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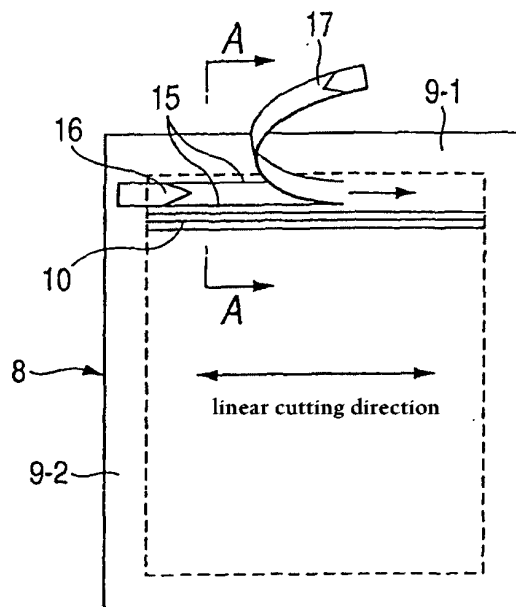
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(54) **EASY-TO-UNSEAL PACKAGING BAG**

(57) An object of the present invention is to provide a packaging bag capable of being realized only by a rather simple processing and opened easily by hand without deteriorating the sealing strength of the packaging bag and the strength of the packaging bag itself and without suffering from the possibility of peeling-off of the sealed portion during a distribution stage. The present invention relates to a packaging bag formed by adhering

two sheets of front and rear side films mutually at peripheral parts to seal an inside thereof, wherein the front side film has, in one direction, linearly cuttable property that is larger than linearly cuttable property in any direction of the rear side film, and a processed portion capable of starting cutting of the front side film along the one direction is provided at a part of the peripheral parts that intersects with the one direction.

**Fig. 6**



## Description

### <Technical Field>

**[0001]** The present invention relates to an easy open packaging bag capable of being easily opened by hand by tearing off one side of the bag linearly in predetermined width.

**[0002]** The present invention relates to a packaging bag used in a wide variety of packaging fields such as foods, articles of clothing, medical supplies, groceries, and so forth. More particularly, the invention relates an easy open packaging bag with a zipper capable of maintaining its sealed state in a distribution stage and also reproducing the sealed state as occasion demands after such bag is opened by the consumer, or the like.

### <Background Art>

**[0003]** Sealing bags using various synthetic resins are utilized in many packaging fields such as foods, articles of clothing, medical supplies, groceries, and others. When the contents are used, the bag must be torn open by any method to take out the contents.

**[0004]** Conventionally, flat type sealing bags are constructed to take out the packed contents by cutting off an open end portion of the bag using scissors, a kitchen knife, a knife, or the like. Otherwise, in order to make it possible to open the bag with fingers without these tools, the flat type sealing bags are constructed to be opened by providing a notch or a fine scar to a seal end portion or a folded portion of the bag as a starting point.

**[0005]** As a conventional opening method of four sided seal bags, it is normal to provide a notch to a seal portion, then tear open the bag from this notch as the starting point, and then take out the contents from the opened portion of the torn bag. However, there has been such a problem that, when the contents are easy-deformable goods such as a Japanese-style confection, a cookie or the like, or flat goods, the contents are broken or deformed upon tearing open the bag.

**[0006]** In order to prevent such event, JP 10-230971 A proposes an easy open packaging bag in which a non-bonded portion is formed in the area extending from the end portion of a side to be sealed to the sealed portion, then two notches are provided at an interval to cut partially into the bonded portion from the film end portion in the non-bonded portion, and then only one face of the bag can be opened in a stripe shape having the width corresponding to the interval between the notches by picking the portion between two notches with fingers. In this case, front and rear films in the sealed portion to which the notches are provided must be separated from each other to open the bag. Thus, the easy peel-off property is provided to the sealed portion to release and separate the front and rear films. For this purpose, the easy peel-off property must be provided to the overall sealed portion of the bag, or the easy peel-off property

must be provided only to the notched portions. In the case where the easy peel-off property is provided to the overall sealed portion, there is a fear that such sealed portion may be broken in a distribution stage. On the other hand, in order for partially providing the easy peel-off property only to the part that is required to open the bag, the easy peeling-off processing must be carried out only on the required part.

**[0007]** Also, JP 2001-55248 A relates to a pillow packaging bag and proposes a method of opening the bag semicircularly by providing two notches to the joining sealed portion at an interval and then picking and tearing the joining sealed portion between the notches with fingers. Also in this case, left and right films must be separated from each other at the root of the joining sealed portion. For this purpose, the fine scar is provided to the portion corresponding to the root of the joining sealed portion between the to-be-opened film and the opposite-side film, and thereby the opposite-side film can be cut to separate at that portion. Therefore, this technique involves the problems that an additional step of providing the fine scar to the film becomes necessary and that the strength of the portion to which the scar is provided becomes lowered.

**[0008]** In other words, according to above-described opening methods, one film must be separated from the other film at the sealed portion irrespective of the shape of the bag. That is, although there is the difference in the separating method between them, i.e., according to the film peeling-off by forming the weakly adhesive and easy peel-off sealing or the film cutting by providing the easy tear-off property to the film, in either case the foregoing problems have arisen because of the necessity for film separation.

**[0009]** Meanwhile, some contents are used bit by bit after the bag is opened. In this case, the user often wants to seal the contents again after the bag is opened. In order to satisfy this purpose, a packaging bag with a zipper having an engaging zipping/unzipping function to seal the contents again has been known.

