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(54) **SPOUT MEMBER AND PACKAGING BAG UTILIZING SAME**

(57) It is aimed to provide a spout member and a packaging bag using the spout member which have excellent handling property and hygiene management performance at the time of supplying water or the like from the outside before and during use such as administration of water and medicine, in which a closure means for freely opening and closing an aperture formed by cutting off parts of peripheral portions of sealed film pieces is protected from a contained content at the time of storage or transportation and which have excellent protecting property even when an inner pressure acts in the packaging bag, excellent contamination preventing property until a spout is opened and excellent contamination preventing property and handling property after opening.

In a packaging bag formed by sealing peripheral portions of a plurality of film pieces and including an inlet portion and a spout portion at the peripheral portions, the inlet portion is opened as an inlet port by cutting off parts of the peripheral portions of the sealed film pieces to form an aperture by an unsealed portion, at least two holes are formed at the opposite sides of a part which becomes the inlet port at the peripheral portions near the inlet portion, and the holes serve as a suspension means for enabling the packaging bag to be suspended and a finger holding means. An openable and closable closure means including first and second members engageable with

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each other is formed by bonding an upper part of a first base member including the first member and an upper part of a second base member including the second member respectively to inner sides of the film pieces forming the aperture and facing each other, and a bottom end portion of one base member is formed to be longer than that of the other base member and bonded to the other film piece opposite thereto by an easily peelable seal, thereby forming an easily peelable portion which is peeled open to open the aperture at the time of opening. A spout member is provided with a spout portion including a base portion and a cylindrical portion projecting from the base portion, a sealing portion for sealing a tip portion of the cylindrical portion via a tearable weakened portion, and a cap portion. The weakened portion is torn by turning the cap portion to separate the sealing portion and the cap portion from the spout portion and simultaneously open the tip portion of the cylindrical portion, thereby forming a spout. The cap portion is shaped to cover the entire cylindrical portion, and the cap portion and the spout portion include a locking mechanism capable of locking the cap portion to the spout portion.

Description

[Technical Field]

[0001] The present invention relates to a spout member to be attached to a packaging bag, particularly a packaging bag for containing a tube-feeding enteral nutrient, tube-feeding enteral liquid diet, or the like which bag is opened by cutting off parts of peripheral portions of sealed film pieces to form an aperture or includes a spout for discharging a contained content, and a packaging bag using the same.

[Background Art]

[0002] Tube-feeding enteral nutrients (abbreviated as nutrients in some cases below) and tube-feeding enteral liquid diets (abbreviated as liquid diets in some cases below) are used while being contained in various packaging containers such as cans, paper containers, pouches and bottles. Above all, pouch-type packaging bags have excellent sealing property and handling property and are widely used. A pouch-type packaging bag generally includes a spout, and administration is performed by connecting a tube to the spout. Particularly, in the case of a nutrient or liquid diet, it is a general practice to use it after diluting it according to a patient's condition at the time of first introduction and to supply lacking medicine or water when the condition is stable. In such a case, some packaging bags are such that another member such as a molded member is attached to a peripheral edge portion of a packaging bag to serve as a spout (see patent literature 1 below) . However, there are problems of increasing material cost and attaching cost and difficult handling because packaging bags become bulky upon being stacked up particularly when spouts are large due to the fact that another member is tucked in the peripheral edge portion. Thus, packaging bags in each of which a part of the packaging bag is cut off to form a spout are also widely used (see patent literature 2 below).

[0003] However, when the spout is formed by cutting off the part of the packaging bag as described above, holding of a pouch becomes unstable with a liquid content contained unless there is any reliable holding means for enabling handling of the pouch. Further, it is also difficult to cut off the part of the pouch and to perform an operation of supplying water and medicine. In addition to problems of dropping and tilting the packaging bag to spill out the contained content, there have been also problems in hygiene management such as contamination of an inlet port such as by contact with the interior of the packaging bag and opening of the packaging bag more than necessary.

[0004] Further, a closure means such as a fastener seal provided at an aperture beforehand may be opened due to an inner pressure of a contained content at the time of storage or transportation and the contained content may attach to engaging parts to result in insufficient engagement or contaminate the contained content. Thus, there have been developed bags in which a closure means is separated from a contained content before opening and an easily peelable portion which is peeled open at the time of opening is provided (see patent literatures 3 and 4 below).

[0005] Conventionally, such an easily peelable portion is formed by bonding film pieces forming a packaging bag by a peelable seal. However, if an inner pressure acts in a packaging bag such as due to a fall at the time of storage or transportation, the easily peelable portion may be peeled open and its original purpose may not be fulfilled.

[0006] There are also packaging bags in which an easily peelable portion is provided at a part which becomes an aperture for the purpose of clearly showing opening by the peel opening of the easily peelable portion or reducing an inner pressure by the breakage of the easily peelable portion (see patent literatures 5, 6 below), but these packaging bags are not for preventing the easily peelable portion from being peeled open due to an inner pressure in the packaging bag.

[0007] Further, packaging bags each having another member such as a molded part as a spout member attached to a peripheral edge portion of the packaging bag beforehand to easily discharge a contained content are widely used. The spout member may be contaminated by being exposed to outside air and dust if it exposed to the outside of the packaging bag before opening such as at the time of transportation and storage. Further, H_2O O_2 and the like may permeate through the spout member to cause oxidation, deterioration and the like of a contained content such as vitamin destruction. Due to such susceptibility to problems in hygiene management and quality management, a spout member is sealed between film pieces in some packaging bags (see patent literatures 7, 8).

[0008] However, any of the spout members of the packaging bags disclosed in patent literatures below has a possibility that hands, fingers and the like touch the vicinity of the spout at the time of opening. Further, although the spout member is re-closable after being opened, it has to be used after being taken out from the separated film pieces, which presents problems in handling property and contamination preventing property.

[0009] Further, the spout member is easily movable even when being sealed in the packaging bag and subject to damage due to an external impact.

[Citation List]

[Patent Literatures]

[0010]

[Patent Literature 1]
Japanese Unexamined Patent Publication No. 2008-105696
[Patent Literature 2]
Japanese Unexamined Patent Publication No. 2005-206221
[Patent Literature 3]
Japanese Unexamined Patent Publication No. 2005-154017
[Patent Literature 4]
Japanese Unexamined Patent Publication No. 2005-40630
[Patent Literature 5]
Japanese Unexamined Patent Publication No. 2006-315760
[Patent Literature 6]
Japanese Unexamined Patent Publication No. 2002-225889
[Patent Literature 7]
Japanese Unexamined Patent Publication No. H10-305850
[Patent Literature 8]
Japanese Unexamined Patent Publication No. H11-130153

[Summary of Invention]

[Technical Problem]

[0011] The present invention aims to provide a spout member used for a packaging bag which is opened by cutting off parts of peripheral portions of sealed film pieces to form an aperture, in which a closure means for freely opening and closing the aperture is protected from a contained content at the time of storage or transportation, and which has excellent protecting property even when an inner pressure acts in the packaging bag and excellent handling property and hygiene management performance at the time of supplying water or the like from the outside before, after and during use such as administration of water or medicine and includes a spout, the spout member having excellent contamination preventing property until the spout is opened and excellent contamination preventing property and handling property after the spout is opened, and to provide a packaging bag using such a spout member.

[Solution to Problem]

[0012] The present invention has the following constructions to solve the above problem.

[0013]

(1) In a packaging bag formed by sealing peripheral portions of a plurality of film pieces and including an inlet portion and a spout portion at the peripheral portions, the inlet portion is opened as an inlet port by cutting off parts of the peripheral portions of the sealed film pieces to form an aperture by an unsealed portion, at least two holes are formed at the opposite sides of a part which becomes the inlet port at the peripheral portions near the inlet portion, and the holes serve as a suspension means for enabling the packaging bag to be suspended and a finger holding means.

[0014]

(2) In the packaging bag according to (1), a part of the inlet portion on a line connecting the holes at the opposite sides of the part that becomes the inlet port is made more rigid than other parts.

[0015]

(3) In the packaging bag according to (2), an openable and closable linear fastener portion is formed in the inlet portion on the line connecting the holes at the opposite sides of the part that becomes the inlet port.

[0016]

(4) In the packaging bag according to any one of (1) to (3), the holes are circular or substantially circular holes having a diameter in the range of 8 to 30 mm.

[0017]

(5) In the packaging bag according to any one of (1) to (3), peripheral edge portions of the holes are formed by perforation or half-cutting while leaving parts thereof uncut, the perforation or half-cutting is torn when the packaging bag is used, and the holes are formed in a state where parts of the film pieces are connected to a packaging bag main body.

[0018]

(6) In the packaging bag according to any one of (1) to (3), the holes are slits having a length in the range of 30 to 60 mm.

[0019]

(7) In the packaging bag according to any one of (1) to (6), the film pieces at peripheral edge portions of the holes are not sealed.

[0020]

(8) In the packaging bag according to any one of (1) to (3), parts of the holes that become upper edge portions when the holes are used as the finger holding means have a downward convex shape.

[0021]

(9) In the packaging bag according to (8), the film pieces at the upper edge portions of the holes are not sealed.

[0022]

(10) In the packaging bag according to any one of (1) to (9), at least one of the holes is so arranged that the spout portion is located at a substantially vertically lower position when the packaging bag is suspended using the hole as the suspension means.

[0023]

(11) In a packaging bag in which a containing portion is formed by sealing a peripheral portion of one or more film pieces and the packaging bag is opened by cutting off a part of the peripheral portion of the sealed film piece to form an aperture by an unsealed portion, an openable and closable closure means including first and second members engageable with each other and extending over the entire width of the aperture and an easily peelable portion which extends over the entire width of the aperture, is adapted to isolate the closure means from the containing portion before opening and is peeled open to open the aperture at the time of opening are provided at the aperture; the closure means is formed by bonding an upper part of a first base member including the first member and an upper part of a second base member including the second member respectively to inner sides of film pieces forming the aperture and facing each other; and a bottom end portion of one base member is formed to be longer than that of the other base member and bonded to the other film piece opposite thereto by an easily peelable seal, thereby forming the easily peelable portion.

[0024]

(12) In the packaging bag according to (11), the first and second base members are not exposed at an outer edge portion of a sealed portion formed by sealing the peripheral portion of the film piece.

[0025]

(13) In the packaging bag according to (11) or (12), the closure means is a fastener seal projecting from a base

portion and including a male first member and a female second member.

[0026]

(14) In the packaging bag according to (13), the closure means is formed such that a tip portion of the male first member has an elliptical cross-sectional shape perpendicular to a longitudinal direction, a recess of a tip portion of the female second member has substantially the same cross sectional shape perpendicular to the longitudinal direction as the tip portion of the first member, and a clearance is formed between the tip portion of the first member and that of the second member only near a base portion of the first member when the first and second members are engaged.

[0027]

(15) In the packaging bag according to any one of (11) to (14), an easily openable portion for enabling the peripheral portion of the film piece to be easily cut off is provided in a part which becomes an aperture and so formed that an opening end position cut off using the easily openable portion differs between the film pieces.

[0028]

(16) In the packaging bag according to any one of (11) to (15), a spout portion is provided at the peripheral portion of the sealed film piece.

[0029]

(17) A spout member comprises a spout portion including a base portion and a cylindrical portion projecting from the base portion; a sealing portion for sealing a tip portion of the cylindrical portion via a tearable weakened portion; and a cap portion, the weakened portion being torn by turning the cap portion to separate the sealing portion and the cap portion from the spout portion and simultaneously open the tip portion of the cylindrical portion, thereby forming a spout, wherein the cap portion is shaped to cover the entire cylindrical portion, and the cap portion and the spout portion include a locking mechanism capable of locking the cap portion to the spout portion.

[0030]

(18) In the spout member according to (17), a plurality of annular projecting portions for locking a tube are formed on an outer surface of the cylindrical portion of the spout portion.

[0031]

(19) In the spout member according to (17) or (18), the cap portion is capable of resealing the spout.

[0032]

(20) In the spout member according to any one of (17) to (19), the weakened portion is formed by a thinned portion having a thickness of 0.15 mm or more and below 0.2 mm.

[0033]

(21) In a packaging bag in which a containing portion is formed by a first sealing portion formed by sealing a peripheral portion of one or more film pieces and a spout member sealing portion is provided at the peripheral portion, the spout member sealing portion is formed by arranging the spout member according to (17) between two film pieces forming the packaging bag such that the cylindrical portion of the spout portion projects from the containing portion, fixing the base portion of the spout portion between the film pieces in the first sealing portion, and sealing the cap portion by a second sealing portion formed by sealing the film pieces around the cap portion such that the cap portion is sandwiched between the film pieces; and the spout is opened and the cap portion is separated from the spout portion by cutting off the film pieces forming the spout member sealing portion at a side more toward a tip of the spout member than the base portion of the spout member and simultaneously turning the cap portion of the spout member together with the film pieces.

[0034]

(22) In the packaging bag according to (21), an easily openable portion used to cut off the film pieces forming the spout member sealing portion is provided at the side more toward the tip of the spout member than the base portion of the spout member.

[0035]

(23) In the packaging bag according to (21) or (22), the easily openable portion is formed such that an opening end cut off using the easily openable portion is so curved as to be closer to the base portion of the spout portion at an intermediate part than at an opening start position and an opening end position.

[0036]

(24) In the packaging bag according to any one of (21) to (23), the easily openable portion is provided at a position more toward a tip of the cap portion than a skirt portion of the cap portion.

