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(54) STAND-UP TRAY, PACKAGE AND METHOD

(57) A tray (20) for use in a food package having an outer surrounding wrapper (14), such as a flow wrap, and configured for standing on end, is described herein. The tray can include one or more compartments (30). Each of the compartments can include a bottom wall (34), an opening (36) opposite the bottom wall, and a surrounding side wall (32) extending between the bottom wall and the opening. A generally planar, peripheral flange (22) is disposed about the periphery of the tray and adjacent the opening of the compartment or, if more than one compartments, the openings of the compartments. The tray can include a pair of flaps (40), each disposed on an opposite side of the tray. Each of the flaps (40) is connected to the flange via an associated intersection and extends substantially perpendicular relative to the flange such that the tray can be supported on one of the flaps (40) in a generally upright orientation.

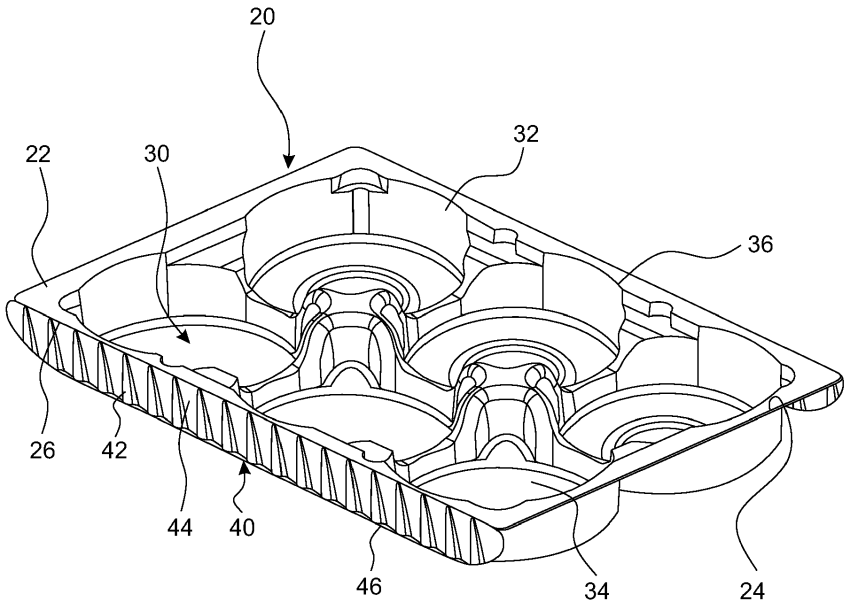

FIG. 1

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Description

Field

[0001] A tray is described herein and, in particular, a tray configured to stand on end, as well as a package incorporating the tray, a method of forming the tray, and a method of forming the package incorporating the tray.

Background

[0002] A common package, such as for food products, includes a tray surrounded by a flow wrap. Such trays can include one or more compartments, where each compartment has a bottom wall, an opposite access opening, and a surrounding sidewall extending between the bottom wall and the access opening. Such trays also include a peripheral flange surrounding the compartment, or, if more than one compartment, surrounding the more than one compartments. However, such packages can be difficult to stand on end because the flange projects outwardly beyond the bottom wall of the compartment. Thus, when standing one edge and supported by an edge of the bottom wall of the compartment and an edge of the flange, a substantial angle of inclination results and the center of gravity of the package can be disposed such that the package is difficult to stand on end. While the package could be disposed on its bottom side or top side, that orientation would result in a small portion of the package being visible to a consumer, such as on a display or retail shelf.

Summary

[0003] A tray for use in a food package having an outer surrounding wrapper, such as a flow wrap, and configured for standing on end, is described herein. The tray can include one or more compartments. Each of the compartments can include a bottom wall, an opening opposite the bottom wall, and a surrounding side wall extending between the bottom wall and the opening. A generally planar, peripheral flange is disposed at least partially, and preferably completely, about the periphery of the tray and adjacent the opening of the compartment or, if more than one compartments, the openings of the compartments. The tray includes at least one and, optionally, a pair of flaps, disposed on opposite sides of the tray, or one side if only one flap. Any description herein with respect to the structure and function of a pair of flaps will also be applicable to a tray having only one flap. Each of the flaps is connected to the flange via an associated intersection or hinge and extends substantially perpendicular relative to the flange such that the tray can be supported on one of the flaps in a generally upright orientation.

[0004] In one aspect, each of the flaps, or the one flap if only one flap, can be movable from a first position, substantially parallel to the flange, to a second position, substantially perpendicular relative to the flange. The flaps can be movable about the intersection from the first position to the second position. The interserction can be one of a channel, score, perforation or thinned section disposed between the flange and the flap. The intersection can optionally be notched at at least one end, and preferably at each end, thereof to facilitate movement from the first positon to the second position.

[0005] In another aspect, each of the flaps can have a plurality of ribs. Each of the ribs of at least one of the flaps can extend generally perpendicular relative to the flange when the at least one of the flaps extends substantially perpendicular relative to the flange.

[0006] In yet another aspect, a portion of the sidewall of the one or more compartments, adjacent one of the flaps, can have an inward taper away from the hinge of the adjacent flap. The ribs of the one of the flaps can have intermediate segments that increase in depth generally corresponding to the inward taper of the sidewall such that, when the one of the flaps is extending substantially perpendicular relative to the flange, a portion of at least one and preferably more than one of the segments between the ribs abuts the portion of the sidewall of the one or more compartments. This can advantageously facilitate a generally perpendicular orientation of the package when supported on the one of the flaps because the flap can abut the adjacent compartment to limit further inward movement of the flap while supporting the flap such that the flap can in turn support the package in the generally upright orientation.

[0007] In one aspect, each of the ribs on one - or both -- of the flaps can taper in width toward the intersection. In other words, the ribs can be wider away from the intersection than adjacent the intersection. Each of the flaps has a free end, opposite the adjacent intersection, that is disposed nearly - but not quite and generally short of -- the bottom wall of at least one of the at least one compartment. In other words, the flap - or both flaps - do not have a length the same as that of the distance from the flange to the bottom wall of the compartment or compartments. The can advantageously ensure that the flap or flaps do not interfere with transport of the tray along a conveyor prior to flow wrapping, as the tray can be supported by the bottom wall of the compartment or walls of the compartments. The free end of each of the flaps can optionally have an outwardly extending minor flange. This minor flange can assist in maintaining the shape of the ribs, particularly adjacent thereto.