**[0010]** A conventional packaging bag with a zipper is opened by tearing similarly at two sheets of front and rear films of the bag. In this case, as shown in FIG.8, cut ends 19-1, 19-2 of the front and rear films of the torn bag are overlapped together linearly over a full length of the opened portion. Therefore, upon unzipping the zipper after the packaging bag is opened or closed again to take out the contents, no finger hold used to separate the front and rear films at the torn portion of the bag is not provided. As a result, there has been a problem of being poor in easy-open property to separate the front and rear films right and left.

**[0011]** It is an object of the present invention to provide a packaging bag, capable of being realized only by a rather simple processing and opened easily by hand, without deteriorating the sealing strength of the packaging bag and the strength of the packaging bag itself and without suffering from a fear of peeling-off of the sealed

portion during a distribution stage. Also, it is another object of the present invention to provide a packaging bag with a zipper, capable of reproducing its sealed state again after the packaging bag is opened, and also having the good easy-open property.

#### <Disclosure of the Invention>

**[0012]** The present invention is concerned with a packaging bag formed by adhering two sheets of front and rear side films mutually at peripheral parts to seal an inside thereof, wherein the front side film has, in one direction, linearly cuttable property that is larger than linearly cuttable property in any direction of the rear side film, and a processed portion capable of starting cutting of the front side film along the one direction is provided at a part of the adhered peripheral parts that intersects with the one direction. According to this configuration, a packaging bag that can eliminate such a fear that the sealed portion is peeled off during a distribution stage and can be opened simply can be obtained.

**[0013]** Also, the present invention is concerned with a packaging bag with a zipper having: a bag main body formed by adhering two sheets of front and rear side films mutually at peripheral parts to seal an inside thereof; and a zipper portion re-sealably provided at an inner side position than the adhered peripheral part of an open edge side of the bag main body, wherein the front side film has, in one direction, linearly cuttable property that is larger than linearly cuttable property in any direction of the rear side film, wherein the zipper portion is provided along the one direction, and wherein a processed portion capable of starting cutting of the front side film along the one direction is provided between the adhered peripheral part of an open edge side of the bag main body and the zipper portion, and at a part of the adhered peripheral parts that intersects with the one direction. According to this configuration, a packaging bag with a zipper that can eliminate such a fear that the sealed portion is peeled off during a distribution stage, can be opened simply, and can attain the easy-open property of the zipper upon sealing the bag again can be obtained.

**[0014]** Also, it is preferred that the front side film comprises a laminated film containing: a linearly cuttable film layer having, in one direction, linearly cuttable property that is larger than the linearly cuttable property in any direction of the rear side film; and a thermally fusible resin film layer, that the rear side film comprises a laminated film containing a thermally fusible resin film layer, and that the thermally fusible resin film layers of the front side film and the rear side film are provided to face each other. According to this configuration, the above bag can be sealed without any adhesive.

**[0015]** Also, the film arrangement may be such that the front side film comprises a laminated film containing a film having linearly cuttable property and a thermally fusible resin film layer, and the rear side film comprises

a laminated film containing a thermally fusible resin film layer that does not contain a film having linearly cuttable property.

**[0016]** The adhered peripheral portions are provided to the periphery of the bag by thermal fusion or the adhesion. It is preferred that the adhered peripheral portions are provided in four sides of the bag by thermal fusion.

**[0017]** Also, it is preferred that the processed portion comprises at least two adjacent notches that are provided at an outer edge portion of the adhered peripheral portions of the packaging bag. According to this configuration, the opening can be started by the simple processing to provide the notches.

**[0018]** Also, it is preferred that the processed portion is formed as a tab-shaped incision provided in the adhered peripheral portions areas of the packaging bag. According to this configuration, a fear of the trouble that the bag is opened in error during a distribution stage can be reduced.

**[0019]** Also, it is preferred that the adhered peripheral portion that is located near the processed portion is to have a wider width than those of the other adhered peripheral portions. According to this configuration, a fear to cause the bag open trouble during a distribution stage can be reduced much more.

**[0020]** The above-mentioned processed portion may be provided at plural locations.

**[0021]** Also, it is preferred that the linearly cuttable film layer comprises any of a monoaxially stretched polyolefin film, a biaxially stretched polyamide film, and a biaxially stretched polyester film.

#### <Brief Description of the Drawings>

##### **[0022]**

FIG.1 is a conceptual sectional view of a part of a packaging bag and a laminated film constituting the same.

FIG.2 is a front-side plan view of an example of the packaging bag with a zipper.

FIG.3 is a front-side plan view of another example of the packaging bag with a zipper.

FIG.4 is a front-side plan view of a still other example of the packaging bag with a zipper.

FIG.5 is a front-side plan view of a yet still other example of the packaging bag with a zipper.

FIG.6 is a conceptual view showing an unsealed situation of the packaging bag with a zipper.

FIG.7 is a conceptual sectional view showing an unsealed situation of the easy-to-unseal packaging bag with a zipper.

FIG.8 a conceptual sectional view showing an unsealed state of a conventional packaging bag with a zipper.

FIG.9 is a schematic view showing a conception of linearly cuttable property.

