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(54) **BOX WITH INTEGRATED DIVIDER ELEMENT**

(57) A foldable cardboard box (1) for containing articles has a plurality of walls foldable with each other to change from a collapsed configuration (50) to an assembled box-shaped configuration (51). The box comprises a box body (2) having a box-shaped configuration defined by side walls (4) and by a bottom wall of the box (62). The side walls (4) and the bottom wall of the box (62), define a box cavity (46) that contains the articles and an upper access opening (3) closable by means of foldable closing flaps (8). The box also comprises a divider element (10) fixed to one of the side walls (4) along a support segment (101) internally to the box cavity (46). Such divider element (10) comprises a divider flap (11) positioned inside the box cavity (46) to separate the products placed on the bottom wall of the box (62) from products placed above said divider flap (11).

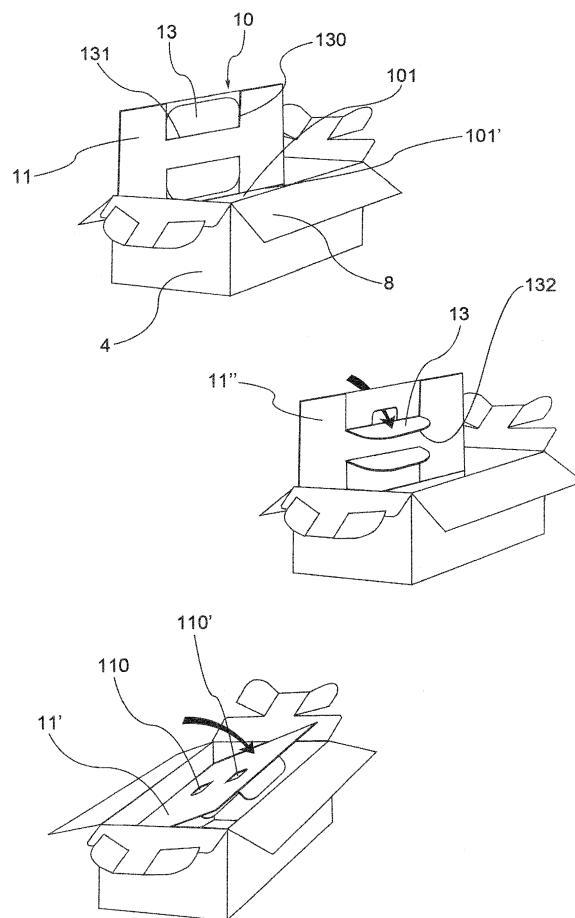


Fig.3

Description

[0001] This invention pertains, in general, to the field of product packaging. In particular, the invention relates to a foldable cardboard box provided with inserts to separate the products in the box, for example for separating bottles on various planes.

[0002] Cardboard and paperboard boxes are typically made through an automated process in which planar sheets of cardboard are cut and shaped according to suitable forms and are subsequently folded and/or glued to form the finished cardboard container. These suitably shaped sheets (blanks) include lines of weakness such as grooves, slots, creases or cuts that act as a guide in the folding step for the realisation of the assembled three-dimensional shape of the box.

[0003] It is known that, in the case of boxes in which it is necessary to position the products on different planes and/or separate products from each other, downstream of the step of folding and creating the shape of the assembled box, divider walls are manually inserted in the box above and between the products.

[0004] These divider walls are generally used in cardboard containers prepared for packaging products of various kinds such as jars of jam, honey, canned food, or, more in particular, glass bottles containing beverages or liquids in general (such as wine, beer, water, oil or the like).

[0005] So, normally, to insert the products in the box, the box is first assembled starting from the blank, after which the products are inserted and then, the divider walls, supplied as separate sheets, are inserted between the products. For example, in the case of packaging bottles, after the box is assembled, a layer of bottles is first inserted on the bottom of the box, after which it is inserted a separator sheet is inserted above the bottles, additional bottles are inserted on the upper level and then the box is closed.

[0006] Disadvantageously, the operations described above force the end user to prepare the box and insert the divider walls in two separate operations, with consequent loss of time.

[0007] In addition, it is necessary to provide separate storage for the boxes and divider walls, with consequent need for more storage space with respect to the storage space required for the single box.

[0008] In addition, the divider walls inserted are not self-supporting but, since the partition walls are supported by the product itself, once the product is removed, the subdivision of the box into different levels is defeated and, for example, it is no longer possible to replace products in just the top level.

[0009] Documents EP 2573002 A1 and EP 2687452 A1 describe boxes for packaging articles that are provided inside with divider walls for separating the articles.

[0010] The purpose of this invention is to provide a cardboard box, a divider element and a method for the insertion of the articles in the box that allows overcoming

the above-mentioned drawbacks, making the operations of packaging the articles simpler and faster and maintaining the advantageous aspects of such type of boxes.

[0011] This purpose is achieved by a foldable cardboard box made according to claim 1, from a blank of a divider element formed according to the claim 10 and by a method for the insertion of products in the box according to claim 11. The dependent claims describe embodiment variants.

[0012] The characteristics and advantages of this invention will be apparent from the following description, given by way of non-limiting example, in accordance with the accompanying figures, wherein:

- Figure 1 is a schematic diagram of a cardboard box according to an embodiment of this invention in a sequence of assembly steps from a collapsed configuration to an assembled configuration;
- Figure 1a is a schematic diagram of a cardboard box according to an embodiment of this invention in a top view in which the inside of the box is visible;
- Figure 2 shows schematically a cardboard box according to another embodiment of this invention in a sequence of folding steps of the divider element with the box body already in box configuration;
- Figure 3 is a schematic diagram of a cardboard box according to a further embodiment of this invention in a sequence of folding steps of the divider element;
- Figures 4, 4a and 4b are schematic diagrams of, respectively, a blank sheet of a divider element, each according to a respective embodiment of this invention;
- Figures 5 to 15b show further embodiment variants of the boxes in the collapsed and assembled (a) configurations according to this invention together with the respective blank sheets of the box bodies, in which the shapes and methods of insertion of the closing flaps and bottom flaps vary; any of the divider elements shown in Figures 4, 4a and 4b can be associated to each embodiment of the box bodies shown.

[0013] In accordance with the accompanying figures, the numeral 1 indicates in its entirety a foldable cardboard box 1 suitable to contain articles and having a plurality of walls foldable with each other to be manipulated from a collapsed configuration 50 to an assembled box configuration 51. The box 1 in the assembled configuration comprises a box body 2 having a box-like configuration defined by side walls 4 on the lower edges 41 of which are formed bottom flaps 6 each of which are foldable along a respective fold line 61 made along a respective bottom edge and which define a bottom wall of the box 62. The side walls 4, together with the bottom wall of the box 62, define a box cavity 46 suitable to contain the articles and an upper access opening 3 delimited at least partially by the upper edges 42 of the side walls 4. On these upper edges 42 are formed closing flaps 8 each

foldable along a respective fold line 81 made along a respective upper edge 42 and suitable to close the upper access opening 3.