[0037]

(25) In the packaging bag according to any one of (21) to (24), an inlet portion is provided at the peripheral portion of the sealed film piece.

[0038]

(26) The packaging bag according to any one of (1) to (25) is for a tube-feeding enteral nutrient or tube-feeding enteral liquid diet.

[Advantageous Effects of Invention]

[0039] In the packaging bag of the present invention, at least two holes are formed at the part that becomes the inlet port at the peripheral portions near the inlet portion and function as the suspension means for enabling the packaging bag to be suspended and the holding means in an operation of handling the packaging bag. Thus, upon supplying water or the like from the outside before, after and during use such as administration of water or medicine, the packaging bag is stably held to facilitate a cutting operation and provide excellent handling property and hygiene management performance. By bonding the bottom end portion of the base member including the closure means to the opposite other film piece, the closure means for freely opening and closing the aperture is isolated from the contained content before opening. Thus, the packaging bag is protected from contamination and the like by the contained content at the time of storage or transportation to provide excellent hygiene management performance and handling property. Further, even if an inner pressure acts in the packaging bag, a pressure is unlikely to act to peel open the easily peelable portion bonding the bottom end portion of the base member, wherefore pressure resistance is excellent. Further, since the above protecting property and pressure resistance can be easily realized by the base member including the closure means, manufacturing is easy and cost performance is excellent. Since the spout member of the present invention includes the cap portion capable of sealing the spout before opening and covering the spout also after opening, contamination preventing property and handling property are excellent at the time of and after opening. Further, since the spout member is sealed and sandwiched in the packaging bag of the present invention, hygiene and control management performances until opening and breakage preventing property of the sealing portion for sealing the spout are excellent, and the spout member can be opened without being touched, wherefore contamination preventing property is excellent.

[Brief Description of Drawings]

[0040]

FIG. 1 is a front view of a packaging bag as an example of an embodiment of the present invention,
FIG. 2 is a sectional view along A-A of the packaging bag of FIG. 1,
FIG. 3 is a view of the packaging bag of FIG. 1 showing a state where a contained content is discharged in a suspended state,
FIG. 4 is a view of the packaging bag of FIG. 1 showing a state where an inlet portion is opened,
FIG. 5 is an enlarged view showing another example of an embodiment of a hole in the present invention,

FIG. 6 is an enlarged view showing another example of the embodiment of the hole in the present invention,
FIGS. 7(a) to 7(d) are enlarged views showing another example of the embodiment of the hole in the present invention and FIG. 7(e) is an enlarged view showing a state where perforation or half-cutting of FIG. 7 (a) to 7 (d) is torn to form the hole,
FIG. 8 is an enlarged view showing another example of a means for opening a spout,
FIG. 9 is a front view of a packaging bag as another example of the embodiment of the present invention,
FIG. 10 is a front view of a packaging bag as another example of the embodiment of the present invention,
FIG. 11 is a front view of a packaging bag as another example of the embodiment of the present invention,
FIG. 12 is a front view of a packaging bag as another example of the embodiment of the present invention,
FIG. 13 is an enlarged view of a hole in the packaging bag of FIG. 12,
FIG. 14 is a front view of a packaging bag as an example of the embodiment of the present invention,
FIG. 15 is a view showing the construction of a part of the packaging bag of FIG. 14 cut along X-X,
FIG. 16 is an enlarged view of a part, which becomes an aperture at the time of opening, in the packaging bag of FIG. 14,
FIG. 17 is a sectional view showing the construction of a fastener seal as an example of an embodiment of a closure means,
FIG. 18 is a sectional view of an aperture at the time of opening,
FIG. 19 is a view showing a state where opening end positions after opening are shifted between films,
FIG. 20 is a front view of a spout member as an example of an embodiment of the present invention,
FIG. 21 is a sectional view of the spout member of FIG. 20 when viewed from front,
FIG. 22 is a sectional view along X-X of the spout member of FIG. 20,
FIGS. 23(a) is a front view of a cap portion after the spout member of FIG. 20 is opened, FIG. 23 (b) is a bottom view of the cap portion of FIG. 23(a) and FIG. 23(c) is a top view of the cap portion of FIG. 23(a),
FIG. 24(a) is a front view of a spout portion after the spout member of FIG. 20 is opened and FIG. 24(b) is a bottom view of the spout portion of FIG. 24(a),
FIG. 25 is a front view showing an example of an embodiment of a packaging bag including the spout member of FIG. 20,
FIG. 26 is an enlarged view of a spout member sealing portion of the packaging bag of FIG. 25, and
FIG. 27 is a sectional view along Y-Y of the spout member sealing portion of FIG. 26.

[Embodiments of Invention]

[First Embodiment]

[0041] The present invention is described in more detail below with reference to the drawings. FIG. 1 shows a front view of a packaging bag as an example of an embodiment of the present invention and FIG. 2 shows a sectional view along A-A of the packaging bag of FIG. 1. In FIGS. 1 and 2, a main portion of a packaging bag 1 is formed by sealing peripheral portions 2 of two film pieces 1a, 1a as a sealed portion (shown by hatching in FIG. 1) by fusing or the like. After a peripheral portion of the packaging bag is sealed while leaving a part thereof as an unsealed portion, a contained content is filled into the packaging bag using the unsealed portion as a filling port and then the unsealed portion is sealed. FIG. 14 shows a front view of a packaging bag as an example of an embodiment of the present invention, FIG. 15 shows the construction of the packaging bag of FIG. 14 cut along X-X, and FIG. 16 shows an enlarged view of a part, which becomes an aperture at the time of opening, in the packaging bag of FIG. 14. In FIGS. 14 to 16, a main portion of a packaging bag 53 is formed by sealing peripheral portions 54 of two film pieces 53a, 53a as a sealed portion (shown by hatching in FIG. 14) by fusing or the like, whereby a containing portion 55 is formed. After a peripheral portion of the packaging bag is sealed while leaving a part thereof as an unsealed portion, a contained content is filled into the packaging bag using the unsealed portion as a filling port and then the unsealed portion is sealed. FIG. 20 is a front view of a spout member as an example of an embodiment of the present invention. FIG. 21 is a sectional view of the spout member when viewed from front. FIG. 22 is a sectional view along X-X of the spout member. FIG. 23 (a) is a front view of a cap portion after the spout member of FIG. 20 is opened, FIG. 23(b) is a bottom view of the cap portion of FIG. 23 (a) and FIG. 23 (c) is a top view of the cap portion of FIG. 23(a). FIG. 24(a) is a front view of a spout portion after the spout member of FIG. 20 is opened and FIG. 24 (b) is a bottom view of the spout portion of FIG. 24(a).

[0042] An inlet portion 3 and a spout portion 4 are provided at the peripheral portion 2 of the packaging bag 1. The inlet portion 3 is provided at an upper side portion 2a of the peripheral portion 2 and an unsealed portion of the interior of the packaging bag projects upward by making sealed portions 2b, 2b at the opposite ends of the upper side portion 2a wide and becomes an inlet port after opening. At the inlet portion 3 is provided an easily openable portion 6 crossing from one sealed portion to the other sealed portion at an opposite side through the unsealed portion that becomes the spout. By gripping one end of an upper side of the easily openable portion 6 and pulling it along the easily openable

portion 6 to cut off upper side portions of the sealed film pieces (a part of the peripheral portion), an aperture is formed by the unsealed portion to become an inlet port 3a, whereby the inlet portion is opened. The easily openable portion 6 is formed by half-cutting such as through laser irradiation. If the easily openable portion 6 is so formed that traces thereof in the respective two film pieces 1a, 1a forming the packaging bag 1 differ, opening end positions cut off along the easily openable portion 6 can be shifted between the film pieces, whereby the respective film pieces are more easily pinched and the inlet port is more easily opened. Note that, in the packaging bag 1 of FIG. 1, an openable and closable linear fastener portion 7 and an easily peelable portion 8 are formed at the unsealed portion on a line connecting holes 5, 5 to be described later. The linear fastener portion 7 is provided to close the inlet port after a pouring operation to facilitate a hygiene management, and the easily peelable portion 8 is provided to increase sealing property before the inlet port is opened. Actually, after the upper side portions of the film pieces are cut off by the easily openable portion 6, the easily peelable portion 8 is peeled open to completely open the inlet port.

[0043] In the packaging bag 1, two holes 5, 5 penetrating through the film pieces are formed in the sealed portions 2b, 2b on the opposite ends of the upper side portion, which becomes a peripheral portion near the inlet portion 3, at the opposite sides of the inlet port 3a. The holes 5, 5 are a suspension means for enabling the packaging bag to be suspended. As shown in FIG. 3, the packaging bag 1 is suspended by hooking one of the holes 5, 5 on a jig (denoted by 20 in FIG. 3) such as at the time of discharge from the spout portion to be described later, whereby the spout portion 4 is arranged at a bottom side so that a contained content can be easily discharged from the spout portion 4 (indicated by an arrow in FIG. 3). Further, water and medicine can be easily supplied through the inlet port 3a formed by opening the inlet portion 3 arranged at an upper side. By forming the holes 5, 5 in such a size that fingers are insertable, the holes 5, 5 also serve as a finger holding means which makes handling of the packaging bag more reliable. Specifically, for example, upon opening the inlet portion 3, the inlet port 3a can be formed as shown in FIG. 4 by inserting a thumb into one of the holes 5, 5 and another finger (e.g. index finger) into the other hole to hold the packaging bag 1 by one hand with the inlet portion 3 located at the upper side and by cutting the easily openable portion to open the inlet port as described above by the other hand. Water and medicine can be supplied through the thus formed inlet port 3a as indicated by an arrow in FIG. 4.

[0044] In the present invention, by providing two or more holes at the opposite sides of the part, which becomes the inlet port, as the finger holding means for the packaging bag as described above, the packaging bag, particularly the vicinity of the inlet port can be reliably held by one hand with the inlet port opened. Thus, water and the like can be easily supplied and various problems such as spill of the contained content caused by a fall or tilt of the packaging bag, contamination of the inlet port caused by contact with the interior of the packaging bag and the like and opening more than necessary can be reduced. Further, by using the holes also as the suspension means that enables the packaging bag to be suspended, the holding means can be easily formed without adding a separate member or the like. It is also possible to stably perform an opening operation by inserting a finger into one hole to hold the packaging bag while using the other hole as the suspension means.

[0045] The inlet portion of the packaging bag of the present invention is formed such that parts of the peripheral portions of the sealed film pieces are cut off to form the aperture, which becomes the inlet port, by the unsealed portion other than attaching a separate member such as a molded part to the peripheral portion. If the inlet port has a large diameter, the molded part as the member to be attached becomes larger. Thus, packaging bags become bulky when being stacked up for storage or transportation both before and after contained contents are contained, which is inconvenient. If the above construction is employed, packaging bags each including a large-diameter inlet port do not become bulky, are easily transported and can be manufactured at low cost. As compared with the case of using a molded part, the above construction of the inlet portion is subject to problems such as instability at the time of opening since the film pieces are cut off by being pulled by hand or using scissors or the like, the spill of the contained content caused by a fall or tilt of the packaging bag at the time of supplying water or the like, and contamination of the inlet port caused by contact with the interior of the packaging bag. However, the packaging bag can be stably held since two or more holes are formed at the opposite sides of the part, which becomes the inlet port, in the present invention.

[0046] It is sufficient to form at least two holes at the opposite sides of the part that becomes the inlet port. For example, three or more holes may be formed in consideration of the size of a packaging bag and a hand size difference. The arrangement of the holes is not particularly limited so long as the packaging bag can be more stably held by fingers substantially at the opposite sides of the part that becomes the inlet port.

[0047] The shape of the holes is not particularly limited so long as fingers are insertable at the time of handling the packaging bag. Circular or substantially circular holes like the holes 5 in the packaging bag of FIG. 1 or slits (denoted by 12 in FIG. 5) as shown in FIG. 5 may be formed. The size of the holes is preferably in the range of 8 to 30 mm in diameter in the case of circular or substantially circular holes and in the range of 30 to 60 mm in length in the case of slits because such holes do not cause any problem in strength and enable easy insertion of fingers and easy holding. Further, the film pieces may not be sealed around the holes as shown in FIG. 6. In FIG. 6, an unsealed part (unsealed portion) is denoted by 16. By not sealing the film pieces around the holes, seal edges caused by bending of end portions of the film pieces are unlikely to directly touch fingers even if the fingers are inserted since the unsealed portions are

softer and more flexible than sealed portions. Thus, the fingers do not get sore. The width of the unsealed portions is appropriately set according to the sizes of the packaging bag and the holes and the like. Further, instead of forming the hole penetrating through the film pieces, a hole may be formed by perforating a peripheral edge portion thereof while leaving a part thereof unperforated (denoted by 13, 13' and 13" in FIGS. 7(a) to 7(c)) as shown in FIGS. 7(a) to 7(c) or by half-cutting (denoted by 13"' in FIG. 7(d)) as shown in FIG. 7(d), and perforation or half-cutting may be torn when the packaging bag is used to obtain a state where parts (denoted by 14 in FIG. 7(e)) of the film pieces are connected to the packaging bag main body as shown in FIG. 7(e). The film pieces connected to the packaging bag main body are folded and end portions of the film pieces are unlikely to touch a finger and, hence, the finger does not get sore. If the parts of the film pieces are connected to the packaging bag main body at an upper position, the packaging bag is held at the folded parts of the film pieces, which is more preferable. To make the perforation or half-cutting easily tearable, some of perforated or half-cut holes may be through holes.

