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(54) **MODULAR BOX**

(57) The present disclosure provides a box fully recyclable by users, with low manufacturing costs and requiring no pieces of adhesive tape to firmly bond the lid to the base of the box. It is substantially composed of a cardboard or paperboard base, which defines the bottom of the box, and a transparent, or non-transparent, lid made of homogeneous plastic material, which is configured to attach in a removable way to the cardboard base without using glue or pieces of adhesive tape.

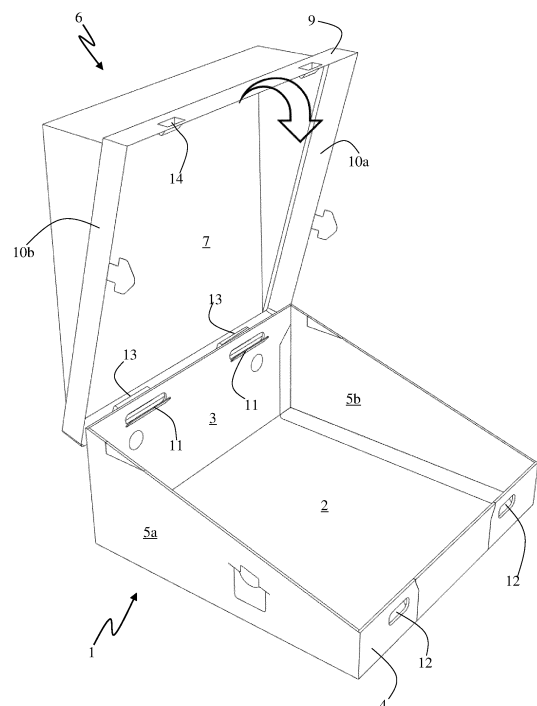


FIG. 7a

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Description**TECHNICAL FIELD**

[0001] The present disclosure relates to boxes for packaging products, and more particularly a modular box composed of two different materials and entirely recyclable.

BACKGROUND

[0002] Boxes used on the market generally consist of a cut out, folded and glued cardboard. However, these boxes do not allow to see the product contained in the box.

[0003] To overcome this drawback, boxes entirely made of transparent or translucent material have been developed as well as boxes that have a lid with an upper surface at least partially made of transparent material, which allow the overall direct view of the contained product. However, boxes made of transparent material, such as resealable trays for food products, have relatively high production costs, as they must have a bottom thickness which confers sufficient rigidity to withstand the weight of the product. For this reason, it is preferred to have a cardboard or paperboard bottom, which has lower production costs and at the same time is more resistant.

[0004] On the other hand, boxes with a transparent lid on a cardboard base require at least two pieces of adhesive tape to glue the transparent lid on the cardboard or paperboard base to prevent accidental opening of the box.

[0005] Also widely used are boxes almost entirely made of cardboard or paperboard, which have a lid with a transparent top surface. These boxes are easy to assemble, as the folding lines for assembling the box are typically defined by die-cutting in a flat sheet of cardboard or paperboard, but they are bi-material so they may be correctly recycled only if users take care to detach the transparent part, typically plastic, from the rest of the cardboard or paperboard in order to trash the two components separately.

[0006] A fully recyclable box easy to recycle, with low production costs, and that does not require pieces of adhesive tape to securely join the lid to the base of the box, would be desirable.

SUMMARY

[0007] A box which at least partially solves the aforementioned drawbacks is defined in claim 1. It is substantially composed of a cardboard or paperboard base, which defines the bottom of the box, and a lid made of homogeneous plastic material, transparent or non-transparent, which is configured to detachably coupled onto the cardboard base without using glue or pieces of adhesive tape.

[0008] Further embodiments are defined in the de-

pendent claims.

BRIEF DESCRIPTION OF THE DRAWINGS**[0009]**

Figure 1 is a top perspective view of a lid of a box according to the present disclosure.

Figure 2 is a bottom perspective view of a lid of a box according to the present disclosure.

Figure 3 is a front perspective view of a base of a box according to the present disclosure with two perforated tear-off lines of weakening.

Figure 4 is a rear perspective view of a base of a box according to the present disclosure.

Figure 5 illustrates the base of figure 3 wherein the front wall was torn-off at the perforated weakening lines and the portion between them was overturned in order to easily grasp a product (not shown) inside the base.

Figures 6a, 6b, 6c, 6d, 6e show in succession how to fold a flat sheet of cardboard or paperboard to obtain a base without holes in the bottom, according to one aspect of the box of the present disclosure.

Figures 7a, 7b and 7c show in succession how to mount a lid of figures 1 and 2 on a base of figures 3 and 4 by snapping the hooking teeth into their respective slots to obtain a box according to the present disclosure.

Figure 8 shows in perspective several lids of a box according to the present disclosure stacked on top of each other.

Figure 9 is a top view of the stacked lids of Figure 8. Figure 10 is a sectional view of the stacked lids of Figure 9.

Figure 11a shows the base of a box according to the present disclosure having tabs on the rear wall.

Figure 11b shows the base of figure 11a wherein the tabs on the rear wall of the base are folded inwards.

Figures 12a, 12b and 12c show in succession how to open a box according to the present disclosure and lock the lid in the semi-open position.

Figure 13a shows how to close a modular box according to the present disclosure using the anti-shoplifting mechanism.

Figure 13b-1 shows how to insert each flap of the lid into the respective open pocket on a side wall of the base of the box, according to an embodiment.

Figure 13b-2 shows how to fold transversely opposite ends of the head of each flap so as to interfere with the edges of the respective slot after it has been inserted into it, according to another embodiment.

Figure 13c shows how to release the lid by tearing the covering surface of the pocket of

Figure 13b-1 along the respective perforated weakening line.

Figure 13d is a detail view of the pocket of figure 13c.

Figure 14a shows a classic box, but equipped with

the anti-shoplifting mechanism of figure 13b.

Figure 14b shows the box of figure 14a closed with the fin 19 inserted in the respective pockets.

DESCRIPTION OF EXAMPLE EMBODIMENTS

[0010] A fully recyclable modular box was designed, made of cardboard / paperboard and plastic, transparent or non-transparent, which will be described referring to the attached figures that show a particular and non-limiting embodiment.

[0011] In its general aspects, the modular box of this disclosure comprises a base 1, which defines a bottom 2 of the box, a rear wall 3, a front wall 4 and side walls 5a, 5b, in relief with respect to the bottom 2, which rigidly connect, in correspondence with respective opposite sides, the front wall 4 with the rear wall 3. The base 1 is the part of the modular box intended to support the product to be packaged, and will be conveniently made of cardboard or paperboard. The box is closed by putting a plastic lid 6, which may be transparent or non-transparent. It is detached from the cardboard or paperboard base 1, is integrally made of plastic material and defines at least an upper surface 7 of the box, a rear edge 8, a front edge 9 and lateral edges 10a, 10b directed downwards with respect to the upper surface 7. As in common box lids, the lateral edges 10a, 10b connect, at respective opposite sides, the front edge 9 with the rear edge 8 so that all edges 8, 9, 10a, 10b surround from the outside all the walls 3, 4, 5a, 5b of the base 1 when the lid 6 is placed on the base 1 to close the box.

[0012] According to one aspect, the plastic lid 6 may be transparent, for example for packaging foods and in particular pastries, or non-transparent, for example for objects in the fashion sector.

[0013] While in common boxes it would be necessary to glue the lid 6 to the base 1 by means of two pieces of adhesive tape on opposite sides of the box, in the box of the present disclosure this is not necessary as the lid 6 and the base 1 may be detachably hooked together. According to one aspect, the rear wall 3 of the base has at least one through slot 11, preferably one or more pairs of through slots 11 as shown in the figures defined substantially at the same first level with respect to the bottom 2 of the box, and the front wall 4 of the base 1 has at least another through slot 12, preferably a pair of through slots 12 defined substantially at the same second level with respect to the bottom 2 of the box. In the following, reference will be made to the embodiments shown wherein there are two through slots 12 and 11 on the front 4 and rear 3 walls, but what will be said may be repeated *mutatis mutandis* in the event that there is only one through slot.

[0014] In figures 3 and 4 it may be seen that the slots 11 and 12 are obtained by cutting out the cardboard or cardboard of the rear 3 and front 4 walls without removing the cardboard or paperboard tabs that are formed. This is due to the fact that in the illustrated exemplary embod-

iment the slots 11 and 12 are opened by bending such tabs which are cut along three sides and for one side are joined to the respective wall 3, 4 of the base 1, but nothing prevents the realization of the slots 11 and 12 making a cut along a closed line.

[0015] The rear edge 8 of the removable lid 6 has at least one hooking tooth 13, preferably at least one pair of hooking teeth 13, defined in the rear edge 8 in correspondence of a first direction X1, wherein each of the hooking teeth 13 protrudes towards the inside the box from the rear edge 8 and is configured to engage in a removable way the respective through slot 11.

[0016] Similarly, the front edge 9 of the removable lid 6 has a respective hooking tooth 14, preferably at least one pair of hooking teeth 14, defined in correspondence of a second direction X2, wherein each of these other hooking teeth 14 projects towards the inside of the box from the front edge 9 and is configured to engage in a removable way the respective through slot 12.

[0017] In the following, reference will be made to the shown embodiments wherein there are two hooking teeth 14 and 13 on the front 9 and rear 8 edges, but what will be said may be repeated *mutatis mutandis* in the case wherein there is only one hooking tooth on a respective edge.

[0018] In practice, when the lid 6 is placed over the base 1 to close the box, the hooking teeth 13 engage the through slots 11 and the hooking teeth 14 are made to engage the through slots 12 exploiting the elastic deformation of the lid 6, up to a snap engagement occurs. In the closed configuration (figure 7c), the engagement of teeth 13 and 14 in the respective slots 11 and 12 prevents accidental opening of the box, without the need to apply adhesive tape.

[0019] According to a particularly convenient aspect, illustrated in figures 7a and 7b, the lid 6 is configured to be lifted from the base 1 to open the box by rotating around an axis of rotation defined by the direction X1 when the hooking teeth 13 engage the respective through slots 11 of the rear wall 3, while the hooking teeth 14 are free. Thanks to this particular configuration of the modular box, the lid 6 may be lifted to expose the contents as would be done in a common cardboard or paperboard box with the lid which forms a single body with the base and which is separated from it only by a folding line. Differently, in the box of the present disclosure, the lid 6 is physically separated from the base 1, so that it is easier to dispose of the lid 6 in the container for the separate collection of plastic and the base 1 in the container for the separate collection of cardboard. According to an aspect illustrated in the attached figures, the lid 6 has at least a fin 19 which hangs from an edge of the lid 6, having a stem 19a which has a longitudinal end anchored to one of the edges 8, 9, 10a, 10b of the lid 6 and the opposite longitudinal end which ends with a head 19b, preferably but not necessarily larger than the transverse width of the stem. The base 1 has a slot 20 on one of the walls 3, 4, 5a, 5b corresponding to the edge of the lid 6

on which the fin 19 is anchored. The slot 20 is shaped and has such dimensions that the head 19b may be forced to enter the respective slot 20 only by elastically deforming the head 19b. According to an aspect shown in the exemplary embodiment illustrated in the figures, the head 19b is wider than the slot 20. According to one aspect, the head 19b is shaped as an arrow so as to be able to pass through the slot 20 being elastically forced to enter, but that it may no longer be pulled out except by visibly deforming or even tearing the slot 20. An equally valid anchoring may also be obtained by folding inwards the two terminals 19c of the head 19b so that, after insertion, they interfere with the profile of the slot 20 during exit, such as a harpoon; in this case, the size of the head 19b does not require either a dimensional increase or forced elastic deformations during insertion. For the sake of brevity, in the continuation of the discussion we will refer only to the first anchoring technique, being understood that the same innovative functional effects also apply to the second.

[0020] Thanks to the aforementioned characteristics, the fin 19 together with the slot 20 constitutes an anti-theft mechanism. In fact, by equipping the lid 6 with at least one or better with two fins 19 on the opposite edges, which in the example of the figures are the edges 10a and 10b, the lid 6 will be hooked onto the base 1 and it will not be possible to remove the contents of the box without visibly tamper the base 1 made of cardboard or paperboard. Since the insertion of each head 19b in the respective slot 20 is an irreversible operation, unless the box is damaged, it will be carried out by the seller only at the time of sale, before delivering the box to the buyer.

[0021] According to one aspect, at least one perforated weakening line 22 is defined in proximity to each slot 20, so as to facilitate for the purchaser the tearing of the base 1 near the slot 20 to free the respective fin 19 when removing the lid 6 from the box. Preferably, the perforated weakening line 22 will define together with the slot 20 a closed line that delimits a tear-off removable portion of the base 1, which the buyer will remove when opening the newly purchased box.

[0022] According to an aspect clearly shown in the detail figures 13a to 13d, in order to avoid that the fin 19 touched by the seller contaminates the contents of the box, which is undesirable in particular for the sale of food products, each pocket 21 is defined by a line of weakening 22 carried out exclusively on the external surface of the walls 5a and 5b, as shown in the assembly in figures 6a to 6e, leaving the internal surface of the walls intact. In this case, the slot 20 is the pocket opening and is not an incision passing through the entire thickness of a wall 5a, 5b of the base 1. As in the previous case, the head 19b will conveniently be wider than the opening 20 of the pocket so as to have to be elastically deformed to be forced to enter and not to be able to exit the pocket without tearing the covering surface 21 along the line of weakening.

[0023] Conveniently, the fins 19 of the lid 6 are integral

with the lid 6 itself and are made of the same plastic material as the lid 6.

[0024] According to an optional aspect, illustrated in Figure 5, the base 1 has two perforated weakening lines 15 defined in correspondence with the front wall 4 so as to cross it transversely in height starting from the bottom 2 of the box. These perforated lines 15 are configured to facilitate a guided tearing of a portion of the front wall 4, from the free edge of the front wall 4 to the bottom 2 of the box. As may be easily understood by looking at figure 5, this allows to easily access the contents of the box and to grasp it without difficulty. For example, this feature will be convenient for taking a plate on which a cake packaged in the box is placed: tearing off the portion of the front wall 4 between the two perforated lines 15 exposes the edge of the plate (not shown) placed on the base 1 and it will be easier to lift it from the base 1.

[0025] According to one aspect, illustrated in figures 6a to 6e, the cardboard or paperboard base 1 may be obtained by folding a flat sheet of cardboard or paperboard along punched fold lines so as to define the bottom 2, the rear wall 3, the front wall 4 and the side walls 5a, 5b of the box. To prevent liquids that drip into the base 1 from escaping, the punched fold lines will conveniently be defined so as to delimit the perimeter of the bottom 2 of the box without drilling it, and will be configured in the manner illustrated in the figures so that the various parts of the flat sheet cardboard or paperboard may be folded along the fold lines to snap together, defining the rear wall 3, the front wall 4 and the side walls 5a, 5b.