[0014] The box bottom flaps 6 are preferably fitted together to form the bottom wall, for example according to an embodiment shown in Figure 1, in which the bottom flaps are snap-closed from the collapsed to assembled configuration with a single gesture. Alternatively, the bottom flaps can be made according to various types, for example as shown in Figures 5 to 15b.

[0015] The box 1 also includes a divider element 10 having an assembled configuration comprising a support segment 101 fixed to one of the side walls 4 of the box body 2 internally to the box cavity 46. The support segment 101 has a support segment upper edge 101' on which is formed a divider flap 11 foldable along a fold line made along said support segment upper edge 101'. The divider flap 11 is positioned inside the box cavity 46 in an intermediate position between the bottom wall of the box 62 and the upper edges of the side walls 42 to separate at least partially the products placed on the bottom wall of the box 62 from products placed above said divider flap 11. The divider flap 11 thus forms a horizontal separation plane 12 between a lower level 30 and a higher level 20.

[0016] The term foldable means that the closing flaps 8, the bottom flaps 6 or the divider flap 11 are orientable around an axis passing along the respective fold line, which is to say that the fold line functions as a hinge around which the flap can rotate.

[0017] Preferably, in the collapsed configuration 50, the side walls 4, the bottom flaps 6, the closing flaps 8 and the divider flap 11 are folded and stacked on substantially parallel planes and close to one another, so as to move from the collapsed configuration to the assembled configuration of the box by means of a single gesture of pressure applied on and least part of the outer edges of the side walls.

[0018] In particular, preferably, in the collapsed configuration 50, the divider flap 11 lies on a plane parallel and adjacent to the side wall to which it is attached.

[0019] In addition, preferably, the divider flap 11 completely separates the products placed on the bottom wall of the box 62 from the products placed above said divider flap 11. For example, the outer edges of the divider flap are shaped according to almost total shape-coupling with the walls of the box cavity 46, so that the lower plane and the upper plane are separated from each by the divider flap 11.

[0020] The box according to the invention is suitable to contain a variety of articles belonging to multiple commercial sectors and preferably in the sector of food products. For example, the box is suitable to contain jars of jam, honey, canned food or, more in particular, glass bottles containing beverages or liquids in general (such as wine, beer, water, oil or the like). In the case of bottles, they are preferably arranged in a prone position on the side of the bottle and the divider element 10 is suitable

to separate such bottles.

[0021] In an embodiment, on the divider flap 11 are formed separator flaps 13, 13' by means of cuts 130 made on said divider flaps. These separator flaps 13, 13' are foldable along a weakening 131, for example a crease or a cut, formed on the divider flap, and are suitable to form vertical divider walls to separate the articles along the direction substantially perpendicular to the horizontal separation plane 12. As mentioned previously, the term "foldable" means that the flaps are orientable around an axis passing along the weakening line 131 created. So, this weakening line 131 acts as an element with the function of a hinge between the divider flap 11 and the separator flaps 13, 13'.

[0022] Preferably, the weakening line is made as a crease, cut, groove or a slot, or through a line of holes.

[0023] If the box should contain the bottles, the separator flaps 13, 13' separate the bottles laid on the bottom wall of the box, interposing and separating each bottle from the adjacent one in order to prevent breakage.

[0024] Preferably, the outer edge 132 of each separator flap 13, 13' rests on the bottom wall of the box 62, inside the box, so that each separator flap acts as a support post of the divider flap 11 when this is in a horizontal position. The outer edge 132 of each separator flap is the edge opposite to the fold line of each separator flap, i.e., it is the edge that is free to rotate around the fold line and that is disposed far from it, for example on an axis substantially parallel.

[0025] In an embodiment variant, the divider flap 11 has an upper divider flap face 11' facing towards the access opening 3 and a lower divider flap face 11" facing towards the bottom wall 62 and the separator flaps 13, 13' are formed on the lower divider flap face 11". In this embodiment, on the upper divider flap face 11' are formed two or more windows 110, 110' to allow access to said separator flaps 13, 13'. These windows 110, 110', in addition to putting the upper level 20 in communication with the lower level 30, are suitable to allow access to the separator flaps 13, 13' so as to fold them in order to create the vertical divider walls. In addition, these windows 110, 110' also act as a grip for folding the divider flap 11 for access to the lower level 30.

[0026] Preferably, in the embodiment variant described above, the fin 11 is at least partially made by means of a first flap sheet 111 joined at least partially to a second flap sheet 112 along a respective first face 111' and second face 112'. The first flap sheet 111 comprises the upper divider flap face 11' and the second flap sheet 112 comprises the lower divider flap face 11". Preferably, the first flap sheet 111 and the second flap sheet 112 are obtained from a single sheet folded back on itself like a closed book, for example along a flap sheet fold line sheet 113. Each flap sheet is then preferably fixed on the other along an area between the first face 111' and the second face 112'.

[0027] Preferably, a box is obtained in which the box body 2 and the divider element 10 are a single body, for

example the divider element 10 is fixed to the side wall of the box by gluing or stapling.

[0028] In an embodiment, the closing flaps 8 comprise two closing flap cuts 82, 82' and two closing flap weakening lines 83, 83', so as to obtain two further upper vertical separation flaps 84, 84', foldable about the respective closing flap weakening line 83 or 83'. These upper vertical separation flaps 84, 84' are suitable to serve as vertical separation walls between the products arranged in the upper level 20. Preferably, in the case of fragile products such as bottles, said upper vertical separation flaps 84 are inserted between one product and another adjacent (i.e., between one bottle and another adjacent) so as to prevent possible breakage.

[0029] It is understood that the terms vertical or horizontal used above are not limiting to absolute directions, but must be understood as relative to a certain orientation of the box.

[0030] In an embodiment variant, the box body 2 or the divider element 10 are covered by varnish or materials in the form of plastic films on the surface suitable to protect the box. For example, the varnishes or plastic materials are perfectly adherent to all surfaces of all the component parts of the box. The materials in the form of plastic films, for example, can be useful to waterproof the box or protect it from external agents.

