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(54) **BOX LID PROVIDED WITH AT LEAST ONE FLAP**

(57) Lid (C) for a box (1) comprising a bearing frame (2) defining a central opening (20), at least one flap (3) connected to said bearing frame (2), and connection means (L) between said at least one flap and said bearing frame (2) configured in such a way that said at least one

flap (3) can alternately be disposed in a closing position, wherein the flap (3) covers the central opening (20) of the bearing frame (2), and an opening position, wherein said flap (3) does not cover the central opening (20) of the bearing frame (2).

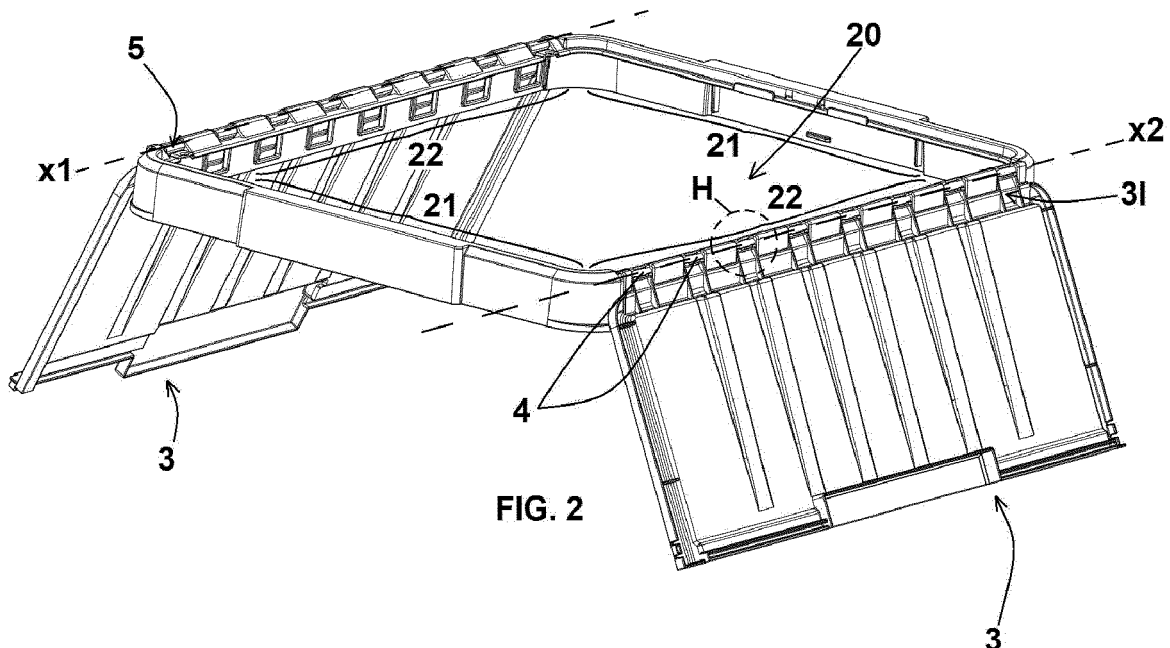


FIG. 2

Description

[0001] The present patent application for industrial invention relates to a box lid having at least one movable flap, as well as to a box equipped with such a lid.

[0002] The present invention has been devised in order to solve the problems encountered during the use of the boxes of the prior art, which are commonly made of plastic and are used to store/display products, in particular fruit and vegetable.

[0003] The peculiarities and the advantages of the present invention will become manifest after a short description of the prior art and its drawbacks.

[0004] Plastic boxes have been known since the application of plastic molding techniques, which comprise a bottom wall and four side walls that define a compartment wherein products, particularly fruit and vegetables, are stored.

[0005] For containment reasons, the side walls are inclined in such a way that the box has a tapered shape with increasing dimensions going from the bottom wall upwards, so that a first box can be partially inserted inside a second box, which is identical to the first one, so as to reduce the volume of the boxes during storage or transportation, at least as long as said boxes are empty.

[0006] In order to protect the products or goods stored inside the compartment of the box, the boxes have been equipped with closure means suitable for covering the opening that provides access to the compartment.

[0007] At present, said closure means are mainly realized in two different versions, which will be described and analyzed hereinafter.

[0008] In a first case, said means consist in a monolithic lid that comprises a perimeter portion suitable for cooperating with the upper edges of the side walls in such a way to be forcedly fastened to the box.

[0009] When fastening the lid to the upper edge of the side walls of the box, the boxes can be stacked one on top of the other, placing an upper box on top of the lid of a lower box.

[0010] On the other hand, if the boxes are to be stacked, it is necessary to unfasten the lid from the box so that an upper box can be at least partially inserted in the compartment of the lower box.

[0011] While, on the one hand, monolithic lids provide a stable support when the boxes are to be stacked, on the other hand they are impaired by the fact that, whenever the user wants to access the interior of the compartment, it is necessary to unfasten the lid from the box.