**[0023]** In the above figures, a reference numeral 1 is a packaging bag, 2 front-side laminated film, 3 rear-side laminated film, 4-1 base film layer of the front-side laminated film, 4-2 base film layer of the rear-side laminated film, 5 linearly cuttable film layer, 6-1 thermally fusible film layer of the front-side laminated film, 6-2 thermally fusible film layer of the rear-side laminated film, 7 intermediate film layer, 8 four sided seal bag, 9-1 lateral seal, 9-2 longitudinal seal, 10 zipper, 11 processed portion, 12 cutting, 13-1 and 13-2 seal projected portion, 14-1 and 14-2 notch, 15 tearing-off line of the front-side laminated film, 16 tearing-off line of the rear-side laminated film, 17 tear strip, 18 opened space after the tear strip 17 is removed, and 19-1 and 19-2 cut end surface of a film of the conventional packaging bag.

#### <Best Mode for Carrying Out the Invention>

**[0024]** Examples of the packaging bag of the present invention are explained with reference to the drawings below.

**[0025]** FIG.1 is a sectional view of a part of the four sided seal bag, and shows respective layered structures of a front-side laminated film 2 and a rear-side laminated film 3 and their relative arrangement to constitute a packaging bag 1. Here, the front-side laminated film 2 is a film with linearly cuttable property. The rear-side laminated film 3 is a film without the linear cuttability or with the linearly cuttable property that is smaller than that of the front-side laminated film 2.

**[0026]** The "linearly cuttable property" mentioned in the present invention signifies the property defined by the measuring method described hereunder. That is, a film 250 mm square is cut out along the flow direction upon manufacturing the film and the direction perpendicular to the flow direction. Then, two notches are formed at an interval of 30 mm on an edge of the cut piece that is perpendicular to the direction along which the linearly cuttable property is tested (FIG.9). Then, the film is torn off in the parallel direction with the linear cutting direction by picking the 30 mm snip with fingers (the film is cut as indicated by the dotted lines in FIG.9). Generally, the cut behavior of the film may vary with the tearing-off direction of the film depending on the directions of the molecular orientation and the blended component orientation. Therefore, the above tear test is carried out in the left direction and the right direction of the film respectively, and then the linearly cuttable property is decided based on the width of the tip end "X" of the film whose torn tip end becomes narrower when it is torn off. The value of X closer to 30 mm represents better linearly cuttable property. The film whose value of X is below 5 mm or the film whose torn end does not arrive at the opposing end edge is called a film without the linearly cuttable property.

**[0027]** The four sided seal bag in FIG.1 is constituted by two types of films of the front-side laminated film 2 and the rear-side laminated film 3.

**[0028]** The front-side laminated film 2 comprises a base film layer 4-1, a film layer 5 with the linearly cuttable property, and a thermally fusible film layer 6-1. Depending on required characteristics of the bag, the base film layer 4-1 and the film layer 5 with the 1 linearly cuttable property may be laminated in reverse order, and the base film layer 4-1 may be omitted. Also, another intermediate film layer, although not shown, may be laminated.

**[0029]** In addition, in the front-side laminated film'2 in FIG.1, the linearly cuttable property is provided to the laminated film by using the film with the linearly cuttable property in a part of the layer arrangement. As another method, the linearly cuttable property may be provided to the front-side laminated film 2, for example, by using, as a part of the layer arrangement, two sheets of films that have different molecular orientation of the film from each other and are laminated back to back, i.e., a combined film layer in which two sheets of films is used as a set to exhibit the linearly cuttable property, as set forth in JP 09-156649 A.

**[0030]** The rear-side laminated film 3 comprises a base film layer 4-2, an intermediate film layer 7, and a thermally fusible film layer 6-2. The intermediate film layer 7 may be omitted.

**[0031]** As the base film layers 4-1 and 4-2, preferably used is a biaxially stretched film such as a polyolefin resin film including polypropylene, a polyamide resin film including nylon 6, nylon 66 and nylon 12, and a polyester resin film including polyethylene terephthalate and polybutylene terephthalate.

**[0032]** As the film layer 5 with the linearly cuttable property, there can be cited a vertically or laterally monoaxially stretched polyolefin resin film such as a monoaxially stretched polyethylene film and a monoaxially stretched polypropylene film; a biaxially stretched polyamide film formed by mixing a polymethacryladiamide resin into a nylon 6 resin to improve a layer separation structure and drawing conditions, as set forth, for example, in JP 07-113015 A; and a biaxially stretched polyester film formed by mixing a polybutylene terephthalate resin into a polyethylene terephthalate resin to improve a layer separation and drawing conditions, as set forth, for example, in JP 11-300916 A.

**[0033]** As the thermally fusible film layers 6-1 and 6-2, a film made of low-density polyethylene, linear low-density polyethylene, a copolymer resin of ethylene and a copolymerizable vinyl compound, or a polypropylene resin can be employed. It is preferred that the kinds of the resins of the thermally fusible film layers 6-1 and 6-2 are the same.

**[0034]** When a steam or gas barrier property, an aroma barrier property, etc. are required of the laminated film to preserve the contents filled in the bag, either a film on which a resin layer mainly comprising a poly(vinylidene chloride) resin or an ethylene vinyl alcohol resin is coated, or a film on which metal oxide, metal, or the like is deposited may be chosen as the base film layers

4-1 and 4-2. Alternatively, a film having a gas barrier property, e.g., a metallic foil made of aluminum or the like, a poly(vinylidene chloride) resin film, an ethylene vinyl alcohol resin film, a co-extruded film of these with other resins, or the like may be laminated as an intermediate film layer 7. Also, when rigidity, design aspect, etc. are required of the film, a paper may be laminated.