[0008] In any of the aspects described herein, the tray can include a single compartment or an array of a plurality of compartments each optionally surrounded by the flange, and the array is preferably at least partially surrounded by the flange.

[0009] In any of the aspects described herein, the tray can be provided with an outer surrounding wrapper. The wrapper can be applied using a flow wrapping process. For instance, the outer surrounding wrapper can be a flow wrap having a pair of end seals, where the end seals

are optionally disposed generally perpendicular to the flaps. Food or other products can be deposited in the compartment or compartments prior to flow wrapping.

[0010] A method of forming a package using the tray described herein can include one or more of the steps of thermoforming or otherwise forming the tray, depositing one or more food products in each of the at least one compartments, folding each of the flaps from the first position to the second position, either before or after the depositing step, and surrounding the tray with a wrapper, such as using a flow wrap process.

Brief Description of the Drawings

[0011]

Figure 1 is a top perspective view of a tray in accordance with an exemplary embodiment, showing a plurality of compartments surrounded by a peripheral flange and a pair of opposing flaps depending from edge of the flange;

Figure 2 is a bottom perspective view of the tray of Figure 1;

Figure 3 is a top plan view of the tray of Figure 1;

Figure 4 is a side elevation view of the tray of Figure 1;

Figure 5 is a section view of the tray taken along line A-A of Figure 3;

Figure 6 is a perspective view of a package having an outer surrounding wrapper surrounding the tray of Figure 1;

Figure 7 is a section view of the package of Figure 6 taken along line VII-VII;

Figure 8 is a perspective view of a tray similar to the tray of Figure 1, but showing the flaps in an unfolded orientation, with further differences described below;

Figure 9 is a bottom perspective view of the tray of Figure 8;

Figure 10 is a top plan view of the tray of Figure 8;

Figure 11 is a side elevation view of the tray of Figure 8; and

Figure 12 is an end view of the tray of Figure 8.

Detailed Description

[0012] A package 10 is provided that has a tray 20 that has one or more compartments 30 for containing a product, such as a food product 12, and an outer surrounding wrapper 14, where the package 10 is configured for standing upright on one of its ends. This can advantageously allow for the large front face of the package to face outwardly when the package is on a shelf in a store, thereby provided a larger space for graphics and other information. The one or more compartments 30 of the tray are at least partially surrounded by a peripheral flange 22. At least one flap 40 is spaced from the compartments 30 by the flange 22. Preferably, though not necessarily, a pair of opposing flaps 40 are spaced from the compartments by the flange 22. The flaps have an orientation that is adjacent to the compartments 30 and, in some instances, abutting the compartments 30, such that the package 10 can be supported in its upright orientation by one of the flaps 40. Optionally, the flaps 40 can each include a plurality of ribs 42 with intermediate segments that have a taper corresponding to, or, in some instances, matching the taper of a sidewall 32 of an adjacent compartment 30 such that part of the flaps 40 can abut the sidewall 32 of the compartment 30. This can result in a generally perpendicular angle between surfaces of the flap and the flange 22 to facilitate supporting the package 10 in its upright orientation.

[0013] Turning now to an exemplary embodiment of the tray 20 for use in the package 10, shown in Figures. 1-5, the tray 20 includes an array of a plurality of compartments 30. Each of the compartments has a bottom wall 34, shown in Figures 1-3, an access opening 36, as shown in Figure 1, and a sidewall 32 extending between the access opening 36 and the bottom wall 34, such as shown in Figures 1 and 2. The sidewalls 32 of the compartments 30 can have an inward taper, as shown in Figure 5, such that the access opening 36 is larger in area than the area of the bottom wall 34. The taper can be provided as part of a draft angle to facilitate withdrawal of the tray 20 from a mold cavity during forming. The compartments 30 are sized to accommodate products, such as food products 12, for example, biscuits. While multiple compartments 30 are shown in the exemplary embodiment of Figures 1-5, the number of compartments can vary, including having one a single compartment. Furthermore, the height of the sidewall 32 can vary for a given compartment 30.

[0014] The compartments 30 are surrounded by a peripheral flange 22 adjacent their access openings 36. Specifically, the array of compartments is surrounded by the flange 22. The flange 22 optionally can extend between adjacent compartments 30 or partially between adjacent compartments 30. The flange 22 is generally planar, and is optionally generally coplanar with at least a portion of the bottom walls 34 of the compartments 30. Although a flange 22 is shown surrounding the array of compartments 30, the flange 22 could instead just be on a pair of opposing sides of the tray 20, or only on one side of the tray 20. The flanges could also be arranged on adjacent sides of a corner of the tray, or on all sides of the tray. The flange 22 can also include a small downturned rim 24, as shown in Figure 9.

[0015] A pair of opposing flaps 40 are attached to the flange 22, as shown in Figures 2 and 5. The flaps 40 can be attached relative to the flange 22 by respective intersections 26, which optionally can be hinges. For example, the flaps 40 can be directly attached to the planar portion of the flange 22, or attached to the rim 24 of the flange 22. The flaps 40 extended generally parallel to each other and generally perpendicular to the generally planar portion of the flange 20. The flanges 40 each advantageously provide a support surface for supporting

the package 10 in an upright orientation, as shown in Figure 7. Although two flanges 40 are shown, only one flange may be provided. Further, although the flanges 40 are shown on a longer side of the tray 20, they could alternatively extend on the shorter side of the tray 20, or on both a long and a short side, or on all sides. Because the flange 40 projects outwardly from the tops of the compartments 30, adjacent the access openings 36, if the flaps 40 were not present, then the tray would be inclined when tried to stand on end. That is, the tray, and package, would be supported by edges of the bottom wall of the compartments and an adjacent edge of the flange. With the recess of the edges of the bottom walls relative to the adjacent edge of the flange, this inclination results. The inclination may be of such a degree that the package is unstable and not able to be supported, or may be unstable, in an upright orientation on one of its ends. The flaps 40 make up for this recess and can provide a more stable package 10 able to be supported in an upright orientation on of the end of the package adjacent one of the flaps 40.

