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(54) **ECO-SUSTAINABLE BAG FOR FOOD USE**

(57) The present invention relates to a bag (1) for food use, having a wall (2) defining an inner compartment (4), said inner compartment (4) being delimited by an upper edge (41) and by a bottom (42). The wall (2) comprises an outer layer (21) and an inner layer (22), mutually overlapping and coupled by means of glue. The outer layer (21) is made of paper and the inner layer (22) is made of cellophane, wherein said inner (22) and outer (21) layers are only partially coupled. Advantageously, the bag (1) maintains those features that are particular to known bags using plastics, such as heat-sealability, water repellency, structural resistance, but with completely biodegradable materials, thus being home compostable and paper-recyclable.

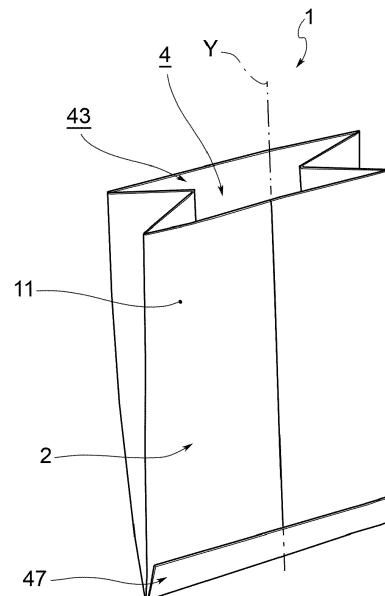


FIG.1

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Description

[0001] The present invention relates to an envelope or bag for food use, of the eco-sustainable type, i.e. which is home compostable and paper-recyclable.

[0002] The sector covers food containers capable of holding solid foods with which liquids or fats may be associated.

[0003] It is known that this type of food may be transported in impermeable containers, i.e., bags having liners therein that are impermeable to liquids or fats. Such known bags comprise an outer layer of paper and an inner layer of a waterproof plastics material, such as polypropylene or high density polyethylene or the like. The properties of the plastics material allow for heat-sealing in such a way as to obtain a water-repellent bag that is suitable for coming into direct contact with fatty and greasy foods and that is resistant to high and low temperatures.

[0004] One of the main problems associated with such known containers is that, since they are not adequately biodegradable, they are not eco-sustainable.

[0005] The aim of the present invention is to identify a solution that maintains those advantageous features that are particular to known bags with an inner plastics layer (heat-sealability, water-repellency, structural resistance) but without the use of the plastics material in order to obtain an eco-sustainable product (which is home compostable and paper-recyclable).

[0006] Given that the sector is that of foods with which liquids or fats may be associated, and given that biodegradable materials have the tendency to sag upon coming into contact with moisture, the aim of the present invention is also to obtain an envelope or bag that is resistant, in particular at the bottom where the greatest accumulation of liquid or fat occurs. The bag will therefore have to have relatively high moisture resistance, so that a product may be contained for some time without leaking or sagging.

[0007] The aim of the present invention is also to obtain a bag-type container that may be produced at relatively low cost using materials that are readily available in reasonably high quantities so that it may be mass-produced, at low cost, in a range of different sizes and typologies.

[0008] This object is achieved by means of an envelope or bag according to claim 1. Those claims that are dependent upon this claim describe preferred variant embodiments.

[0009] The object of the present invention will now be described in detail, with the aid of the accompanying drawings, in which:

- Figure 1 shows a perspective view of the rear side of a bag that is the object of the present invention, in an embodiment variant without a window;
- Figure 2 shows a perspective view of the rear side of a bag that is the object of the present invention, in an embodiment variant with a window;

- Figure 3 shows a perspective view of the front side of a bag that is the object of the present invention, in an embodiment variant without a window that may be associated, for example, with the rear side of Figure 1 or Figure 2;
- Figure 4 shows a perspective view of the front side of a bag that is the object of the present invention, in an embodiment variant with a window that may be associated, for example, with the rear side of Figure 1;
- Figures 5A to 5C show the steps of closing the bottom of a bag that is the object of the present invention by double folding, in particular the bottom before the folding (5A), the bottom after the first folding (5B), and the bottom after the second folding (5C).