[0026] Thanks to this configuration, the bases 1 of modular boxes according to this disclosure will be transportable and stowable in the form of flat sheets of cardboard or paperboard stacked on top of each other, and will be assembled quickly at the time of use without the use of glue or scissors.

[0027] In order to display the contents of the box in a more attractive way, according to an optional aspect the front wall 4 will be lower than the rear wall 3, so that the box will therefore have an asymmetrical configuration. Thanks to the transparent lid 6, the modular box of the present disclosure will allow the product to be seen in its entirety even when it is displayed on a shelf. Furthermore, the front wall 4 lower than the rear wall 3 allows to insert more easily a product inside the box.

[0028] A further advantage of having a relatively high rear wall 3 is that it is possible to put an adhesive label on the rear wall 3, for example a label with a barcode and / or with the list of ingredients, without covering the transparent part of the box and without altering the appearance of the package seen from the front, i.e. from the side of the front wall 4.

[0029] Furthermore, the adhesive label may be read without having to overturn the package, which is desirable when the box contains food products, for example garnished sweets. Conveniently, in order not to limit the capacity of the box, the lid 6 is shaped as shown in figures 1 and 2 so as to compose with the base 1 a substantially

parallelepiped-shaped box when closed. For this purpose, the front of the lid will be higher than the rear, to compensate for the different height of the front wall 4 of the base 1 compared to the rear wall 3.

[0030] According to an aspect not shown in the drawings, the lid 6 will have a front part of the same height as the rear part, so that it will not increase the overall capacity of the modular box beyond the volume defined by the base 1.

[0031] According to an aspect shown in figures 8 to 10, the lid 6 is shaped so as to be stackable on identical lids 6 placed one inside the other, to be transported and stowed on top of each other.

[0032] To ensure a more secure hooking of the lid 6 on the base 1, according to an optional aspect, the upper surface 7 of the lid 6 will have smaller dimensions than the bottom 2 of the box and the edges 8, 9, 10a, 10b of the lid 6 will have a stepped profile 16 configured to rest on a free edge respectively of the walls 3, 4, 5a, 5b of the base 1, when the lid 6 is placed on the base 1 to close the box.

[0033] The fact that the base 1 and the lid 6 are detached allows the base 1 to be made from recyclable or compostable cardboard or paperboard, and the lid 6 from recycled plastic, possibly of the recyclable or compostable type.

[0034] According to an optional aspect illustrated in Figures 11a and 11b, useful for packaging hot food products, it is possible to define by punching the folding tabs 17, for example (but not necessarily) in correspondence with the rear wall 3 of the base 1. The folding tabs 17 are raised with respect to the bottom 2 and may be folded towards the inside of the box so as to create openings to let out the humidity of hot products to be packaged and to avoid the formation of condensation inside the box.

[0035] The folding tabs 17 have been illustrated with reference to the embodiment of the base 1 with the rear wall 3 higher than the front wall 4, but it is possible to make the tabs 17 even if the front 4 and rear 3 walls have the same height, thus as on different walls of the rear wall 3, for example on the side walls 5a and 5b.

[0036] To allow the box of the present disclosure to be kept in a semi-open position, according to one aspect, the base 1 may be configured so that at least one flap 18 may be folded outwards as shown in the succession of figures 12a-12c. In this way, by opening the lid and folding outwards the at least one flap 18 of one of the two side walls 5a and 5b, the lid 6 hinged to the base 1 in the manner described in Figures 7a-7c will rest on the at least one flap and will leave the box in a semi-closed configuration.

[0037] According to an aspect of the present disclosure, it is possible to use the anti-theft mechanism illustrated above on any box and not necessarily on the box shown in figures 1 to 13d. For example, a modular box with an anti-theft mechanism may also be made with a box of the classic type, illustrated in figures 14a and 14b. Like all modular boxes, it has a base 1 and a lid 6.

[0038] Unlike common boxes, the lid 6 has at least one fin 19 (in the example shown there are two fins 19 and they are arranged in correspondence with the lateral edges 8a, 8b) of the type described above, and the base 1 has at least one slot 20 which opens at a respective wall of said walls (5a, 5b) corresponding to the respective edge of the lid 6 from which the fin 19 (or the fins, as in the example shown in figures 14a and 14b) hangs. In the illustrated case where there are two fins 19 hanging from the edges 8a and 8b of the lid 6, they are configured to engage the respective slots 20, which open at the side walls 5a, 5b, when the lid 6 is placed on the base 1 to close the modular box.

[0039] Numerous other examples of modular boxes may be made by combining the different aspects disclosed herein. Among others, the following examples of modular boxes are possible:

Example 1. A modular box, comprising:

a base (1) in cardboard or paperboard, defining a bottom (2) of the box, a rear wall (3), a front wall (4) and side walls (5a, 5b) in relief which rigidly connect, in correspondence with respective opposite sides, the front wall (4) with the rear wall (3) rising from said bottom (2);
a removable lid (6) integrally made of plastic material, transparent or not, defining at least an upper surface (7) of the box, a rear edge (8), a front edge (9) and lateral edges (10a, 10b), downwards with respect to the upper surface (7), which rigidly connect, at respective opposite sides, the front edge (9) with the rear edge (8), all said edges (8, 9, 10a, 10b) being configured to surround from the outside all the walls (3, 4, 5a, 5b) of the base (1) in cardboard or paperboard when the lid (6) is placed on the base (1) to close the box;
characterized by the fact that
said lid (6) comprises at least one fin (19) integral with said lid (6) and which hangs from a respective edge of the edges (8, 9, 10a, 10b) of the lid (6), said at least one flap having a stem (19a) which has a longitudinal end anchored to one of the edges (8, 9, 10a, 10b) of the lid (6) and the opposite longitudinal end which ends with a head (19b), preferably but not necessarily of larger dimensions than the transversal width of the stem (19a);
said base (1) has at least one slot (20) which opens at a respective wall of said walls (3, 4, 5a, 5b) corresponding to the respective edge of the lid (6) from which said at least one fin (19) hangs, said at least one slot (20) being configured so that the head (19b) of said at least one fin (19) may be inserted, made like a harpoon, or forced to enter the respective slot (20) only by deforming the head elastically (19a).

Example 2. Modular box according to the previous example, wherein said head (19b) is shaped as an arrow so as to be configured to cross the respective slot (20), made as a harpoon, or only by being elastically forced to cross it, and elastically returning to a form of rest once it has crossed the slot (20).

Example 3. Modular box according to one of the previous examples, wherein: said lid (6) comprises two fins (19), wherein each fin (19) hangs from a respective lateral edge of said lateral edges (10a, 10b); said base (1) comprises two slots (20), wherein each slot (20) opens on a respective side wall of said side walls (5a, 5b) and is configured so as to be engaged by a respective fin (19) of said two fins (19) when the lid (6) is placed on the base (1) to close the modular box.

Example 4. Modular box according to example 1, wherein said at least one slot (20) is a through opening made through a thickness of the respective wall of said walls (3, 4, 5a, 5b) of the base (1).

Example 5. Modular box according to one of examples 1 to 3, wherein said base (1) is provided, for each fin (19) of said fins (19), with a respective pocket defined by means of a weakening line 22 made exclusively on the external surface of the walls 5a and 5b, as shown in the assembly in figures 6a to 6e, leaving the internal surface of the same walls intact and isolating the fin (19) from the contents of the box.

Example 6. Modular box according to one of the preceding examples, wherein said base has at least one respective perforated weakening line (22) defined in proximity to a respective slot (20), configured to facilitate a breaking of the base (1) by widening the respective slot (20) to free the respective fin (19) when the lid (6) has to be lifted from the base (1).

Example 7. Modular box according to the previous example, wherein said perforated weakening line (22) defines together with the respective slot (20) a closed line that delimits a removable tear-off portion of the base (1).

Example 8. Modular box according to examples 5 and 6, wherein said respective covering surface (21) is made on said external face and is delimited by said perforated weakening line (22).

Example 9. Modular box according to one of the previous examples, wherein

the rear wall (3) of the base (1) has at least a first through slot (11) defined substantially at a first level with respect to the bottom (2) of the box;

the front wall (4) of the base (1) has at least a second through slot (12) defined substantially at a second level with respect to the bottom (2) of the box;

the rear edge (8) of the removable lid (6) has at least one first hooking tooth (13) defined in said rear edge (8) in correspondence with a first di-

rection (X1), said first hooking tooth (13) being configured to protrude towards the inside of the box from the rear edge (8) of the lid (6) and to engage in a removable way the respective first through slot (11) when the lid (6) is placed on said base (1) to close the box;

the front edge (9) of the removable lid (6) has at least a second hooking tooth (14) defined in said front edge (9) in correspondence with a second direction (X2), said second hooking tooth (14) being configured to protrude towards the inside of the box from the front edge (9) of the lid (6) and to engage in a removable way the respective second through slot (12) when the lid (6) is placed on said base (1) to close the box;

said lid (6) has flat lateral edges (10a, 10b) and is configured to be raised from the base (1) to open the box by rotating around an axis of rotation defined by said first direction (X1) when said at least one first tooth (13) is engaged in the respective first through slot (11) of the rear wall (3) while said at least one second hooking tooth (14) does not engage the respective second through slot (12), with said lateral edges (10a, 10b) planes configured to slide on said side walls (5a, 5b) without interfering with them.

Example 10. Box according to example 9, wherein said cardboard or paperboard base (1) has two perforated weakening lines (15) defined in correspondence with the front wall (4) so as to cross it transversely in height starting from the bottom (2) of the box, configured to facilitate the tearing of a portion of the front wall (4) between the two perforated lines (15) of weakening and between a free edge of the front wall (4) and the bottom (2) of the box.

Example 11. Box according to example 9 or 10, wherein said base (1) made of cardboard or paperboard may be obtained by folding a flat sheet of cardboard or paperboard along punched fold lines so as to define the bottom (2), the wall rear (3), the front wall (4) and the side walls (5a, 5b) of the box.

Example 12. Box according to example 11, wherein said punched fold lines delimit a perimeter of the bottom (2) of the box without drilling it, and delimit parts of the flat sheet of cardboard or paperboard that may be folded along the fold lines to interlock each other defining the rear wall (3), the front wall (4) and the side walls (5a, 5b).

Example 13. Box according to one of examples 9 to 12, wherein the front wall (4) rises from said bottom (2) for a first height and the rear wall (3) rises from the bottom for a second height, wherein said first height is smaller than said second height.

Example 14. Box according to one of examples 9 to 13, wherein:

said rear wall (3) of the base (1) has a pair of

first through slots (11);
 said front wall (4) of the base (1) has a pair of
 second through slots (12);
 the rear edge (8) of the removable lid (6) has a
 pair of first hooking teeth (13) defined in corre-
 spondence with said first direction (X1);
 the front edge (9) of the removable lid (6) has a
 pair of second hooking teeth (14) defined in cor-
 respondence with said second direction (X2).

Example 15. Box according to one of examples 9 to
 14, wherein said lid (6) is shaped so as to compose
 with said base (1) a box substantially in the shape
 of a parallelepiped when closed, and is shaped so
 as to be stackable on identical lids (6) placed one
 inside the other. Example 16. Box according to one
 of examples 9 to 15, wherein said lid (6) defines said
 upper surface (7) having smaller dimensions than
 the bottom (2) of the box, and said rear (8), front (9)
 and side (10a, 10b) edges have a stepped profile
 (16) configured to rest on a free edge respectively
 of said rear (3), front (4) and side (5a, 5b) walls of
 the base (1) when the lid (6) is placed on the base
 (1) to close the box.

Example 17. Box according to one of examples 9 to
 16, comprising at least one tab (17) defined by
 punching in the rear wall (3) or in at least one of the
 side walls (5a, 5b) and raised with respect to the
 bottom (2) of the box, wherein said tab (17) may be
 bent towards the inside of the box to open a through
 hole to let steam out of the box when closed. Example
 18. Box according to one of examples 9 to 17,
 wherein at least one of said side walls (5a, 5b) has
 a flap (18) that may be folded outwards and config-
 ured to support the lid (6) raised with said at least a
 first hooking tooth (13) engaged in the respective
 first through slot (11) of the rear wall (3) and said at
 least one second hooking tooth (14) raised with re-
 spect to the respective second through slot (12).

Example 19. Box according to one of Examples 9 to
 18, wherein said base (1) is made of recyclable or
 compostable cardboard or paperboard and said lid
 (6) is made of recycled, recyclable or compostable,
 transparent or non-transparent plastic.

Although the various technical aspects of boxes ac-
 cording to the present disclosure have been dis-
 closed with reference to particular embodiments, the
 skilled person will be able to obtain other embodi-
 ments by combining the technical aspects described
 in numerous other different ways without thereby de-
 parting from the scope of the invention as defined in
 the enclosed claims.

Claims

1. A modular box, comprising:

a base (1) in cardboard or paperboard, defining
 a bottom (2) of the box, a rear wall (3), a front
 wall (4) and side walls (5a, 5b) in relief which
 rigidly connect, in correspondence with respec-
 tive opposite sides, the front wall (4) with the
 rear wall (3) rising from said bottom (2);
 a removable lid (6) integrally made of plastic ma-
 terial, transparent or not, defining at least an up-
 per surface (7) of the box, a rear edge (8), a front
 edge (9) and lateral edges (10a, 10b), lowering
 with respect to the upper surface (7), which rig-
 idly connect, at respective opposite sides, the
 front edge (9) with the rear edge (8), all said
 edges (8, 9, 10a, 10b) being configured to sur-
 round from the outside all the walls (3, 4, 5a, 5b)
 of the base (1) in cardboard or paperboard when
 the lid (6) is placed on the base (1) to close the
 box; **characterized by** the fact that
 the rear wall (3) of the base (1) has at least a
 first through slot (11) defined substantially at a
 first level with respect to the bottom (2) of the
 box;
 the front wall (4) of the base (1) has at least a
 second through slot (12) defined substantially
 at a second level with respect to the bottom (2)
 of the box;
 the rear edge (8) of the removable lid (6) has at
 least one first hooking tooth (13) defined in said
 rear edge (8) in correspondence with a first di-
 rection (X1), said first hooking tooth (13) being
 configured to protrude towards the inside of the
 box from the rear edge (8) of the lid (6) and to
 engage in a removable way the respective first
 through slot (11) when the lid (6) is placed above
 said base (1) to close the box;
 the front edge (9) of the removable lid (6) has at
 least one second hooking tooth (14) defined in
 said front edge (9) in correspondence with a sec-
 ond direction (X2), said second hooking tooth
 (14) being configured to protrude towards the
 inside of the box from the front edge (9) of the
 lid (6) and to engage in a removable way the
 respective second through slot (12) when the lid
 (6) is placed on said base (1) to close the box;
 said lid (6) has flat lateral edges (10a, 10b) and
 is configured to be raised from the base (1) to
 open the box by rotating around an axis of rota-
 tion defined by said first direction (X1) when said
 at least one first hooking tooth (13) is engaged
 in the respective first through slot (11) of the rear
 wall (3) while said at least one second hooking
 tooth (14) does not engage the respective sec-
 ond through slot (12), with said flat lateral edges
 (10a, 10b) configured to slide on said side walls
 (5a, 5b) without interfering with them.