[0012] In order to such a problem, a second solution has been devised, wherein said closure means of the box comprise two opposite flaps that are hinged at the ending edges of the longitudinal walls of the box by means of revolving connection means. In view of the above, the two flaps can be rotated from a closed position, wherein the flaps cover the access to the compartment, to an open position wherein the flaps do not close the access to the compartment.

[0013] Typically, said revolving connection means comprise elastic snap-in seats that are rotatably fastened to respective pins respectively obtained on the ending edges of the walls of the box and on the flaps.

[0014] From the closed position to the open position, the flaps are tilted by an angle of approximately 270° and, when they are disposed in the opening position, they protrude laterally with respect to the side wall whereto they are hinged.

[0015] Despite the fact that such a solution makes it possible to move the two flaps as desired from the closed position to the open position in a simple and fast way, such a solution is impaired by drawbacks.

[0016] In particular, a drawback occurs when the boxes are to be stacked.

[0017] In fact, in order to stack the boxes, the flaps need to be tilted from the closed position to the open position in such a way to free the access to the compartment.

[0018] However, as mentioned above, when the flaps are in the open position, the lateral encumbrance of the box is considerably increased and the easy stacking of the boxes is prevented.

[0019] Therefore, in order to stack the boxes, it is necessary to unfasten the flaps of the boxes.

[0020] However, such an extraction is an extremely difficult and fatiguing operation.

[0021] In fact, in order to extract the flaps, it is necessary to hold the box with one hand and in the meantime pull the lid off with the other hand exerting a force that is sufficient to overcome the resistance of the elastic snap-in seats on the hinging pins.

[0022] It is easy to understand that the greater the resistance of the hinging seats, the greater the force to be exerted by an operator in order to hold the box and pull the flap will be.

[0023] Moreover, it must be considered that the reverse operation, that is to say the fastening of the elastic snap-in seats with the pins, is also far from simple.

[0024] In addition, said fastening and unfastening of the flaps with/from the box can progressively damage the connection means, jeopardizing the operational effectiveness of said connection means in the long run, and severely impairing the life of said connection means.

[0025] The observation of the two aforementioned alternative solutions and the consideration of the respective drawbacks have led to conceive the new lid according to the invention, which is capable of remedying the aforementioned problems.

[0026] Otherwise said, the purpose of the present invention to overcome the drawbacks of the prior art by devising a box lid that:

- makes it possible to close the box and to access the box without having to extract/fasten the lid from/to the box; and
- can be easily and rapidly extracted from or attached to the box, if necessary.

[0027] These purposes are achieved according to the invention with the characteristics of the appended independent claim 1.

[0028] Advantageous embodiments appear from the dependent claims. The lid of the invention is defined by claim 1.

[0029] For the sake of clarity, the description of the lid according to the invention continues with reference to the appended drawings, which have a merely illustrative, not limiting value, wherein:

- Fig. 1 and Fig. 2 are two axonometric views of the lid according to the invention in two different positions;
- Fig. 2A is an enlarged view of the detail enclosed in the broken circle H of Fig. 2;
- Fig. 3 and Fig. 4 are two axonometric views of the lid according to the invention in two different positions associated with a respective box;
- Fig. 5 is a side view of a box with the lid in opening position;
- Fig. 6 is a sectional view of the upper edge and of the frame that shows in particular the snap-in fastening means of the frame to the upper edge;
- Fig. 7 is an axonometric view of the bearing frame of the lid;
- Fig. 7A is an enlarged view of the detail enclosed in the circle H1 of Fig. 7;
- Fig. 8 is an axonometric view of a flap of the lid;
- Fig. 8A is an enlarged view of the detail enclosed in the circle H2 of Fig. 8.

[0030] With reference to the appended figures, a lid (C) according to the invention and a box (1) provided with such a lid (C) are described.

[0031] As mentioned above, the lid (C) is suitable for being associated with a box (1) suitable for being used to store fruit and vegetable products.

[0032] With reference to Figs. 3, 4 and 5, the box (1), which is preferably made of a plastic material, has a parallelepiped shape and comprises a bottom wall (10), and four side walls (11, 12) which are planar and disposed two by two in opposite position, namely two longitudinal side walls (12) and two transverse side walls (11).

[0033] The side walls (11, 12) are inclined in such a way that the box (1) has a tapered shape with increasing dimensions going from the bottom wall (10) upward.

[0034] Each side wall (11, 12) comprises an upper edge (13).

[0035] A compartment (V) is defined by the side walls (11, 12) and by the bottom wall (10). The upper edges (13) of the side walls (11, 12) define an opening that provides access to said compartment (V).

[0036] With reference to Figs. 1 and 2, the lid (C) according to the invention, which is preferably made of a plastic material, comprises a boxed bearing frame (2) that defines a central opening (20). The bearing frame (2) is suitable for being coupled with the upper edges

(13) of the side walls (11, 12), and therefore its shape will correspond to the one defined by the upper edges of the side walls. Precisely for this reason, the bearing frame (2) is quadrangular and comprises four rectilinear sections (21, 22), disposed two by two in parallel opposed position, namely two longitudinal sections (22) and two transverse sections (21), which are suitable for being disposed above the respective upper edges (13) of the side walls (11, 12).