[0048] A part of the hole which becomes an upper edge portion when the hole is used as the finger holding means may have a downward convex shape. With such a shape, the convex upper edge portion is bent when being held by the finger, the packaging bag is held at folded parts of the film pieces, and end portions of the film pieces are unlikely to touch the finger, which is preferable since the finger does not get sore. The film pieces at the upper edge portion of the hole may not be sealed to become an unsealed portion. If the film pieces at the upper edge portion of the hole are not sealed, the convex upper edge portion is more easily bent, which is more preferable, since the unsealed portion is softer and more flexible than the sealed portion.

[0049] FIGS. 12 and 13 show an embodiment in the case where parts of the holes that become the upper edge portions when the holes are used as the finger holding means have a downward convex shape. FIG. 12 is a front view of a packaging bag as another example of the embodiment of the present invention and FIG. 13 is an enlarged view of a hole in the packaging bag of FIG. 12. Note that the packaging bag of FIG. 12 differs from the packaging bag of FIG. 1 in the shape of the holes 5 and parts having the same constructions as the packaging bag of FIG. 1 are denoted by the same reference numerals. Each hole 50 in the packaging bag of FIG. 12 is formed such that a part 50a which becomes a lower edge portion when the hole 50 is used as a finger holding means has a semicircular shape and a part 50b which becomes an upper edge portion has a downward convex shape (convex portion 51) as shown in FIG. 13. Further, film pieces at the upper edge portion of the hole 50 are unsealed portions 52. In the case of the above construction, so long as the part of the hole that becomes the upper edge portion when the hole is used as the finger holding means has a downward convex shape, the shape of the hole other than the upper edge portion is not particularly limited and may be a circular, substantially circular, elliptical, substantially elliptical, substantially rectangular or like shape or a combination of these shapes. Further, the convex shape of the upper edge portion and the range of the unsealed portions are not particularly limited within such a range as not to prevent an effect that the folded end portions of the film pieces are unlikely to touch the finger.

[0050] In the present invention, a part of the inlet portion on a line connecting the holes at the opposite sides of the part that becomes the inlet port is preferably made more rigid than other parts to increase stability and facilitate a handling operation when the packaging bag is held by fingers. By employing such a construction, the film pieces of the packaging bag main body are unlikely to be wrinkled at the time of opening, thereby facilitating an opening operation. In addition, the inlet port is opened only by being lightly pushed from left and right sides by the fingers inserted in the holes of the holding means after opening, wherefore a pouring operation can be more stably and easily performed. After the pouring operation, the inlet port returns to its original shape only by relaxing the finger force, which is preferable also in hygiene management.

[0051] As a method for making the part on the line connecting the holes at the opposite sides of the part that becomes the inlet port more rigid than other parts, there is a method for forming an openable and closable linear fastener portion on the line connecting the holes at the opposite sides of the part that becomes the inlet port. The linear fastener portion has advantages of easy hygiene management because the inlet port can be closed after the supply through the inlet port and, simultaneously, can increase the rigidity on the line. Besides, a member having a higher rigidity than the film pieces forming the packaging bag may be attached in a strip on the line.

[0052] The packaging bag of the present invention includes the spout portion aside from the inlet portion at the peripheral portion 2. The spout portion needs to be so arranged that the contained content can be discharged in a suspended state since the packaging bag is suspended by the suspension means at the time of discharge, and is preferably provided at a position facing the suspension means, i.e. at a position facing the inlet port. In FIG. 1, a lower end portion of the packaging bag main body is slanted inwardly and the spout portion 4 is provided on one side of the slanted part. If the packaging bag 1 is suspended such as by hooking one of the holes 5 as the suspension means that doubles as the holding means on a jig, the spout portion 4 is arranged at a substantially vertically lower position, whereby the contained content is easily discharged from the spout portion 4 and easily supplied through the inlet port 3a formed by opening the inlet portion 3 arranged at the upper side. In the packaging bag of the present invention, it is preferable to arrange the spout portion at the substantially vertically lower position when the packaging bag is suspended using at least one of the holes as the suspension means as described above.

[0053] In the packaging bag 1 of FIG. 1, the spout portion 4 is formed by attaching a base portion of a molded spout member 4a to the packaging bag main body by thermal bonding or the like so that the tip of the spout member 4a projects out from the packaging bag main body. Although not shown, a tip portion of the spout member 4a is sealed by a cap or the like until opening. At the time of discharge, a tube or the like is connected to the spout to discharge the contained content to the outside after the cap or the like is removed to open the spout portion, thereby forming the spout.

[0054] In the present invention, the construction of the spout portion is not limited to the above. Besides, a pipe may be tucked in between the film pieces forming the packaging bag main body and exposed by cutting off parts of the film pieces, and a tube or the like may be connected to an end of the pipe to discharge the contained content to the outside. The material, size and attachment method of the above spout member are not particularly limited so long as the contained content is not affected and desired sealing property can be ensured.

[0055] In the embodiment of FIG. 1, the easily openable portion 6 crossing from one sealed portion to the other sealed portion at the opposite side through the unsealed portion that becomes the inlet port is provided at the inlet portion 3. It is preferable to provide the packaging bag of the present invention with the easily openable portion for opening the inlet portion because the opening operation can be more stably performed. As the easily openable portion, a curved cut is formed in an end portion of the sealed portion and a straight easily tearable part is provided to enable easy tearing by hand from the cut in the above embodiment of FIG. 1. The cut may be straight or triangular. For lower cost, only a cut as denoted by 6' in FIG. 8 may be formed or an opening position to be cut by scissors or the like may be clearly indicated by printing or the like.

[0056] In the packaging bag of the present invention, a through hole formed in the sealed portion or a separately formed suspension means such as a hook may be provided in addition to the above suspension means that doubles as the holding means.

[Second Embodiment]

[0057] The packaging bag of the present invention is not limited to the above embodiment, and the following arrangement of the inlet portion and the spout portion may be, for example, cited as the one that enables the contained content to be discharged when the packaging bag is suspended. FIG. 9 shows a front view of a packaging bag as another example of the embodiment of the present invention. In FIG. 9, a main portion of a packaging bag 21 is formed by sealing peripheral portions 22 of two film pieces as a sealed portion (shown by hatching in FIG. 9) by fusing or the like. An inlet portion 23 and a spout portion 24 are provided at the peripheral portion 22 of the packaging bag 21. The inlet portion 23 is provided at one corner of an upper side portion 22a of the peripheral portion 22 and an unsealed portion, which becomes an inlet port, projects at a corner portion of the packaging bag. Two holes 25, 25 penetrating through the film pieces are formed at the sealed portion at the opposite sides of the unsealed portion and serve as a suspension means at the time of discharge and a finger holding means when the packaging bag is handled. The spout portion 24 is provided at one lateral portion facing the inlet port.

[Third Embodiment]

[0058] FIG. 10 shows a front view of a packaging bag as another example of the embodiment of the present invention. In FIG. 10, a main portion of a packaging bag 31 is formed by sealing peripheral portions 32 of two film pieces as a sealed portion (shown by hatching in FIG. 10) by fusing or the like. An inlet portion 33 and a spout portion 34 are provided at the peripheral portion 32 of the packaging bag 31. The inlet portion 33 is constructed similarly to the inlet portion 3 of the packaging bag 1 of FIG. 1 and provided at an upper side portion 32a of the peripheral portion 32. Two holes 35, 35 penetrating through the film pieces are formed at the sealed portion at the opposite sides of an unsealed portion which becomes an unsealed portion, and serve as a suspension means at the time of discharge and a finger holding means when the packaging bag is handled. The spout portion 34 is provided at a bottom piece portion facing the inlet port.

[Fourth Embodiment]

[0059] FIG. 11 shows a front view of a packaging bag as another example of the embodiment of the present invention. In FIG. 11, a main portion of a packaging bag 41 is formed by sealing peripheral portions 42 of two film pieces as a sealed portion (shown by hatching in FIG. 11) by fusing or the like. An inlet portion 43 and a spout portion 44 are provided at the peripheral portion 42 of the packaging bag 41. The inlet portion 43 is provided at one corner of an upper side portion 42a of the peripheral portion 42 and projects obliquely upward from a corner portion of the packaging bag. Sealed portions bulge out to the left and right at the opposite sides of an unsealed portion which becomes an inlet port, and two holes 45, 45 penetrating through the film pieces are formed at the sealed portions at the opposite sides of the unsealed portion that becomes the inlet port. The holes 45, 45 serve as a suspension means at the time of discharge and a finger holding means when the packaging bag is handled. The spout portion 44 and a filling port are constructed similarly to

those of the packaging bag of FIG. 1. By shaping the inlet portion to project obliquely upward from the corner portion of the packaging bag, a pouring operation can be more easily performed.

[Fifth Embodiment]

[0060] A part 56 which becomes an aperture at the time of opening is formed in an upper side of a packaging bag 53 of FIG. 14. An easily openable portion 58 crossing from one sealed portion to the other sealed portion at an opposite side through an unsealed portion 57 which becomes the aperture is provided at the part 56 that becomes the aperture. By gripping one end of an upper side of the easily openable portion 58 and pulling it along the easily openable portion 58 to cut off upper side portions of the sealed film pieces (a part of the peripheral portion), the aperture is formed by the unsealed portion to open the packaging bag. The easily openable portion 58 is formed by half-cutting such as through laser irradiation. Note that the easily openable portion 58 is so formed that traces thereof in respective two film pieces 53a, 53a forming the packaging bag 53 differ and opening end positions cut off along the easily openable portion 58 are shifted between the film pieces. Thus, the respective film pieces are more easily pinched and the inlet port is more easily opened.

[0061] In the packaging bag 53 of FIG. 14, a fastener seal 59 as an openable and closable closure means including first and second members engageable with each other and extending over the entire width of the unsealed portion 57 that becomes the aperture is provided in the part 56 that becomes the aperture at the time of opening, and an easily peelable portion 61 is provided at a side of the fastener seal toward a containing portion 55. The easily peelable portion 61 extends over the entire width of the unsealed portion 57 that becomes the aperture, isolates the fastener seal 59 from the containing portion 55 before opening and is peeled open to open the aperture at the time of opening. The above fastener seal 59 is provided to close the aperture after opening if necessary. Actually, the fastener seal 59 is opened and the easily peelable portion 61 is peeled open to completely open the packaging bag 53 of FIG. 14 after the upper side portions of the film pieces are cut off by the easily openable portion 58.

[0062] The part 56 of the packaging bag of FIG. 14 that becomes the aperture is constructed as follows. Specifically, the fastener seal 59 (closure means) includes a first member 60a with a male end portion 67 projecting from a base portion 69 and a second member 60b with a female end portion 68 projecting from a base portion 70 as shown in FIGS. 15 and 17, and the end portions 67, 68 are engaged with each other for closure. The first and second members 60a, 60b are respectively integrally formed to a first base member 65 and a second base member 66. As shown in FIG. 15, an upper part of the first base member 60a and that of the second base member 66 are bonded to inner sides of the film pieces 53a, 53a forming the packaging bag, which form the aperture and face each other, by seal portions 65a, 66a, a bottom end portion of the second base member 66 is formed to be longer than that of the first base member 65, and a surface of the former bottom end portion opposite to a surface where the seal portion 66a is formed at the upper side is bonded to the opposite other film piece 53a by an easily peelable seal, whereby the easily peelable portion 61 is formed. FIG. 18 shows a sectional view of the aperture at the time of opening. As shown in FIG. 15, the closure means 59 is isolated from the containing portion 55 by the bottom end portion of the second base member 66 as a partition wall before opening, wherefore the packaging bag is protected from contamination and the like by the contained content at the time of storage or transportation. Even if an inner pressure acts in the packaging bag when the packaging bag is dropped or placed below other packaging bags, a pressure acts on the second base member 66 in a direction of an arrow A and is unlikely to act in a direction to peel the easily peelable portion, wherefore pressure resistance is excellent and a problem such as breakage of the easily peelable portion is unlikely to occur. Further, since the closure means and the easily peelable portion are sealed in the packaging bag by a seal portion 54a at a top side of the packaging bag, there is no likelihood of contamination of the closure means 59 from the outside and there are no problems such as contamination and spill of the contained content due to the broken easily peelable portion 61.

[0063] In the packaging bag of the present invention, the easily peelable portion is formed only by causing the base members formed with the closure means to extend downward and bonding them to the film pieces to attach the closure means to the film pieces forming the packaging bag. Thus, the closure means can be isolated from the contained content to prevent contamination thereof by a simple structure. Further, as compared with the case of bonding the film pieces, a pressure is unlikely to act to peel the easily peelable portion and pressure resistance, hygiene management performance and handling property are excellent. Furthermore, since the above properties can be easily realized by the base members provided with the closure means, manufacturing is easy and cost performance is excellent.

[0064] It does not matter which of the first and second members of the closure means is formed on the base member whose bottom end portion is longer than that of the other base member to form the easily peelable portion.