2. The box according to claim 1, wherein said base (1)
 made of cardboard or paperboard has two perforated

- lines (15) of weakening defined in correspondence with the front wall (4) so as to cross transversely in height starting from the bottom (2) of the box, configured to facilitate the breaking of a portion of the front wall (4) between the two perforated lines (15) of weakening and between a free edge of the front wall (4) and the bottom (2) of the box.
3. The box according to claim 1 or 2, wherein said base (1) made of cardboard or paperboard is obtained by folding a sheet of cardboard or paperboard along fold lines punched so as to define the bottom (2), the rear wall (3), the front wall (4) and the side walls (5a, 5b) of the box.
 4. The box according to claim 3, wherein said punched fold lines delimit a perimeter of the bottom (2) of the box without drilling it, and delimit parts of the flat sheet of cardboard or paperboard that may be folded along the fold lines to interlock each other defining the rear wall (3), the front wall (4) and the lateral walls (5a, 5b).
 5. The box according to one of the preceding claims, wherein the front wall (4) rises from said bottom (2) for a first height and the rear wall (3) rises from the bottom to a second height, wherein said first height is less than said second height.
 6. The box according to one of the preceding claims, wherein:
 - said rear wall (3) of the base (1) has a first pair of through slots (11);
 - said front wall (4) of the base (1) has a pair of second through slots (12);
 - the rear edge (8) of the removable lid (6) has a pair of first hooking teeth (13) defined in correspondence with said first direction (X1);
 - the front edge (9) of the removable lid (6) has a pair of second hooking teeth (14) defined in correspondence with said second direction (X2).
 7. The box according to one of the preceding claims, wherein said lid (6) is shaped so as to form with said base (1) a box substantially shaped as a parallelepiped when closed, and is shaped so as to be stackable on identical lids (6) placed one inside the other.
 8. The box according to one of the preceding claims, wherein said lid (6) defines said upper surface (7) having smaller dimensions with respect to the bottom (2) of the box, and said rear (8), front (9) and lateral (10a, 10b) edges have a stepped profile (16) configured to rest on a free edge respectively of said rear (3), front (4) and side (5a, 5b) walls of the base (1) when the lid (6) is placed on the base (1) to close the box.
 9. The box according to one of the preceding claims, comprising at least one tab (17), defined by punching in the rear wall (3) or in at least one of the side walls (5a, 5b), and raised with respect to the bottom (2) of the box, wherein said tab (17) may be bent towards the inside of the box to open a through hole to let steam out of the box when closed.
 10. The box according to one of the preceding claims, wherein at least one of said side walls (5a, 5b) has a flap (18) foldable towards the outside and configured to support the lid (6) raised with said at least one first hooking tooth (13) engaged in the respective first through slot (11) of the rear wall (3) and said at least one second hooking tooth (14) raised with respect to the respective second through slot (12).
 11. The box according to one of the preceding claims, wherein said base (1) is made of recycled or compostable cardboard or paperboard and said lid (6) is made from recycled plastic, recyclable or compostable, transparent or non-transparent plastic.
 12. The box according to one of the preceding claims, wherein said lid (6) comprises at least one fin (19) integral with said lid (6) and that hangs from a respective edge of the edges (8, 9, 10a, 10b) of the lid (6), said at least one fin having a stem (19a) which has a longitudinal end anchored to one of the edges (8, 9, 10a, 10b) of the lid (6) and the opposite longitudinal end ending with a head (19b); said base (1) has at least one slit (20) which opens at a respective wall of said walls (3, 4, 5a, 5b) corresponding to the respective edge of the lid (6) from which said at least one fin hangs (19), said at least one slit (20) being configured so that the head (19b) of said at least one fin (19) may be forced to enter the respective slit (20) only by elastically deforming the head (19b).
 13. The box according to the preceding claim, wherein said head (19b) is arrow-shaped so as to be configured to cross the respective slit (20) either when being elastically forced to cross it and elastically returning to a rest form once the slit (20) has been crossed, or by folding two transversely opposite ends (19c) of the arrow-shaped head (19b) so that, after the head (19b) has crossed the respective slit (20), said two transversely opposite ends (19c) interfere with the edges of said slit (20) hindering the exit of the fin (19) from the respective slit (20).
 14. The box according to one of claims 12 or 13, wherein:
 - said lid (6) comprises two fins (19), wherein each fin (19) hangs from a respective lateral edge of said lateral edges (10a, 10b);
 - said base (1) comprises two slits (20), wherein

each slit (20) opens on a respective side wall of said side walls (5a, 5b) and is configured so as to be engaged by a respective fin (19) of said two fins (19) when the lid (6) is placed on the base (1) to close the modular box.

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15. The box according to one of claims 12 to 14, wherein said base (1) is provided, for each fin (19) of said fins (19), of a respective pocket defined by a respective surface of the lid (21), made of cardboard or paperboard, realized on an external face of a respective wall of the base (1), said slit (20) being an opening of said pocket, wherein said respective covering surface (21) is made on said external face and is delimited by a perforated weakening line (22) defined in proximity to a respective slit (20), configured to facilitate a break in the base (1) by widening the respective slit (20) to free the respective fin (19) when the lid (6) must be lifted from the base (1).

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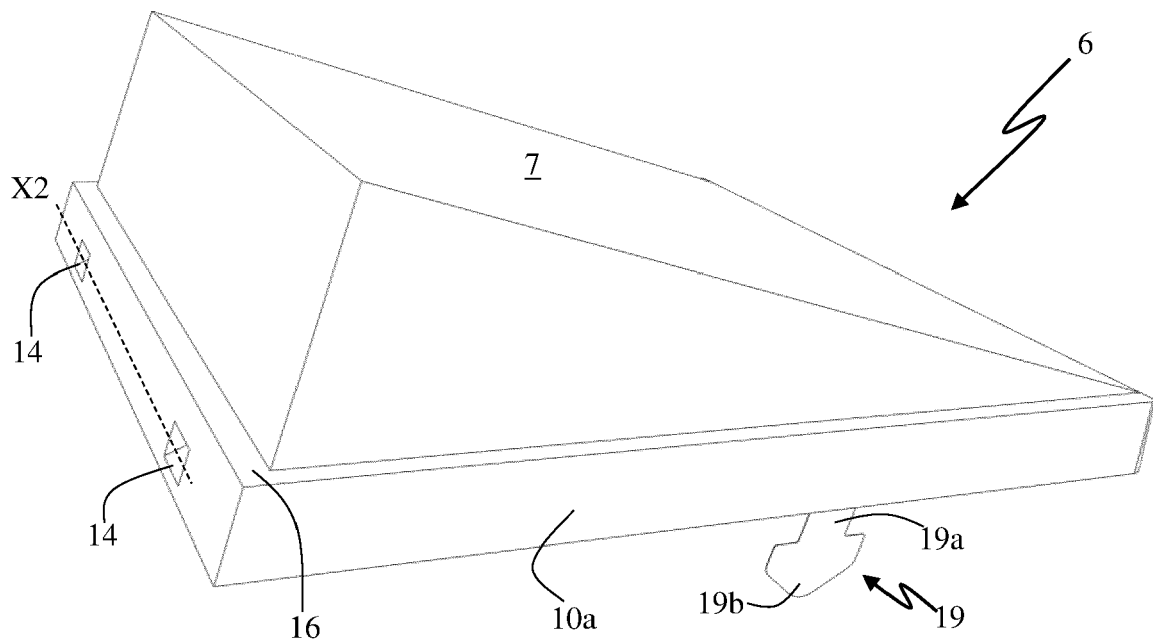


