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(54) FOOD TRAY WITH TAMPER-EVIDENT CLOSURE

(57) The present invention relates to a food tray, in particular a tray provided with a tamper-evident closure.

In particular, the invention relates to a tamper evident tray (1) for food, comprising a bottom (2), side walls (3), a rear wall (3a) and a front wall (3b), extending in elevation from the bottom (2), a cover (6), hinged to said rear wall (3a) and made in one piece with the tray (1), and a peripheral edge (4) extending outwards from an upper end of said walls (3, 3a, 3b), the cover (6) comprising a front edge (6c), a rear edge (6d) and side edges (6e, 6f), **characterized in that** the peripheral edge (4) comprises a rib (4d) extending upwards so as to make the front edge (6c) of the cover (6) inaccessible when the cover (6) is in the closing position, **and in that** the cover (6) and the front wall (3b) comprise a pin (9) and a deformable button (13), respectively, arranged in vertical alignment, when the cover (6) is in the closing position, and cooperating so that the pressure on the deformable button (13) acts on the pin (9) for opening the cover (6) and so that the deformable button (13) is permanently deformed.

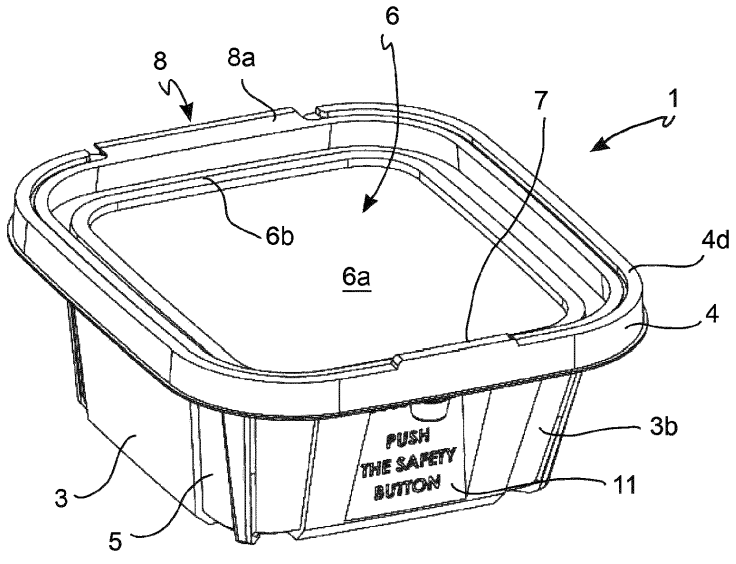

FIG. 1

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Description

[0001] The present invention relates to a food tray, in particular a tray provided with a tamper-evident closure.

[0002] It is known that many foods, in particular fresh foods or pre-cooked foods, are marketed by large retailers packaged in special trays made of transparent materials such as polypropylene (PP), polyethylene terephthalate (PET), and similar materials.

[0003] Such trays are normally provided with a cover hinged on one side of the edge and which is made in one piece therewith. A frequent problem is related to the ease of opening and closing the cover, whereby it is difficult to subsequently understand if third parties have had access to the contents of the tray and have then placed it back on the shelf. For example, when the trays are provided with an adhesive tab joining the cover and the edge, it is sometimes possible to partially detach the tab and then make it adhere again, without an obvious trace of having opened the tray.

[0004] Therefore, trays with tamper-evident closure have been suggested, which provide for the at least partial removal of a tab placed at the hinging portion and also made in one piece with the rest of the container. This solution, although effective for the purpose pursued, is however relatively expensive to manufacture. Furthermore, the partially detached tab increases the volume of the tray when the consumer, having withdrawn a part of the contents, places it in the refrigerator for storage.

[0005] Therefore, the problem addressed by the present invention is that of providing a food tray which is simple and inexpensive to manufacture, simple to use and with a small volume.

[0006] Such a problem is solved by a food tray as outlined in the appended claims, the definitions of which form an integral part of the present description.

[0007] Therefore, the present invention relates to:

1) a tamper evident tray for food, comprising a bottom, side walls, a rear wall and a front wall, extending in elevation from the bottom, a cover, hinged to said rear wall and made in one piece with the tray, and a peripheral edge extending outwards from an upper end of said walls, the cover comprising a front edge, a rear edge and side edges, **characterized in that** the peripheral edge comprises a rib extending upwards so as to make the front edge of the cover inaccessible when the cover is in the closing position, **and in that** the cover and the front wall comprise a pin and a deformable button, respectively, arranged in vertical alignment, when the cover is in the closing position, and cooperating so that the pressure on the deformable button acts on the pin for opening the cover and so that the deformable button is permanently deformed;

2) a tray as in point 1), wherein said walls are slightly flared in shape and are connected by angular portions, preferably beveled or curvilinear in shape, which preferably have ribs or channels, so as to form stiffening elements;