[0031] This invention thus also comprises a blank sheet of a divider element 10 for a foldable cardboard box. This blank has a divider element weakening line 101" along a horizontal direction X of said blank. This weakening line 101" separates a region with the function of support segment 10a from a region with the function of divider flap 10b, in which the region with the function of a support segment 10a is suitable to be secured to one of the side walls 4 of the box body 2 inside the box 1. In other words, the weakening line 101" corresponds to the support segment upper edge 101' previously described, when the blank sheet is incorporated in the box body. The region with the function of divider flap 10b, i.e., the region that, in assembled configuration in the box 1, represents the divider flap 11, is foldable along the divider element weakening line 101". Preferably, the region with the function of divider flap 10b is composed of a first flap sheet 111 and a second flap sheet 112 joined along a flap fold line 113. On the first flap sheet 111 are formed the two windows 110, 110', while on the second flap sheet 113 are formed the separator flaps 13, 13'.

[0032] The invention also covers the method for inserting articles in a cardboard box, preferably a box having one or more of the characteristics described previously. This procedure provides for the steps of:

- changing the cardboard box from a collapsed configuration to an assembled box configuration;
- inserting on the bottom wall of the box the articles to be boxed;
- folding a divider flap, partially attached to a wall of the box, by means of a rotation around a fold line

made on said divider flap in order to create a partition plane between an upper level and a lower level of the box;

- placing the articles on the divider flap, i.e. above the divider plane in the upper level;
- closing the upper opening of the box using other closing flaps.

[0033] Preferably, the method also provides for the steps of folding the separator flaps 13, 13' so as to position them along vertical planes between the products placed on the box bottom and/or inserting the upper vertical separation flaps 84 between the products placed on the upper level.

[0034] In an embodiment variant, the method provides for the step of inserting the fingers of an operator inside the windows 110, 110' and bending the separator flaps 13, 13' so as to position them along planes vertical and, preferably, substantially perpendicular to the horizontal separation plane 12 and/or resting on the bottom of the box.

[0035] Innovatively, this invention relates to a foldable cardboard box with a divider element partially internally fixed on a side wall of the box that thus allows a more rapid packaging of the articles to be inserted in the box. In fact, in the box according to the invention, it is not necessary to manually insert additional dividers, but the divider element is already integrated into the box. This also allows simplifying management of the warehouse and handling.

[0036] Advantageously, in an embodiment the box is supplied in a collapsed configuration that also allows a rapid change to the assembled box-shaped configuration with a single gesture.

[0037] Additionally, in an advantageous manner, the vertical divider walls resting on the box bottom provide stability to the divider element even in the absence of the products themselves.

[0038] Moreover, the fact of providing the divider element as a single body together with the box body significantly reduces the overall storage dimensions since it is not necessary to provide two different storage areas, one for the box body and one for the divider elements. Plus, the problem of a lack of divider elements is eliminated. In fact, using the divider elements of the known art separated from the box body can lead to a lack of divider elements to manually insert during packaging and one is therefore forced to suspend processing. This cannot happen with the box according to this invention, since the box body and the divider element are a single body. Advantageously, therefore, even packaging times are optimised with consequent reduction of the respective costs.

[0039] It is clear that one skilled in the art, in order to meet specific needs, may make changes to the box or divider element or the method described above, all contained within the scope of protection defined by the following claims.

Claims

1. Foldable cardboard box (1) suitable to contain articles and having a plurality of walls folding on each other and suitable to be manipulated from a collapsed (50) configuration to an assembled box configuration (51), wherein said box (1) in the assembled configuration comprises:
 - a box body (2) having a box-like configuration defined by side walls (4) on the lower edges (41) of which bottom flaps (6) are made each foldable along a respective fold line (61) made along a respective lower edge and defining a bottom wall of the box (62), said side walls (4) and said bottom wall of the box (62) defining a box cavity (46) suitable to contain the articles and an upper access opening (3) delimited at least partially by the upper edges of the side walls (42), wherein closing flaps (8) are made on said upper edges (42) each folding along a respective fold line (81) made along a respective upper edge (42) and suitable to close the upper access opening (3) ;
 - a divider element (10) having an assembled configuration comprising a support segment (101) attached to one of the side walls (4) of the box body (2) inside the box cavity (46), said support segment (101) having a on which a divider flap (11) foldable along a fold line made along said support segment upper edge (101') is made, wherein said divider flap (11) is positioned inside the box cavity (46) in an intermediate position between the bottom wall of the box (62) and the upper edges of the side walls (42) to separate at least partially the products placed on the bottom wall of the box (62) from products placed above said divider flap (11) and in which said flap attached (20) form at least one horizontal separation plane (12) between a lower level (30) and a higher level (20), said divider flap 11 having an upper divider flap face (11') facing towards the access opening (3) and a lower divider flap face (11'') facing towards the bottom wall (62), said cardboard box (1) **characterised in that**, on the lower divider flap face (11'') are formed separator flaps (13, 13') by means of cuts (130) made on said divider flap (11), said separator flaps (13, 13') being foldable along a weakening (131) made on the divider flap (11) and suitable to form vertical divider walls to separate the articles along the direction substantially perpendicular to the horizontal separation plane (12), and **in that**, on the upper divider flap face (11') are formed two or more windows (110, 110') that put the upper level (20) in communication with the lower level (30) to allow access to said separator flaps (13, 13').
2. Cardboard box (1) according to claim 1, wherein in the collapsed configuration the divider flap (11) lies on a plane parallel and adjacent to the side wall (4) to which it is attached.
3. Cardboard box (1) according to any of the preceding claims, wherein the outer edge (132) of each separator flap rests on the bottom wall of the box (62) so that each separator flap acts as a support post of the divider flap when the divider flap (11) is in a horizontal position.
4. Cardboard box (1) according to any of the preceding claims, wherein the divider flap (11) is made at least partially by means of a first flap sheet (111) at least partially joined to a second flap sheet (112) along a respective first face (111') and second face (112'), wherein the first flap sheet (111) comprises the divider flap upper face (11') and the second flap sheet (112) comprises the divider flap lower face (11'').
5. Cardboard box (1) according to claim 4, wherein the first flap sheet (111) and the second flap sheet (112) are made from a single sheet folded on itself like a closed book.
6. Cardboard box (1) according to any of the previous claims wherein the support segment (101) is attached to the side wall by means of glue.
7. Cardboard box (1) according to any of the previous claims, wherein in the collapsed configuration the side walls (4), the bottom flaps (6), the closing flaps (8) and the divider flap (11) are folded and stacked on substantially parallel planes and close to one another, so as to move from the collapsed configuration to the assembled configuration of the box by means of a single gesture of pressure applied on at least part of the outer edges of the side walls.
8. Cardboard box (1) according to any of the previous claims wherein the box body (2) or the divider element (10) are covered on the surface by varnish or materials in the form of plastic films suitable for protecting the box.
9. Cardboard box (1) according to claim 8, wherein the varnishes or plastic materials are perfectly adherent to all surfaces of all the component parts of the box.
10. A blank of a divider element (10) for a foldable cardboard box, said blank having a divider element weakening line (101'') that extends along a horizontal direction (X) of said blank, wherein said weakening line (101'') separates a first region (10a) from a second region (10b), wherein the first region (10a) is suitable to be fixed to one of the side walls (4) of the box inside the box, and wherein the second region

(10b) is foldable along the divider element weakening line (101") and is suitable to act as a divider flap when inserted in the box, said second region (10b) being composed of a first flap sheet (111) and a second flap sheet (112) joined along a flap sheet fold line (113), on said first flap sheet (111) being formed in two windows (110, 110') and on the second flap sheet (113) being formed foldable separator flaps (13, 13').

