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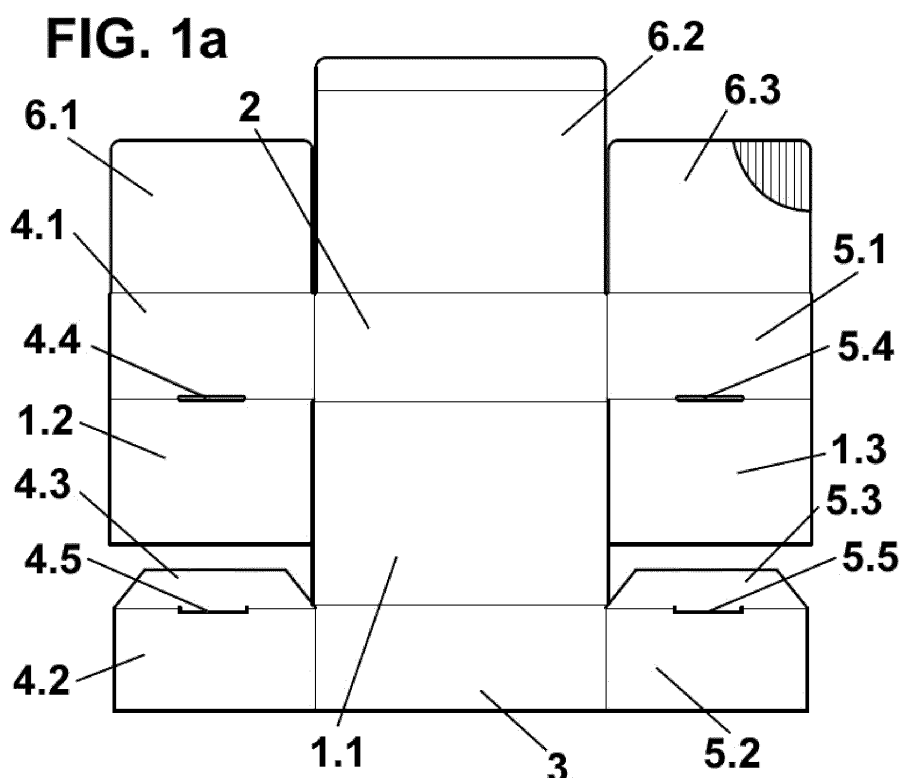
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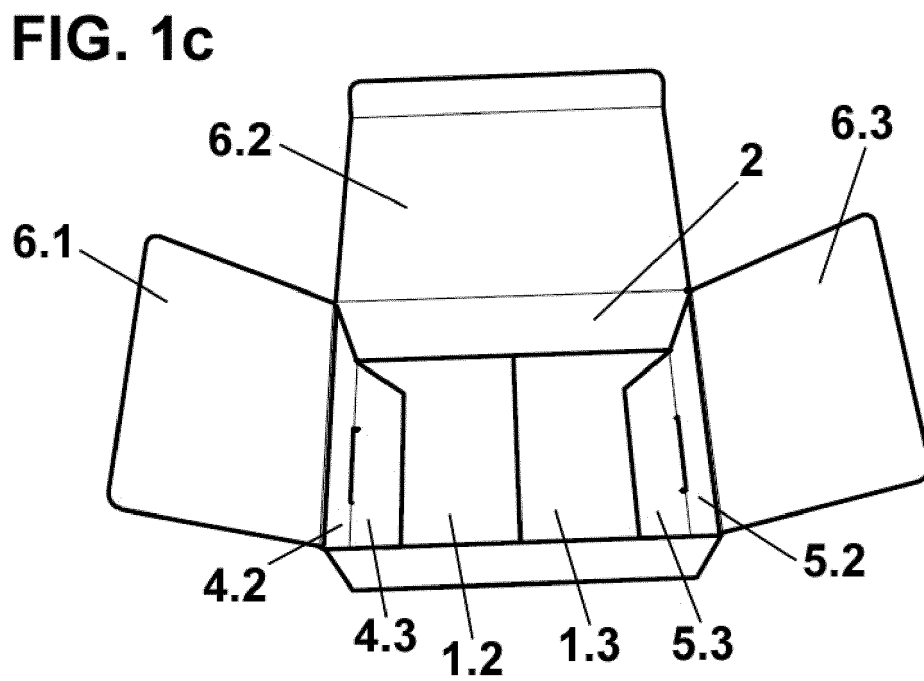
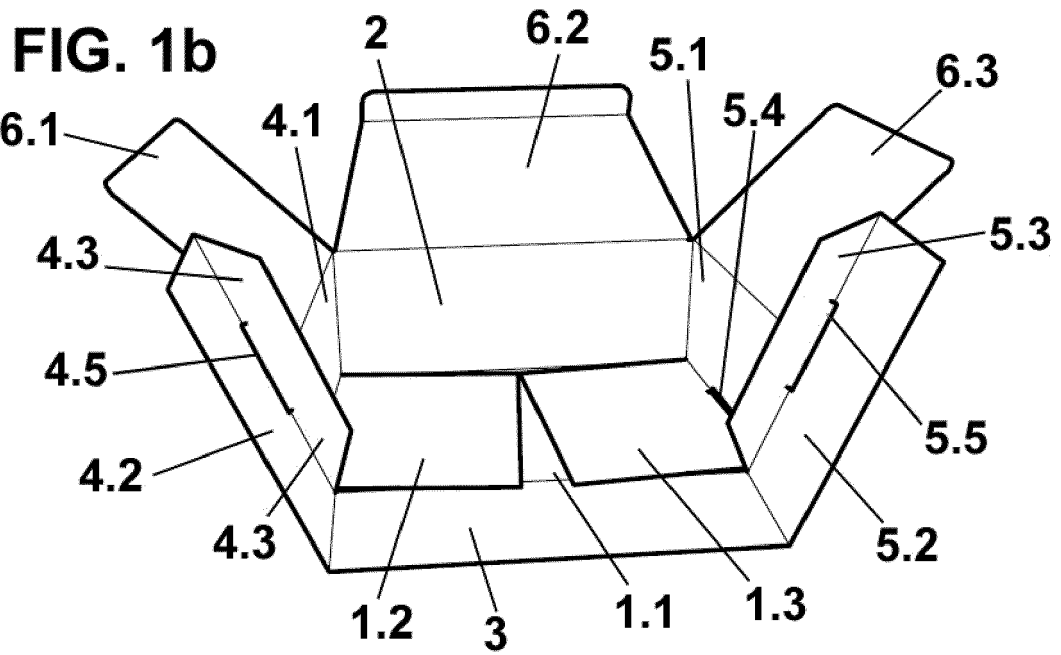
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(54) **SHIPPING BOX**

(57) The shipping box comprises a bottom structural flap (1.1) and a plurality of sidewall structural flaps (2, 3, 4.1, 4.2, 5.1, 5.2), of which at least two arise from the bottom structural flap (1.1), and assembly elements (4.4, 4.5, 5.4, 5.5) that assemble the box in a stable way, the box being foldable in a flat folded position, in which, from its upper part, in the use position, from at least three of the structural sidewall flaps (2, 3, 4.1, 4.2, 5.1, 5.2) arise at least three functional flaps (6.1, 6.2, 6.3, 6.4, 9, 13, 15) independent of each other, making the functional flaps the functions of lid, interior space reducer, fastening and/or handle, and that said assembly elements (4.4, 4.5, 5.4, 5.5) are located on the internal part of the box.





Description

[0001] The present invention relates to a shipping box, in particular to a box for shipping objects by mail.

Background of the invention

[0002] Postal boxes are known for shipping medium or reduced-sized objects, which are made from a single sheet of cardboard in which the bottom folds to form two or more sidewalls and a lid.

[0003] Usually these boxes are intended to be filled from the top. These boxes belong to or are variants of the boxes included in group 04 of the FEFCO catalog, which is the international code for corrugated cardboard boxes, and they are also known as folding boxes, most of which do not require any type of gluing for their assembly.

[0004] These boxes differ from box models in which the sides are all consecutively joined to each other and require a joint system at the ends.

[0005] In these boxes, the joining means is usually a flange that articulates along one of these ends and that is glued or stapled to the end of the other sidewall.

[0006] For boxes of reduced height that are the most used in postal shipments, the flange is logically shorter, and can be fragile and cause structural problems since when the box is broken or detached it loses its integrity. In some cases, this even makes it technically impossible to manufacture.

[0007] Sometimes these designs are used by changing the direction of use of the design, so that, considering the position of the box with respect to its position of use, four flaps arise from the bottom, from one of them another flap rises that is glued or stapled with the front flap, thus forming a ring.

[0008] The other two flaps that rises from the bottom close the ring on the sides, often forming lids from the end of which a short flap arises, which is inserted into the ring. These boxes are filled on one or both sides. Therefore, it is not possible for the four sides to remain perpendicular to the bottom during the filling.

[0009] When filled at the sides, they are less comfortable boxes both for filling and for extracting the product later.

[0010] Representative examples of the group 04 boxes of the FEFCO catalog, mentioned above, are box 427 and 470, as well as their variants. Both one and the other, as well as some of their variants, are characterized in that to remain assembled they require two flaps necessary to maintain the assembled box, which we will call structural flaps, of length basically equal to the height of the box, which rise respectively from the upper ends of the walls that are perpendicular to the wall from which the box lid arises, and that fold 180° on themselves, embracing one or more flaps that rise in turn from the adjacent walls.

[0011] These structural flaps are anchored by means

of some element, for example, a flange that is inserted into a hole conveniently located at the bottom of the box, thus generating a sidewall with a thickness of three times the thickness of the material.

[0012] This type of models, like many others, has some design restrictions when choosing the size of the box, especially related to the relationship between the different dimensions of length, width and height; we will call this from now on ratio problems.

[0013] In the case of these designs, specifically, it is not possible to generate boxes whose height is greater than their length, since this would prevent assembly since it is not possible to fold the structural flaps inwardly.

[0014] In most cases these models only incorporate a functional flap that acts precisely as a lid. Sometimes on its opposite side another functional flap arises, which often forms an internal accessory.

[0015] There are designs that need to be closed so that the box is fully assembled, so the filling is done on a box that is not yet fully conformed with the difficulties or discomfort that this may cause.

[0016] This is the case of model 426 and the like, in which a structural flap similar to that of the previously described models is used but located on the wall parallel to the face from which the lid arises.

[0017] By correctly folding this flap, a box is obtained in which only three of the walls are kept perpendicular to the bottom, since the wall from which the lid arises is not fixed when the lid is open to fill, so the box will not be assembled until we close the lid and with this all vertical walls are fixed.

[0018] Other designs of the enveloping type such as model 401 or similar articulate the walls of the box by means of slits that arise from the bottom in a similar way to some previously described models without resorting to any type of structural or anchor flap and therefore resulting in designs that they are not able to maintain the assembled box by themselves before closing it.

[0019] There are other designs that use external elements, such as staples or some type of gluing, so that they can be assembled before filling. In some cases, the result is a completely rigid box that once manufactured is directly assembled and therefore cannot be stored flat, folded, or extended.

[0020] Normally these boxes are linked to a manufacturing process in which they are glued or stapled when the product is already inside or if it is not, it will then be introduced within the same forming and filling process. In no case they are boxes designed to be manufactured and stored for later use because they take up too much space when assembled.

[0021] In other cases, the boxes have a design that allows them to be glued or stapled when folded, they are known as four- or six-point glue boxes. The manufacturing system of these boxes determines their design, so the sidewalls do not incorporate functional flaps.

[0022] Sometimes they incorporate very short structural flaps that serve to keep the box assembled before

filling. This is so because the gluing system for these folded boxes does not allow flaps long enough to be functional, for example, they could not serve as a lid or accessory.

[0023] By folding these structural flaps substantially at right angles, they keep the sidewall from which they arise straight, which would otherwise be bent by the diagonal slits that serve precisely to fold the box.

[0024] In addition, these box models have ratio problems, the maximum height that the box may have is limited by its width or length, depending on the variant of the box design.

[0025] There are also other designs that use anchoring systems between the flaps that arise from the sides. These systems, which tend to be more elaborate, fragile, or not very stable, usually involve flaps arising on one or some of the sides and fit into grooves located on their adjacent side.

[0026] Some versions locate this fit on the outside of the box, making it vulnerable to theft or accidental or unwanted opening. Other versions that locate the fit inside result in a structure incapable of keeping its four outer lateral faces in a rigid position and perpendicular to the bottom of the box.

[0027] Regardless of the assembly system, there are boxes in which three flaps joined together arise from their upper part to form a lid with a bellows at the junction between the flaps.

[0028] This design is a means to guarantee the inviolability of the contents of the box, in addition to providing it with a certain structural resistance, however, they are boxes that are difficult to fill since the lid cannot be articulated, allowing it to be fully opened.

[0029] The length of these flaps is also conditioned by ratio problems due to the bellows that make up the lid, so they cannot have a different function from that of the lid, so they could not be used as a divider, reducer of the internal space or as any accessory type.

Disclosure of the invention

[0030] Therefore, an objective of the present invention is to provide a shipping box comprising a series of flaps that allow performing other functions other than forming the box structure.

[0031] With the shipping box of the invention said disadvantages are solved, presenting other advantages that will be described below.

[0032] The shipping box according to the present invention is formed from a single sheet comprising:

- a structural bottom flap that forms a bottom and occupies the entire surface of the bottom; and
- a plurality of structural sidewall flaps forming at least four sidewalls of the box, of which at least two arise from the bottom structural flap, the sidewalls being positioned substantially perpendicular to the bottom in their position of use when the box is open, and

- assembly elements that assemble the box stably, the box being foldable in a flat folded position, wherein:

from its upper part, in the position of use, from at least three of the sidewall structural flaps, at least three independent functional flaps arise, the functional flaps performing the functions of lid, interior space reducer, fastening and/or handle, said assembly elements are located on the internal part of the box.

[0033] Advantageously, said sheet is of a corrugated material that defines a plurality of channels substantially parallel to each other, and the channels of the corrugated material in the sidewalls are substantially perpendicular to the bottom.

[0034] Said channels of the corrugated material are also advantageously perpendicular to the slits separating the structural flaps.

[0035] Furthermore, the box according to the present invention preferably comprises two additional bottom structural flaps that form a double thickness bottom, which arise from two sidewall structural flaps.

[0036] The box according to the present invention also preferably comprises two additional sidewall structural flaps forming two double thickness sidewalls, which arise from a sidewall structural flap.

[0037] According to one embodiment, from each of said two opposite additional sidewall structural flaps a bottom structural reinforcement flap arises, defining a projection between the additional sidewall structural flap and the bottom reinforcing structural flap, said projection being housed in a complementary slot.

[0038] Preferably, each additional bottom structural flap comprises a cavity for housing one of said bottom reinforcing structural flaps.

[0039] According to one embodiment, two of said functional flaps are functional lid flaps which, in their closed position, have their ends substantially in contact with each other or are totally or partially overlapped, one of the functional lid flaps comprising at least one sealing element and at least one tear strip when the functional cover flaps are totally or partially overlapped.

[0040] Preferably, two of said functional flaps are functional lid flaps that comprise at least one slot for engagement with each other.