3) a tray as in point 1) or 2), wherein the edge comprises a stepped section formed by, in succession from an upper end of said walls, an abutment plane, a step having a rise and a tread, and said rib from which a vertical side departs outwards, which preferably ends at the level of the abutment plane;

4) a tray as in any one of points 1 to 3, wherein, at the front wall, in a substantially central position, the rib comprises an elevation preferably extending over a third or more of the width of the front wall;

5) a tray as in any one of points 3) to 4), wherein the edges of the cover have a stepped-profile cross-section, comprising a first flat portion, a rise portion and a second flat portion, wherein the first flat portion, the rise portion and the second flat portion are configured to abut against the abutment plane, the rise and the tread of the edge, respectively, and to snap-fit therewith;

6) a tray according to any one of points 1) to 5), wherein the cover comprises a flat portion from which a rib rises concentrically, which is interrupted at the height of the midpoint of the front edge, where the flat portion comprises a cavity obtained by deformation and defining said downwardly projecting pin;

7) a tray according to any one of points 1) to 6), wherein the cover is hinged to the edge of the rear wall by a hinged portion joining a lower end of the vertical side with a tab extending from the rear edge of the cover and comprising a corrugated surface having a fretted profile in section;

8) a tray according to any one of points 1) to 7), wherein the front wall of the tray comprises a recess formed at the central portion of the front wall and comprising a connecting portion with the edge, wherein the connecting portion comprises, on an upper surface, a cavity defining said deformable button facing downwards and arranged in vertical alignment with the pin of the cover, said pin being partially accommodated in said cavity when the cover is in the closing position;

9) a tray according to any one of points 1) to 8), wherein the tray is made of a plastic material selected from polypropylene or polyethylene terephthalate.

[0008] Further features and advantages of the present invention will become more apparent from the description of some embodiments thereof, given below by way of non-limiting indication, with reference to the following figures:

Figure 1 depicts a perspective view of the tray according to the invention;

Figure 2 depicts a top view of the tray in figure 1;

Figure 3A depicts a front view of the tray in figure 1 in a first operating condition;

Figure 3B depicts a front view of the tray in figure 1

in a second operating condition;

Figure 4A depicts a side view according to section A-A of the tray of the invention in said first operating condition;

Figure 4B depicts a side view according to section A-A of the tray of the invention in said second operating condition;

Figure 5 depicts a view according to section B-B of the tray of the invention;

Figure 6 depicts a detail of the view in figure 5;

Figure 7 depicts a partial perspective view of the hinge detail of the tray of the invention.

[0009] The tray, indicated as a whole by numeral 1, comprises a bottom 2, side walls 3, a rear wall 3a and a front wall 3b, extending in elevation from the bottom 2, and a cover 6 hinged to said rear wall 3a and made in one piece with the tray 1.

[0010] The tray 1 further comprises a peripheral edge 4 extending outwards from the upper end of the walls 3, 3a, 3b.

[0011] The tray 1 can be made of a plastic material normally used for this type of application, sufficiently elastic and deformable, for example polypropylene or polyethylene terephthalate and can be made by hot molding (thermoforming) or injection.

[0012] The walls 3, 3a, 3b can be slightly flared in shape and are connected by angular portions 5, preferably beveled or curvilinear in shape. The angular portions 5 can have ribs or channels, so as to form stiffening elements.

[0013] The bottom 2 can be smooth or have a slightly raised central portion of width such as to occupy at least 80% of the total surface of the bottom 2.

[0014] As shown in detail in figure 6, the edge 4 comprises a stepped section formed, in succession from the upper end of a wall 3, 3a, 3b, by an abutment plane 4a, a step having a rise 4b and a tread 4c, and a rib 4d from which a vertical side 4e departs outwards, which preferably ends at the level of the abutment plane 4a.

[0015] At the front wall 3b, in a substantially central position, the rib 4d comprises an elevation 7 extending for example over a third or more of the width of the front wall 3b.

[0016] The cover 6 comprises a flat portion 6a, a front edge 6c, a rear edge 6d and side edges 6e, 6f.

[0017] The edges 6c, 6d, 6e, 6f of the cover 6 have a stepped-profile cross-section 10, comprising a first flat portion 10a, a rise portion 10b and a second flat portion 10c, where the first flat portion 10a, the rise portion 10b and the second flat portion 10c are configured to abut against the abutment plane 4a, the rise 4b and the tread 4c of the edge 4 of the tray 1, respectively, and to snap-fit therewith. Such a coupling is obtained by the interference between the various surfaces and the deformability of the material with which the tray 1 is made.

[0018] From the flat portion 6a a rib 6b rises concentrically, which is interrupted at the height of the midpoint of the front edge 6c, where the flat portion 6a comprises a cavity obtained by deformation of the flat portion 6a and which therefore defines a downwardly projecting pin 9.