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- 11.** Method of inserting articles in a cardboard box comprising a divider flap partially fixed on a wall of the box and separator flaps carried by the divider flap, which provides for the steps of:

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- changing the cardboard box from a collapsed configuration to an assembled box configuration;
- inserting on a bottom wall of the box the articles to be boxed;
- inserting the fingers of an operator in windows formed on the divider flap and folding the separator flaps in order to position them along vertical planes;
- folding the divider flap by means of a rotation around a fold line made on said divider flap in order to create a divider plane between an upper level and a lower level of the box;
- placing the articles on the divider flap, i.e. above the divider plane in the upper level;
- closing the upper opening of the box using further closing flaps.

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- 12.** Box group comprising a box (1) according to any of claims 1 to 9 and bottles, preferably in a prone position on the bottle side, wherein the divider element (10) separates the bottles from each other.

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- 13.** Box group according to claim 12, wherein the bottles are laid on the bottom wall of the box (62) and the separator flaps (13, 13') of the box (1) separate the bottles by being interposed between each bottle and the adjacent one.

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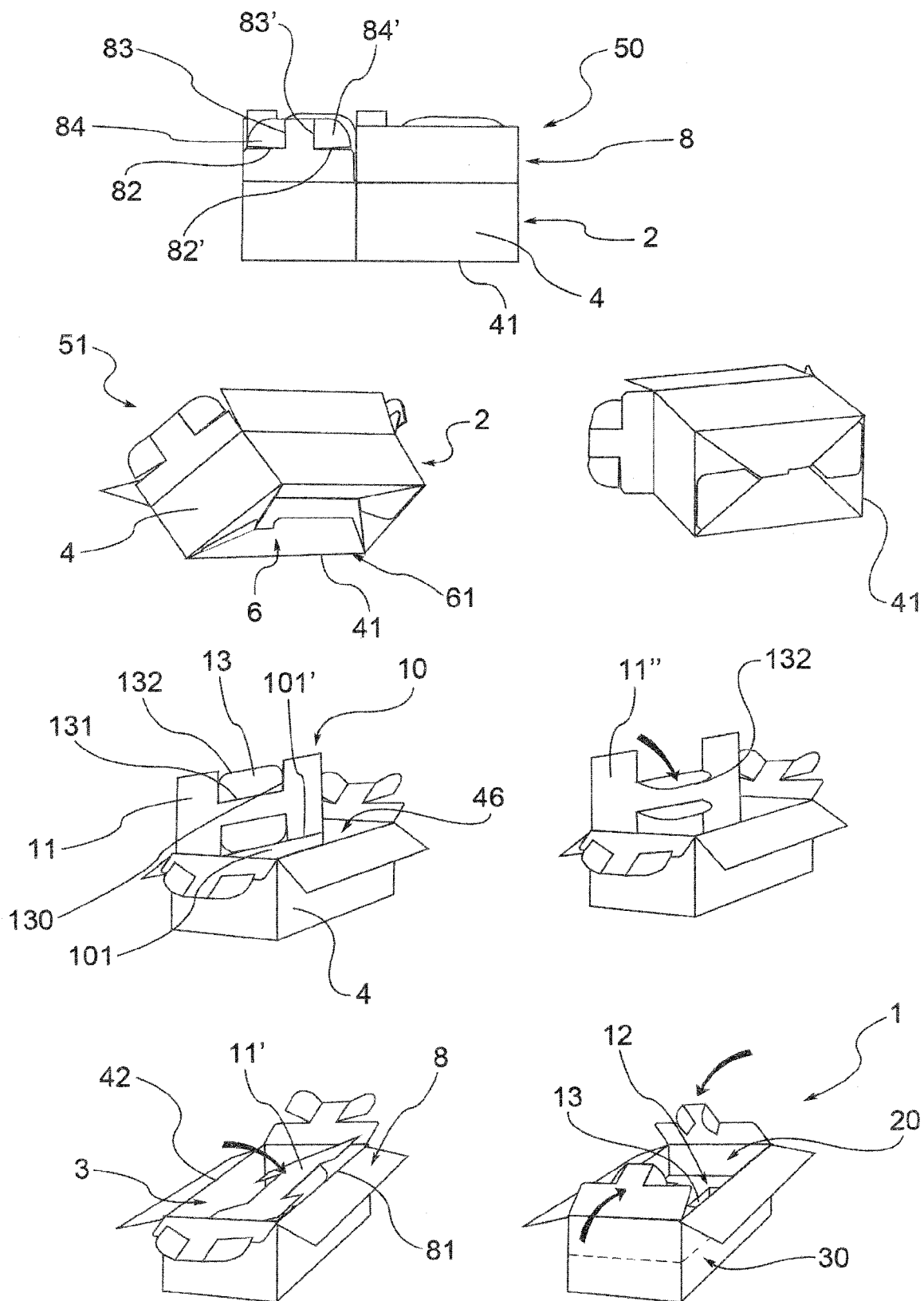