[0065] Note that, in the packaging bag 53 of FIG. 14, a hole 62 penetrating through the film pieces is formed as a suspension means which enables the packaging bag to be suspended in the sealed portion near the part 56 that becomes the aperture. By suspending the packaging bag 53 by hooking the hole 62 on a jig or the like such as at the time of discharge through a spout portion to be described later, the spout portion is located at a lower side and the contained content is easily discharged through the spout portion. Depending on the application of the packaging bag of the present

invention, one or more holes as described above may be formed for the purpose of suspension or the like. Particularly, it is preferable to include the spout portion and the hole described above in the case of application accompanied by a discharging operation. The shape, size, arrangement and the like of the hole are appropriately set according to the application, size, material and the like of the packaging bag. Further, a separately formed hook or the like may be provided as a suspension means.

[0066] In the packaging bag 53 of FIG. 14, an end portion of the lower side of the packaging bag main body is slanted inwardly and a spout portion 63 for discharging the contained content is provided at one side of the peripheral portion 54 at the slanted part. For the purpose of storage, the packaging bag of the present invention may be provided with only a part which becomes an aperture at the time of opening. However, for the purpose of discharging a contained content such as a nutrient or liquid diet, the spout portion as described above may also be provided. The arrangement and construction of the spout portion are appropriately set according to the application and the like of the packaging bag. Particularly when the contained content is a nutrient or liquid diet, the spout portion needs to be so arranged that the contained content can be discharged at the time of suspension since the packaging bag is suspended by the suspension means at the time of discharge. The spout portion is preferably provided at a position facing the suspension means such as the hole 62 in the packaging bag 53 of FIG. 14. The material, shape, size, arrangement, attachment method and the like of the spout portion are not particularly limited and a commonly used one can be generally used. In the packaging bag 53 of FIG. 14, the spout portion 63 is formed by attaching a base portion of a molded spout member 64, which becomes a spout at the time of opening, to the packaging bag main body by thermal bonding or the like, so that the tip of the spout member 64a projects out from the packaging bag main body, and a tip portion of the spout member 64a is sealed by a sealing member 64b, which can be torn open, until opening. The spout member 64a and the sealing member 64b are arranged between two film pieces formed to project from the packaging bag main body and peripheral portions (denoted by 54' in FIG. 14) of the film pieces are sealed, whereby the spout member 64a and the sealing member 64b are sealed between the film pieces. Further, an easily openable portion 58' for enabling the film pieces to be easily cut off is provided at base portions of the film pieces sealing the spout member 64a and the sealing member 64b. At the time of discharge, the filmpieces sealing the spout member 64a and the sealing member 64b are cut off using the easily openable portion 58' and, simultaneously, the sealing member 64b is twisted to tear the sealed position and the sealing member 64a is removed together with the film pieces, whereby the spout member 64a is exposed to open the spout. A tube or the like may be connected to the spout to discharge the contained content to the outside. By sealing the spout member 64a and the sealing member 64b by the film pieces, contamination of the spout before opening can be prevented. As another construction of the spout portion, a pipe may be tucked in between the film pieces forming the packaging bag main body and exposed by cutting off parts of the film pieces, and a tube or the like may be connected to an end of the pipe to discharge the contained content to the outside.

[0067] In the embodiment of FIG. 14, the easily openable portion 58 crossing from one sealed portion to the other sealed portion at the opposite side through the unsealed portion 57 that becomes the aperture is provided at the part 56 which becomes the aperture at the time of opening. It is preferable to provide the packaging bag of the present invention with the easily openable portion for enabling the peripheral portions of the film pieces to be easily cut off because the opening operation can be more stably performed. As the easily openable portion, a curved cut is formed in an end portion of the sealed portion and a straight easily tearable part is provided to enable easy tearing by hand from the cut in the above embodiment. The cut may be straight or triangular. For lower cost, only a cut may be formed or an opening position to be cut by scissors or the like may be clearly indicated by printing or the like. In the present invention, the easily openable portion is preferably so formed that opening end positions cut off using the easily openable portion differ between the film pieces. A specific method is, as shown in the above embodiment, such that the easily openable portion is so formed by half-cutting or the like that traces thereof in the two film pieces forming the packaging bag differ, and opening end positions cut off along the easily openable portion are shifted between the film pieces, whereby the respective film pieces are more easily pinched. FIG. 19 shows a state where the opening end positions (denoted by 71a, 71b in FIG. 19) after opening are shifted between the film pieces.

[0068] The packaging bag of the present invention is preferably formed such that the first and second base members formed with the first and second members as the closure means are not exposed at an outer edge portion of the sealed portion formed by sealing the peripheral portions of the film pieces. Since the base members are not exposed at the outer edge portion of the sealed portion, i.e. the end portions of the closure means and the easily peelable portion are not exposed at the outer edge portion of the sealed portion, the strength of the sealing portion is not reduced and leakage of the contained content and a reduction in sealing property caused by breakage such as at the time of a fall are unlikely to occur. Particularly, since the easily peelable portion is easily peelable, if the end portion thereof is exposed at the outer edge portion of the sealed portion, the interior of the packaging bag communicates with the outside to cause leakage of the contained content and a hygienic problem such as when the easily peelable portion is peeled open due to a damage or the like at the time of fall or handling.

[0069] In the packaging bag of the present invention, when the closure means is the fastener seal composed of the male first member and the female second member projecting from the base portions as in the above embodiment, the

sealing property of the part that becomes the aperture is more effective. Unless the fastener seal is isolated by the easily peelable portion as in the present invention, engaging parts of the fastener seal may be disengaged due to an inner pressure caused by the contained content at the time of storage or transportation and the contained content adheres to the engaging parts to result in insufficient engagement.

[0070] In the packaging bag of the present invention, the fastener seal is preferably formed such that a tip portion of the male first member has an elliptical cross-sectional shape perpendicular to a longitudinal direction, a recess of a tip portion of the female second member has substantially the same cross sectional shape perpendicular to the longitudinal direction as the tip portion of the first member, and a clearance is formed between the tip portion of the first member and that of the second member only near the base portion of the first member when the first and second members are engaged. FIG. 17 shows a sectional view of an embodiment of the construction of a fastener seal. The fastener seal of FIG. 17 includes a male first member 60a integrally formed to a first base member 65 and a female second member 60b integrally formed to a second base member 66. The first member 60a includes a tip portion 67 and a base portion 69 connected to the base member, and the second member 60b includes a tip portion 68 and a base portion 70 connected to the base member. The tip portion 67 of the first member 60a has an elliptical cross sectional shape perpendicular to the longitudinal direction, and a recess of the tip portion 68 of the second member 60b has substantially the same cross sectional shape perpendicular to the longitudinal direction as the tip portion 67 of the first member. Further, at the time of engaging the first and second members, a clearance is formed between the tip portion 67 of the first member and that 68 of the second member only near the base portion 69 of the first member. If the above construction is employed, the tip portions 67, 68 closely adhere to each other to improve sealing property when the first and second members are engaged. Further, by forming the engaging parts to have an elliptical cross sectional shape, the tip portion 67 of the first member and that 68 of the second member are more strongly engaged and not easily disengaged even if an inner pressure in the containing portion increases. Further, at the time of disengagement, the fastener seal is easily opened by inserting a finger into the above clearance.

[Sixth Embodiment]

[0071] A spout member S of FIG. 20 is mainly composed of a cap portion, a spout portion 73 and a sealing portion 81. The spout portion 73 includes a base portion 85 and a cylindrical portion 80 projecting from the base portion 85. The sealing portion 81 seals a tip portion of the cylindrical portion 80 in the spout portion 73 via a tearable weakened portion 81a and is supported at an inner side of a tip portion of the cap portion 72 as described later. By turning the cap portion 72 either to the left or right as indicated by arrows A in FIG. 20, the weakened portion 81a is torn to separate the cap portion 72 and the sealing portion 81 from the spout portion 73 and, simultaneously, the tip portion of the cylindrical portion 80 can be opened to serve as a spout. The cap portion 72 is shaped to entirely cover the cylindrical portion 80 and the cap portion 72 and the spout portion 73 are provided with a locking mechanism capable of locking the cap portion 72 to the spout portion 73.

[0072] In the spout portion of the present invention, the "tearable weakened portion" means a part worked to reduce material strength or a part having a lower strength than other parts by being thinned or narrowed.

[0073] The cap portion 72 in the spout member S of FIG. 20 mainly includes a cap main body 74, a supporting portion 75 provided at an inner side of a tip portion of the cap main body 74 and opening assisting portions 76, and flange portions 77 and cut portions 78 are provided at the bottom of the cap portion. Together with locking portions 83 and projecting portions 84 of the spout portion 73 to be described later, the flange portions 77 and the cut portions 78 constitute the locking mechanism capable of locking the cap portion 72 to the spout portion 73 after the cap portion 72 is separated.

[0074] The cap main body 74 is shaped to entirely cover and protect the cylindrical portion 80 of the spout member S, and it is preferable in terms of preventing breakage that a clearance which cannot be resealed is not formed between the inner surface of the cap main body and the outer surface of the cylindrical portion. The supporting portion 75 supports the sealing portion 81 for sealing the tip portion of the cylindrical portion 80 and prevents the sealing portion 81 from falling after opening. The sealing portion 81 seals the tip portion of the cylindrical portion 80 via the tearable weakened portion 81a circumferentially formed on the tip portion of the cylindrical portion before opening as shown in FIGS. 21, 22. A projecting portion 81b projecting in a lateral direction is formed on an upper side of the side surface of the sealing portion 81 and supported by the supporting portion 75 of the cap portion. Further, four convex guide portions 79 are formed on the inner side of the cap main body 74 and, as shown in FIG. 23(b), the sealing portion 81 has a side surface portion thereof supported by the guide portions 79 of the cap portion so as not to move in the lateral direction. After opening, as shown in FIGS. 23, the supporting portion 75 and the guide portions 79 support the sealing portion 81 to prevent the sealing portion 81 from falling to a lower side of the cap portion. The upper surface of the cap portion is sealed as shown in FIG. 23(c). The lower surface of the sealing portion 81 is shaped to be engageable with a spout 82 to be described later after the separation of the cap portion, and resealing is possible by the engagement of the sealing portion 81 and the spout 82. Note that, by thinning the weakened portion 81a to have a thickness of 0.15 mm or more and below 0.2 mm, the tip portion of the cylindrical portion (inner side of the spout) after tearing can be a smooth fracture

surface free from roughness. In the present invention, it is preferable in terms of operability that the spout can be resealed by the cap portion after the separation of the cap portion if necessary as in the above embodiment.

[0075] The opening assisting portions 76 are a pair of plate portions bulging out to the left and right from the tip portion of the cap portion. The opening assisting portions are preferably provided to easily turn the cap portion at the time of opening. The shape of the opening assisting portions is not particularly limited and may have a substantially rectangular shape, a semicircular shape and another shape in addition to the shape obliquely projecting downward as in the spout member of FIG. 20 and only either the left or right one may be provided.

[0076] The spout portion 73 of the spout member S of FIG. 20 mainly includes the base portion 85 and the cylindrical portion 80 projecting from the base portion 85. Annular projecting portions 80a, 80b and 80c for locking a tube are formed on the outer side surface of the cylindrical portion 80. As described above, by turning the cap portion to tear the sealing portion, the tip portion of the cylindrical portion is opened to serve as the spout 82 as shown in FIG. 24.

[0077] The base portion 85 has a boat shape bulging out to the left and right and includes a plurality of linear reinforcing portions 85a on a side portion to increase strength and adhesion to the sealing portion. The shape of the base portion is not particularly limited, but it is preferable in terms of easy manufacturing and adhesion to the sealing portion to have a boat shape.

[0078] Two locking portions 83 are provided on the upper surface of the base portion 85 and two projecting portions 84 are provided on the side surface of the cylindrical portion 83. These constitute the locking mechanism together with the flange portions 77 and the cut portions 78 of the cap portion 72. The flange portions 77 of the cap portion 72 are locked by the locking portions 83 of the spout portion 73 to prevent the cap portion 72 from moving in a vertical direction. Further, the cut portions 78 of the cap portion 72 are locked by the projecting portions 84 to prevent the cap portion 72 from turning to the left and right. Normally, when no external force acts to turn the cap portion to the left or right, the cap portion 72 is locked to the spout portion 73. When a force acts to turn the cap portion to the left or right, the cap portion 72 is unlocked due to the flexibility of the cut portions 78 and the projecting portions 84 and the flange portions 77 turn along recessed portions of the locking portions 83. When the cut portions 78 turn 90° up to the projecting portions 83, the cap portion and the spout portion can be unlocked at intervals between the flange portions 77. Since sealing by the sealing portion is eliminated at this state at the time of opening, the cap portion can be separated to open the spout and, by performing a reverse operation, the cap portion can be locked to the spout portion to reseal the spout. Note that the locking mechanism in the present invention is not limited to the above.

[0079] In the spout member of the present invention, the annular projecting portions for locking the tube are preferably formed on the outer surface of the cylindrical portion of the spout portion as in the above embodiment. Since a plurality of types of tubes with different diameters are to be connected to the spout, various tubes can be firmly connected without using a connecting jig by providing a plurality of annular projecting portions with different outer diameters conforming to the inner diameters of the tubes for locking the tubes. Of course, one annular projection may be provided in the case of use only for specific tubes.

[0080] The spout member of the present invention can be manufactured by injection molding or other molding of a thermoplastic resin such as polyethylene or polypropylene generally used for spout members. If the spout member is formed as described above, the sizes of the entire spout member and the respective parts are not particularly limited within such a range as not to prevent the functions of the present invention and set according to the vicinity, discharge rate and the like of the contained content to be discharged.

