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(54) **A TRAY FOR HOLDING AND DISPLAYING ARTICLES AND A METHOD TO OPEN AND PLACE SUCH A TRAY ON A SHELF**

SCHALE ZUM HALTEN UND AUSSTELLEN VON ARTIKELN UND VERFAHREN ZUM ÖFFNEN UND PLATZIEREN SOLCH EINER SCHALE AUF EINEM REGAL

PLATEAU SERVANT À MAINTENIR ET PRÉSENTER DES ARTICLES ET PROCÉDÉ POUR OUVRIR ET PLACER UN TEL PLATEAU SUR UNE ÉTAGÈRE

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Description

Technical field

[0001] The invention relates to a tray for holding and displaying articles suitable for use at the place of sale, for example in retail shops. The tray is in particular suitable for use in a pushfeed system. The invention further relates to a method to open and place such a tray onto the display shelves, more particularly on a pushfeed system at the place of sale.

Background of the invention

[0002] It is known practice to employ trays generally made of cardboard to store and transport articles from the manufacturing location to the place of sale. Typically, a tray for holding and displaying articles is formed from at least one blank made of corrugated cardboard which is suitably cut, scored and folded to produce a box, generally a rectangular shaped box. Once the trays reach the place of sale, the articles are unpackaged from the container and are typically placed on display shelves. As it requires a significant amount of labor to remove the articles from the trays to the display shelves at the place of sale, Shelf Ready Packaging (SRP) became more attractive during recent years.

[0003] Shelf Ready Packaging is the term used to refer to a product that comes in a ready merchandised unit to the place of sale. The Shelf Ready Packaging is preferably easy to identify, easy to open, can easily be put onto the shelf and can be easily be disposed of.

[0004] Shelf Ready Packaging normally includes a cover part which can be removed from a bottom part, for example by tearing away the cover part from the bottom part. To facilitate the removal of the cover part from the bottom part the packaging can be provided with a tear strip or with a tear line, for example a perforated tear line.

[0005] It is important that the trays have sufficient stability to avoid collapsing and/or breaking of the trays when being placed on the shelves. The stability problem is more pronounced in case the trays have a longer length and/or the articles in the tray have a high weight.

[0006] The stability problem can be solved by increasing the design strength of the trays (for example by using thicker cardboard) or by increasing the amount of material (for example by using trays with a higher side walls).

[0007] Although such solutions are solving the stability problem of the trays, such solutions are not desired as they increase the costs (higher material costs) and can not be considered as environmentally friendly solutions as using thicker or more material increases the amount of material to dispose.

[0008] A particular type of Shelf Ready Packaging comprises packaging used in a pushfeed system. In a pushfeed system the articles such as pouches present in the packaging are forwarded to the front of the tray by a pusher plate, for example a plastic pusher plate, driven by a biasing means, such as a spring. In this way the articles are always at the front in the shelves and are thus always visible for the customer. The pusher plate is movably mounted on a guiderail on the shelf. Before putting a tray with pouches in such a pushfeed system the tray is provided with an opening in the back wall or in the back wall and the bottom wall allowing the pusher plate to reach the articles present in the tray and thus to allow the pusher plate to push the articles in the tray forward. To provide the tray with an opening in the back wall or in the back wall and the bottom wall, a strip (tear strip) is removed from the back wall or from the bottom wall and the back wall. Once the strip is removed from the bottom wall and/or from the back wall, the bottom wall and/or the back wall are provided with a recess (open space) and consequently the tray loses strength. In case the trays have a limited length and/or a limited weight, no considerable problems are observed when a tray is placed in a pushfeed system. However, in case trays with a longer length are used or the weight of the articles in the tray is high, problems occur such as collapsing of the trays or breaking of the sidewalls with as consequence that the articles fall. Although the problem can be solved by using thicker cardboard for example B-flute (3 mm) instead of E-flute (1.8-2mm) or by using higher side walls, none of these solutions is desired.

[0009] GB893562 relates to folding boxes which are adapted for stacking and nesting one within the other such as may be used for packing and dispatching vegetables or fruit, which box is usually made of pliable material, such as cardboard and which can be erected by bending the side and end walls along fold lines.

[0010] The first solution results in broader trays with as consequence that less pushfeed systems can be installed on a shelf and that the guiderails of existing pushfeed systems are not suitable anymore. The second solution is not desired as it increases the costs (higher material costs) and the use of more material increases the amount of material to dispose.

Summary of the invention

[0011] It is a first object of the invention to provide a tray in particular a tray suitable for displaying articles at a place of sale such as a retail store avoiding the problems of the prior art.

[0012] It is another object of the invention to provide a tray that allows quick and easy placing of the trays on the shelves at the place of sale even in case long trays and/or trays holding heavy weight articles.

[0013] It is a further object of the invention to provide a tray that is strong while using a minimum amount of material.

[0014] It is still a further object of the invention to provide a tray that is suitable to be used in pushfeed systems.

[0015] It is a further object of the invention to provide a method to open and place such a tray onto a shelf, for example in a pushfeed system without risking the collapsing of the tray.

[0016] According to a first aspect of the invention a tray for holding and displaying articles is provided. The tray is in particular suitable for use at the place of sale of the articles for example in retail shops and more particularly for use in pushfeed systems. The tray comprises a bottom part comprising

- a bottom wall;
- a front wall and a back wall, both of the front wall and the back wall are extending vertically upwards from the bottom wall and are mutually opposed;
- a first and a second side wall, both of the first and the second side wall have a length L, both of the first side wall and the second side wall are extending vertically upwards from the bottom wall and are mutually opposed.

At least one of the first side wall or the second side wall has a straight upper edge provided with a concave section. The straight upper edge of the first and or the second side wall is oriented parallel to the bottom wall at a height H1 above the bottom wall. The concave section has preferably a symmetric shape and has its minimum at a height H2 above the bottom wall. The ratio of the height H2 over the height H1 (H2/H1) ranges preferably between 0.60 and 0.90, more preferably between 0.65 and 0.9 as for example 0.68, 0.70 ,0.75, 0.80 or 0.90,
whereby:

- the curve describing the concave section (109) comprises at least one circle arc having a radius R, whereby said radius R is larger than 1.5 times the length L of said first and said second side wall (105, 106); and
- the cover part is removably connected to the bottom part.

[0017] The tray is preferably made of cardboard, preferably corrugated cardboard. The corrugated cardboard comprises for example E-flute, B-flute or S-flute. The choice is for example determined by the length of the tray. In a preferred embodiment the tray comprises B-flute or S-flute. With "a concave section" is meant a section that is curving in or hollowing inwards. A characteristic of a concave section is that for each line drawn between any two point of the curve of the concave section this line will not cross the curve of the concave section.

