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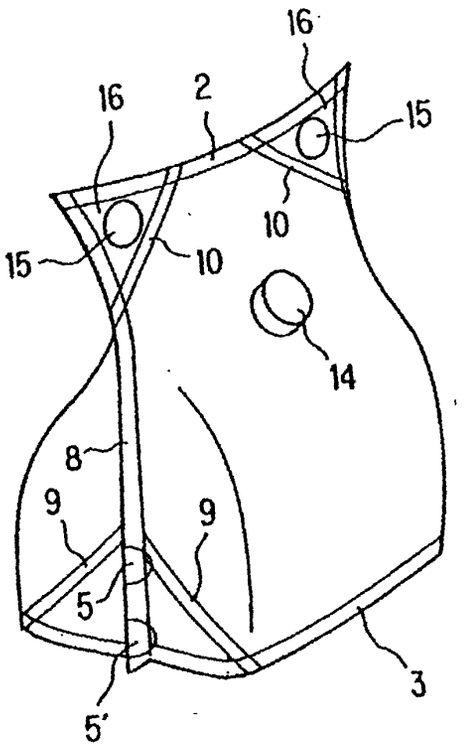
(54) **BAG-IN-BOX INNER BAG**

(57) A bag-in-box inner bag which has compatibility established therein between excellent self-standing ability and practical strength when the inner bag is to be handled without an outer box and which allows less liquid to remain during liquid discharge and makes it easy to hold container and is superior in container handling and handiness and which is rugged. This bag-in-box is a bag-in-box inner bag in the form of a self-standing bag comprising a front film having a charging/discharging spout, a rear film and a bottom film inserted between these two films, the three films being adhered by sealing, characterizing in that the bag-in-box inner bag has a comer part in the upper region divided from the containing part by the heat sealed part.

Fig.5



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Description

FIELD OF THE INVENTION

[0001] The present invention relates to the improvement for the handling of a container for liquid which is generally called as a bag-in-box, comprising an inner bag prepared by heat sealing synthetic resin films and an outer box made of cardboard, which is used for the purpose of filling up, preserving and transferring of liquid. More in detail, the present invention relates to the improvement of self-standing ability and mechanical strength of an inner bag for bag-in-box when it is filled up with liquid and handled without an outer box, further the present invention aims to reduce the remaining amount of liquid in a container after whole contents are discharged, and further to improve the easiness for handling of the inner bag filled up with liquid.

BACKGROUND OF THE INVENTION

[0002] In general, a container for liquid composed of an inner bag produced by heat sealing of synthetic resin films 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. Recently, for the purpose of severe sanitary controlling of production environment of foods or medicines, the requirements to pick out an inner bag from an outer box and carrying it in alone into production environment so as to protect the producing environment from the contamination by dusts generated from the outer box is becoming more serious.

[0003] However, an inner bag made of an ordinary synthetic resin film is a flat square bag whose four sides are sealed, and when the inner bag is filled up and handled without an outer box, the following problems are arisen. That is, the self-standing ability of the bag is very poor, and since there is no handling part, the handling of the inner bag is very bad. Further, in a case when the inner bag of flat square shape is set in the outer box and entire contents in the inner bag is discharged, there is also a problem that the small portion of the contents is easily remaining between the films at the corners of the inner bag. Concerning the above mentioned problems, there is a strong demand from the consumers of the bag-in-box to develop a new inner bag for bag-in-box having self-standing ability, with easiness in handling and the amount of remaining liquid is small.

[0004] Regarding to the improvement of the self-standing ability, uses of molded type containers having good shape maintaining stability fabricated by a blow molding method or by a vacuum forming method can be considered. However, from the view point that the reduction of the amount of garbage is currently strongly required and from the view point of the manufacturing costs, an inner bag for bag-in-box made of film, which is recognized to have a good disposable adaptability and to be lower price, is requested. The gazette type inner bag disclosed in Japanese Utility Model Laid-open Publication JP64-9174 has adequate self-standing ability as a container when taken out from an outer box and handled. Further, as disclosed in Japanese Patent Laid-open Publication JP2-8736, in a case of said gazette type inner bag, an upper folding part can be used as a handling part, and can be said as the more desirable shape than a flat shape bag (refer to Fig.11 and Fig.12).

[0005] However, even if the said gazette shape bag, when it is filled up, the shape of the bag becomes to have peculiarity that the frame part of it is more swollen than the bottom part and the center of gravity of it exists at the higher position, therefore, the self-standing ability of it is not sufficient. Further, concerning the case to discharged the contents in an inner bag without an outer box, it is necessary to hold the container by one hand for the easiness of work, therefore, when the gazette shape inner bag is handled by using an upper folded in part as the handle part, the easiness for holdling is not sufficient.