[0019] The cover 6 is hinged to the edge 4 of the rear wall 3a by a hinged portion 8.

[0020] The hinged portion 8 joins the lower end of the vertical side 4e with a tab 8a extending from the rear edge 6d of the cover 6 and comprises a corrugated surface 8b having a fretted profile in section, i.e., formed by segments alternately arranged in perpendicular and parallel lines. The corrugated surface 8b thus configured allows obtaining a good elasticity, favoring the closure of the cover 6 on the tray 1.

[0021] The front wall 3b of the tray 1 comprises a recess 11 formed at the central portion of the front wall 3b and comprising a connecting portion 12 with the edge 4. The connecting portion 12 comprises, on the upper surface, a cavity 12a defining a deformable button 13 facing downwards.

[0022] The cavity 12a is arranged in vertical alignment with the pin 9 of the cover 6 and accommodates it at least partially when the cover 6 is in the closing position. Conversely, as shown in figures 3A-3B and 4A-4B, the deformable button 13, under the bias of the pressure of a user's finger, is configured to deform until it protrudes, at least partially, upwards and presses against the pin 9 of the cover 6, causing it to open.

[0023] The tamper-evident tray 1 works as follows. When the cover 6 has been closed on the body of the tray, matching the respective edges thereof by snap-fitting, the pin 9 is positioned in vertical alignment with the recess 12a. The rib 4d and the elevation 7 protruding further therefrom prevent gripping the stepped profile 10 of the edges 6c, 6d, 6e, 6f of the cover 6, so that the user cannot lift the cover 6 to open the tray.

[0024] The only way to open the tray 1 is to press the button 13, so as to apply a pressure to the pin 9 of the cover 6 and cause it to lift, as shown in figure 4B. However, such a pressure on the deformable button 13 causes the irreversible deformation thereof. If the tray 1 were then closed again, a subsequent buyer would notice the tampering by virtue of the permanent deformation of the button 13.

[0025] For example, as shown in the figures, the recess 11 of the front wall 3b can comprise instructions, obtained for example by relief deformation of the material, with the function of inviting to press the button 13 to open the tray 1.

[0026] The tray 1 according to the invention allows achieving the preset purposes. In fact, it is fact simple to manufacture, is compact and does not have protruding elements of such a size as to impact the overall volume of the tray. The tamper evident system is also simple and effective.

[0027] It is apparent that only some particular embodiments of the present invention have been described, to which those skilled in the art will be able to make all

changes required to adapt it to particular applications, without departing from the scope of protection of the present invention.

Claims

1. A tamper evident tray (1) for food, comprising a bottom (2), side walls (3), a rear wall (3a) and a front wall (3b), extending in elevation from the bottom (2), a cover (6), hinged to said rear wall (3a) and made in one piece with the tray (1), and a peripheral edge (4) extending outwards from an upper end of said walls (3, 3a, 3b), the cover (6) comprising a front edge (6c), a rear edge (6d) and side edges (6e, 6f), **characterized in that** the peripheral edge (4) comprises a rib (4d) extending upwards so as to make the front edge (6c) of the cover (6) inaccessible when the cover (6) is in the closing position, **and in that** the cover (6) and the front wall (3b) comprise a pin (9) and a deformable button (13), respectively, arranged in vertical alignment, when the cover (6) is in the closing position, and cooperating so that the pressure on the deformable button (13) acts on the pin (9) for opening the cover (6) and so that the deformable button (13) is permanently deformed.

2. The tray (1) according to claim 1, wherein said walls (3, 3a, 3b) are slightly flared in shape and are connected by angular portions (5), preferably beveled or curvilinear in shape, which preferably have ribs or channels, so as to form stiffening elements.

3. The tray (1) according to claim 1 or 2, wherein the edge (4) comprises a stepped section formed by, in succession from an upper end of said walls (3, 3a, 3b), an abutment plane (4a), a step having a rise (4b) and a tread (4c), and said rib (4d) from which a vertical side (4e) departs outwards, which preferably ends at the level of the abutment plane (4a).

4. The tray (1) according to any one of claims 1 to 3, wherein, at the front wall (3b), in a substantially central position, the rib (4d) comprises an elevation (7) preferably extending over a third or more of the width of the front wall (3b).

5. The tray (1) according to any one of claims 3 to 4, wherein the edges (6c, 6d, 6e, 6f) of the cover (6) have a stepped-profile cross-section (10), comprising a first flat portion (10a), a rise portion (10b) and a second flat portion (10c), wherein the first flat portion (10a), the rise portion (10b) and the second flat portion (10c) are configured to abut against the abutment plane (4a), the rise (4b) and the tread (4c) of the edge (4), respectively, and to snap-fit therewith.