[0018] With "a straight upper edge provided with a concave section" is meant that the straight upper edge is provided with a section that is curving in or hollowing inwards. If the concave section is considered as a function f(x), the second derivative of this function f''(x) is greater than zero.

[0019] According to the present invention, the minimum of the concave section is located at a height H2 above the bottom wall.

[0020] Preferably, the concave section of the first and/or the second side wall has a symmetric shape. More preferably, the concave section has a mirror symmetry with as mirror axis an imaginary axis situated in the plane of the first or the second side wall and located at half length of the first or the second side wall (= L/2).

[0021] By providing one or both of the side walls with a concave section as described above, the flexibility and/or bendability of the side wall or side walls is improved allowing to bend the side wall laterally outwards.

[0022] The trays according to the present invention allow easy opening and easy placing of the tray on the display shelves without risking collapsing and/or breaking of the trays without using significant thicker material, such as thicker cardboard or without using significant more material, such as significant higher side walls. By providing trays according to the present invention, trays having a long length or trays holding heavy weight articles can be opened and placed on display shelves without risking collapsing and/or breaking of the trays. The trays according to the present invention are even suitable to be used on pushfeed systems even if the trays have a long length or hold heavy articles. Trays according to the present invention having a length of 354 mm made of E-flute or S-flute may hold a weight of 1.5 to 2 kg without problems.

[0023] Furthermore the trays according to the present invention allow to increase the length of trays without need to increase the thickness of the cardboard. This is of particular importance as if the thickness of the cardboard is not or not considerable increased compared to existing trays used for pushfeed systems, the width of the trays is not or not considerable increased compared to existing trays so that existing pushfeed systems with the existing guiderails can be used. The thickness of the cardboard is for example lower than 2.3 mm for trays having a length of 354 mm.

[0024] The curve describing the concave section comprises preferably a circle arc having a radius R. The radius R of the circle arc of the concave section is preferably larger than the length L of the first side wall and of the second side wall. More preferably, the radius R of the circle arc of the concave section is larger than 1.2 times the length L or larger than 1.5 times the length L.

[0025] In some embodiments the curve of the concave section comprises more than one circle arc having a radius R, for example two circle arcs connected by a straight line. The straight line connecting the two circle arcs is for example oriented parallel with the bottom wall, for example the height of the minimum of the concave section, i.e. at a height H2

above the bottom wall.

[0026] According to a preferred embodiment both the first and the second side wall have a straight edge provided with a concave section.

[0027] Preferably, the upper edge of the first and the upper edge of the second side wall have the same height, H1.

[0028] Preferably, the minimum of the concave section of the first side wall and the minimum of the concave section of the second side wall have the same height H2.

[0029] In particular embodiments the height H1 of the upper edge of the first side wall can be different from the height H1 of the upper edge of the second side wall. Similarly, the height H2 of the minimum of the concave section of the first side wall can be different from the height H2 of the minimum of the concave section of the second side wall.

[0030] Preferably, the concave section is extending over the major part of the length L of the first and/or second side wall. The length d over which the concave section is extending is defined as the length of projection of the concave section in the plane of the side wall (the first or the second side wall) on the plane of the bottom wall.

[0031] With "extending over the major part of the length L of the first and/or second side wall" is meant that the length d over which the concave section is extending is at least 60 % of the length L of the first and/or second side wall. Preferably, the ratio of the length d over which the concave section is extending divided by the length L of the first or second side wall, I/L is higher than 0.65, more preferably the I/L is higher than 0.70, as for example higher than 0.75, 0.80 or 0.85.

[0032] In a particular embodiment, a tray according to the present invention is used on a pushfeed system. Such tray is preferably provided with a tear strip extending at least partially over the back wall and preferably partially over the back wall and partially over the bottom wall of the bottom section. The tear strip is created in the back wall and/or in the bottom wall by a perforated line. Once the tear strip is removed from the bottom part, an opening is created in the back wall or in the back wall and bottom wall of the bottom part allowing the pusher plate to reach the articles present in the tray, i.e. in the bottom part of the tray.

[0033] The tray comprises a bottom part and a cover part. The cover part is removably connected to the bottom part. The cover part is for example connected to the bottom part by a temporary connection means for example by a glue or a holt melt.

[0034] The cover part comprises a top wall, a front wall, a back wall, a first side wall and a second side wall, whereby said front wall, back wall, first side wall and second side wall are extending vertically downwards from said top wall. The front and the back wall of the bottom part are mutually opposed. Similarly, the first side wall and the second side wall of the bottom part are mutually opposed.

[0035] In a preferred embodiment the cover part and the bottom part are removably connected by a temporary connection means temporary connecting the first side wall of the cover part to the first side wall of the bottom part and/or by a temporary connecting means temporary connecting the second side wall of the cover part to the second side wall of the bottom part.

[0036] In a preferred embodiment at least one of the first side wall and the second side wall is provided with a first extension and a second extension. The first and the second extensions are situated in the plane of the side wall, either the first or the second side wall. When the cover part is removably connected to the bottom part, the first and the second extensions are extending downwards, i.e. from the top wall of the cover part to the bottom wall of the bottom part. Furthermore, when the cover part is removably connected to the bottom part, the first extension and the second extension are positioned over the side wall of the bottom part, i.e. at the outside side of the side wall of the bottom part of the tray.

[0037] It can be preferred that at least one of the first side wall and the second side wall is provided with a further extension, for example a third extension. The third extension is positioned between the first and the second extension. The third extension is situated in the plane of the first side wall or in the plane of the second side wall and is extending vertically downwards.

[0038] When the cover part is placed on the bottom part, the third extension is preferably positioned at the inside side of the first and/or the second side wall of the bottom part of the tray.

[0039] In preferred embodiments the first and/or the second side wall is/are provided with an opening (access gap) to facilitate the removal of the cover part from the bottom part.

[0040] Trays according to the present invention are in particular suitable for holding, transporting and displaying articles at the place of sale, for example in retail shops. The trays are in particular suitable to hold, transport and display food articles, such as pouches holding soups, sweets, cookies or chips.

[0041] According to a second aspect the use of a tray to feed a pushfeed system is provided. The pushfeed system comprises at least a pusher plate to push articles present in the tray forward. The pusher plate is thereby driven by a biasing means such as a spring.

[0042] Preferably a tray to be used to feed a pushfeed system is provided with a tear strip extending at least partially over the back wall or at least partially over the back wall and at least partially over the bottom wall. Once the tear strip is removed an opening or recess is created in the back wall or in the back wall and the bottom wall allowing the pusher plate to reach the articles present in the tray, more particularly in the bottom part of the tray.

[0043] The opening or recess in the back wall or in the back wall or the bottom wall allows to receive the pusher plate so that the pusher plate reaches the articles in the tray and so that the pusher plate may forward the articles in the tray.
[0044] According to a third aspect of the invention a method to open and place a tray as described above on a shelf is provided. The method comprises the steps of :

- loosen the cover part from the bottom part by bending the first and/or the second side wall of the bottom part at least partially laterally outwards;
- remove the cover part from the bottom part by sliding the cover part upwards.