[0037] The bearing frame (2) comprises a first face (2a) suitable for facing the box (1), more precisely towards the upper edges (13) of the side walls (11, 12) of the box (1), and a second face (2b) facing the opposite direction.

[0038] Snap-in fastening means, which are suitable for cooperating with the upper edges (13) of the side walls (11, 12) of the box (1), are provided on the first face (2a) of the bearing frame (2), in such a way as to fasten the lid (C) to the box (1).

[0039] The snap-in fastening means comprise a tooth (6) that protrudes from said first face (2a) and interferes against a counter-surface (7) disposed on the upper edge (13) of the side walls (11) of the box (1).

[0040] With reference to Fig. 6, the upper edge (13) comprises a first section (131) disposed in a substantially horizontal position that extends outwardly from the box (1), and a second section (132) disposed in a substantially vertical position that extends under the first section (131).

[0041] The second section (132) comprises a free ending edge provided with the counter-surface (7) against which said tooth (6) interferes.

[0042] The bearing frame (2) has an inverted "L" cross-section and comprises a first wing (2a) suitable for being disposed side-by-side with the first section (131) of the upper edge (13), and a second wing (2b) suitable for being disposed side-by-side with the second section (132) of the upper edge (13).

[0043] Said tooth (6) is provided on the first face (2a) in correspondence with said second wing (2b) and in proximity to the free edge of the second wing (2b).

[0044] With reference to Figs. 1 and 2, the lid (C) comprises two flaps (3) connected to the bearing frame (2) by means of connection means (L) configured in such a way that the two flaps (3) can be alternately disposed:

- in a closing position (shown in Fig. 1), wherein said flap (3) covers said central opening (20) of the bearing frame (2);
- and in an opening position (shown in Fig. 2), wherein said flap (3) does not cover said central opening (20) of the bearing frame (2).

[0045] More precisely, said connection means (L) for each flap (3) are revolving connection means and have an axis of rotation (X1, X2), in such a way that said flap (3) can rotate around the axis of rotation (X1, X2).

[0046] In particular, according to the preferred embodiment of the invention shown in the attached figures, said

connection means for each flap (3) comprise a spaced-out set of pins (4) provided on the second face of the bearing frame (2) and aligned along said axis of rotation (X1, X2), as well as a spaced-out set of hinging seats (5) provided on a longitudinal edge (31) of the flap (3) and suitable for receiving and elastically engaging said pins (4) with possibility of rotating around said axis of rotation (X1, X2).

[0047] Preferably, the sets of pins (4) for the two flaps (3) are obtained on the longitudinal sections (22) of the bearing frame (2).

[0048] It should be noted that nothing would change in the implementation of the coupling between the flap (3) and the bearing frame (2) if said hinging seats and said pins were reversed, that is to say if the hinging seats were provided on the bearing frame (2) and said pins were provided on the flap (3).

[0049] Each flap (3) has a substantially rectangular shape and comprises a longitudinal connecting edge (31), wherein said hinging seats (5) are disposed, a longitudinal stop edge (32) suitable for abutting against the other longitudinal stop edge (32) of the other flap (3) and two transverse edges (33).

[0050] With reference to Fig. 7, 7A, 8 and 8A, said lid also comprises elastic snap-in fixing means (91, 92) obtained on each flap (3) and on the bearing frame (2) configured in such a way as to firmly fix the flaps (3) when they are in closing position.

[0051] Said fixing means (91, 92) ensure that flaps (3) remain in closed position even if the lid (C) is tipped over.

[0052] According to the embodiment of Figs. 7, 7A, 8 and 8A, said fixing means (91, 92) comprise:

- a flexible tab (91), one for each transverse border (33) of the flap (3), having a retention member (91a); and
- a recess (92) obtained on an inner edge of the bearing frame (2) wherein said retention member (91a) is inserted.

[0053] The recess (92) comprises an invitation surface that is suitably configured in such a way as to favor the inward bending of the flexible tab (91) during the insertion and the removal of the retention member (91a) from the recess (92).

[0054] Said lid (C) further comprises end-of-travel means that go in contact with the flaps (3) when they are disposed in closing position.

[0055] More precisely, said end-of travel means comprise a protrusion (D) that is obtained on the internal edge of the bearing frame (2), which goes in contact with the transverse edges (33) of the flaps (3).

[0056] It should be noted that, although the attached figures show a lid (C) provided with two opposite flaps (3), nothing would change for the achievement the objectives pursued by the present invention in case of a lid (C) provided with a single flap.

[0057] Moreover, although the attached figures show

a parallelepiped box (1) with rectangular section provided with four planar side walls (11, 12), the box (1) can have a different shape, such an hexagonal or octagonal shape, or even another particular shape, for example with side walls, namely two planar opposite walls and two curved walls with concavity towards the center of the box.

[0058] In such a case the lid (C) will be made in such a way as to coincide with the shape of the box (100) and will in any case have at least two rectilinear sections, disposed in parallel opposite position.

