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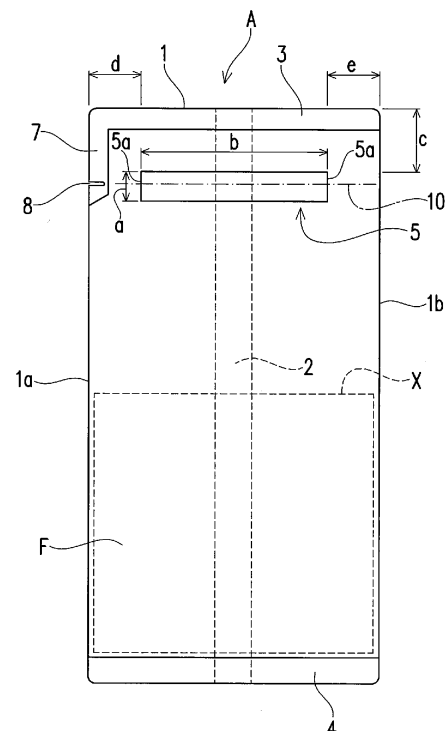
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(54) **PACKAGING BAG AND METHOD OF MANUFACTURING PACKAGING BAG**

(57) Provided is a packaging bag including a notch being formed in the edge seal portion, the notch serving as a starting point for opening of the bag body, and an easy-to-cut portion disposed on an extension of the notch in an opening direction. The easy-to-cut portion is formed to extend beyond the back seal portion between one side and the other side of the back seal portion, and the ends of the easy-to-cut portion are disposed away from side ends of the bag body, respectively.

FIG. 1



Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a packaging bag for packaging various contents, such as medicines and food, with a film, and a method of producing the packaging bag.

Description of the Related Art

[0002] As an example of known packaging bags, there is known a packaging bag for packaging contents by pillow packaging with a laminate film formed by laminating several types of plastic films. Such a packaging bag is easy to handle and contributes to a reduction in volume of garbage, and thus is preferably used.

[0003] A laminate film forming a packaging bag has various functions, such as high strength, high tension strength, gas barrier, moisture permeability, and aroma retention, for each film layer. The packaging bag is formed by laminating plastic films having functions suitable for each type of the contents.

[0004] However, the packaging bag formed of plastic films is excellent in strength and tension strength, which makes it difficult for a user to cut an end of the packaging bag with hands and necessitates the user to use scissors, a knife, or the like to cut the end. Further, when the user forms a cut line with scissors or the like and opens the bag along the cut line, the cut portion is not always linearly formed. Thus, there is a possibility that the contents burst out of the packaging bag.

[0005] Furthermore, the pillow-type packaging bag includes a heat seal portion (back seal portion) formed on the back surface with a certain thickness. Accordingly, this back seal portion deteriorates the openability of the packaging bag. The problem of deterioration in openability is more remarkable for physically weak users such as patients and children.

[0006] For example, as a known technique in which the openability is improved, there is known a technique disclosed in Patent Document 1. This technique improves the openability by forming an opening facilitating portion (rough surface having fine unevenness) serving as a starting point for opening the packaging bag, thereby improving the openability. Further, according to this technique, to prevent the packaging bag from being erroneously opened (to make it difficult to open the packaging bag) by an infant who plays a trick, for example, the opening facilitating portion is partially formed on the inside of the outer periphery of the packaging bag so as not to be formed on the outer periphery.

[0007] Thus, the opening facilitating portion is formed on the inside of the outer periphery, which makes it difficult for the user to cut the outer peripheral portion, even if he or she attempts. On the other hand, the user pulls

the film to thereby allow the opening facilitating portion to be moved to the outer periphery of the packaging bag. Accordingly, in this state, the user can open the packaging bag with the opening facilitating portion as a starting point of opening. However, in the technique disclosed in Patent Document 1, the operation for pulling the film is required for the user to open the bag, which makes the opening operation extremely troublesome.

10 Prior Art Document

Patent Document

15 **[0008]** Patent Document 1: Japanese Patent No. 3971910

DISCLOSURE OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

20 **[0009]** In this regard, to simplify the opening operation, there is proposed a packaging bag E including an opening facilitating portion 32 formed along a side end 31 of a bag body 30 as illustrated in FIG. 8. However, in the case where the packaging bag E illustrated in FIG. 8 has dropped, there is a possibility that the opening facilitating portion 32 of the packaging bag E bursts due to an impact of the drop.

25 **[0010]** For example, in the packaging bag, the surrounding portion of which is heat-sealed, as in a four-sided seal, the packaging bag hardly bursts. Meanwhile, in the pillow-type packaging bag including a soft side end which is not heat-sealed, the packaging bag is liable to burst. In particular, in the case of a packaging bag having a large width and containing heavy contents (for example, a packaging bag having a width of 70 mm and containing contents of 50 g), there is a possibility that the packaging bag bursts at a portion near a side end due to the impact of the drop.

30 **[0011]** In view of this, an experiment was conducted to drop the packaging bag E illustrated in FIG. 8. Then, a portion of the opening facilitating portion 32 which is slightly above a drop surface G was deformed to be recessed into a square shape. Further, the impact of the drop was centered on the portion deformed to be recessed in a square shape, with the result that a hole (pin-hole) 33 was formed at this portion. Thus, the packaging bag E illustrated in FIG. 8 cannot solve the problem of suppressing the formation of a hole when the packaging bag drops.

35 **[0012]** When the packaging bag E illustrated in FIG. 8 is gripped by the user, the packaging bag is similarly deformed to be recessed into a square shape in the vicinity of the side end. When the grip force is centered on the portion deformed to be recessed into a square shape, a hole is formed in some cases. Thus, the packaging bag E illustrated in FIG. 8 cannot solve the problem of suppressing the formation of the hole 33 when the user grips

the packaging bag with hands.

[0013] Furthermore, the packaging bag E illustrated in FIG. 8 has the opening facilitating portion 32 partially formed in the width direction. This may cause the user not to perfectly open the packaging bag from one side end to the other side end when the user is to open the wide packaging bag E. That is, the cutting may be stopped halfway. When the cutting is stopped halfway, there is a problem that it takes time and troublesome works for the user to transfer the contents of the packaging bag E to another container. Note that such a problem occurs also in the packaging bag disclosed in Patent Document 1.

[0014] The pillow-type packaging bag formed of soft plastic films is preferable in that the packaging bag is easy to handle and contributes to a reduction in volume of garbage. However, the film is high in strength and tension strength, which makes it difficult for the user to easily open the packaging bag.

[0015] In this regard, it is also possible to perform scratch work on a side end of an outer plastic film to allow the user to easily open the packaging bag with hands. However, the strength of the film is lowered at the portion subjected to the scratch work. This may result in formation of a hole in the packaging bag due to the impact of the drop, for example. In particular, the packaging bag containing heavy contents and having a large width is liable to burst due to the impact of the drop, for example.

[0016] In view of the above, it is an object of the present invention to provide a packaging bag having two incompatible functions, i.e., the function of allowing a user to easily open the packaging bag with hands, and the function of preventing formation of an unwanted hole when an unexpected external force acts, and a method of producing the packaging bag.

SUMMARY OF THE INVENTION

[0017] According to the present invention, there is provided a packaging bag, which includes a bag body for containing a content, the bag body including: a back seal portion formed by sealing a film in a length direction and disposed on a back surface; a pair of end seal portions formed by sealing the film in a width direction and disposed on ends in a length direction; an edge seal portion formed by sealing the film and disposed on one side end; and a notch being formed in the edge seal portion, the notch serving as a starting point for opening of the bag body; and an easy-to-cut portion disposed on an extension of the notch in an opening direction, the easy-to-cut portion being formed to extend beyond the back seal portion between one side and the other side of the back seal portion, and the ends of the easy-to-cut portion being disposed away from side ends of the bag body, respectively.