6. The tray (1) according to any one of claims 1 to 5, wherein the cover (6) comprises a flat portion (6a) from which a rib (6b) rises concentrically, which is interrupted at the height of the midpoint of the front edge (6c), where the flat portion (6a) comprises a cavity obtained by deformation and defining said downwardly projecting pin (9).

7. The tray (1) according to any one of claims 1 to 6, wherein the cover (6) is hinged to the edge (4) of the rear wall (3a) by a hinged portion (8) joining a lower end of the vertical side (4e) with a tab (8a) extending from the rear edge (6d) of the cover (6) and comprising a corrugated surface (8b) having a fretted profile in section.

8. The tray (1) according to any one of claims 1 to 7, wherein the front wall (3b) of the tray (1) comprises a recess (11) formed at the central portion of the front wall (3b) and comprising a connecting portion (12) with the edge (4), wherein the connecting portion (12) comprises, on an upper surface, a cavity (12a) defining said deformable button (13) facing downwards and arranged in vertical alignment with the pin (9) of the cover (6), said pin (9) being partially accommodated in said cavity (12a) when the cover (6) is in the closing position.

9. The tray (1) according to any one of claims 1 to 8, wherein the tray (1) is made of a plastic material selected from polypropylene or polyethylene terephthalate.

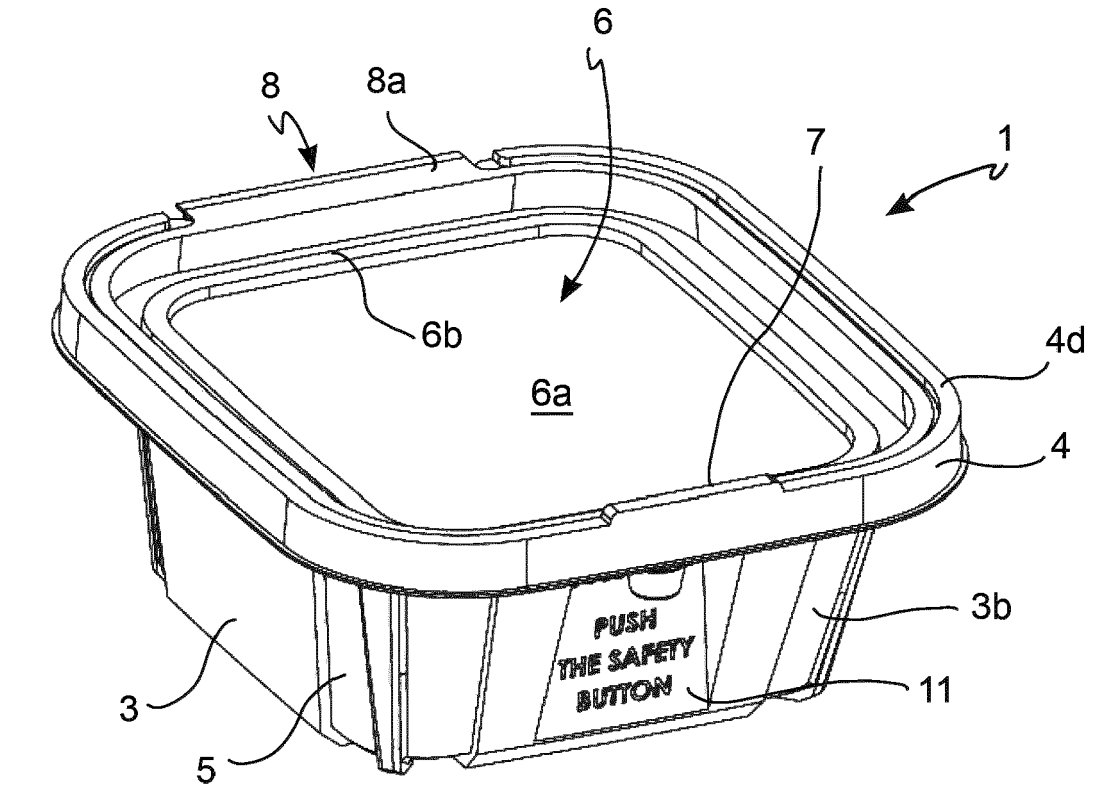
6
8
8a
7
1
6b
4d
6a
4
3b
PUSH
THE SAFETY
BUTTON
11
3
5