[0016] Turning now to details of the flaps 40, each of the flaps can have a series of ribs 42, as shown in Figure 4. The ribs 42 can provide strength to the flaps 40, and can extend outwardly - away from the compartments 30 - relative to inward portion or segments 44 of the flaps 40 disposed between adjacent ribs 42. The ribs 42 can have an outward surface that is optionally curved. The inward segments 44 of the flaps 40 can taper inwardly toward the adjacent compartments 30, with an increasing taper as the inward segments 44 extend away from the adjacent intersection 26. In other words, the depth of the ribs 42 increases as the ribs 42 extend away from the intersection 26, thereby positioning the inward segments 44 of the flaps 40 progressively more inward. The taper of the inward segments 44 of the flaps 40 can correspond or match the taper of the sidewalls 32 of the adjacent compartments 30. Advantageously, this can allow the flaps 40 - specifically, the inward segments 44 thereof, to abut the sidewalls 32 of the adjacent compartments 30, as shown in Figure 5, such that the angle between the outward surface of the ribs 42 and the generally planar portion of the flange 22 are generally perpendicular or at another preferred angle that facilitates support of the package 10 on the flange 40 of the tray 20 when the tray 20 is surrounded by the outer wrapper 14. The ribs 42 can also have a width that tapers, increasing in width as the ribs 42 extend away from the intersection 26, in addition to the depth of the ribs 42 that tapers. The ribs 42 can optionally extend to free edges of the flaps 40, and optional flanges 46 can extend between bottom edges of the ribs 42. While it has been described that the ribs 42 are projecting outwardly from the inward segments 44 of the flaps 40, that arrangement could be reversed. For example, the ribs could project inwardly instead of outwardly such that the ribs abut the compartments and the inward portion of the flaps is now an outward portion of the flaps that the tray can reset on when on end.

[0017] The flaps 40 preferably have a length that is less than the depth of the compartments 30, as shown in Figures 4 and 5. This means that the free edges of the flaps 40 are not coplanar with the bottom walls 32 of the compartments 30. This can help reduce a lifting of the tray 20 by the flaps 40, such as from a conveyor, during movement of the tray 20 prior to and during flow wrapping.

[0018] As mentioned above, the flaps 40 are connected to the flange of the tray by intersections 26, which can be hinges. The intersection 26 or hinge can optionally be any one of or combinations of channel, score, perforation, unformed section or thinned section disposed between the flange 22 and the flap 40. The tray 20 can be formed with the flaps 40 in an unfolded orientation, as shown in Figures 8-12, where the flaps 40 are generally coplanar with the generally planar portion of the flange 22 as opposed to the folded orientation of Figures 1-5. Notches 28 can be formed at one or both ends of the intersection 26, as shown in Figure 10, to facilitate folding of the flaps 40 to the orientation of Figures 1-5. The trays 20 of Figures 8-12 differ from the trays of Figures 1-5 in that the corners of the flaps 40 are not tapered (see tapered corners in Figures 1 and 4), the ribs 42 are not as deep, and the flaps 40 are longer.

[0019] Turning now to the method of manufacturing the package 10, the tray 20 can be formed from any suitable manufacturing process, such as thermoforming. After forming, the flaps 40 of the tray 20 can be folded from an unfolded orientation (shown in Figures 8-12) to a folded configuration (shown in Figures 1-5). This folding can be done manually or using automated equipment. Products 12 can be placed in the one or more compartments 30, either prior to folding or after folding of the flaps 40. The placement of product 12 in the compartments 30 can either be done manually or using automated equipment. The tray 20 with the product 12 therein and the flaps 40 folded can be advanced through flow wrapping equipment to place an outer surrounding wrapper 14 about the tray 20. The flow wrapping equipment can form end seals 16, which can optionally be gusseted so as to reduce the width of the end seals 16. The resulting package 10 can advantageously be stood upright and supported in that upright orientation by one of the flanges 40, including if the flange 40 abuts the sidewall 32 of an adjacent compartment 30. The wrapper can be a flexible film suitable, for example, for contact with food.

Claims

1. A tray for use in a package having an outer surrounding wrapper, the tray comprising:

   at least one compartment having a bottom wall, an opening opposite the bottom wall, and a surrounding side wall extending between the bot-

tom wall and the opening;

a generally planar, peripheral flange disposed about the compartment and adjacent the opening;

at least one flap connected relative to the flange via an associated intersection and extending substantially perpendicular relative to the flange such that the tray can be supported on the flap in a generally upright orientation.

2. The tray of claim 1, wherein the flap is movable about the intersection from a first position, substantially parallel relative to the flange, to a second position, substantially perpendicular relative to the flange.

3. The tray of any one of claims 1 and 2, wherein the intersection is one of a channel, score, perforation or thinned section disposed between the flange and the flap.

4. The tray of any one of claims 2 and 3, wherein the intersection is notched at at least one end thereof to facilitate movement from the first positon to the second position.

5. The tray of any one of claims 1-4, wherein the flap has a length substantially the same as the sidewall of the compartment.

6. The tray of any one of claims 1-5, wherein the flap has a plurality of ribs.

7. The tray of claim 6, wherein each of the ribs of the flap extends generally perpendicular relative to the flange when the flap extends substantially perpendicular relative to the flange.

8. The tray of claim 7, wherein a portion of the sidewall of the compartment, adjacent the flap has an inward taper away, and wherein the ribs of the flap have intermediate segments that increase in depth generally corresponding to the inward taper of the sidewall such that, when the flap is extending substantially perpendicular relative to the flange, a portion of at least some of the intermediate segments abut the portion of the sidewall of the compartment.

9. The tray of any one of claims 6-8, wherein each of the ribs on the flap tapers in width toward the intersection.

10. The tray of claim 9, wherein the flap has a free end, opposite the adjacent intersection, and wherein the free end of flap has an outwardly extending minor flange.

11. The tray of any one of claims 1-10, wherein a pair of the flaps are provided, each of the flaps being on opposite sides of the tray.

12. The tray of any one of claims 1-11, wherein the tray comprises a plurality of compartments disposed in an array, and wherein the array of compartments is at least partially surrounded by the flange.

13. The tray of any one of claims 1-12, in combination with an outer surrounding wrapper, preferably, a flow wrap having a pair of end seals, the end seals being disposed generally perpendicular to the flap.