[0041] According to one embodiment, at least one of said functional flaps is a functional space reduction flap, each of them comprising one or more slits that define secondary flaps from each functional space reduction flap.

[0042] According to one embodiment, at least one of said functional flaps is a functional fastening flap, and each functional fastening flap comprises at least one hole and slits.

[0043] According to one embodiment, at least one of

said functional flaps is a handle functional flap.

[0044] With the shipping box according to the present invention, as from the top, in its position of use, at least three of its structural sidewall flaps give rise to at least three functional flaps independent of each other, which can be as long as desired, these can be used for functions not related with the assembly of the box.

[0045] Therefore, these flaps are functional and can perform the function of lid, reducer of the interior space, reinforcement and/or fastening.

Brief description of the drawings

[0046] For better understanding of what has been disclosed, some drawings in which, schematically and only by way of a non-limiting example, a practical case of embodiment is shown.

Figure 1 a is a plan view of an unfolded sheet that forms the shipping box of the present invention according to a first embodiment;

Figure 1b is a perspective view of the shipping box of the invention according to the first embodiment during its assembly process;

Figure 1c is a perspective view of the shipping box of the invention according to the first embodiment in its assembled position;

Figure 2a is a plan view of an unfolded sheet that forms the shipping box of the present invention according to a second embodiment;

Figure 2b is a perspective view of the shipping box of the invention according to the second embodiment during its assembly process;

Figure 2c is a perspective view of the shipping box of the invention according to the second embodiment in its assembled position;

Figures 3 and 4 are perspective views showing two variants of the lid of the shipping box according to the first and second embodiments;

Figure 5a is a plan view of an unfolded sheet that forms the shipping box of the present invention according to a third embodiment;

Figure 5b is a perspective view of the shipping box of the invention according to the third embodiment during its assembly process;

Figure 5c is a perspective view of the shipping box of the invention according to the third embodiment in its assembled position;

Figure 6a is a plan view of an unfolded sheet that forms the shipping box of the present invention according to a fourth embodiment;

Figure 6b is a perspective view of the shipping box of the invention according to the fourth embodiment during its assembly process;

Figure 6c is a perspective view of the shipping box of the invention according to the fourth embodiment in its assembled position;

Figures 7a and 7b are perspective views of a variant of the fourth embodiment of the box according to the present invention;

Figure 8a is a plan view of an unfolded sheet that forms the shipping box of the present invention according to a fifth embodiment;

Figure 8b is a perspective view of the shipping box of the invention according to the fifth embodiment during its assembly process;

Figure 8c is a perspective view of the shipping box of the invention according to the fifth embodiment in its assembled position;

Figures 9a and 9b are perspective views of the fifth embodiment of the box according to the present invention, with different closure options;

Figure 10 is a perspective view of a variant of the lid of the shipping box according to the present invention, applicable to the above embodiments;

Figure 11a is a plan view of an unfolded sheet that forms the shipping box of the present invention according to a sixth embodiment;

Figure 11b is a perspective view of the shipping box of the invention according to the sixth embodiment during its assembly process;

Figure 11c is a perspective view of the shipping box of the invention according to the sixth embodiment in its assembled position;

Figure 12a is a plan view of an unfolded sheet that forms the shipping box of the present invention according to a seventh embodiment;

Figures 12b to 12f is a perspective view of the shipping box of the invention according to the seventh embodiment during its assembly process;

Figure 13a is a plan view of an unfolded sheet that forms the shipping box of the present invention ac-

cording to an eighth embodiment; and

Figures 13b to 13e is a perspective view of the shipping box of the invention according to the eighth embodiment during its assembly process.

Description of preferred embodiments

[0047] First, in the present description and in the appended claims, the following terms should be interpreted as follows:

An "assembled box" is understood to mean that its sidewalls remain rigid and substantially perpendicular to the bottom without the help of external elements.

"Stiffness" is understood to mean that a wall does not tend to bend due to any slit contained in it or that delimits it.

"Flap" is understood to be the section of material pertaining to the development of the box that is completely delimited by lines, whether cut or slit.

"Structural flap" is understood to be those flaps that form the structure of the box, that is, that form the bottom and the sidewalls of the box, or that are necessary to keep the box assembled.

By "functional flap" is meant those flaps that perform some additional function other than forming the box structure, such as, for example, a lid function, a space reduction function, a fastening function, and/or a handle function.

[0048] Furthermore, in the embodiments described below, identical, or similar elements in the different embodiments are described by the same term and indicated by the same reference number for the sake of simplicity.

[0049] The shipping box according to the present invention is preferably formed from a single sheet of corrugated material, said corrugated material defining a plurality of channels parallel to each other.

[0050] This box includes the following structural flaps:

- A first structural bottom flap 1.1 that defines the bottom of the box;
- A second and third additional bottom structural flaps 1.2 and 1.3, which form a double thickness bottom;
- A fourth and fifth structural bottom reinforcement flaps 4.3 and 5.3;
- A plurality of sidewall structural flaps 2, 3, 4.1, 4.2, 5.1 and 5.2 that structurally define the four sidewalls.

[0051] In addition, the box also includes functional flaps, i.e. that unlike what we will call structural flaps, they are not necessary for the assembly of the box, independ-

ent of each other, which arise from the upper part of at least three of its sidewalls and they can be as long as required without being limited by the development of the unfolded box or by the articulation of the box when it is mounted, thanks to what they can perform as a lid function, the function of reducing the interior space, the clamping function, for example, to assist in clamping an object contained in the box, or the handle function.

[0052] The result will be a box that can be stored flat on already finished. We consider the box finished when a user is able to assemble it for filling without the need to use additional elements such as staples or glue.

[0053] We understand by assembled box that its four sidewalls remain rigid, which means that the walls do not tend to bend due to any slit contained in them or that delimits them, and perpendicular to the bottom even when the lid is ready to be filled. All this without the need for any external element to hold it. In addition, the flaps or any other elements that are involved in the box assembly will be protected inside once it is closed for shipment to avoid accidental or unwanted openings.

[0054] In the embodiments shown in Figures 1a to 1c and 2a to 2c, two of the sidewall structural flaps 2, 3, parallel to each other, arise from the bottom structural flap 1.1.

[0055] Other structural sidewall flaps 4.1, 5.1, 4.2 and 5.2 arise from the two structural sidewall flaps 2, 3. Of these, two sidewall structural flaps 4.1 and 5.1 serve as external sidewalls and the external walls comprise the two additional sidewall structural flaps 4.2 and 5.2 placed therein. This way, these two sidewalls parallel to each other will be formed by a double cardboard layer.

[0056] In addition, from the additional sidewall flaps 4.2 and 5.2 arise the structural bottom reinforcement flaps 4.3 and 5.3 from their lower part in the position of use.

[0057] These structural bottom reinforcement flaps 4.3 and 5.3 are attached by attaching to two additional structural bottom flaps 1.2 and 1.3 and which in turn arise from the sidewall structural flaps 4.1 and 5.1.

[0058] They do this by means of slots 4.4 and 5.4 located in a slit that acts as a hinge between the additional structural bottom flaps 1.2 and 1.3 in which protrusions 4.5 and 5.5 are housed incorporated between the structural bottom reinforcement flaps 4.3 and 5.3.

[0059] This assembly system, unlike others, allows to create a box without ratio restrictions, i.e., structurally there are no restrictions regarding the measures with which the box can be created.

[0060] The box lid, in the embodiment shown in Figures 1a to 1c, is formed by three separate functional lid flaps 6.1, 6.2 and 6.3 that arise from three of the ends of the box sidewall structural flaps.

[0061] In addition, this system allows us to store the self-assembling box fully finished flat. By self-assembling we mean that a user can assemble it for filling without having to use external elements such as glue or staples, that is, they do not need any type of gluing or staples for

assembly, such as most of the boxes in the group 04 of the FEFCO catalog.

[0062] Also in this embodiment, as in successive ones, the channel direction of the corrugated material is preferably perpendicular to the bottom for all the sidewalls, preventing them from being easily crushed in the very probable case that it has to bear weight when stacking other boxes on it.

[0063] Said arrangement of the channels of the material is perpendicular to the slits that separate the functional flaps from the structural sidewall flaps, thereby achieving a precise folding of the functional flaps.

[0064] In another embodiment, shown in Figures 2a to 2c, the box comprises an additional functional lid flap 6.4. This way, a functional flap arises from each of the sidewalls of the box on its upper part, in its position of use.

[0065] The advantage of having these four functional flaps each linked to the structural flaps on the sidewalls of the box is that they provide structural resistance and against possible attempts to steal the contents of the box, since the sidewalls and the lid are thus physically joined, always maintaining the continuity of the material between them without leaving any slits.

[0066] In this described embodiment, the box has at least a double thickness of cardboard both on the bottom and on the lid and on two of its sidewalls, giving extra protection to the content.

[0067] As for the lid closure system, in this embodiment, as in embodiment 1, at least one of the functional lid flaps that arise from the sidewalls will be the outer one at the time of shipping the box.

[0068] Another variant is shown in figure 3, in which the functional lid flaps 6.1 and 6.3 are internal and the functional lid flaps 6.2 and 6.4 are external. In this case the sealing system could be an external element, such as, for example, an adhesive tape or glue.

[0069] In another variant shown in figure 4, at least one of the outer functional lid flaps 6.4 at the time the box is shipped may incorporate at least one sealing element 7.1 to close the box for shipping and or one or more tear strips 8.1 allowing easy opening of the previously sealed box without the need for any sharp object.

[0070] Said external functional lid flap or flaps 6.4 may carry a second sealing element 7.2 that would allow the recipient of the shipped box to make a second shipment, for example, to return the product.

[0071] In another embodiment shown in figures 5a to 5c, from each of the additional sidewall structural flaps 4.2 and 5.2 a structural bottom reinforcing flap 4.3 and 5.3 arises from its lower part in use position, which does not cover the entire extension of the side of the box, being able to be located, for example, in its central area.

[0072] These reduced length structural bottom reinforcement flaps 4.3 and 5.3 are engaged to the two additional structural bottom flaps 1.2 and 1.3.

[0073] They do this by housing in cavities 1.4 and 1.5 located in the additional bottom flaps 1.2 and 1.3 and by means of projections 4.5 and 5.5 of the structural bottom

reinforcement flaps 4.3 and 5.3 that are housed in grooves 1.4 and 1.5 of similar dimensions located in the hinge slit between the additional structural bottom flaps 1.2 and 1.3 and the structural wall flaps 4.1 and 5.1.

[0074] This allows, in addition to a firm and stable fixation, to form a smoother bottom for the box than in previous configurations, since all the flaps that arise from the lower part of the sidewalls remain coplanar. This is an advantage when the content is a set of products, for example, a series of bottles, which benefit from a smooth bottom so that they are more stable and leveled.

[0075] Another embodiment is shown in figures 6a to 6c, which is a box similar to the one previously described. The main difference is that it comprises functional reduction flaps 9.

[0076] These functional reduction flaps 9 comprise slits 9.1, 9.2, preferably parallel to the slit that hinges each functional reduction flap, which in turn is preferably perpendicular to the direction of the corrugated material channel.

[0077] In the embodiment shown, a first slit 9.1 from the slit that hinges the functional reduction flap creates a first secondary flap 9.3 of length equal to the width to be reduced, a next slit 9.2 is arranged leaving a second secondary flap 9.4 equal or very close to the interior height of the box and a third secondary flap 9.5 at the end equal to or very close to the space left with the first slit 9.1.

[0078] This way, folding each slit at 90 degrees forms a closed and fixed compartment inside the box, allowing the space to be adapted to the objects we want to package.

[0079] Unlike other systems on the market that allow adjusting the dimensions of the box, this system does not alter or break any element of the original development, so we can always recover the starting structure.

[0080] In addition to reducing the interior of the box, this reducing accessory or a variant thereof can be used to separate the space into two or more parts. Also, in more complex versions of this structure, more slits can be added that, specifically arranged, would allow us to make a variable regulation of the structure.

[0081] In an alternative embodiment shown in figures 7a and 7b, starting from the embodiment described above in relation to figures 6a to 6c, slits 9.6 and 9.7 can be added in the middle of the first and third sections 9.3 and 9.5, in which a functional reduction flap would be divided.

[0082] If we fold these slits 9.6, 9.7 outwardly, keeping the first slits folded inwardly, we achieve an accordion-shaped structure that allows us to create a variable and adjustable space-reducing accessory. Through this element we will be able to secure the content, in addition to reducing the space in a totally flexible way.

[0083] This reducing accessory created from a functional reduction flap can also be created in its opposite reduction functional flap for greater variability in the interior space of the box, since in any case its use is optional.

[0084] Other slots, cuts, gaps, or flanges can be incorporated into one or more functional flaps to contribute to different functionalities of the box.

[0085] In the embodiment shown in figures 8a to 8c, two or more functional lid flaps 6.2 and 6.4, which are located below the functional lid flaps 6.1 and 6.3 at the time of shipment, may incorporate any coupling element that allows link them together.

[0086] For this purpose, said pair of flaps comprise at least one slot 10 that gives rise to at least two flanges 11.1 and 11.2 that, in use position, are overlapped with each other.

[0087] To facilitate this function, one of the flanges can be longer than the other. Said at least one slot 10 is preferably parallel to the corrugated cardboard channel that forms the box.

[0088] The incorporation of these grooves 10 and their use at the time of shipment supposes an extra structural reinforcement since it avoids that the opposite sidewalls from which these structural flaps 4.1 and 5.1 arise can collapse when crushed.

[0089] Furthermore, advantageously, these functional lid flaps 6.2 and 6.4 internal at the time of shipment (Figure 9a) can become external flaps at other times in the life of the box, such as, for example, during previous and subsequent storage, shown in Figure 9b.

[0090] This way, being engageable, they would allow us to keep the box temporarily closed.

[0091] This can be useful both for the person who receives the box, who can use it to store the product temporarily, and for the person who sends it, who could access the content and provisionally close the box as many times as required during the filling process of the box.

[0092] Other types of flanges could also be incorporated. In the embodiment shown in Figure 10, in cases where only two or one of the flaps that arise from the sidewalls serve as a cover, this could negatively affect the security of the box. To fix this, one or more additional flanges 12 could emerge from the at least one outer flap at the time of shipment.

[0093] If necessary, according to the embodiment of the box shown in figures 11a to 11c, this box comprises more than four functional flaps, each of which arises from a different sidewall structural flap, which protrude from the top of the box, in its position of use. This provides the advantage of being able to use, for example, four of them as a lid 6.1, 6.2, 6.3 and 6.4 and the remaining ones 9, for example, as reducing, separating structures or as preferred.

[0094] In another preferred embodiment, optional functional flaps may arise from the bottom of the sidewall, specifically from the additional bottom structural flaps 1.2 and 1.3. These flaps incorporate at least one slit preferably perpendicular with respect to the direction of the flap that allows it to be folded up and used as a divider or, by means of a series of cuts and slits, to adapt it to specific needs.

[0095] This is the case of the embodiment shown in

figures 12a to 12f, in which functional fastening flaps 13 and 14 form an accessory for fastening bottles. The functional fastening flaps 13 arise from the flaps 4.2 and 5.2 and the functional fastening flaps 14 arise from the flaps 1.2 and 1.3.

