(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 277 666 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
15.08.2007 Bulletin 2007/33

(21) Application number: **01908208.0**

(22) Date of filing: **01.03.2001**

(51) Int Cl.:
B65D 33/10 *(2006.01)* ***B65D 77/06*** *(2006.01)*
B65D 33/02 *(2006.01)* ***B65D 33/06*** *(2006.01)*

(86) International application number:
PCT/JP2001/001579

(87) International publication number:
WO 2001/064536 (07.09.2001 Gazette 2001/36)

(54) **INNER BAG FOR BAG-IN-BOX**

INNENBEUTEL FÜR BAG-IN-BOX

SACHET INTERIEUR D'UNE CAISSE-OUTRE

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR

(30) Priority: **01.03.2000 JP 2000056403**
08.03.2000 JP 2000063866

(43) Date of publication of application:
22.01.2003 Bulletin 2003/04

(73) Proprietor: **FUJIMORI KOGYO CO., LTD.**
Tokyo 103-0002 (JP)

(72) Inventors:
- **YONEYAMA, Michinori,**
  Fujimori Kogyo Co., Ltd
  Tokyo 103-0002 (JP)
- **ICHIKAWA, Makoto,**
  Fujimori Kogyo Co., Ltd
  Tokyo 103-0002 (JP)

(74) Representative: **Banzer, Hans-Jörg**
Kraus & Weisert
Patent- und Rechtsanwälte
Thomas-Wimmer-Ring 15
80539 München (DE)

(56) References cited:
GB-A- 2 126 984
JP-A- 6 312 750
JP-A- 10 250 747
JP-U- 2 008 763
JP-U- 62 087 033
US-A- 5 788 121

- **PATENT ABSTRACTS OF JAPAN vol. 2000, no. 19, 5 June 2001 (2001-06-05) -& JP 2001 031110 A (MITSUBISHI HEAVY IND LTD), 6 February 2001 (2001-02-06)**

EP 1 277 666 B1

Description

FIELD OF THE INVENTION

[0001] The present invention relates to an improvement for handling of inner bag for bag-in-box comprising an inner bag which is a molded product made of synthetic resin film and an outer box made of cardboard. More in detail, the present invention relates to an improved inner bag for bag-in-box possessing a gusset part.

BACKGROUND OF THE INVENTION

[0002] In general, a container composed of an inner bag fabricated by heat sealing of synthetic resin film and an outer box made of cardboard which is prepared for the purpose of filling up, preserving and transferring of fluid such as liquid or powder is commonly called as a bag-in-box, and ones whose capacity are from 5 to 20 liter are broadly used as a container for foods or medicines. These containers are mainly applied for the business use, and actually used as a container for materials of foods or medicines or as a large size container for subdivisional use.

[0003] In the meanwhile, recently, for the purpose of severe sanitary controlling of producing environment of foods or medicines, the requirements to protect the contamination of the producing environment by dusts generated from the outer box by picking out an inner bag from the outer box and carrying it alone in into the producing environment is becoming more serious.

[0004] Therefore, for these inner bag for bag-in-box, the easiness in handling when handled without outer box is becoming strongly required.

[0005] In the meanwhile, these inner bags for bag-in-box are becoming to be required to have a good handling efficiency when handled without an outer box.

[0006] The inner bag for bag-in-box can be classified into following two types. That is, one is a molded type inner bag having excellent self-standing ability prepared by a blow molding method or by a vacuum molding method and another one is a film type inner bag which is prepared by thermally sealing of film which is characterized by using smaller amount of synthetic resin. Further, said film type can be classified into a plane bag type and a gusset bag type.

[0007] Although the self-standing ability of the above mentioned gusset type inner box as a container is not superior to that of a molded type, it is superior to that of a plane bag type, therefore, it is desirably used as the inner bag to be handled without an outer box.

[0008] But the gusset type bag-in-box has several problems and the intensity of it is pointed out as one of the problems.

[0009] For example, in Japanese utility model laid open publication JP64-9174 (refer to drawing No.7), a gazette type bag-in-box whose gusset part is formed by folding both sides of periphery edge of the bag main-body to inner side is disclosed.

[0010] As disclosed in said Japanese utility model laid open publication JP64-9174, a bag of gusset shape has following defect. That is, when the bag is filled up by liquid, since the stress is concentrated to the crossing point of crease of folding part of film located to the side surface and a heat sealed part of upper or lower side, the bag is weak against the stress such as inner pressure.

[0011] In above mentioned Japanese utility model laid open publication JP64-9174, for the purpose to improve above mentioned defect, there is the description that the intensity of the crossing point is improved by preparing an oblique belt shape heat sealed part which traverses from the crossing point of crease of folding part and a heat sealed part of upper or lower side to the voluntary point of the both sides of periphery edge of the bag. The preparation of said oblique belt shape heat sealed part is also useful from the view point to reduce the remaining amount of liquid at the discharging of the liquid, because it is effective to prevent the liquid from remaining between a film and a film at the end of inner bag.

[0012] However, the effect of preparation of the oblique belt shape heat sealed part is not sufficient. Sometimes, by the strong impact such as falling down, the bag is broken because of lack of intensity. According to the description of above mentioned Japanese utility model laid open publication JP64-9174, the effect of the improvement is only illustrated as follows. Namely, since the tensile tension is dispersed homogeneously, it is possible to use a press discharging method characterizing by discharge the contents by pressing the outer surface of the bag. Further, the triangle part locating at the outside of oblique belt shape heat sealed part is easily opened at the handling of a filled up bag and deteriorate the intensity of above mentioned crossing point.

[0013] Furthermore, this triangle part disturbs the easiness in handling of the filled up bag, when it is contained into an outer box.

[0014] Still further, since this triangle part becomes hard and disturbs the self-standing ability of the bag, said triangle part becomes the cause to disturb the self-standing of the filled up inner bag when it is handled without outer bag.

[0015] By the way, in above mentioned Japanese utility model laid open publication JP64-9174, there is a description to cut off the triangle parts of the lower part of the inner bag for the purpose to improve the self-standing ability of it. However, when the triangle part is cut off, the new problems, that the crossing point becomes more easily opened and

the intensity to the inner pressure is affected, are arisen. Such kind of problems can be observed when a laminated film prepared by laminating multi layers so as a biaxial orientated film or a nylon resin layer which are hard to be adhered by heat sealing to be arranged at the surface. And, for the improvement of the intensity of gusset type bag-in-box inner bag, above mentioned problem is an obstacle to disturb said improvement.

[0016] Further, another problem is pointed out. Namely, since an adequate hand hold part is not attached to the inner bag, the handling of it is not so easy, especially when a filled up inner bag is picked up and removed from an outer box or is carried without outer box. For the purpose of easiness in handling of an inner bag, as shown in Fig.21, the inner bag for bag-in-box to which a hand hold is attached is disclosed in Japanese Patent Laid Open Publication 2-8763. In this case, a heat sealed part is formed on the upper part of gusset type inner bag, and further a heat sealed part is formed so as a front film and a rear film become one body at the corner part of the inner bag. And said heat sealed part can be held by a hand. However, according to said reference invention, since whole upper side of the bag is sealed by heat in a straight line at the forming process of a heat sealed part of the corner part, there is no space to thrust a finger into. Therefore, the problem that the heavy load is burdened with a finger is pointed out.

[0017] Additionally, at the filling up process, in a case when an inner bag is set to an outer box after contents are filled up into the inner bag, there is also a problem same as mentioned above.

DISCLOSURE OF THE INVENTION

[0018] The structural feature of a gusset shape inner bag for bag-in-box is characterized as that the side film which is folded from both side edge part to inner side is inserted between a front film and a rear film at the gusset part. A heat sealed part of an upper or lower side is consisted of two heat sealed parts. That is, one is the heat sealed part locating at the center position where the front film and the rear film are faced and said front film is adhered with said rear film directly by heat sealing (this part is called as a heat sealed part), and another one is the heat sealed part locating to the outer side where the front film or the rear film is adhered with the side film by heat sealing. At the preparation of the heat sealed part of upper side or lower side, said two heat sealed part are prepared continuously to form a straight line. Generally, the surface and the reverse surface of the film which consist of a gusset shape inner bag for bag-in-box are usually made of thermo fusable film, and the films of the side surface are sealed by heat and adhered each other at the folded part of upper or lower side. In a case when a laminated film prepared by laminating multi layers so as a biaxial orientated film or a nylon resin layer which are hard to be adhered by heat sealing to be arranged at the surface is used, for the purpose to improve the intensity of inner bag, films of the side surface are not sealed by heat and not adhered each other.