[0010] With reference to the above figures, reference numeral 1 globally denotes an envelope or bag for food use according to the present invention.

[0011] It is specified that the terms "envelope" or "bag" will be used in a substantially interchangeable manner. For this reason, the features described herein, unless otherwise specified, are to be considered common to the envelope or bag.

[0012] Such an envelope or bag 1 comprises a wall 2, extending about a longitudinal axis Y defining an inner compartment 4.

[0013] The compartment 4 is delimited by an upper edge 41 and a bottom 42. The inner compartment 4 is accessible from the upper edge 41 by means of an access opening 43. Food may then be introduced into the inner compartment 4 (or extracted therefrom) by means of the access opening 43, while the bottom 42 prevents it from escaping from below.

[0014] According to one embodiment, the wall 2 of the envelope or bag 1 comprises, coupled together, an outer paper layer 21 and an inner cellophane layer 22.

[0015] Advantageously, the inner cellophane layer 22 is sufficiently resistant to the passage of water there-through, so that the double layer paper-cellophane bag maintains the structural integrity thereof even after prolonged contact with food containing liquids, fats or oils.

[0016] Preferably, the outer paper layer 21 has a basis weight comprised between 35 and 80 gr/m².

[0017] Preferably, the inner cellophane layer 22 has a thickness of between 15 and 30 microns.

[0018] In order to obtain the domestic compostability, the coupling between the outer layer 21 and the inner layer 22 has been modified by decreasing the percentage of glued surface. Compared to a traditional paper-plastics bag having a glue-filled surface between the two materials (100% glued), in the bag 1 according to the present invention the gluing surface has been considerably reduced.

[0019] In one embodiment, the inner 22 and outer 21 layers are coupled at most by 30% of the overlapping surface, preferably at most by 20% of the overlapping surface.

[0020] In a preferred example, the wall 2 of the envelope or bag 1 comprises an outer layer 21 and an inner layer 22 mutually overlapping and coupled only partially by means of glue disposed upon a maximum of 10% of the overlapping surface of the two layers 21,22. Advantageously, therefore, the gluing has been reduced by 90% compared to a traditional paper-plastics bag.

[0021] Advantageously, the wall 2 of the envelope or bag 1 comprises an outer layer 21 and an inner layer 22 mutually overlapping and coupled only partially by means of, for example, spot gluing and/or line gluing.

[0022] Advantageously, the wall 2 of the envelope or bag 1 comprises an outer layer 21 and an inner layer 22 mutually overlapping and partially coupled by gluing only at the most critical points of the product so as not to compromise the performance thereof.

[0023] Preferably, the outer layer 21 and the inner layer 22 are fully glued only at the upper edge 41 and preferably also at the lower edge 25. For example, the outer layer 21 and the inner layer 22 are glued by 5 mm in length (measured along the Y axis) at the upper edge 41 and by 5 mm in length (measured along the Y axis) at the lower edge 25.

[0024] Preferably, the outer layer 21 and the inner layer 22 are glued over the entire area that is intended to form the bottom 42, i.e. the entire area that is intended to be double-folded (Figure 5A).

[0025] For example, the glue used to couple together the outer layer 21 and the inner layer 22 is based on vinyl and/or acrylic polymers.

[0026] For example, the bag 1 has lettering or printing on the outer layer 21, implemented using water-based ink obtained from inorganic mineral pigments. The ink is suitable for printing on packaging that is intended to come into contact with foodstuffs. The ink is compostable.