**[0035]** The front-side laminated film 2 and the rear-side laminated film 3 are formed into the four sided seal bag by the conventional method so as to oppose the thermally fusible film layers 6-1 and 6-2 to each other. The method of manufacturing the laminated film is not particularly limited. For example, the dry or wet lamination method of laminating the films by using an adhesive, the sand lamination method of laminating the films by extruding a melted polyethylene or the like from a T die, the extrusion lamination method of extruding and laminating a melted polyethylene or the like from a T die, the thermal lamination method using a thermally fusible resin having a low melting point, and others may be employed in accordance with the purpose.

**[0036]** FIG.2 to FIG.5 show examples of a four sided seal bag 8 with a zipper respectively. In this bag 8, the front-side laminated film 2 and the rear-side laminated film 3 (assuming that the front-side laminated film is positioned on the front side of the sheets in respective figures) are sealed at four sides of the bag by a lateral seal 9-1 on the open end side, a lateral seal on the closed end side, and two longitudinal seals 9-2. That is, the lateral seal 9-1 on the open end side, the lateral seal on the closed end side, and two longitudinal seals 9-2 constitute peripheral portions of the packaging body or the film. A processed portion 11 used to start an easy cutting is provided to the fused portion of the longitudinal seal between the lateral seal 9-1 and a zipper 10. Generally, the bag 8 is obtained by filling the contents into the bag that is shaped into a state that three sides are sealed once and the remaining one side is opened, and then sealing the open surface.

**[0037]** In the bag 8 in FIG.2, the front-side laminated film 2 has the linearly cut table property in the direction indicated with the arrow that is depicted in parallel with the lateral seal 9-1. A incision 12 that is formed into a square well-shape, a U-shape, a V-shape or the like and used as a tear starting portion to tear off the front-side laminated film 2 in the linear cutting direction indicated with the arrow is provided to an edge portion of the longitudinal seal 9-2 in the direction perpendicular to this direction. The incision 12 is formed in such a manner that the axis of symmetry of the incision 12 is arranged in substantially parallel with the direction of the linearly cuttable property of the film. Also, the incision 12 is formed such that its part closest to the outer edge of the bag along the direction of the linearly cuttable property is cut whereas its part farthest to the outer edge of the bag along the direction of the linearly cuttable property is not cut and is still connected to the film as it is. As a result, the cut portion constitutes the tab shape that can

be held with fingers. This tab shape corresponds to the processed portion 11.

**[0038]** In FIG.3, a part of the longitudinal seal 9-2, which is positioned near the processed portion 11, out of the sealed portions (peripheral portions) constitutes a projected portion 13-1 that is projected into the inner side of the bag. Therefore, the width of the sealed portion is formed locally wider than that of the other sealed portions. By this configuration, it is feasible to reduce a possibility of the unintended breakage trouble of the bag started from the processed portion 11, which is caused due to the short interval between the inner edge of the sealed portion of the bag and the leading end of the incision 12. Incidentally, FIG.3 shows an example in which the projected portion 13-1 of the processed portion 11 extends over the lateral seal 9-1, and FIG.4 shows an example in which a projected portion 13-2 does not extend over the lateral seal 9-1. The projected sealed portions 13-1, 13-2 in FIG.3 and FIG.4 are shaped into a squarish shape, but there may be employed other than this shape, for example, a shape having rounded corner portions.

**[0039]** FIG.5 shows an example in which two notches 14-1, 14-2 are provided closely at a predetermined interval to the outer edge of the sealed portion as the processed portion 11. In FIG.5, an example in which the large notches 14 are provided to two locations is shown. But fine scars may be provided along the outer edge of the sealed portion in place of the notches 14. In the processed portion 11 in FIG.5, it is desired that the notch or the scar used to start the linear cutting should be provided to at least two locations and that a distance between two locations should be provided to some extent in the direction perpendicular to the linear cutting direction. The bag can be opened by using the tear strip, which is torn off along two almost-parallel tearing-off lines starting from these two locations, without an influence on other portions of the bag.

**[0040]** More particularly, the size of the incision 12 and the interval between the notches 14 in the processed portion 11 in FIG.2 to FIG.5 may be any as far as the cut portion can be held and pulled up with fingers. Specifically, they may be set from about 5 mm to 15 mm. The size of the incision 1,2 and the interval between the notches 14 define a tear-off width of the front-side laminated film 2 when the bag is opened, and thus this length may be changed when change of the tear-off width is required. In this case, the direction of the notches 14 is set in substantially parallel with the linear cutting direction. The incision 12, the notches 14 and others as the processed portion 11 are produced when the bag is formed.

**[0041]** FIG.6 shows an intermediate opening state of the four sided seal bag 8 in FIG.2. In the opening operation, the incision 12 in the processed portion 11 in FIG. 2 is pulled up and held with fingers, and then pulled along the linear cutting direction of the front-side laminated film 2 of the bag indicated with the arrow, i.e., the

direction perpendicular to the longitudinal seal 9-2 in which the processed portion 11 is provided (the pulling direction indicated with an arrow in FIG.6). Since the film 5 with the linearly cuttable property is laminated in the front-side laminated film 2, the front-side laminated film 2 can be torn off along substantially-linear tearing-off lines 15 as a tear strip that have a width equal to the interval between the incisions 12.

**[0042]** In contrast, the rear-side laminated film 3 does not have the linearly cuttable property or has the small linearly cuttable property. Therefore, although the tearing force in the linear direction is applied to the rear-side laminated film 3 by the influence of the tearing force of the front-side laminated film 2 in the linear direction, such rear-side laminated film 3 is torn off in a tapered fashion indicated by tearing-off lines 16 at a slightly inner location from the inner sealed edge of the bag to cut out a part of the inner surface of the rear-side laminated film and then such part together with the tear strip 17 is separated from the rear-side laminated film. As a result, only the front-side laminated film 2 can be cut away as the tear strip 17.