14. The tray of any one of claims 12 and 13, wherein the compartment contains at least one food product.

15. A method of forming a package using the tray of any one of claims 1 and 3-12, the method comprising:

forming the tray, and preferably thermoforming the tray, and, after forming;

depositing one or more food products in the compartment;

folding the flap from a first position substantially parallel relative to the flange, to a second position, substantially perpendicular relative to the flange, either before or after the depositing step; and

flow wrapping the tray and food products in an outer surrounding wrapper.

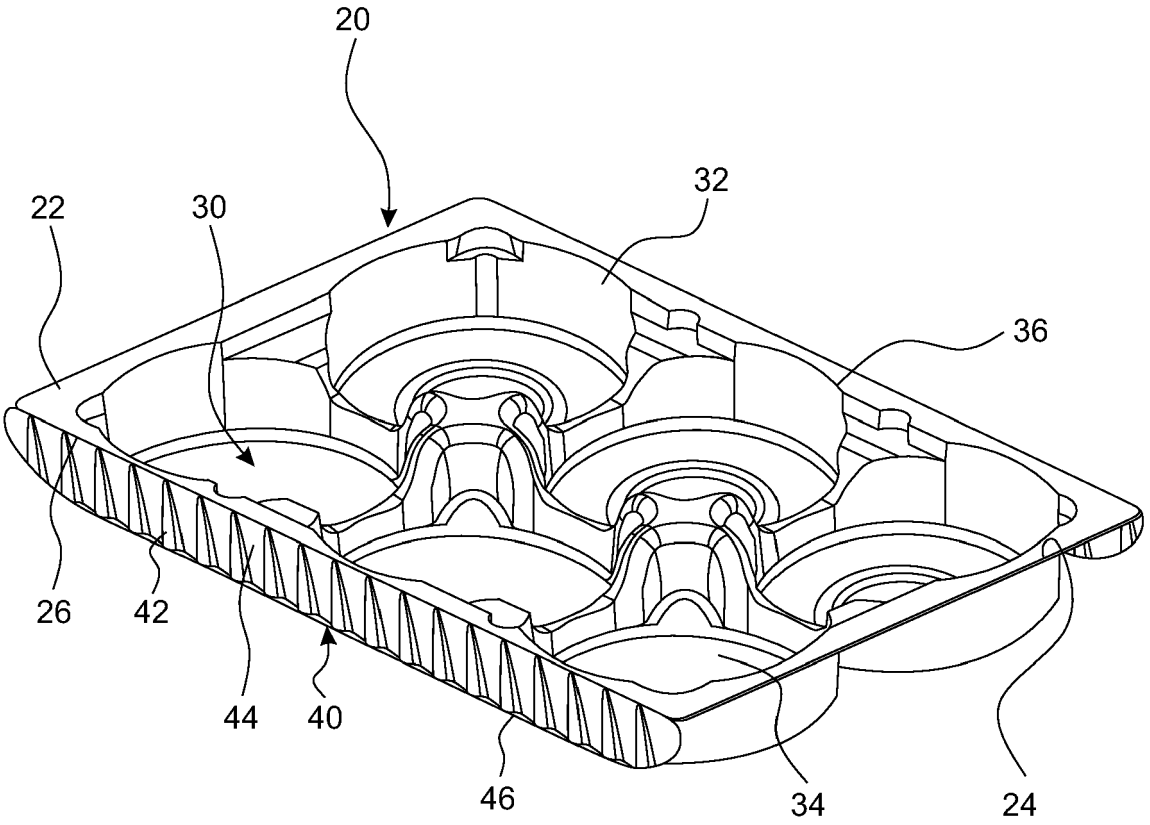

FIG. 1

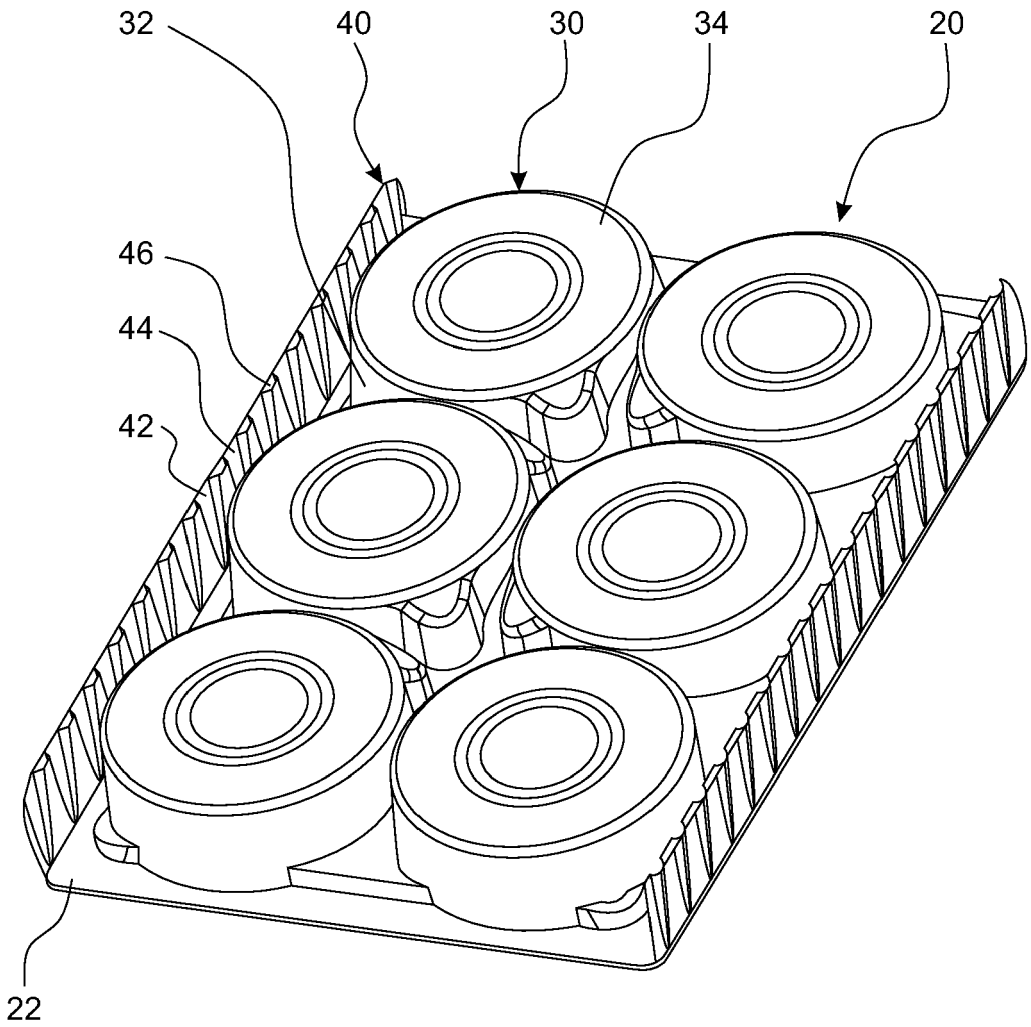

FIG. 2

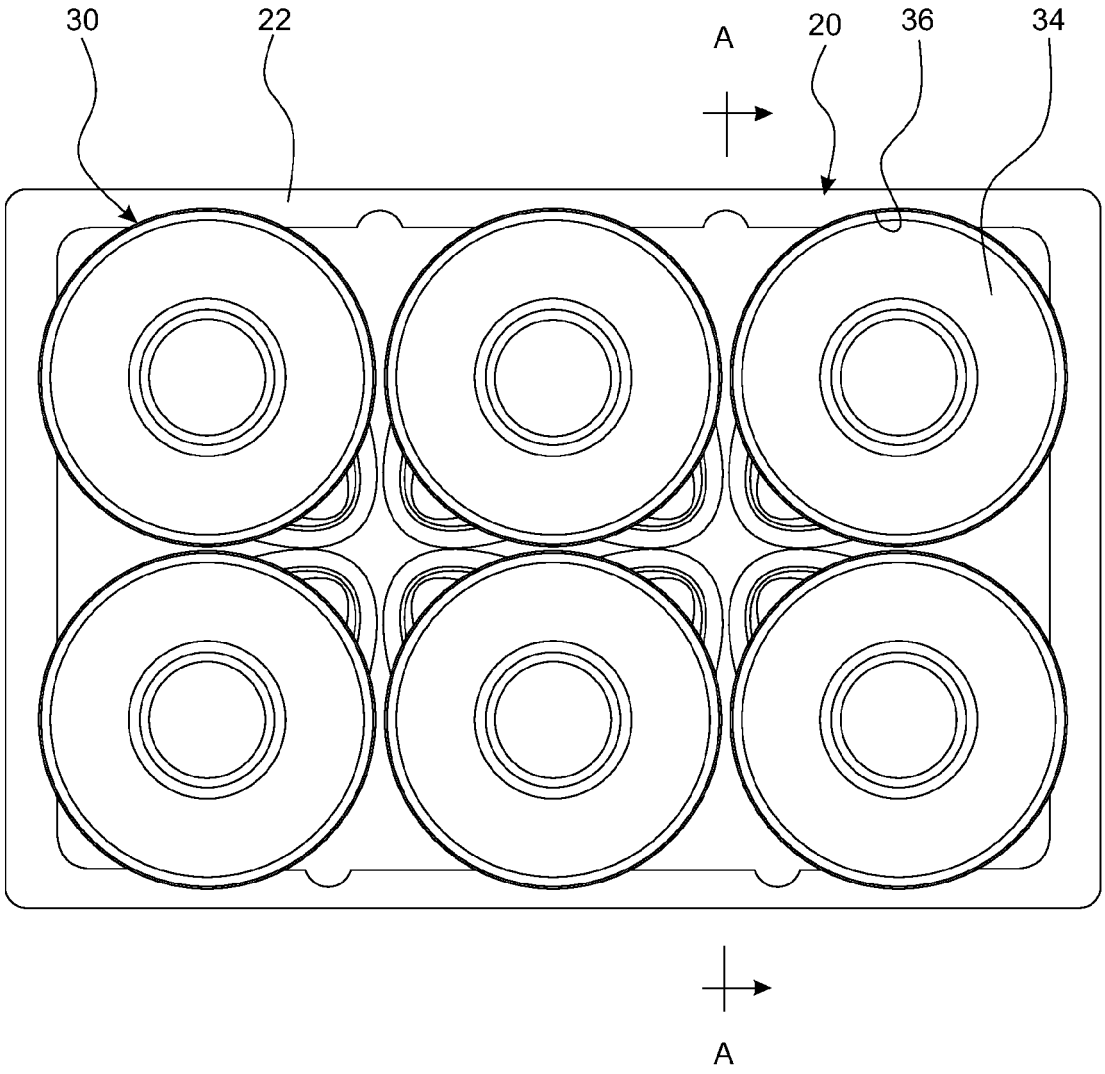

FIG. 3

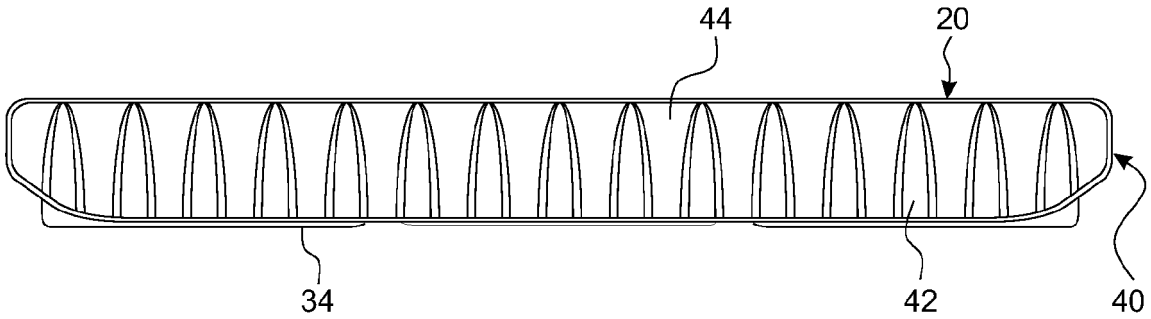

FIG. 4

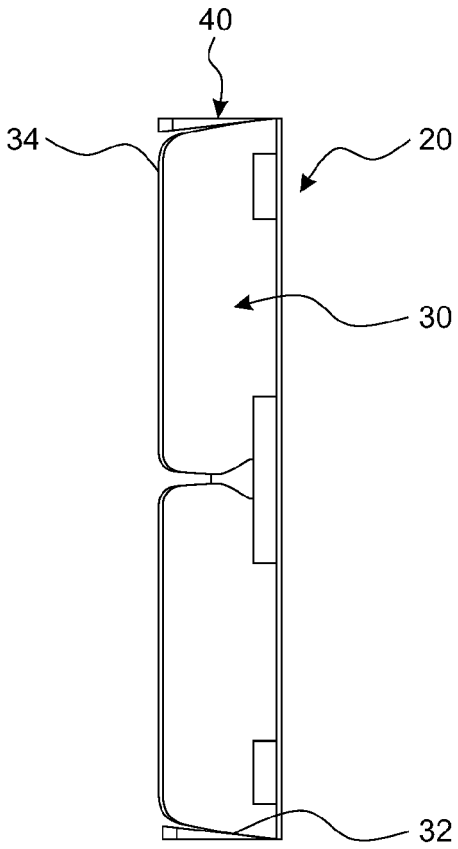