[0096] These functional fastening flaps 13 and 14 comprise holes 16 to house a part of the bottles and slits 17 to suitably fold them to form the fastening accessory.

[0097] As can be seen in figure 12f, once the box according to this embodiment has been formed, it can be placed inside a larger box, and to facilitate its removal, the box according to the present invention may be provided with functional handle flaps 15.

[0098] A similar embodiment shown in figure 13 also incorporates up to four functional flaps 6.1, 6.2, 6.3 and 6.4, thus allowing the box to be closed at the top.

[0099] In this last embodiment, the box comprises eight functional flaps not necessary for assembling the box, four of which serve as lids and the other four as fasteners.

[0100] Although reference has been made to specific embodiments of the invention, it is apparent to a person skilled in the art that the described shipping box is susceptible of numerous variations and modifications, and that all the details mentioned can be replaced by other technically equivalents, without departing from the scope of protection defined by the appended claims.

Claims

1. Shipping box, which is formed from a single sheet comprising:

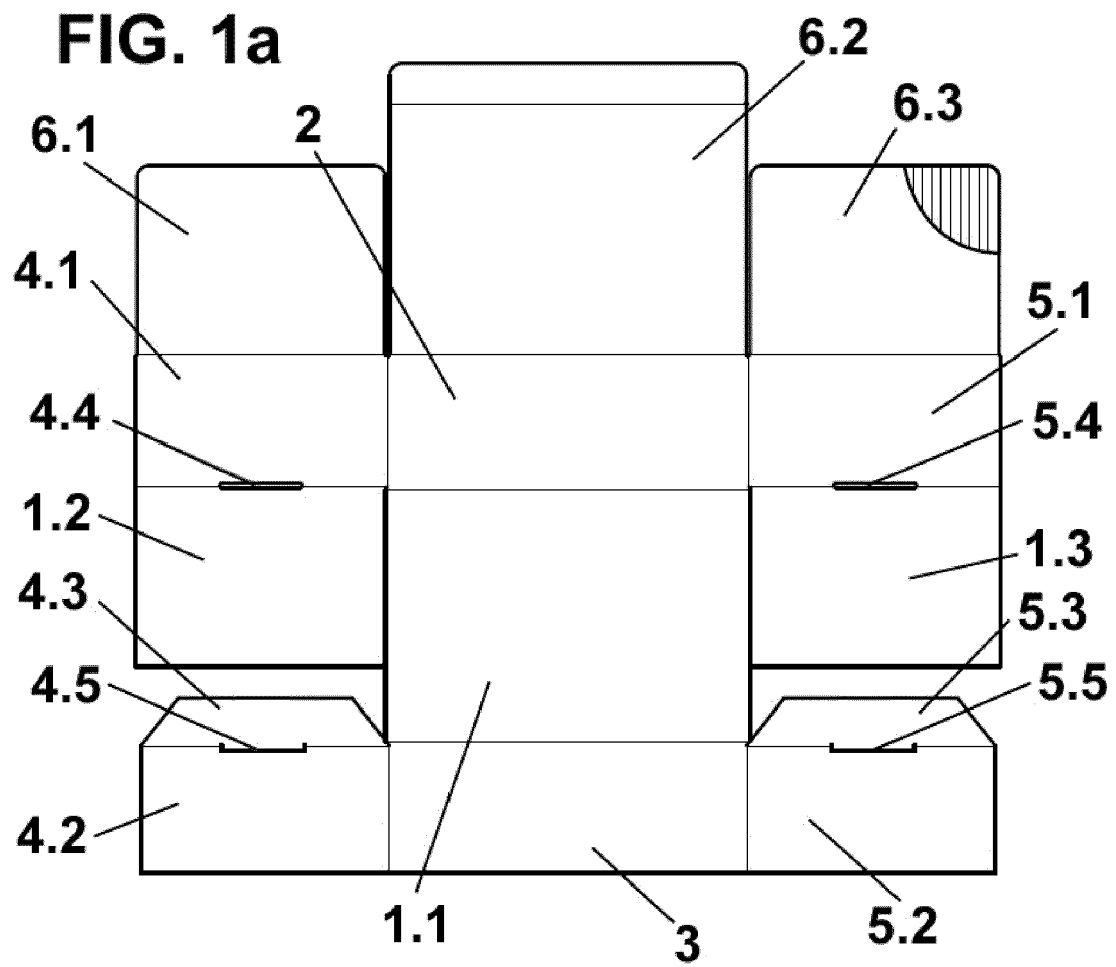
- a structural bottom flap (1.1) that forms a bottom and occupies substantially the entire surface of the bottom; and
- a plurality of structural sidewall flaps (2, 3, 4.1, 4.2, 5.1, 5.2) that form at least four sidewalls of the box, of which at least two arise from the bottom structural flap (1.1), all the sidewalls being positioned substantially perpendicular to the bottom in their position of use when the box is open, and
- assembly elements (4.4, 4.5, 5.4, 5.5) that assemble the box in a stable way, the box being foldable in a flat folded position,

characterized in that

from its upper part, in the position of use, from at least three of the structural sidewall flaps (2, 3, 4.1, 4.2, 5.1, 5.2) arise at least three functional flaps (6.1, 6.2, 6.3, 6.4, 9, 13, 15) independent of each other, the functional flaps performing the functions of lid, interior space reducer, clamping and/or handle, and that said assembly elements (4.4, 4.5, 5.4, 5.5) are located on the internal part of the box.

2. Box according to claim 1, wherein said sheet is of a

- corrugated material that defines a plurality of channels substantially parallel to each other.
3. Box according to claim 2, in which the channels of the corrugated material in the sidewalls are substantially perpendicular to the bottom.
 4. Box according to any one of the previous claims, comprising two additional structural bottom flaps (1.2, 1.3) that form a double thickness bottom, which arise from two structural sidewall flaps (4.1, 5.1).
 5. Box according to any one of the previous claims, comprising two opposite additional sidewall structural flaps (4.2, 5.2) forming two double thickness sidewalls, which arise from a sidewall structural flap (3).
 6. Box according to claim 5, wherein from each of said two opposite additional sidewall structural flaps (4.2, 5.2) a structural bottom reinforcing flap (4.3, 5.3) arises, defining a projection (4.5, 5.5) between the additional sidewall structural flap (4.2, 5.2) and the bottom reinforcing structural flap (4.3, 5.3), said projection (4.5, 5.5) being housed in a complementary groove (4.4, 5.4), forming the projections (4.5, 5.5) and the grooves (4.4, 5.4) of the assembly elements.
 7. Box according to claims 4 and 6, wherein each additional structural bottom flap (1.2, 1.3) comprises a cavity (1.4, 1.5) to house one of said structural bottom reinforcement flaps (4.3, 5.3).
 8. Box according to any one of the previous claims, wherein two of said functional flaps are functional lid flaps (6.2, 6.4) which, in their closed position, have their ends substantially in contact with each other or are totally or partially overlapped, one of the lid flaps (6.4) comprising, when the lid flaps (6.2, 6.4) are totally or partially overlapped, at least one sealing element (7.1, 7.2).
 9. Box according to claim 8, wherein at least one of the functional lid flaps (6.2, 6.4) comprises at least one tear strip (8.1) when the functional lid flaps (6.2, 6.4) are totally or partially overlapped.
 10. Box according to any one of claims 1 to 7, in which two of said functional flaps are functional lid flaps (6.2, 6.4) comprising at least one slot (10) for their engagement to each other.
 11. Box according to any one of the previous claims, wherein at least one of said functional flaps is a functional space reduction flap (9), each of them comprising one or more slits (9.1, 9.2) defining secondary flaps (9.3, 9.4, 9.5) from each functional space reduction flap.
 12. Box according to any one of the previous claims, comprising at least two functional fastening flaps (13, 14).
 13. Box according to claim 12, wherein each functional fastening flap (13, 14) comprises at least one hole (16) and slits (17).
 14. Box according to claim 1, wherein at least one of said functional flaps are functional handle flaps (15).
 15. Box according to claims 1, 2 and 3, wherein the channels of the corrugated material are perpendicular to the slits that separate said functional flaps (6.1, 6.2, 6.3, 6.4, 9, 13, 15) that perform the lid functions, of interior space reducer, fastening and/or handle of the sidewall structural flaps.



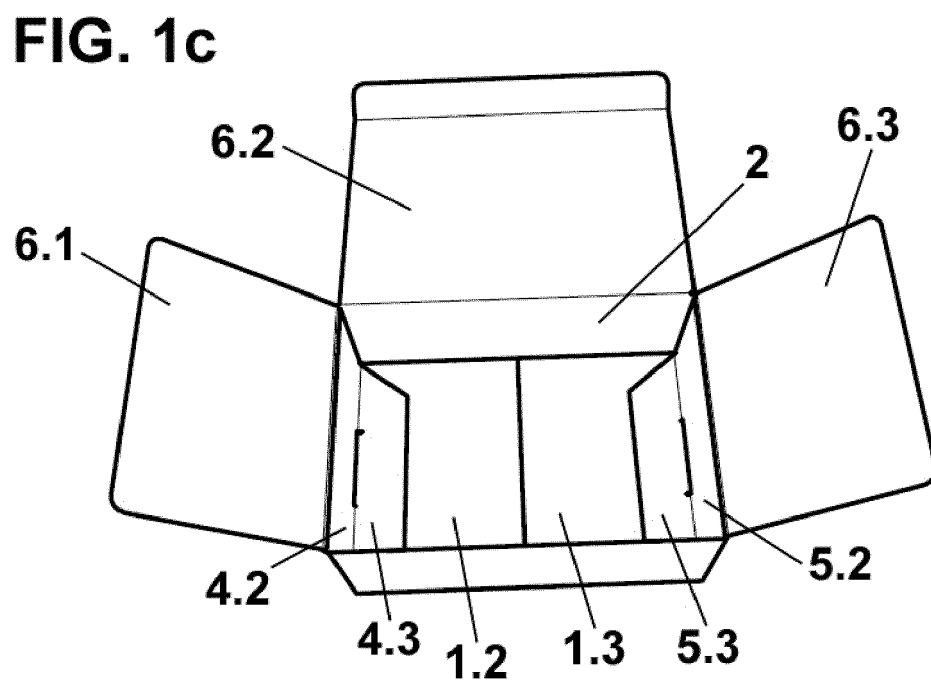
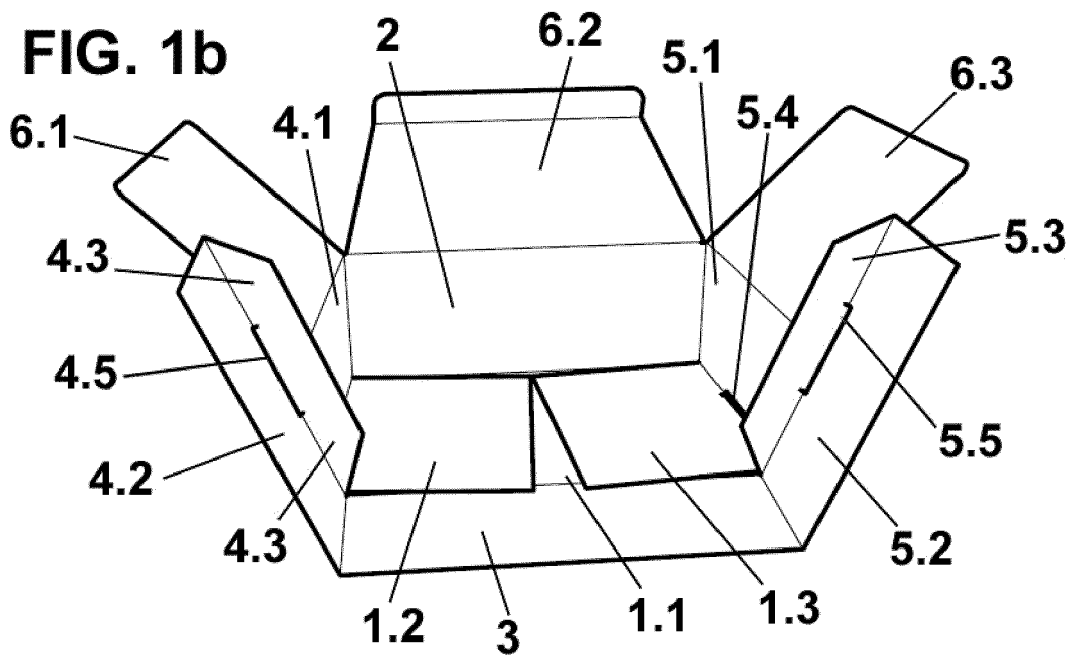
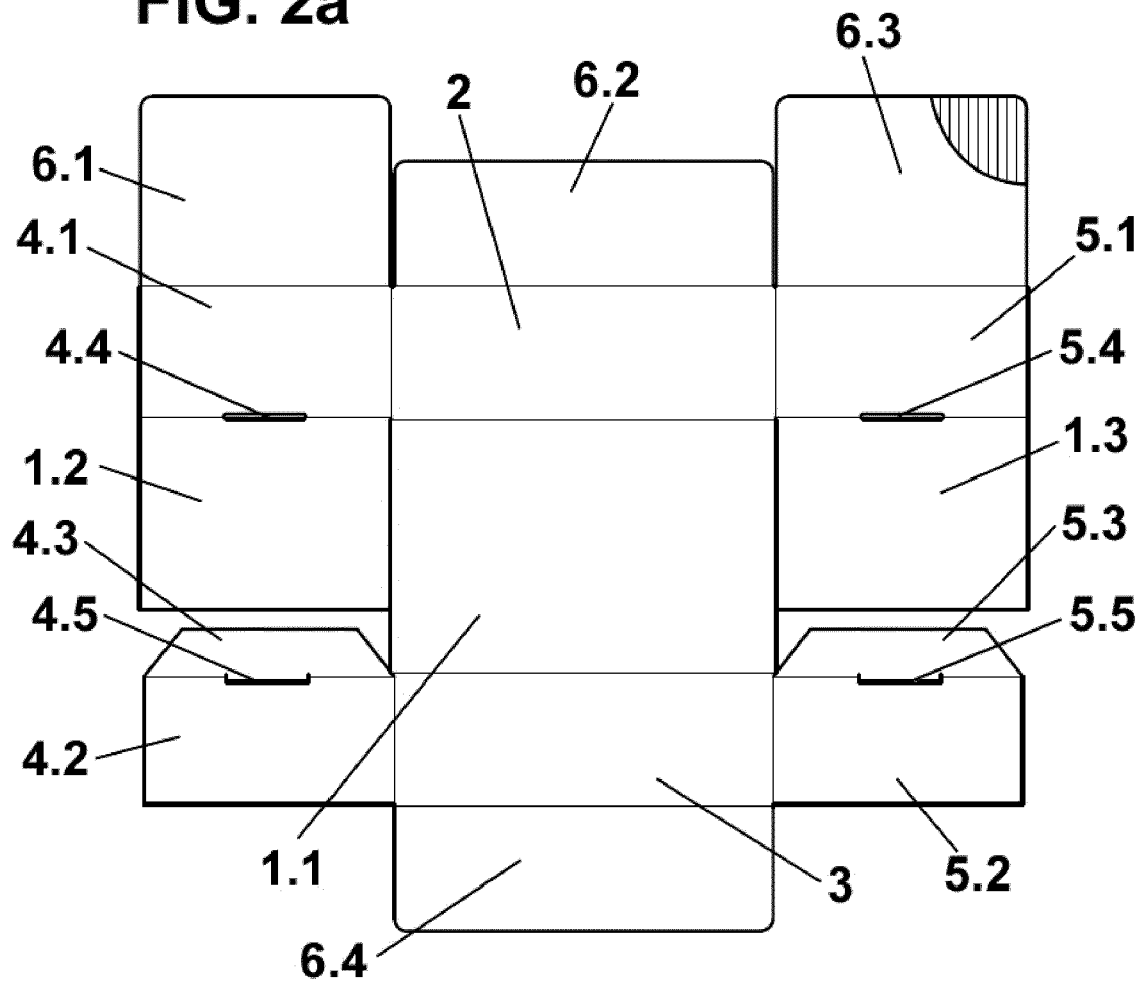