DISCLOSURE OF THE INVENTION

[0006] The present invention is carried out to dissolve the above mentioned problems and the object of this invention can be illustrated as follows. That is, the object of the present invention is to provide good self-standing ability and substantial mechanical strength to a filled up inner bag for bag-in-box when it is handled without an inner bag. Further, the object of the present invention is to obtain an inner bag for bag-in-box characterized that the remaining amount of the liquid at the discharging operation is small, the easiness for holding of the container is improved and easiness in handling and convenience are improved and having strong mechanical strength.

[0007] The inner bag for bag-in-box of the present invention is comprising, a front film with a spout, a rear film and a self-standing bag prepared by adhering a bottom film to be folded in between said front film and said rear by heat sealing with said front and rear films, wherein said inner bag for bag-in-box possesses at the upper position a corner part divided from a containing part by a heat sealed part.

BRIEF ILLUSTRATION OF THE DRAWINGS

[0008]

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

Fig.3 is the plane view of the folded state of the other example of the inner bag for bag-in-box of the present invention.

Fig.4 is the cross sectional view by A-A' line of the inner bag of Fig.3.

Fig.5 is the perspective illustration of the inner bag for bag-in-box of Fig.1 in which liquid is filled up without an outer box.

Fig.6 is the perspective view illustrating the discharging operation of the contents from the inner bag for bag-in-box of Fig.1 filled up with liquid after taken out from the outer box.

Fig.7 is the other example of the present invention.

Fig.8 is the other example of the present invention.

Fig.9 is the other example of the present invention.

Fig. 10 is the perspective diagram illustrating the discharging operation of the contents setting the inner bag to the outer box.

Fig.11 is the plane view of the folded state of a conventional gazette type inner bag for bag-in-box.

Fig.12 is the perspective illustration of a conventional type inner bag for bag-in-box in which liquid is filled up.

THE BEST EMBODYMENT TO CARRY OUT THE INVENTION

[0009] As mentioned above, the shape of the inner bag of the present invention is so called standing pouch, characterized by being prepared by inserting a bottom film which is folded in into inner side between a front film and a rear film and the side periphery part of these films are adhered by heat sealing. When the inner bag of this shape is empty and folded in, it is flat and not bulky, however, when the bag is filled up with liquid, the bottom film is opened and becomes an excellent inner bag with good self-standing ability.

[0010] Further, it is possible to prepare a corner part by dividing a containing part with a oblique heat sealed part formed from the side periphery part toward the upper periphery part. By preparing said corner part, in a case to discharge the contained liquid in the inner bag by turning the bag upside down, it can be possible to reduce the remaining amount of liquid in the upper part of the inner bag. Furthermore, it is desirable to make a hole in the corner part, because the hole can act as a handle part and make the easiness of handling better in cases when the inner bag is transferred without an outer box or when the contents in the inner bag is discharged. The outer periphery surrounding the hole can be sealed by heat or not be sealed by heat, however, it is preferable not to prepare a heat sealed part surrounding the hole, because the mechanical strength is improved and the function as the handle part becomes more reliable and the load burdened to fingers becomes smaller.

[0011] It is also preferable to prepare a handle part at the upper position of the upper sealing part instead of making a hole in a corner part.

[0012] The preferable shape of a bottom film of the inner bag of the present invention is rectangular or square. And as the type of the inner bag, the DOY PACK (registered trademark) type having radius in bottom seal or a so-called square bottom type having a bottom straight line seal and a oblique heat sealed part can be mentioned. And it is desirable to use the inner bag with square bottom, because said inner bag becomes stable when it is filled up with contents and placed in an outer box. Further, at the lower part of the inner bag of the present invention a bottom film is folded in into inner side between a front film and a rear film and the outer periphery side of these films are adhered by heat sealing. In this case, it is desirable to prepare a oblique belt shape heat sealed part which traverses from the crossing point of crease of folding part of the bottom film and the front film or the rear film or near the crossing point to the voluntary point of the heat sealed part of the lower side of the inner bag.

[0013] And, a case that a film on the outermost surface of which a resin layer not easily sealed by heat is arranged, such as a co-extruded multi layered film of polyamide and polyethylene or a laminate film prepared by laminating a polyolefin resin layer with a biaxial orientated film is used as the bottom film of the inner bag of the present invention will be illustrated as follows. Namely, a structure that a front film and a rear film are adhered by heat sealing can be obtained at the position where the side periphery heat sealed part is sealed by heat by making a cutting off part e.g. a punch hole in the bottom film at the corresponding position to the side periphery heat sealed part locating lower than the crossing point of above mentioned oblique belt shape heat sealed part and the side periphery heat sealed part. By said structural feature, the bottom film expands when contents is filled up into the inner bag, and the sole part of the bag forms a solid body and provides excellent self-standing ability to the filled up inner bag. And by preparing above mentioned oblique heat sealed part, it becomes possible to reduce the remaining amount of liquid between films at the corner of the bottom part when contained liquid is discharged from the inner bag.