[0019] The present invention is carried out to dissolve above mentioned problem that a conventional bag-in-box has. The first object of the present invention is to improve the intensity of the inner bag without spoiling the self-standing ability of it when a filled up inner bag for bag-in-box is handled without an outer box. The second object of the present invention is to provide an inner bag for bag-in-box whose easiness in handling and convenience are improved.

[0020] The first invention is the invention which is preferable to be applied to a gusset shape inner bag for bag-in-box whose side film to be folded is composed of a laminated film prepared by laminating multi layers so as a resin layer which is hard to be adhered by heat sealing is arranged at the surface. The important point of the first invention is an inner bag for bag-in-box comprising reinforcing heat sealed parts formed by cutting out side films and sealing a front film with a rear film are provided continuously or closely to heat sealed parts on an upper side and/or a lower side of the inner bag. In a case of above mentioned inner bag for bag-in-box, it is desirable that the front film is adhered by heat sealing with the rear film by cutting out the side films at a corner part or near the corner part. In a case of above mentioned inner bag for bag-in-box, it is further desirable to divide the containing part for contents by heat sealed part so that forms fin parts of triangle shape. At least one of said fin parts of triangle shape can be cut off, and it is desirable to cut off all fin parts of triangle shape locating at the lower part.

[0021] The inner bag for bag-in-box to which a reinforcing heat sealed parts formed by sealing a front film with a rear film are provided has following strong points based on above mentioned structural feature, that is;

(1) At the heat sealed part on an upper side or a lower side of the gazette shape inner bag for bag-in-box, a front film is adhered by heat seal with a rear film by cutting out side films, and when abnormal stress caused by careless falling down of the inner bag is loaded to the bag, the breaking of the side films near the heat sealed part on an upper side or a lower side is prevented by this structural feature, and further the load burdened to the top heat sealed part can be reduced.

(2) Further, at the corner part or near the corner part, side films are cut off and a front film is adhered by heat sealing with a rear film, and by this structural feature, the reinforcing effect described in (1) becomes more remarkable and the damage of a side film caused by the contact with the inner surface of an outer box can be prevented. And, since the heat sealed parts at the corner part can be used as the holding part, it is convenience for loading and unloading of the filled up inner bag from the outer box, transferring of the filled up inner bag or for discharging of the contents

contained in the inner bag.

(3) The amount of the remaining liquid after whole contents in the inner bag is discharged can be reduces by making the inner bag gazette shape having fin parts divided from the containing part by the heat sealed part. And at the forming process of a reinforcing heat sealed part, even if the cutting off width of a side film is wider than the width of an upper or lower heat sealed part, the cut out part is existing in the fin part, and the leaking of the contained liquid does not occur.

(4) And, in a case when the film composing an inner bag is a hard material, since the presence of the fin part prevents easiness in handling at insertion of the filled up inner box into an outer box, at putting on the lid and further deteriorates the self standing ability of the bag, it is desirable to cut off the fin part previously to avoid such kinds of inconvenience.

[0022] In the present invention, for the purpose to prevent the leak of the contents in the inner bag which is caused by preparing the cut out part, it is desirable to prepare a band shape heat sealed part at the voluntary position from the edge of a heat sealed part locating at upper and/or lower side to an outer periphery part, and prepare a fin part divided by triangle shape. And by providing a holding part to the triangle fin part, the contents do not remain in the corner part at the discharging operation, further it acts as a protector of the side film at the transferring operation of the filled up bag-in-box. Further, by cutting off the triangle shape fin part located at the lower side, the self standing stability of the inner bag, which is important when the inner bag is took out, is improved so that the inner bag is easily contained in the outer box.

[0023] The gusset shape inner bag for bag-in-box of the present invention is the gazette shape bag prepared by inserting a side film which is folded to inner side between the front film and rear film and whose surrounding part is sealed by heat and having tucks at the side part, however, it is possible to use a cylinder shape film instead of the front film, rear film and the side surface film, both sides of the cylindrical film are fold to inner side, and to adhere the upper corner part with the lower corner part by heat sealing without forming a heat sealed part on a side part.

BRIEF ILLUSTRATION OF THE DRAWINGS

[0024]

Fig.1 is the plane view of the folded state of one example of the inner bag for bag-in-box of the first invention.
Fig.2 is the plane view of the folded state of the other example of the inner bag for bag-in-box of the first invention.
Fig.3 is the plane view from the bottom of the inner bag for bag-in-box of Fig.2 in which liquid filled up.
Fig.4 is the plane view of the other example of the inner bag for bag-in-box of the first invention.
Fig.5 is the plane view from the bottom of the inner bag for bag-in-box of Fig.4 in which liquid is filled up.
Fig.6 is the plane view of the other example of the inner bag for bag-in-box of the invention.
Fig.7 is the example of the conventional gusset shape inner bag for bag-in-box on which oblique heat sealed parts are formed.
Fig.8 is the example of the conventional gusset shape inner bag for bag-in-box from which the outside parts from oblique heat sealed parts are cut off.
Fig.9 is the plane view from the bottom of the inner bag for bag-in-box of Fig.7 in which liquid contents is filled up.
Fig.10 is the plane view from the bottom of the inner bag for bag-in-box of Fig.8 in which liquid is filled up.
Fig.11 is the plane view of the folded state of one example of the inner bag for bag-in-box
Fig.12 is the plane view of the folded state of the other example of the inner bag for bag-in-box
Fig.13 is the plane view of the folded state of the other example of the inner bag for bag-in-box to which cut out parts are formed.
Fig.14 is other example of the inner bag for bag-in-box of the second invention showing the plane view of the folded state of the inner bag for bag-in-box of Fig.13 from which triangle fin parts locating at lower position are cut off.
Fig.15 is the perspective view of the inner bag for bag-in-box of Fig.14 in which liquid is filled up.
Fig.16 is the other example of the inner bag for bag-in-box of the second invention showing the plane view of the folded state of the inner bag to the corner part of which a punch hole is formed.
Fig.17 is the other example of the inner bag for bag-in-box showing the plane view of the folded state of the inner bag which abbreviate to form a heat sealed part at the both sides.
Fig.18 is the other example of the inner bag for bag-in-box which abbreviates to form a heat sealed part at the sides, showing the plane view of the folded state of the inner bag.
Fig.19 is the partial plane view of the other example of the inner bag for bag-in-box showing the folded state of the inner bag to the corner part and near the heat sealed part of which punch holes are formed.
Fig.20 is the partial plane view of another example of the inner bag for bag-in-box showing the folded state of the inner bag to the corner part and near the heat sealed part of which punch holes and also cut out parts are formed.
Fig.21 is the conventional inner bag for bag-in-box with handle parts.

THE BEST EMBODYMENT TO CARRY OUT THE INVENTION

[0025] The present invention is illustrated more in details.

[0026] As the materials of the bag used in the first invention, a laminate such as a laminated film or a co-extruded film is used according to the required ability. As a laminate to be used, a laminate having following structural feature can be mentioned. That is, a film having relatively high mechanical strength such as biaxial orientated polyamide, biaxial orientated polyester or biaxial orientated polypropylene or a resin layer not to be easy sealed by heat e.g. polyamide resin layer is arranged to be the outermost surface layer, and a polyolefin resin layer to be easily sealed by heat such as polyethylene or polypropylene is arranged to be the inmost layer, can be mentioned. When it is necessary to add further ability to these laminate, an adequate functional film can be voluntarily added to the laminate. For example, when a barrier ability against oxygen gas is necessary, a silica evaporated film or copolymer of ethylene-vinylalcohol (EVOH) can be added, and when a light shielding ability is necessary, an aluminum foil or an aluminum evaporated film can be added to the laminate. That is, adequate multi layered film, which is a laminate, is voluntarily selected according to the use. For example, a laminate film composed of polyester, aluminum foil and polyethylene, a co-extruded multi layered film of EVOH and polyethylene or a co-extruded multi layered film of polyamide, EVOH and polyethylene can be mentioned. Further, these films can be used alone or can be used by overlapping with polyethylene single film without sealing, however, not intending to be limited to them.