Fig.1

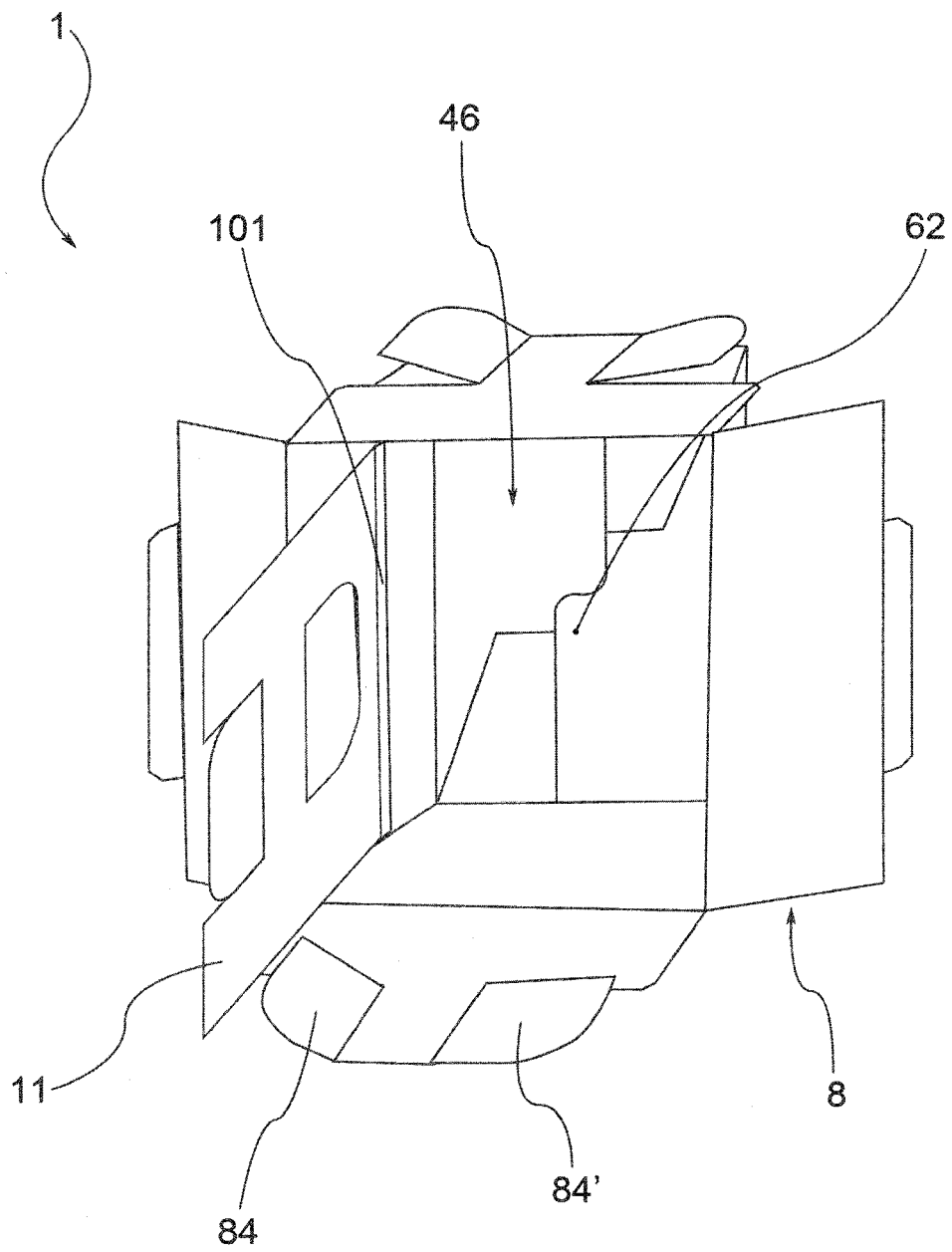


Fig.1a

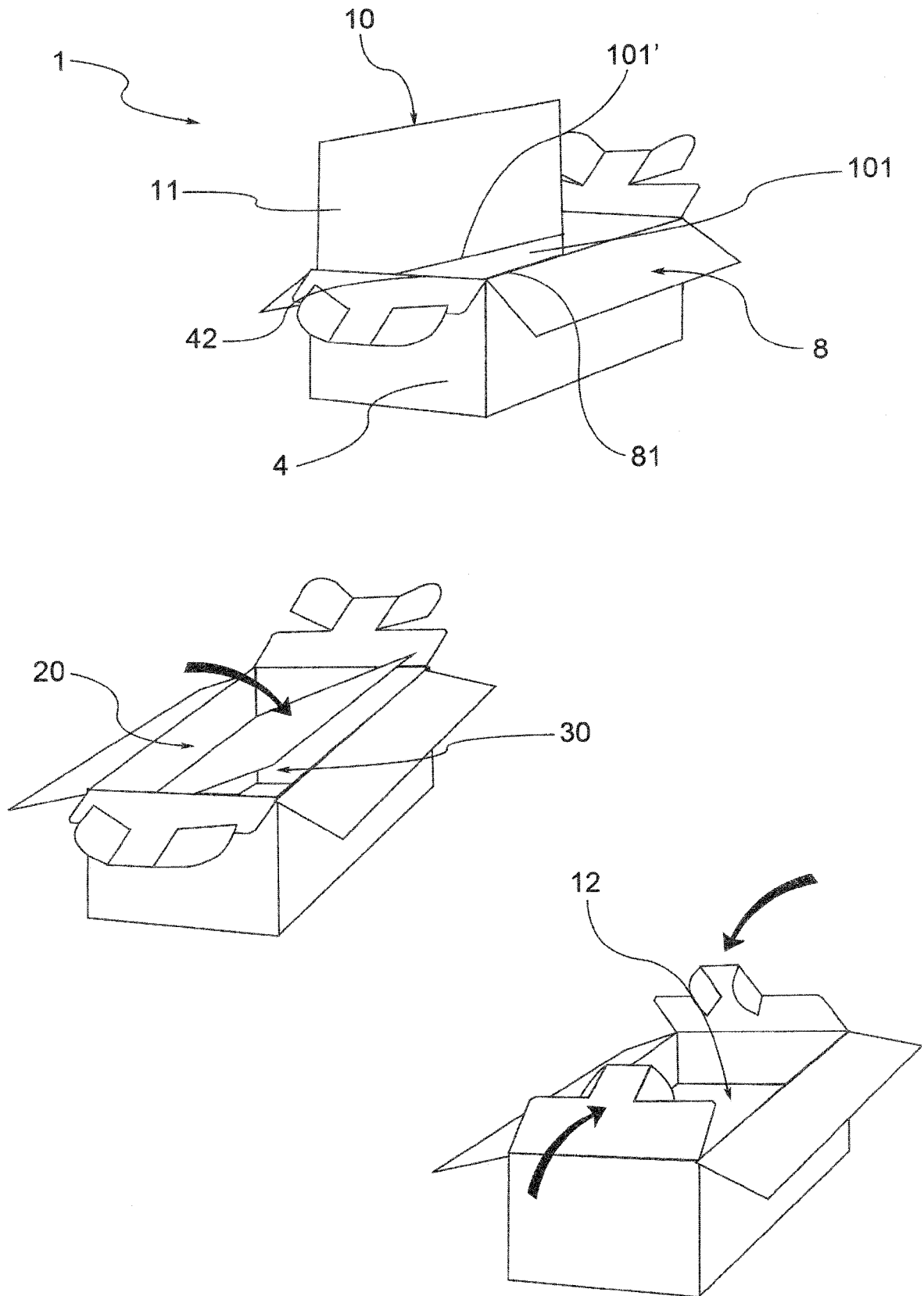


Fig.2

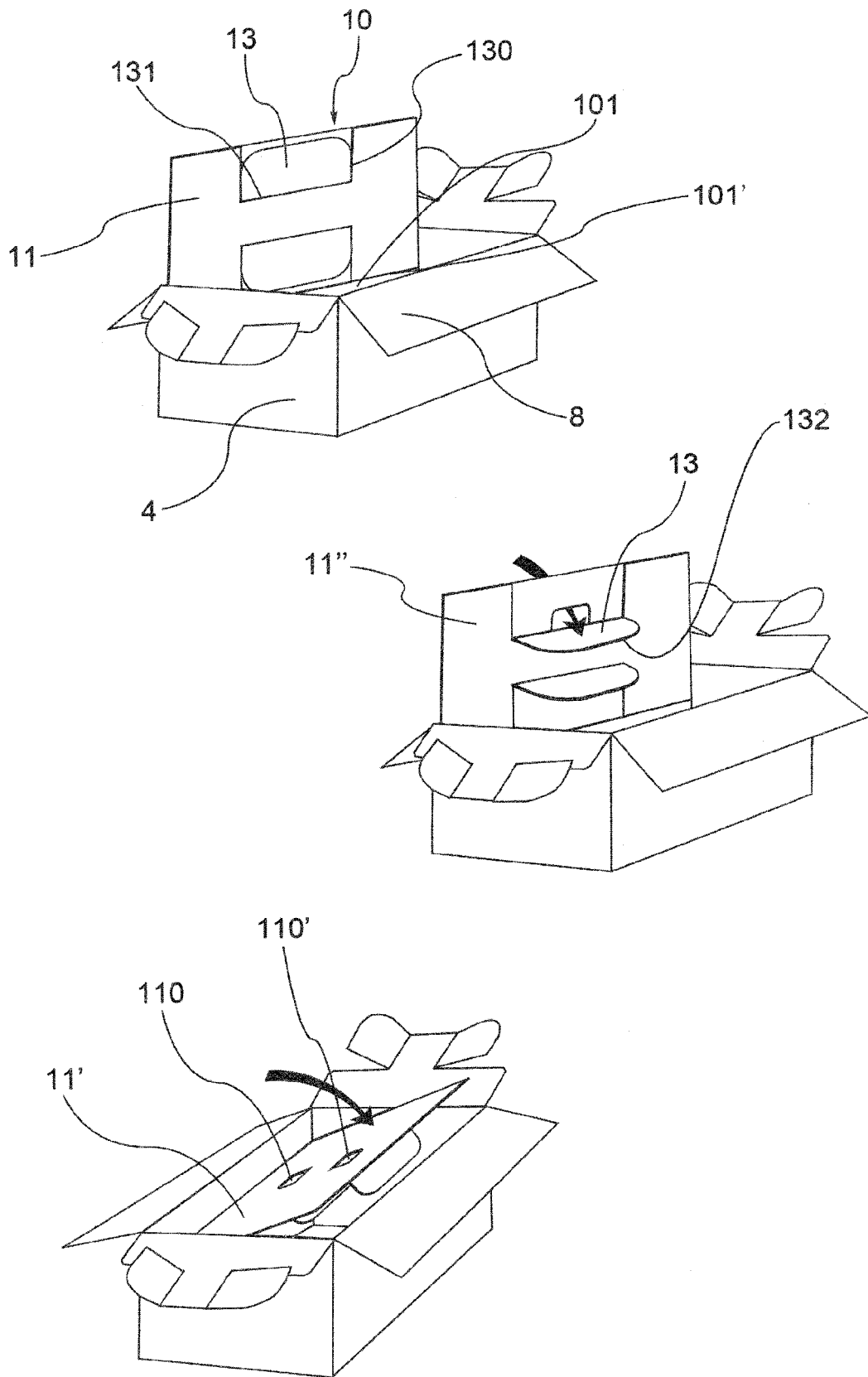
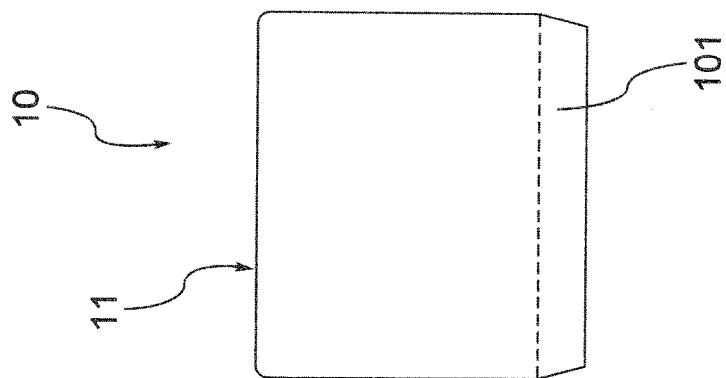
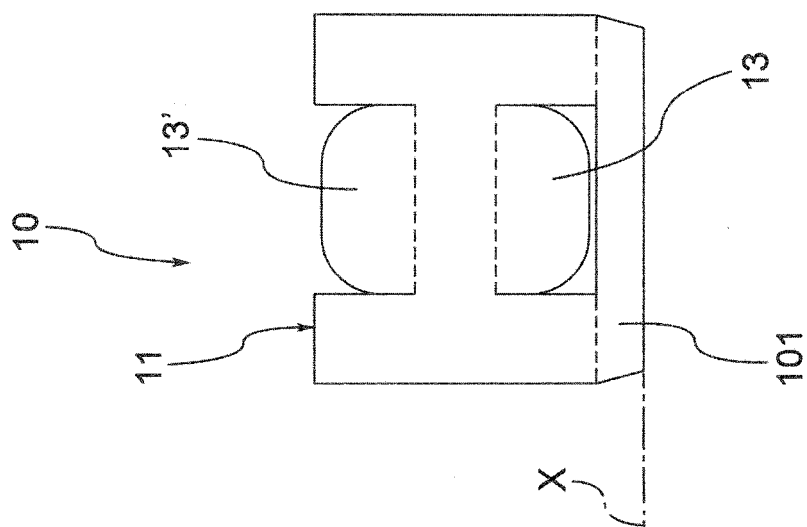
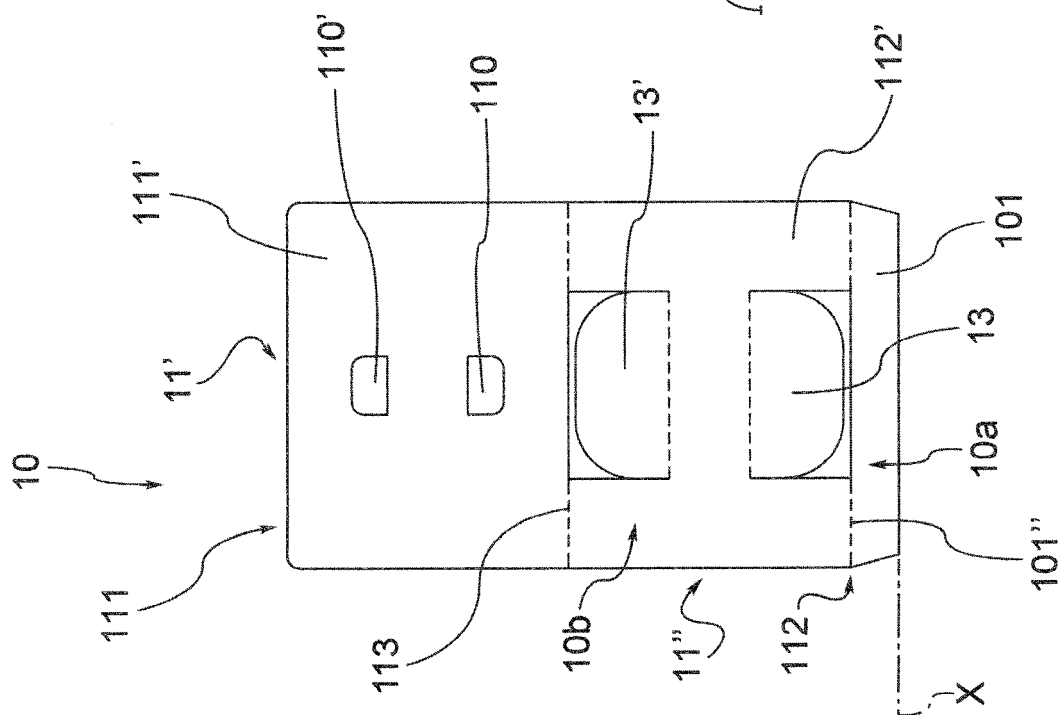