**[0043]** This four sides seal bag that can be opened easily in this manner neither requires the easy peel-off property provided to the sealed portion nor the easy tear-off processing applied to the rear-side film upon sealing. Therefore, only the front-side laminated film 2 can be torn open in the predetermined width not to damage the strength of the bag.

**[0044]** Also, the tearing-off of the tear strip 17 comes, from the sealed portion at which the opening is started, up to the opposing sealed portion in the linear cutting direction and then stops there. Therefore, the tear strip 17 is still attached to the bag and left as it is, and thus is never scattered about as the dust. FIG.7 is a sectional view of the opened portion of the bag taken along the A-A arrowed line in FIG.6. Here, reference numeral 3 is the rear-side laminated film, 2 is the front-side laminated film, 9-1 is the lateral sealed portion, 10 is the zipper, 18 is a space formed after the tear strip 17 is torn off and the front-side laminated film 2 is removed.

**[0045]** In order to take out the contents, the consumer can grasp simply the cut edge of the front-side laminated film 2 by inserting fingers into the space portion 18, which is formed by removing the tear strip 17 of the front-side laminated film 2, to open the front-side laminated film 2 and the rear-side laminated film 3 rightward and leftward respectively. Thus, the consumer can release the engagement of the zipper 10 to open the bag.

**[0046]** Of course, the zipper 10 may not be provided to the packaging bag of the present invention.

**[0047]** In this way, according to the easy open packaging bag of the present invention, only the front-side laminated film 2 of the four sided seal bag 8 can be opened without the provision of the easy peel-off property to the sealed portion and the application of the easy tear-off processing to the rear-side film upon sealing.

**[0048]** The explanatory view and the sentences to in-

form the consumer of the open starting part and make the consumer to comprehend the opening method may be printed on the above packaging bag. The contents filled in the packaging bag are not particularly limited.

This packaging bag is especially suitable for easy-deformable goods such as Japanese-style confection, cake or the like, easy-fragile and foldable goods such as thin-baked rice cracker, cookie, wafer, rod-like candy or the like, flat goods such as wet tissue, napkin, sliced ham, sliced cheese or the like, dry goods, and others.

#### <Examples>

##### Example 1

**[0049]** The front-side laminated film was formed by extruding a low-density polyethylene, which has a density of 0.920 g/cm<sup>3</sup> and a thickness of 15  $\mu$ m, from a T die to laminate together with EMBLET PC, which is a vertically linearly-cuttable polyethylene terephthalate film of 12  $\mu$ m thickness manufactured by Unitika Ltd. and an aluminum foil of 7  $\mu$ m thickness via an anchor coating agent by means of sand lamination method, and then extruding the above low-density polyethylene of 300  $\mu$ m thickness from the T die to laminate on the aluminum foil side. The rear-side laminated film was formed in the same way as above, except that a general polyethylene terephthalate film of 12  $\mu$ m thickness and without the linearly cuttable property was used in place of the linearly-cuttable polyethylene terephthalate film.

**[0050]** With a bag forming machine, films serving as the front and rear surfaces of the bag were fed continuously from the biaxial feeder to oppose the low-density polyethylene films to each other and simultaneously the zipper tape was fed. Thereby, the so-called laterally formed bag, whose one side on the opposite side to the side on which the zipper is provided in parallel with the flow direction of the bag forming machine was opened and the remaining three sides were sealed and in which a seal width was 10 mm, a length in the flow direction (lateral direction of the bag) was 100 mm, and a length in the direction perpendicular to the flow direction (longitudinal direction of the bag) was 150 mm, was obtained. The zipper tape was provided such that its upper end was positioned away from the inner edge of the lateral seal by 15 mm. The incision 12 was provided to the position that is located in the middle between the lateral seal and the zipper and on the inner side from the outer edge of the longitudinal seal by 3 mm such that the square well-shape cut whose width (longitudinal length on the sheet in FIG.3) is 10 mm and whose length (lateral length on the sheet in FIG.3) is 5 mm and whose part connected to the film serves as the processed portion 11 directed to the inner side of the bag was formed as shown in FIG.3.

**[0051]** Then, the four sided seal bag was formed by inserting three wafers, each having a width of 20 mm and a thickness of 10 mm, in parallel from the open por-

tion of the bag as the contents and then sealing the open portion of the bag. When the bag was opened by picking the square well-shape incision with fingers and pulling it in the direction indicated with an arrow in FIG.6, the rear-side laminated film is peeled off from the tear strip 17 at the position, which is away from the inner sealed edge of the bag by 10 mm, in a taper fashion as indicated by 15 in FIG.6. The front-side laminated film could be torn open stably only in the about 10 mm width not to break the contents. Also, the front and rear films could be separated easily by inserting fingers into the space portion 18 formed after the tear strip 17 was cut off. In addition, the contents could be picked up smoothly by opening the zipper.