[0081] A further embodiment of the packaging bag using the spout member of the present invention is shown below. FIG. 25 is a front view of the packaging bag including the spout member of FIG. 20, FIG. 26 is an enlarged view of a spout member sealing portion of the packaging bag of FIG. 25, and FIG. 27 is a sectional view along Y-Y of the spout member sealing portion of FIG. 26. In a packaging bag 86 of FIG. 26, peripheral portions of two film pieces are sealed by fusing or the like to form a first sealed portion 87, whereby a containing portion 88 is formed. After a peripheral portion of the packaging bag is sealed while leaving a part thereof as an unsealed portion, a contained content is filled using the unsealed portion as a filling port and then the unsealed portion is sealed.

[0082] In the packaging bag 86 of FIGS. 25 to 27, an end portion of the lower side of the containing portion 88 is slanted inwardly and a spout member sealing portion 95 for discharging the contained content is provided at one side of the peripheral portion 87 of the inwardly slanted part. The spout member sealing portion 95 is formed by arranging the spout member S of FIG. 20 between the two film pieces (denoted by 95a, 95a in FIG. 27) forming the packaging bag so that the cylindrical portion 80 of the spout portion projects from the containing portion, fixing the base portion 85 of the spout portion between the film pieces at the first sealed portion 87 by thermal bonding or the like when the first sealed portion is formed, and sealing the cap portion 72 by a second sealed portion 96 formed by sealing the film pieces around the cap portion 72 so that the cap portion 72 is sandwiched between the film pieces 95a, 95a.

[0083] In the packaging bag of FIGS. 25 to 27, the cap portion 72 and the sealing portion 81 are separated from the spout portion 73 by cutting off the film pieces 95a, 95a forming the spout member sealing portion 95 at a side of the spout member S more toward the tip than the base portion 85 and simultaneously turning the cap portion 72 of the spout member together with the film pieces 95a, 95a, whereby the cap portion 72 and the sealing portion 81 are separated

from the spout portion 73 to open the spout and the cylindrical portion of the spout member is exposed to enable the connection of a discharge tube or the like. The cap portion of the spout member is separated in a state sandwiched between the cut-off film pieces while holding the sealing portion. Since the cap portion is shaped to entirely cover the cylindrical portion and can be locked to the cylindrical portion if necessary, the spout is hygienically maintained even after opening. Since the cap portion is separated while being sandwiched between the film pieces, a possibility that the cap portion is dropped to the floor or the like from between the film pieces by mistake after separation to be contaminated can be reduced and, if not being reused, the cap portion can be discarded together with the film pieces.

[0084] Since the spout member is sealed in the packaging bag of the preset invention by the film pieces, hygiene management performance until the opening of the spout member is excellent. Further, even if the spout member is made of a material having low barrier property such as polyolefin, the barrier property of the spout portion is improved by providing the film pieces forming the packaging bag with barrier property. Further, a function such as a light blocking effect that is difficult to impart can be imparted to the entire packaging bag by imparting this function to the film pieces forming the packaging bag, wherefore quality management performance is also excellent. Furthermore, since the spout member is sandwiched by the film pieces, it is unlikely to move in the packaging bag and breakage preventing property such as prevention of unintended opening caused such as by breakage of the weakened portion is excellent. As described above, contamination preventing property is excellent since the spout can be opened without touching the spout member, and the spout is easily opened.

[0085] To sandwich the cap portion between the film pieces in the packaging bag of the present invention, the range of the second sealed portion is so set that the cap portion is held by the surrounding sealed portion without being fixed to the film pieces. If the second sealed portion is shaped in conformity with the outer shape of the cap portion, retention property is improved to improve breakage preventing property and easy opening. Thus, particularly when the cap portion is shaped to include the opening assisting portions as in the above embodiment, the second sealed portion may bulge out or an auxiliary sealed portion as a separated part of the second sealed portion may be provided below the opening assisting portions as shown in FIG. 26. If the cap portion needs to be removed from between the film pieces and includes opening assisting portions, it is better that the second sealed portion does not bulge out below the opening assisting portions.

[0086] The spout member sealing portion 95 is provided with an easily openable portion 97 to cut off the film pieces 95a, 95a at the side more toward the tip than the base portion 85 of the spout member. By providing the spout member sealing portion with the easily openable portion as described above in the packaging bag of the present invention, the film pieces can be easily cut off to realize easy opening and it can be prevented that the vicinity of the tip of the spout member sealing portion is cut off by mistake and fingers or the like touch the spout member sealed inside. The easily openable portion is formed such as by a method for forming a half-cut groove in the film pieces forming the packaging bag by a laser beam, a method for forming another layer after base films of the film pieces are perforated or a method for forming a cut having a curved, straight, triangular or other shape in the end portion of the sealed portion or by clearly indicating an opening position to be cut by scissors or the like by printing or the like for cost reduction. These methods may be combined. Further, if the easily openable portion 97 is provided at a side more toward the tip than a skirt portion of the cap portion of the spout member (corresponding to the flange portions 77 and their vicinities in the spout member S of FIG. 20), i.e. at a position at the spout side, the skirt portion of the cap portion is exposed from the film pieces after separation by cutting off the film pieces, wherefore the spout can be easily resealed.

[0087] In the present invention, it is preferable to form the easily openable portion such that the opening ends cut off using the easily openable portion are so curved as to be closer to the base portion of the spout portion at an intermediate part than at an opening start position and an opening end position since the spout member is easily opened together with the film pieces with a smaller force.

[0088] In the present invention, the arrangement and construction of the spout member sealing portion are appropriately set according to the application and the like of the packaging bag. Particularly when the contained content is a nutrient or liquid diet, the spout member sealing portion needs to be so arranged that the contained content can be discharged at the time of suspension since the packaging bag is suspended by the suspension means at the time of discharge. The spout member sealing portion is preferably provided at a position facing the suspension means such as a hole 94 in the packaging bag 86 of FIG. 25 to be described later. The material, shape, size, arrangement and attachment method of the spout member sealing portion are appropriately set according to the purpose using the above spout member of the present invention.

[0089] The packaging bag of the present invention may include an inlet portion at the peripheral portions of the sealed film pieces when the contained content is the one that requires the supply of medicine, water or the like such as a nutrient or liquid diet. An inlet portion 89 is formed in an upper part of the packaging bag 86 of FIG. 25. In the inlet portion 89, an aperture by an unsealed portion 90 is formed by cutting off upper side portions of the sealed film pieces (a part of the peripheral portion). An easily openable portion 91 crossing from one sealed portion to the other sealed portion at an opposite side through the unsealed portion 90 is provided at the inlet portion 89, and the upper side portions of the sealed film pieces (a part of the peripheral portion) can be cut off by gripping one end of an upper side of the easily

openable portion 91 and pulling it along the easily openable portion 91. In the packaging bag of the present invention, the easily openable portion for enabling the peripheral portions of the film pieces to be easily cut off is preferably provided at the inlet portion since an opening operation can be more stably performed. An easily openable portion similar to that in the above spout member sealing portion may be used. If a curved cut is formed in an end portion of the sealed portion as in FIG. 25 and a straight easily tearable part is provided to enable easy tearing by hand from the cut, the film pieces can be easily torn and the easily openable portion is so formed that traces thereof in the two film pieces forming the packaging bag differ. If opening end positions cut off along the easily openable portion are shifted between the film pieces, the respective film pieces are more easily pinched so that the inlet portion is easily opened. A specific method for forming an easily openable portion is such that the two film pieces forming the packaging bag are so half-cut that traces of the easily openable portion in the respective film pieces differ.

[0090] In the packaging bag 86 of FIG. 25, a fastener seal 92 as an openable and closable closure means extending over the entire width of the unsealed portion 90 is provided at the inlet portion and an easily peelable portion 93 is provided at a side of the fastener seal toward a containing portion 88 . The easily peelable portion 93 extends over the entire width of the unsealed portion 90, isolates the fastener seal 92 from the containing portion 88 before opening and is peeled open to open the inlet portion at the time of opening. The fastener seal 92 is provided to close the inlet portion after opening if necessary. The packaging bag 86 of FIG. 25 is actually completely opened by peeling open the easily peelable portion 93 after the upper side portions of the film pieces are cut off by the easily openable portion 91. Note that the form of the inlet portion is not limited to that of the above embodiment and an inlet member as a molded member may be attached. In this case as well, similar to the spout member sealing portion of the present invention, hygiene management performance, quality management performance and breakage preventing property of the inlet member are excellent if the inlet member is sealed by the film pieces.

[0091] In the packaging bag 86 of FIG. 25, the hole 94 penetrating through the film pieces is formed as a suspension means for enabling the packaging bag to be suspended in the sealed portion near the inlet portion 89. Such as when the contained content is discharged from the spout portion, the spout portion is arranged at the lower side and the contained content is easily discharged from the spout portion such as by hooking the hole 94 on a jig to suspend the packaging bag 86. The packaging bag of the present invention may be formed with one or more holes as described above for suspension purpose or other purpose according to the application. It is preferable to include the hole as described above particularly when the packaging bag includes the spout portion and used for a discharging operation. The shape, size, arrangement and the like of the hole are appropriately set according to the application, size, material and the like of the packaging bag. Further, a separately formed hook or the like may be provided as a suspension means.

[0092] In the present invention, a single film piece may be folded or a plurality of film pieces may be bonded to form the packaging bag main body. The material of the film piece is not particularly limited and materials conventionally used for pouches are usable. Such materials include, for example, composite films produced by laminating olefin-containing thermally adhesive resins as sealant layers such as low-density polyethylenes, linear low-density polyethylenes, ethylene-vinyl acetate copolymers and polypropylenes on various films as base materials such as biaxially-oriented polyolefin resin films, biaxially-oriented polyamide resin films, biaxially-oriented polyester resin films and ethylene-vinyl alcohol copolymer films. Further, in terms of improving protection for contained content, films in which a plurality of single layer films, metal foils and composite films are laminated on the above composite films and films in which silica, aluminum oxide and the like are laminated on the above composite films may also be used. Particularly, if a film in which an aluminum oxide layer is laminated on a laminate film of biaxially-oriented polyethylene terephthalate and biaxially-oriented polyamide is used as a base material, barrier property and aroma retention property are excellent and it becomes possible to use a pinhole testing machine or a metal detector and heat by microwaves after filling. The respective film pieces used may have a general thickness of 10 to 150 μm and the entire size thereof can be appropriately set according to a contained amount. The packaging bag is formed by sealing the peripheral portions of the sealant layers by thermal bonding or the like depending on the construction of the film pieces. Note that, if a retort sterilization process needs to be performed, the materials of the film pieces, the spout portion and the like forming the packaging bag are accordingly selected beforehand.

[0093] The shape of the containing portion of the packaging bag of the present invention is not particularly limited so long as it is formed by sealing the peripheral portions of the film pieces. However, such as when the packaging bag of the present invention is used to contain a tube-feeding enteral nutrient or tube-feeding enteral liquid diet, a gusset portion may be provided on a bottom surface portion or the like in terms of operability at the time of transportation and dissolving. In the case of providing a gusset portion, self-standing property of the packaging bag is improved and the contained amount is also increased. The gusset portion may be formed, for example, by arranging a film piece forming the gusset portion only on the bottom surface portion between the two film pieces forming a principal part of the main body. A gusset portion may also be provided on a side surface portion where neither the inlet portion nor the spout portion is provided or on a ceiling surface portion for an increase in the contained amount or another purpose.

[0094] The seal form and seal width of the peripheral portions of the film pieces at the time of forming the containing portion of the packaging bag of the present invention are also not particularly limited so long as the containing portion

is sealable. The shape and width may be so changed that hole(s), a hooking portion and the like as in the above embodiment can be formed.

[Example 1]

[0095] A packaging bag 1 having a similar construction as in FIG. 1 was manufactured by using laminate films in which a polyethylene terephthalate (PET) film having a thickness of 12μ m, a polyethylene terephthalate (PET) film having a thickness of 12 μm and barrier property and including an aluminum oxide (Al_2O_3) thin film, a polyamide (PA) film having a thickness of 15 μm and a linear low-density polyethylene (LLDPE) film having a thickness of 100 μm were successively laminated via adhesive layers as the film pieces 1a, 1a in the packaging bag 1 of FIG. 1, thermally fusing peripheral portions with the LLDPE films as sealant layers, and forming a linear fastener portion 7 and an easily peelable portion 8 at an inlet portion. At this time, a spout member 4a made of a high-density polyethylene (HDPE) resin was thermally bonded as a spout portion 4 to one side of the peripheral portion such that a base portion of the spout member 4a was sandwiched between the film pieces. Further, two through holes 5, 5 were formed as a suspension means and a holding means in sealed portions at the opposite sides of an unsealed portion, which becomes an inlet port 3a, by punching. The packaging bag was substantially dimensioned such that a width was 200 mm (width of a containing portion was about 180 mm), a height was 240 mm, a seal width was 5 to 10 mm, and a seal width of through hole formed parts was 40 to 50 mm. The through holes were round holes having a diameter of 20 mm. A contained content was filled using the unsealed portion as a filling port after the peripheral portion of the packaging bag was formed while leaving a part thereof unsealed as the unsealed portion, and then the unsealed portion was sealed by thermal fusion bonding. The inlet port was formed by tearing an easily openable portion 6 of the inlet portion and peeling open the easily peelable portion 8 to open the inlet port 3a. Water was supplied into the packaging bag while the inlet port 3a was opened by inserting two fingers into the through holes 5, 5. After the supply was completed, the inlet port was closed by the linear fastener portion 7. Subsequently, upon suspending the packaging bag, the packaging bag was brought to a suspension table while being held by the two fingers inserted in the through holes 5, 5 and suspended by hooking the through hole 5 facing the spout 4 on a jig, and the spout member 4a was opened to discharge the contained content.