[0045] In a preferred method the first and the second side wall are simultaneously bent laterally outwards.
[0046] Preferably, the first and/or second side wall of the bottom part are bent laterally outwards by grasping and bending the first and/or second side wall at the minimum of the concave section of the first and/or second side wall or at a location close to the minimum of the concave section of the first and/or second side wall.
[0047] In case the bottom part and the cover part are connected by means of a temporary connection means as for example glue or a glue tab, the temporary connection means is preferably removed before or while the first and/or second side wall is/are bent laterally outwards.
[0048] Preferably, the method further comprises the step of placing the tray, more particularly the bottom part of the tray on a display shelf.
[0049] It can be preferred to provide the first and/or second side wall of the cover part and/or the first and/or second side wall of the bottom part with an opening (access gap) allowing a finger, for example the thumb to grasp the side wall for bending laterally outwards. It is clear that such opening (access gap) may also facilitate the removal of the temporary connection means between the cover part and the bottom part. Such opening is preferably located close to the minimum of the concave section.
[0050] A preferred method comprises a method to open and place a tray as described above on a pushfeed system. The tray comprises a bottom part and a cover part and is preferably provided with a tear strip. This method comprises the following steps

- remove the tear strip from the back wall and/or the bottom wall of said bottom part of said tray;
- loosen said cover part from said bottom part by bending said first and/or said second side wall of said bottom part at least partially laterally outwards;
- remove said cover part from said bottom part by sliding said cover part upwards;
- place said bottom part of said tray on the pushfeed system by pushing said bottom part against the pushfeed force of said pushfeed system.

Brief description of the drawings

[0051] The invention will now be described into more detail with reference to the accompanying drawings whereby

- Figure 1 is an illustration of a blank used for assembling a bottom part of a tray according to the present invention;
- Figure 2 is an illustration of a blank used for assembling the cover part of a tray according to the present invention;
- Figure 3 is an illustration of the side view of an assembled tray according to the present invention comprising a bottom part and a cover part.

Detailed description of the invention

[0052] The present invention will be described with respect to particular embodiments and with reference to certain drawings but the invention is not limited thereto but only by the claims. The drawings described are only schematic and are non-limiting. In the drawings, the size of some of the elements may be exaggerated and not drawn on scale for illustrative purposes. The dimensions and the relative dimensions do not correspond to actual reductions to practice of the invention.
[0053] Figure 1 is an illustration of a blank 100 used for assembling a bottom part 101 of a tray according to the present invention. The blank 100 has a bottom wall 102, a front wall 103, a back wall 104, a first side wall 105 and a second side wall 106. The blank 100 includes a number of fold lines 107 extending between the various walls of the bottom part 101 of the tray. The hatched areas indicated in Figure 1 are the areas that are glued in order to assemble the bottom part 101 of the tray.
The first side wall 105 and the second side wall 106 have a length L. The length L is preferably ranging between 300 mm and 400 mm, as for example 354 mm.
The first side wall 105 and the second side wall 106 have an upper edge 108 at a distance H1 from the fold line 107

between the bottom wall 102 and the first or second side wall 105, 106. When the blank 100 is assembled to form the bottom part 101 of the tray the distance H1 corresponds with the height H1 of the upper edge of the first or second side wall 105, 106 above the bottom wall 102. The height H1 is preferably ranging between 40 mm and 60 mm, as for example 51 mm.

In the embodiment shown in Figure 1 both the first side wall 105 and the second side wall 106 are provided with a concave section 109.

The concave section 109 has a minimum 110. This minimum 110 of the concave section 109 is situated at a distance H2 from the fold line 107 between the bottom wall 102 and the first or second side wall 105, 106. The height H2 is preferably ranging between 30 mm and 50 mm and is for example 40 mm.

The concave section 109 preferably comprises at least one circle arc 111 having a radius R. The radius R is preferably greater than the length L of the tray, more preferably the radius R is at least 1.5 times the length L. In the embodiment shown in Figure 1 the concave section 109 comprises two circle arcs 111, 111' having a radius R. For a tray having a length L equal to 354 mm, the radius R is for example equal to 550 mm. Both circle arcs 111, 111' are connected by a straight line 112.

[0054] The dimensions of the tray according to the present invention shown in Figure 1 are summarized in Table 1.

Table 1

	L (mm)	H1 (mm)	H2 (mm)	H1/H2	R (mm)	R/L
Tray 1	352	51	40	0.78	550	1.56

[0055] Preferably, the bottom part 101 is provided with a tear strip 113. The tear strip 113 is formed by means of a perforated line 114. The tear strip 113 is preferably extending partially over the bottom wall 102 and partially over the back wall 104 so that when the tear strip 113 is removed an opening is created centrally in the bottom wall 102 and centrally in the back wall 104. In a preferred embodiment the back wall 104 is further provided with an access opening 115 to facilitate the grasping and the removal of the tear strip 113.

[0056] Figure 2 is an illustration of a blank 200 used for assembling the cover part 201 of a tray according to the present invention.

The blank 200 comprises a top wall 202, a front wall 203, a back wall 204, a first side wall 205 and a second side wall 206. The blank 200 includes a number of fold lines 207 extending between the various walls of the cover part 201 of the tray. The hatched areas indicated in Figure 2 are the areas that are glued in order to assemble the cover part 201 of the tray. The first and second side walls 205, 206 of the cover part 201 are provided with a first extension 213, a second extension 213' and a third extension 214. The first and second side walls 205, 206 are furthermore provided with an opening (access hole) 215 to facilitate the removal of the cover part 201 from the bottom part 101. The cover part 201 can be removably connected to the bottom part 101 by applying glue on section 216 of the first and the second side wall 205, 206.

[0057] Figure 3 shows the side view of a assembled tray 300 having a length 354 mm. The tray 300 comprises a bottom part 101 and a cover part 201. The bottom part 101 is obtained by assembling a blank 100 as shown in Figure 1; the cover part 201 is obtained by assembling a blank 200 as shown in Figure 2. The cover part 201 is removably connected to the bottom part 101.

[0058] The first extensions 213, 213' of the side wall 205 of the cover part 200 are extending downward from the cover part 200 to the bottom part 101 and are positioned at the outside side of the side wall 205. The third extension 214 of the side wall 205 is extending downward form the cover part 200 to the bottom part 100 and is positioned at the inside side of the side wall 205. When the cover part 201 is removably connected to the bottom part 101, the first extensions 213, 213' (and similarly the second extension 213') are visible whereas the third section 214 is not visible. The first and second side walls 205, 206 of the cover part are furthermore preferably provided with an opening (access hole) 215 to facilitate the removal of the cover part 201 from the bottom part 101. The cover part 201 is removably connected to the bottom part 101 by applying glue on section 216 of the first and the second side wall 205, 206.