[0059] Moreover, although the lid (C) of the attached figures is suitable for being fastened and unfastened with respect to the upper edge (13) of the side walls (11, 12), according to an alternative form of the invention said lid (C) can be made in one piece with the upper edge (13) of the side walls (11, 12) of the box (1).

[0060] As a result of the foregoing description it is manifest that the present invention may prove to be a viable and improved alternative to the solutions of the prior art.

[0061] In particular, the provision of a lid (C) with two flaps (3) allows to move the flaps between the open position and the closed position in order to permit or prevent the access to the compartment (V) as desired, and, if necessary, to easily extract the entire lid (C) without having to unfasten the revolving connection means of the flaps (3), thus avoiding possible breakage or damage of the connection means.

[0062] In this regard, if the boxes are empty and the user wants to stack them together, it will be simply necessary to unfasten the lid from box and stack the boxes.

[0063] In this way, the connection means (L) that connect the flaps to the bearing frame (2) of the lid (C) will be protected.

[0064] Finally, it should be pointed out that, even until now it has always been assumed that the lid (C) is used to cooperate with a box (1), nothing prevents from advantageously using the innovative idea of the present invention, without leaving the scope of the innovative idea, also for different purposes.

[0065] For illustrative purposes, said lid (C) may be applied to a dustbin or to other types of containers.

[0066] Moreover, a further object of the present invention is an assembly comprising a box, a lid (C) and an additional monolithic lid, wherein the lid (C) and the additional monolithic lid may be alternately fastened to the box.

[0067] Numerous variations and modifications may be made to the present embodiment of the invention, within the scope of a person skilled in the art, and in any case falling within the scope of the invention as expressed by the appended claims.

Claims

1. Lid (C) for a box comprising:

- a bearing frame (2) defining a central opening

- (20); said bearing frame (2) comprising a first face (2a) suitable for facing the box, and a second face (2b) facing the opposite direction; wherein said bearing frame (2) comprises at least four sections (21, 22), of which two sections (22) are rectilinear, parallel and opposite; - at least one flap (3) connected to one of the two rectilinear, parallel and opposite sections (22) of the bearing frame (2); - connection means (L) between the at least one flap (3) and the bearing frame (2) configured in such a way that said at least one flap (3) can be alternatively disposed: - in a closing position, wherein said flap (3) covers said central opening (20) of the bearing frame (2); and - in an opening position, wherein said flap (3) does not cover said central opening (20) of the bearing frame (2).
2. The lid (C) of claim 1, wherein said connection means (L) are revolving connection means and have an axis of rotation (X1, X2) disposed laterally with respect to said central opening (20).
3. The lid (C) according to any one of the preceding claims, comprising two opposing flaps (3), each one of them being connected to one of said two rectilinear, parallel and opposite sections (22).
4. The lid (C) of claim 2 or 3, wherein said connection means (L) comprise:
- a set of pins (4) obtained on the annular frame (20) and aligned along said axis of rotation (X1, X2);
 - a set of hinging seats (5) obtained on a longitudinal edge (31) of said at least one flap (3) wherein said pins (4) are suitable for being inserted with elastic snap-in coupling and with the possibility of rotating around said axis of rotation (X1, X2).
5. The lid (C) according to any one of the preceding claims, comprising elastic snap-in fixing means (91, 92) obtained on the at least one flap (3) and on the bearing frame (2) and configured in such a way as to firmly fix the at least one flap (3) when it is in closing position.
6. The lid (C) of claim 5, wherein said fixing means (91, 92) comprise:
- at least one flexible tab (91) obtained on an edge of the flap (3) and having a retention member (91a); and
 - at least one recess (92) obtained on an inner edge of the bearing frame (2) wherein said re-
- tention member (91a) of the at least one flexible tab is inserted.
7. The lid (C) according to any one of the preceding claims, wherein said bearing frame (2) comprises snap-in fastening means obtained on said first face (2a) of the bearing frame (2), which are suitable for cooperating with upper edges (13) of side walls (11, 12) of the box (1).
8. The lid (C) of claim 7, wherein said snap-in fastening means comprise at least one tooth (6) suitable for interfering against a counter-surface (7) disposed on an upper edge (13) of at least one of said side walls (11, 12) of the box (1).
9. The lid (C) of claim 8, wherein said bearing frame (2) has an inverted "L" shaped cross-section comprising a first wing (2a) suitable for being disposed side-by-side with a first horizontal portion (131) of the upper edge (13), and a second wing (2b) suitable for being disposed side-by-side with a second vertical portion (132) of the upper edge (13); said second wing (2b) comprising a free ending edge that abuts said tooth (6).
10. Box (1) comprising:
- a bottom wall (10);
 - at least four side walls (11, 12), of which two planar opposite walls (12); each side wall (11, 12) comprising an upper edge (13); wherein said side walls (11, 12) have such an inclination that the box (1) has a tapered shape with increasing dimensions going from the bottom wall (10) upwards;
 - a compartment (V) defined by said side walls (11, 12) and by said bottom wall (10);
 - an upper opening that provides access to the compartment (V) defined by the upper edge (13) of the side walls (11, 12);
 - a lid (C) according to any one of claims 1 to 6; wherein said lid (C) is connected to the upper edge (13) of said side walls (11, 12); wherein the two rectilinear, parallel and opposite sections (12) surmount the upper edges (13) of the planar side walls (12) of the bearing frame (2).
11. The box (1) of claim 10, wherein said lid (C) is connected to the upper edge (13) of said side walls (11, 12) in a removable manner by means of snap-in fastening means of the bearing frame (2).
12. The box (1) of claim 11, wherein said snap-in fastening means comprise a tooth (6) obtained on the bearing frame (2) and suitable for interfering against a counter-surface (7) disposed on the upper edge (13) of the side walls (11, 12).