[0014] Further, by above mentioned structural feature, even if a laminate film based on not-stretchable film e.g. a biaxial orientated film is used as the bottom film, since a front film and a rear film locating at the lower position from the crossing point of above mentioned oblique belt shape heat sealed part and the side periphery heat sealed part are adhered each other by heat sealing, it is possible to prevent the opening of the bottom film when inner pressure is loaded to the inner bag. Therefore, the stress burdened to the crossing point of the folding line of the bottom film and the side periphery heat sealed part can be reduced, and the substantial mechanical strength against the abnormal impact caused by careless falling down of the inner bag can be im-

proved.

[0015] Furthermore, it is possible to make at least one similar cut off part at further lower position than above mentioned cut off part or preferably at a corner part, and to adhere a front film and a rear film each other by heat sealing at said cut off part. By above mentioned structural feature, it becomes possible to improve the self-standing ability by providing a shape maintaining ability to the inner bag, and the effect to prevent the opening of the bottom film when inner pressure is loaded to the inner bag can be increased, therefore the substantial mechanical strength against the abnormal impact caused by careless falling down of the inner bag can be improved.

[0016] Still further, it is possible to make the bottom film of the inner bag open easily so that the operation for filling up the inner bag becomes easy by cutting off lower corner parts locating at the outer periphery of above mentioned oblique heat sealed part along with the oblique seal part. However, when this part is cut off, the self-standing ability of the inner bag and the mechanical strength against the falling down of the inner bag are deteriorated, it is necessary to select the materials and constitution of the inner bag voluntarily according to the required function level for the inner bag. And, when a laminate prepared so as a resin layer not easily sealed by heat is arranged on the outermost surface is used as the bottom film of the inner bag, it is desirable to cut off a lower angled corner part locating closely below the crossing point of a oblique sealing part and a side periphery heat sealed part.

[0017] The present invention will be illustrated more in detail.

[0018] As the materials of the inner bag used in the present invention, a polyolefin film e.g. polyethylene or polypropylene film can be used by alone, further, a laminated film can be also used. As the laminate, a laminated film prepared by following constitution can be used. Namely, a resin layer having good adhesive ability by heat sealing e.g. polyolefin type resin such as polyethylene or polypropylene (CPP) is arranged in the inmost layer, and a film having relatively high mechanical strength such as biaxial orientated polyamide, biaxial orientated polyester or biaxial orientated polypropylene is used as a base material. For the purpose to add a further necessary function, other kind of film can be further laminated. For example, according to the required function, a laminated film which laminates an adequate functional film can be voluntarily selected. For example, when the moisture-proof ability is necessary, a silica evaporated film or copolymer of ethylene-vinylalcohol can be added to the laminate, and when a light shielding ability is necessary, an aluminum foil or an aluminum metalized film can be added to the laminate. 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 adhering, however, not intending to be limited to them.

[0019] Examples of the present invention are illustrated in accordance with the drawings.

[0020] Fig.1 to Fig.4 are the examples of an inner bag for bag-in-box of the present invention showing the folded state. And Fig.4 is the A-A' line cross sectional view of the inner bag of Fig.3.

[0021] In Fig.1 to Fig.4, 1 is an inner bag, 2 is an upper heat sealed part, 3 is a lower heat sealed part, 4 is a bottom film in folded in state, 5, 5' are through holes maked in the bottom film before sealing process, 6 is a front film of the inner bag, 7 is a rear film of the inner bag, 8 is a side periphery heat sealed part, 9 is a oblique heat sealed part at the bottom and 10 is an upper oblique heat sealed part. 14 is a spout for pouring the contents out.

[0022] To the folded in bottom film 4 a through holes 5 and 5' are previously made closely under the crossing point 12 of side periphery heat sealed part 8 and lower oblique heat sealed part, then by adhering the side periphery by heat using the front film and rear film are sealed by heat at this hole.

[0023] Further, a handle hole 15 is prepared at the outer side of the upper oblique heat sealed part 10.

[0024] Fig.5 shows the filled up state of the inner bag for bag-in-box of Fig.3 with liquid without an outer box. The bottom film is extended and forms a sole of the container. Since the inner bag is characterized to have full-cheeked shape, center of gravity of the bag locates at the lower position, the excellent self-standing ability can be obtained.