FIG. 2a



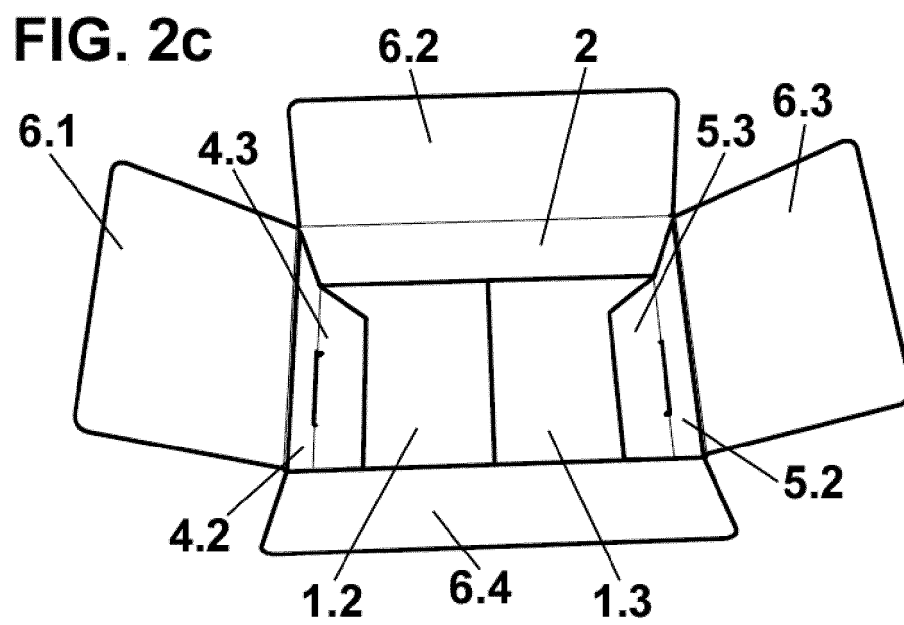
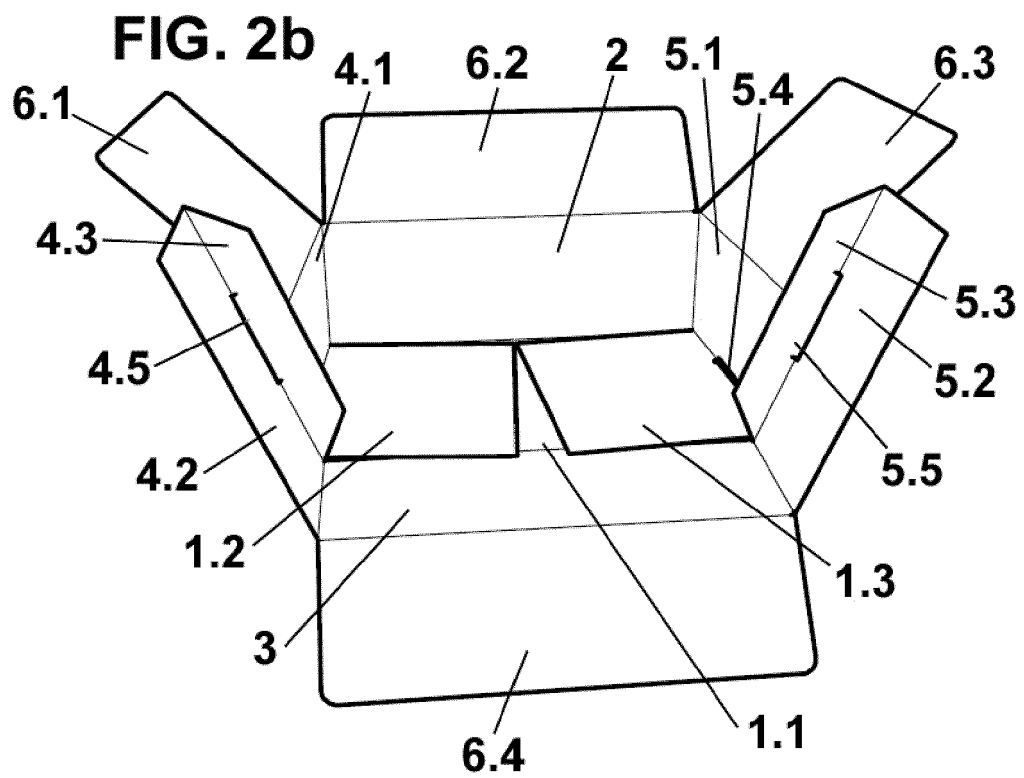


FIG. 3

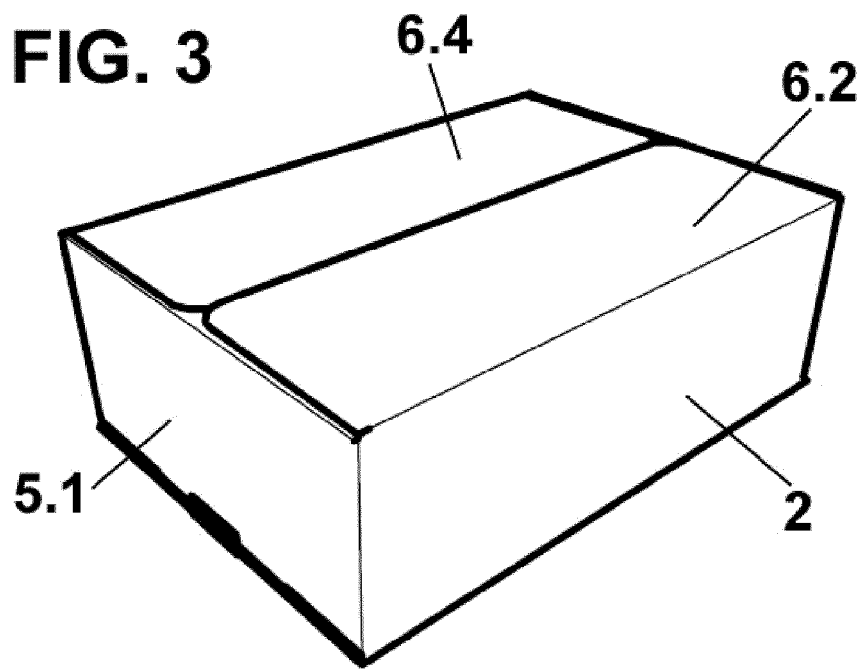
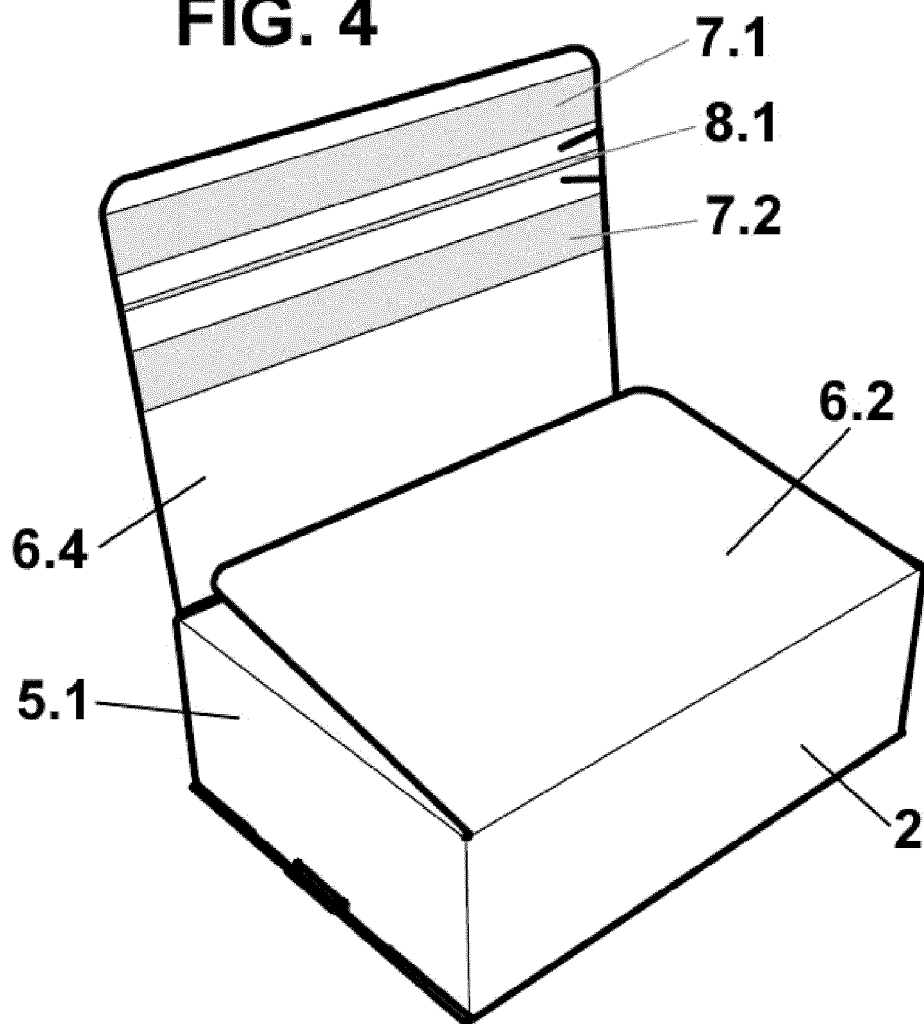