FIG. 1

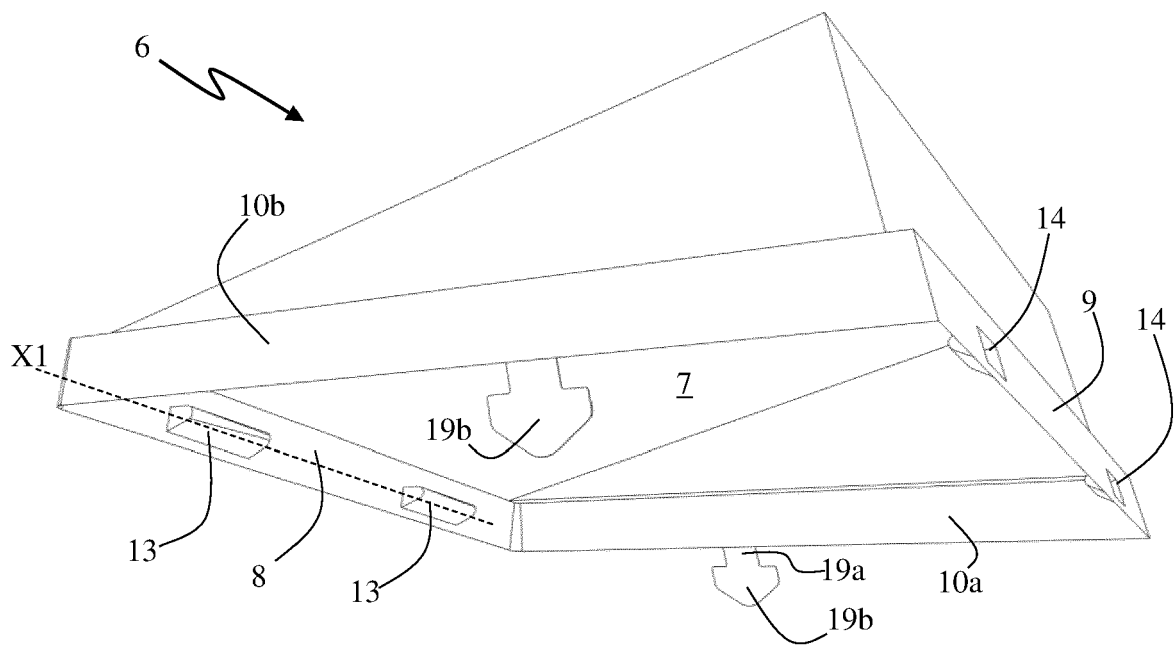


FIG. 2

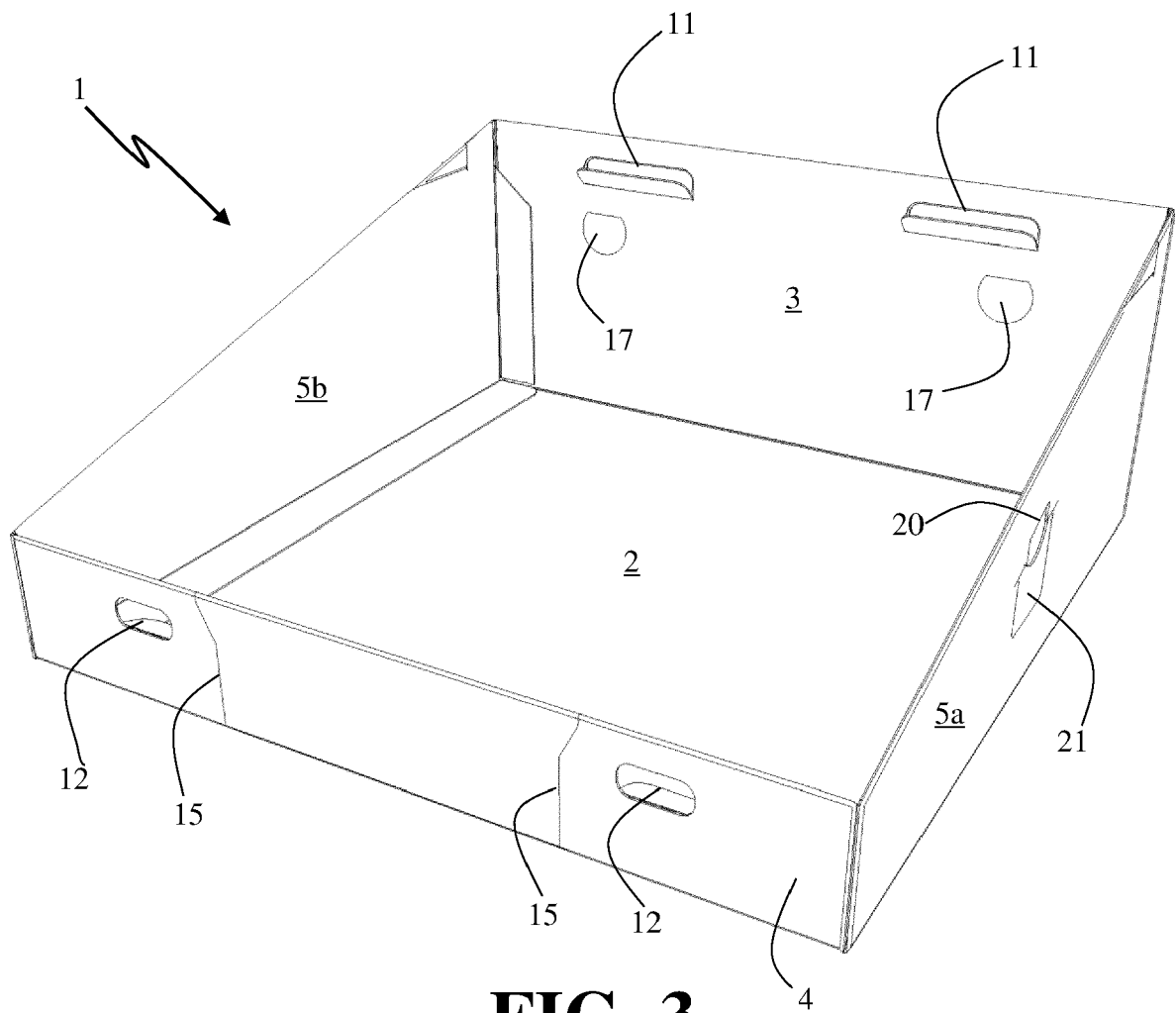


FIG. 3

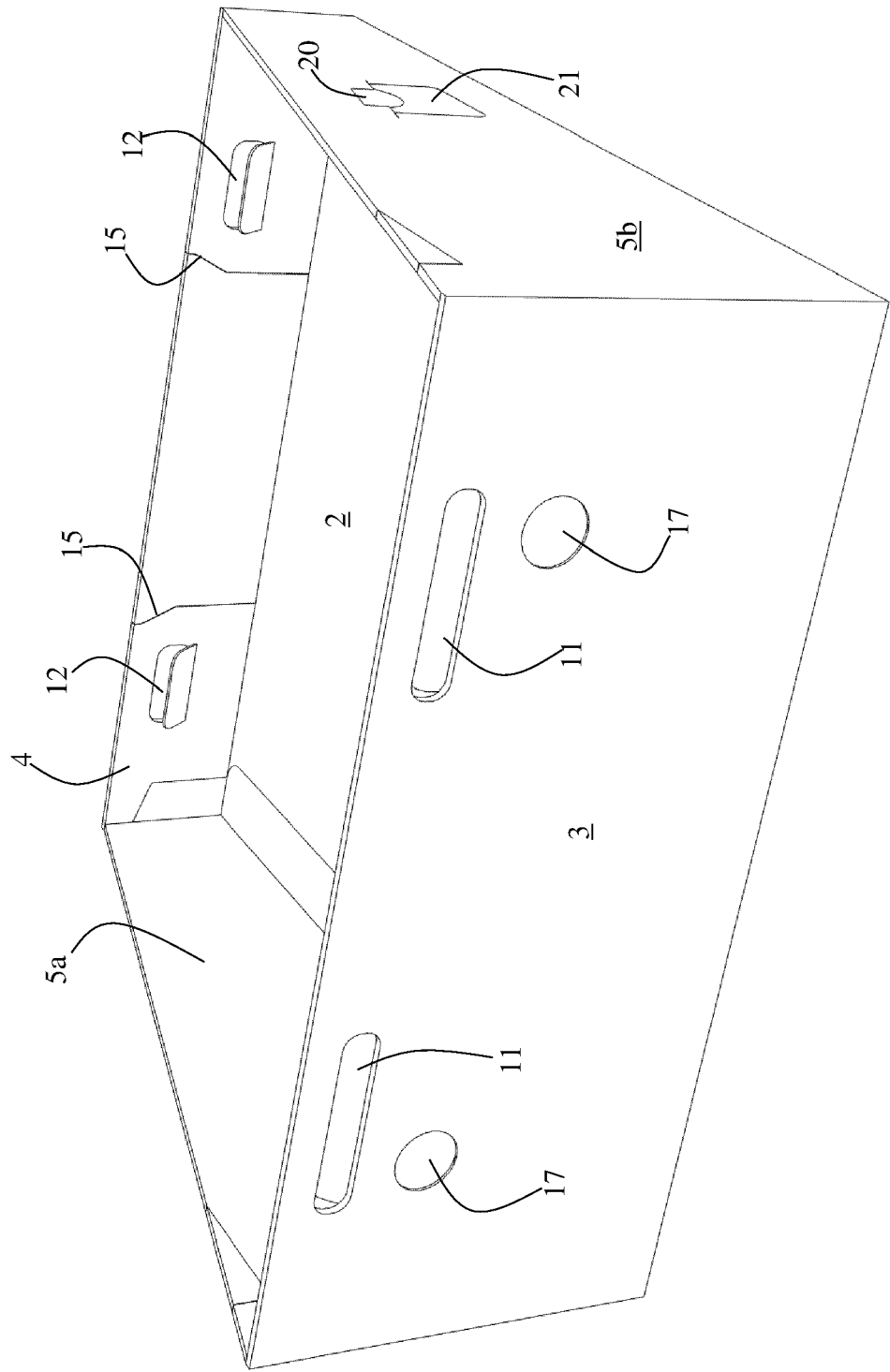


FIG. 4

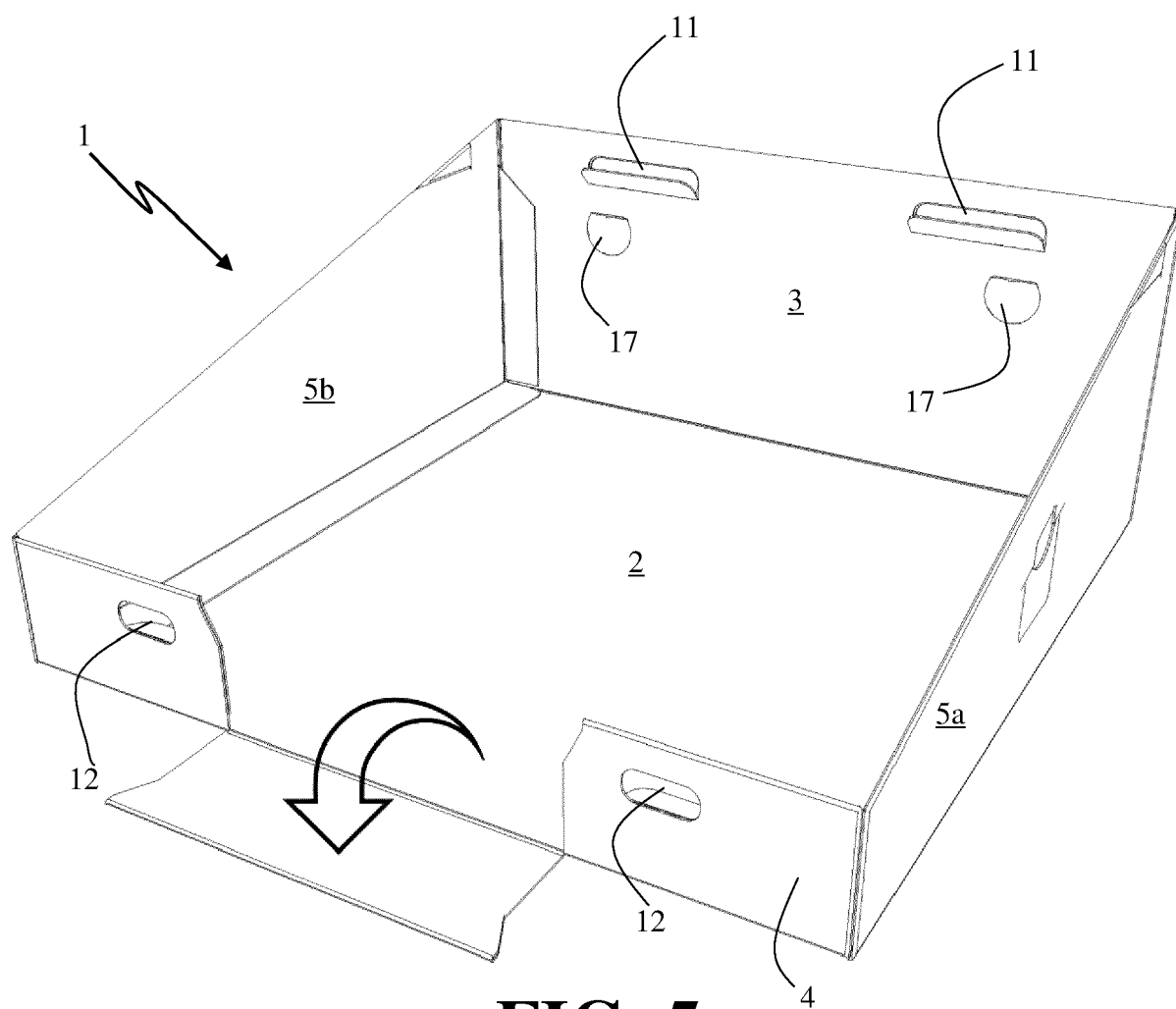


FIG. 5

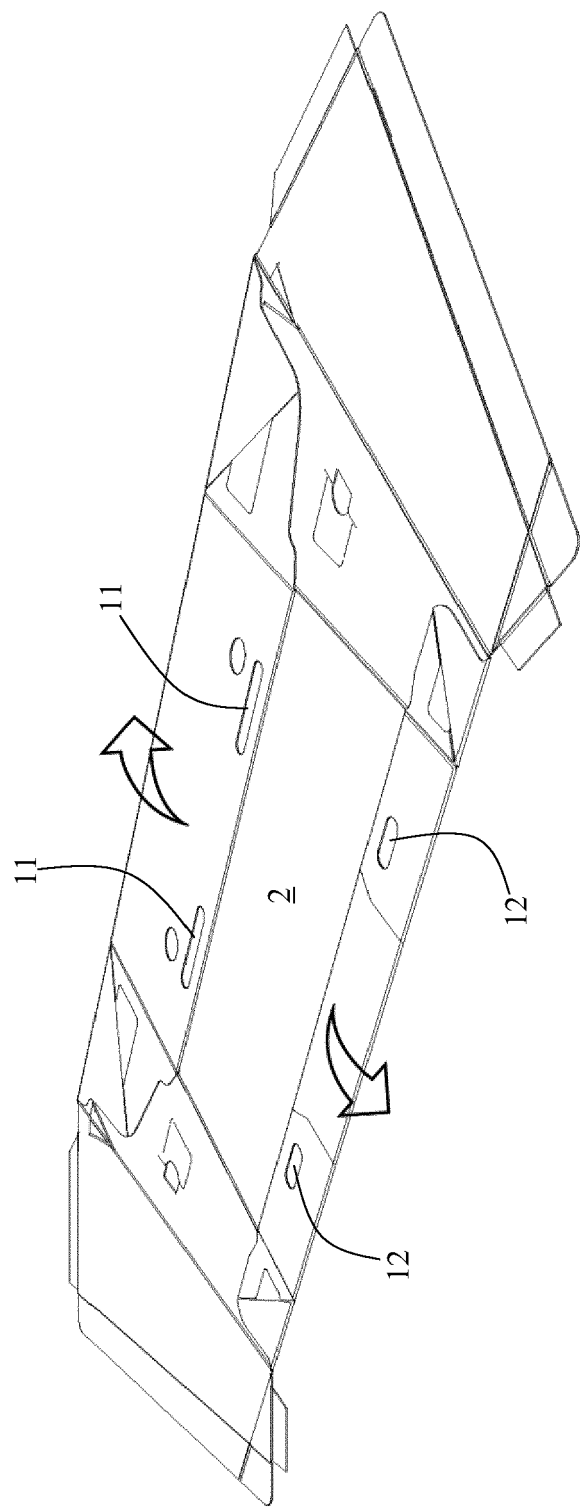