13. The box (1) of claim 12, wherein the upper edge (13) of each side wall (11, 12) comprises a first substantially horizontal section (131) that extends outwardly from the box (1), and a second section (132) disposed in substantially vertically position, which extends below the first section (131); said second section (132) comprising a free ending edge provided with said counter-surface (7) against which said tooth (6) interferes; wherein said bearing frame (2) has an inverted "L" shaped cross-section comprising a first wing (2a) suitable for being placed side by side to the first section (131) of the upper edge (13), and a second wing (2b) suitable for being disposed side by side to the second section (132) of the upper edge (13); said tooth (6) being obtained in said second wing (2b) of said bearing frame (2) close to a free edge of said second wing.
14. Assembly comprising:
- a box (1) according to any one of claims 10 to 13; and
 - an additional monolithic lid (Q);
 - wherein said lid (C) and said additional lid (Q) can be alternatively connected to said upper edge (13) of the box (1).
15. The assembly of claim 14, wherein said additional monolithic lid (Q) completely covers the opening that provides access to the compartment.

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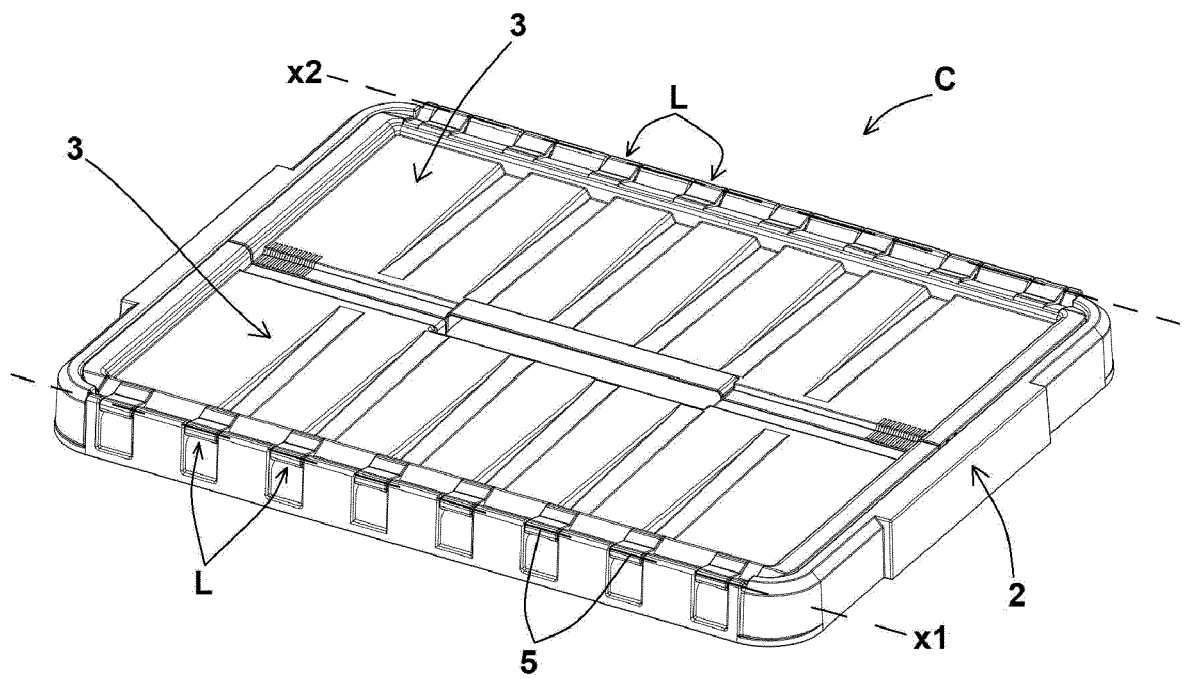
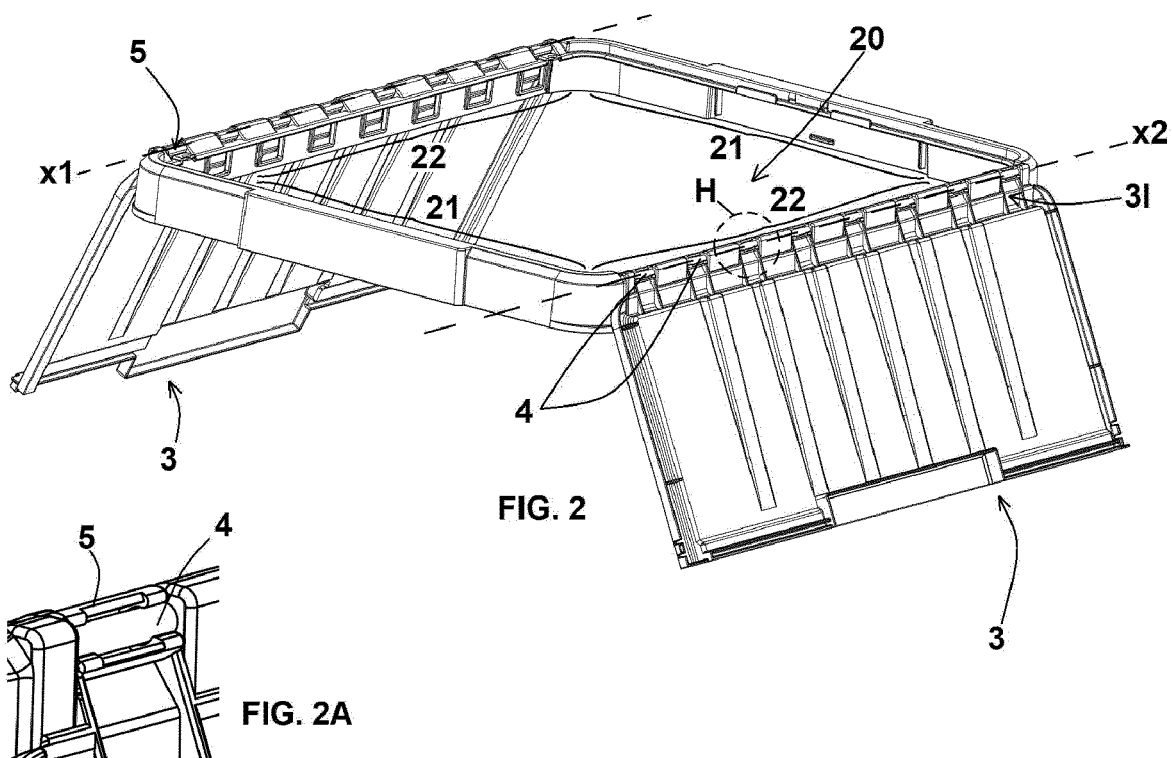
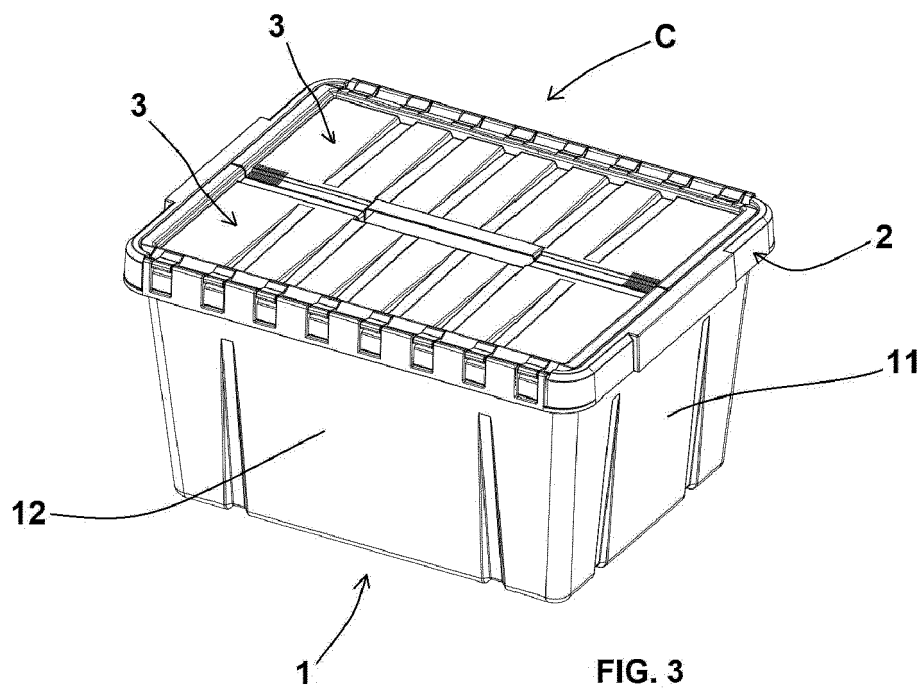