[0027] In the present invention, the heat sealed part of upper and/or lower side indicates the part where a front film is directly adhered by heat seal with a rear film at upper and/or lower side. In the present invention, a cut out part is prepared to a side film continuously or closely to said heat sealed part, and a reinforced heat sealed part is formed by adhering a front film with a rear film by heat sealing. As the shape of the cut out part, any shape such as circular or oval shape can be used, and for the purpose to improve the mechanical strength plural numbers of cut out parts can be prepared. In this case, it is desirable to prepare a cut out part on the corner part or closely to the corner part.

[0028] Still further, it is desirable to provide a heat sealed part at the position from the edge part of heat sealed part locating at upper and/or lower side toward the side periphery part, and to divide the containing part for contents by said heat sealed part, because the amount of remaining liquid can be reduced by dividing the containing part. And, it is further desirable by the reason mentioned above to cut off and remove the triangle shape fin parts that is divided by said heat sealed parts.

[0029] The invention will be illustrated more readily according with the drawings.

[0030] Fig.1 is the plane view of the folded state of one example of the inner bag for bag-in-box of the invention.

[0031] In Fig.1, 1 is an inner bag, 2 is a heat sealed part of the upper side, 3 is a heat sealed part of the lower side, 4, 4' are side films which are folded, 5, 5' are reinforcing heat sealed parts which exist closely to the heat sealed part of the upper side, 6 is a front film of the inner bag and 7 is a heat sealed part which divides a containing part and a fin part. By preparing holes previously to each folded side films 4, 4', and by sealing lower side, the reinforce heat sealed part is formed by adhering the front film with the rear film by heat sealing at the hole position. And, in the drawings, 8 and 10 are a crossing point of the heat sealed part of the lower side and the side film, 9 and 11 are crossing point of the heat sealed part of the upper side and the side film, 13 is a heat sealed part of the side periphery, 14 is a rear film and 15 is a spout.

[0032] Fig.2 is the case of the inner bag for bag-in-box of Fig.1 to which a corner heat sealed part 16 is formed by cutting out the side film near the corner point. Fig.3 is a plane view from the bottom of the inner bag for bag-in-box of Fig.2 in which liquid is filled up. In addition to the reinforced heat sealed part 5, 5', since the front film and the rear film of the bag are becoming one body, even if the impact is added, the side film near the heat sealed part does not spread and the mechanical strength is improved.

[0033] Fig.4 is the shape showing outer part of the heat sealed part 7 which divide a containing part and fin part is cut off.

[0034] Fig.5 is the perspective illustration from the bottom side of the inner bag for bag-in-box of Fig.4 in which liquid is filled up. Same as to Fig.1, a front film and a rear film of inner bag are adhered by heat sealing and become one body at the reinforcing heat sealed parts 5, 5', therefore, even if the impact is added, the side film near the heat sealed part does not spread and the mechanical strength is improved. Further, the inner bag can stand up by itself stable, because the fin part is cut off.

[0035] Fig.6 is another example of the present invention. This drawing shows the example that the all fin parts are cut off.

[0036] Fig.7 and Fig.8 are the plane view of the conventional inner bag for bag-in-box. Fig.9 is the perspective illustration from the bottom side of the inner bag for bag-in-box of Fig.7 in which liquid is filled up, and Fig.10 is the perspective illustration from the bottom side of the inner bag for bag-in-box of Fig.8 in which liquid is filled up. The inner bag for bag-in-box shown in Fig.9 and Fig.10 have a weak point that the side films near the heat sealed part is easily open and the mechanical strength against the inner pressure is not so strong.

[0037] Further, another type of gusset bag will be illustrated more readily in accordance with the drawings.

[0038] Fig.11 is the plane view of the folded state of the inner bag for bag-in-box. In Fig.11, 17 is the not sealed part, 2 is the heat sealed part of the upper side, 3 is the heat sealed part of the lower side, 13 is the heat sealed part of the

side periphery, 12 and 12' are the folding line of the side film, 15 is the spout, 4 is the side film and 6 is the front film. In a case of this inner bag for bag-in-box, when a hand is inserted from the side part, a finger can pass through from the not sealed part 17 and can hold the corner heat sealed part. Regarding the lower side, it is also possible to prepare a not sealed part and to seal it.

[0039] Fig.12 is the plane view of the folded state of the inner bag for bag-in-box of another Example. In Fig. 12, 18 is a cut out part and 7 is a oblique heat sealed part. When the inner bag is hold by the finger passed through the not sealed part of the inner bag for bag-in-box of Fig.11, since sometimes the film of not sealed part cuts into the finger, Fig. 12 is the Example to avoid said problem and to reduce the load to the finger by preparing a cut out part (handle hole) 18. And, for the purpose to prevent the leak of the contents in the inner bag from the cut out part (handle hole) 18, a heat sealed part 7 is prepared obliquely from the edge part of the heat sealed part to the outer periphery part. By preparing the cut out part (handle hole) 18, it becomes possible to hold the heat sealed part of the upper side easily and certainly without burden.

[0040] Fig.13 is the plane view of the other Example, to the lower part of which a oblique heat sealed part 7 is prepared. By preparing the oblique heat sealed part 7 at the lower part, it becomes possible to reduce the amount of remaining liquid in the inner bag at the discharging of the contained liquid in the inner bag. Further, it is possible to prevent the damage of the inner box caused by rubbing of the side surface film at the transferring action of the filled up inner bags for bag-in- box.

[0041] Fig.14 is the plane view of the inner bag for bag-in-box from which a triangle shape fin part formed by preparing a oblique heat sealed part at the lower side. And by cutting off said triangle shape fin part, the self-standing ability of the inner bag filled up with liquid is improved.

[0042] Fig.15 is the perspective view of the inner bag for bag-in-box of Fig.14 in which liquid is filled up. It is clearly understand from Fig.15 that the film locating at the both side of the upper heat sealed part can expand to front and rear direction, and the filled up inner bag can be easily lifted by inserting fingers into handle holes. If the handling holes are not prepared, it is not so easy to lift the large capacity inner bag of 20 liter around, because the high load is burdened to the fingers.

[0043] If the laminate which laminate a biaxial orientated film or a nylon resin layer which are hard to be adhered by heat sealing are arranged at the surface is used as a side film, a front film and a rear film can be sealed by heat and adhered each other without sealing the side film by preparing a punch hole on the side film. Fig.16 is the plane view of the inner bag for bag-in-box using a laminate arranging a resin layer which is hard to be sealed by heat on the surface as a side film. In Fig.16, a punch hole is prepared at the corner of the side film, the front film and rear film forms the reinforcing heat sealed part 16 by being sealed by heat together with without sealing the side film throughout the punch hole, and a cut out part 18 can be prepared between a heat sealed part and a corner heat sealed part so as the cut out part acts as a handle.

[0044] Figs.17 and 18 are the plane view showing the other examples. These examples are showing the cases abbreviating the sealing of the side part. These bags show the following case, that is, the both ends of the cylindrical film such as an inflation tube or a cylindrical tube formed by back sealing method is folded to inner side so as to form tucks and upper and lower part are adhered by heat sealing. Fig.17 shows an example that a handle hole is prepared at the upper triangle shape fin part of the inner bag that abbreviating the preparation of the sealing at the side part, further another handle hole is also prepared at the lower triangle shape fin part of the inner bag. Fig.18 shows an example that a reinforcing heat sealed part 16 is prepared by a punch hole closely to the upper corner and a handling hole is prepared at the upper triangle shape fin part, further, the lower triangle shape fin part is cut off.

[0045] Furthermore, Figs.19 and 20 are the partial plane view showing the other examples. Fig. 19 shows an example that a reinforcing heat sealed part 16 is prepared by a punch hole at the corner part and closely to the end of the heat sealed part by making a punch hole, and Fig.20 shows an example that a cut out part 18 is prepared between reinforcing heat sealed part 16 prepared by two punch holes shown in Fig.19. In Fig.19, since the part between two holes is not sealed, it is possible to hold the bag for bag-in-box by piercing fingers throughout this not sealed part. As shown in Fig. 20, the bag for bag-in-box can be hold more easily by preparing a cut out part 18.