[Example 2]

[0096] Using laminate films in which a polyethylene terephthalate (PET) film having a thickness of 12 μm, a polyethylene terephthalate (PET) film having a thickness of 12 μm and barrier property and including an aluminum oxide (Al_2O_3) thin film, a polyamide (PA) film having a thickness of 15 μm and a linear low-density polyethylene (LLDPE) film having a thickness of 100 μm were successively laminated via adhesive layers as the film pieces 53a, 53a in the packaging bag 53 of FIG. 14, peripheral portions were thermally fused with the LLDPE films as sealant layers. At that time, a fastener seal 59 as a closure means and an easily peelable portion 61 for an aperture to protect the fastener seal 59 before opening were provided at inner sides of the film pieces of a part 56 which becomes an aperture at the time of opening as shown in FIG. 14. As shown in FIG. 15, a first base member 65 with a male first member 60a and a second base member 66 with a female second member 60b of the fastener seal 59 were arranged at the inner sides of the respective film pieces facing each other and forming the aperture, upper parts of the respective base members were respectively bonded to the inner sides of the film pieces, and a bottom end portion of the second base member 66 formed to be longer than that of the first base member 65 was bonded to a part of the opposite other film piece below the closure means by an easily peelable seal, thereby forming the easily peelable portion 61. Note that the first and second members and the base members of the fastener seal were both made of a linear low-density polyethylene (LLDPE), and an easily peelable tape was bonded to the bottom end portion of the second base member 66. As shown in FIG. 14, a spout portion 63 was formed by arranging a spout member 64a made of a high-density polyethylene (HDPE) resin and a sealing member 64b at a tip portion of the spout member 64b between the two film pieces formed to project from the packaging bag main body, attaching a base portion of the spout member 64a to the packaging bag main body by thermal bonding, and sealing the peripheral portions of the film pieces to seal the spout member 64a and the sealing member 64b between the film pieces. Further, a through hole 62 was formed as a suspension means by punching. The packaging bag was substantially dimensioned such that a width was 200 mm (width of a containing portion was about 180 mm), a height was 240 mm, a seal width was 5 to 10 mm, and a seal width of a through hole formed part was 40 to 50 mm. The through hole was a round hole having a diameter of 20 mm. A contained content was filled using the unsealed portion as a filling port after the peripheral portion of the packaging bag was formed while leaving a part thereof unsealed as the unsealed portion, and then the unsealed portion was sealed by thermal fusion bonding. The unsealed portion 57 was formed into an aperture by tearing an easily openable portion 58 to open the fastener seal 59 and peeling open the easily peelable portion 61. After the packaging bag 53 was suspended by hooking the through hole 62 on a jig and water was supplied into the packaging bag by opening the fastener seal at the aperture, the fastener seal was closed and the spout portion 63 was opened to discharge the contained content.

[0097] The aperture of the packaging bag of Example 2 was opened, 600 ml of water was filled through the aperture, the packaging bag was horizontally statically placed with the fastener seal closed to close the aperture, and leakage through the fastener seal was visually confirmed for 10 minutes with and without application of pressure as shown in Table-1. 30 bags were tested. A test result is shown in Table-1.

[0098] It is understood from the result of Table-1 that the fastener seal in the packaging bag of the present invention has excellent pressure resistance.

[0099]

[Table-1]

	Example 2
No application of pressure	No leakage
Pressure of 300 g	No leakage
Pressure of 500 g	No leakage

[Example 3]

[0100] A cap portion shaped as shown in FIG. 20, made of a high-density polyethylene resin and having a thickness of 1 mm and a height of 35 mm was fabricated by injection molding. Further, a spout portion shaped as shown in FIG. 20, made of a high-density polyethylene resin and having a base portion width of 30 mm, a base portion height of 10 mm and a cylindrical portion height of 30 mm and a sealing portion were integrally fabricated by molding with the sealing portion mounted at a tip portion of a cylindrical portion via a thinned portion (weakened portion) having a thickness of 0.2 mm. The sealing portion was engaged with a supporting portion of the cap portion to form a spout member.

[Example 4]

[0101] A spout member was formed as in Example 3 except that the thickness of a thinned portion was 0.18 mm.

[Example 5]

[0102] A spout member was formed as in Example 3 except that the thickness of a thinned portion was 0.15 mm.

[Example 6]

[0103] Using laminate films in which a polyethylene terephthalate (PET) film having a thickness of 12 μm, a polyethylene terephthalate (PET) film having a thickness of 12 μm and barrier property and including an aluminum oxide (Al_2O_3) thin film, a polyamide (PA) film having a thickness of 15 μm and a linear low-density polyethylene (LLDPE) film having a thickness of 100 μm were successively laminated via adhesive layers as the film pieces in the packaging bag 86 of FIG. 25, peripheral portions were thermally fused with the LLDPE films as sealant layers. At that time, a fastener seal 92 as a closure means and an easily peelable portion 93 for an aperture to protect the fastener seal 92 before opening were provided at inner sides of the film pieces of an inlet portion 89 at the time of opening as shown in FIG. 25. Further, as shown in FIG. 25, a spout member sealing portion 95 was formed by arranging the spout member of Example 3 as the spout member S between the two film pieces forming the packaging bag such that the cylindrical portion 80 of the spout portion projects from a containing portion 88, fixing the base portion 85 of the spout portion between the film pieces in a first sealed portion 87 by thermal bonding or the like when the first sealed portion was formed, and sealing the cap portion 72 by a second sealed portion 96 formed by sealing the film pieces around the cap portion 72 so that the cap portion 72 was sandwiched between the film pieces. Further, a through hole 94 was formed as a suspension means by punching. The packaging bag was substantially dimensioned such that a width was 200 mm (width of a containing portion was about 180 mm), a height was 240 mm, a seal width was 5 to 10 mm, and a seal width of a through hole formed part was 40 to 50 mm. The through hole was a round hole having a diameter of 20 mm. A contained content was filled using the unsealed portion as a filling port after the peripheral portion of the packaging bag was formed while leaving a part thereof unsealed as the unsealed portion, and then the unsealed portion was sealed by thermal fusion bonding. In the inlet portion, the unsealed portion 90 was formed into an aperture by tearing an easily openable portion 91 to open the fastener seal 92 and peeling open the easily peelable portion 93. After the packaging bag 86 was suspended by hooking the through hole 94 on a jig and water was supplied into the packaging bag by opening the fastener seal 92 of the inlet portion, the fastener seal 92 was closed, the film pieces forming the spout member sealing portion 95 at a side more

toward a tip than the base portion 85 of the spout member S are cut off and, simultaneously, the cap portion 72 of the spout member was turned together with the film pieces to separate the cap portion 72 from the spout portion 73, thereby opening the spout, and a tube was connected to the cylindrical portion 80 for discharge.

[Example 7]

[0104] A packaging bag was fabricated as in Example 6 except that the spout member of Example 4 was used as the spout member S.

[Test Example 1]

[0105] For each of the spout members of Examples 3 to 5, the cap portion was turned to tear the weakened portion (thinned portion) and separate the cap portion from the spout portion, thereby opening the spout, and a fracture surface of the spout was visually observed. A result is shown in Table-2. It is understood from the result of Table-2 that roughness and stringiness were found on the fracture surface of only the spout member of Example 3 including the thinned portion having a thickness of 0.2 mm. The cap portion can be actually used even if having some roughness or stringiness, but is preferably free from roughness and stringiness.

[Test Example 2]

[0106] A test was conducted 10 times in which 400 ml of water was contained in each of the packaging bags of Examples 6 and 7, the sealed packaging bag was dropped from a height of 1.2 m with the spout portion faced downward, and leakage from the spout portion was visually confirmed every time the packaging bag was dropped. For the packaging bag from which no leakage was confirmed up to the 10^{th} drop test, a split in the thinned portion of the sealing portion was confirmed by a dye penetrant testing liquid. As a Comparative Example 1, a similar test was conducted for the exposed spout member of Example 4 without being covered by the film pieces. A result is shown in Table-3. It is understood from the result of Table-3 that the packaging bag of the present invention has excellent breakage preventing property of the spout portion even if the weakened portion is thinned to ensure a smooth fracture surface free from roughness in addition to easy opening and excellent hygiene management performance and quality management performance brought about by sandwiching the spout member between the film pieces.

[0107]

[Table-2]

	Visual Observation Result
Example 3	Roughness, stringiness found
Example 4	No roughness, no stringiness
Example 5	No roughness, no stringiness

[0108]

[Table-3]

	Visual Observation Result After Drop	Confirmation by Testing Liquid
Example 6	No abnormality after 1^{st} to 10^{th} drops	No abnormality
Example 7	No abnormality after 1^{st} to 10^{th} drops	No abnormality
C. Example 1	No abnormality after 1^{st} to 10^{th} drops	Bleed caused by breakage of thinned portion

[Industrial Applicability]

[0109] Since the packaging bag of the present invention is handled such as for supply and opening of the inlet port by being stably and hygienically held, it can be suitably used for application with a possibility of pouring a liquid or the like from the outside besides discharging a contained content, particularly as a packaging bag for containing a tube-feeding enteral nutrient or tube-feeding enteral liquid diet while enabling water or the like to be supplied from the outside before, after and during the discharge of the contained content. Further, since the closure means is protected from

contamination and the like by the contained content at the time of storage or transportation, hygiene management performance and handling property are excellent. Furthermore, since having excellent pressure resistance when an inner pressure acts in the packaging bag, the packaging bag of the present invention can be suitably used as a packaging bag including a closure means at an aperture for hygiene and control management of a contained content and particularly suitable as a packaging bag for containing a tube-feeding enteral nutrient or tube-feeding enteral liquid diet which requires hygiene management performance. Further, the packaging bag using the spout member of the present invention has excellent hygiene property of the spout member before opening, is less subject to breakage and capable of resealing to cover the spout. Thus, this packaging bag has excellent handling property, is easily manufactured and has excellent cost performance, wherefore the packaging bag is suitable for packaging of mass-produced goods.

[Reference Signs List]

[0110]

1	packaging bag
1a	film piece
2	peripheral portion
2a	upper side portion
2b	seal portions at the opposite ends of upper side portion
3	inlet portion
3a	inlet port
4	spout portion
4a	spout member
5	hole
6, 6’	easily openable portion
7	linear fastener portion
8	easily peelable portion
12	slit-like hole
13, 13’, 13"	perforation
13"’	half-cutting
14	part of film piece
16	unsealed portion
20	jig
21, 31, 41	packaging bag
22, 32, 42	peripheral portion
22a, 32a, 42a	upper side portion
23, 33, 43	inlet portion
24, 34, 44	spout portion
25, 35, 45	hole
50	hole
51	convex portion
52	unsealed portion
53	packaging bag
53a	film piece
54	peripheral portion
54’	spout portion peripheral portion
54a	upper seal portion
55	containing portion
56	part which becomes an aperture at the time of opening
57	unsealed portion
58, 58’	easily openable portion
59	closure means (fastener seal)
60a	male first member
60b	female second member
61	easily peelable portion
62	hole
63	spout portion
64a	spout member

64b	sealing member
65	first base member
66	second base member
65a, 66a	seal portion of base member
67, 68	tip portion
69, 70	base portion
71a, 71b	opening end position
72	cap portion
73	spout portion
74	cap main body
75	supporting portion
76	opening assisting portion
77	flange portion
78	cut portion
79	guide portion
80	cylindrical portion
81	sealing portion
81a	weakened portion
82	spout
83	locking portion
84	projecting portion
85	base portion
85a	reinforcing portion
86	packaging bag
87	peripheral portion (first sealed portion)
88	containing portion
89	inlet portion
90	unsealed portion
91	easily openable portion
92	closure means (fastener seal)
93	easily peelable portion
94	hole
95	spout member sealing portion
95a	film piece
96	second sealed portion
97	easily openable portion
S	spout member

Claims

1. A packaging bag formed by sealing peripheral portions of a plurality of film pieces and including an inlet portion and a spout portion at the peripheral portions, **characterized in that**:

the inlet portion is opened as an inlet port by cutting off parts of the peripheral portions of the sealed film pieces to form an aperture by an unsealed portion,
at least two holes are formed at the opposite sides of a part which becomes the inlet port at the peripheral portions near the inlet portion, and
the holes serve as a suspension means for enabling the packaging bag to be suspended and a finger holding means.

2. The packaging bag according to claim 1, wherein a part of the inlet portion on a line connecting the holes at the opposite sides of the part that becomes the inlet port is made more rigid than other parts.

3. The packaging bag according to claim 2, wherein an openable and closable linear fastener portion is formed in the inlet portion on the line connecting the holes at the opposite sides of the part that becomes the inlet port.

4. The packaging bag according to any one of claims 1 to 3, wherein the holes are circular or substantially circular

holes having a diameter in the range of 8 to 30 mm.