[0025] And, since the front film and the rear film of the bag are forming one body by through hole heat sealed parts 5 and 5', the film at the crossing point 12 does not extend and the substantial mechanical strength can be improved.

[0026] Fig.6 is showing the discharging process of the contents from the filled up inner bag for bag-in-box of Fig.3 by taking out the bag from the outer box. The upper part of the bag is double folded and two upper handle parts are grasped by one hand by piling up them each other and one corner part of the bottom part is grasped by another hand. Thus, the handling of the inner bag is very easy.

[0027] Fig.7 is the other example of the present invention, and shows that a bottom angled corner is cut off remaining the heat sealed part of the front film and the rear film of the bottom part.

[0028] Fig.8 and Fig.9 are also the other examples of the present invention and showing that a handle part 16 is formed at the upper position of the upper heat sealed part 2.

[0029] And, Fig.10 is the perspective diagram of the inner bag illustrating the state that the content in the inner bag is discharged while the inner bag is set to the

outer box.

[0030] In the meanwhile, Fig.11 is the perspective illustration of an example of an inner bag for bag-in-box of the conventional gazette shape type bag-in-box and Fig.12 is an example of an inner bag for bag-in-box of the conventional gazette shape type bag-in-box.

POSSIBILITY FOR THE INDUSTRIAL USE

[0031] As mentioned above, the inner bag for bag-in-box of the present invention is characterized to have structural features described below. That is, a bottom film is folded in to the inner side and put between lower part of a front film and a rear film, then the outer periphery side of these films is adhered by heat sealing. A oblique belt shape heat sealed part which traverses from the crossing point of crease of folding part of the bottom film and a front film or a rear film or near the crossing point to the voluntary point of the heat sealed part of the lower side of the inner bag is prepared. And a front film and a rear film are adhered by heat sealing at the position where the side periphery is sealed by making a cutting off part e.g. a punch hole in the bottom film at the corresponding position to the side periphery heat sealed part locating lower than the crossing point of above mentioned oblique belt shape heat sealed part and the side periphery heat sealed part. By performing above mentioned structural feature, it becomes possible to provide an excellent self-standing ability to the inner bag and to reduce the remaining amount of liquid between films at the corner of the bottom part when contained liquid is discharged from the inner bag. Further, in a case when the abnormal inner pressure is loaded to the inner bag, the stress burdened to the crossing point of the folding line of the bottom film and the side periphery heat sealed part can be reduced, and the substantial mechanical strength against the abnormal impact caused by careless falling down of the inner bag can be improved.

[0032] Further, by preparing a oblique heat sealed part which connect an upper heat sealed part and side periphery heat sealed part on both corners of the upper part of the bag, in a case to discharge the contained liquid in the inner bag by turning the bag upside down, it can be possible to reduce the amount of remaining liquid in the upper corner part of the inner bag.

[0033] Furthermore, it is possible to seal the side periphery by making a hole in the bottom film closely lower the crossing point of above mentioned lower oblique heat sealed point and side periphery heat sealed part, and to cut off the outer part of said oblique heat sealed part along with the oblique seal part remaining the heat sealed part of the front film and the rear film. Thus, it becomes possible to make the bottom film of the inner bag open easily so that the operation for filling up the inner bag becomes easy.

[0034] Still further, by making a hole for handling at the outer side of the oblique heat sealed part connecting an upper heat sealed part and side periphery heat sealed part on both corners of the upper part of the bag, easiness of handling of the filled up inner bag without outer box can be accomplished.

Claims

1. An inner bag for bag-in-box comprising, a front film with a spout, a rear film and a self-standing bag prepared by adhering a bottom film to be folded in between said front film and rear film by heat sealing with said front and rear films, wherein said inner bag for bag-in-box possesses a corner part divided from a containing part by a heat sealed part at the upper position.

2. The inner bag for bag-in-box of claim 1, wherein a hole is made in at least one corner part.

3. The inner bag for bag-in-box in accordance with claim 1 or claim 2, wherein the self-standing bag is a bag with a rectangular sole.

4. The inner bag for bag-in-box of claim 3, wherein the triangle part locating to the lower part of the rectangular sole is cut off.

5. The inner bag for bag-in-box in accordance with any one of claims claim 1 to daim 4, wherein the bottom film is made of a laminate prepared by laminating so as a resin layer which is hard to be adhered by heat sealing is arranged on the outermost surface, and the front film and the rear film are adhered by heat sealing at or closely to the crossing point of the side periphery and the folding line of the bottom film by making a cut off part on said bottom film.