EXAMPLES AND COMPARTIVE EXAMPLES

[0046] The first invention will be illustrated in more detail according to the Examples, however, not intended to be limited to these Examples.

Example A and B and Comparative Example C and D

[0047] The self-standing test and the dropping test of the container are carried out on Example A and B of the present invention corresponding to Fig.2 and Fig.4 and Comparative Example C and D corresponding to Fig.7 and Fig.8 which are the conventional type container. The self-standing ability and the intensity for dropping of these containers are

compared. The materials of these inner bag are the double bag using linear polyethylene mono film of μm thickness as an inner layer and using laminated film composed of 15 μm thickness nylon film/60μm thickness linear polyethylene mono film as an outer layer. The capacity of the inner bag is united to 20 liter.

[0048] The method for self-standing test of the container is illustrated as follows. That is, an inner bag of 20 liter capacity is filled up with 20 liter of water is settled without an outer box, then the floor is inclined to the front and rear direction and the right and left direction of the inner box. The incline angle of the floor when the inner bag tumbles down is measured. The test is repeated for five times. The results are summarized in Table.1.

[0049] The method for the dropping test of the container is illustrated as follows. That is, an inner bag of 20 liter capacity is filled up with 20 liter of water is fallen down to the floor, and the height that the inner bag is broken and the broken position are measured. The test is repeated for five times. The results are summarized in Table.2.

Table 1 Comparison test results of Self-standing ability

· Inclined angle of floor for a bag tumbling down · 20 liter of water is filled into a bag of 20 liter capacity · Measuring number: n=5		
specimen	inclined angle for the bag tumbling down (degree)	
	front and rear direction	right and left direction
Example A	10~15	10~20
Example B	20~25	20~25
Comp. Example C	10~15	10~20
Comp. Example D	20~25	20~25

Table 2 Comparison test results of the dropping test

· Height for breaking · 20 liter of water is filled into a bag of 20 liter capacity · Dropped down from the bottom surface measuring Temp. :20°C, Measuring number: n=5		
specimen	height for bag breaking (m)	broken position of bag
Example A	1.0~1.5	bottom crossing point
Example B	0.8~1.2	ditto
Comp. Example C	0.5~0.7	ditto
Comp. Example D	0.3~0.5	ditto

[0050] According to these test results, following facts are become clear. That is, from the results of Table 1, it is clearly understood that the self-standing ability of Examples A and B are not spoiled in comparison with that of Comparative Examples C and D. Further, from the results of Table 2, the inner bag of Comparative Examples C and D breaks at lower height than that of Examples A and B, and the breaking position is the crossing position of lower heat sealed part and side film. Therefore, it is obvious that the intensity for dropping of Examples A and B are superior to that of Comparative Examples C and D.

POSSIBILITY FOR THE INDUSTRIAL USE

[0051] As mentioned above, in the inner bag for bag-in-box of gazette shape, the first invention is an inner bag for bag-in-box comprising reinforcing heat sealed parts formed by cutting out side films and sealing a front film with a rear film are provided continuously or closely to heat sealed parts on an upper side and/or a lower side of the inner bag. And according to the first invention, when abnormal stress caused by careless falling down of the inner bag is loaded to the bag, it is possible to prevent the breaking of the side films near the heat sealed part on an upper side or a lower side and can reduce the load to the top heat sealed part without spoiling the self-standing ability of the container, that is the substantial mechanical strength of the bag can be improved.

[0052] According to the present invention, at the corner part or near the corner part, side films are cut off and a front film is adhered by heat sealing with a rear film, and by this structural feature, the damage of a side film caused by the contact with the inner surface of an outer box can be prevented. And, since the heat sealed parts at the corner part can be used as the handling part, it is convenience for loading and unloading of the filled up inner bag from the outer box, transferring of the filled up inner bag or for discharging of the contents contained in the inner box.

[0053] Further, although the upper fin part does not have influence on the self-standing ability of the inner box directly, it is possible to be cut off as well as the lower fin part so as to improve the self-standing ability by making the center of gravity lower, or not to be cut off so as to be used as a handle part when the bag is handled. Furthermore, it is possible to prepare a partial heat sealed part or a full heat sealed part.

[0054] According to the second invention, by preparing a not sealed part or a cut out part at upper and/or lower side, the heat sealed part in the corner part can be used as a handle part, consequently it brings excellent effects such as easy work, good handling and convenience in cases when a filled up inner bag is lifted without an outer box, transferred or the contained liquid is discharged.

Claims

1. A gusset shape inner bag for a bag-in box, comprising a front film (6), a rear film and two side films (4, 4') inserted between the front film (6) and the rear film, the bag comprising a heat sealed part (2, 3) where the front film and the rear film are directly facing each other and where the front film is adhered with said rear film directly by heat sealing, **characterized by** further comprising reinforcing heat sealed parts (5, 5') located to the outer side where the front film or the rear film is adhered with the side film (4, 4') by heat sealing, wherein the reinforcing heat sealed parts are formed by cutting out the side films and by sealing the front film with the rear film, the reinforcing heat sealed parts being provided continuously or closely to heat sealed parts (2, 3) on an upper side or a lower side of the inner bag.

2. The inner bag for bag-in-box of claim 1, wherein the front film is adhered by heat sealing with the rear film by cutting out the side film at a corner part or near the corner part.

3. The inner bag for bag-in-box in accordance with claim 1 or claim 2, wherein said inner bag possesses a fin part of triangle shape which is divided from a containing part by a heat sealed part.

4. The inner bag for bag-in-box of claim 3, wherein at least one fin part is cut off.

5. The inner bag for bag-in-box of claim 4, wherein all fin parts locating at the lower side are cut off.

Patentansprüche

1. Faltiger innerer Beutel für eine Bag-In-Box, umfassend eine vordere Schicht (6), eine hintere Schicht und zwei seitliche Schichten (4, 4'), welche zwischen der vorderen Schicht (6) und der hinteren Schicht eingefügt sind, wobei der Beutel einen heißverschweißten Teil (2, 3) umfasst, wo die vordere Schicht und die hintere Schicht einander direkt gegenüberliegen und wo die vordere Schicht durch Heißverschweißen direkt an die hintere Schicht geklebt ist, **dadurch gekennzeichnet, dass** er weiter verstärkende heißverschweißte Teile (5, 5') umfasst, welche an der äußeren Seite angeordnet sind, wo die vordere Schicht oder die hintere Schicht durch Heißverschweißen an die seitliche Schicht (4, 4') geklebt ist, wobei die verstärkenden heißverschweißten Teile ausgebildet sind, indem die seitlichen Schichten ausgeschnitten werden und indem die vordere Schicht mit der hinteren Schicht verschmolzen wird, wobei die verstärkenden heißverschweißten Teile kontinuierlich zu den heißverschweißten Teilen (2, 3) oder dicht bei diesen auf einer oberen Seite oder einer unteren Seite des inneren Beutels vorhanden sind.

2. Innerer Beutel für eine Bag-In-Box nach Anspruch 1, wobei die vordere Schicht durch Heißverschweißen mit der hinteren Schicht geklebt wird, indem die seitliche Schicht an einem Eckteil oder in der Nähe des Eckteils ausgeschnitten wird.

3. Innerer Beutel für eine Bag-In-Box nach Anspruch 1 oder Anspruch 2, wobei der innere Beutel ein Rippenteil einer dreieckigen Form aufweist, welches von einem aufnehmenden Teil durch ein heißverschweißtes Teil abgeteilt ist.

4. Innerer Beutel für eine Bag-In-Box nach Anspruch 3, wobei mindestens ein Rippenteil abgeschnitten ist.

5. Innerer Beutel für eine Bag-In-Box nach Anspruch 4, wobei alle Rippenteile, welche auf der unteren Seite angeordnet sind, abgeschnitten sind.

Revendications

1. Sachet intérieur en forme de gousset d'une caisse-outre qui comprend un film avant (6), un film arrière et deux films latéraux (4, 4') insérés entre le film avant (6) et le film arrière, le sachet comprenant une partie thermocollée (2, 3) dans laquelle le film avant et le film arrière se font face directement et dans laquelle le film avant adhère audit film arrière directement par thermocollage, **caractérisé en ce qu'**il comprend en outre des parties de renforcement thermocollées (5, 5') situées sur le côté externe où le film avant ou le film arrière adhère au film latéral (4, 4') par thermocollage, les parties de renforcement thermocollées étant formées en découpant les films latéraux et en collant le film avant au film arrière, les parties de renforcement thermocollées étant disposées en continu ou près des parties thermocollées (2, 3) sur une face supérieure ou une face inférieure du sachet intérieur.