FIG. 4



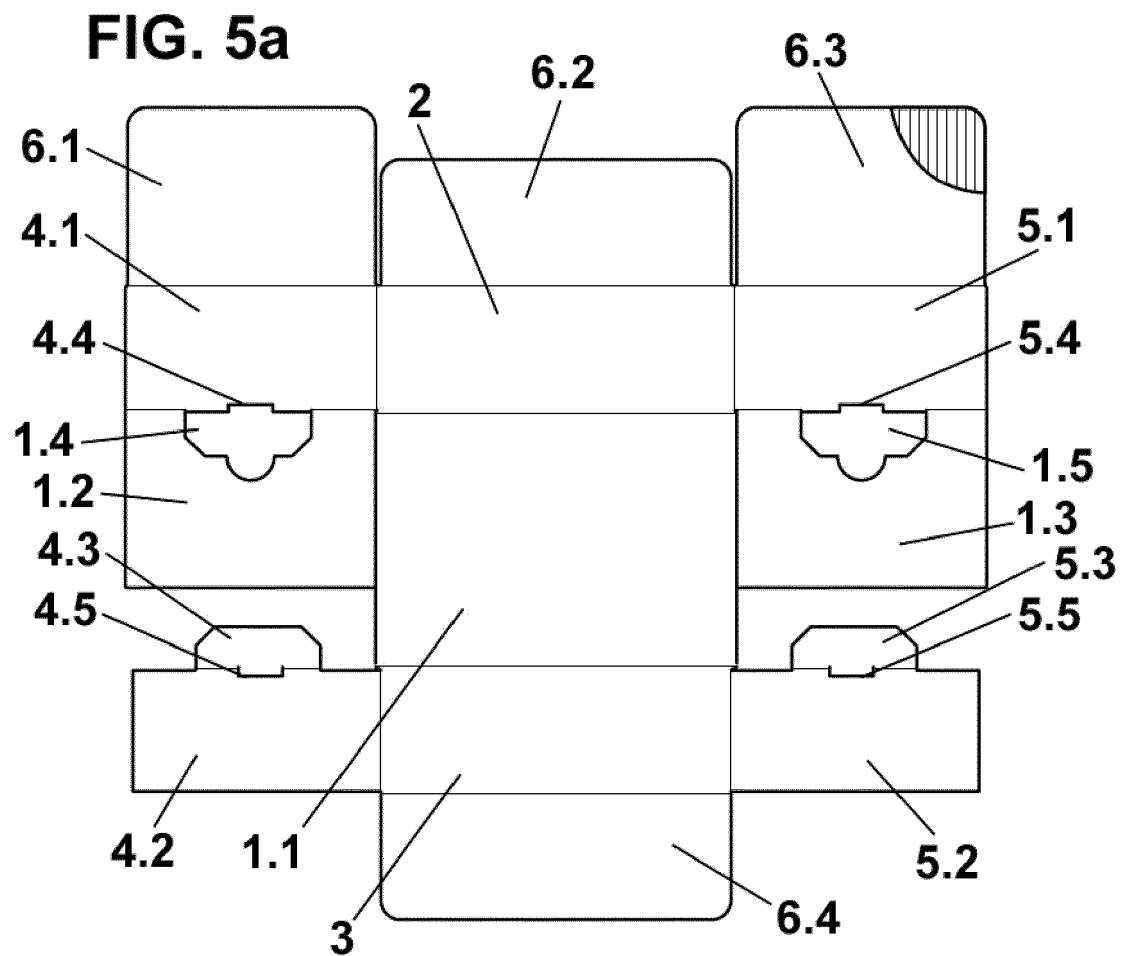


FIG. 5b

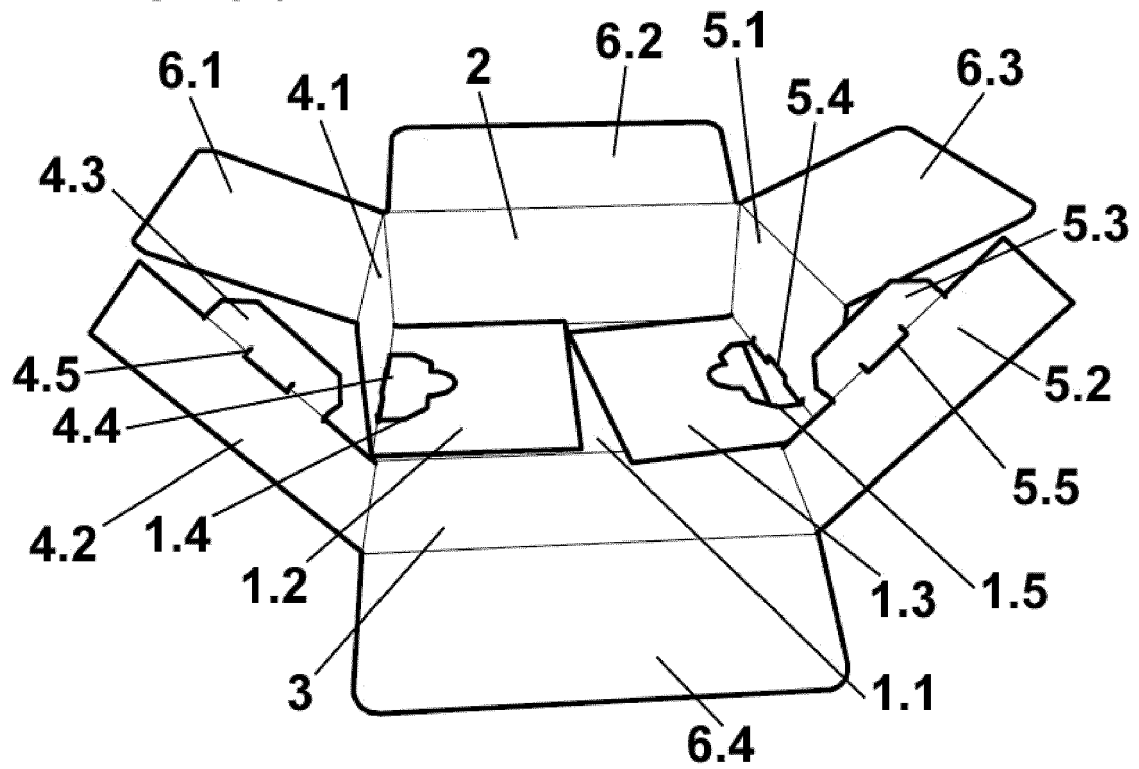


FIG. 5c

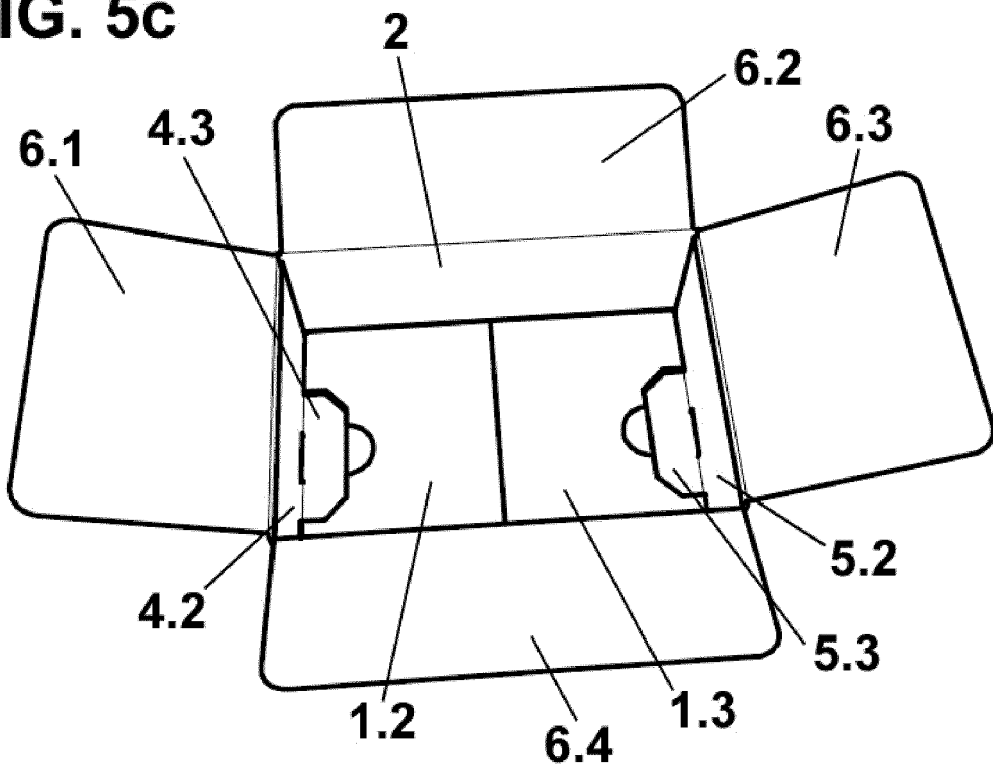


FIG. 6a

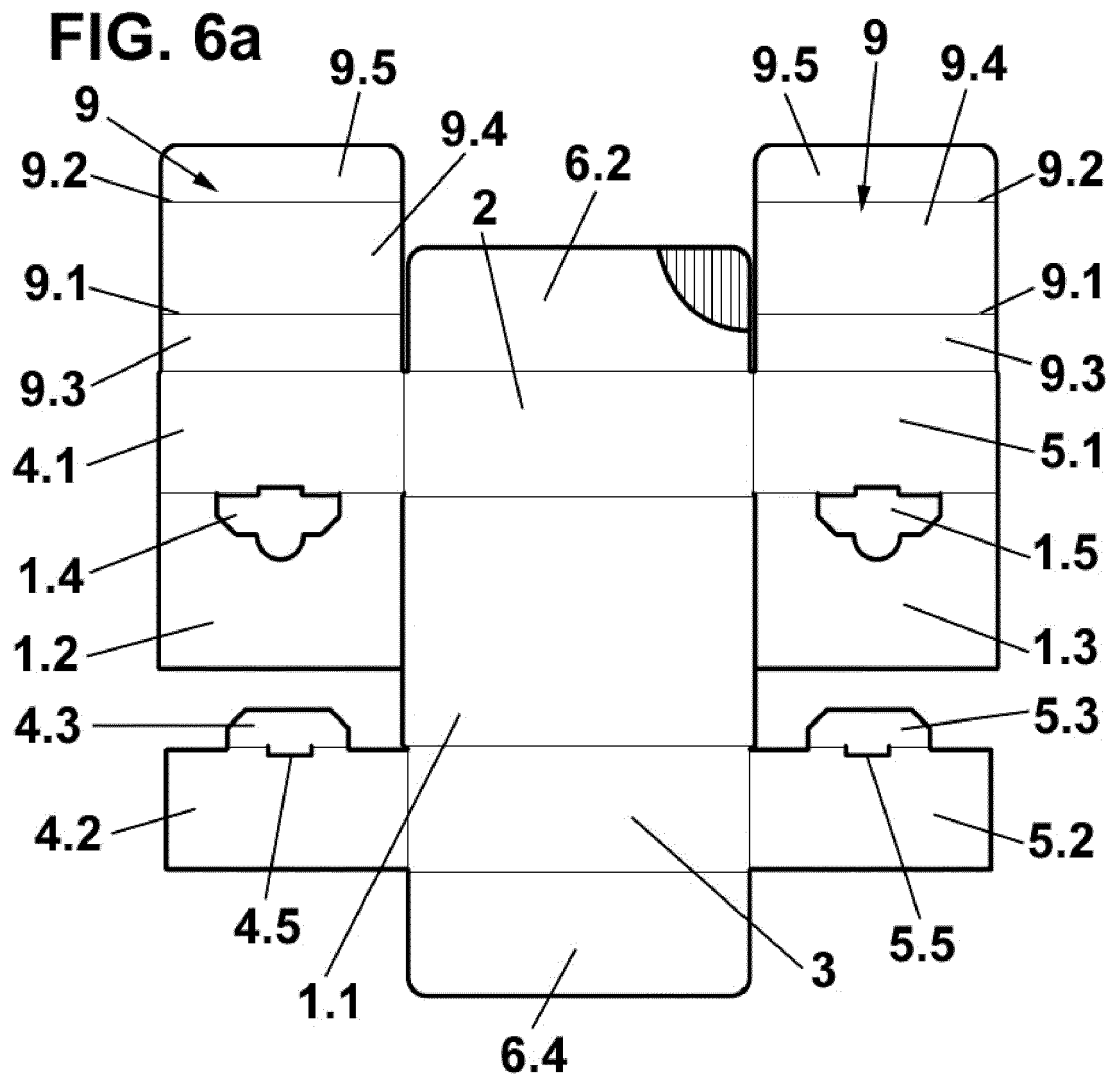


FIG. 6b

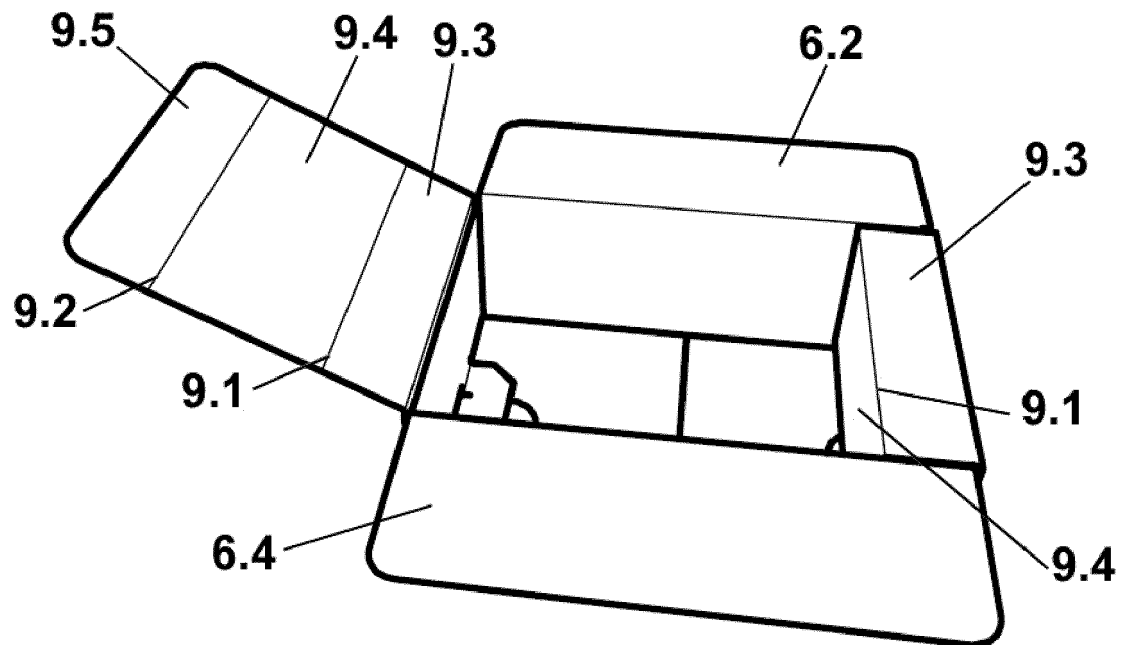


FIG. 6c

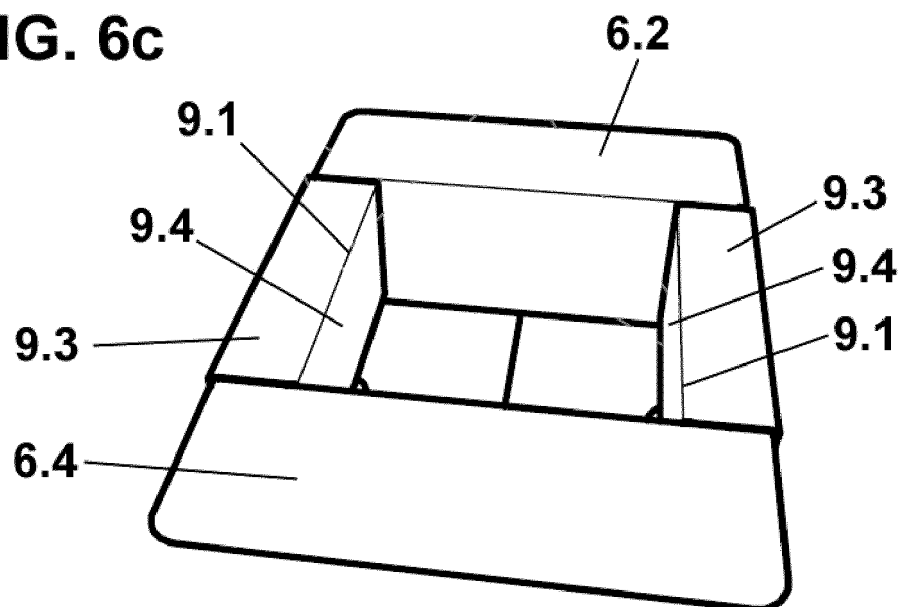


FIG. 7a

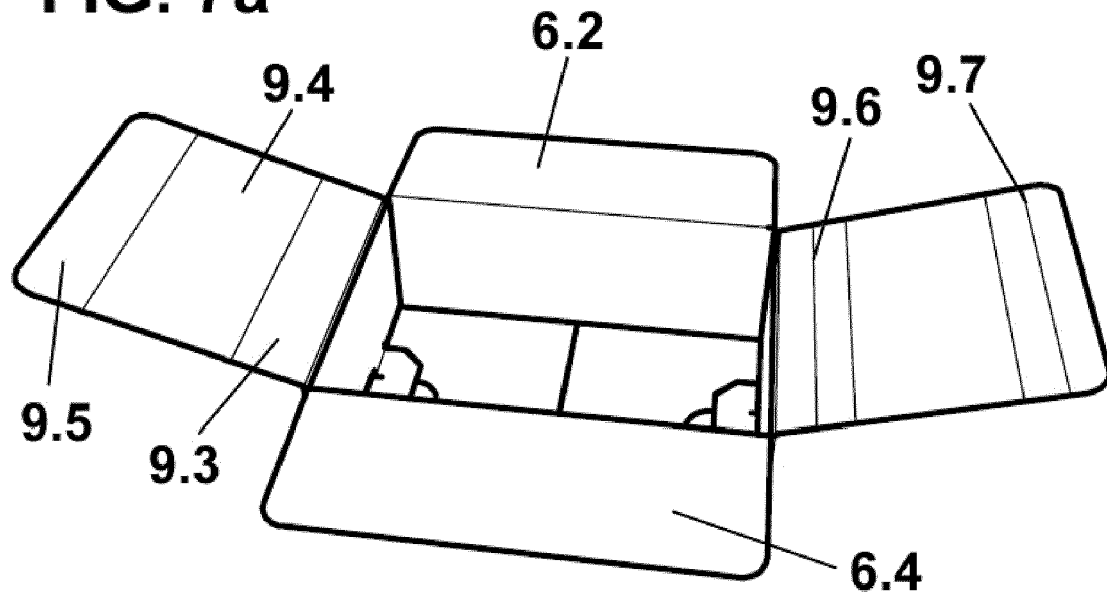