[0027] The two outer 21 and inner 22 layers are coupled together to form a base sheet which implements the wall 2 of the bag 1. The base sheet is folded in such a way as to create a tube and closed longitudinally by means of heat sealing in order to form a longitudinal weld 46, obtained by partially overlapping the base sheet. The tube is cut to the desired size, forming a lower edge 25. The lower edge 25 of the tube is folded twice upon itself, i.e. turned up twice, and transversely closed by means of heat sealing so as to form a transversal weld 47 that forms the bottom 42 of the bag 1. The lower edge 25 of the tube (Figure 5A) is folded along a first folding line 27, and subsequently along a second folding line 29 so that at least two longitudinal strips 26,28 remain mutually overlapping. This solution makes it possible to confer greater structural strength to the bottom 42 of the bag 1. Preferably, glue is applied along the longitudinal strips 26,28 in order to glue the double fold that implements the bottom 42.

[0028] In one embodiment, shown in Figures 1 and 3, the outer paper layer 21 completely covers the inner cellophane layer 22, which is not visible externally.

[0029] In one embodiment, the inner cellophane layer

22, being transparent or semi-transparent and extending without interruption so as to define the inner compartment 4, contributes to forming an inspection window 44 delimited by means of an opening 45 in the outer paper layer 21, as in the examples of Figures 2 and 4. In the example of Figure 4, the inspection window 44 is made by die-cutting through the outer paper layer 21; in such an example the opening 45 is therefore a hole. In the example of Figure 2, the inspection window 44 is obtained by means of an interruption to the outer layer 21 which terminates earlier than the inner layer 22, which layer instead continues.

[0030] In one embodiment, the bag 1 is provided with side gussets 3, i.e. longitudinal folds 31 in the base sheet, for example three longitudinal folds 31, which implement a pair of side gussets.

[0031] The bag 1 thus comprises a rear face 11 containing the transverse weld 47 and/or the longitudinal weld 46, an opposite front face 12, a pair of sides 13, and a flat bottom 42. The bottom 42 corresponds to the second folding line 29.

[0032] For example, the bag 1 may be produced in different variants.

1. Windowless bag - wherein both the rear face 11 and the front face 12 are windowless; see the combination of Figures 1 and 3. In such an example, the size of the paper outer layer 21 and that of the cellophane inner layer 22 is identical; once the two materials are coupled, the bag is sealed and glued, and no window is visible.

2. Bag with a die-cut window - wherein the rear face 11 is windowless and the front face 12 is provided with an inspection window 44 obtained by means of die-cutting the outer layer 21; see the combination of Figures 1 and 4. Also in such an example, the size of the paper outer layer 21 and that of the cellophane inner layer 22 is identical. However, before the two materials are coupled together, a portion of the outer paper layer 21 is removed (die-cut). Then, once the two materials have been coupled, sealed and glued to the bag, a transparent die-cut window is visible.

3. Bag with a longitudinal window - wherein the rear face 11 is provided with a longitudinal inspection window 44 and the front face is windowless; see the combination of Figures 2 and 3. In this example, the size of the paper outer layer 21 is smaller than that of the cellophane inner layer 22, so as to allow for the formation of a longitudinal transparent window.

[0033] In one example, the envelope or bag 1 further comprises a lifting handle.

[0034] The object of the present invention is therefore a heat-sealed bag 1 made of paper coupled to cellophane. The bag 1 has a bottom seal (transverse weld 47) and a longitudinal seal (longitudinal weld 46) obtained by means of heat sealing. The bottom 42 is flat, obtained by double folding the base sheet.

[0035] Advantageously, the bag 1 is 100% water-repellent and fat-resistant.