2. Sachet intérieur d'une caisse-outre selon la revendication 1, dans lequel le film avant adhère par thermocollage au film arrière en découpant le film latéral sur une partie angulaire ou à proximité de la partie angulaire.

3. Sachet intérieur d'une caisse-outre selon la revendication 1 ou 2, dans lequel ledit sachet intérieur possède une partie nervurée en forme de triangle qui est séparée d'une partie de réception par une partie thermocollée.

4. Sachet intérieur d'une caisse-outre selon la revendication 3, dans lequel au moins une partie nervurée est découpée.

5. Sachet intérieur d'une caisse-outre selon la revendication 4, dans lequel toutes les parties nervurées situées sur la face inférieure sont découpées.

Fig.1

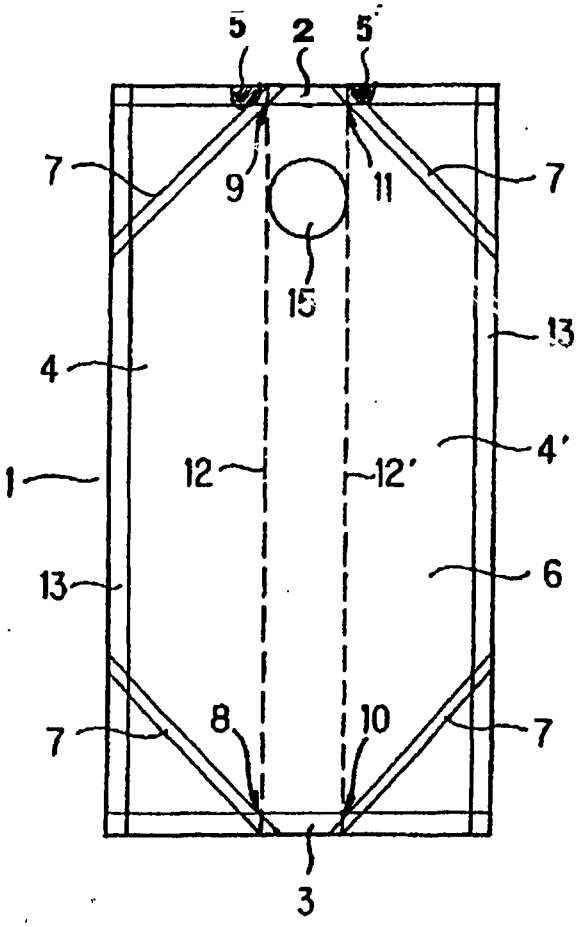


Fig.2

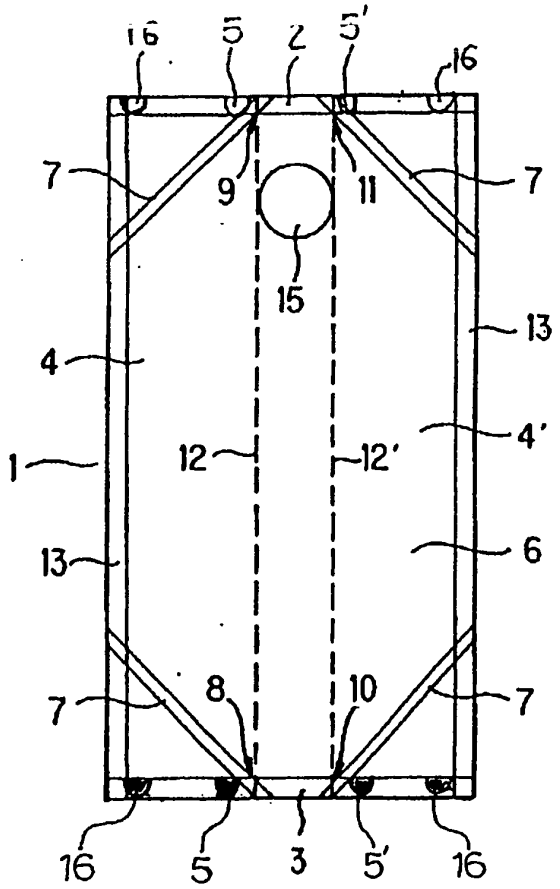


Fig.3

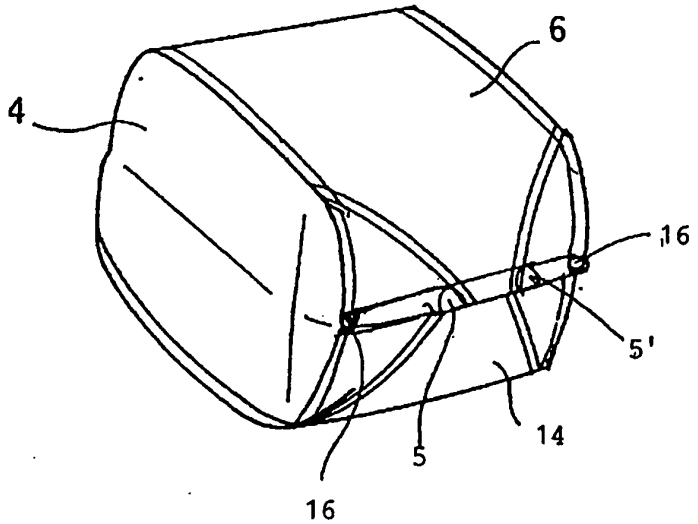


Fig.4

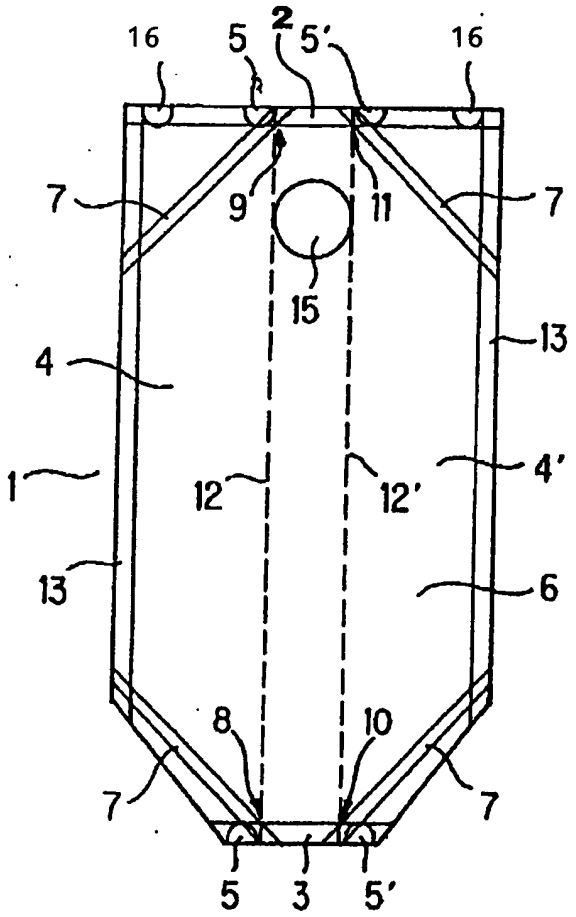


Fig.5

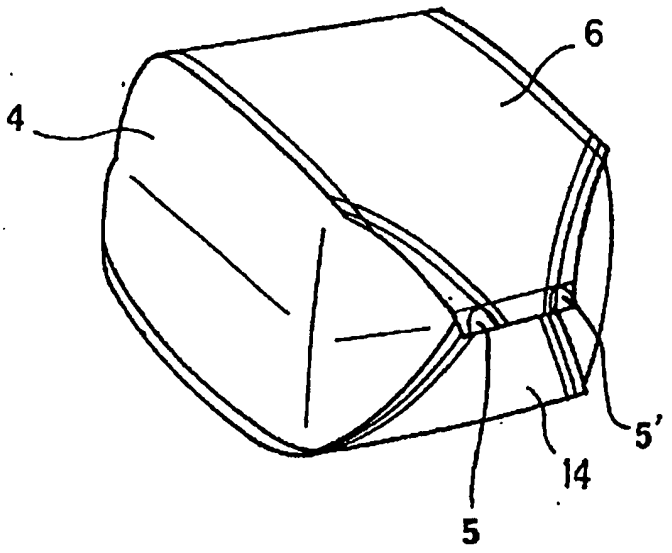