FIG. 7b

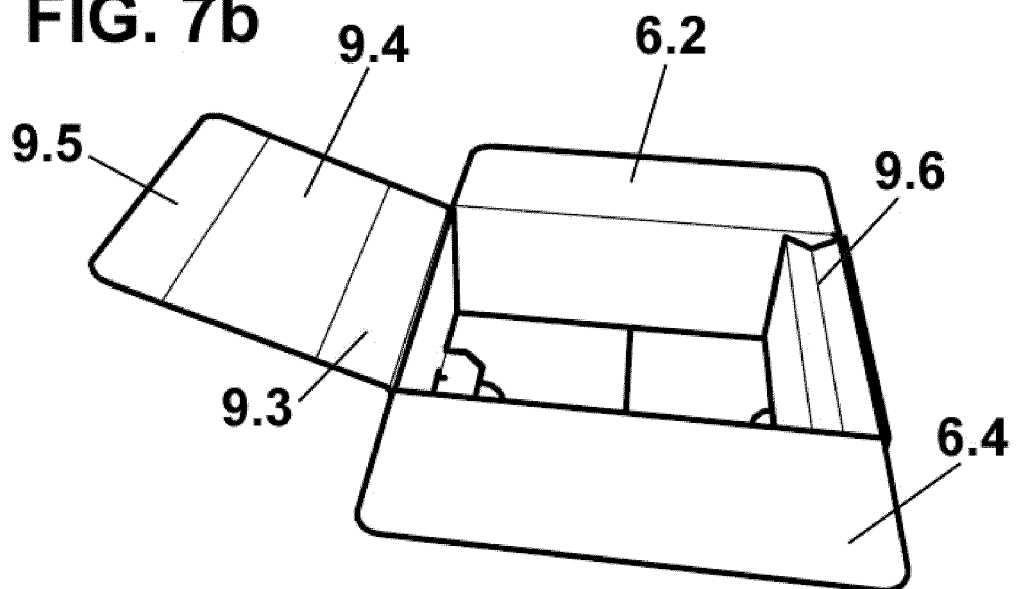


FIG. 8a

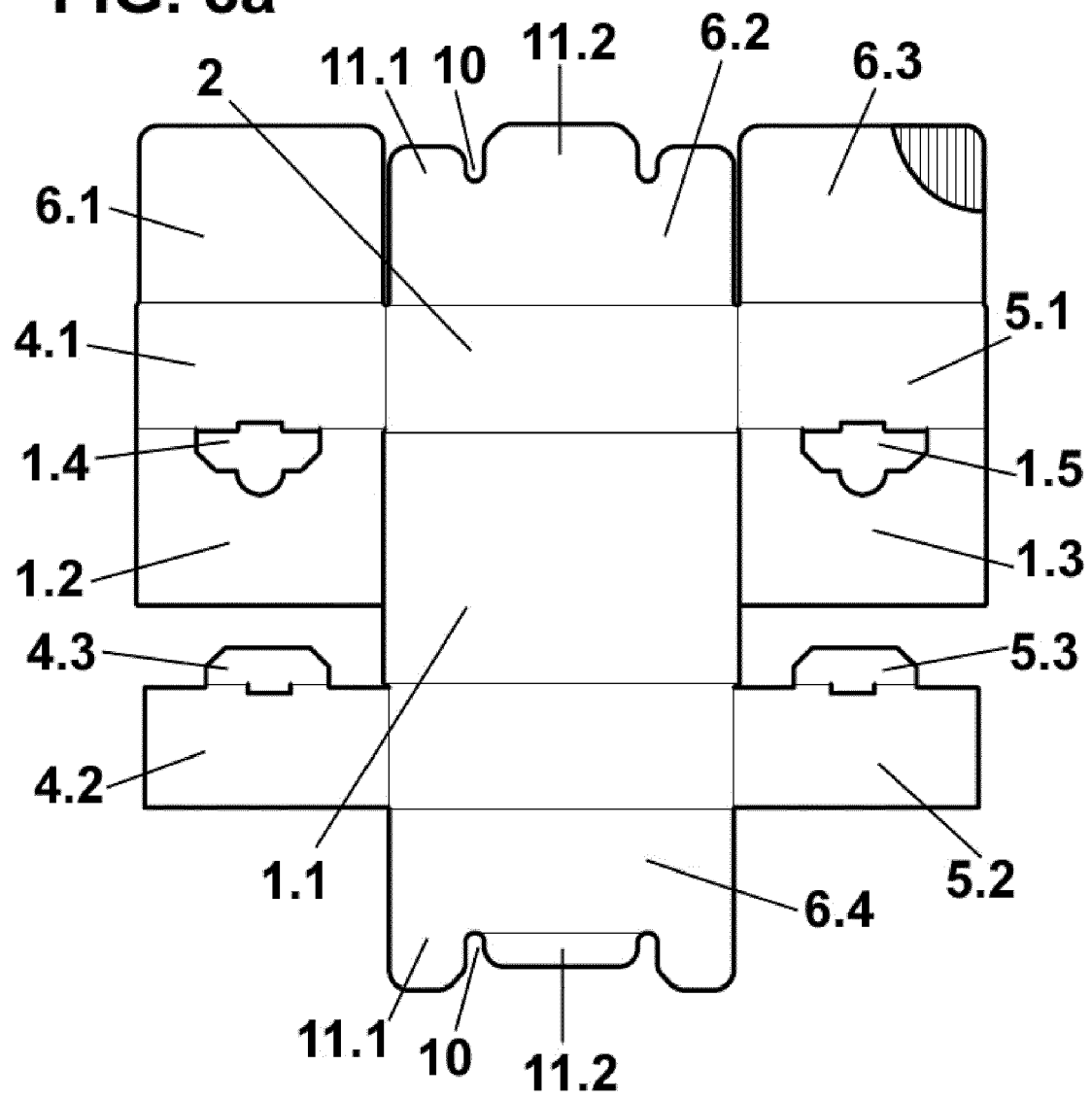


FIG. 8b

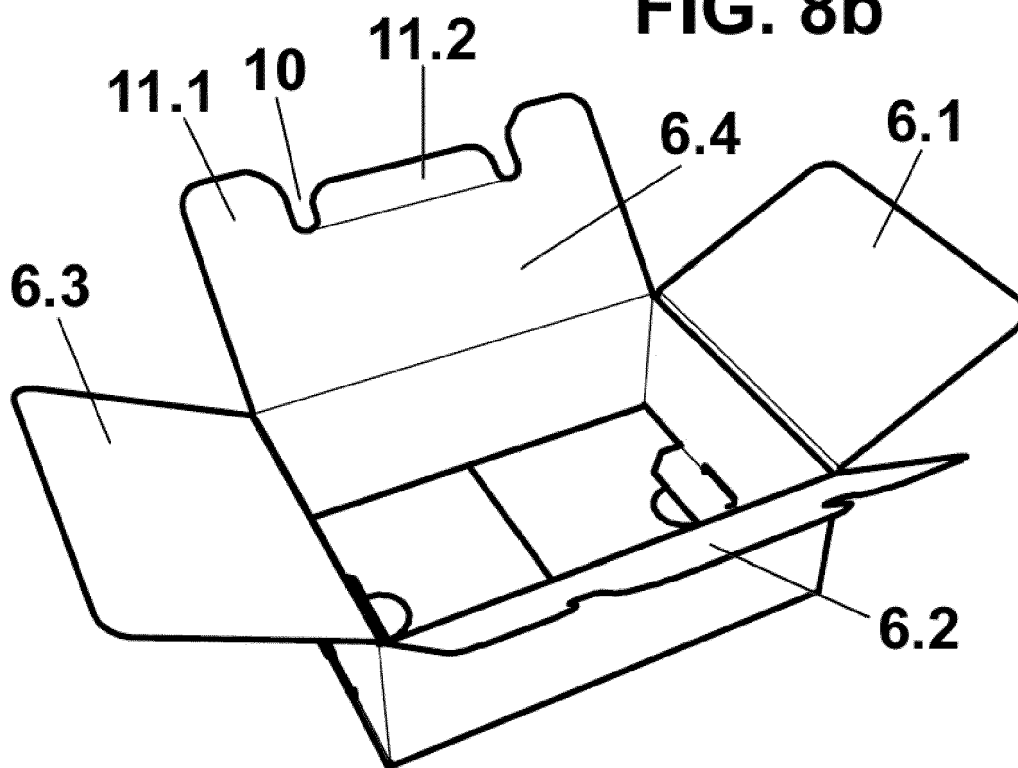


FIG. 8c

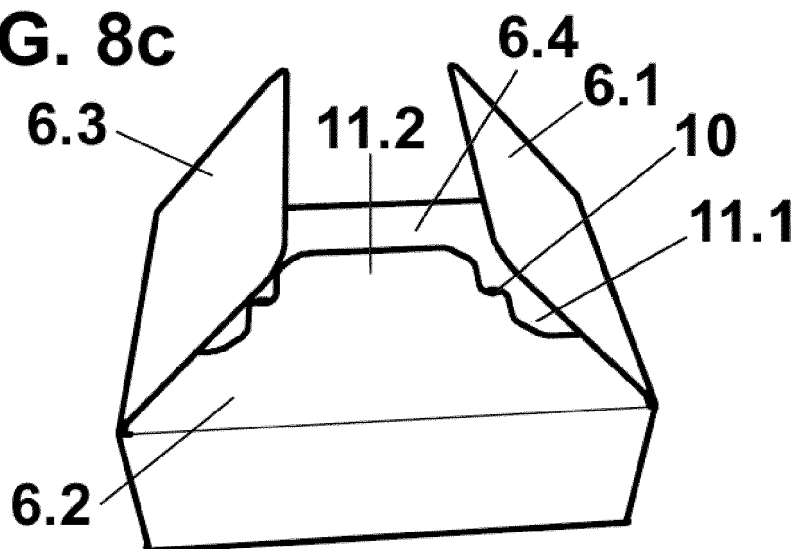


FIG. 9a

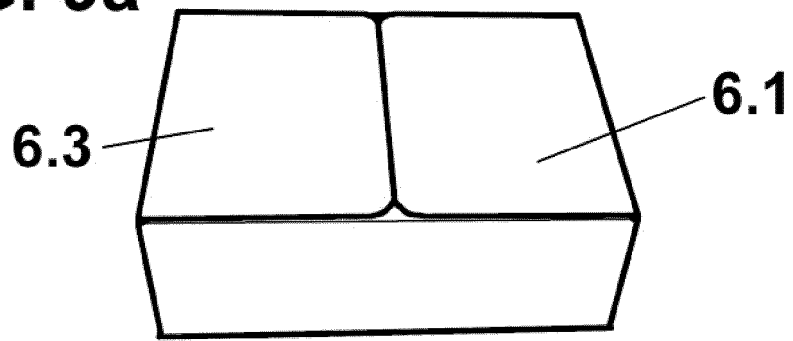


FIG. 9b

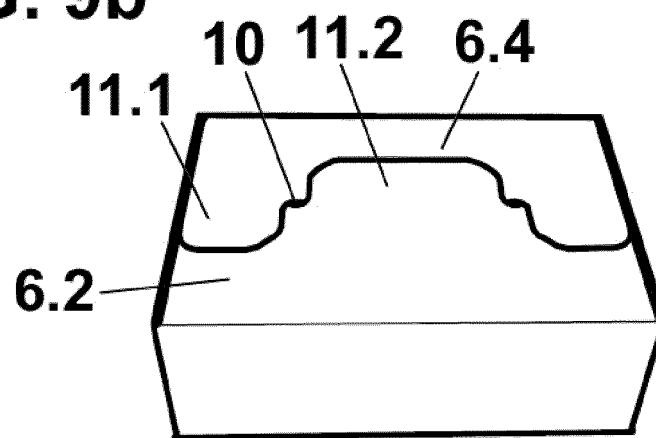


FIG. 10

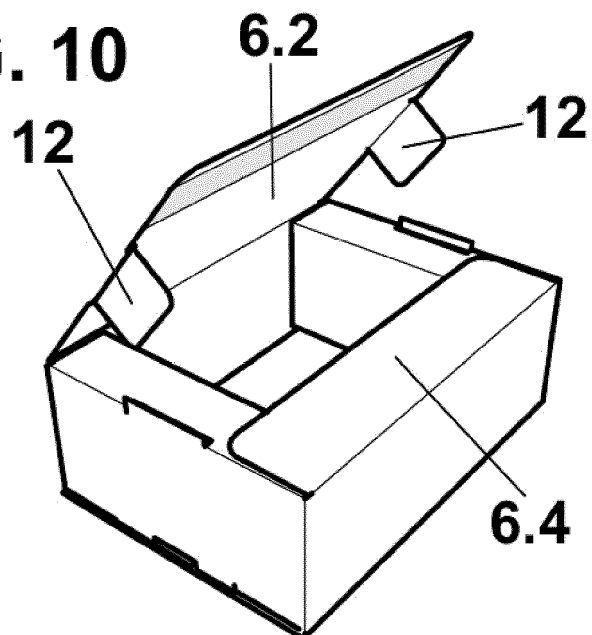