[0059] A preferred method to open tray 300 and to place tray 300 on a shelf, more particularly on a pushfeed system, comprises the steps of :

- remove the tear strip 113 from the back wall 104 and/or the bottom wall 102 of said bottom part 101 of said tray;
- loosen said cover part 201 from said bottom part 101 by bending said first and/or said second side wall 105, 106 of said bottom part 101 at least partially laterally outwards;
- remove said cover part 201 from said lower part 101 by sliding said cover part 201 upwards;
- placing said bottom part 101 of said tray on the pushfeed system by pushing said bottom part 101 against the pushfeed force of said pushfeed system.

[0060] The first and/or second side wall 105, 106 of the bottom part are preferably bent laterally outwards by grasping the first and/or the second side wall 105, 106 of the bottom part 101 at the minimum of the concave section 109 of the first and/or the second side wall 105, 106 or alternatively at a location close to the minimum of the concave section 109 of the first and/or the second side wall 105, 106.

[0061] The grasping of the first and/or second side wall 105, 106 can be facilitated by inserting at least one finger, for example the thumb in opening 215 thereby disconnecting the temporary connection means 216 between the bottom part 101 and the cover part 201.

Claims

1. A tray for holding and displaying articles, said tray comprising a bottom part (101), said bottom part (101) and a cover part (201), the cover part is removably connected to the bottom part, comprising

   - a bottom wall (102);
   - a front wall (103) and a back wall (104), both of said front wall (103) and said back wall (104) extending vertically upwards from said bottom wall (102) and being mutually opposed;
   - a first side wall (105) and a second side wall (106), both of said first side wall (105) and said second side wall (106) having a length L, said first side wall (105) and said second side wall (106) extending vertically upwards from said bottom wall (102) and being mutually opposed; whereby at least one of said first side wall (105) or said second side wall (106) has a straight upper edge oriented parallel to said bottom wall (102) at a height H1 above said bottom wall (102), said straight upper edge being provided with a concave section (109), said concave section (109) having a symmetric shape and having its minimum at a height H2 above said bottom wall (102), **characterized by** a ratio of the height H2 over the height H1 (H2/H1) ranging between 0.6 and 0.9, and
   - the curve describing the concave section (109) comprises at least one circle arc having a radius R, whereby said radius R is larger than 1.5 times the length L of said first and said second side wall (105, 106).

2. A tray according to claim 1, whereby the upper edge of both of said first and said second side walls (105,106) is provided with a concave section (109).

3. A tray according to any one of the preceding claims, whereby said concave section (109) is extending over a length d of said first or said second side wall (105, 106), said length d being defined as the length of the projection of said concave section (109) in the plane of said first or said second side wall (105, 106) on the plane of said bottom wall (102), whereby said length d is at least 60 % of the length L of said first or said second side wall (105, 106).

4. A tray according to any one of the preceding claims, whereby said bottom part (101) is provided with a tear strip (113) extending at least partially over said back wall (104) or at least partially over said back wall (104) and at least partially over said bottom wall (102).

5. A tray according to any one of the preceding claims, whereby said tray further comprises a cover part (201), said cover part (201) comprising a top wall (202), a front wall (203), a back wall (204), a first side wall (205) and a second side wall (206), whereby said front wall (203), said back wall (204), said first side wall (205) and said second side wall (206) of said cover part (201) are extending vertically downwards from said top wall (202), said front wall (203) and said back wall (204) being mutually opposed and said first side wall (205) and said second side wall (206) being mutually opposed.

6. A tray according to claim 5, whereby said cover part (201) and said bottom part (101) are connected by means of a temporary connection means.

7. A tray according to claim 6, whereby said temporary connection means comprises glue or hot melt.

8. A tray according to any one of claims 5 to 7, whereby at least one of said first or said second side wall (205, 206) of said cover part (201) is provided with a first and a second extension (213, 213'), said first and said second extension (213, 213') being situated in the plane of said first or said second side wall (205, 206) and extending downwards from the top wall (202), said first and said second extension (213, 213') being positioned at the outside side of the first and or second side wall (105, 106) of the bottom part (101) when said cover part (201) is removably connected to said bottom part (101).

9. A tray according to claim 8, whereby at least one of said first or said second side wall (205, 206) of said cover part (201) is provided with a third extension (214), said third extension (214) being situated in the plane of said first or said second side wall (205, 206) and extending downwards from the top wall (202), said third extension (214) being positioned between said first and said second extension (213, 213') and said third extension (214) being positioned at the inside side of the first and/or second side wall (205, 206) when said cover part (201) is removably connected to said bottom part (101).

10. A tray according to any one of the preceding claims, whereby at least one of said first or said second side wall (205, 206) of said cover part (201) or at least one of said first or said second side wall (205, 206) of said bottom part (101) is provided with an opening (215) to facilitate the removal of the cover part (201) from the bottom part (101).

11. Use of a tray as defined in any one of claims 1 to 10 to feed a pushfeed system, **characterized in that** said pushfeed system comprises at least a pusher plate to push articles present in said tray forward, said pusher plate being driven by a biasing means.

12. A method to open and place a tray as defined in any one of claims 1 to 10 comprising a bottom part (101) and a cover part (201) on a shelf, said method being **characterized by** comprising the steps of

- loosen said cover part (201) from said bottom part (101) by bending said first and/or said second side wall (105, 106) of said bottom part (101) at least partially laterally outwards;
- remove said cover part (201) from said bottom part (101) by sliding said cover part (201) upwards.

13. A method according to claim 12, whereby said first and/or said second side wall (105, 106) are bent laterally outwards by grasping and bending said first and/or said second side wall (105, 106) at said minimum of said concave section (109).

14. A method according to claim 12 or claim 13, whereby a temporary connection means is removed before or while said first and/or said second side wall (105, 106) are bent laterally outwards.

15. A method to open and place a tray on a pushfeed system, said tray being a tray as defined in any one of claims 1 to 10 **characterised by** comprising a bottom part (101) and a cover part (201), whereby said bottom part (101) is provided with a tear strip (113), said method comprising the steps of:

- removing the tear strip (113) from the back wall (104) and/or from the bottom wall (102) of said bottom part (101) of said tray;
- loosen said cover part (201) from said bottom part (101) by bending said first and/or said second side wall (105, 106) of said bottom part (101) at least partially laterally outwards;
- remove said cover part (201) from said bottom part (101) by sliding said cover part (201) upwards;
- placing said bottom part (101) of said tray on the pushfeed system by pushing said bottom part (101) against the pushfeed force of said pushfeed system.