FIG. 1

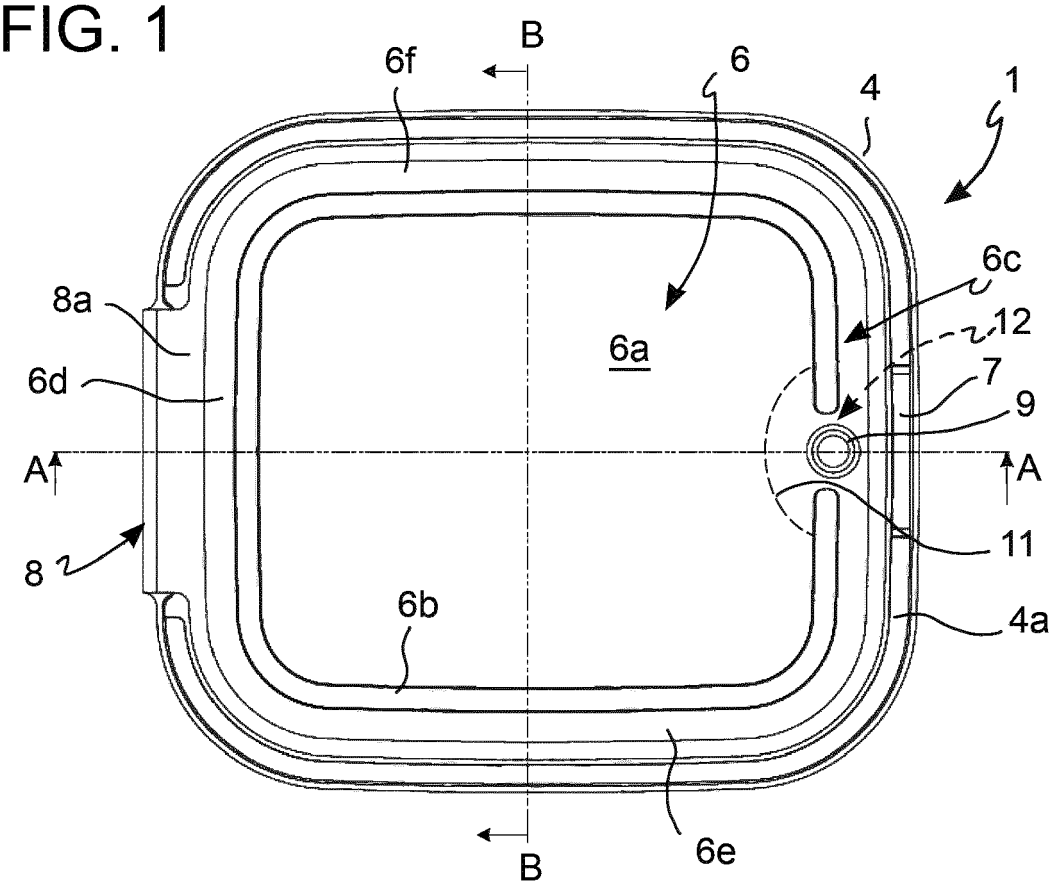
B
6f
6
4
1
6c
8a
12
6a
6d
7
9
A
A
11
8
6b
4a
6e
B

FIG. 2

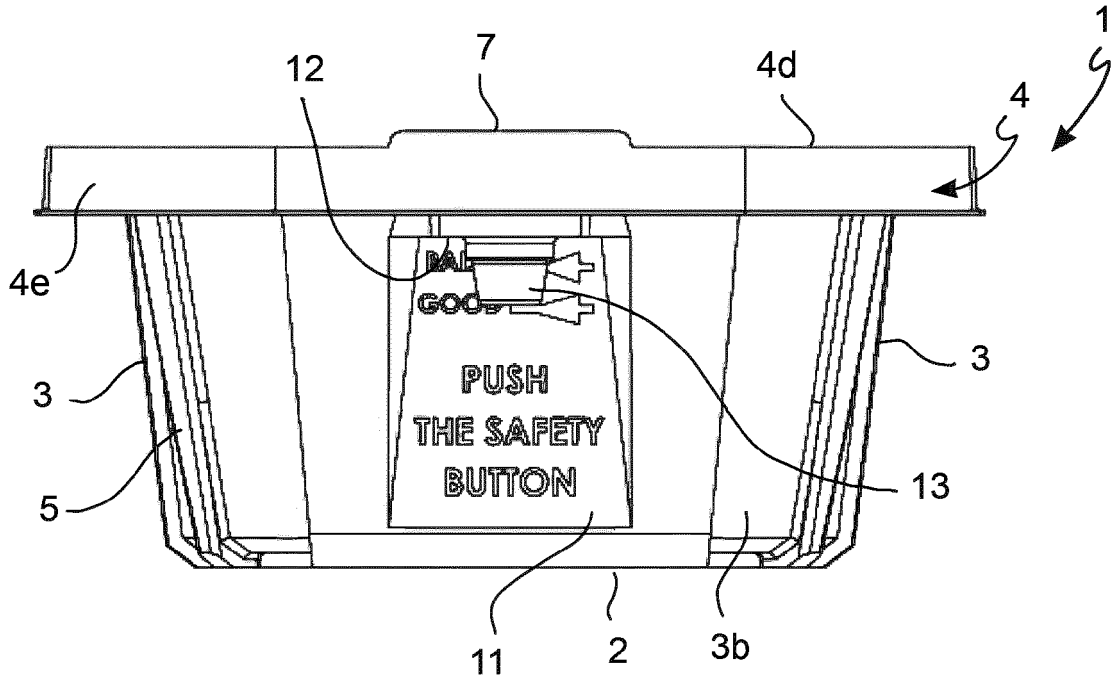
1
7
12
4d
4
4e
3
3
5
PUSH
THE SAFETY
BUTTON
13
11
2
3b