FIG. 1





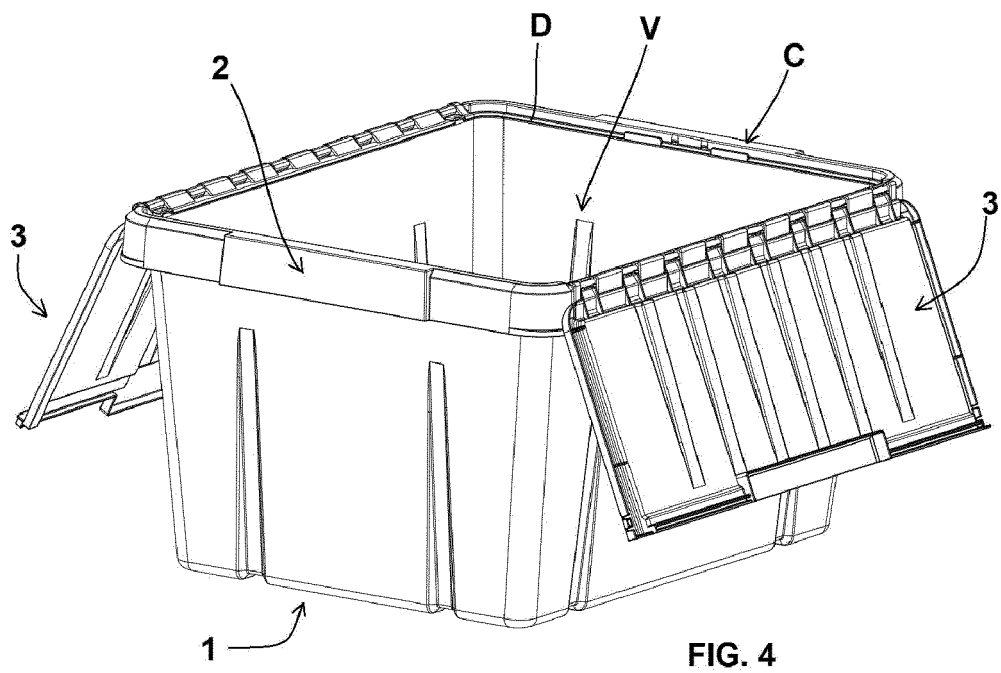
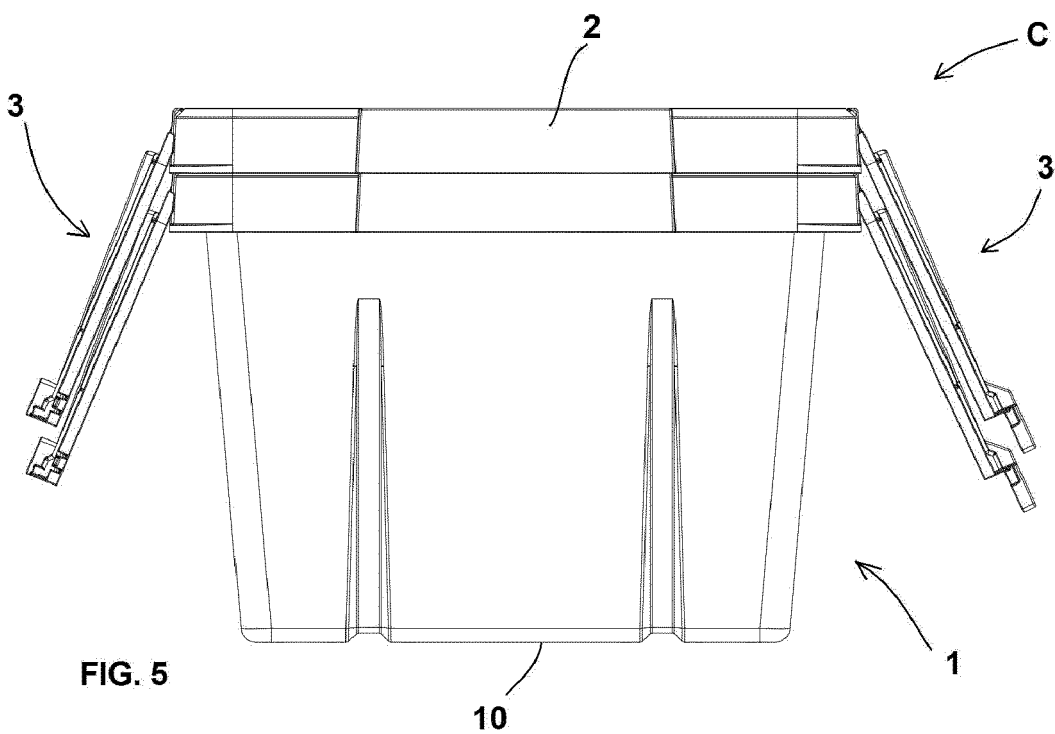