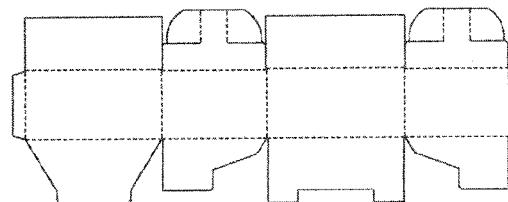
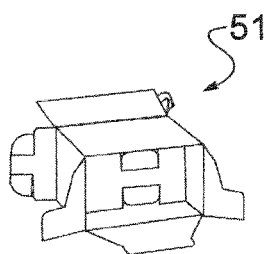
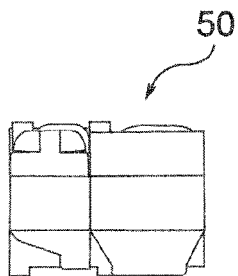
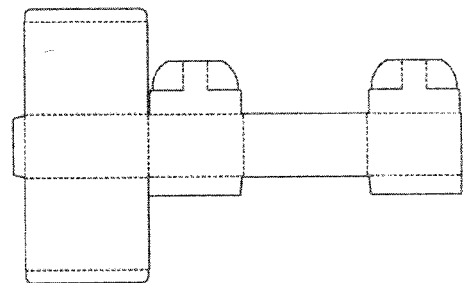
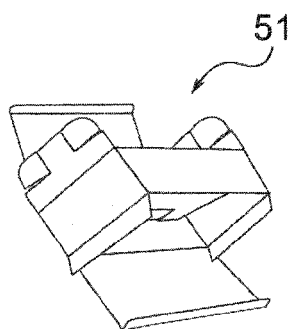
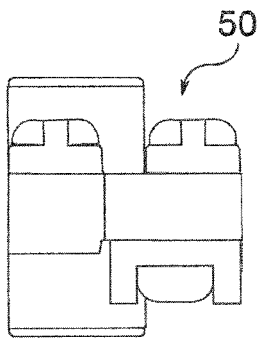