[0018] The packaging bag according to the present invention may have a configuration in which each of the ends of the easy-to-cut portion is disposed 10 to 25 mm

away from a corresponding one of the side ends of the bag body.

[0019] The packaging bag according to the present invention may have a configuration in which each of the ends of the easy-to-cut portion is disposed 10 to 15 mm away from a corresponding one of the side ends of the bag body.

[0020] The packaging bag according to the present invention may have a configuration in which each of the ends of the easy-to-cut portion is disposed at a distance of 14 to 36% of a width dimension of the bag body away from a corresponding one of the side ends of the bag body.

[0021] The packaging bag according to the present invention may have a configuration in which each of the ends of the easy-to-cut portion is disposed at a distance of 14 to 21% of a width dimension of the bag body away from a corresponding one of the side ends of the bag body.

[0022] The packaging bag according to the present invention may have a configuration in which the back seal portion is formed by sealing both side edges of the film in a length direction and is folded at a proximal end of the back seal portion such that a distal end of the back seal portion faces the other side of the bag body.

[0023] The packaging bag according to the present invention may have a configuration in which the edge seal portion is disposed along a length direction of the bag body from one of the pair of end seal portions and is disposed to overlap the easy-to-cut portion in the width direction of the bag body.

[0024] The packaging bag according to the present invention may have a configuration in which the easy-to-cut portion is formed in a rectangular shape, and the notch is disposed at a central portion of the easy-to-cut portion in a length direction of the bag body.

[0025] A method of producing the packaging bag according to the present invention, includes: forming the back seal portion by sealing both side edges of a film having a band shape in a length direction to form the film into a cylindrical shape; and forming the pair of end seal portions by sealing in a width direction the film having a cylindrical shape to form the film into a bag shape, in which the film includes the easy-to-cut portion formed on both side ends such that the easy-to-cut portion is formed to extend beyond the back seal portion between one side of the back seal portion and the other side of the back seal portion.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026]

FIG. 1 illustrates an overall front view of a packaging bag according to a first embodiment of the present invention;

FIG. 2 illustrates an overall back view of the packaging bag according to the first embodiment;

FIG. 3 illustrates a perspective view illustrating an essential part of the packaging bag according to the first embodiment;

FIG. 4 illustrates a development diagram of the packaging bag according to the first embodiment;

FIG. 5 illustrates an overall back view of a packaging bag according to a second embodiment of the present invention;

FIG. 6 illustrates an overall back view of a packaging bag according to a comparative example;

FIG. 7 illustrates an overall back view of a packaging bag according to another comparative example; and

FIG. 8 illustrates an overall front view of a packaging bag in a state where the packaging bag has been dropped.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0027] Hereinafter, a packaging bag according to an embodiment of the present invention will be described with reference to FIGS. 1 to 5. Note that in the following description, the upper side, the lower side, the left side, and the right side of FIG. 1 respectively correspond to the upper side, the lower side, the left side, and the right side of a packaging bag A. The upper side and the lower side of FIGS. 2, 4, and 5 respectively correspond to the upper side and the lower side of each of packaging bags A and B. The left side and the right side of FIGS. 2, 4, and 5 respectively correspond to the right side and the left side of each of the packaging bags A and B.

<First Embodiment>

[0028] First, a packaging bag according to a first embodiment of the present invention will be described with reference to FIGS. 1 to 4. As illustrated in FIGS. 1 and 2, the packaging bag A includes contents X and a bag body 1 containing the contents X. In the first embodiment, the contents X are powdery drug, but the contents X are not limited thereto. For example, the contents X may be liquid drug, granular drug, or aggregated solid food (such as individually-wrapped candies). In the first embodiment, the bag body 1 is a pillow type packaging body having a flat rectangular shape as viewed from the front.

[0029] The bag body 1 is formed of a laminate film F. The laminate film F is formed by sequentially laminating polymeric resin (SPE) serving as a binder, aluminum foil for giving a gas barrier property, polymer resin serving as a binder, and linear low density polyethylene (LLDPE) for preventing electrification on one surface of a film formed of polyethylene terephthalate (PET).

[0030] The bag body 1 includes a back seal portion 2 disposed on the back surface, and a pair of end seal portions 3 and 4 disposed on ends in a length direction. Specifically, the bag body 1 includes the back seal portion 2 formed by sealing (center sealing) both side edges of the band-like film F in the length direction so as to wrap

the contents X; the upper-side end seal portion 3 formed by sealing an upper end of the film F in a width direction; and the lower-side end seal portion 4 formed by sealing a lower end of the film F in the width direction.

[0031] The bag body 1 includes an easy-to-cut portion 5 formed to be weaker than the surrounding portion so that the bag body can be easily cut therethrough. The bag body 1 includes an edge seal portion 7 disposed on a left side end (one side end) 1a, and a notch 8 for an opening starting point formed in the edge seal portion 7. Note that a surface on the opposite side of the back surface of the bag body 1 is referred to as a front surface of the bag body 1.

[0032] The bag seal portion 2 is formed in a band shape and disposed at substantially the center in the width direction of the back surface of the bag body 1. The back seal portion 2 is folded at a proximal end 2b such that a distal end 2a faces the right side (the other side). The upper end seal portion 3 is formed in a band shape and disposed at an upper end serving as a short-side portion of the bag body 1. The lower end seal portion 4 is formed in a band shape and disposed at a lower end serving as a short-side portion of the bag body 1.

[0033] Easy-to-cut portions 5 are provided in a pair and are respectively disposed on the front surface and the back surface of the bag body 1. Each easy-to-cut portion 5 is formed in a rectangular shape. Specifically, each easy-to-cut portion 5 is formed in a band shape. Ends 5a of each easy-to-cut portion 5 are disposed away from the side ends 1a and 1b, respectively.

[0034] Each easy-to-cut portion 5 is disposed on an extension of the notch 8 in the opening direction. Each easy-to-cut portion 5 is disposed along the upper end seal portion 3 of the bag body 1. One end (left end) 5a of the easy-to-cut portion 5 on the back surface side is disposed at a position on one side (left side) of the back seal portion 2, and the other end (right end) 5a of the easy-to-cut portion 5 on the back surface side is disposed at a position on the other side (right side) of the back seal portion 2.

[0035] Thus, the easy-to-cut portion 5 on the back surface side is disposed to continuously extend beyond the back seal portion between a portion on the left side of the back seal portion 2 and a portion on the right side of the back seal portion 2. In other words, the easy-to-cut portion 5 on the back surface side is disposed to extend across the back seal portion 2.

[0036] If a vertical dimension "a" of each easy-to-cut portion 5 is small, a cut line may deviate from the easy-to-cut portion 5 when the user opens the bag body 1. On the contrary, if the vertical dimension "a" of each easy-to-cut portion 5 is large, the bag body 1 may burst. For this reason, the vertical dimension "a" of each easy-to-cut portion 5 is set to be in a range of 3 to 30 mm, preferably 3 to 10 mm, and more preferably 4 to 7 mm.

[0037] If a distance "d" between the side end 1a of the bag body 1 and the end 5a of each easy-to-cut portion 5 and a distance "e" between the side end 1b of the bag

body 1 and the end 5a of each easy-to-cut portion 5 are small, the bag body 1 may burst. On the contrary, if the distances "d" and "e" are large, the cut direction skews when the user opens the bag body 1, with the result that the cut may deviate from the easy-to-cut portion 5, or the cut may be stopped halfway.

[0038] For this reason, the distances "d" and "e" each are set to 10 to 25 mm, preferably 10 to 15 mm, and more preferably 13 to 15 mm. In other words, the distances "d" and "e" each are set to 14 to 36%, preferably 14 to 21%, and more preferably 19 to 21% of the width dimension of the bag body 1.

