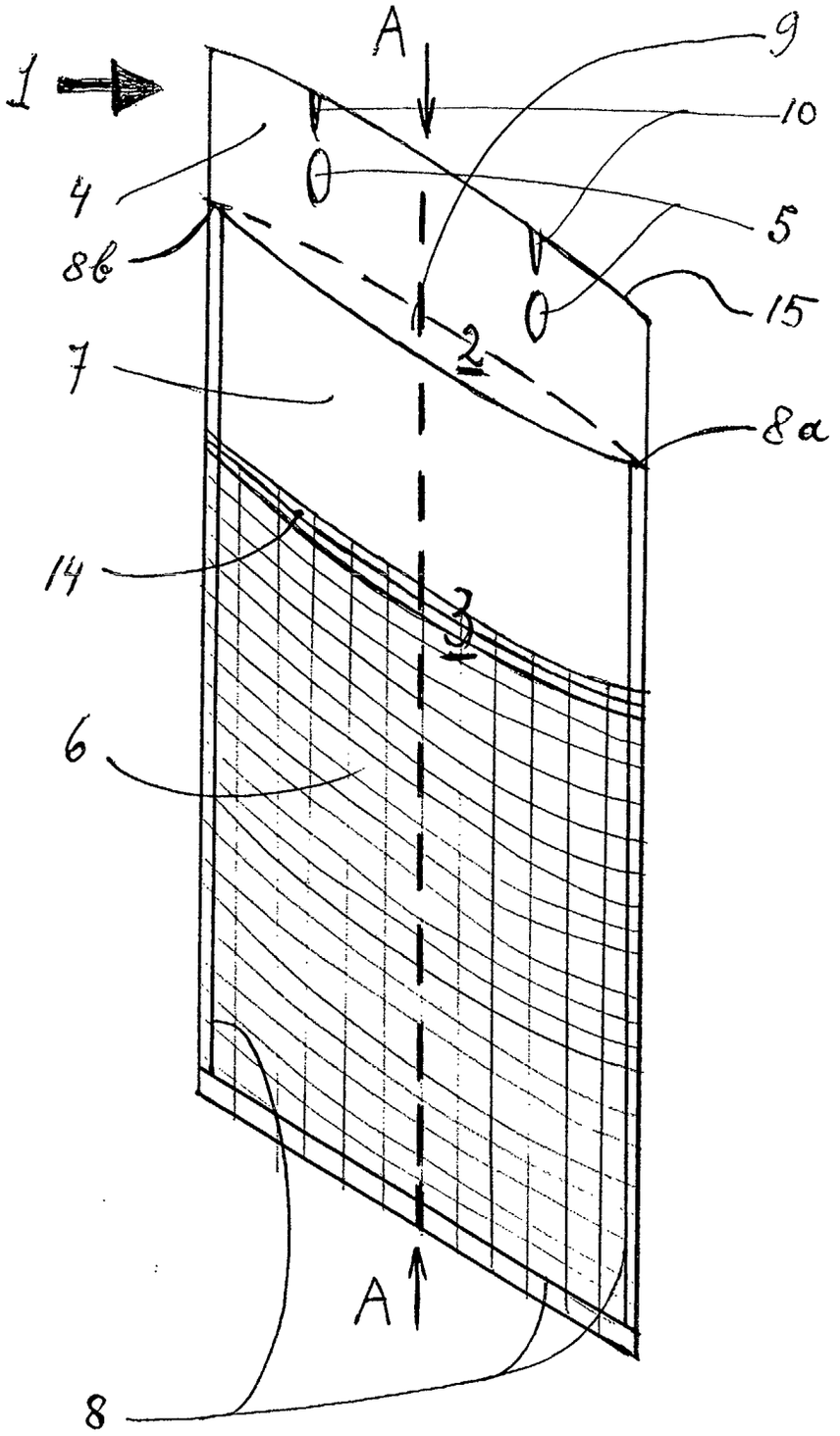


Fig. 1

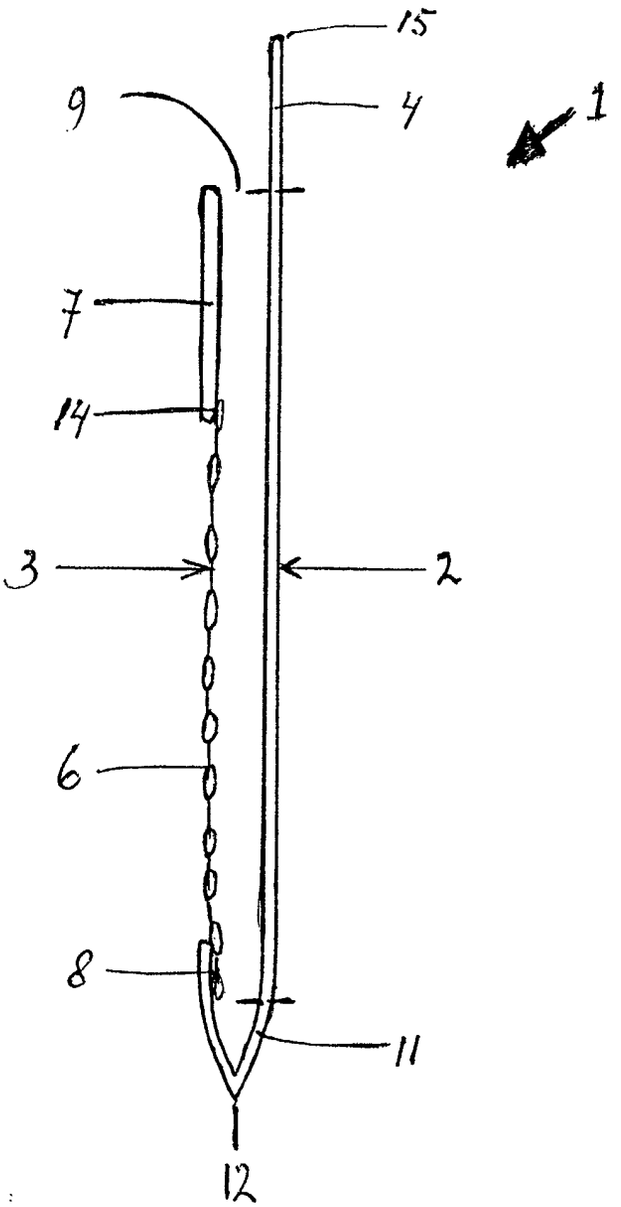


Fig. 2

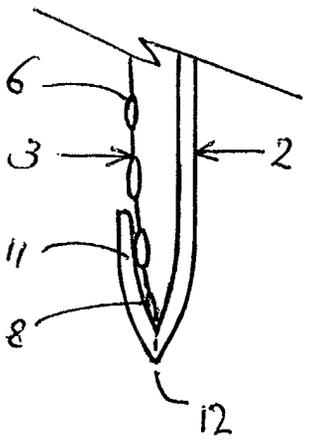


Fig. 3

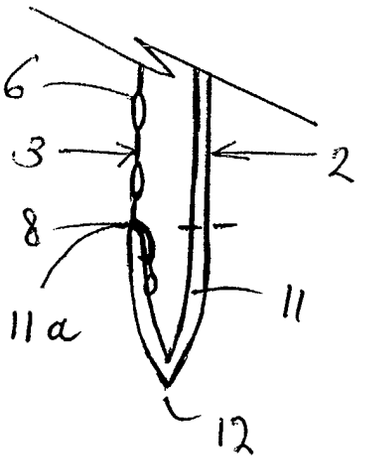


Fig. 4

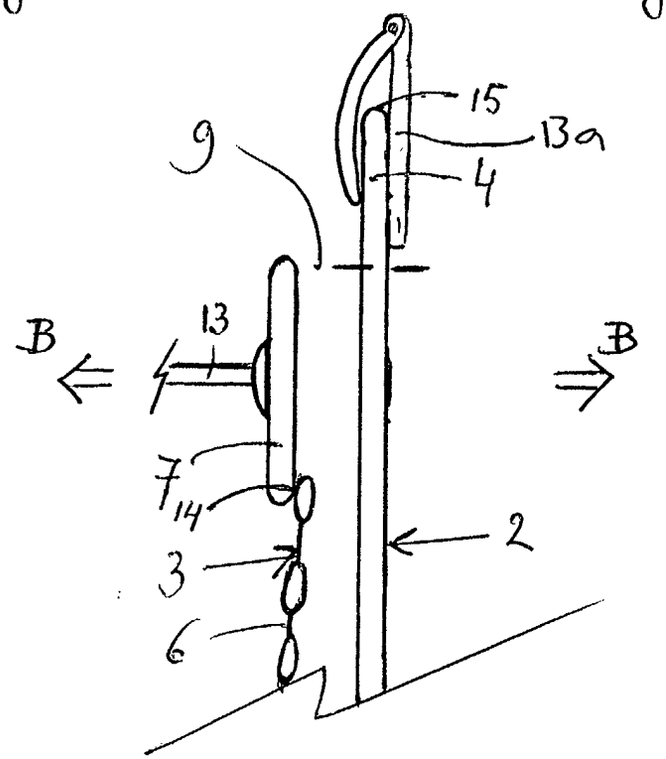