5. The packaging bag according to any one of claims 1 to 3, wherein peripheral edge portions of the holes are formed by perforation or half-cutting while leaving parts thereof uncut, the perforation or half-cutting is torn when the packaging bag is used, and the holes are formed in a state where parts of the film pieces are connected to a packaging bag main body.

6. The packaging bag according to any one of claims 1 to 3, wherein the holes are slits having a length in the range of 30 to 60 mm.

7. The packaging bag according to any one of claims 1 to 6, wherein the film pieces at peripheral edge portions of the holes are not sealed.

8. The packaging bag according to any one of claims 1 to 3, wherein parts of the holes that become upper edge portions when the holes are used as the finger holding means have a downward convex shape.

9. The packaging bag according to claim 8, wherein the film pieces at the upper edge portions of the holes are not sealed.

10. The packaging bag according to any one of claims 1 to 9, wherein at least one of the holes is so arranged that the spout portion is located at a substantially vertically lower position when the packaging bag is suspended using the hole as the suspension means.

11. A packaging bag in which a containing portion is formed by sealing a peripheral portion of one or more film pieces and the packaging bag is opened by cutting off a part of the peripheral portion of the sealed film piece to form an aperture by an unsealed portion, **characterized in that**:

an openable and closable closure means including first and second members engageable with each other and extending over the entire width of the aperture and an easily peelable portion which extends over the entire width of the aperture, is adapted to isolate the closure means from the containing portion before opening and is peeled open to open the aperture at the time of opening are provided at the aperture,
the closure means is formed by bonding an upper part of a first base member including the first member and an upper part of a second base member including the second member respectively to inner sides of film pieces forming the aperture and facing each other, and
a bottom end portion of one base member is formed to be longer than that of the other base member and bonded to the other film piece opposite thereto by an easily peelable seal, thereby forming the easily peelable portion.

12. The packaging bag according to claim 11, wherein the first and second base members are not exposed at an outer edge portion of a sealed portion formed by sealing the peripheral portion of the film piece.

13. The packaging bag according to claim 11 or 12, wherein the closure means is a fastener seal projecting from a base portion and including a male first member and a female second member.

14. The packaging bag according to claim 13, wherein the closure means is formed such that a tip portion of the male first member has an elliptical cross-sectional shape perpendicular to a longitudinal direction, a recess of a tip portion of the female second member has substantially the same cross sectional shape perpendicular to the longitudinal direction as the tip portion of the first member, and a clearance is formed between the tip portion of the first member and that of the second member only near a base portion of the first member when the first and second members are engaged.

15. The packaging bag according to any one of claims 11 to 14, wherein an easily openable portion for enabling the peripheral portion of the film piece to be easily cut off is provided in a part which becomes an aperture and so formed that an opening end position cut off using the easily openable portion differs between the film pieces.

16. The packaging bag according to any one of claims 11 to 15, comprising a spout portion at the peripheral portion of the sealed film piece.

17. A spout member, comprising:

a spout portion including a base portion and a cylindrical portion projecting from the base portion;
a sealing portion for sealing a tip portion of the cylindrical portion via a tearable weakened portion; and
a cap portion,
the weakened portion being torn by turning the cap portion to separate the sealing portion and the cap portion from the spout portion and simultaneously open the tip portion of the cylindrical portion, thereby forming a spout, wherein:
the cap portion is shaped to cover the entire cylindrical portion, and
the cap portion and the spout portion include a locking mechanism capable of locking the cap portion to the spout portion.

18. The spout member according to claim 17, wherein a plurality of annular projecting portions for locking a tube are formed on an outer surface of the cylindrical portion of the spout portion.

19. The spout member according to claim 17 or 18, wherein the cap portion is capable of resealing the spout.

20. The spout member according to any one of claims 17 to 19, wherein the weakened portion is formed by a thinned portion having a thickness of 0.15 mm or more and below 0.2 mm.

21. A packaging bag in which a containing portion is formed by a first sealing portion formed by sealing a peripheral portion of one or more film pieces and a spout member sealing portion is provided at the peripheral portion, **characterized in that**:

the spout member sealing portion is formed by arranging the spout member according to claim 17 between two film pieces forming the packaging bag such that the cylindrical portion of the spout portion projects from the containing portion, fixing the base portion of the spout portion between the film pieces in the first sealing portion, and sealing the cap portion by a second sealing portion formed by sealing the film pieces around the cap portion such that the cap portion is sandwiched between the film pieces, and
the spout is opened and the cap portion is separated from the spout portion by cutting off the film pieces forming the spout member sealing portion at a side more toward a tip of the spout member than the base portion of the spout member and simultaneously turning the cap portion of the spout member together with the film pieces.

22. The packaging bag according to claim 21, comprising an easily openable portion used to cut off the film pieces forming the spout member sealing portion at the side more toward the tip of the spout member than the base portion of the spout member.

23. The packaging bag according to claim 21 or 22, wherein the easily openable portion is formed such that an opening end cut off using the easily openable portion is so curved as to be closer to the base portion of the spout portion at an intermediate part than at an opening start position and an opening end position.

24. The packaging bag according to any one of claims 21 to 23, wherein the easily openable portion is provided at a position more toward a tip of the cap portion than a skirt portion of the cap portion.

25. The packaging bag according to any one of claims 21 to 24, comprising an inlet portion at the peripheral portion of the sealed film piece.

26. The packaging bag according to any one of claims 1 to 25, **characterized by** being for a tube-feeding enteral nutrient or tube-feeding enteral liquid diet.

Fig.1

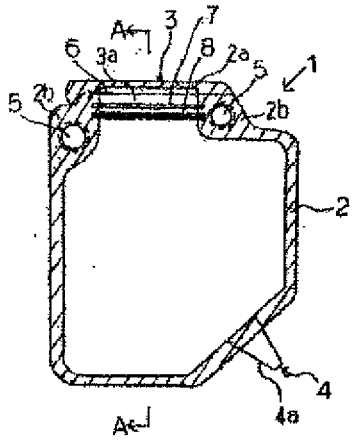


Fig.2

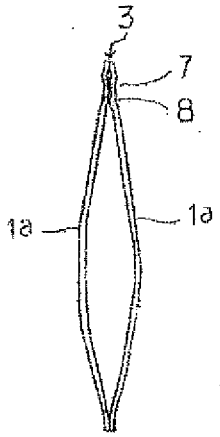
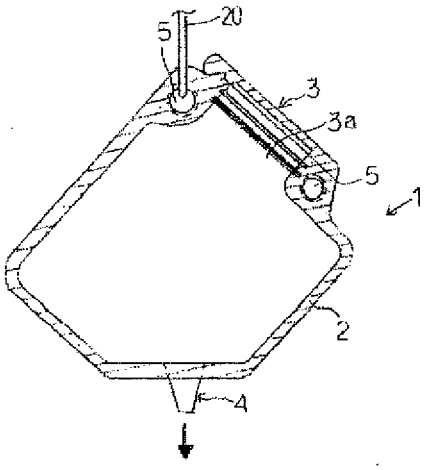


Fig.3



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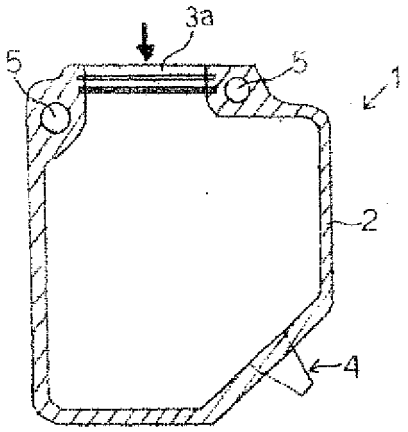

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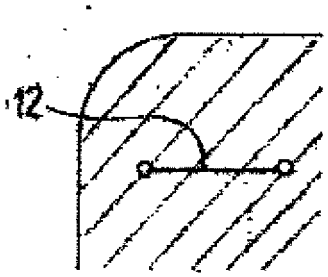

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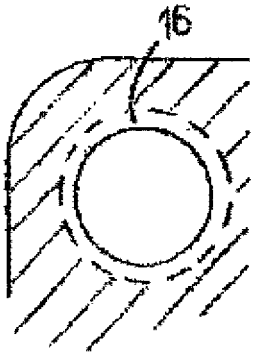

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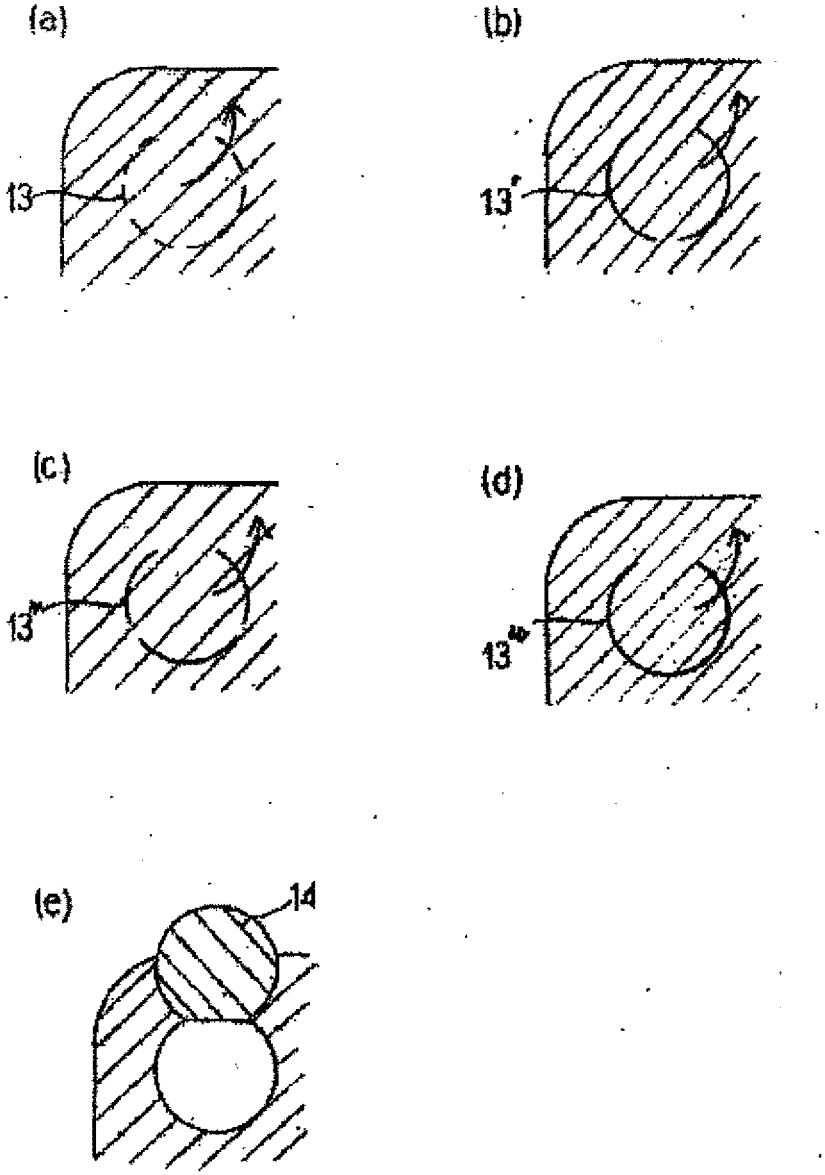

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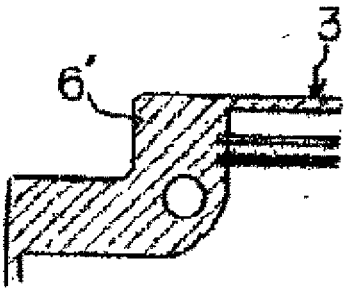

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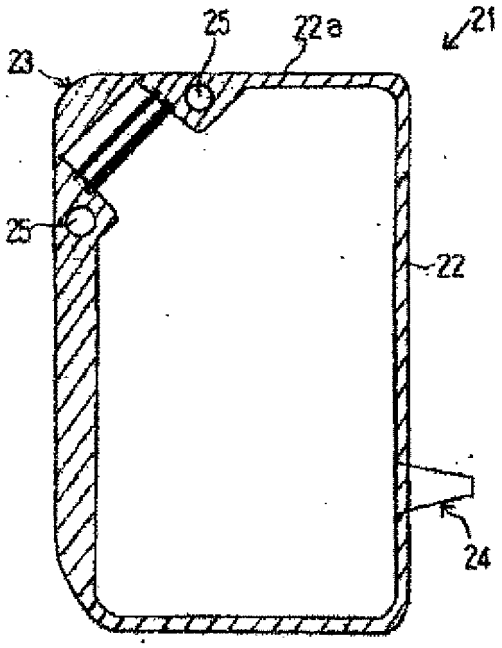

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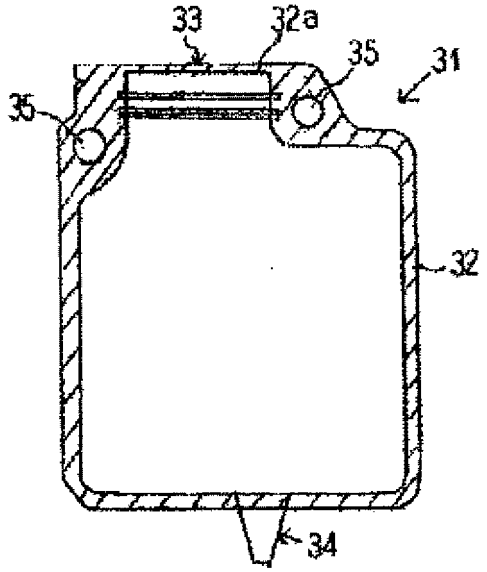