[0039] In the first embodiment, the length dimension of the bag body 1 is 173 mm; the width dimension of the bag body 1 is 70 mm; the vertical dimension (length dimension) "a" of each easy-to-cut portion 5 is 5 mm; a horizontal dimension (width dimension) "b" of each easy-to-cut portion 5 is 42 mm; a distance "c" between the upper end of the bag body 1 and the upper end of each easy-to-cut portion 5 is 20 mm; a distance "d" between one side end (left side end) 1a of the bag body 1 and one end (left end) 5a of each easy-to-cut portion 5 is 13 mm; and a distance "e" between the other side end (right side end) 1b of the bag body 1 and the other end (right end) 5a of each easy-to-cut portion 5 is 15 mm.

[0040] In the first embodiment, each easy-to-cut portion 5 has a plurality of linear flaws (notches) arranged along the width direction. Note that work to be performed on each easy-to-cut portion 5 may be work for allowing the area of each easy-to-cut portion 5 to be easily opened. The type of the work is not particularly limited. For example, the work may be scratch work for physically applying a force onto a target area of the film F a through contacting engagement, scratch work in a non-contact manner (for example, laser), or work for forming a non-penetrating perforation or a recess.

[0041] In the first embodiment, the flaws of each easy-to-cut portion 5 penetrate through only a PET layer serving as a surface layer (outermost layer) of the film F. Note that any work may be performed on each easy-to-cut portion 5, as long as an aluminum layer (a layer made of aluminum foil) is not penetrated. That is, any work may be performed on each easy-to-cut portion 5, as long as the aluminum layer and a layer on the back side thereof (back-side layer) are not penetrated.

[0042] The edge seal portion 7 is disposed on an upper portion of the left side end 1a of the bag body 1 along the left side end 1a. Specifically, the edge seal portion 7 is disposed along the length direction of the bag body 1 from the upper end seal portion 3.

[0043] The edge seal portion 7 is disposed to overlap each easy-to-cut portion 5 in the width direction of the bag body 1. Specifically, the upper end of the edge seal portion 7 is disposed on the upper side of the upper end of each easy-to-cut portion 5, and the lower end of the edge seal portion 7 is disposed on the lower side of the lower end of each easy-to-cut portion 5. The edge seal portion 7 is formed by sealing the film F.

[0044] The notch 8 is disposed at a central portion of each easy-to-cut portion 5 in the length direction of the bag body 1. The notch 8 is formed in the edge seal portion 7 from the left side end 1a of the bag body 1 toward the inside. Thus, as illustrated in FIG. 3, a folding direction of the heat-sealed back seal portion 2 of the bag body 1 (a direction from the proximal end 2b of the back seal portion 2 toward the distal end 2a) and a cut direction of the notch 8 coincide with each other in the opening direction.

[0045] Since the contents X are powdery drug in the first embodiment, about 50% of the quantity that can be contained in the bag body 1 is contained in the bag body 1. This is because when the powdery contents X are filled, the content flies. Thus, when a large amount of the contents X are contained in the bag body 1, the contents X may be caught between the upper end seal portion 3 and the lower end seal portion 4. Note that when the contents X are individually-wrapped candies or the like, about 70 to 80% of the quantity of the contents X that can be contained in the bag body 1 are contained in the bag body 1.

[0046] Next, a method of producing the packaging bag A according to the first embodiment will be described.

[0047] First, back surfaces of both side edges of the laminate film F are fit together and the fit portion is heat-sealed in the length direction. As a result, the back seal portion 2 is formed at a central portion in the width direction of the bag body 1, and the band-like film F is formed into a cylindrical body. Next, one opened end of the cylindrical body is heat-sealed in the width direction, thereby forming the lower end seal portion 4.

[0048] Then, after the contents X are contained in the film F, the other end is heat-sealed in the width direction, thereby forming the upper end seal portion 3. The packaging bag A is produced in this manner. Note that the packaging bag A may be continuously formed by continuously sealing the both side edges of the long band-like film (web) F in the length direction and sealing and cutting the film F in the width direction at predetermined intervals in the length direction.

[0049] Each easy-to-cut portion 5 is preferably formed in the film F having a uniform thickness (with no back seal portion 2 formed therein) prior to the formation of the packaging bag A. Then, as illustrated in FIG. 4, each easy-to-cut portion 5 is formed in a band shape at a central portion in the width direction of the film F so as to be disposed on the front surface of the bag body 1. The easy-to-cut portions 5 are formed in a pair in a band shape along the width direction of the both side ends (both ends in the width direction) of the film F so as to extend from one side of the back seal portion 2 to the other side of the back seal portion 2 on the back surface of the bag body 1.

[0050] Next, a first function, i.e., a function of facilitating opening when the user opens the packaging bag with hands, of the packaging bag A according to the first embodiment will be described.

[0051] A divided one area (upper end corner of the bag

body 1) is gripped by one hand of the user, and the other area (the left side end 1a in the vicinity of the notch 8) is gripped by the other hand of the user. Further, the upper end corner of the bag body 1 is pulled toward the other end side by the user. Then, cutting is started from the right end of the notch 8 and the cut portion reaches the left end of each easy-to-cut portion 5.

[0052] After that, the cutting advances along each easy-to-cut portion 5, the cut portion reaches the right end of each easy-to-cut portion 5. Then, the cut portion finally reaches the right side end 1b of the bag body 1. In this manner, the packaging bag 1 can be easily opened along the area extending from the left side end 1a to the right side end 1b of the bag body 1 even by a physically weak user.

[0053] Further, the bag body 1 is divided into a lower side portion (large part of the bag body 1) of the easy-to-cut portions 5 and an upper side portion (a band-like cut piece) of the easy-to-cut portions 5. A portion (a portion indicated by dot-dashed lines in FIG. 1) which is cut substantially linearly along the easy-to-cut portions 5 serves as an opening 10 of the bag body 1. This allows the contents X to be easily taken out. Note that the width of the opening 10 (that is, the width of the edge seal portion 7) is set so that the contents X can be taken out from the opening 10 without difficulty.

[0054] Next, a second function, i.e., a function of preventing formation of an unwanted hole when an unexpected external force acts, of the packaging bag A according to the first embodiment will be described.

[0055] When the packaging bag A drops, for example, the force acting on the bag body 1 is determined by the weight of the contents X, an acceleration generated by the gravity, and a drop distance. Accordingly, when the packaging bag A containing the heavy contents X drops, the above-mentioned force acting on the bag body 1 and a force (drop impact force) from the drop surface G, which is a reaction force of the force acting on the bag body 1, act on the packaging body A.

[0056] For example, assume that the packaging bag A drops with the upper side end seal portion 3 of the bag body 1 being on the lower side. In this case, there is a large difference between the strength of the upper end seal portion 3 and the strength of the both side ends (non-sealed portions) 1a and 1b of the bag body 1. Accordingly, the impact received by the upper end seal portion 3 is concentrated on the corner portions on both sides of the bag body 1. As a result, the corner portions are extremely bent or deformed and deformed in an angular shape. If the easy-to-cut portions 5 are formed at the portions deformed into an angular shape, the easy-to-cut portions 5 are bent or folded, so that a hole is easily formed in the easy-to-cut portions 5.

[0057] On the other hand, in the packaging bag A according to the first embodiment, the ends 5a of each easy-to-cut portion 5 are spaced away from the side ends 1a and 1b of the bag body 1, respectively. In other words, each easy-to-cut portion 5 is formed at a position slightly

inside the side ends 1a and 1b of the bag body 1 and at a position inside the portions deformed into an angular shape. Accordingly, even when the bag body 1 drops and deformed, the easy-to-cut portions 5 are not bent or folded and thus no hole is formed in the easy-to-cut portions 5. Therefore, the bag body 1 is prevented from bursting even when the bag body 1 drops and is subjected to impact.