FIG. 6a

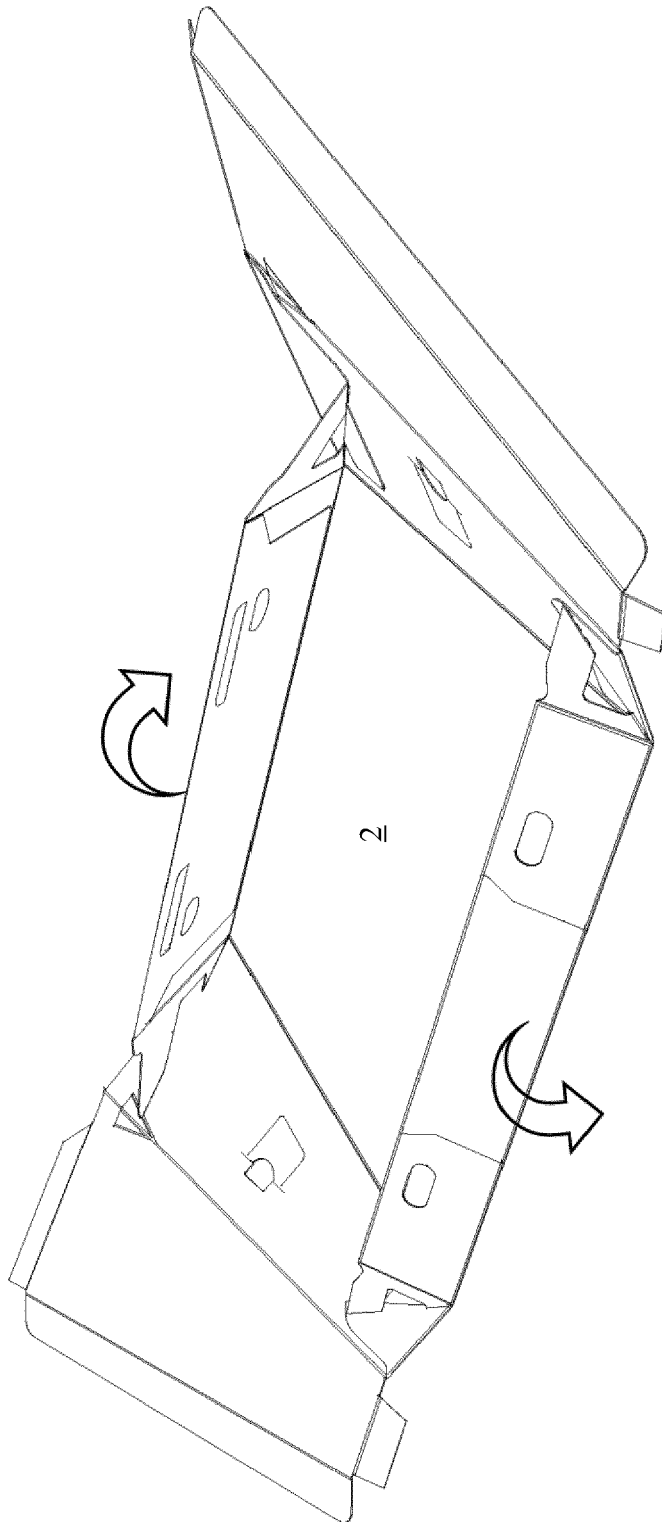


FIG. 6b

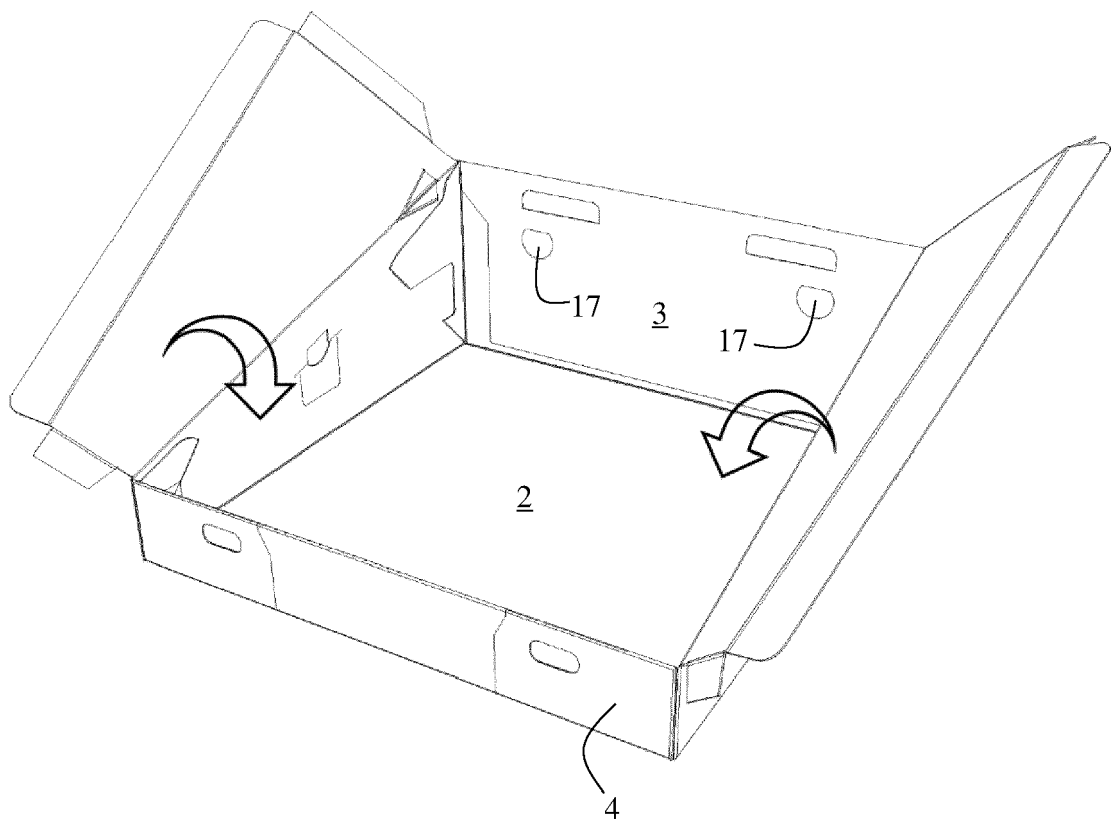


FIG. 6c

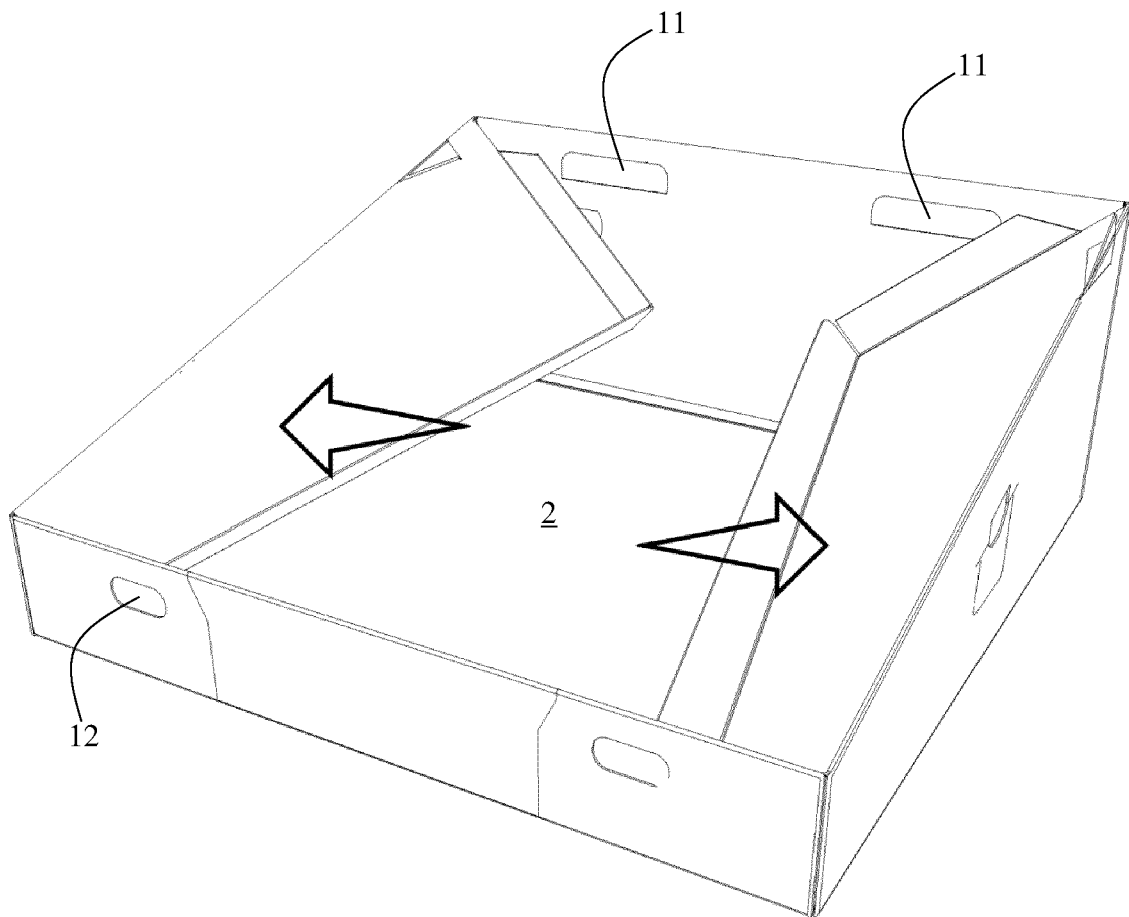


FIG. 6d

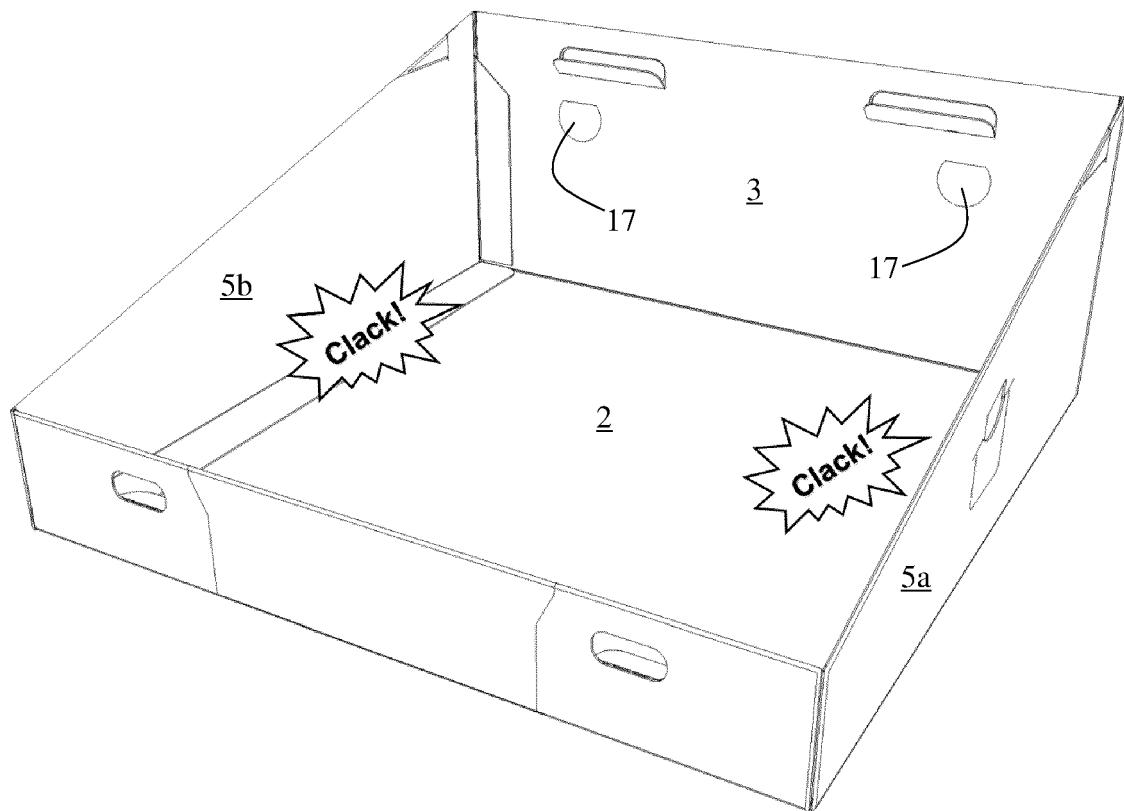


FIG. 6e

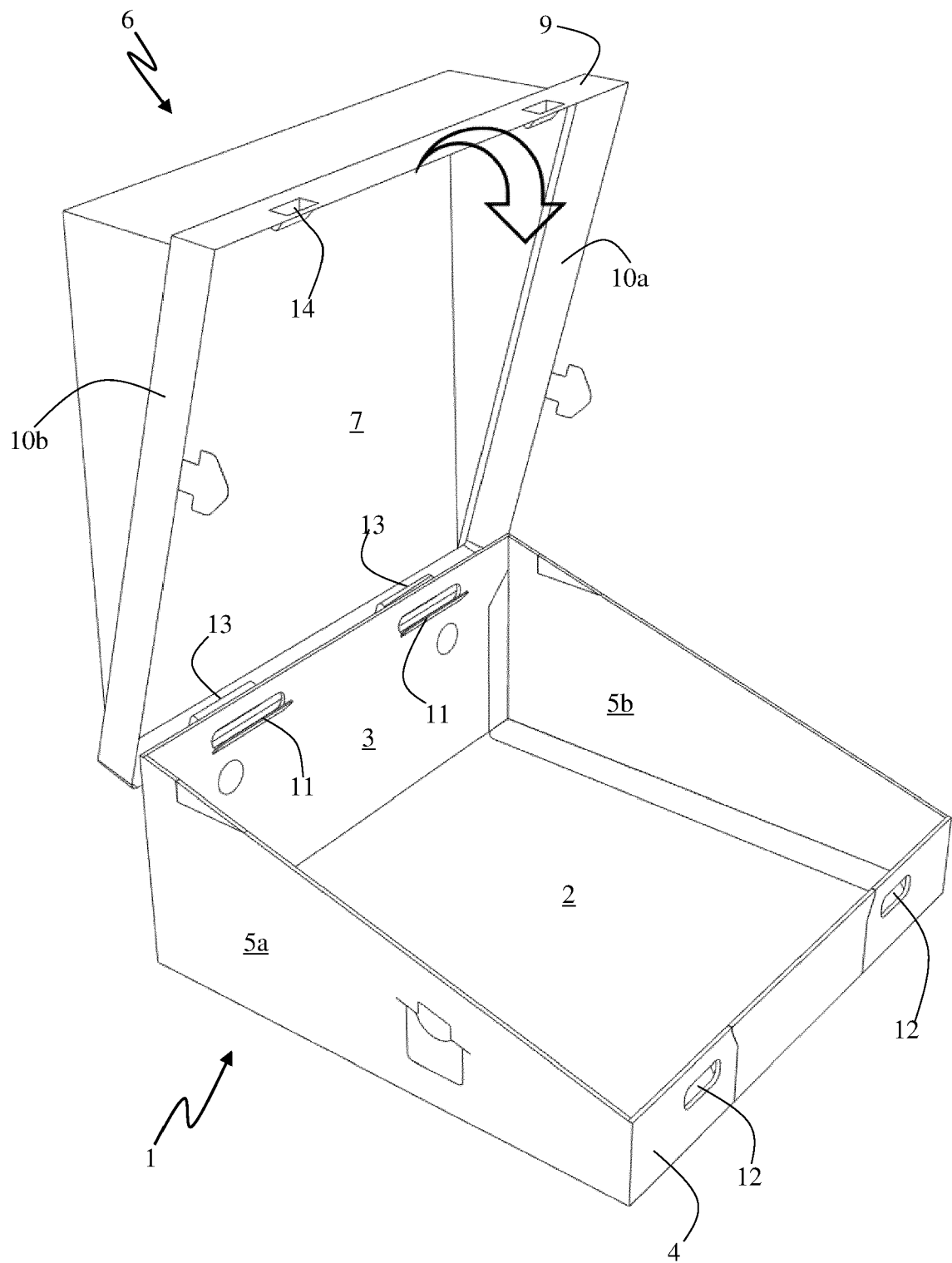