Fig.6

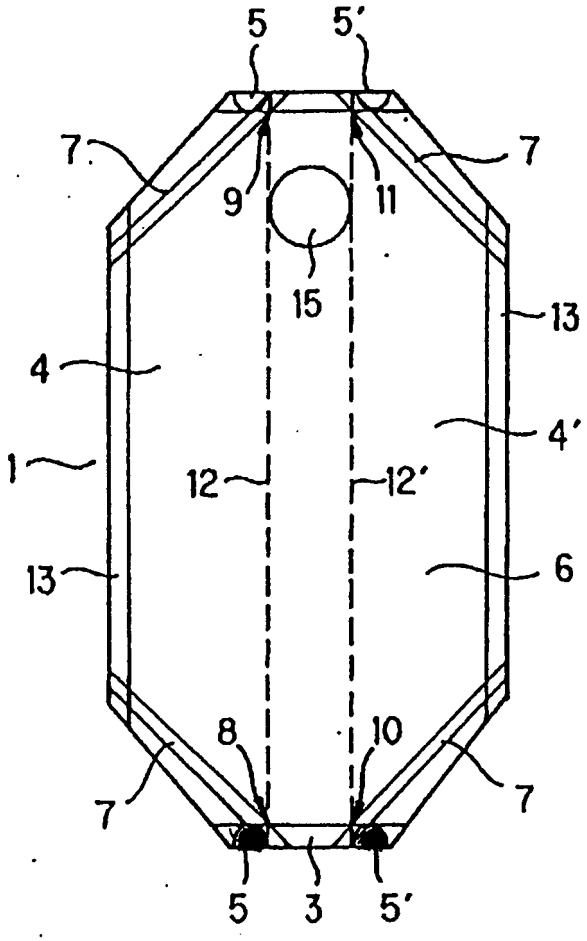


Fig.7

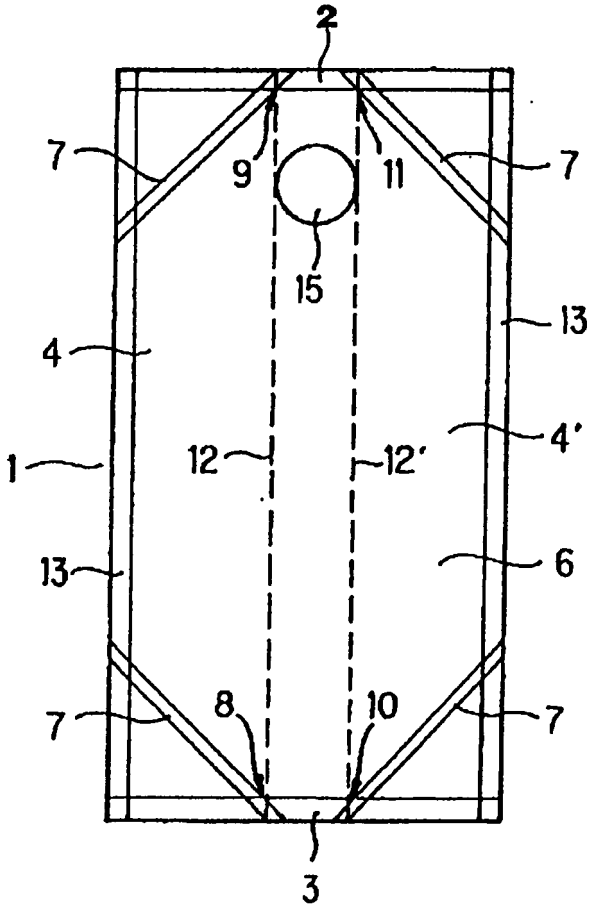


Fig.8

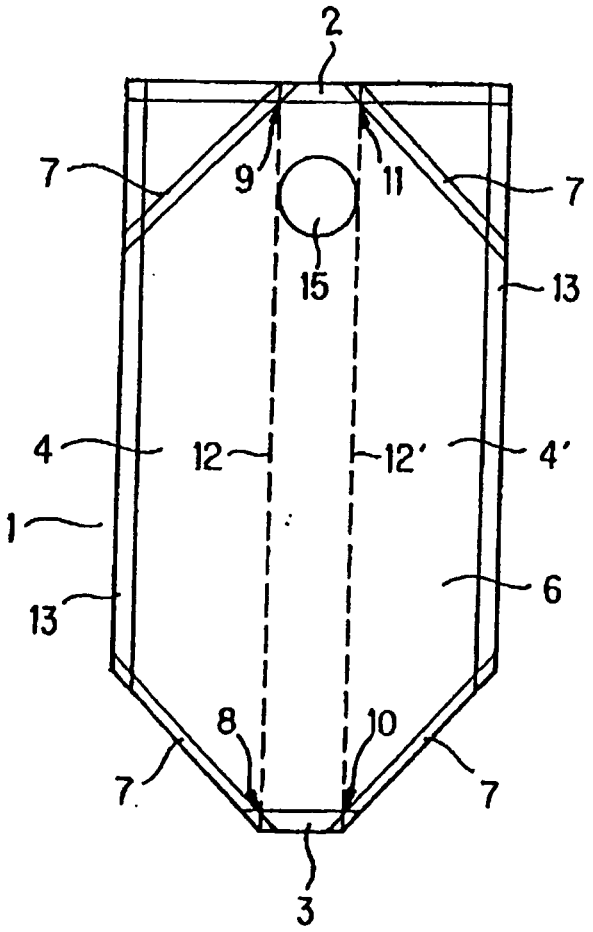


Fig.9

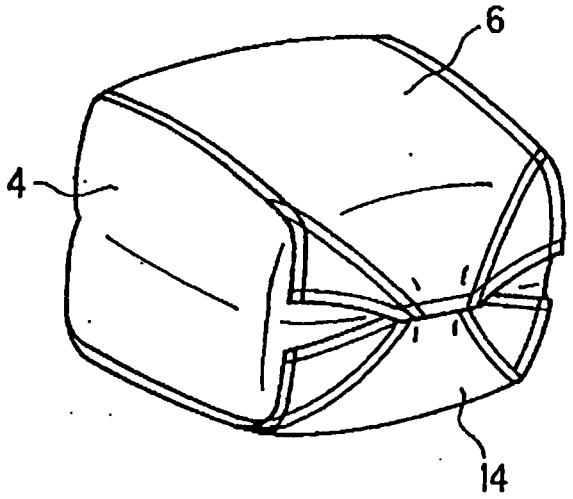


Fig.10

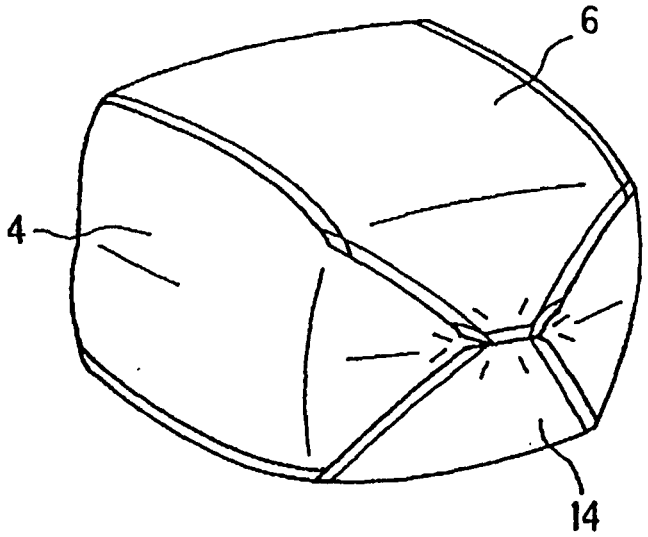


Fig.11

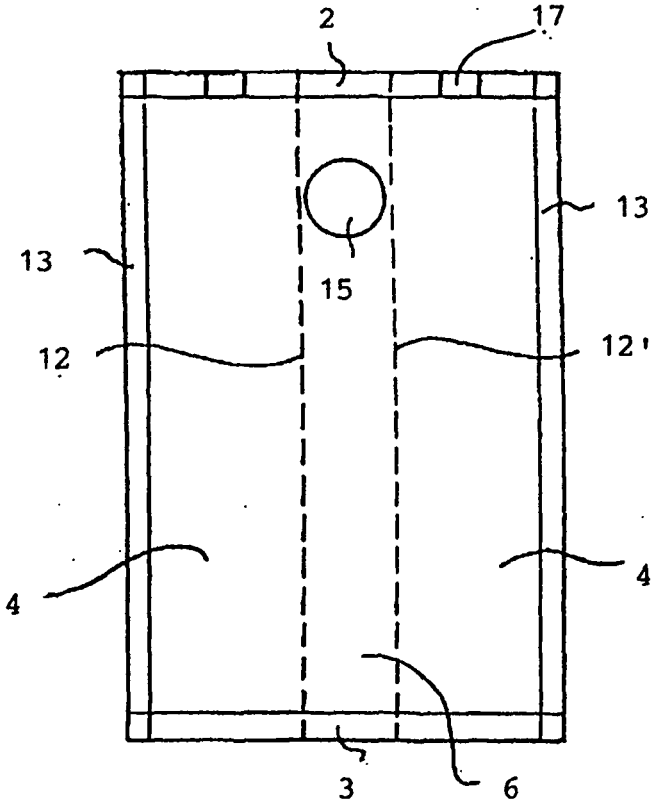


Fig.12

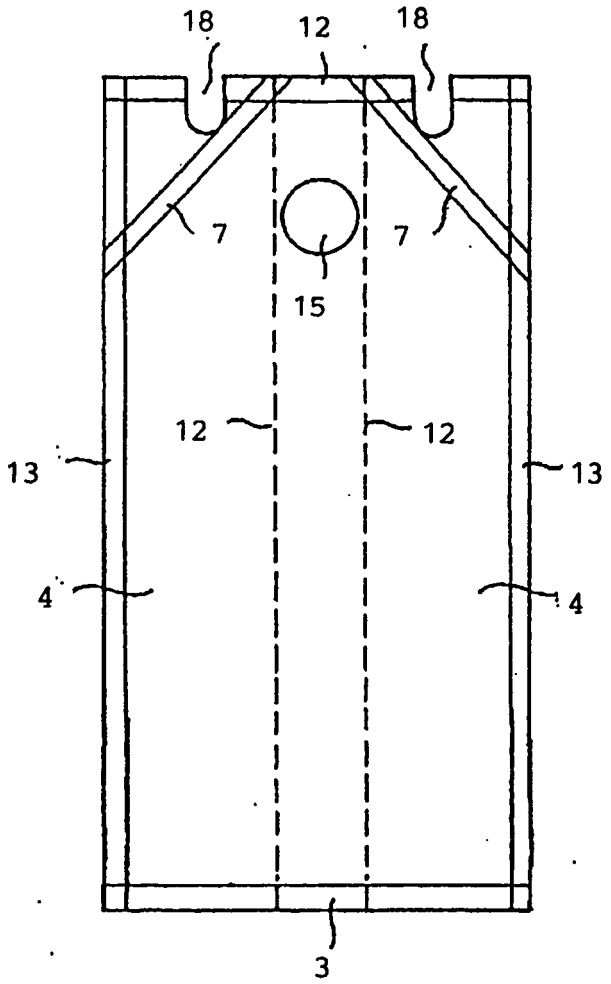


Fig.13

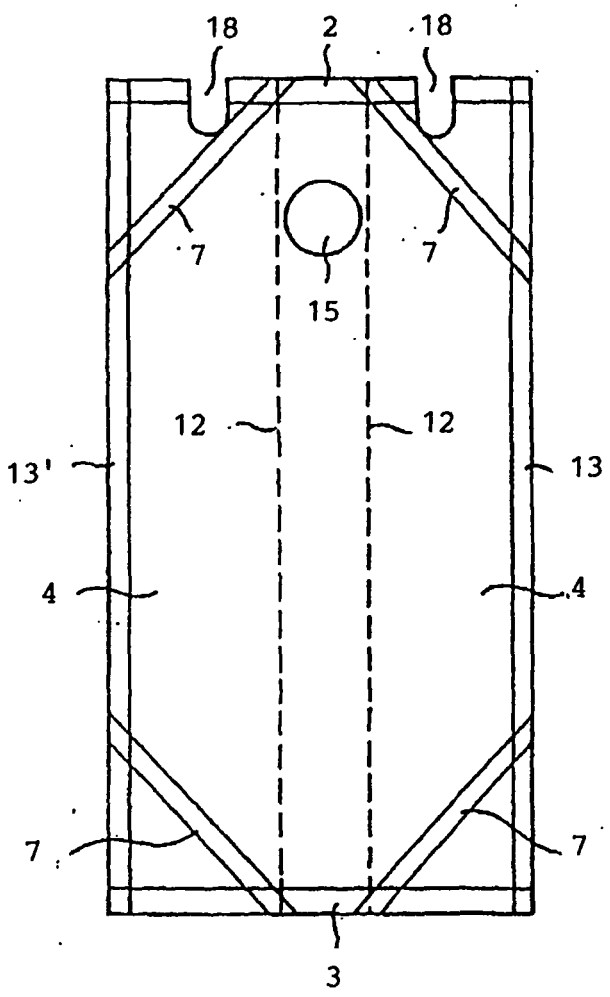


Fig.14

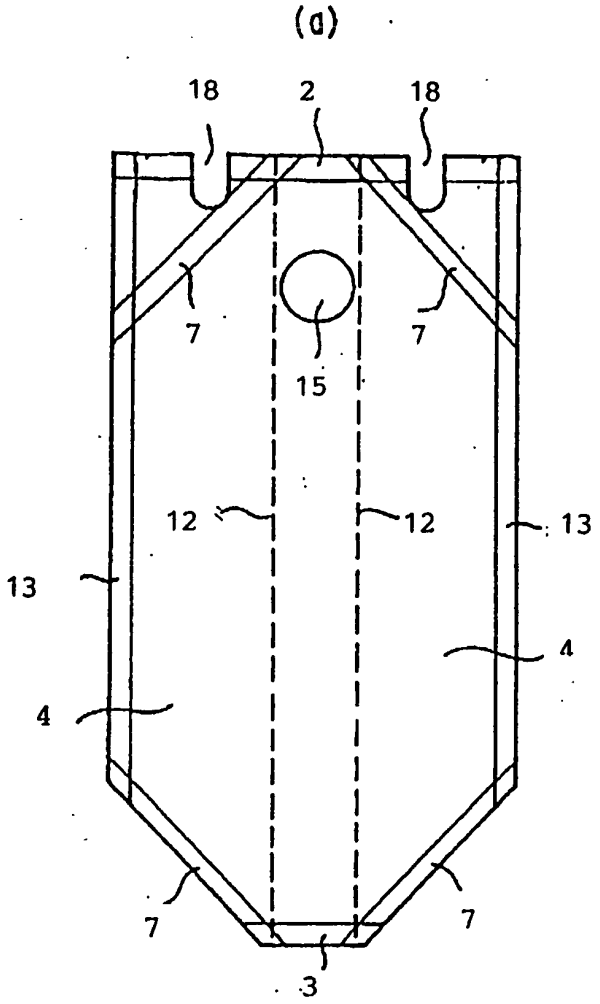


Fig.15