[0058] As described above, the packaging bag A according to the first embodiment includes the bag body 1 containing the contents X. The bag body 1 includes the back seal portion 2 formed by sealing the film F in the length direction and disposed on the back surface; a pair of the end seal portions 3 and 4 formed by sealing the film F in the width direction and disposed at ends in the length direction; the edge seal portion 7 formed by sealing the film and disposed on one side end 1a; the notch 8 being formed in the edge seal portion 7, the notch serving as a starting point for opening of the bag body; and the easy-to-cut portions 5 disposed on an extension of the notch 8 in the opening direction. Each easy-to-cut portion 5 is disposed to extend beyond the back seal portion between one side of the back seal portion 2 and the other side of the back seal portion 2, and the ends 5a of each easy-to-cut portion 5 are disposed away from the side ends 1a and 1b of the bag body 1.

[0059] Accordingly, in the packaging bag A according to the first embodiment, each easy-to-cut portion 5 is disposed to extend beyond the back seal portion between the position on the left side of the back seal portion 2 and the position on the right side of the back seal portion 2. Specially, each easy-to-cut portion 5 is continuously formed with a constant width and is formed to extend across at least the back seal portion 2. Further, the notch 8 for an opening starting point is formed in the edge seal portion 7 disposed on the left side end 1a of the bag body 1, and each easy-to-cut portion 5 is disposed on an extension of the notch 8 in the opening direction.

[0060] Thus, when the packaging bag is opened, the notch 8 serves as a starting (cutting) point of opening. The bag body 1 is cut along each easy-to-cut portion 5 disposed on an extension of the notch 8. Accordingly, the bag body 1 is cut substantially linearly along the area extending from the left side end 1a to the right side end 1b. This enables anybody to easily open the packaging bag A.

[0061] For example, when a physically weak user is to open the packaging bag A to transfer the contents X to another container (for example, a glass-like container) and add water into the container to drink it, the packaging bag A can be easily opened with even a small force. In addition, the opening 10 is formed linearly, which enables the user to easily transfer the contents X to another container without troublesome works.

[0062] Moreover, in the packaging bag A according to the first embodiment, the ends 5a of each easy-to-cut portion 5 are disposed away from the side ends 1a and 1b. Specifically, none of the ends 5a of the easy-to-cut

portions 5 are connected to the notch 8 (that is, all the ends 5a of the easy-to-cut portions 5 are spaced away from the notch 8), and all the ends 5a of the easy-to-cut portions 5 are positioned at portions slightly inside the side ends 1a and 1b of the bag body 1.

[0063] Accordingly, when the packaging bag A containing the contents X drops, the deformed portions which are bent or folded into an angular shape are formed at the corners of the bag body 1, but can be prevented from reaching the easy-to-cut portions 5. This prevents the packaging bag from bursting at the portions corresponding to the easy-to-cut portions 5, and also prevents the contents X from leaking out of the bag body 1.

[0064] Further, in the packaging bag A according to the first embodiment, the ends 5a of each easy-to-cut portion 5 are disposed 10 to 25 mm (specifically, 10 to 15 mm, more specifically, 13 to 15 mm) away from the side ends 1a and 1b of the bag body 1. In other words, the ends 5a of each easy-to-cut portion 5 are disposed at a distance corresponding to 14 to 36% (specifically, 14 to 21%, more specifically, 19 to 21%) of the width dimension of the bag body 1 away from the side ends 1a and 1b of the bag body 1.

[0065] Accordingly, in the packaging bag A according to the first embodiment, the ends 5a of each easy-to-cut portion 5 are disposed a predetermined distance away from both side ends 1a and 1b of the bag body 1. This prevents each easy-to-cut portion 5 from being deformed even when the packaging bag A drops, causing deformation of the bag body 1. Therefore, the bag body 1 can be prevented from bursting.

[0066] Further, in the packaging bag A according to the first embodiment, the back seal portion 2 is formed by sealing the both side edges of the film F in the length direction, and is folded at the proximal end 2b of the back seal portion 2 such that the distal end 2a of the back seal portion 2 faces the other side of the bag body 1.

[0067] Accordingly, in the packaging bag A according to the first embodiment, the back seal portion 2 is folded at the proximal end 2b, and the distal end 2a of the back seal portion 2 is positioned on the right side. In addition, the proximal end 2b of the back seal portion 2 is positioned on the left side. Thus, the folding direction of the back seal portion 2 and the cutting direction of the notch 8 coincide with each other in the opening direction, thereby allowing the packaging bag A to be more easily opened.

[0068] Further, in the packaging bag A according to the first embodiment, the edge seal portion 7 is disposed along the length direction of the bag body 1 from the end seal portion 3 on one side, and is disposed to overlap each easy-to-cut portion 5 in the width direction of the bag body 1.

[0069] Accordingly, in the packaging bag A according to the first embodiment, the edge seal portion 7 is disposed along the length direction of the bag body 1 from the upper end seal portion 3. Furthermore, the edge seal portion 7 is disposed to overlap each easy-to-cut portion

5 in the width direction of the bag body 1. Thus, the portion (left side end 1a) of the edge seal portion 7 of the bag body 1 is not deformed when the packaging bag A drops, thereby reliably preventing deformation of the left end of each easy-to-cut portion 5.

[0070] Further, in the packaging bag A according to the first embodiment, each easy-to-cut portion 5 is formed in a rectangular shape and the notch 8 is disposed at a central portion of each easy-to-cut portion 5 in the length direction of the bag body 1.

[0071] Accordingly, in the packaging bag A according to the first embodiment, each easy-to-cut portion 5 is formed in a rectangular shape, more specifically, a long band shape in the width direction of the bag body 1. Further, the notch 8 is disposed at a central portion of each easy-to-cut portion 5 in the length direction of the bag body 1. This allows the cut portion started from the notch 8 to reliably reach the left end 5a of each easy-to-cut portion 5.

[0072] Further, the method of producing the packaging bag A according to the first embodiment includes: forming the back seal portion 2 by sealing both side edges of the film F having a band shape in the length direction to form the film F into a cylindrical shape; and forming a pair of the end seal portions 3 and 4 by sealing the film in the width direction F having a cylindrical shape to form the film F into a bag shape. The film F includes the easy-to-cut portions 5 formed on both side ends such that the easy-to-cut portions 5 is formed to extend beyond the back seal portion between one side of the back seal portion 2 and the other side of the back seal portion 2.

[0073] Accordingly, in the packaging bag A according to the first embodiment, the film F includes the easy-to-cut portions 5 on the both side ends. Thus, when the back seal portion 2, the upper end seal portion 3, and the lower end seal portion 4 are formed by sealing the film F, each easy-to-cut portion 5 is disposed to extend beyond the back seal portion 2 between the position on the left side of the back seal portion 2 and the position on the right side of the back seal portion 2.

<Second Embodiment>

[0074] Next, a packaging bag according to a second embodiment of the present invention will be described with reference to FIG. 5. Note that in FIG. 5, portions denoted by the same reference symbols as those of FIGS. 1 to 4 represent components (elements) identical or corresponding to those of the first embodiment, and the description thereof is omitted.

[0075] As illustrated in FIG. 5, a packaging bag B according to the second embodiment includes a rectangular (substantially square) easy-to-cut portion 5A, which is wider than the back seal portion 2, at a position closer to the upper end seal portion 3 of the bag body 1, that is, at a central portion on the upper side of the bag body 1. In the packaging bag B according to the second embodiment, the easy-to-cut portion 5A is disposed at an upper

portion of the back seal portion 2, as compared with the packaging bag A according to the first embodiment.

[0076] In the second embodiment, the length dimension of the bag body 1 is 173 mm; the width dimension of the bag body 1 is 70 mm; the vertical dimension "a" and the horizontal dimension "b" of the easy-to-cut portion 5A are 30 mm which is larger than the width dimension of the back seal portion 2; the distance "c" between the upper end of the bag body 1 and the upper end of the easy-to-cut portion 5A is 15 mm; the distance "d" between the side end 1a of the bag body 1 and an end 5A1 of the easy-to-cut portion 5A is 20 mm; and the distance "e" between the side end 1b of the bag body 1 and the end 5A1 of the easy-to-cut portion 5A is 20 mm.