Patentansprüche

1. Schale zum Halten und Ausstellen von Artikeln, wobei die Schale einen Bodenteil (101), den Bodenteil (101) und einen Deckelteil (201) umfasst, wobei der Deckelteil abnehmbar mit dem Bodenteil verbunden ist, umfassend

- eine Bodenwand (102);
- eine Vorderwand (103) und eine Rückwand (104), wobei sich sowohl die Vorderwand (103) als auch die Rückwand (104) von der Bodenwand (102) vertikal nach oben erstrecken und einander gegenüberliegen;
- eine erste Seitenwand (105) und eine zweite Seitenwand (106), wobei sowohl die erste Seitenwand (105) als auch die zweite Seitenwand (106) eine Länge L aufweisen, wobei sich die erste Seitenwand (105) und die zweite Seitenwand (106) von der Bodenwand (102) vertikal nach oben erstrecken und einander gegenüberliegen;

wobei wenigstens eine von der ersten Seitenwand (105) oder der zweiten Seitenwand (106) eine gerade Oberkante aufweist, die parallel zu der Bodenwand (102) in einer Höhe H1 über der Bodenwand (102) ausgerichtet ist, wobei die gerade Oberkante mit einem konkaven Abschnitt (109) versehen ist, wobei der konkave Abschnitt (109) eine symmetrische Form aufweist und sein Minimum in einer Höhe H2 über der Bodenwand (102) hat,

gekennzeichnet durch ein Verhältnis der Höhe H2 über der Höhe H1 (H2/H1) im Bereich zwischen 0,6 und 0,9, und

- wobei die Kurve, die den konkaven Abschnitt (109) beschreibt, wenigstens einen Kreisbogen umfasst, der einen Radius R aufweist, wobei der Radius R größer als das 1,5-Fache der Länge L der ersten und der zweiten Seitenwand (105, 106) ist.

2. Schale nach Anspruch 1, wobei die Oberkante sowohl der ersten als auch der zweiten Seitenwand (105, 106) mit einem konkaven Abschnitt (109) versehen ist.

3. Schale nach einem der vorhergehenden Ansprüche, wobei sich der konkave Abschnitt (109) über eine Länge d der ersten oder der zweiten Seitenwand (105, 106) erstreckt, wobei die Länge d als die Länge der Projektion des konkaven Abschnitts (109) in der Ebene der ersten oder der zweiten Seitenwand (105, 106) auf die Ebene der Bodenwand (102) definiert ist, wobei die Länge d wenigstens 60 % der Länge L der ersten oder der zweiten Seitenwand (105, 106) beträgt.

4. Schale nach einem der vorhergehenden Ansprüche, wobei der Bodenteil (101) mit einem Aufreißstreifen (113) versehen ist, der sich wenigstens teilweise über die Rückwand (104) oder wenigstens teilweise über die Rückwand (104) und wenigstens teilweise über die Bodenwand (102) erstreckt.

5. Schale nach einem der vorhergehenden Ansprüche, wobei die Schale ferner einen Deckelteil (201) umfasst, wobei der Deckelteil (201) eine obere Wand (202), eine Vorderwand (203), eine Rückwand (204), eine erste Seitenwand (205) und eine zweite Seitenwand (206) umfasst, wobei sich die Vorderwand (203), die Rückwand (204), die erste Seitenwand (205) und die zweite Seitenwand (206) des Deckelteils (201) von der oberen Wand (202) vertikal nach unten erstrecken, wobei die Vorderwand (203) und die Rückwand (204) einander gegenüberliegen und die erste Seitenwand (205) und die zweite Seitenwand (206) einander gegenüberliegen.

6. Schale nach Anspruch 5, wobei der Deckelteil (201) und der Bodenteil (101) durch ein Mittel zur temporären Verbindung miteinander verbunden sind.

7. Schale nach Anspruch 6, wobei das Mittel zur temporären Verbindung einen Kleber oder Heißschmelzen umfasst.

8. Schale nach einem der Ansprüche 5 bis 7, wobei wenigstens eine von der ersten oder der zweiten Seitenwand (205, 206) des Deckelteils (201) mit einer ersten und einer zweiten Verlängerung (213, 213') versehen ist, wobei die erste und die zweite Verlängerung (213, 213') in der Ebene der ersten oder der zweiten Seitenwand (205, 206) angeordnet sind und sich von der oberen Wand (202) nach unten erstrecken, wobei die erste und die zweite Verlängerung (213, 213') an der Außenseite der ersten und/oder der zweiten Seitenwand (105, 106) des Bodenteils (101) positioniert sind, wenn der Deckelteil (201) entfernbar mit dem Bodenteil (101) verbunden ist.

9. Schale nach Anspruch 8, wobei wenigstens eine von der ersten oder der zweiten Seitenwand (205, 206) des Deckelteils (201) mit einer dritten Verlängerung (214) versehen ist, wobei die dritte Verlängerung (214) in der Ebene der ersten oder der zweiten Seitenwand (205, 206) angeordnet ist und sich von der oberen Wand (202) nach unten erstreckt, wobei die dritte Verlängerung (214) zwischen der ersten und der zweiten Verlängerung (213, 213') positioniert ist und die dritte Verlängerung (214) an der Innenseite der ersten und/oder zweiten Seitenwand (205, 206) positioniert ist, wenn der Deckelteil (201) entfernbar mit dem Bodenteil (101) verbunden ist.

10. Schale nach einem der vorhergehenden Ansprüche, wobei wenigstens eine von der ersten oder der zweiten Seitenwand (205, 206) des Deckelteils (201) oder wenigstens eine von der ersten oder der zweiten Seitenwand (205, 206) des Bodenteils (101) mit einer Öffnung (215) versehen ist, um die Entfernung des Deckelteils (201) vom Bodenteil (101) zu erleichtern.

11. Verwendung einer Schale, wie sie in einem der Ansprüche 1 bis 10 definiert ist, zum Versorgen eines Vorschubsystems, **dadurch gekennzeichnet, dass** das Vorschubsystem wenigstens eine Drückplatte umfasst, um in der Schale vorhandene Artikel nach vorne zu drücken, wobei die Drückplatte durch ein Vorspannmittel angetrieben wird.

12. Verfahren zum Öffnen und Anordnen einer in einem der Ansprüche 1 bis 10 definierten Schale, die einen Bodenteil (101) und einen Deckelteil (201) umfasst, auf einem Regalbrett, wobei das Verfahren **dadurch gekennzeichnet ist, dass** es die folgenden Schritte umfasst:

- Lösen des Deckelteils (201) von dem Bodenteil (101), indem die erste und/oder die zweite Seitenwand (105, 106) des Bodenteils (101) wenigstens teilweise seitlich nach außen gebogen wird;
- Entfernen des Deckelteils (201) von dem Bodenteil (101), indem der Deckelteil (201) nach oben geschoben wird.