FIG. 4



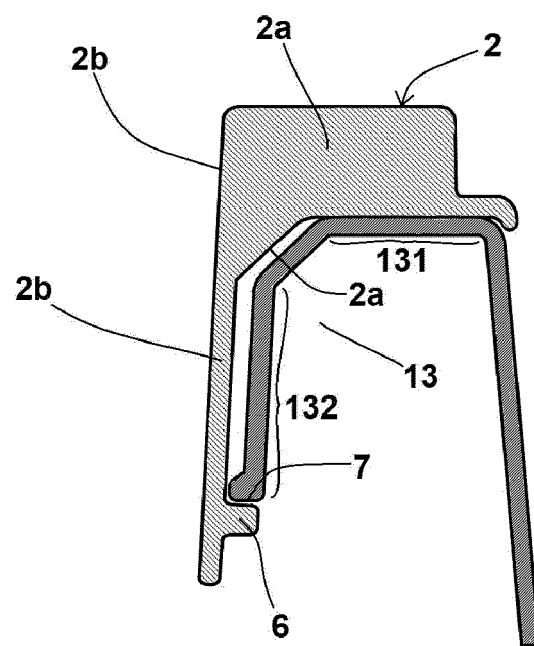


FIG. 6

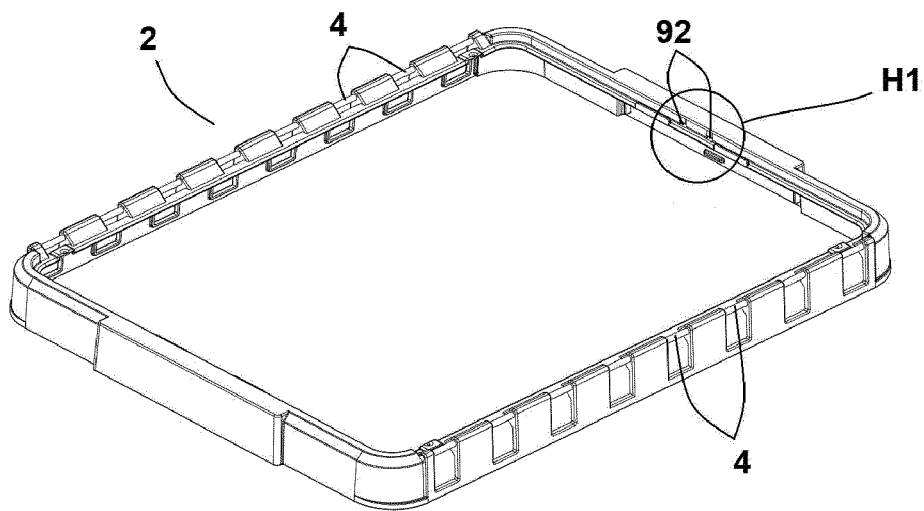


FIG. 7

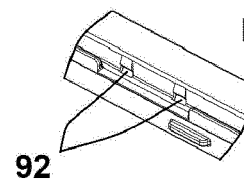
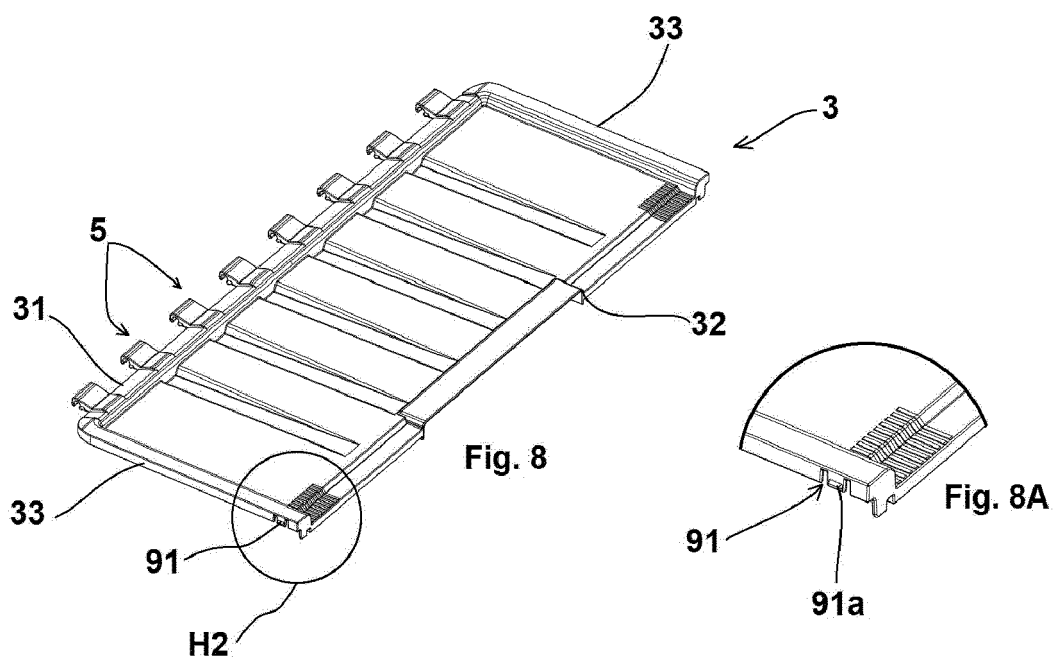


FIG. 7A





EUROPEAN SEARCH REPORT

 Application Number
EP 21 18 4074

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X	US 4 765 579 A (ROBBINS III EDWARD S [US] ET AL) 23 August 1988 (1988-08-23) * column 4, line 43 - column 5, line 47 * * figures 1-4 *	1,2,4, 7-13	
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 14 October 2021	Examiner Leijten, René
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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 Application Number
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Place of search Munich		Date of completion of the search 14 October 2021	Examiner Leijten, René
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			

1 EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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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
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