<Example>

[0077] Next, an example will be described. To compare the packaging bag A according to the first embodiment and the packaging bag B according to the second embodiment, a packaging bag C of Comparative Example 1 illustrated in FIG. 6 and a packaging bag D of Comparative Example 2 illustrated in FIG. 7 were prepared. The packaging bag C of Comparative Example 1 illustrated in FIG. 6 includes a band-shaped easy-to-cut portion 5B formed to extend across the both ends 1a and 1b of the bag body 1. The packaging bag D of Comparative Example 2 illustrated in FIG. 7 includes band-shaped easy-to-cut portions 5C and 5C formed to extend between the upper end seal portion 3 and the lower end seal portion 4 of the bag body 1. Note that the packaging bag C of Comparative Example 1 and the packaging bag D of Comparative Example 2 are not provided with the edge seal portion 7 and the notch 8.

[0078] First, a unit drop test and a packaging drop test were conducted on the packaging bags A, B, C, and D each packaging a content of 50 g. The unit drop test is a test in which each packaging bag is allowed to drop from a position at a height (drop distance) of 80 cm. The number of samples used in the unit drop test was set as follows. That is, the number of the packaging bags A of the first embodiment was 63; the number of the packaging bags B of the second embodiment was 63; the number of the packaging bags C of Comparative Example 1 was 60; and the number of the packaging bags D of Comparative Example 2 was 60.

[0079] The packaging drop test is a test in which an outer box filled with 21 packaging bags is allowed to drop three times in succession from a position at a height of 1.2 m. The number of samples used in the packaging drop test was set as follows. That is, the number of outer boxes containing the packaging bags A of the first embodiment was three (3 boxes x 21 packaging bags = 63 packaging bags); the number of outer boxes containing the packaging bags B of the second embodiment was three (3 boxes x 21 packaging bags = 63 packaging bags); the number of outer boxes containing the packaging bags C of Comparative Example 1 was 15 (15 box-

es x 21 packaging bags = 315 packaging bags); and the number of outer boxes containing the packaging bags D of Comparative Example 2 was 15 (15 boxes x 21 packaging bags = 315 packaging bags).

[0080] The packaging bags A of the first embodiment and the packaging bags B of the second embodiment did not burst in the unit drop test and the packaging drop test. On the other hand, two of the 60 packaging bags C of Comparative Example 1 burst in the unit drop test, and eight of the 315 packaging bags C of Comparative Example 1 burst in the packaging drop test. Meanwhile, two of the 60 packaging bags D of Comparative Example 2 burst in the unit drop test, and four of the 315 packaging bags D of Comparative Example 2 burst in the packaging drop test.

[0081] Further, a test for side cutting properties in areas extending from the notch 8 to each of the easy-to-cut portions 5 and 5A (to determine whether the cutting in the width direction is easy or not) was conducted on the packaging bags A of the first embodiment and the packaging bags B of the second embodiment. As a result, both the packaging bags A of the first embodiment and the packaging bags B of the second embodiment exhibited favorable side cutting properties.

[0082] Furthermore, a test for the straightness in each easy-to-cut portions 5 (easy-to-cut portion 5A) (to determine whether the cutting in the width direction is linear or not) was conducted on the packaging bags A of the first embodiment and the packaging bags B of the second embodiment. As a result, in the packaging bags A of the first embodiment, the cut portion (opening 10) was formed along each easy-to-cut portion 5, so that the straightness was favorable. In the packaging bags B of the second embodiment, the cut portion (opening 10) deviated upward and downward to some extent within the easy-to-cut portion 5A because the width of the easy-to-cut portion 5A was wide, but no problem was posed.

[0083] Moreover, a tearing sensory test was conducted on 12 persons for the packaging bags A of the first embodiment. As a result, 10 persons felt that "the packaging bag was cut very well"; one person felt that "the packaging bag was cut well"; and the remaining one person felt "good".

[0084] Thus, the packaging bags A of the first embodiment and the packaging bags B of the second embodiment can be easily opened with even a small force and can be opened with the cut portion being substantially linearly, thereby facilitating transfer of the contents X to another container. Furthermore, the packaging bags A of the first embodiment and the packaging bags B of the second embodiment can withstand the drop impact. These functions have been demonstrated from the test results.

[0085] As described above, according to the packaging bag A and the packaging bag B of the present invention, it is possible to provide a packaging bag having two incompatible functions, i.e., the function of allowing a user to easily open the packaging bag with hands, and the

function of preventing formation of an unwanted hole when an unexpected external force acts.

[0086] For example, when the user is to open the packaging bag A (packaging bag B) to transfer the contents X to another container (for example, a glass-like container) and add water into the container to drink it, the packaging bag A (packaging bag B) can be easily opened even by a physically weak user such as a patient. In addition, the opening 10 is formed linearly, which enables the user to easily transfer the contents X to another container. Furthermore, while the easy-to-cut portions 5 subjected to scratch work or the like are provided, the packaging bag A (packaging bag B) is prevented from bursting even when the packaging bag A (packaging bag B) having the contents X enclosed therein drops.

[0087] In this manner, the packaging bag A (packaging bag B) of the present invention can improve both the function of preventing bursting and the function of facilitating the opening. Further, the packaging bag A (packaging bag B) can be designed into a vertically long stick shape of a pillow type, or can be designed with a large width. This enables such a design that the powdery contents X can be easily transferred to another container such as a glass. Therefore, the packaging bag A (packaging bag B) of the present invention is a packaging bag particularly suitable for physically weak users such as patients and children.

[0088] Note that the packaging bag of the present invention is not limited to the above-described embodiments, and the design of the packaging bag can be arbitrarily changed and modified, for example, as needed, without departing from the gist of the invention. The constituents, methods, and the like of the plurality of embodiments described above can be arbitrarily employed and combined (the constituents, methods, and the like of one embodiment can be applied to the constituents, methods, and the like of the other embodiments), and the constituents, methods, and the like of various modified examples described below may be arbitrarily selected and employed as the constituents, methods, and the like of the embodiments described above, as a matter of course.

[0089] For example, in the packaging bag A (packaging bag B) according to the embodiments described above, the easy-to-cut portion 5 (easy-to-cut portion 5A) is provided on each of the front surface and the back surface of the bag body 1. However, the present invention is not limited to this structure. Specifically, the packaging bag may have a structure in which the easy-to-cut portion 5 (easy-to-cut portion 5A) is provided only on the back surface of the bag body 1. In short, it is sufficient that the packaging bag may include the easy-to-cut portion 5 (easy-to-cut portion 5A) on the back surface of the bag body 1 such that the easy-to-cut portion 5 (easy-to-cut portion 5A) is disposed to extend beyond the back seal portion 2 between one side of the back seal portion 2 and the other side of the back seal portion 2.

INDUSTRIAL APPLICABILITY

[0090] The packaging bag according to the present invention is provided with a notch and an easy-to-cut portion in combination, thereby obtaining the favorable opening property. Further, the packaging bag according to the present invention enables formation of the opening with a width that allows the contents to be easily taken out, while the notch (edge seal portion) is provided. In addition, the packaging bag can be prevented from bursting when the packaging bag drops, while the easy-to-cut portion is provided. Moreover, the packaging bag according to the present invention can be adopted as a packaging bag for various contents (powder, granular or aggregated solid, and liquid) such as medicines and food. The packaging bag according to the present invention is a packaging bag suitable for physically weak users.