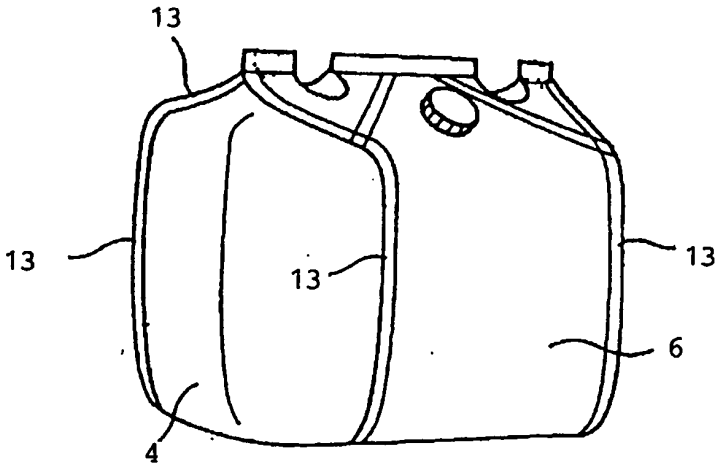


Fig.16

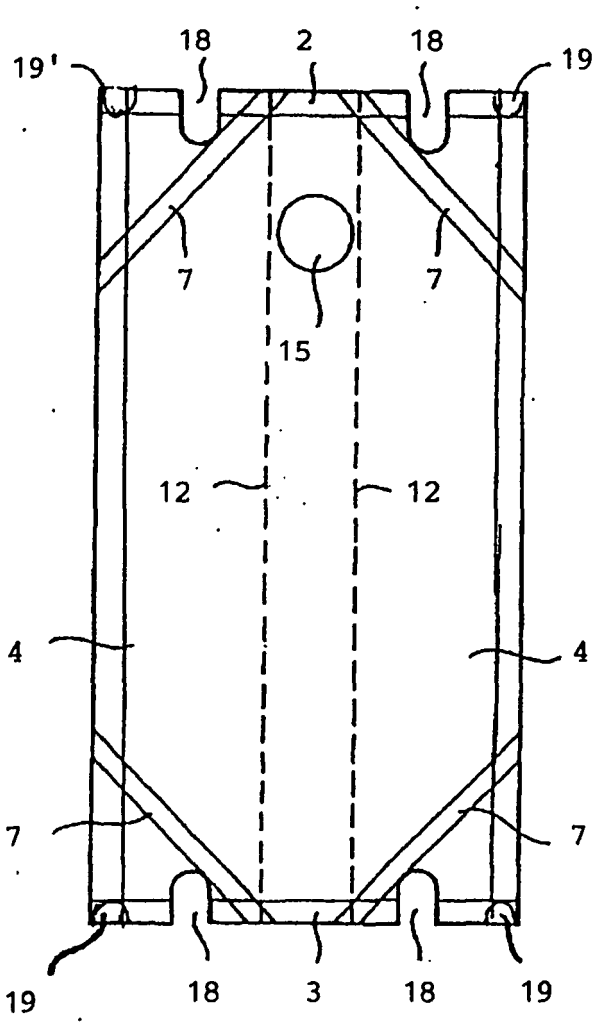


Fig.17

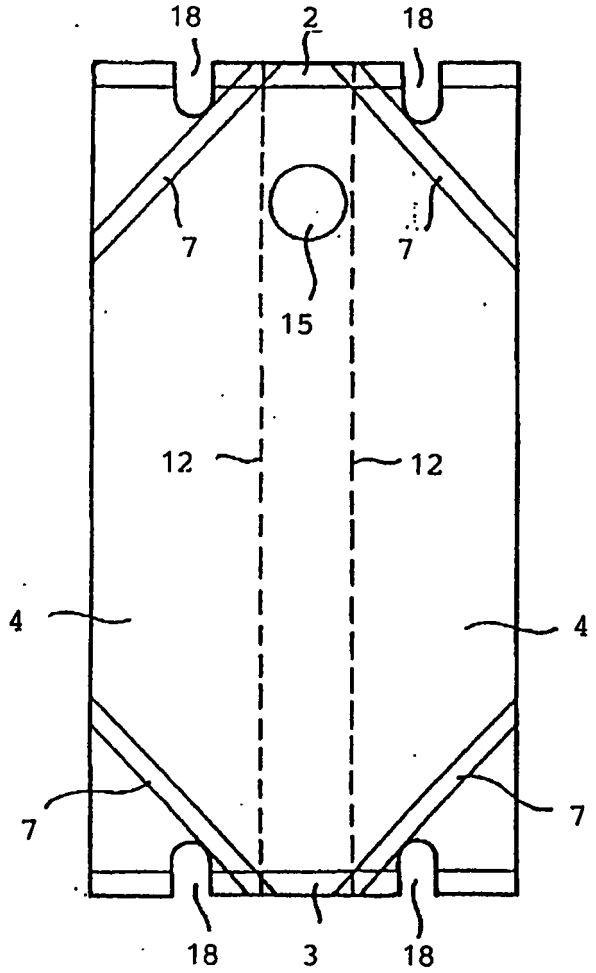


Fig.18

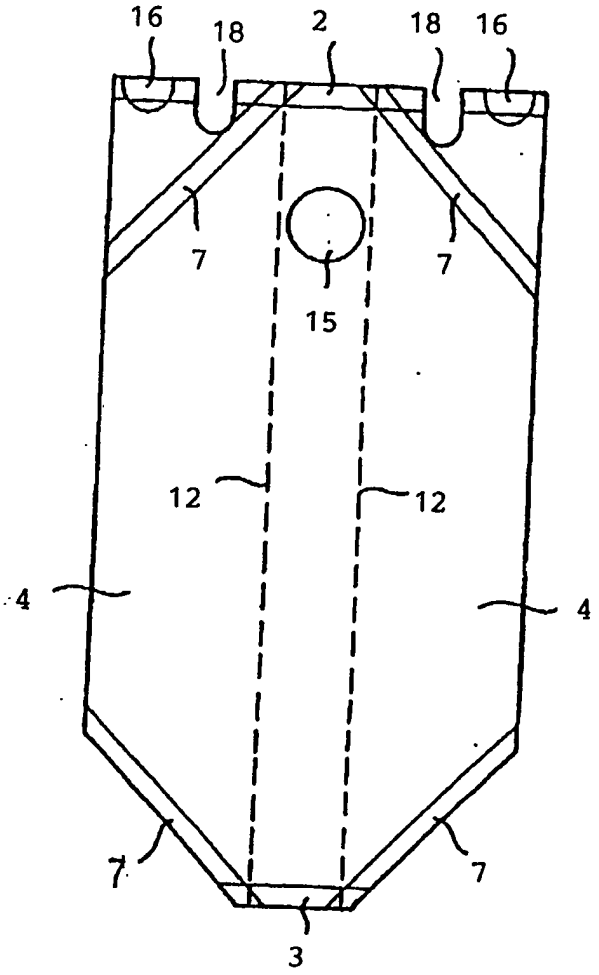


Fig.19

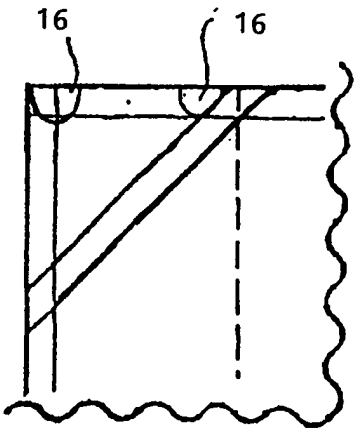


Fig.20

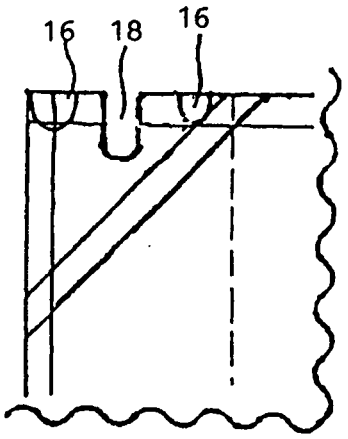
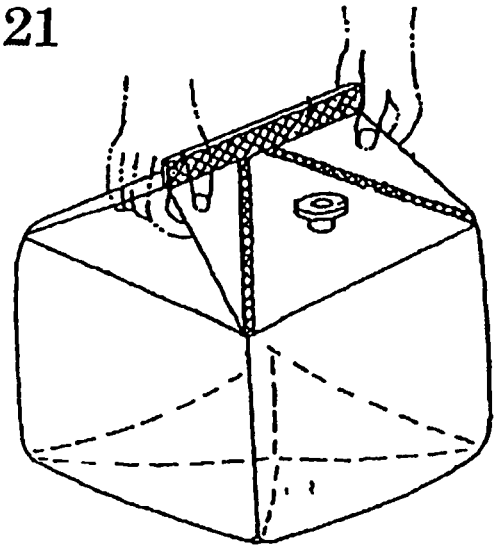


Fig.21



REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- JP 649174 U **[0009] [0010] [0011] [0012] [0015]**
- JP 2008763 A **[0016]**