Fig.1

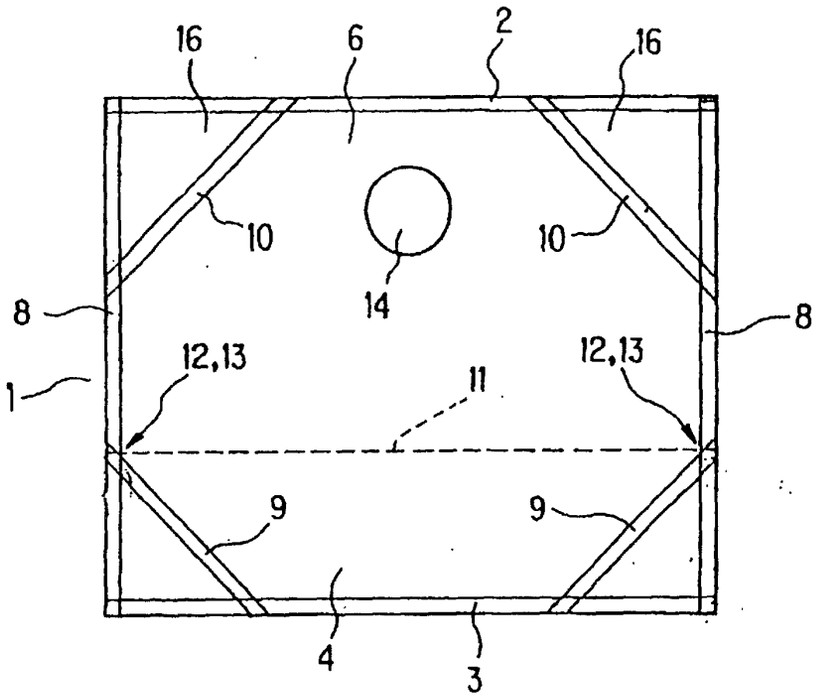

Fig.2

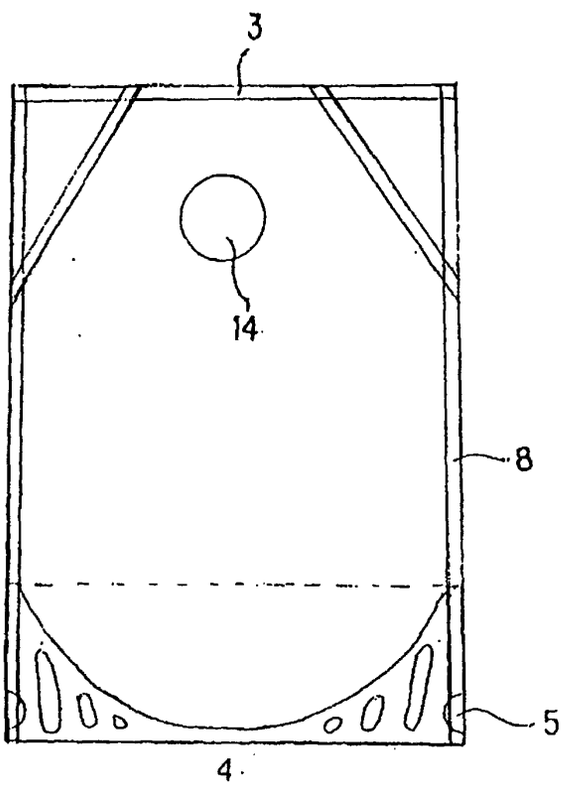

Fig.3

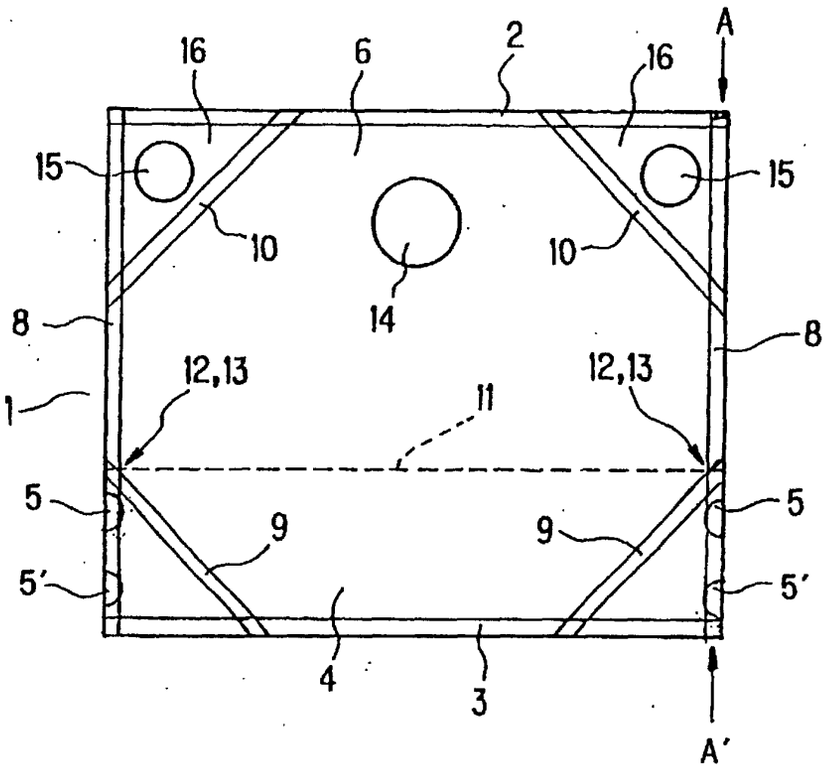

Fig.4

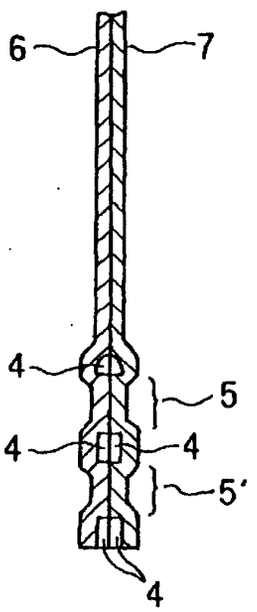

Fig.5