DESCRIPTION OF THE REFERENCE NUMERALS

[0091] 1: bag body, 1a: side end (left side end), 1b: side end (right side end), 2: back seal portion, 2a: distal end, 2b: proximal end, 3: end seal portion (upper end seal portion), 4: end seal portion (lower end seal portion), 5, 5A: easy-to-cut portion, 5a, 5A1: end, 7: edge seal portion, 8: notch, 10: opening, A, B: packaging bag, F: film, X: contents

Claims

1. A packaging bag comprising a bag body containing a content, wherein the bag body comprises:
 - a back seal portion formed by sealing a film in a length direction and disposed on a back surface;
 - a pair of end seal portions formed by sealing the film in a width direction and disposed on ends in a length direction;
 - an edge seal portion formed by sealing the film and disposed on one side end;
 - a notch being formed in the edge seal portion, the notch serving as a starting point for opening of the bag body; and
 - an easy-to-cut portion disposed on an extension of the notch in an opening direction, the easy-to-cut portion being formed to extend beyond the back seal portion between one side and the other side of the back seal portion, and the ends of the easy-to-cut portion being disposed away from side ends of the bag body, respectively.
2. The packaging bag according to claim 1, wherein each of the ends of the easy-to-cut portion is disposed 10 to 25 mm away from a corresponding one of the side ends of the bag body.

3. The packaging bag according to claim 2, wherein each of the ends of the easy-to-cut portion is disposed 10 to 15 mm away from a corresponding one of the side ends of the bag body. 5
4. The packaging bag according to claim 1, wherein each of the ends of the easy-to-cut portion is disposed at a distance of 14 to 36% of a width dimension of the bag body away from a corresponding one of the side ends of the bag body. 10
5. The packaging bag according to claim 2, wherein each of the ends of the easy-to-cut portion is disposed at a distance of 14 to 21% of a width dimension of the bag body away from a corresponding one of the side ends of the bag body. 15
6. The packaging bag according to any one of claims 1 to 5, wherein the back seal portion is formed by sealing both side edges of the film in a length direction and is folded at a proximal end of the back seal portion such that a distal end of the back seal portion faces the other side of the bag body. 20
7. The packaging bag according to any one of claims 1 to 6, wherein the edge seal portion is disposed along a length direction of the bag body from one of the pair of end seal portions and is disposed to overlap the easy-to-cut portion in the width direction of the bag body. 25
30
8. The packaging bag according to any one of claims 1 to 7, wherein the easy-to-cut portion is formed in a rectangular shape, and 35
the notch is disposed at a central portion of the easy-to-cut portion in a length direction of the bag body.
9. A method of producing the packaging bag according to any one of claims 1 to 8, comprising. 40
forming the back seal portion by sealing both side edges of a film having a band shape in a length direction to form the film into a cylindrical shape; and forming the pair of end seal portions by sealing in a width direction the film having a cylindrical shape to form the film into a bag shape, 45
wherein the film includes the easy-to-cut portion formed on both side ends such that the easy-to-cut portion is formed to extend beyond the back seal portion between one side and the other side of the back seal portion. 50