[0036] The bag 1 that is the object of the present invention is suitable for use in small rotisseries, also street vendors, in supermarkets and in large retailers. It is a type of packaging that is intended to contain food for human consumption. It is used to transport cooked products (for example, chicken on a spit, fried foods, ready meals, etc.) or raw products (for example, meat, fish, etc.) from the point of sale to the final consumer. The bag, once the food has been packaged, may be used as follows:

- in a refrigerator in order to keep the product cool;
- in a freezer in order to freeze the product, respecting the minimum temperature of -40°C;
- in an electric or ventilated oven in order to heat it, respecting the maximum temperature of +150°C for a maximum interval of 20 minutes;
- in a microwave oven in order to heat it, respecting a maximum power of 800 Watt for a maximum interval of 3 minutes;
- within the heated counters of supermarkets in order to keep it warm, respecting a maximum temperature of +80°C for 4 hours.

[0037] Innovatively, the invention described is capable of overcoming the above-mentioned drawbacks that are lamented in relation to the known art.

[0038] Advantageously, the bag 1 that is the object of the present invention maintains those advantageous features that are particular to known bags using plastics (heat-sealability, water repellency, structural resistance) but with completely biodegradable materials, thus being home compostable and paper-recyclable.

[0039] Advantageously, the bag 1 that is the object of the present invention is resistant, in particular at the bottom where the greatest accumulation of liquid or fat occurs.

[0040] Advantageously, the bag 1 that is the object of the present invention has a relatively high moisture resistance, so that the product may be contained for some time without leaking or sagging.

[0041] Advantageously, the bag 1 that is the object of the present invention may be produced at relatively low cost using materials that are readily available in reasonably high quantities so that it may be mass-produced, at low cost, in a range of different sizes and types.

[0042] To the embodiments of the aforementioned envelope or bag and to the method, a person skilled in the art, in order to meet specific requirements, may make changes or replace elements with other functionally equivalent ones. These variants are also contained within the scope of protection as defined by the following claims. Moreover, each variant described as belonging to a possible embodiment may be implemented independently of the other variants described.

Claims

1. A bag (1) for food use, having a wall (2) extending about a longitudinal axis (Y) defining an inner compartment (4), said inner compartment (4) being delimited by an upper edge (41) and by a bottom (42); wherein the wall (2) comprises an outer layer (21) and an inner layer (22), mutually overlapping and coupled by means of glue, **characterized in that** the outer layer (21) is made of paper and the inner layer (22) is made of cellophane, and **in that** said inner (22) and outer (21) layers are only partially coupled.
2. A bag (1) according to claim 1, wherein said inner (22) and outer (21) layers are coupled at most by 30% of the overlapping surface, preferably at most by 20%, even more preferably at most by 10%.
3. A bag (1) according to any one of the preceding claims, wherein said inner (22) and outer (21) layers are coupled by means of a gluing by points and/or by lines.
4. A bag (1) according to any one of the preceding claims, wherein said inner (22) and outer (21) layers are coupled by means of a full gluing only at the upper edge (41) and the bottom (42).
5. A bag (1) according to any one of the preceding claims, wherein the bottom (42) is obtained with a double folding of a lower edge (25), previously closed with a transverse welding (47), wherein said lower edge (25) is folded along a first folding line (27) and then along a second folding line (29) so that at least two longitudinal strips (26,28) remain mutually overlapping.
6. A bag (1) according to claim 5, wherein glue is applied along the longitudinal strips (26,28) to glue the double fold that creates the bottom (42).
7. A bag (1) according to any one of the preceding claims, wherein the glue used for carrying out the gluing is vinyl and/or acrylic polymer based.
8. A bag (1) according to any one of the preceding claims, wherein the wall (2) consists of the outer layer (21) made of paper and of the inner layer (22) made of cellophane so as to be domestic compostable and recyclable made of paper.
9. A bag (1) according to any one of the preceding claims, wherein the outer layer (21) made of paper has a basis weight comprised between 35 and 80 gr/m².
10. A bag (1) according to any one of the preceding

claims, wherein the inner layer (22) made of cellophane has a thickness from 15 to 30 micron.

11. A bag (1) according to any one of the preceding claims, wherein the outer layer (21) breaks or has an opening (45) and the inner layer (22), which is see-through or semi-see-through, closes such break, or opening, by forming an inspection window (44).