Fig. 5

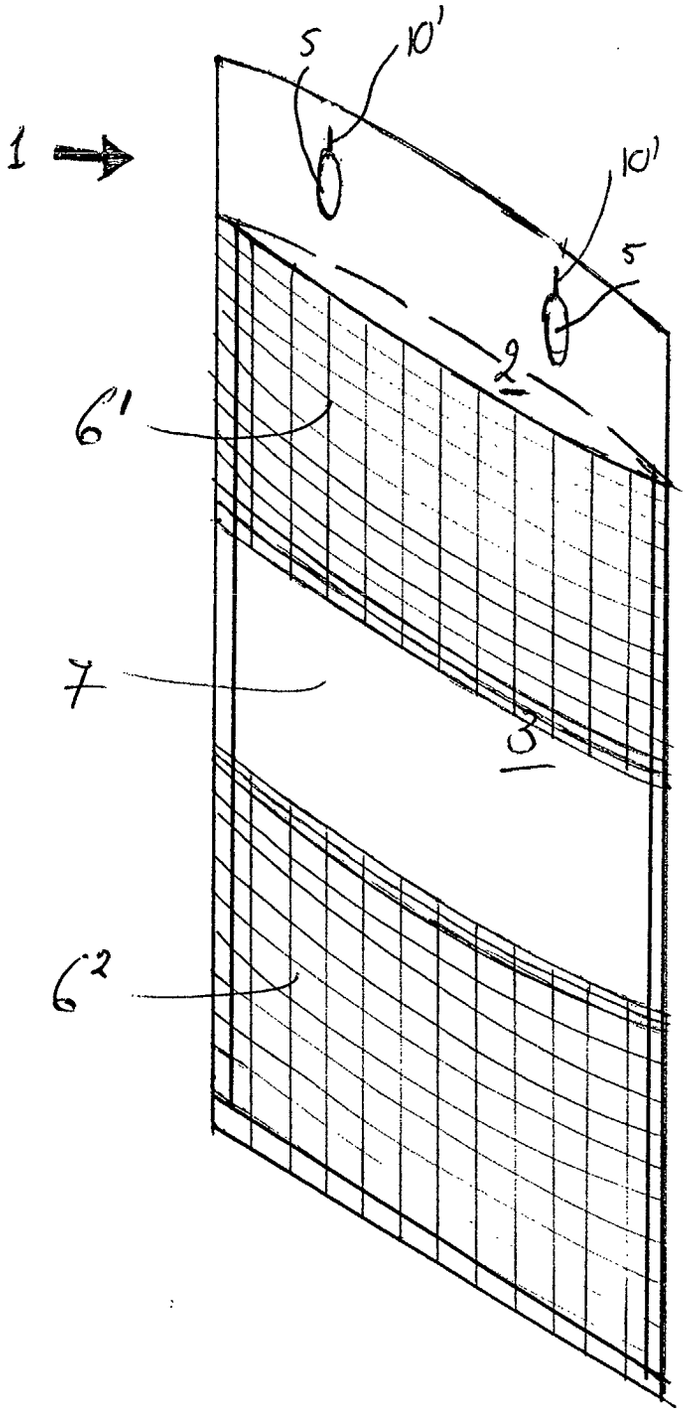
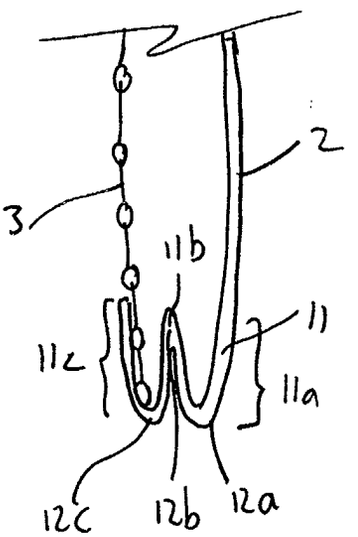


Fig. 6

Fig. 7



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EUROPEAN SEARCH REPORT

Application Number
EP 02 07 7327

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)
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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
BERLIN	11 November 2002	Spettel, J

CATEGORY OF CITED DOCUMENTS

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