55

FIG. 1

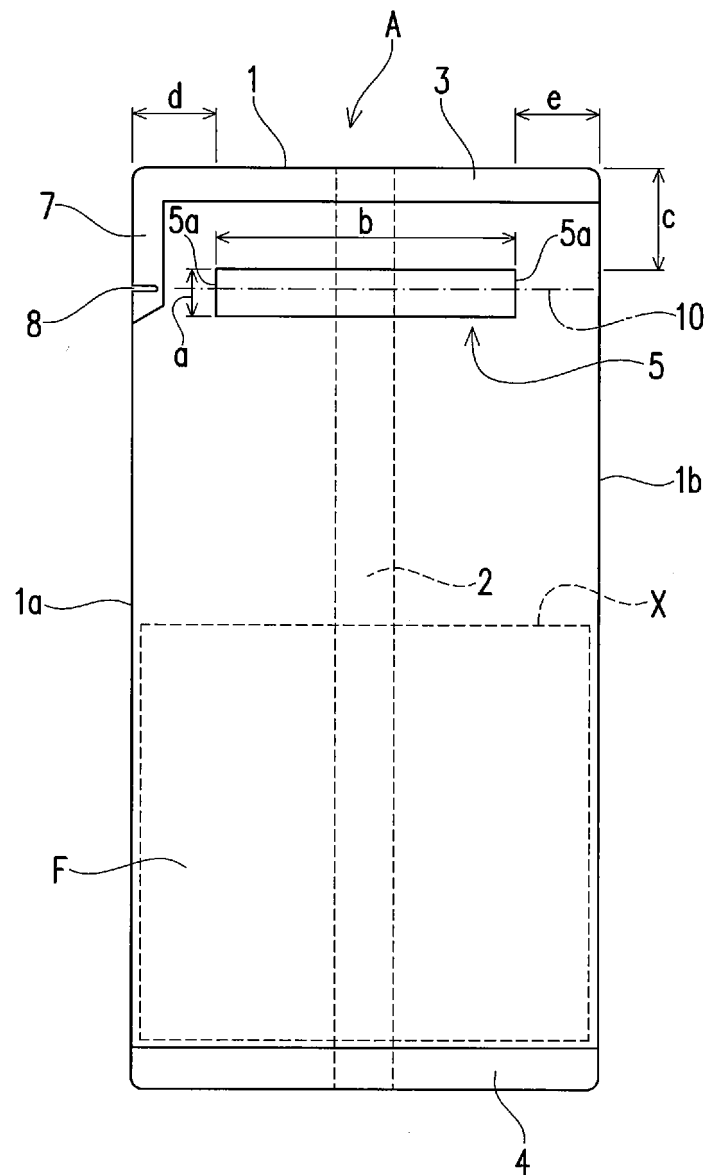


FIG. 2

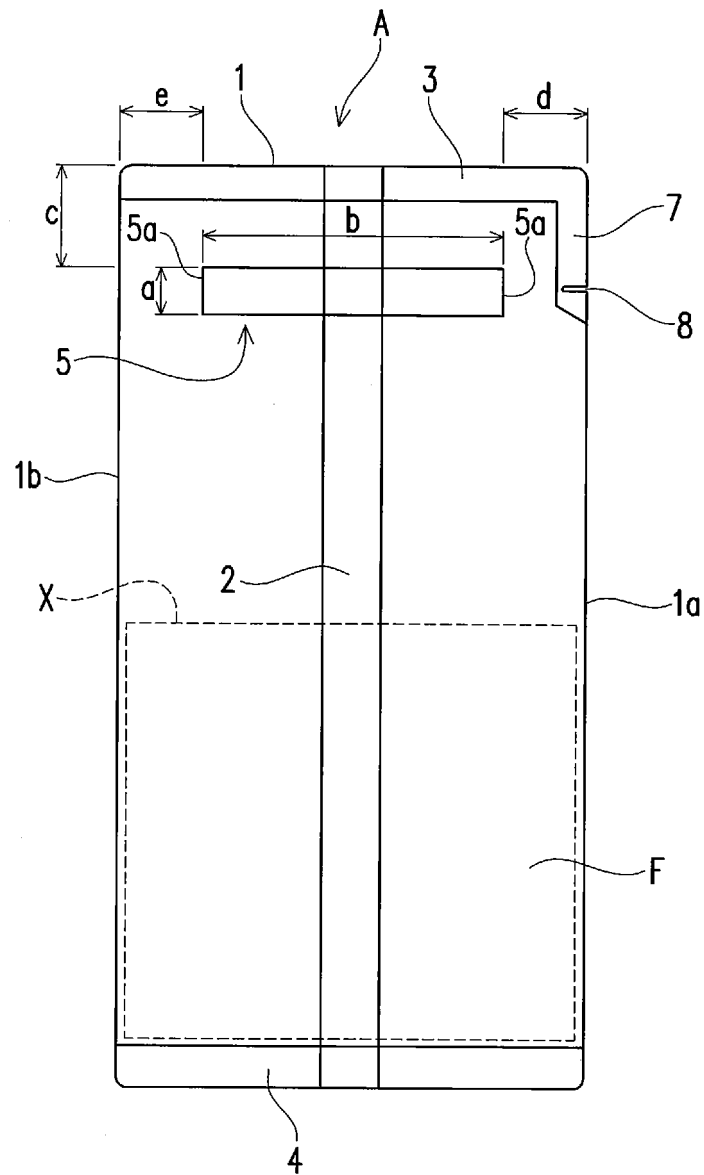


FIG. 3

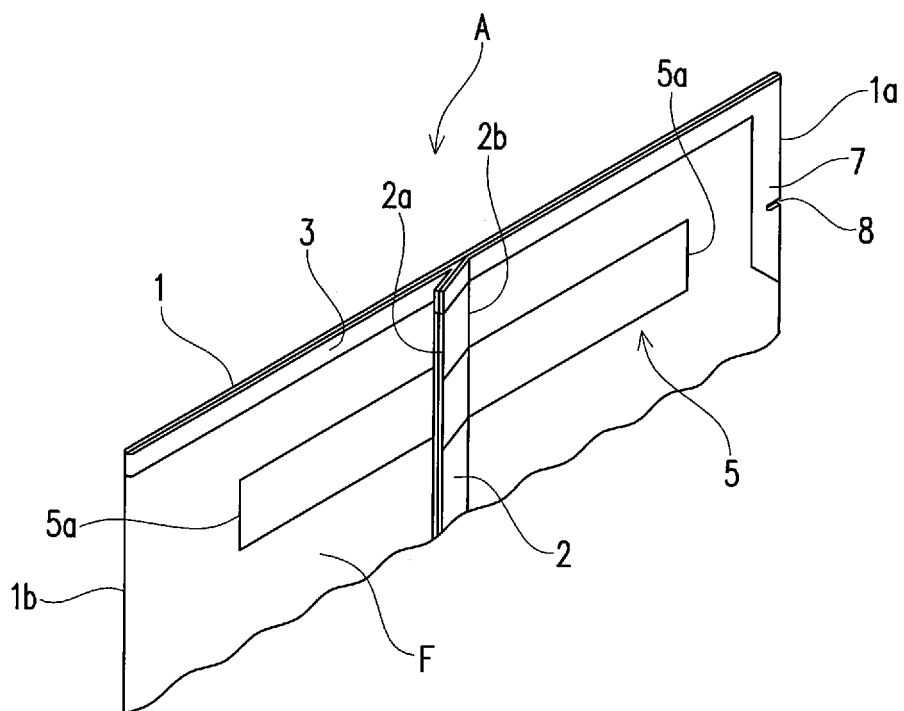


FIG. 4

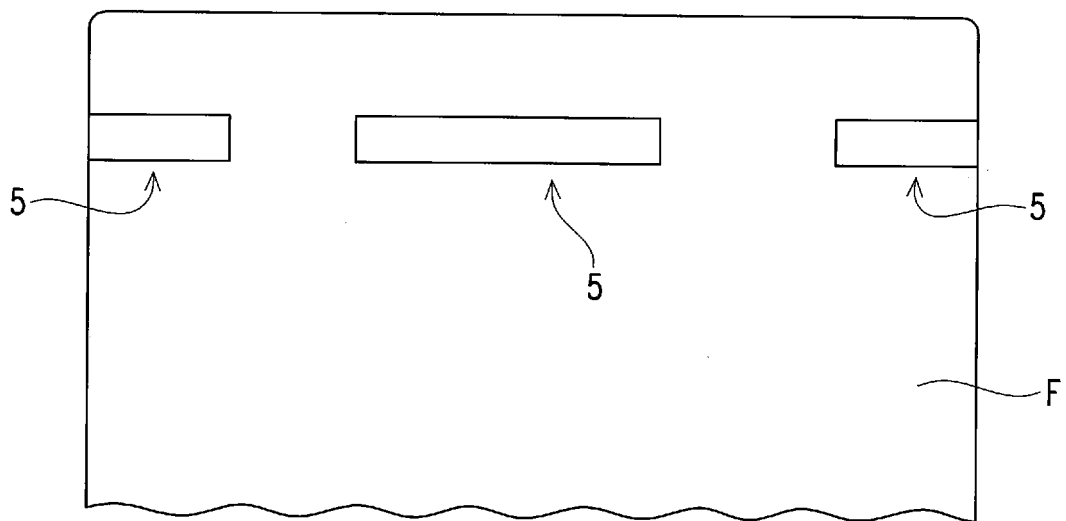


FIG. 5

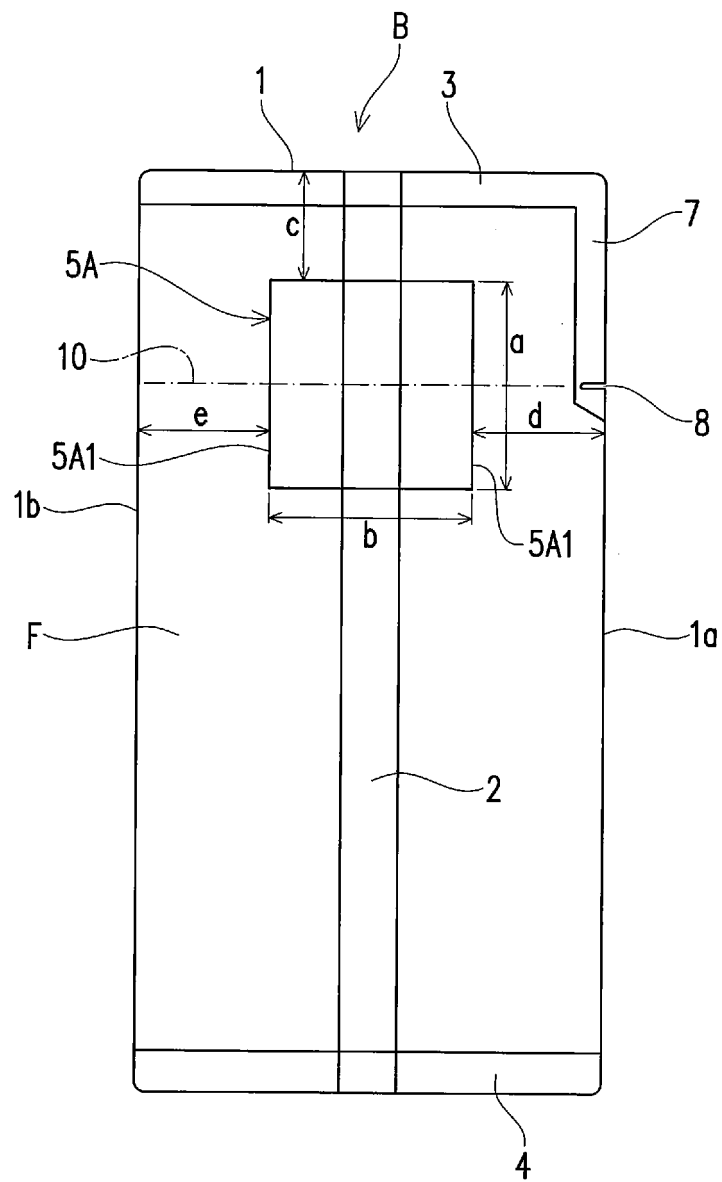


FIG. 6

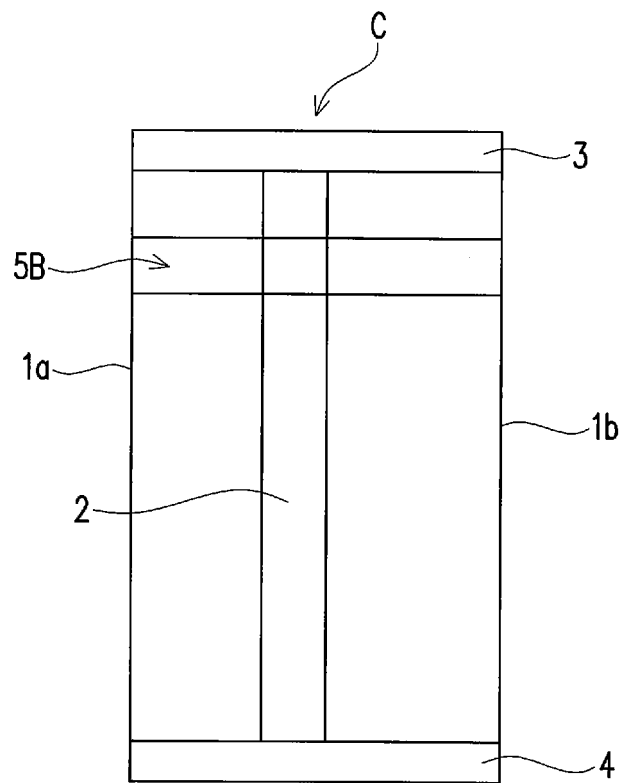


FIG. 7

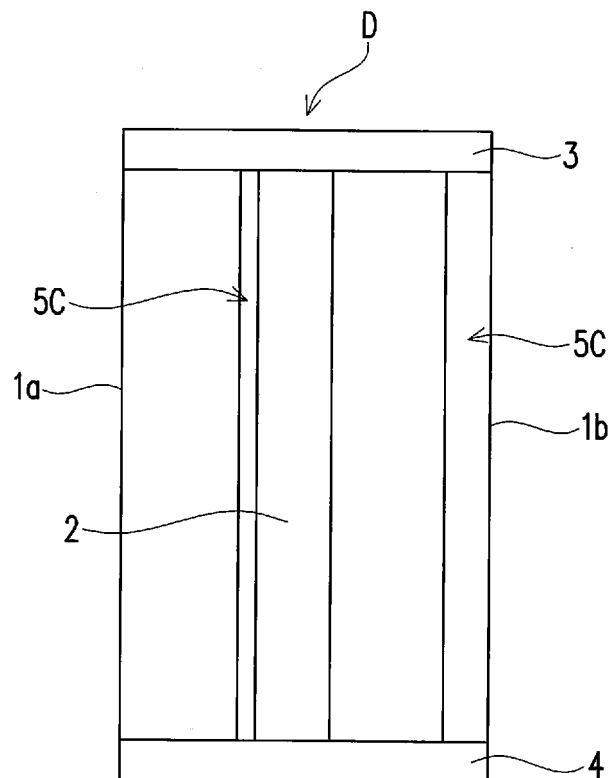
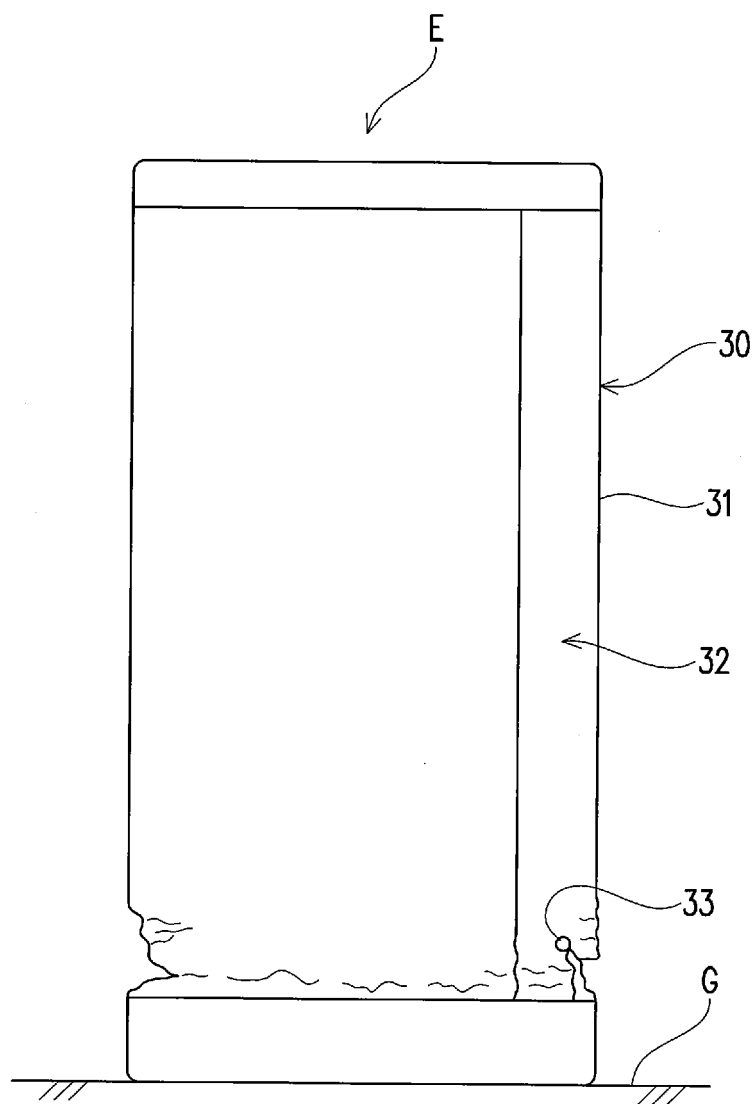


FIG. 8



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2012/062839

A. CLASSIFICATION OF SUBJECT MATTER B65D75/62 (2006.01) i		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) B65D75/58, B65D75/62, B65D30/00-33/38		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2012 Kokai Jitsuyo Shinan Koho 1971-2012 Toroku Jitsuyo Shinan Koho 1994-2012		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 259/1983 (Laid-open No. 106874/1984) (Denpei SAKURAI), 18 July 1984 (18.07.1984), page 2, line 20 to page 3, line 20; page 5, line 7 to page 6, line 6; fig. 8 (Family: none)	1-7, 9 8
Y	JP 9-132249 A (Toppan Printing Co., Ltd.), 20 May 1997 (20.05.1997), paragraphs [0021] to [0024]; fig. 1, 3(d) (Family: none)	8
☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 14 June, 2012 (14.06.12)		Date of mailing of the international search report 03 July, 2012 (03.07.12)
Name and mailing address of the ISA/ Japanese Patent Office		Authorized officer
Facsimile No.		Telephone No.

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2012/062839

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6318894 B1 (KRAFT FOODS HOLDINGS, INC.), 20 November 2001 (20.11.2001), column 16, line 59 to column 17, line 40; fig. 1 to 2 (Family: none)	1-9
A	US 2004/0190800 A1 (ALCAN PACKAGING ITALIA S.R.L.), 30 September 2004 (30.09.2004), paragraphs [0040] to [0054]; fig. 1 to 6 & EP 1464587 A1 & US 2007/0173395 A1	1-9