13. Verfahren nach Anspruch 12, wobei die erste und/oder die zweite Seitenwand (105, 106) seitlich nach außen gebogen werden, indem die erste und/oder die zweite Seitenwand (105, 106) an dem Minimum des konkaven Abschnitts (109) ergriffen und gebogen werden.

14. Verfahren nach Anspruch 12 oder Anspruch 13, wobei ein Mittel zur temporären Verbindung entfernt wird, bevor oder während die erste und/oder die zweite Seitenwand (105, 106) seitlich nach außen gebogen werden.

15. Verfahren zum Öffnen und Anordnen einer Schale auf einem Vorschubsystem, wobei es sich bei der Schale um eine Schale handelt, wie sie in einem der Ansprüche 1 bis 10 definiert ist, **dadurch gekennzeichnet, dass** sie einen Bodenteil (101) und einen Deckelteil (201) umfasst, wobei der Bodenteil (101) mit einem Aufreißstreifen (113) versehen ist, wobei das Verfahren die folgenden Schritte umfasst:

- Entfernen des Aufreißstreifens (113) von der Rückwand (104) und/oder von der Bodenwand (102) des Bodenteils (101) der Schale;
- Lösen des Deckelteils (201) vom Bodenteil (101), indem die erste und/oder die zweite Seitenwand (105, 106) des Bodenteils (101) wenigstens teilweise seitlich nach außen gebogen werden;
- Entfernen des Deckelteils (201) vom Bodenteil (101), indem der Deckelteil (201) nach oben geschoben wird;
- Anordnen des Bodenteils (101) der Schale auf dem Vorschubsystem, indem der Bodenteil (101) gegen die Vorschubkraft des Vorschubsystems gedrückt wird.

Revendications

1. Plateau pour maintenir et présenter des articles, ledit plateau comprenant une partie de fond (101), ladite partie de fond (101) et une partie de couvercle (201), la partie de couvercle est raccordée de manière amovible à la partie de fond, comprenant :

une paroi de fond (102) ;
une paroi avant (103) et une paroi arrière (104), à la fois ladite paroi avant (103) et ladite paroi arrière (104) s'étendant verticalement vers le haut à partir de ladite paroi de fond (102) et étant mutuellement opposées ;
une première paroi latérale (105) et une seconde paroi latérale (106), à la fois ladite première paroi latérale (105) et ladite seconde paroi latérale (106) ayant une longueur L, ladite première paroi latérale (105) et ladite seconde paroi latérale (106) s'étendant verticalement vers le haut à partir de ladite paroi de fond (102) et étant mutuellement opposées ;
moyennant quoi au moins l'une de ladite première paroi latérale (105) ou ladite seconde paroi latérale (106) a un bord supérieur droit orienté parallèlement à ladite paroi de fond (102) à une hauteur H1 au-dessus de ladite paroi de fond (102), ledit bord supérieur droit étant prévu avec une section concave (109), ladite section concave (109) ayant une forme symétrique et ayant son minimum à une hauteur H2 au-dessus de ladite paroi de fond (102), **caractérisé par** un rapport de la hauteur H2 sur la hauteur H1 (H2/H1) compris entre 0,6 et 0,9, et
la courbe décrivant la section concave (109) comprend au moins un arc de cercle ayant un rayon R, moyennant quoi ledit rayon R est supérieur à 1,5 fois la longueur L de ladite première et de ladite seconde paroi latérale (105, 106).

2. Plateau selon la revendication 1, moyennant quoi le bord supérieur à la fois de ladite première et de ladite seconde paroi latérale (105, 106) est prévu avec une section concave (109).

3. Plateau selon l'une quelconque des revendications précédentes, moyennant quoi ladite section concave (109) s'étend sur une longueur d de ladite première ou ladite seconde paroi latérale (105, 106), ladite longueur d étant définie comme étant la longueur de la saillie de ladite section concave (109) dans le plan de ladite première ou de ladite seconde paroi latérale (105, 106) sur le plan de ladite paroi de fond (102), moyennant quoi ladite longueur d représente au moins 60 % de la longueur L de ladite première ou de ladite seconde paroi latérale (105, 106).

4. Plateau selon l'une quelconque des revendications précédentes, moyennant quoi ladite partie de fond (101) est prévue avec une bande de déchirure (113) s'étendant au moins partiellement sur ladite paroi arrière (104) ou au

moins partiellement sur ladite paroi arrière (104) et au moins partiellement sur ladite paroi de fond (102).

5. Plateau selon l'une quelconque des revendications précédentes, moyennant quoi ledit plateau comprend en outre une partie de couvercle (201), ladite partie de couvercle (201) comprenant une paroi supérieure (202), une paroi avant (203), une paroi arrière (204), une première paroi latérale (205) et une seconde paroi latérale (206), moyennant quoi ladite paroi avant (203), ladite paroi arrière (204), ladite première paroi latérale (205) et ladite seconde paroi latérale (206) de ladite partie de couvercle (201) s'étendent verticalement vers le bas à partir de ladite paroi supérieure (202), ladite paroi avant (203) et ladite paroi arrière (204) étant mutuellement opposées et ladite première paroi latérale (205) et ladite seconde paroi latérale (206) étant mutuellement opposées.

6. Plateau selon la revendication 5, moyennant quoi ladite partie de couvercle (201) et ladite partie de fond (101) sont raccordées au moyen d'un moyen de raccordement temporaire.

7. Plateau selon la revendication 6, moyennant quoi ledit moyen de raccordement temporaire comprend de la colle ou un adhésif thermofusible.

8. Plateau selon l'une quelconque des revendications 5 à 7, moyennant quoi au moins l'une parmi ladite première ou ladite seconde paroi latérale (205, 206) de ladite partie de couvercle (201) est prévue avec une première et une deuxième extension (213, 213'), ladite première et ladite deuxième extension (213, 213') étant situées dans le plan de ladite première ou ladite seconde paroi latérale (205, 206) et s'étendant vers le bas à partir de la paroi supérieure (202), ladite première et ladite deuxième extension (213, 213') étant positionnées au niveau du côté externe de ladite première et/ou seconde paroi latérale (105, 106) de la partie de fond (101) lorsque ladite partie de couvercle (201) est raccordée de manière amovible à ladite partie de fond (101).

9. Plateau selon la revendication 8, moyennant quoi au moins l'une de ladite première ou de ladite seconde paroi latérale (205, 206) de ladite partie de couvercle (201) est prévue avec une troisième extension (214), ladite troisième extension (214) étant située dans le plan de ladite première ou de ladite seconde paroi latérale (205, 206) et s'étendant vers le bas à partir de la paroi supérieure (202), ladite troisième extension (214) étant positionnée entre ladite première et ladite deuxième extension (212, 213') et ladite troisième extension (214) étant positionnée au niveau du côté interne de la première et/ou seconde paroi latérale (205, 206) lorsque ladite partie de couvercle (201) est raccordée de manière amovible à ladite partie de fond (101).