FIG. 11a

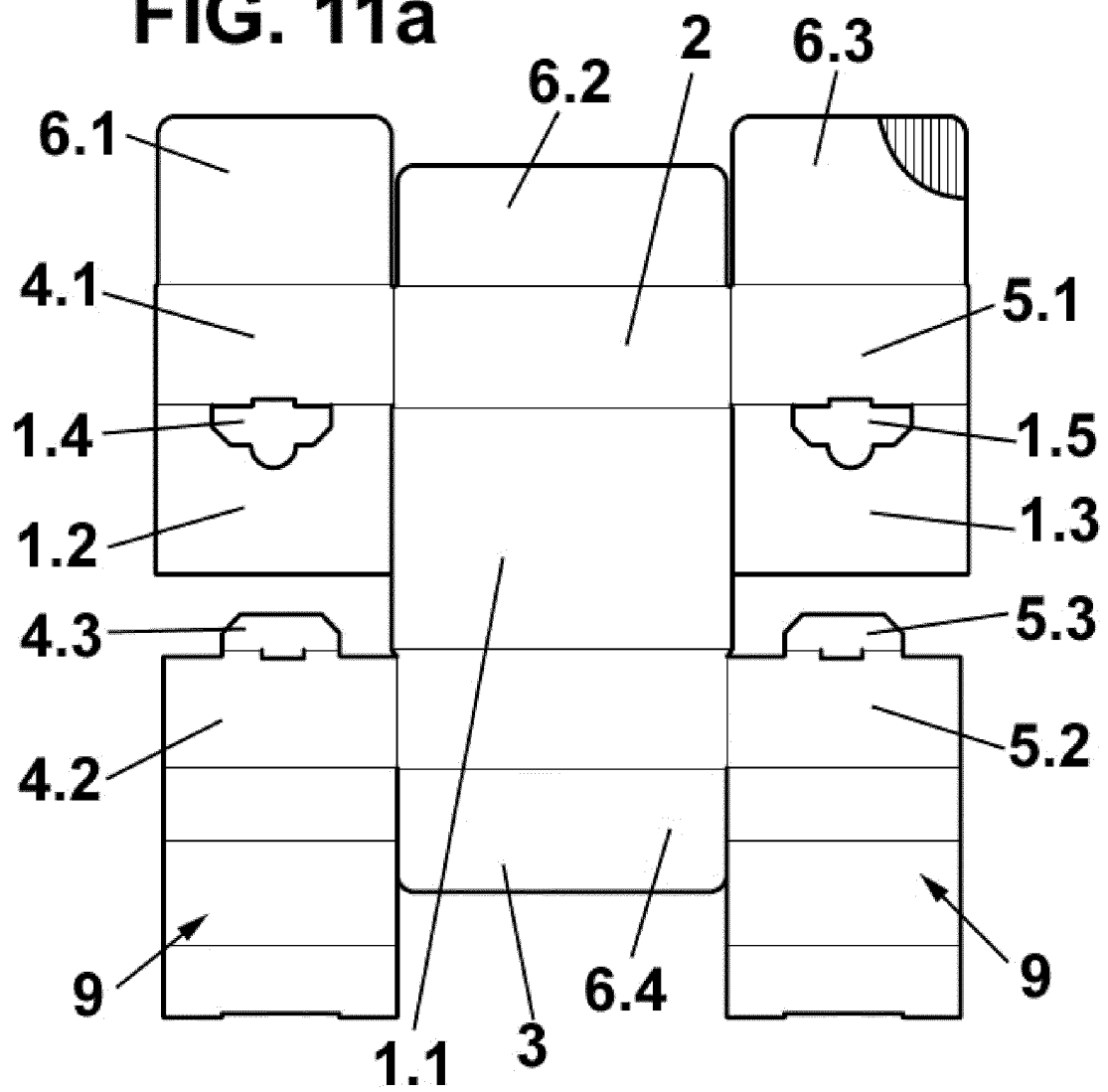


FIG. 11b

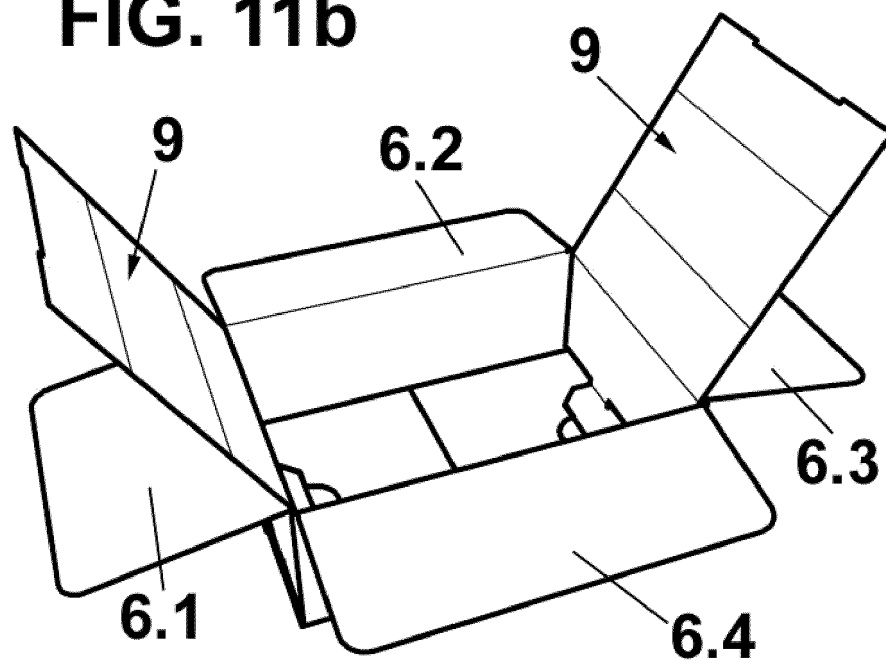
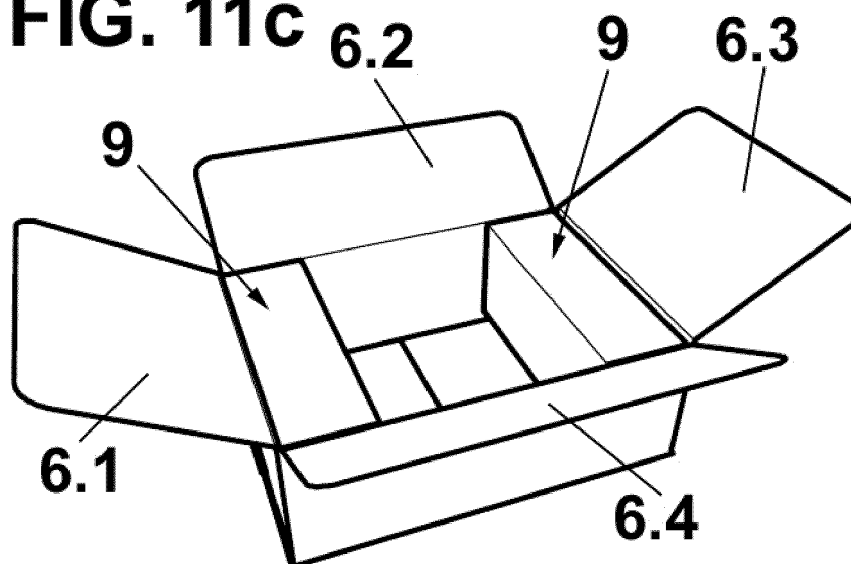


FIG. 11c



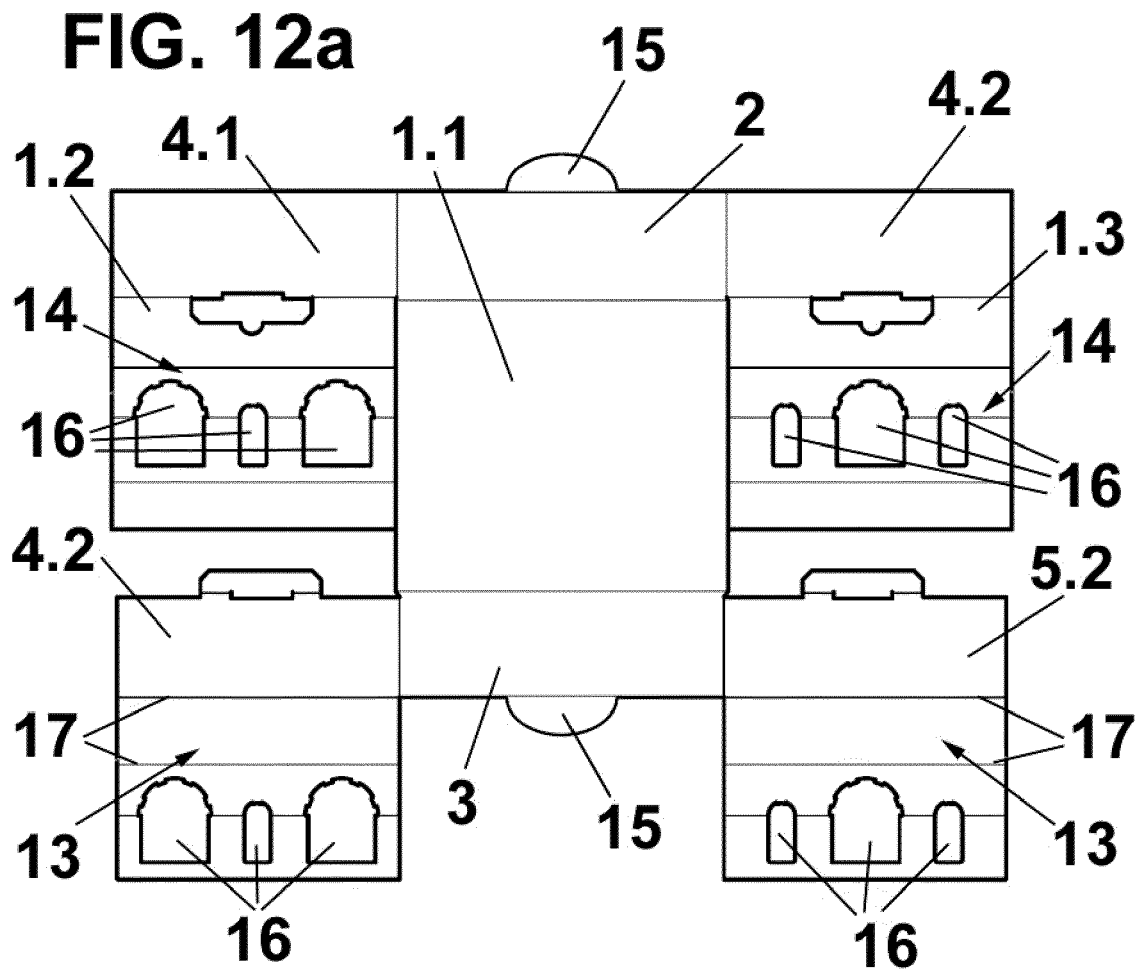


FIG. 12b

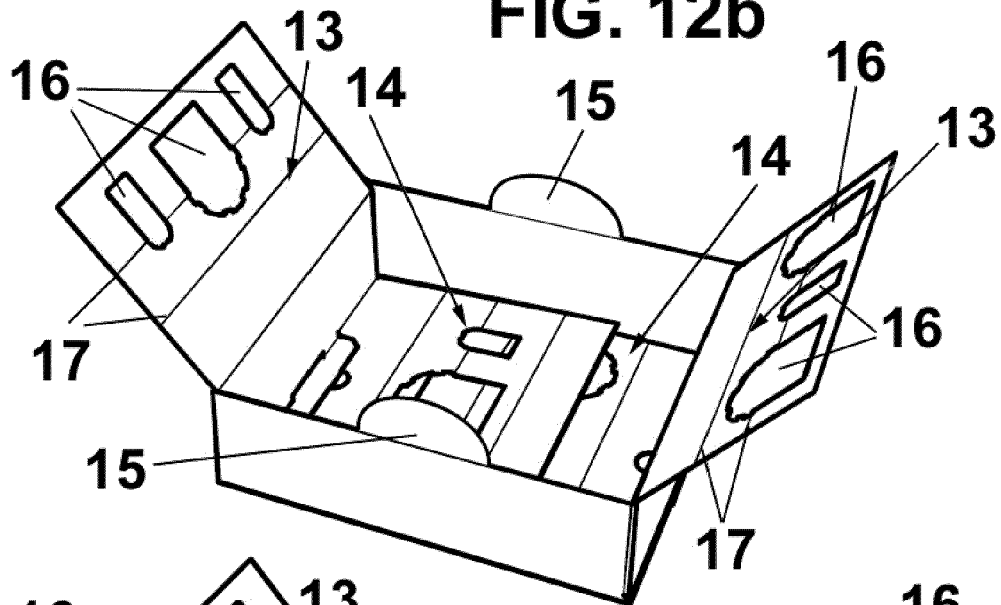


FIG. 12c

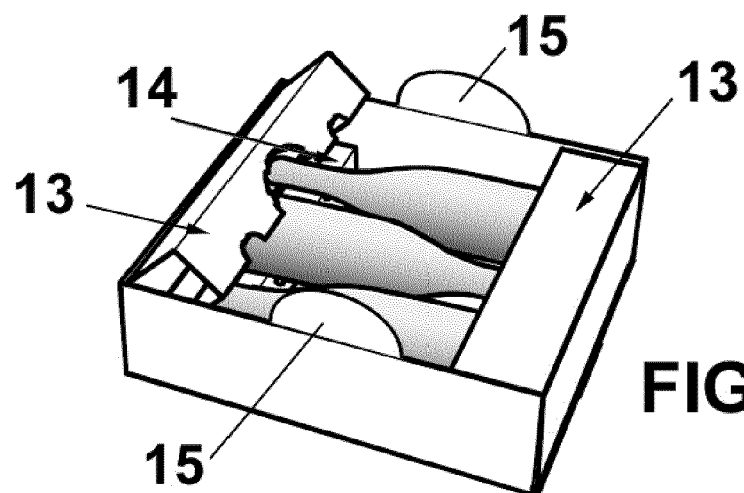
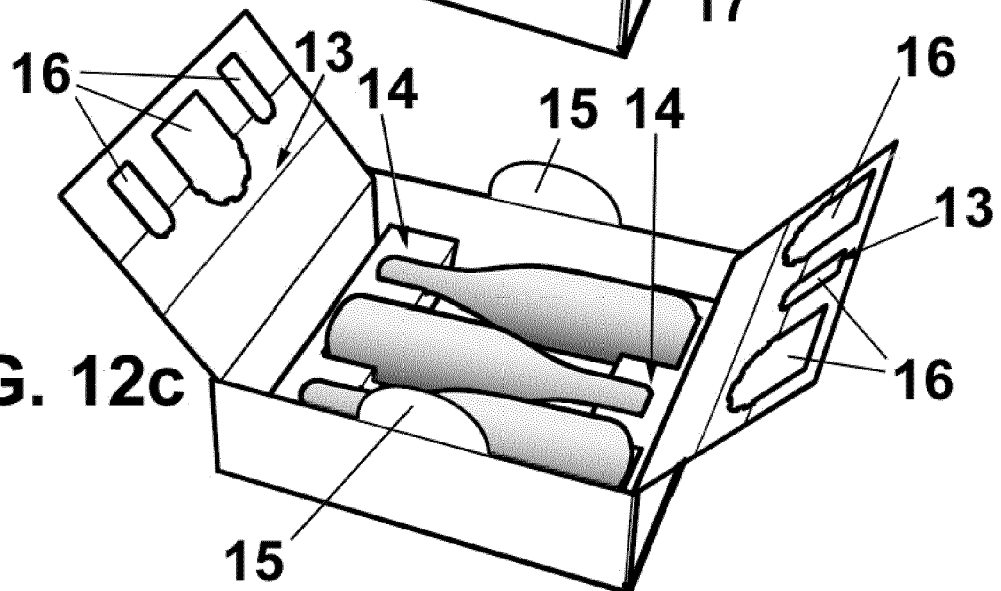