#### Example 2

**[0052]** As the front-side laminated film, UNIASLON TB1000 which is a vertically linearly-cuttable polyamide film of 15  $\mu$ m thickness manufactured by Idemitsu UniTech Co. Ltd. and a linear low-density polyethylene film of 50  $\mu$ m thickness were laminated by the dry lamination method using a two-liquid polyurethane adhesive. As the rear-side laminated film, a laminated film was formed in the same way as in Example 1, except that a general nylon 6 film of 15  $\mu$ m thickness and without the linearly cuttable property was used in place of the linearly-cuttable polyamide film. Then, a bag with a zipper was obtained by forming these laminated films into the bag in the same way as in Example 1. In this case, regarding the processed portion, a width of the sealed portion was widened locally to 15 mm by protruding the sealed end portion into the inner side of the packaging bag by 5 mm as indicated by 13-1 in FIG.3, and the same incision as in Example 1 was provided to the position that is on the inner side from the seal outer edge by 5 mm.

**[0053]** Then, when the bag was evaluated in the same way as in Example 1, the rear-side laminated film was also peeled off from the tear strip 17 at the position, which is away from the inner sealed edge of the bag by 13 mm, in a taper fashion. Thus, the front-side laminated film could be torn open stably only in the about 10 mm width not to break the contents. In addition, the easy-open property of the zipper was also good.

#### Example 3

**[0054]** As the front-side laminated film, the nylon 6 film of 15  $\mu$ m thickness and without the linearly cuttable property used in the rear-side laminated film in Example 2, a laterally monoaxially stretched polypropylene film YT22 of 25  $\mu$ m thickness manufactured by Toray Industries, Inc., and a linear low-density polyethylene film of 30  $\mu$ m thickness were laminated in this order by using a two-liquid polyurethane adhesive. Also, the same rear-side film as in Example 2 was used as the rear-side laminated film.

**[0055]** Then, a bag whose one side in the flow direction of the bag forming machine was opened and remaining three sides were sealed and in which a longitudinal length was 150 mm, and a lateral length was 100 mm, and a seal width was 10 mm was obtained by forming the laminated films serving as the front and rear surfaces of the bag into a bag by means of the bag forming machine having the biaxial feeder. At this time, a zipper as provided in Examples 1, 2 was not provided.

**[0056]** A first I notch having a length of 5 mm in the direction perpendicular to the sealed edge was provided to the sealed portion in the flow direction of the bag forming machine of this bag at the position that is away from the edge of the bag by 25 mm, and a second I notch was provided away from the first I notch by a distance of 10 mm in the sealed edge direction.

#### Comparative Example 1

**[0057]** A bag was formed in the same way as in Example 1 by using also the front-side laminated film in Example 1 as the rear-side laminated film, i.e., using the laminated film with the linearly cuttable property as both the front and rear side films of the bag.

**[0058]** Then, the bag was evaluated in the same way as in Example 1. This bag could not be opened since the rear-side laminated film could not be separated from the tear strip.

#### Comparative Example 2

**[0059]** A bag was formed in the same way as in Example 2 by using also the rear-side laminated film in Example 2 as the front-side laminated film, i.e., using the laminated film without the linearly cuttable property as both the front and rear side films of the bag.

**[0060]** Then, when the bag was evaluated in the same way as in Example 1, the cut of the rear-side laminated film was changed unstably depending upon the strength and the direction of the force applied when the tab portion of the incision is held with fingers and pulled up. Therefore, the bag could not be smoothly opened.

**[0061]** While the present invention has been described in detail and with reference to specific embodiments thereof, it will be apparent to one skilled in the art that various changes and modification can be made therein without departing from the spirit and scope thereof.

**[0062]** This application is based on Japanese Patent Application No.2001-393707 filed on December 26, 2001 and Japanese Patent Application No. 2002-187442 filed on June 27, 2002, and the contents thereof are herein incorporated by reference.

#### <Industrial Applicability>

**[0063]** One side of the bag can be torn open linearly easily with fingers in a predetermined width without par-

tical processing other than the provision of a processed portion serving as the open starting part. Also, when a zipper is provided, the easy-open property of the zipper becomes good after the bag is opened.

## Claims

1. A packaging bag formed by adhering two sheets of front and rear side films mutually at peripheral parts to seal an inside thereof,  
     wherein the front side film has, in one direction, linearly cuttable property that is larger than linearly cuttable property in any direction of the rear side film, and a processed portion capable of starting cutting of the front side film along the one direction is provided at a part of the adhered peripheral parts that intersects with the one direction. 10
2. The packaging bag according to claim 1,  
     wherein the front side film comprises a laminated film containing: a linearly cuttable film layer having, in one direction, linearly cuttable property that is larger than the linearly cuttable property in any direction of the rear side film; and a thermally fusible resin film layer, 20  
     wherein the rear side film comprises a laminated film containing a thermally fusible resin film layer, and 25  
     wherein the thermally fusible resin film layers of the front side film and the rear side film are provided to face each other. 30
3. The packaging bag according to claim 1 or 2,  
     wherein the front side film comprises a laminated film containing a film having linearly cuttable property and a thermally fusible resin film layer, 35  
     wherein the rear side film comprises a laminated film containing a thermally fusible resin film layer that does not contain a film having linearly cuttable property, and 40  
     wherein the thermally fusible resin film layers of the front side film and the rear side film are provided to face each other. 45
4. The packaging bag according to any one of claims 1 to 3, wherein the adhered peripheral portions are provided in four sides of the bag.
5. The packaging bag according to any one of claims 1 to 3, wherein the processed portion comprises at least two adjacent notches that are provided at an outer edge portion of the adhered peripheral portions of the packaging bag. 50
6. The packaging bag according to any one of claims 1 to 3, wherein the processed portion comprises a tab-shaped incision provided in the adhered peripheral 55

eral portion areas of the packaging bag.