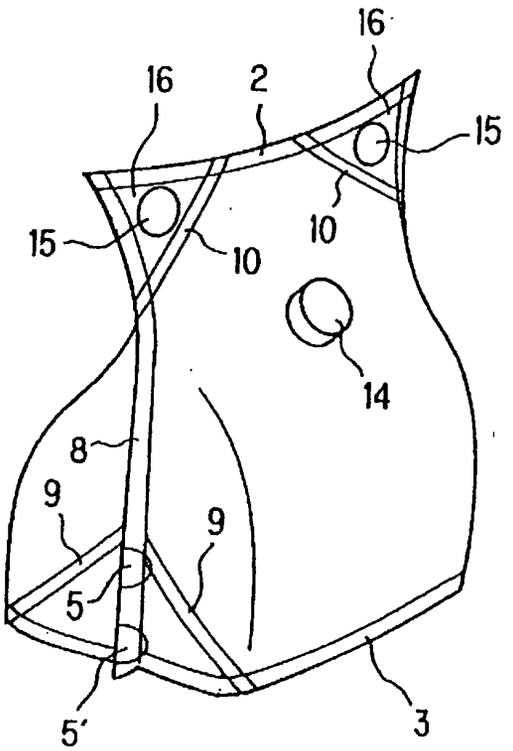

Fig.6

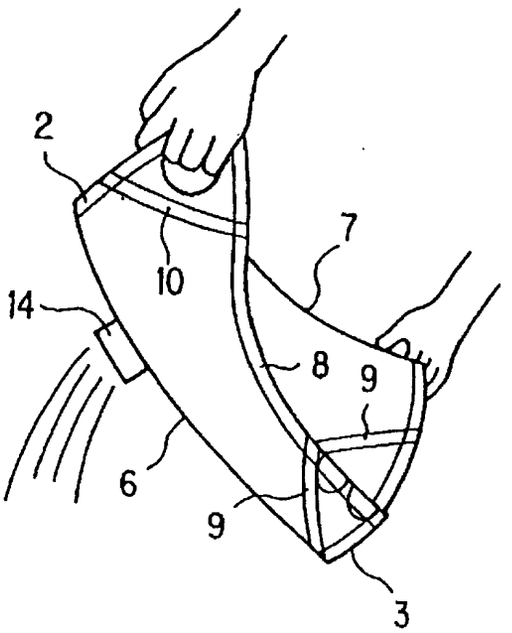

Fig.7

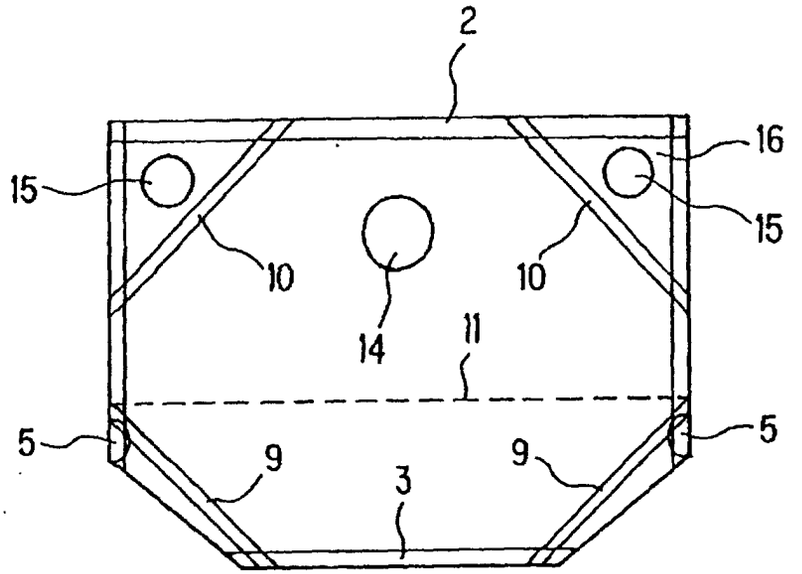
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Fig.8