FIG. 12d

FIG. 12e

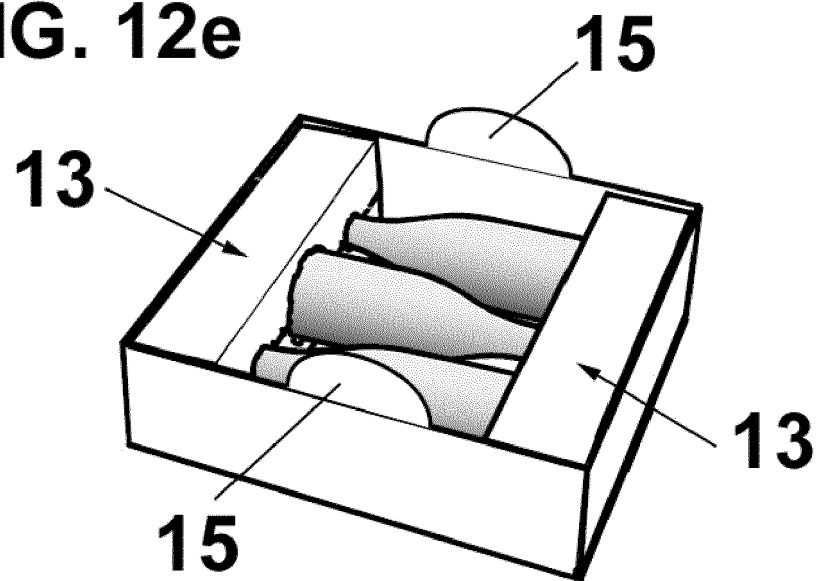


FIG. 12f

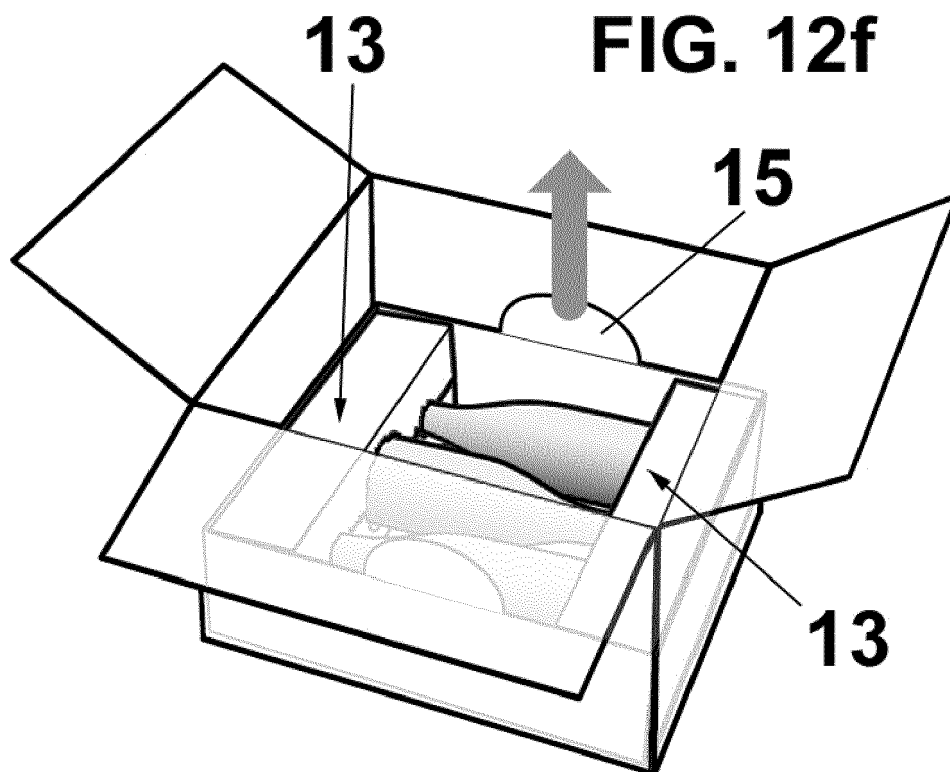
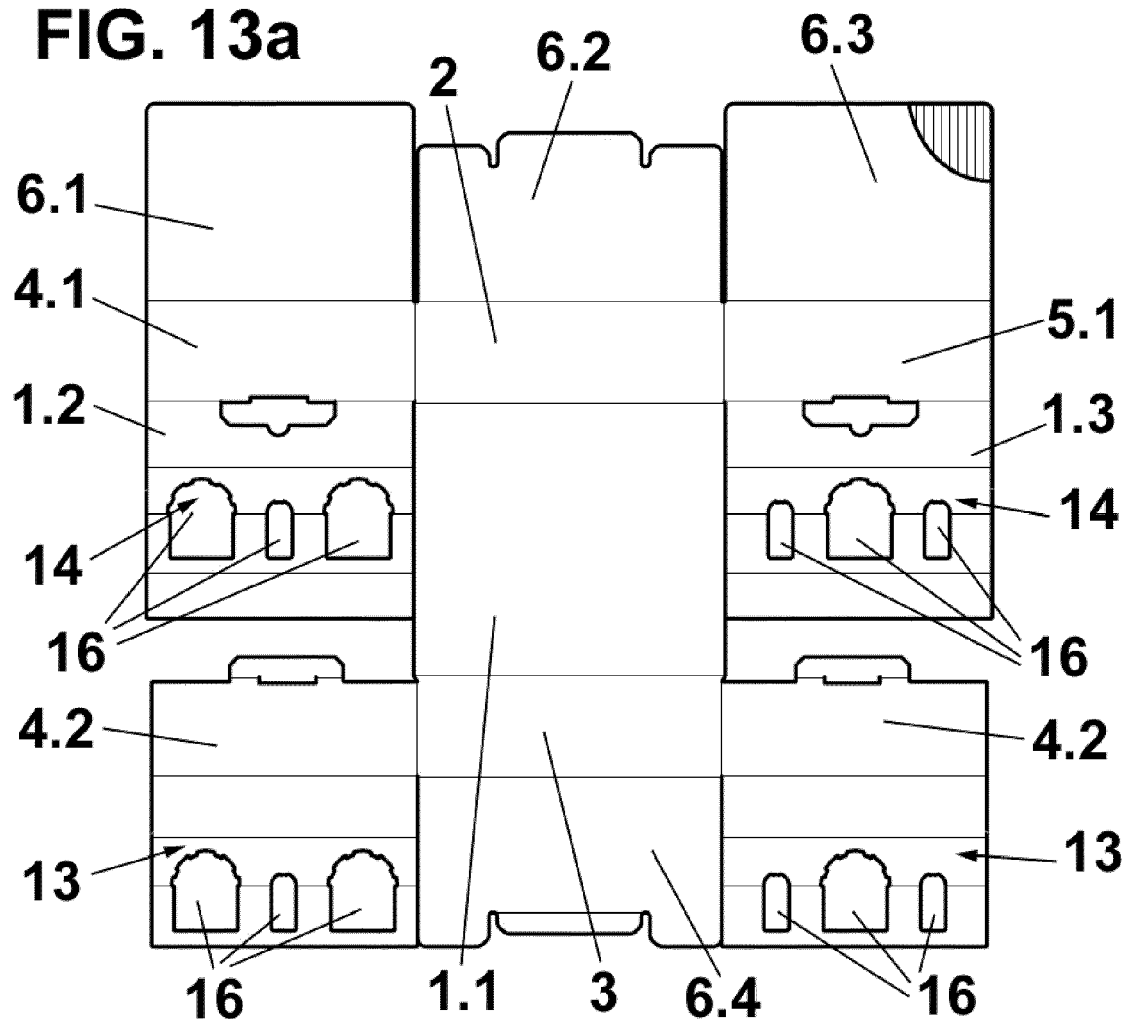


FIG. 13a



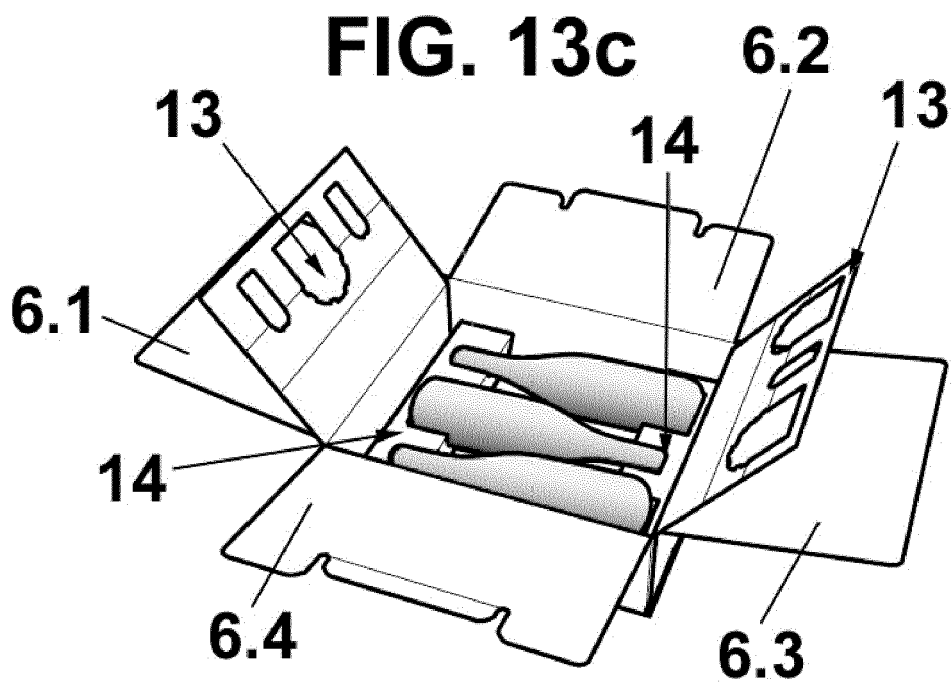
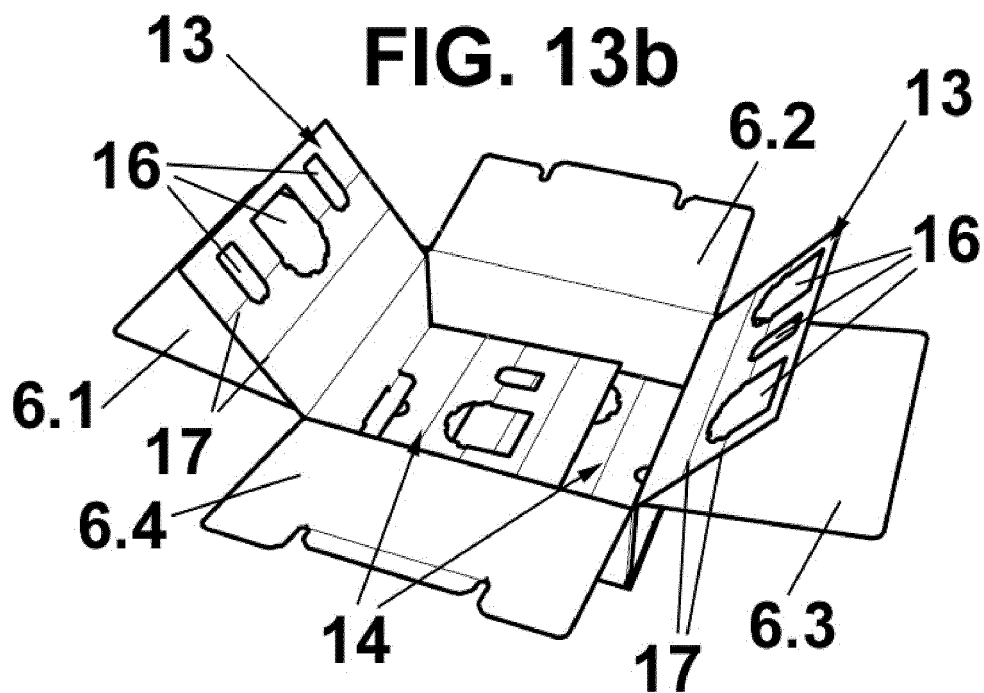


FIG. 13d

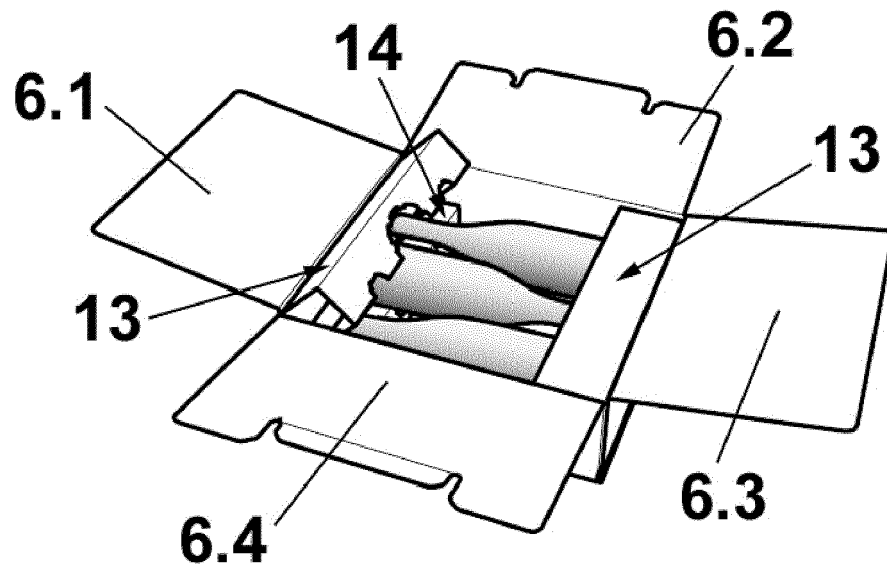
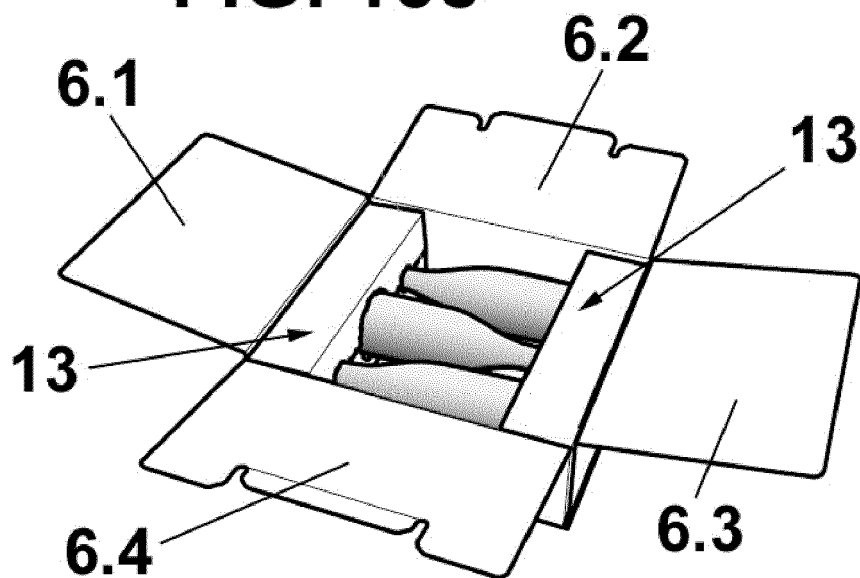


FIG. 13e





EUROPEAN SEARCH REPORT

 Application Number
 EP 20 38 2474

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 5 007 580 A (MORRISON WAYNE P [US] ET AL) 16 April 1991 (1991-04-16)	1-5,15	INV. B65D5/18 B65D5/44 B65D5/46 B65D5/50 B65D5/66
A	* column 2, line 41 - column 3, line 40; figures 1-3 *	6,7	

X	US 4 511 079 A (LOPEZ LOUIS [US]) 16 April 1985 (1985-04-16)	1-5,15	
A	* page 2, line 44 - line 56; figures 1-2 *	6,7	

X	FR 2 615 482 A1 (COMPTOIR GENERAL EMBALLAGE [FR]) 25 November 1988 (1988-11-25)	1-5,15	TECHNICAL FIELDS SEARCHED (IPC) B65D
A	* page 5, last paragraph; figures 1-2 *	6,7	

X	US 3 055 570 A (PORTOLA HAMILTON JOSEPH) 25 September 1962 (1962-09-25)	1-5,15	
A	* column 2, line 46 - line 64; figures 1-2 *	6,7	

X	US 2 845 211 A (HAUCK WILLIAM E ET AL) 29 July 1958 (1958-07-29)	1-5,15	
A	* column 1, line 66 - column 2, line 18; figures 1-4 *	6,7	

The present search report has been drawn up for all claims			
Place of search Munich			
Date of completion of the search 14 October 2020			
Examiner Derrien, Yannick			
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			

EPO FORM 1503 03.82 (P04C01)



Application Number

EP 20 38 2474

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-7, 15

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

**LACK OF UNITY OF INVENTION
SHEET B**

Application Number

EP 20 38 2474

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-7, 15

shipping box having bottom reinforcing flaps with assembling elements,

2. claims: 8-10

shipping box having lid flaps with locking elements,

3. claim: 11

shipping box having a space reduction flap,

4. claims: 12, 13

shipping box having at least two fastening flaps,

5. claim: 14

shipping box having a handle flap.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 20 38 2474

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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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

14-10-2020

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5007580	A	16-04-1991	NONE	
US 4511079	A	16-04-1985	NONE	
FR 2615482	A1	25-11-1988	NONE	
US 3055570	A	25-09-1962	NONE	
US 2845211	A	29-07-1958	NONE	

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EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82