FIG. 7a

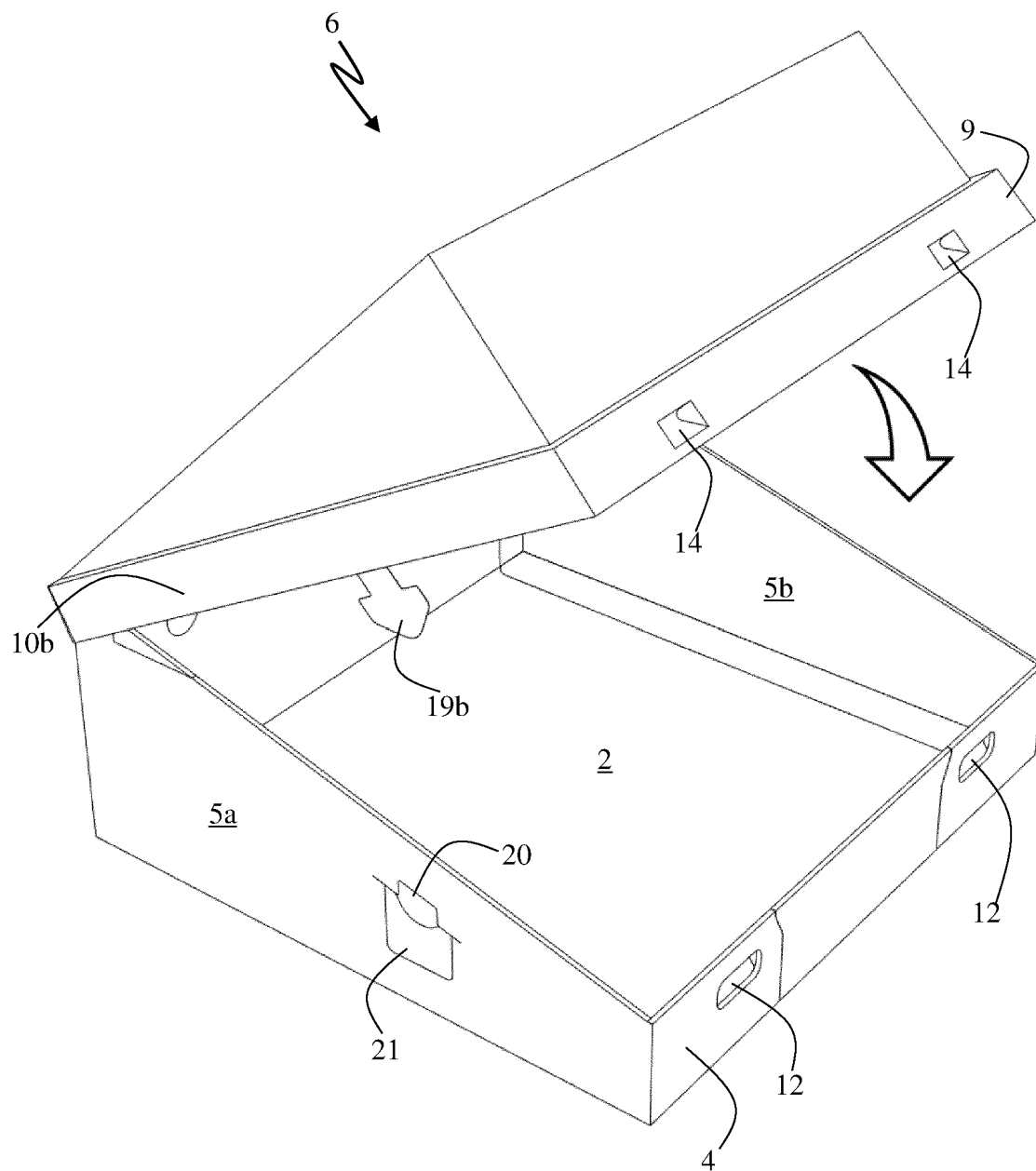


FIG. 7b

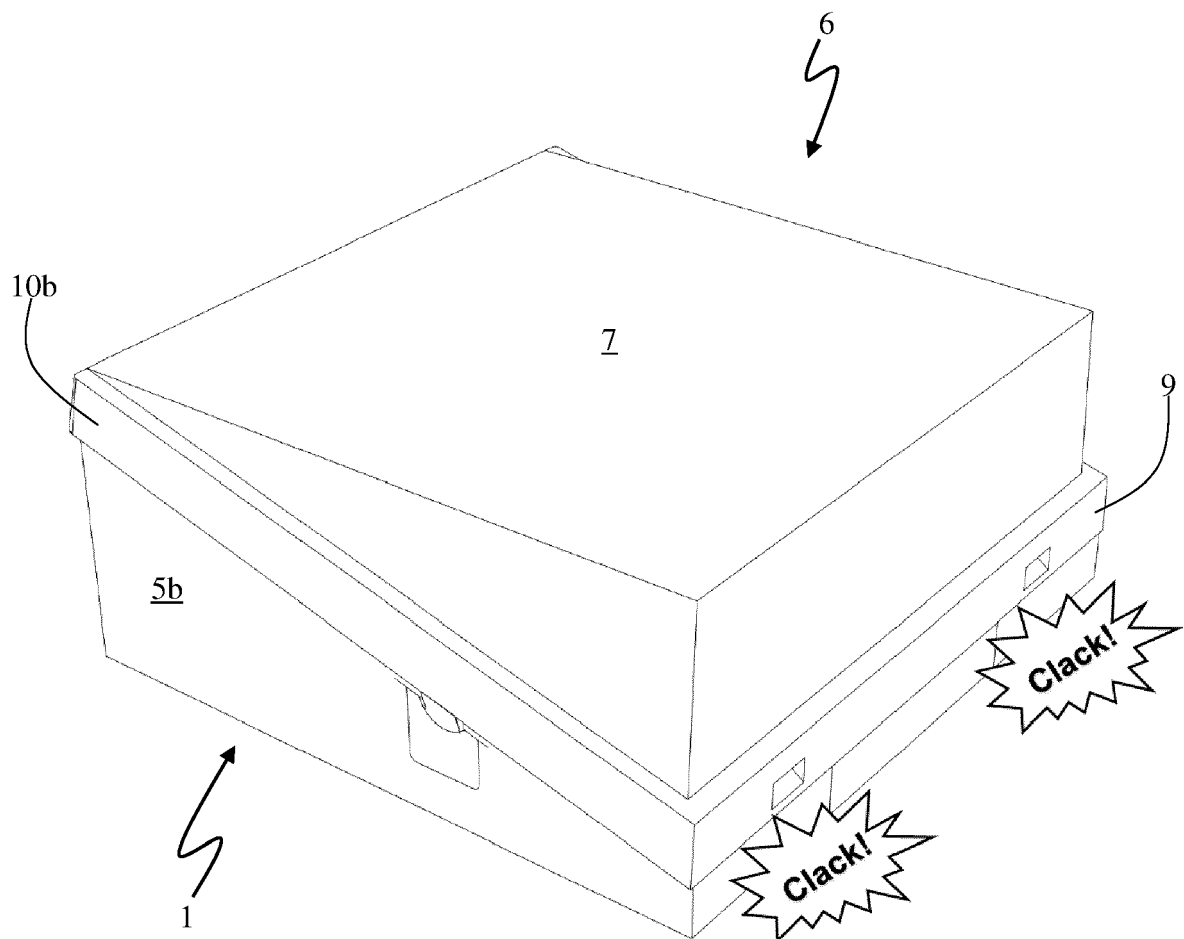


FIG. 7c

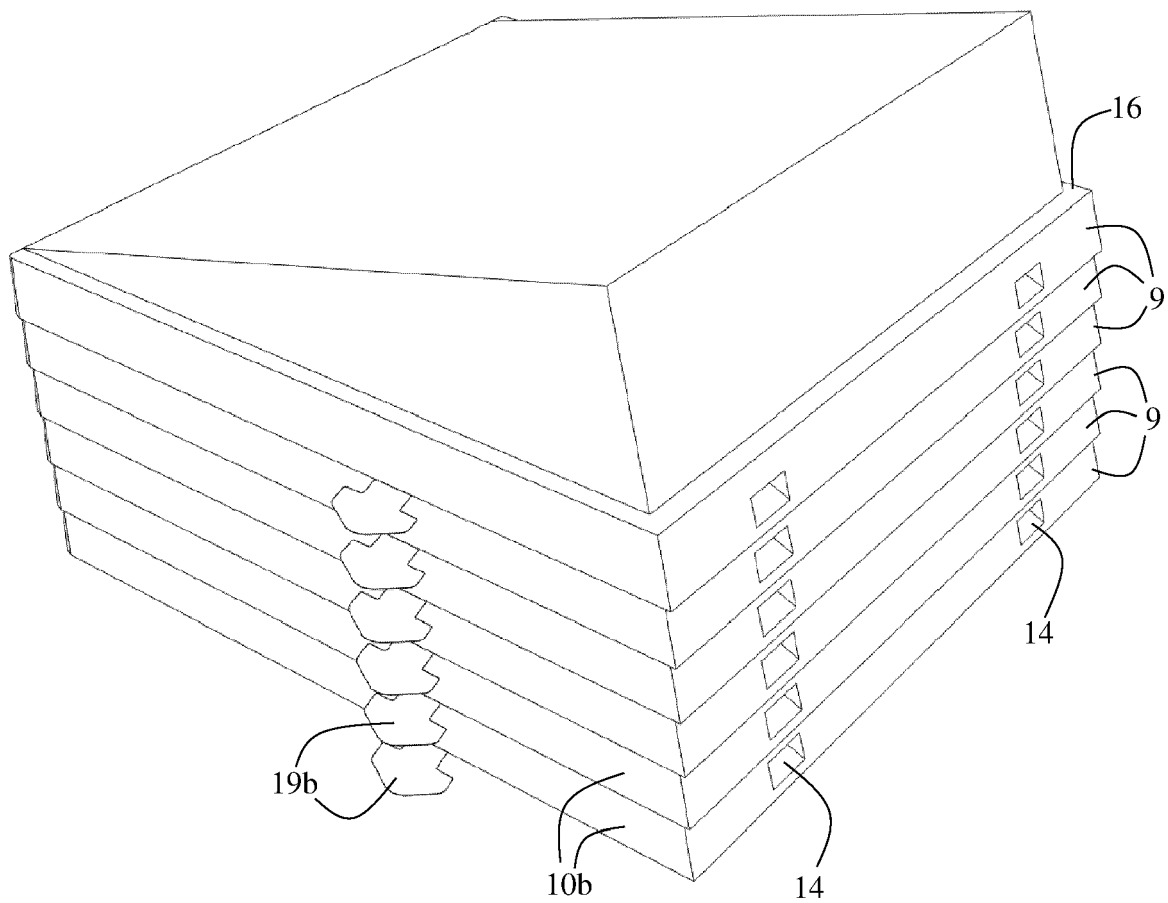


FIG. 8

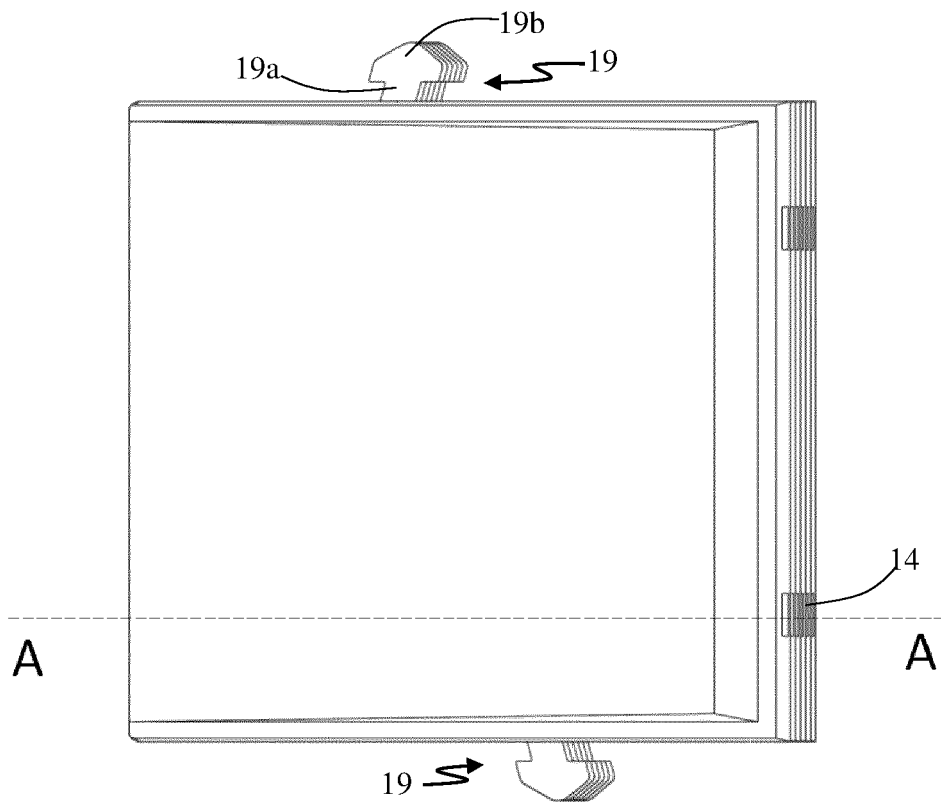
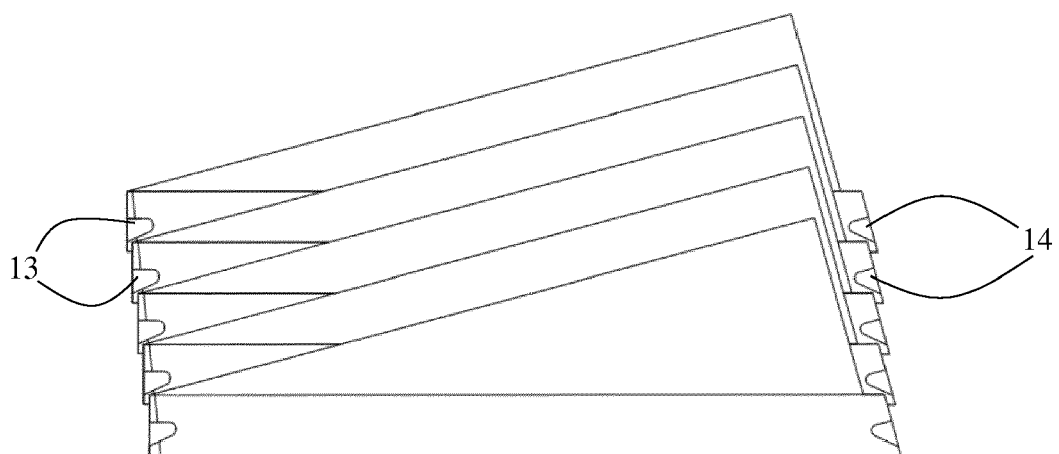