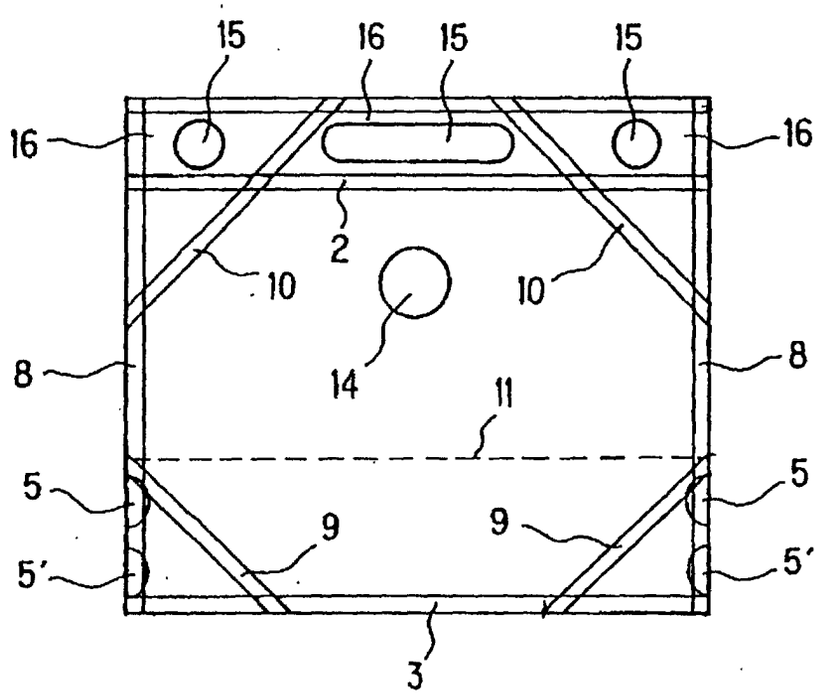
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Fig.9