FIG. 3A

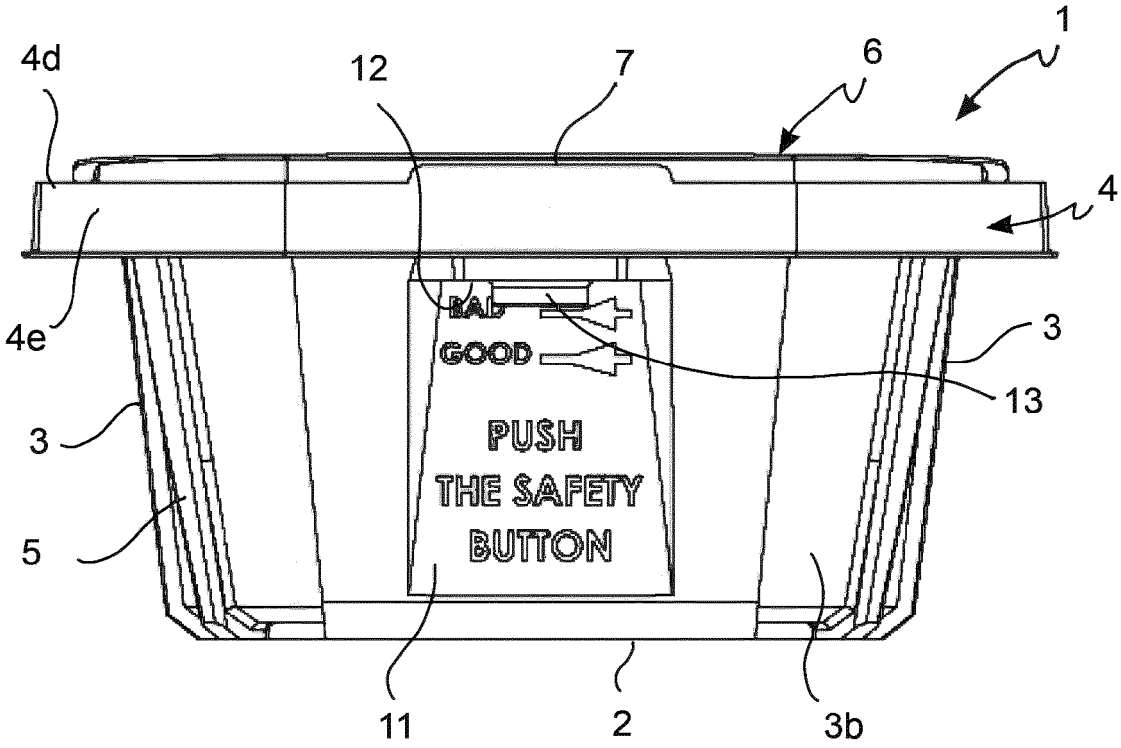
1
4d
12
7
6
4
4e
3
3
5
PUSH
THE SAFETY
BUTTON
13
11
2
3b