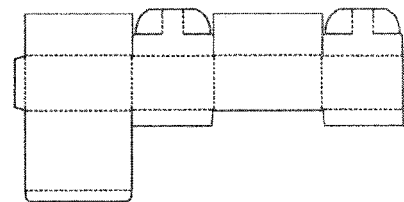
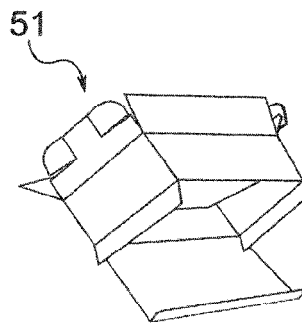
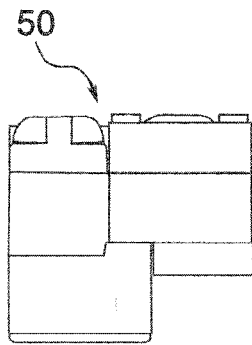
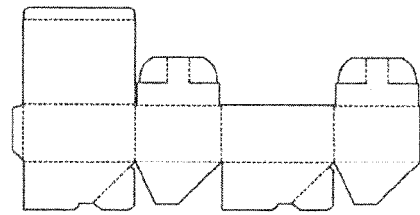
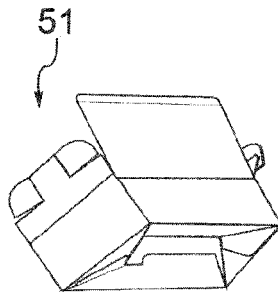
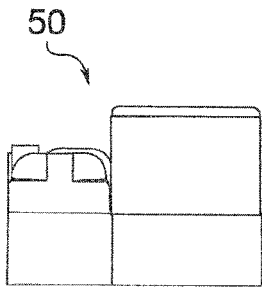