7. The packaging bag according to claims 5 or 6, wherein the adhered peripheral portion that is located near the processed portion is formed to have a wider width than those of the other adhered peripheral portions.
8. The packaging bag according to any one of claims 1 to 3, wherein the linearly cuttable film layer comprises any of a monoaxially stretched polyolefin film, a biaxially stretched polyamide film, and a biaxially stretched polyester film.
9. A packaging bag with a zipper having: a bag main body formed by adhering two sheets of front and rear side films mutually at peripheral parts to seal an inside thereof; and a zipper portion re-sealably provided at an inner side position than the adhered peripheral part of an open edge side of the bag main body,  
     wherein the front side film has, in one direction, linearly cuttable property that is larger than linearly cuttable property in any direction of the rear side film,  
     wherein the zipper portion is provided along the one direction, and  
     wherein a processed portion capable of starting cutting of the front side film along the one direction is provided between the adhered peripheral part of an open edge side of the bag main body and the zipper portion, and at a part of the adhered peripheral parts that intersects with the one direction.



Fig. 1

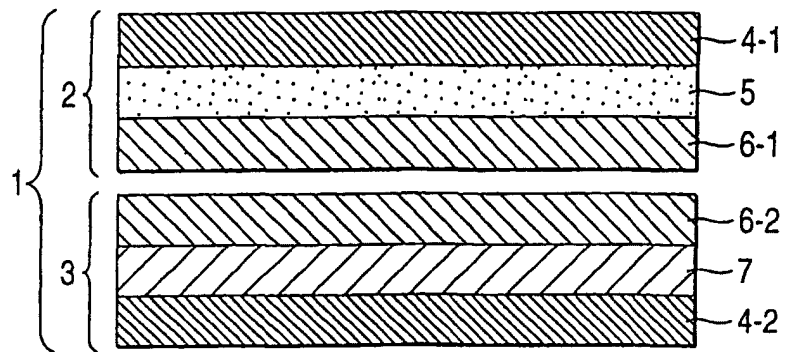


Fig. 2

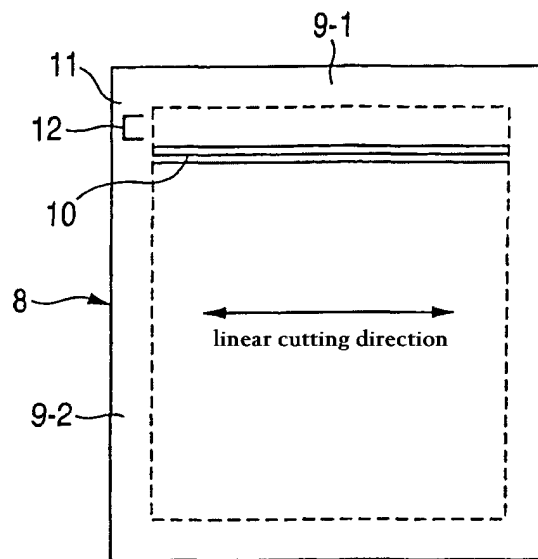


Fig. 3

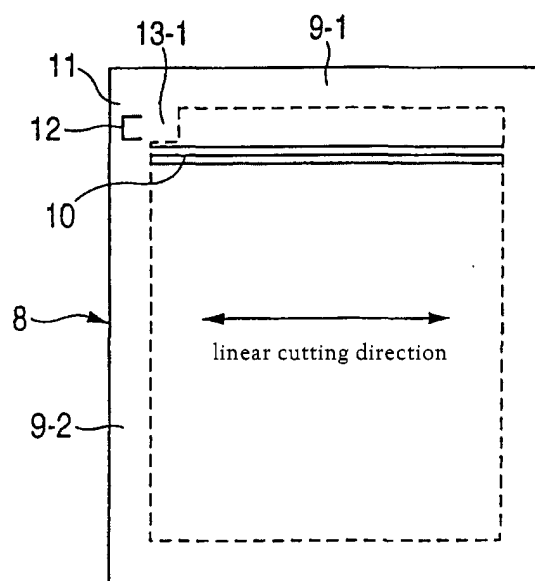


Fig. 4

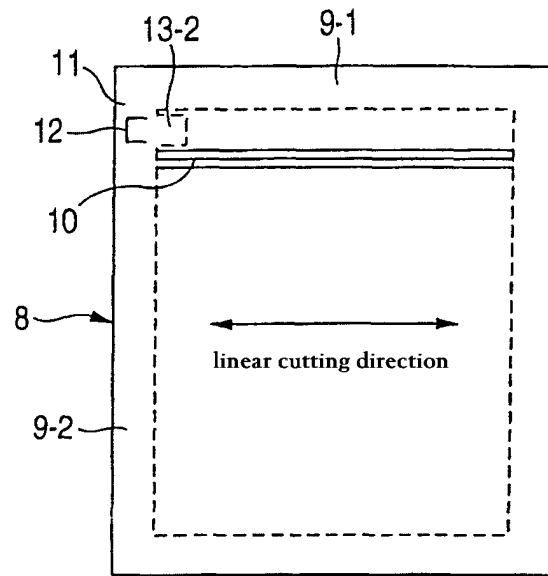


Fig. 5

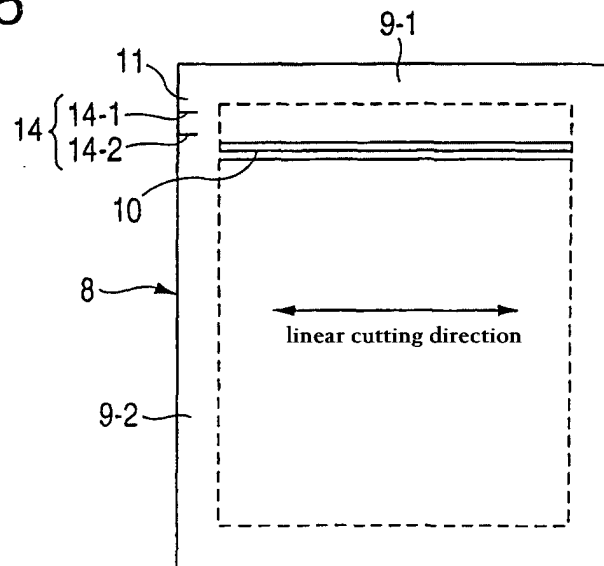


Fig. 6

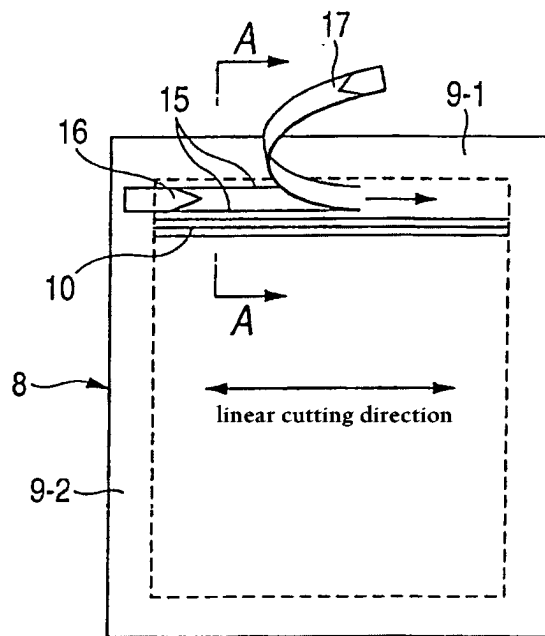


Fig. 7

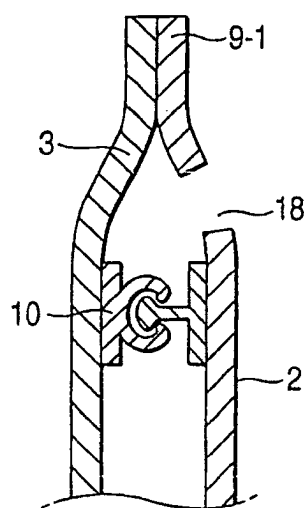


Fig. 8

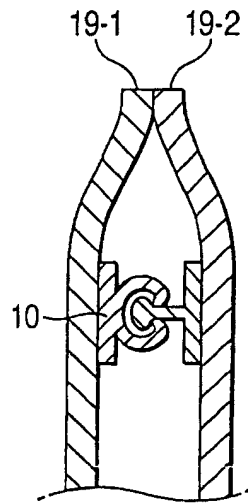
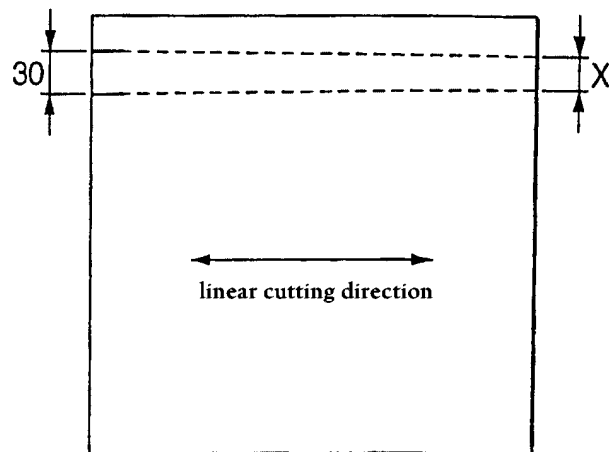


Fig. 9



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP02/13686

## A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl<sup>7</sup> B65D33/00, B65D33/25

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