FIG. 3B

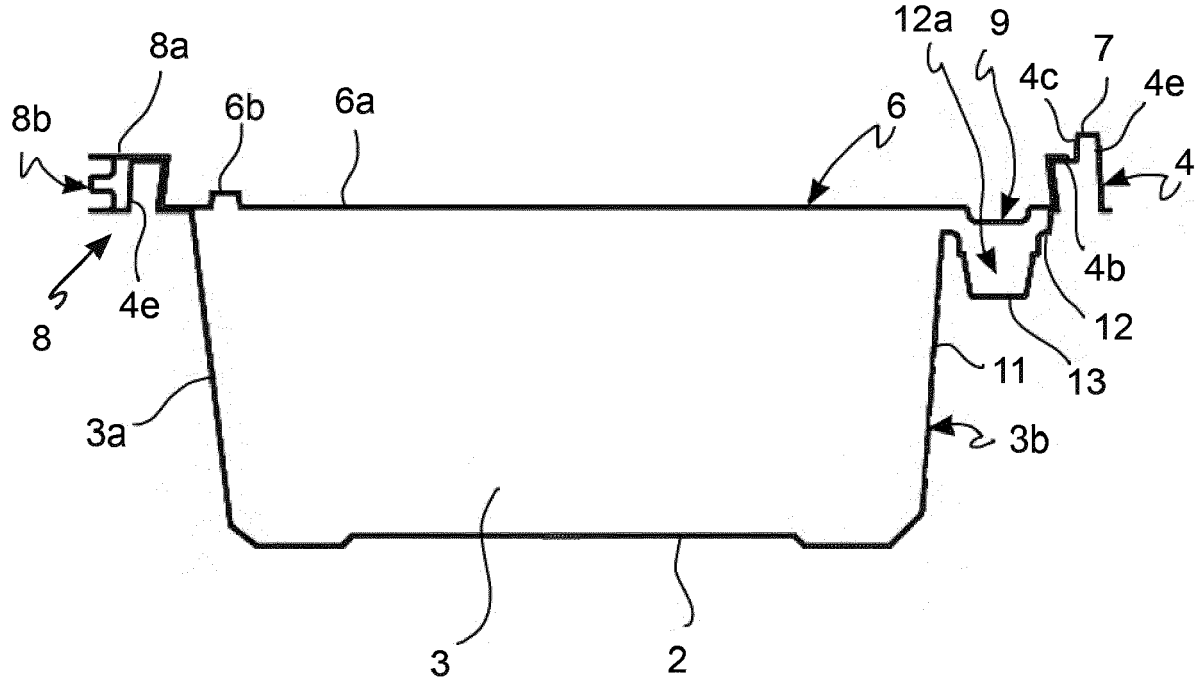
8a
8b
6b
6a
6
12a
9
7
4c
4e
4
4b
12
13
11
3b
3a
8
4e
3
2

FIG. 4A

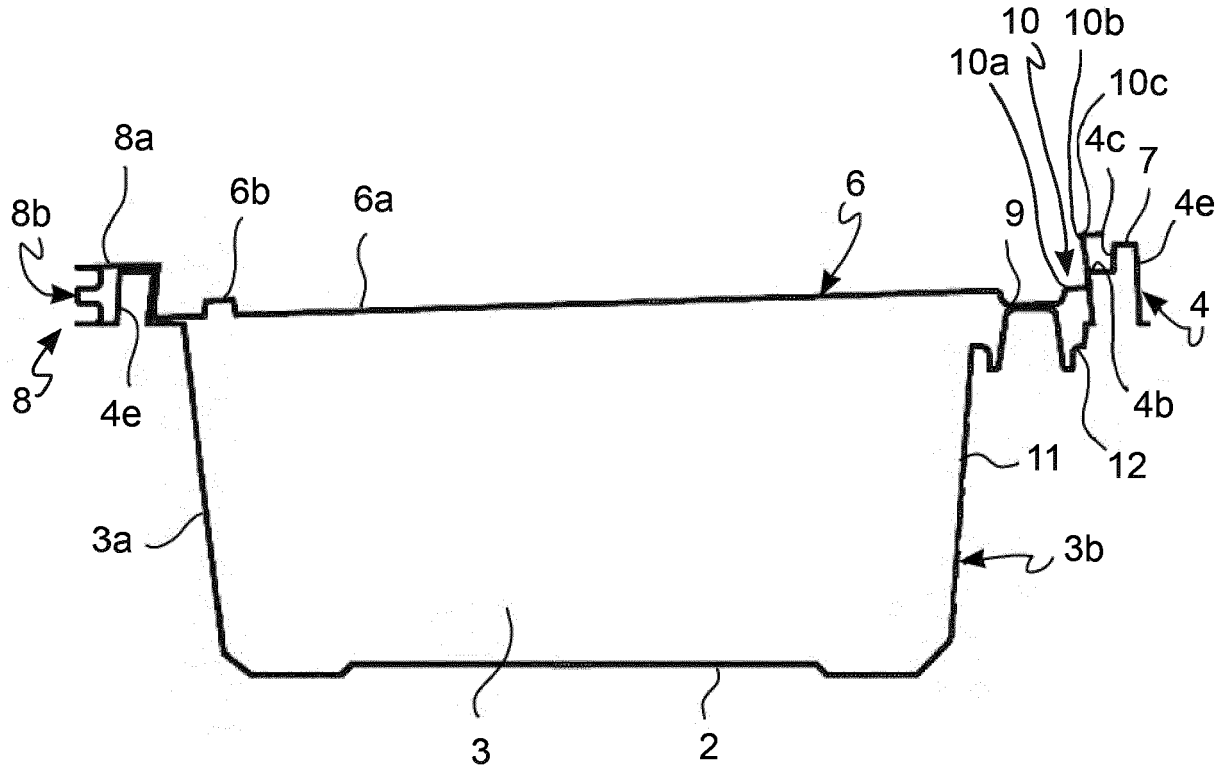
10
10b
10a
10c
8a
4c
7
6b
6a
6
9
4e
8b
4
8
4e
4b
11
12
3a
3b
3
2