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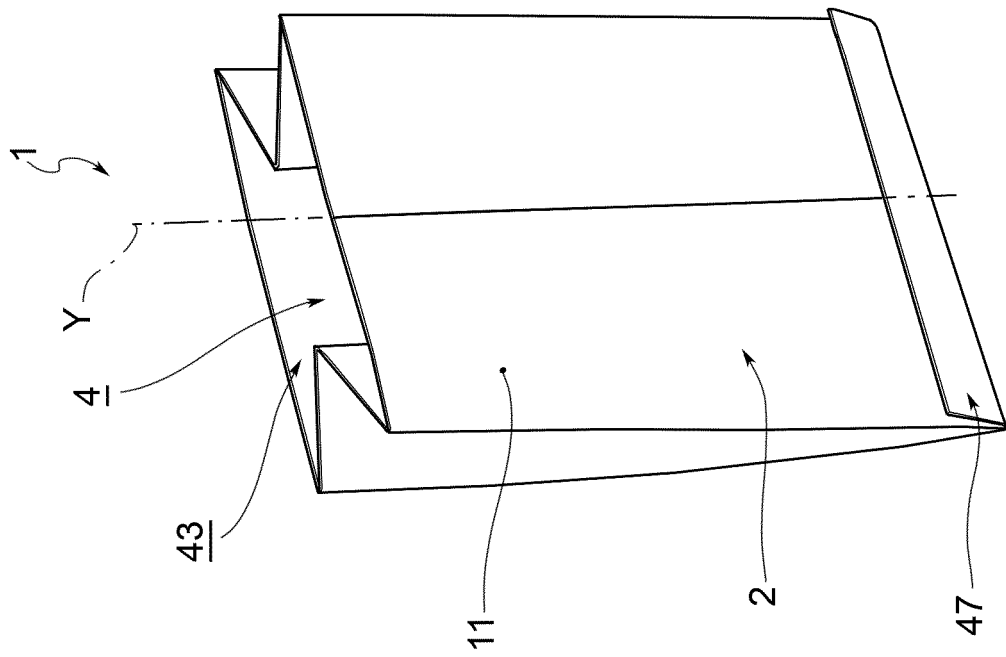
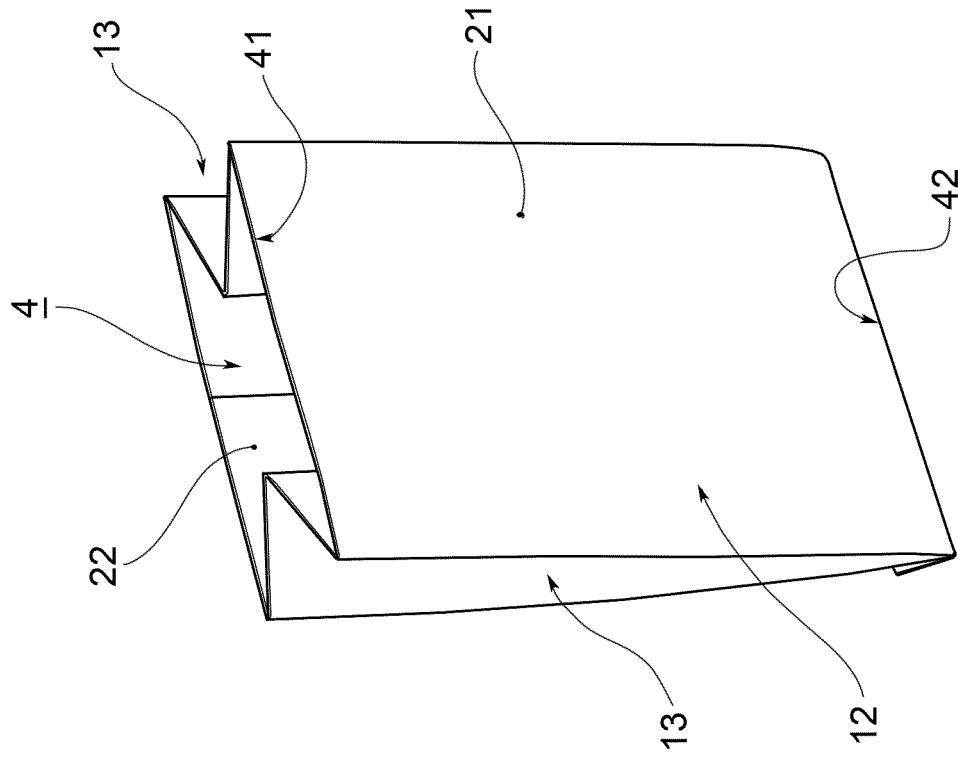