FIG. 5

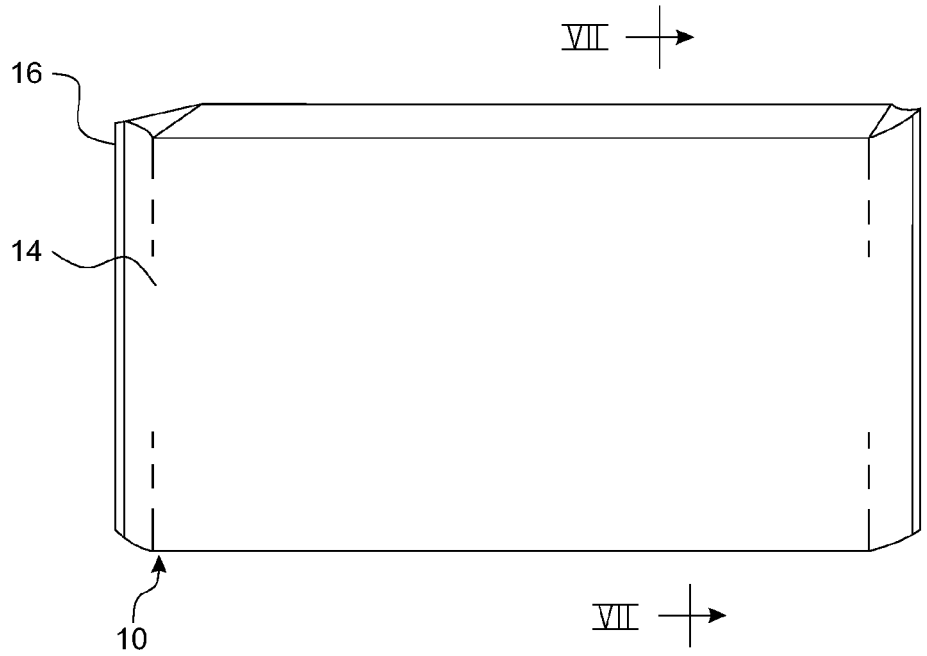

FIG. 6

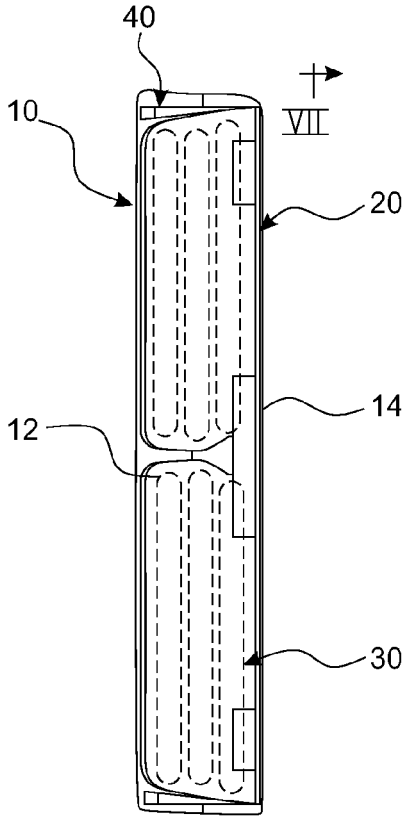

FIG. 7

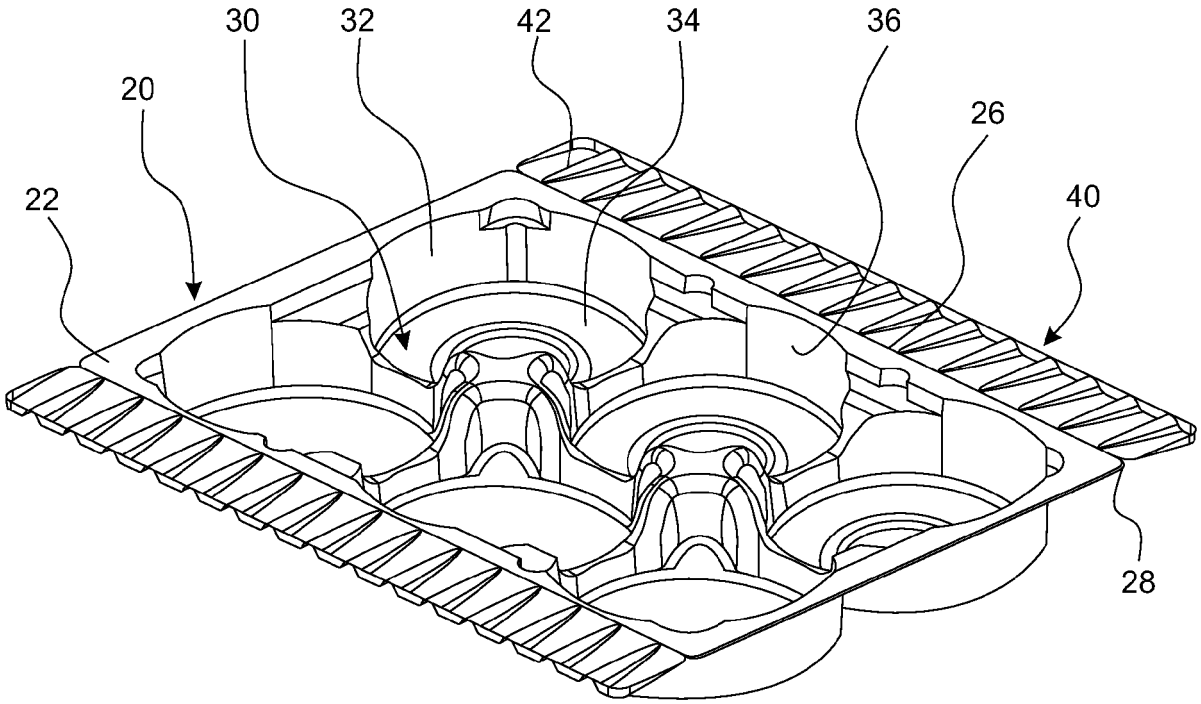

FIG. 8

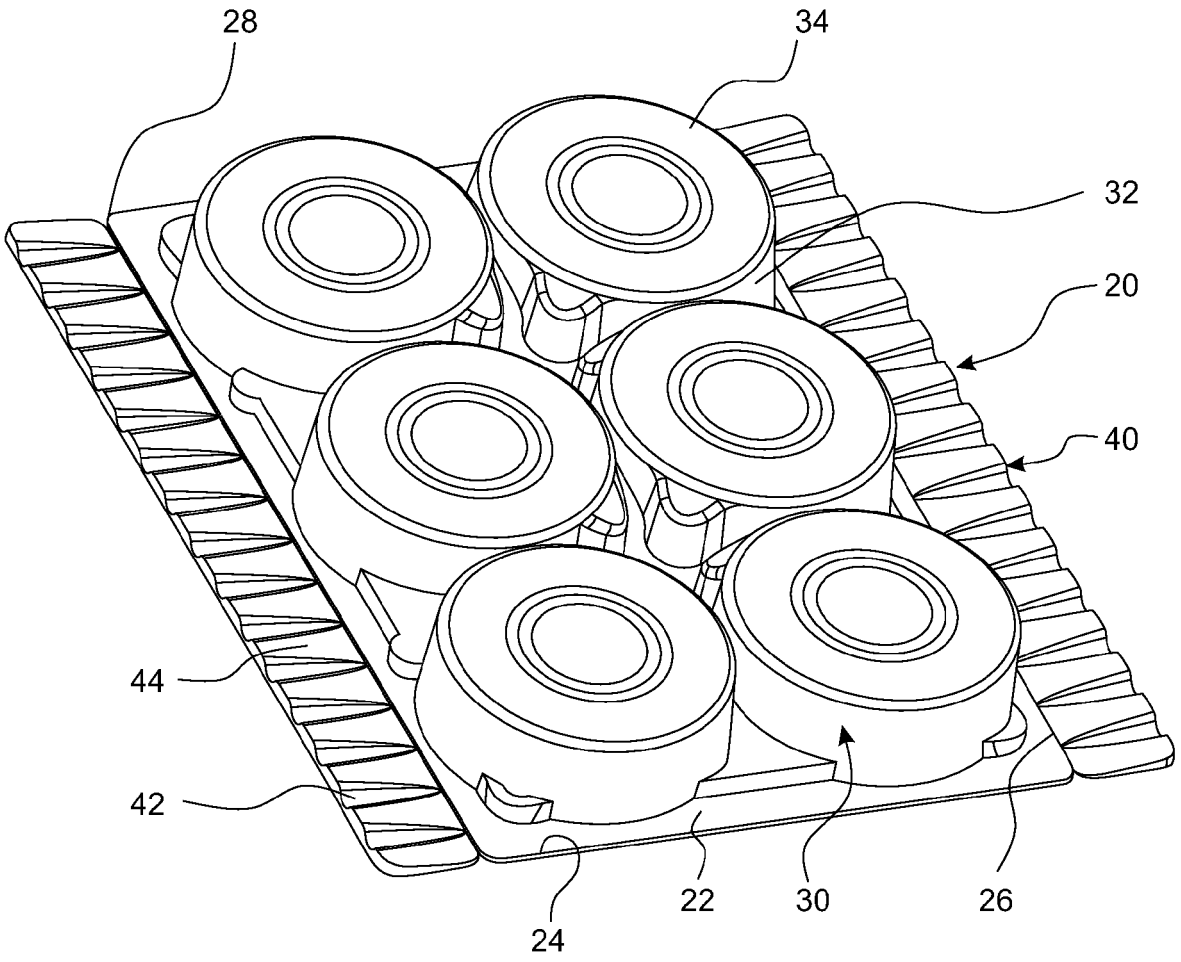

FIG. 9

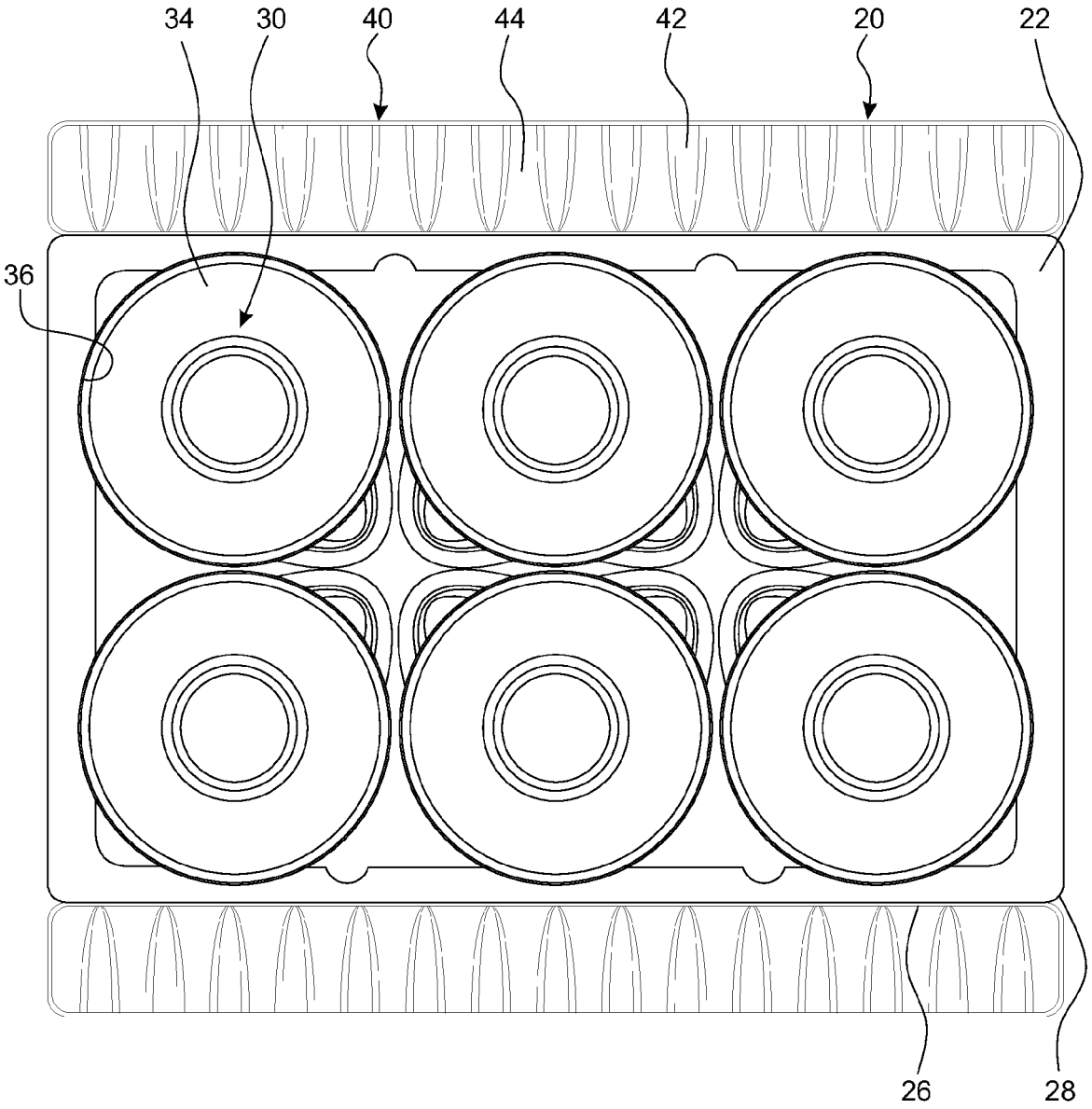

FIG. 10

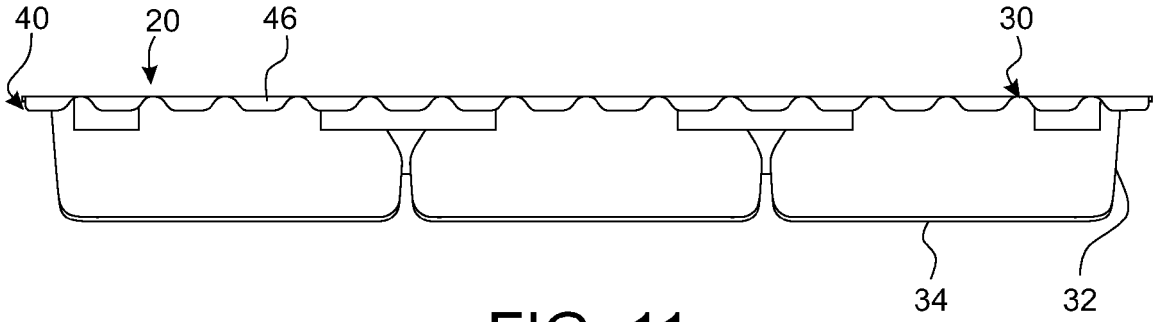

FIG. 11

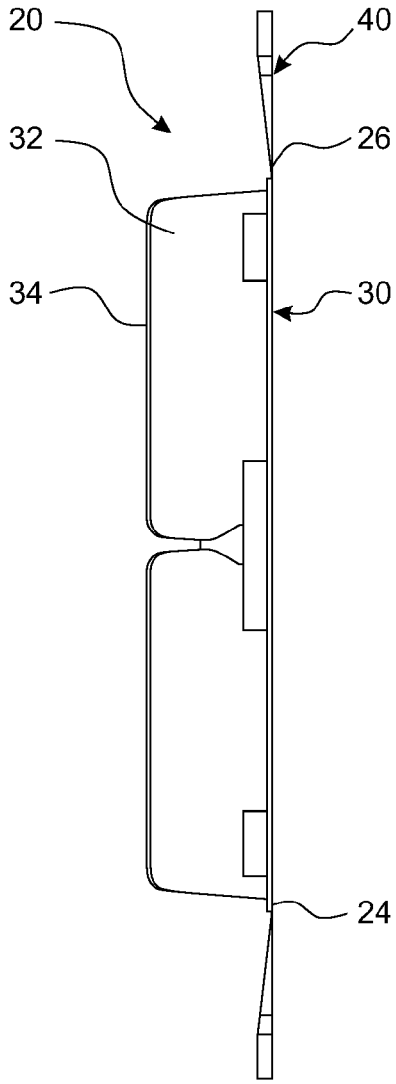

FIG. 12

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EUROPEAN SEARCH REPORT

Application Number
EP 16 18 2274

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 4 158 408 A (THIESSEN FRED L) 19 June 1979 (1979-06-19) * column 2, line 66 - column 4, line 19; figures 1-4 *	1,3,5,6, 11-15	INV. B65D77/00 B65D85/36 B65D1/36
X	GB 1 205 473 A (REMPLOY LTD [GB]) 16 September 1970 (1970-09-16) * page 1, line 52 - line 87; figures 1-2 *	1,3,5,6, 11-15	
X	US 2003/106829 A1 (COSTELLO ANTHONY WILLIAM [NZ]) 12 June 2003 (2003-06-12) * paragraph [0018] - paragraph [0020]; figures 1-3 *	1,3, 11-15	
X	US 5 695 798 A (ROZZANO MICHAEL J [US]) 9 December 1997 (1997-12-09) * column 3, line 32 - line 43; figures 1-4 *	1	

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
Munich	13 December 2016	Derrien, Yannick

CATEGORY OF CITED DOCUMENTS

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13-12-2016

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