Fig.3





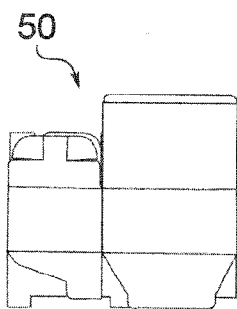


Fig. 9

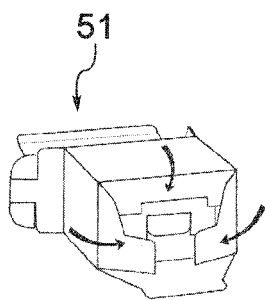


Fig. 9a

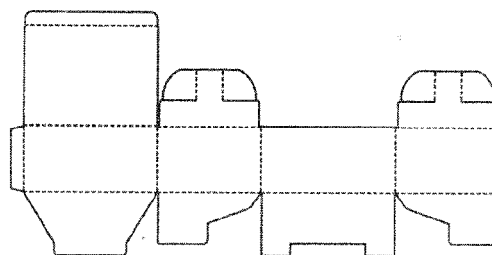


Fig. 9b

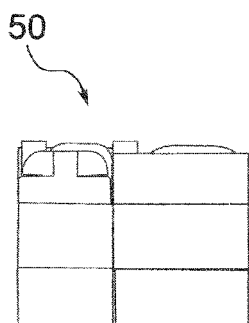


Fig. 10

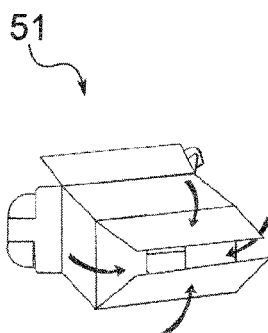


Fig. 10a

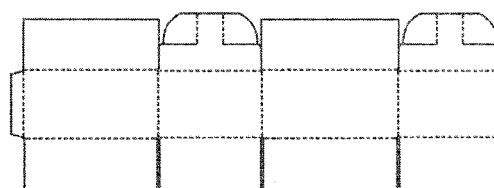


Fig. 10b

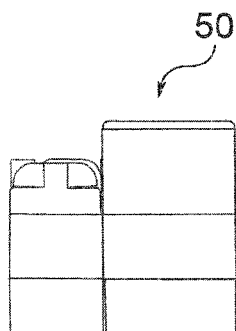


Fig. 11

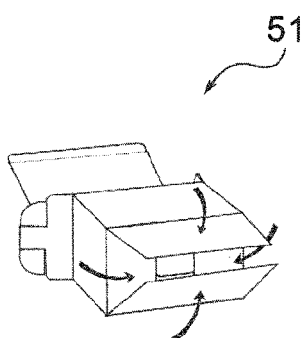


Fig. 11a

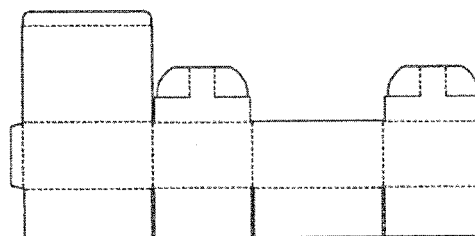


Fig. 11b

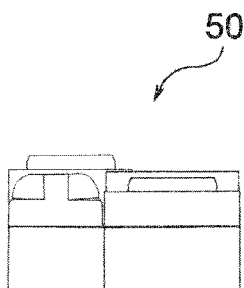


Fig. 12

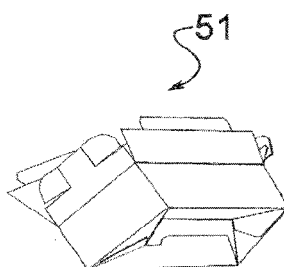


Fig. 12a

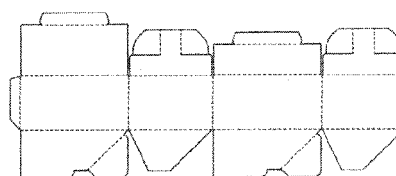


Fig. 12b

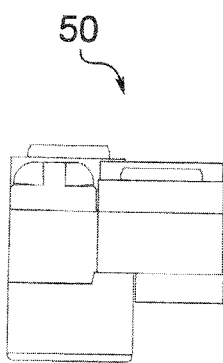


Fig. 13

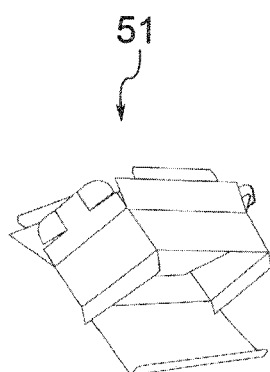


Fig. 13a

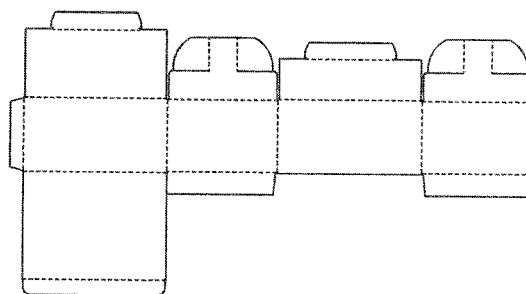


Fig. 13b

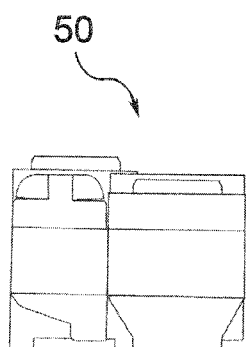


Fig. 14

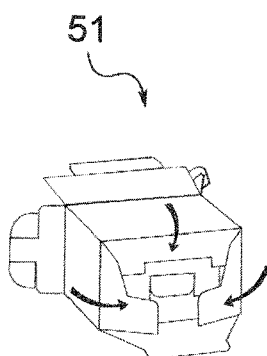


Fig. 14a

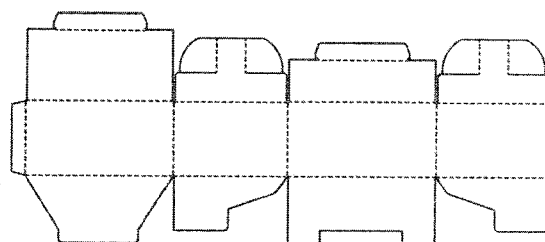


Fig. 14b

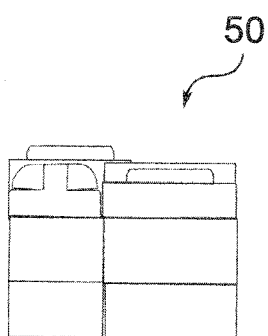


Fig. 15

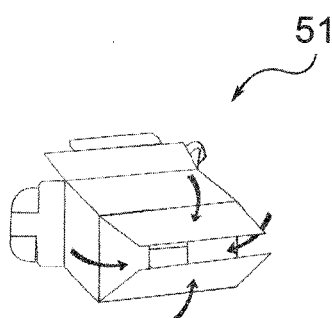


Fig. 15a

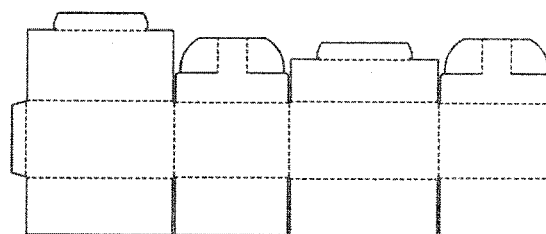


Fig. 15b



EUROPEAN SEARCH REPORT

Application Number
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			B65D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 16 March 2016	Examiner Newell, Philip
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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The members are as contained in the European Patent Office EDP file on
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16-03-2016

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