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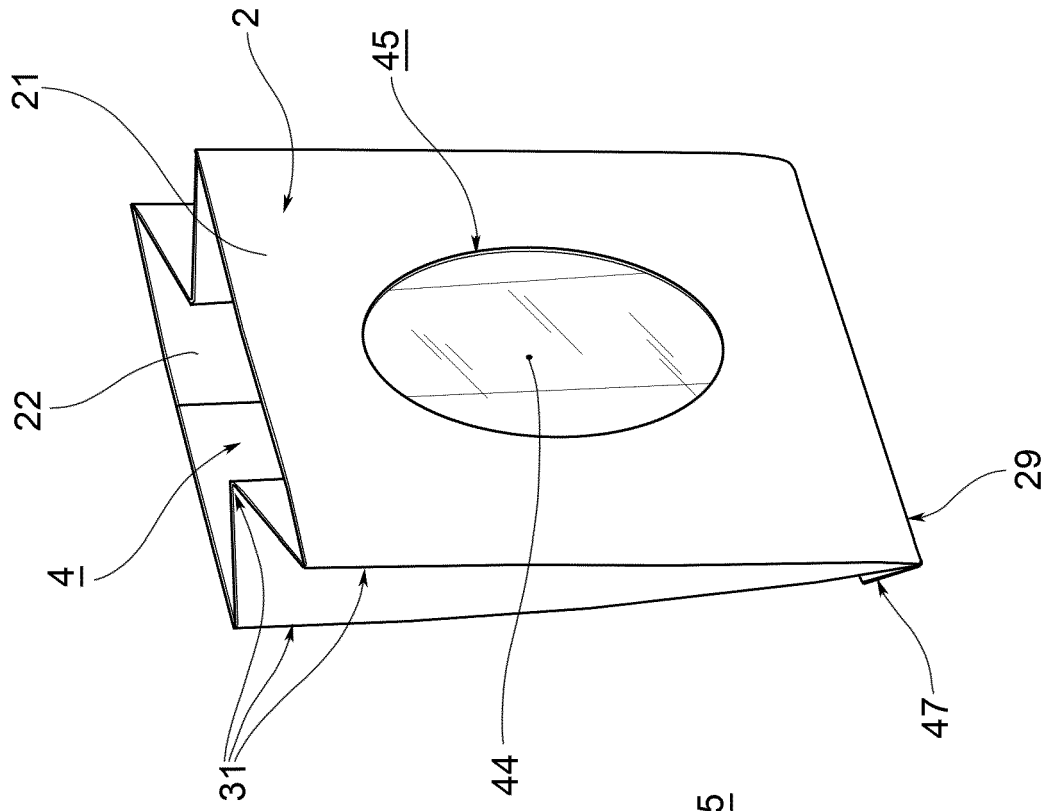