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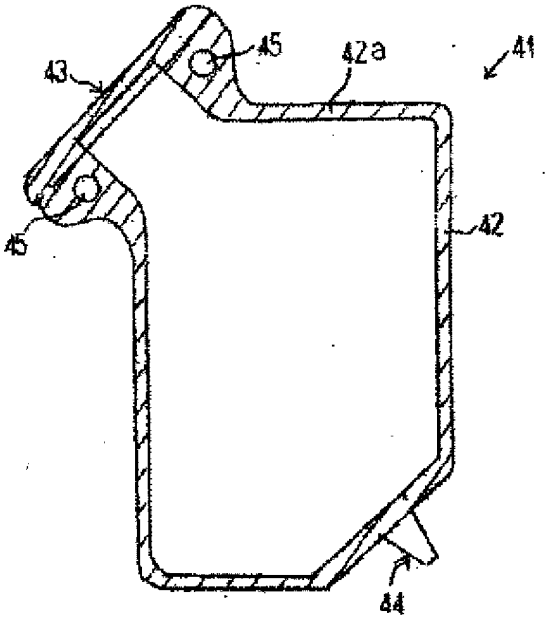

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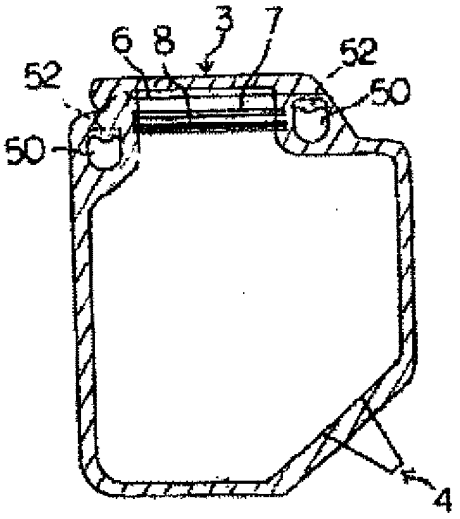

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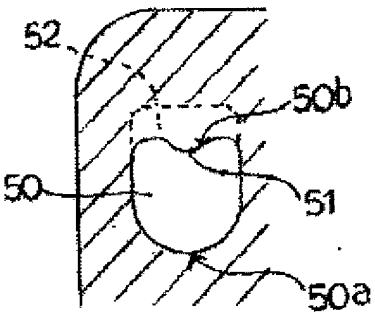


Fig.14

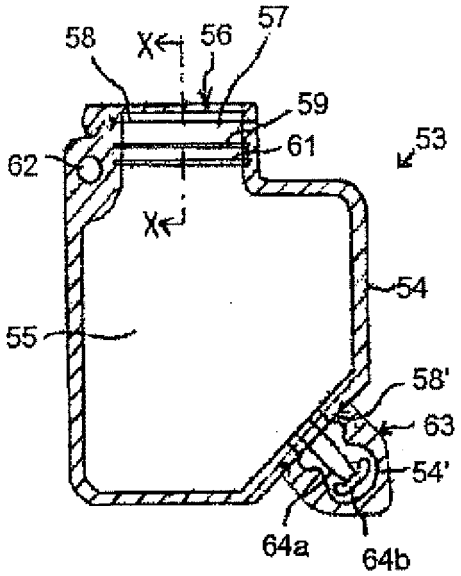
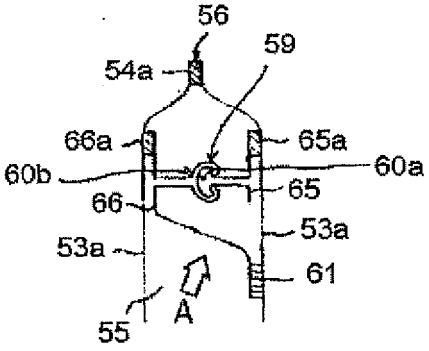


Fig.15



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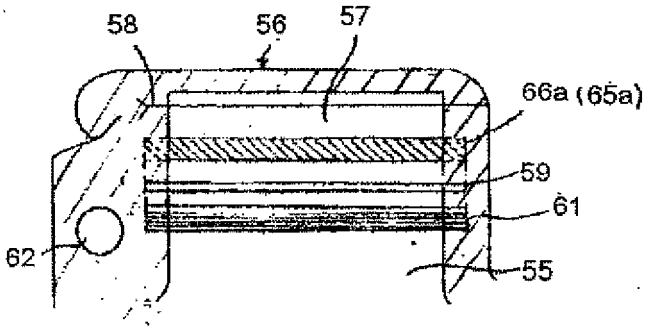

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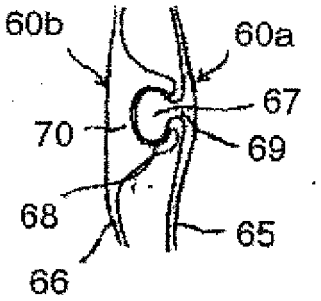

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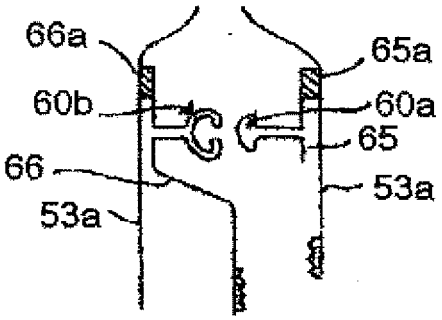

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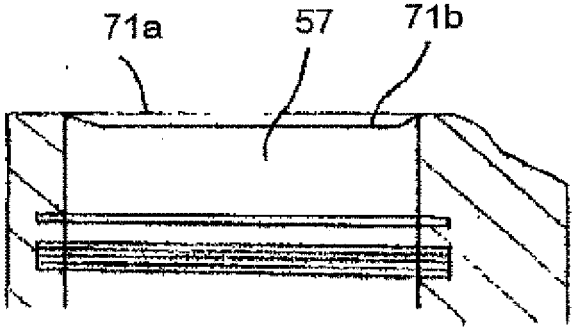

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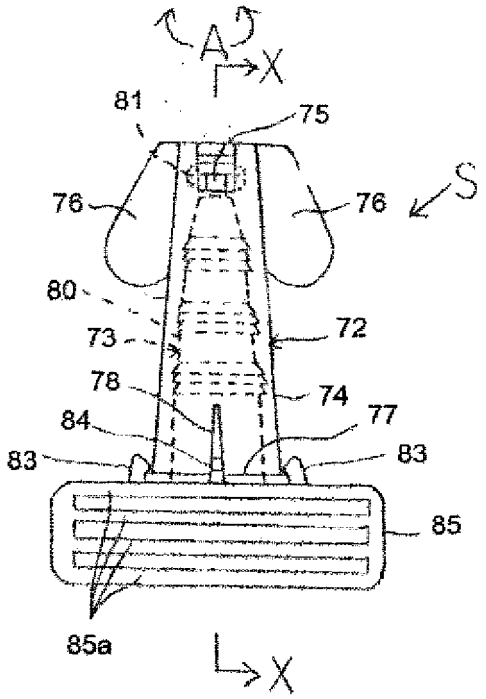
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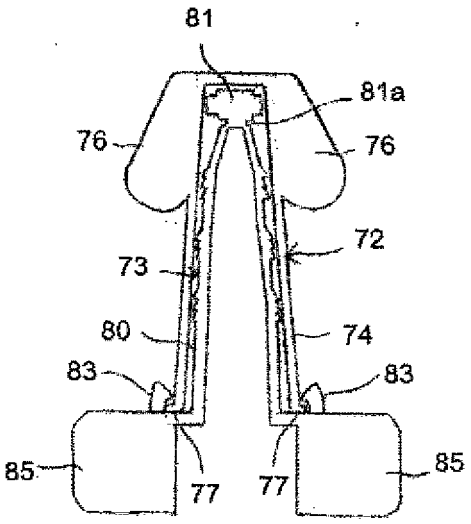
X

Fig.21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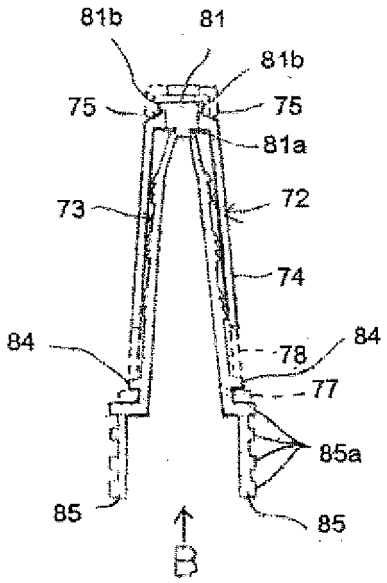
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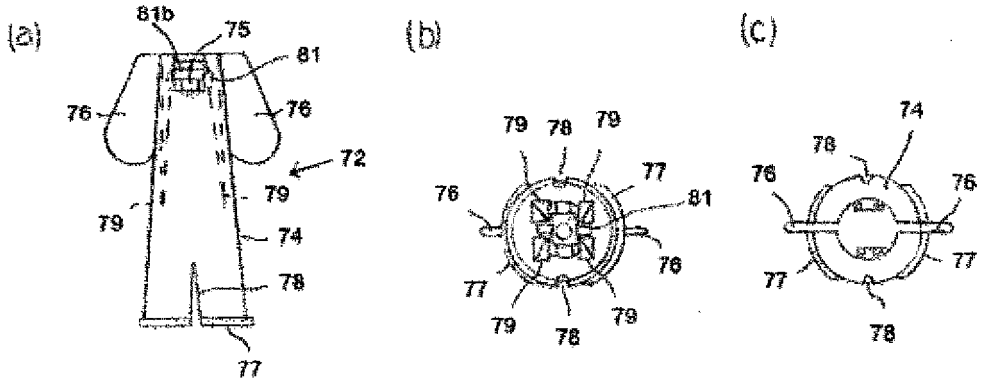
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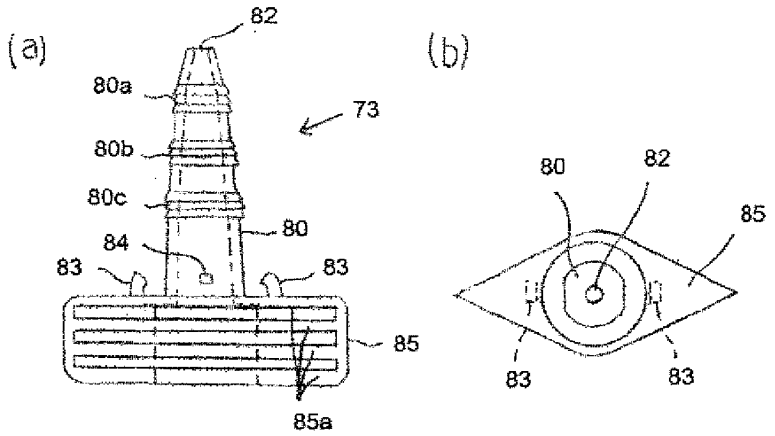
Fig.24



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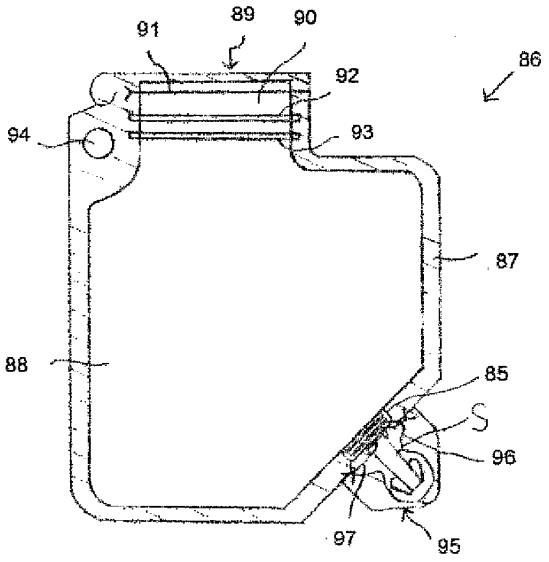

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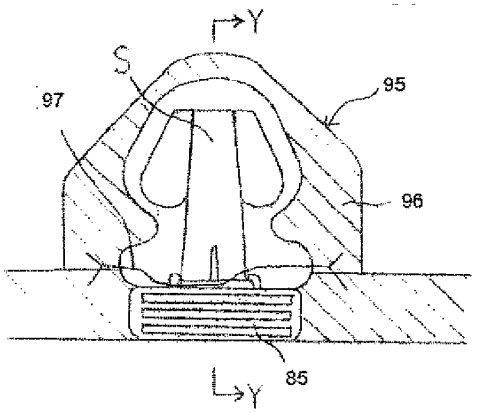
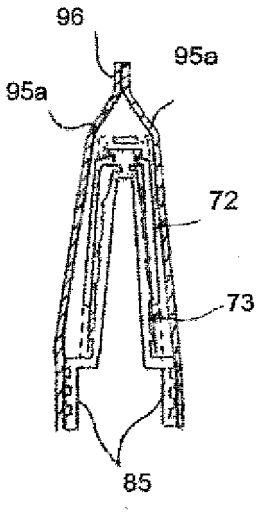


Fig.27



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