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl<sup>7</sup> B65D33/00, B65D33/25

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho 1926-1996 Jitsuyo Shinan Toroku Koho 1996-2003  
 Kokai Jitsuyo Shinan Koho 1971-2003 Toroku Jitsuyo Shinan Koho 1994-2003

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. 133148/1981 (Laid-open No. 38577/1983) (Sumitomo Bakelite Co., Ltd.), 12 March, 1983 (12.03.83), Figs. 2 to 5; Claims; description, page 2, line 15 to page 3, line 10 (Family: none)	1-5, 7, 8 9
X Y	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 66131/1982 (Laid-open No. 169044/1983) (Sumitomo Bakelite Co., Ltd.), 11 November, 1983 (11.11.83), Figs. 2 to 7; Claims; description, page 2, line 15 to page 3, line 9 (Family: none)	1-4, 6, 8 7, 9

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

* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier document but published on or after the international filing date	"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
"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)	"&" document member of the same patent family
"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	

Date of the actual completion of the international search  
03 March, 2003 (03.03.03)Date of mailing of the international search report  
18 March, 2003 (18.03.03)Name and mailing address of the ISA/  
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

Form PCT/ISA/210 (second sheet) (July 1998)

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP02/13686

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CD-ROM of the specification and drawings annexed to the request of Japanese Utility Model Application No. 50503/1993 (Laid-open No. 13746/1995) (Seisan Nipponsha Kabushiki Kaisha), 07 March, 1995 (07.03.95), Figs. 1 to 7 (Family: none)	9

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