FIG. 4B

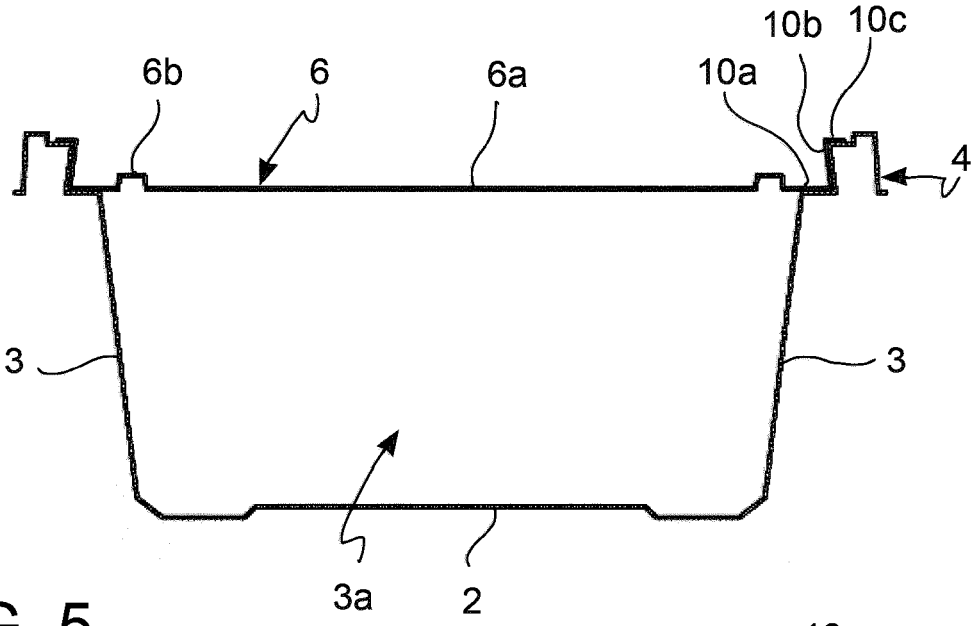

FIG. 5

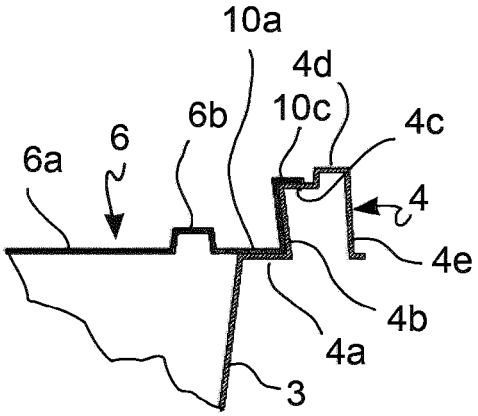

FIG. 6

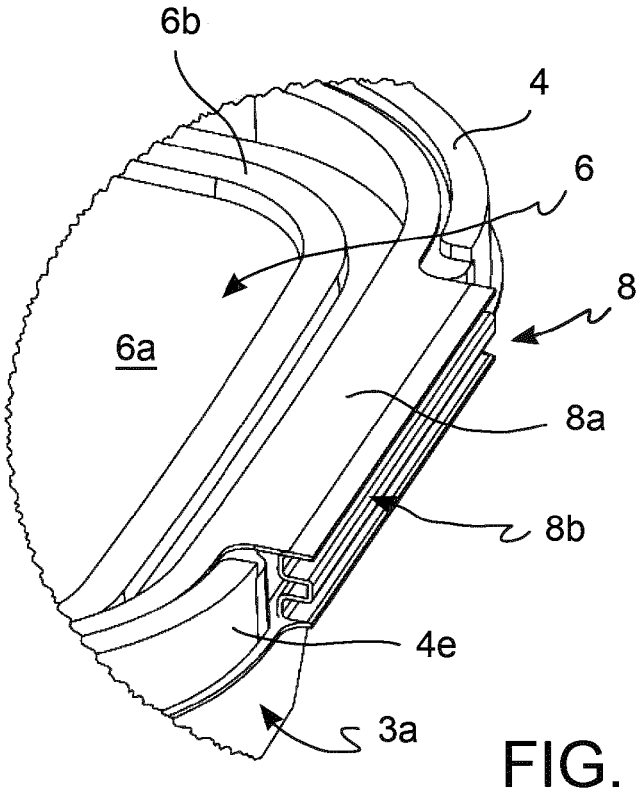

FIG. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 23 17 7949

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			TECHNICAL FIELDS SEARCHED (IPC) B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	20 October 2023	Dominois, Hugo

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20-10-2023

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