10. Plateau selon l'une quelconque des revendications précédentes, moyennant quoi au moins l'une de ladite première ou de ladite seconde paroi latérale (205, 206) de ladite partie de couvercle (201) ou au moins l'une de ladite première ou de ladite seconde paroi latérale (205, 206) de ladite partie de fond (101) est prévue avec une ouverture (215) pour faciliter le retrait de la partie de couvercle (201) de la partie de fond (101).

11. Utilisation d'un plateau selon l'une quelconque des revendications 1 à 10 pour alimenter un système d'alimentation par poussée, **caractérisée en ce que** ledit système d'alimentation par poussée comprend au moins une plaque de poussoir pour pousser les articles présents dans ledit plateau vers l'avant, ladite plaque de poussoir étant entraînée par un moyen de sollicitation.

12. Procédé pour ouvrir et placer un plateau selon l'une quelconque des revendications 1 à 10 comprenant une partie de fond (101) et une partie de couvercle (201) sur une étagère, ledit procédé étant **caractérisé en ce qu'**il comprend les étapes consistant à :

desserrer ladite partie de couvercle (201) de ladite partie de fond (101) en pliant ladite première et/ou ladite seconde paroi latérale (105, 106) de ladite partie de fond (101) au moins partiellement latéralement vers l'extérieur ;
retirer ladite partie de couvercle (201) de ladite partie de fond (101) en faisant coulisser ladite partie de couvercle (201) vers le haut.

13. Procédé selon la revendication 12, moyennant quoi ladite première et/ou ladite seconde paroi latérale (105, 106) sont pliées latéralement vers l'extérieur en saisissant et en pliant ladite première et/ou ladite seconde paroi latérale (105, 106) au niveau dudit minimum de ladite section concave (109).

14. Procédé selon la revendication 12 ou la revendication 13, moyennant quoi un moyen de raccordement temporaire est retiré avant ou pendant que ladite première et/ou ladite seconde paroi latérale (105, 106) sont pliées latéralement

vers l'extérieur.

15. Procédé pour ouvrir et placer un plateau sur un système d'alimentation par poussée, ledit plateau étant un plateau tel que défini selon l'une quelconque des revendications 1 à 10, **caractérisé en ce qu'**il comprend une partie de fond (101) et une partie de couvercle (201), moyennant quoi ladite partie de fond (101) est prévue avec une bande de déchirure (113), ledit procédé comprenant les étapes consistant à :

retirer la bande de déchirure (113) de la paroi arrière (104) et/ou de la paroi de fond (102) de ladite partie de fond (101) dudit plateau ;
desserrer ladite partie de couvercle (201) de ladite partie de fond (101) en pliant ladite première et/ou ladite seconde paroi latérale (105, 106) de ladite partie de fond (101) au moins partiellement latéralement vers l'extérieur ;
retirer ladite partie de couvercle (201) de ladite partie de fond (101) en faisant coulisser ladite partie de couvercle (201) vers le haut ;
placer ladite partie de fond (101) dudit plateau sur le système d'alimentation par poussée en poussant ladite partie de fond (101) contre la force d'alimentation par poussée dudit système d'alimentation par poussée.

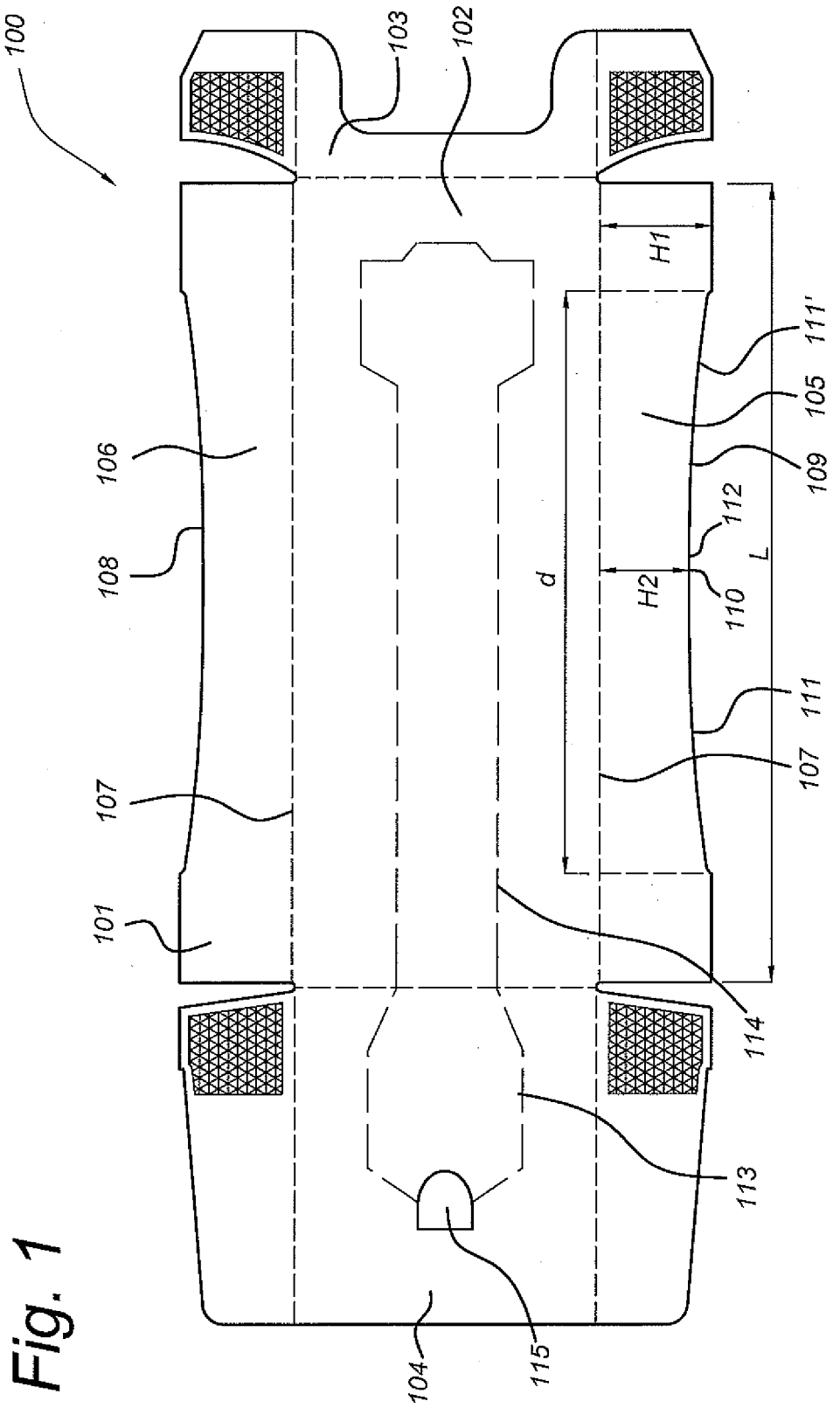

100
103
102
H1
111'
105
109
106
112
108
d
H2
L
110
111
107
107
101
114
113
104
115