FIG. 9



SEZIONE A-A

FIG. 10

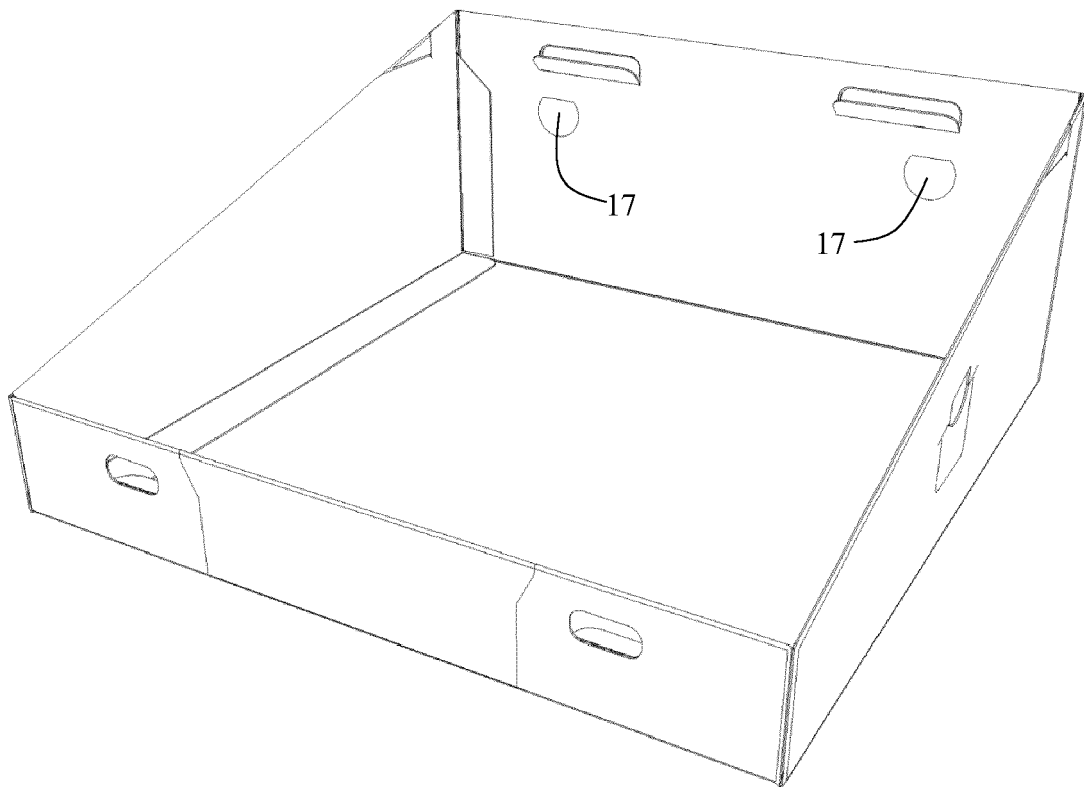


FIG. 11a

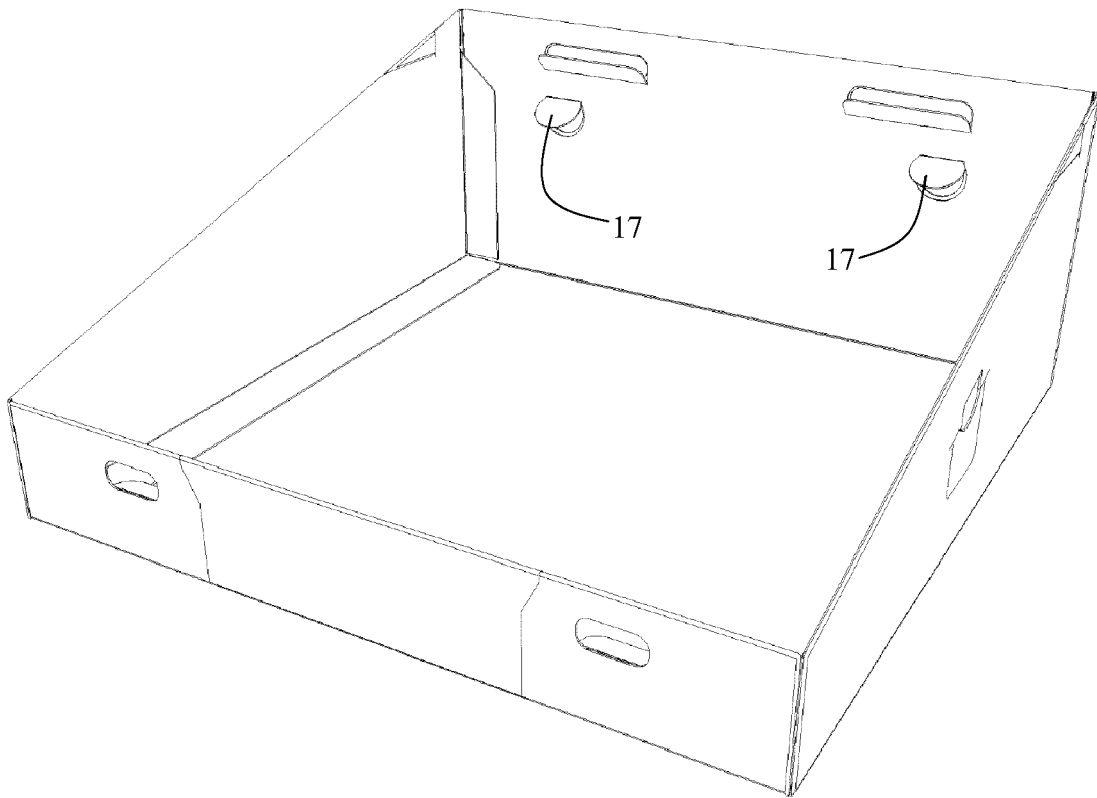


FIG. 11b

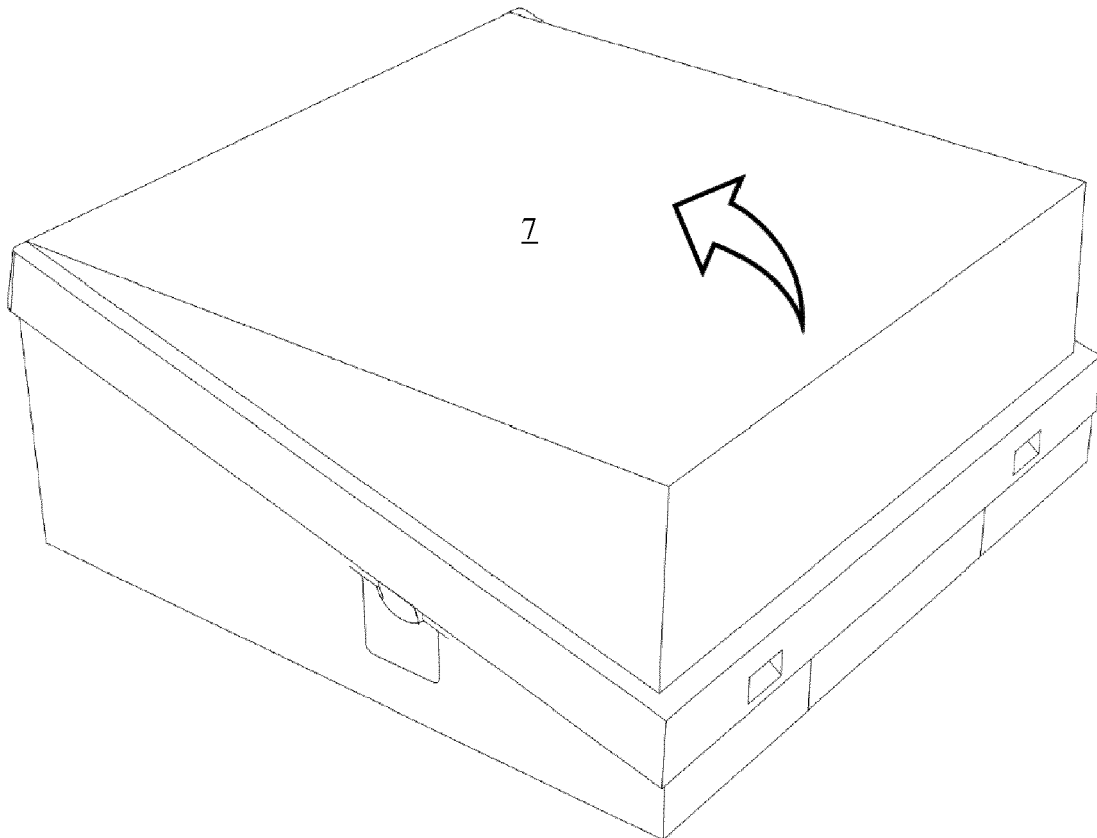


FIG. 12

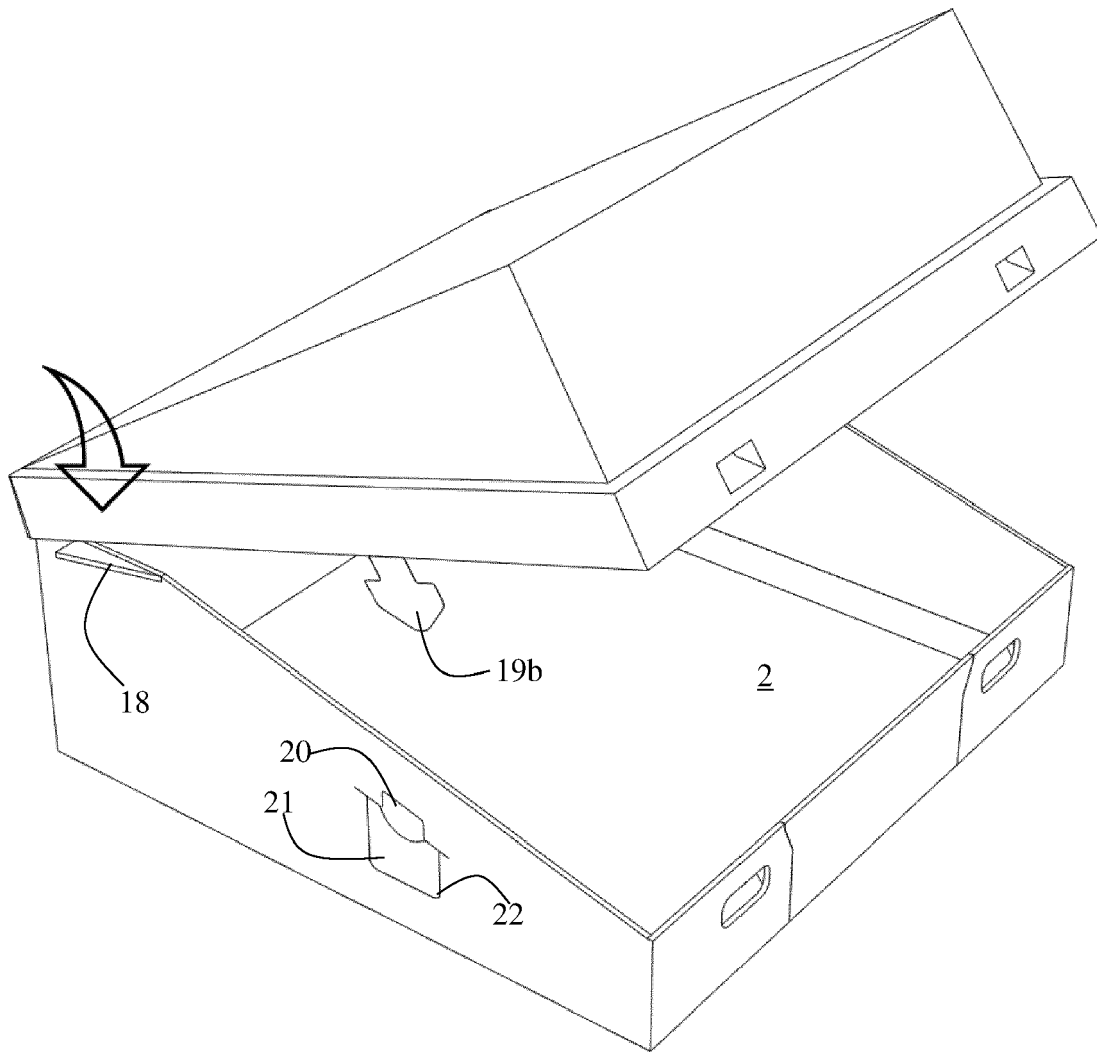


FIG. 12b

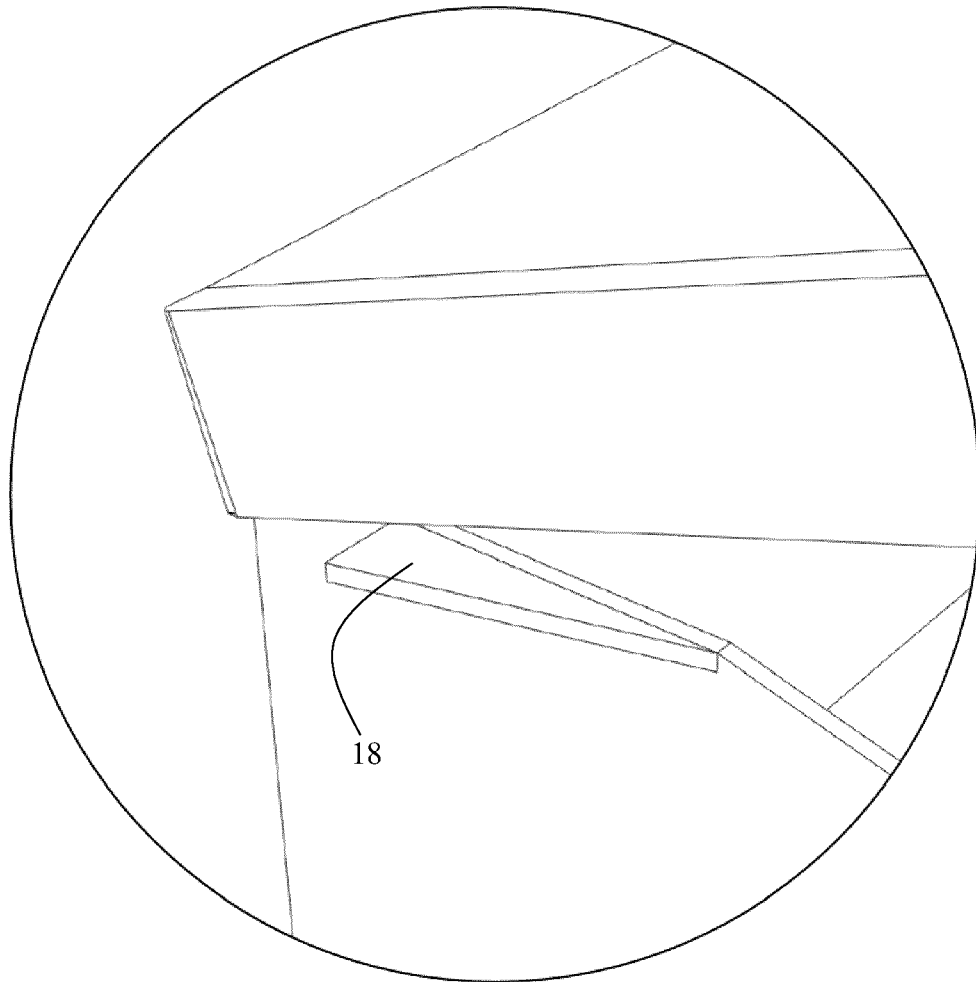


FIG. 12c

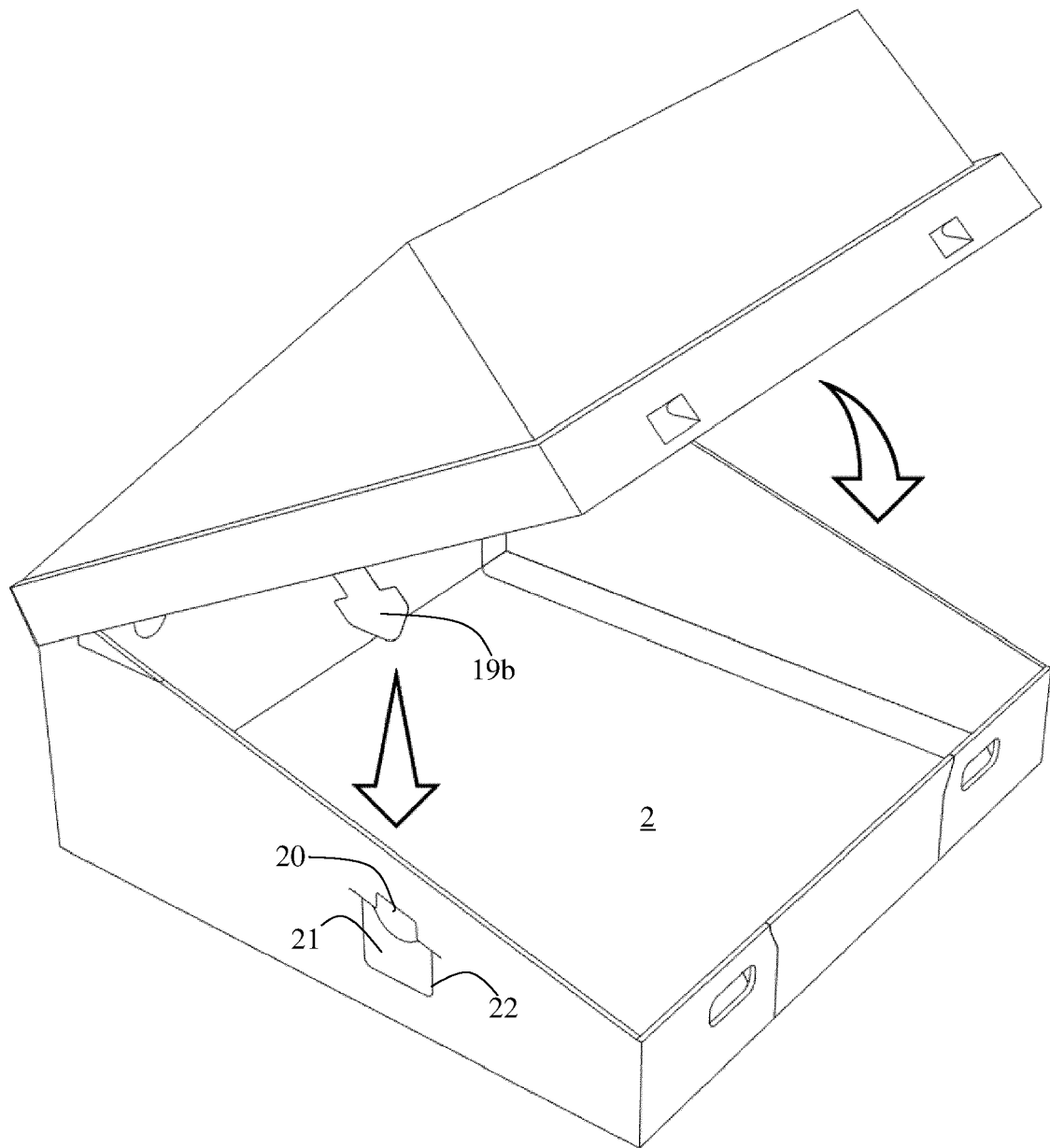


FIG. 13a

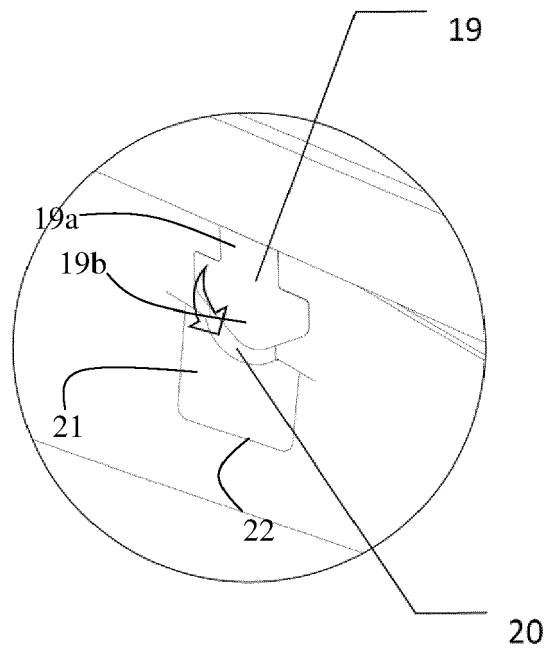


FIG. 13b-1

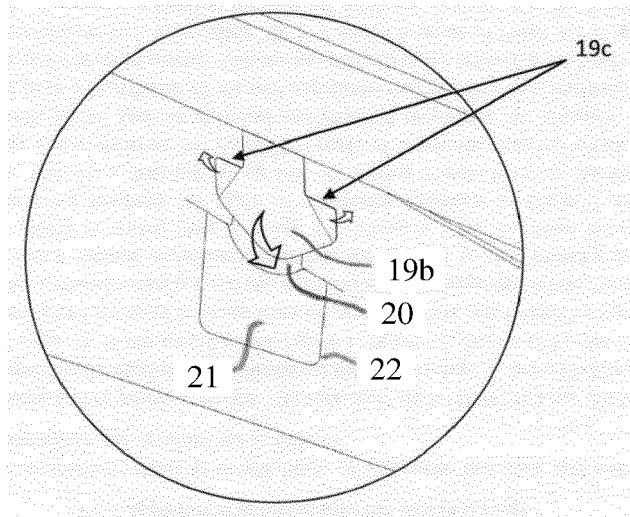


FIG. 13b-2

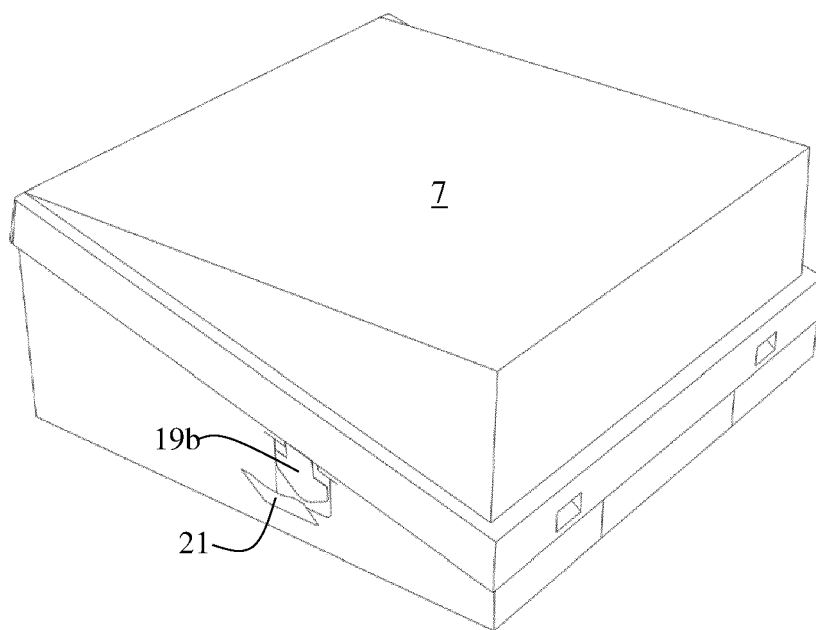


FIG. 13c

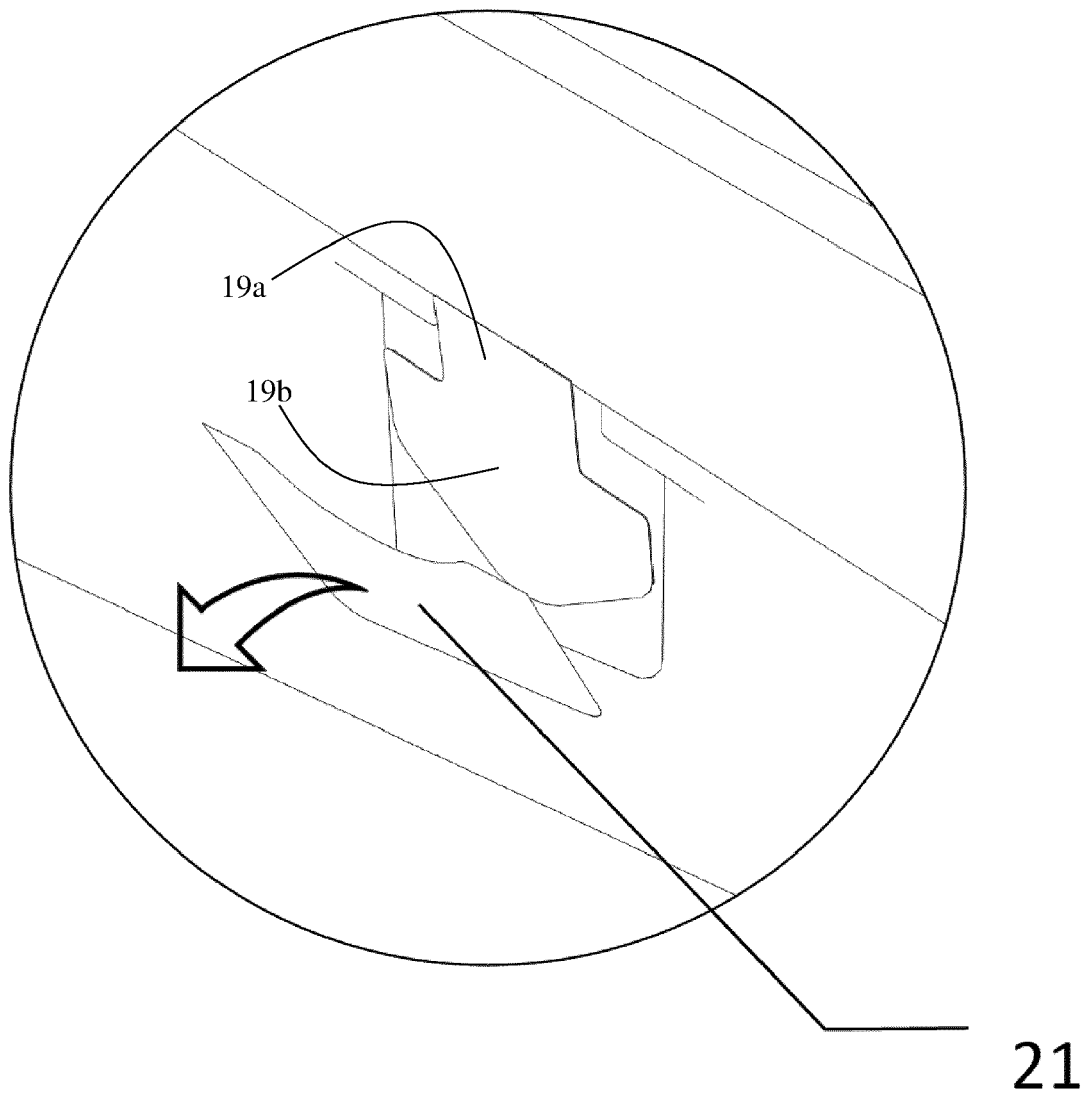


FIG. 13d

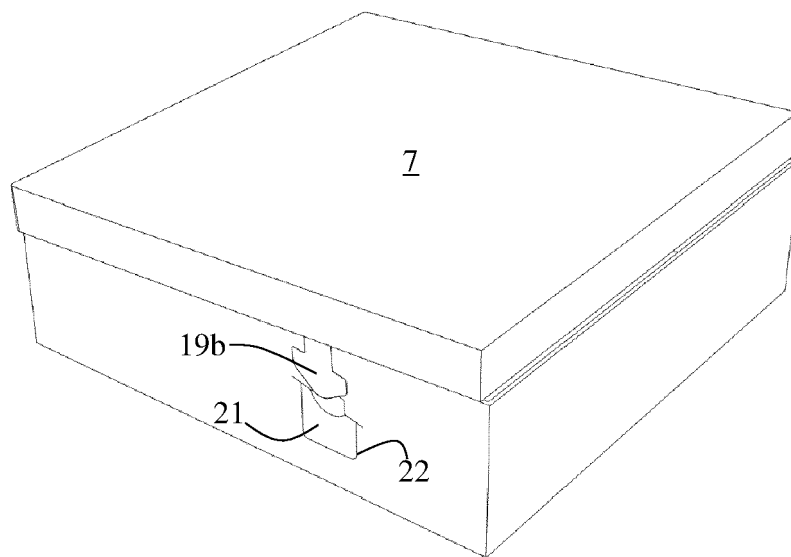


FIG. 14a

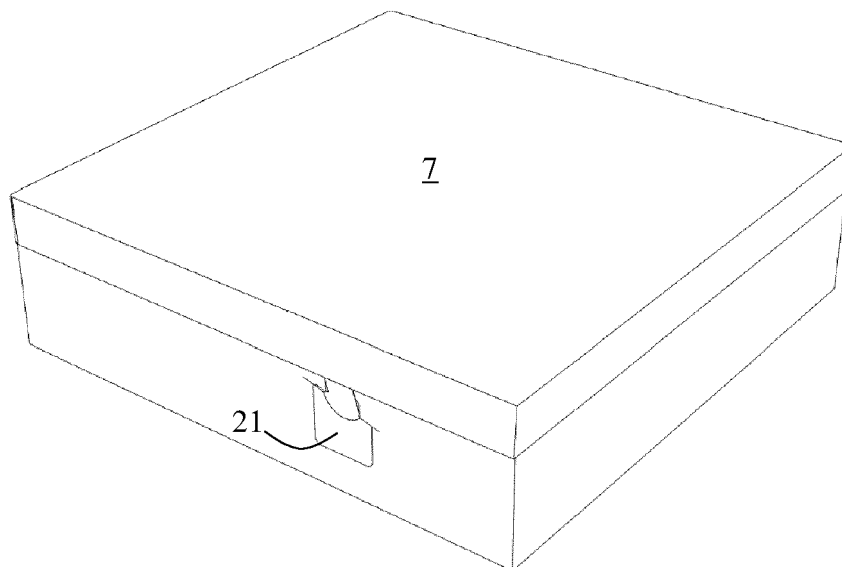


FIG. 14b



EUROPEAN SEARCH REPORT

Application Number

EP 21 19 1204

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2006/289551 A1 (VANHOUTTE GUY [BE]) 28 December 2006 (2006-12-28) * paragraphs [0025], [0045]; figures 1, 6, 10, 13 *	1-15	INV. B65D5/20 B65D5/24 B65D5/40 B65D5/42
A	EP 2 690 025 A1 (CARTOTECNICA ESSE BI S R L [IT]) 29 January 2014 (2014-01-29) * paragraphs [0025], [0070]; figures 4, 7 *	1-15	B65D5/68 B65D25/00 B65D43/02 B65D85/36 B65D5/66
A	US 3 985 289 A (PRINCE KENNETH E) 12 October 1976 (1976-10-12) * column 1, line 40 - line 46; figures 1, 2, 9 *	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
1 The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 2 December 2021	Examiner Sundell, Olli
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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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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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.
The members are as contained in the European Patent Office EDP file on
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02-12-2021

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	US 3985289 A	12-10-1976	NONE	
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82