FIG.2

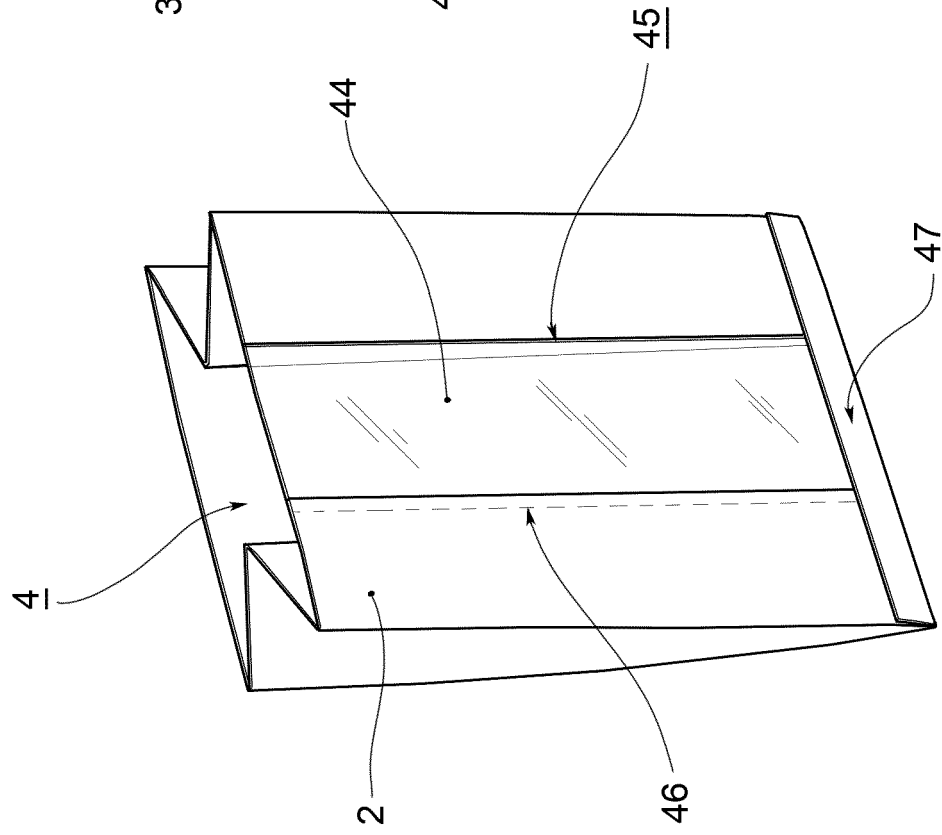


FIG.4

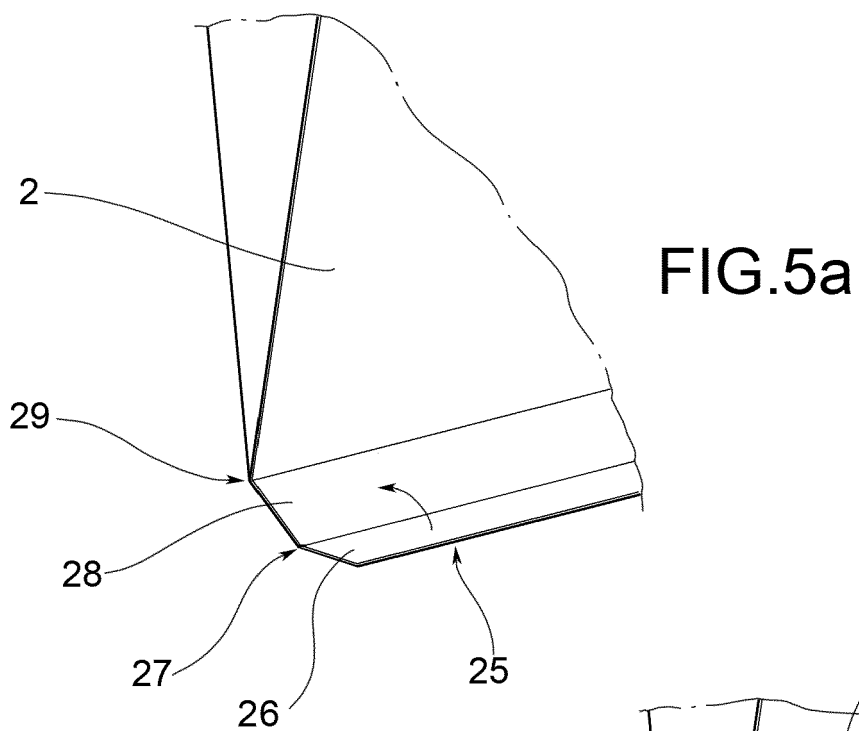
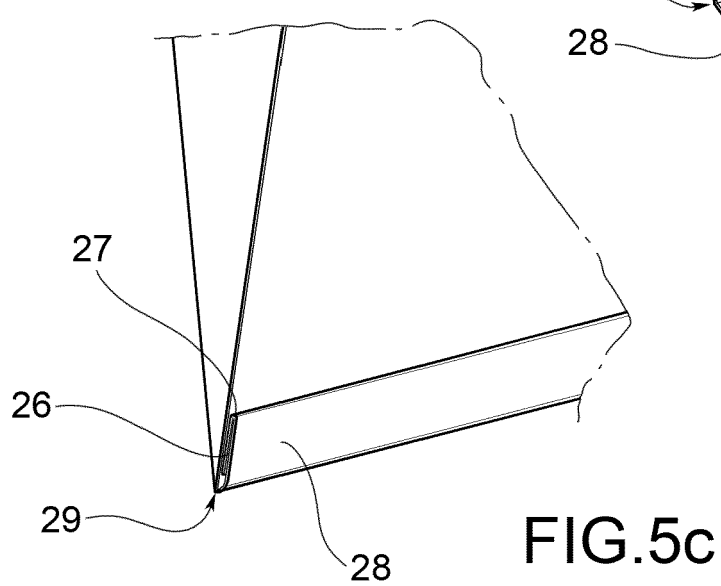
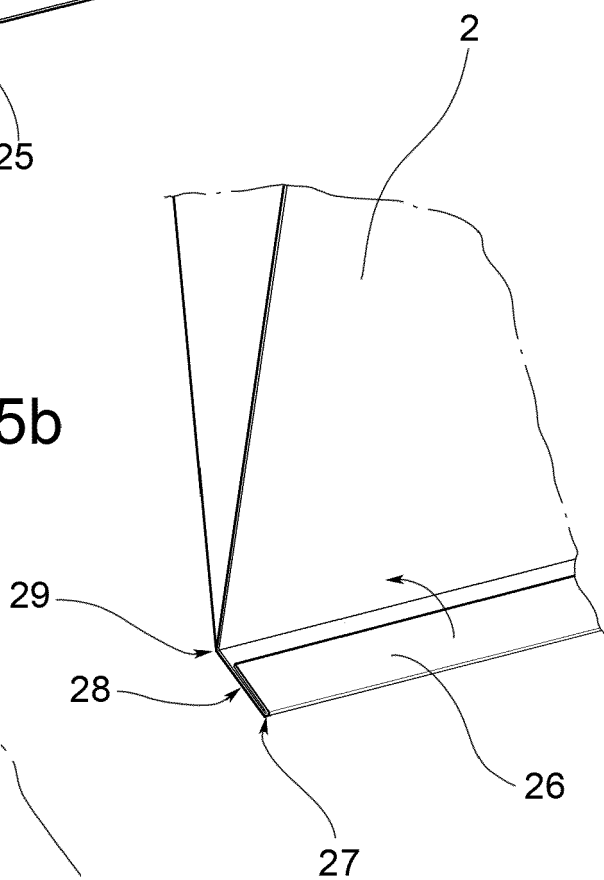


FIG. 5b





EUROPEAN SEARCH REPORT

Application Number

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EPO FORM 1503 03/82 (P04C01)

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Place of search Munich		Date of completion of the search 26 July 2023	Examiner Fitterer, Johann
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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