Fig. 1

Fig. 2

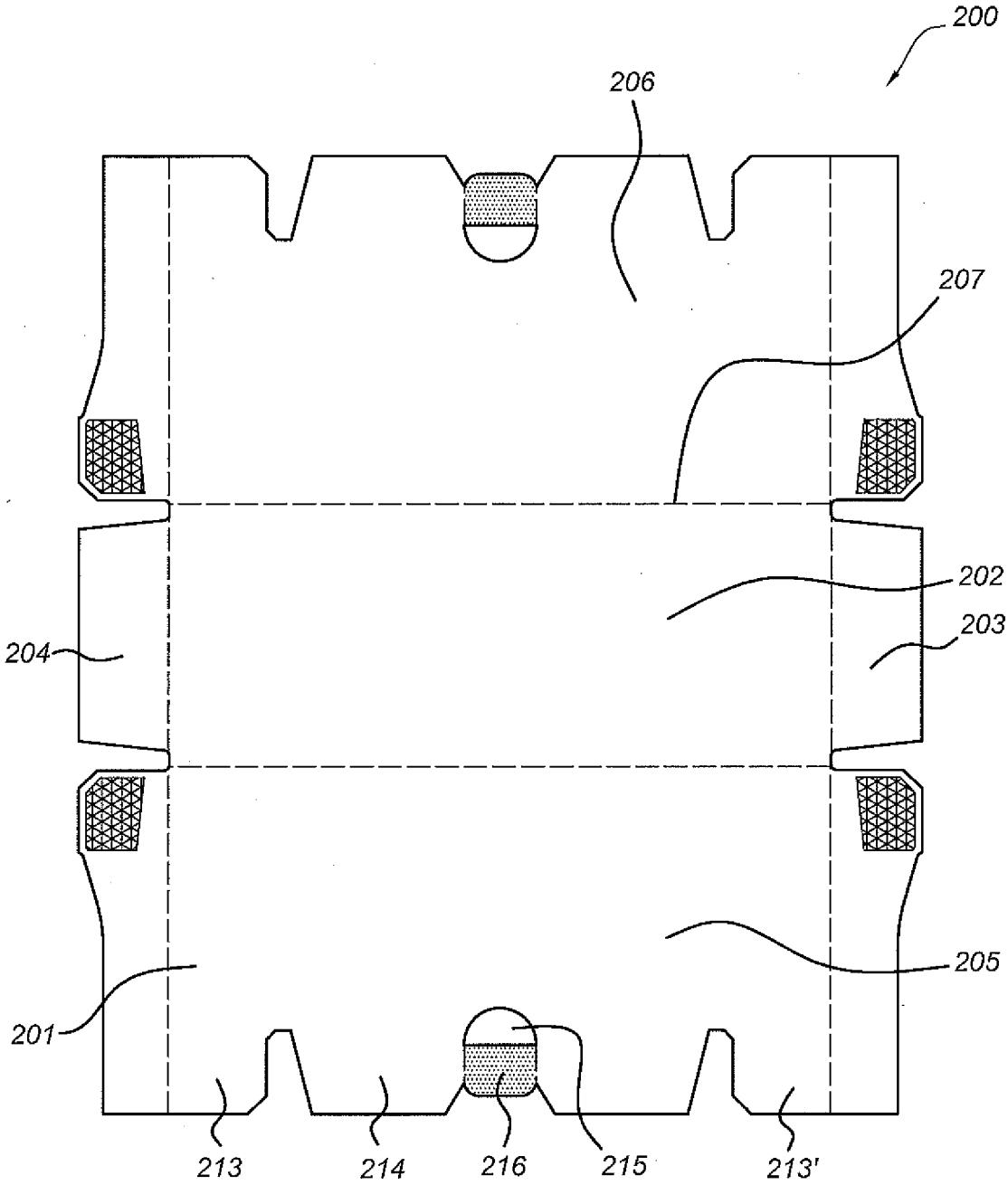
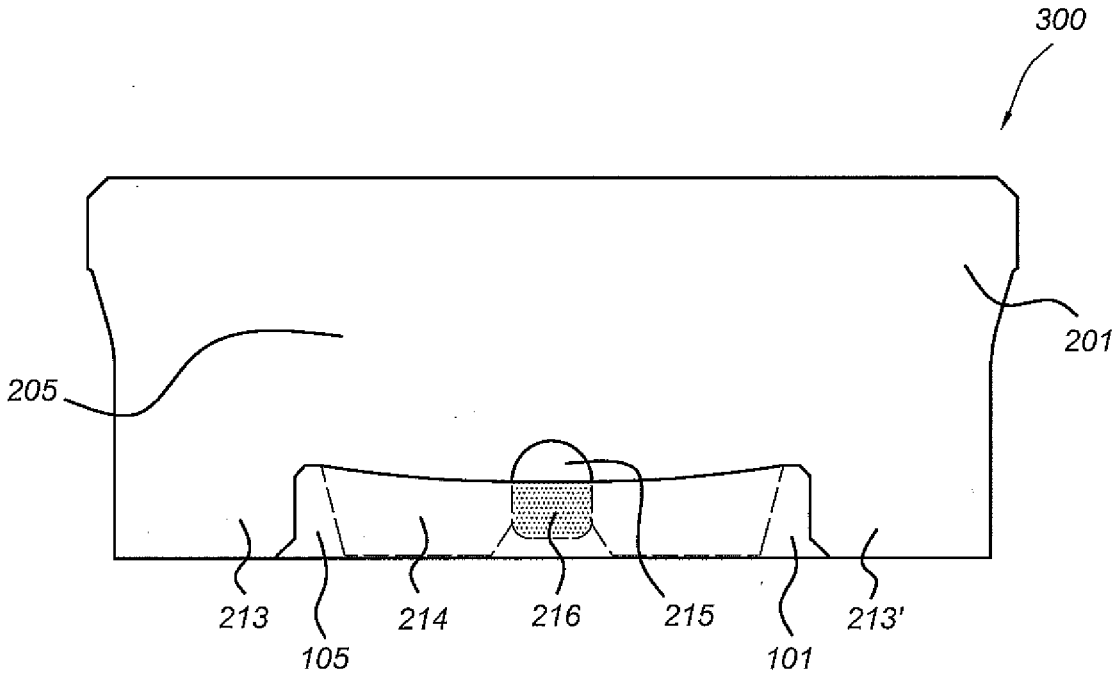


Fig. 3



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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