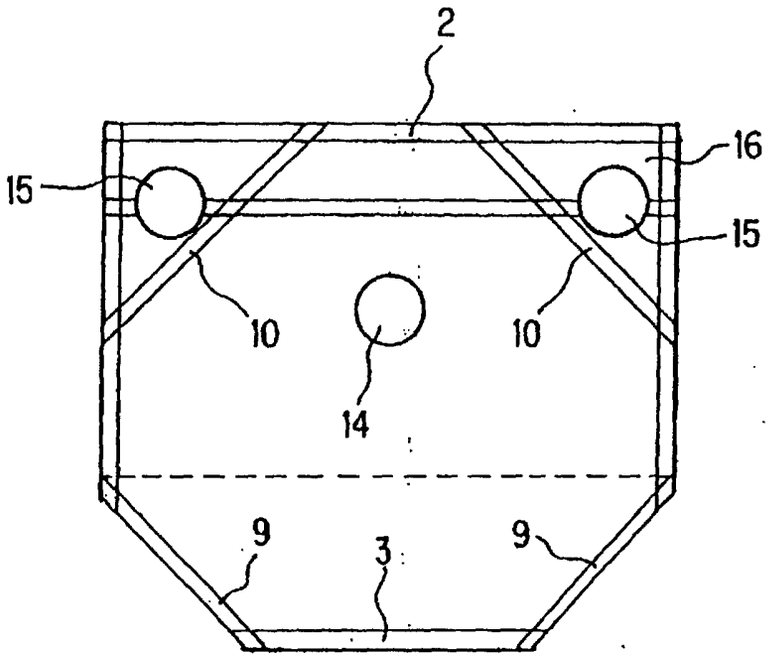


Fig.10

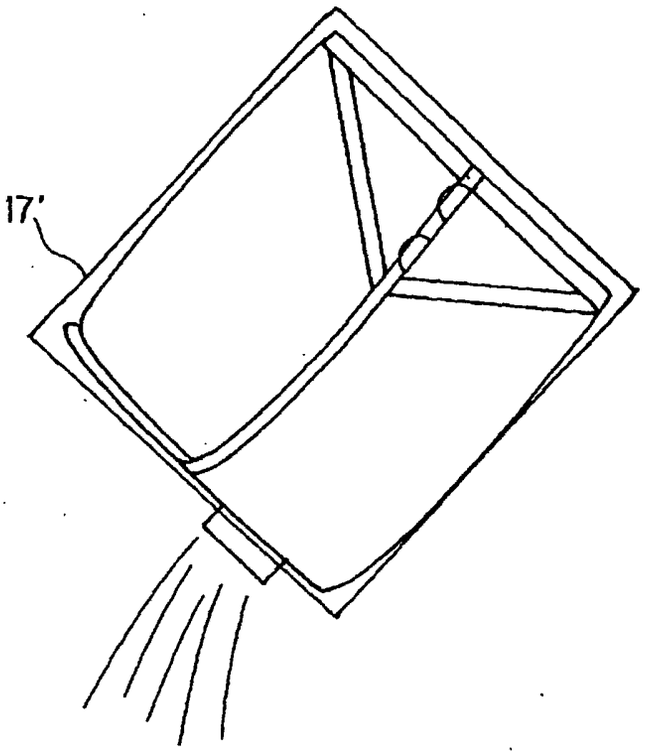


Fig.11

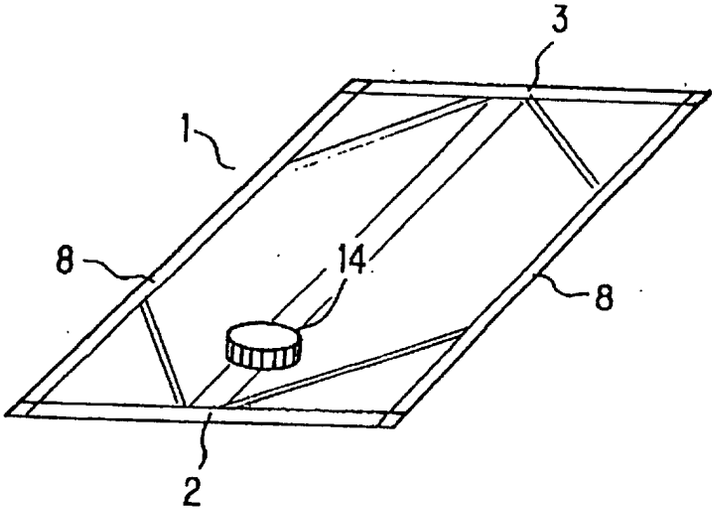
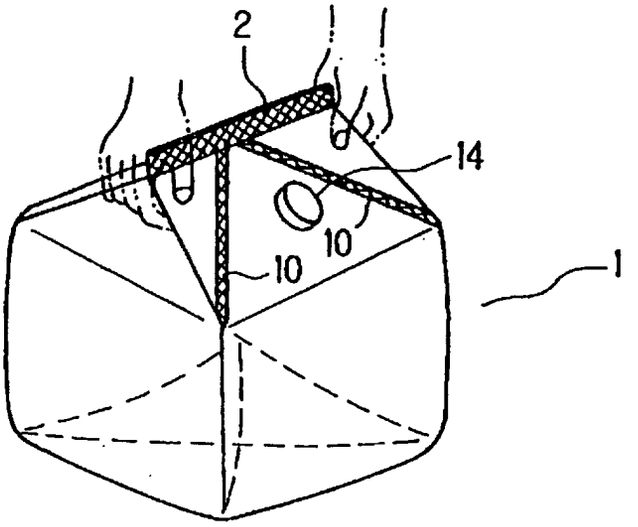


Fig.12



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP01/02357

A. CLASSIFICATION OF SUBJECT MATTER
Int.Cl[7] B65D33/10, 30/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
Int.Cl[7] B65D30/00-33/38, 77/06

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1922-1996 Toroku Jitsuyo Shinan Koho 1994-2001
Kokai Jitsuyo Shinan Koho 1971-2001 Jitsuyo Shinan Toroku Koho 1996-2001

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 156516/1981 (Laid-open No. 61737/1983), (Toppan Printing Co., Ltd.), 26 April, 1983 (26.04.83), Full text; Figs. 1 to 6 (Family: none)	1-5
Y	JP, 7-232748, A (Hosokawa Yoko K.K.), 05 September, 1995 (05.09.95), page 4, left column, line 46 to page 4, right column, line 17 (Family: none)	1-5

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
15 June, 2001 (15.06.01)	26 June, 2001 (26.06.01)
Name and mailing address of the ISA/ Japanese Patent Office	Authorized officer
Facsimile No.	Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)