A	US 6726363 B1 (ALCAN TECHNOLOGY & MANAGEMENT LTD.), 27 April 2004 (27.04.2004), column 6, line 63 to column 7, line 24; fig. 4 & AT 296759 T & AU 1766000 A & BR 0007635 B1 & CA 2360764 C & CH 692980 A5 & EP 1152947 B1 & ES 2239584 T3 & WO 2000/043272 A1	1-9
A	JP 4-327138 A (Taisei Lamick Co., Ltd.), 16 November 1992 (16.11.1992), paragraphs [0009] to [0012]; fig. 1 to 2 (Family: none)	1-9

Form PCT/ISA/210 (continuation of second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2012/062839

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

The invention of claim 1 does not have novelty, since the invention is disclosed in the document: the microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 58-259 (Laid-open No. 59-106874), (Denpei SAKURAI), 18 July 1984 (18.07.1984), page 2, line 20 to page 3, line 20; page 5, line 7 to page 6, line 6; fig. 8.

Therefore, the matter set forth in claim 1 is not a special technical feature within the meaning of PCT Rule 13.2, second sentence.

(Continued to extra sheet)

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet (2)) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2012/062839

Continuation of Box No.III of continuation of first sheet(2)

Since there is no other common matter which is considered to be a special technical feature within the meaning of PCT Rule 13.2, second sentence among the inventions of claims 1-9, it is not considered that there is a technical relationship involving one or more of the same or corresponding special technical features among those different inventions.

Consequently, the inventions of claims 1-9 do not comply with the requirement of unity of invention.

REFERENCES CITED IN THE DESCRIPTION

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

Patent documents cited in the description

- JP 3971910 B [0008]