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(54) **PACKAGING SYSTEM**

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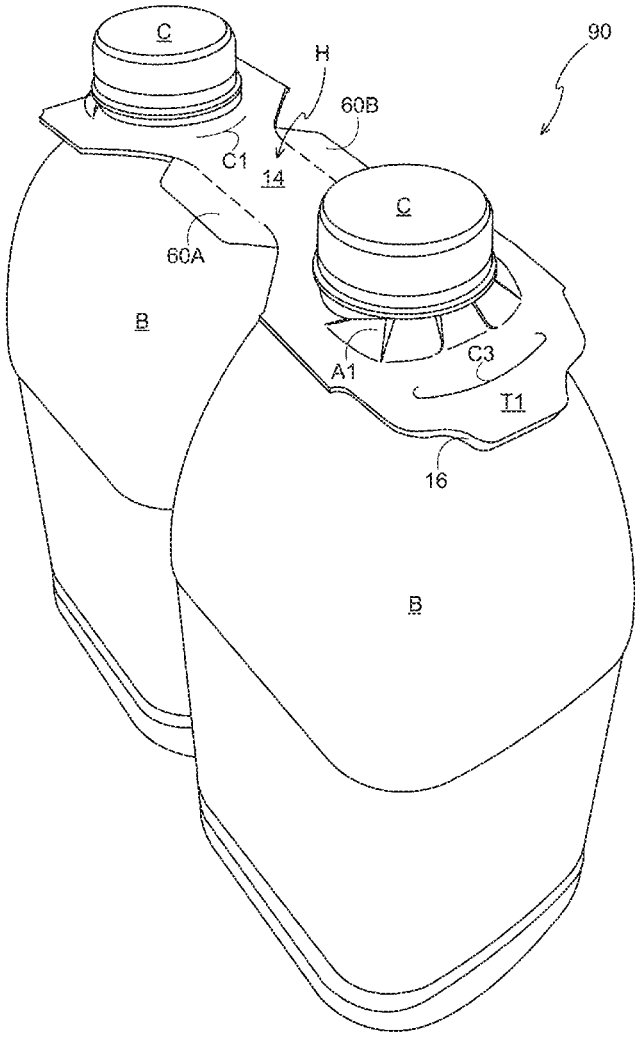
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(57) **ABSTRACT**

Aspects of the disclosure relate to a packaging system, method of packaging, apparatus, handle structure, an article carrier (**90**) for packaging a plurality of articles (B), and to a blank (**10**; **110**; **210**; **410**; **510**; **610**; **710**) for forming the handle structure or article carrier (**90**). The packaging system provides an apparatus (**1000**) for applying the handle structure or article carrier (**90**) to one of more articles (B). The apparatus (**1000**) provides component (**1020**; **1120**) adapted to engage the handle structure or article carrier (**90**) so as to displace a first side of the handle structure or article carrier (**90**), disposed on a first side of an article retention structure RT to a greater extent than a second side of the handle structure or article carrier (**90**), disposed on a second, opposing, side of an article retention structure RT.



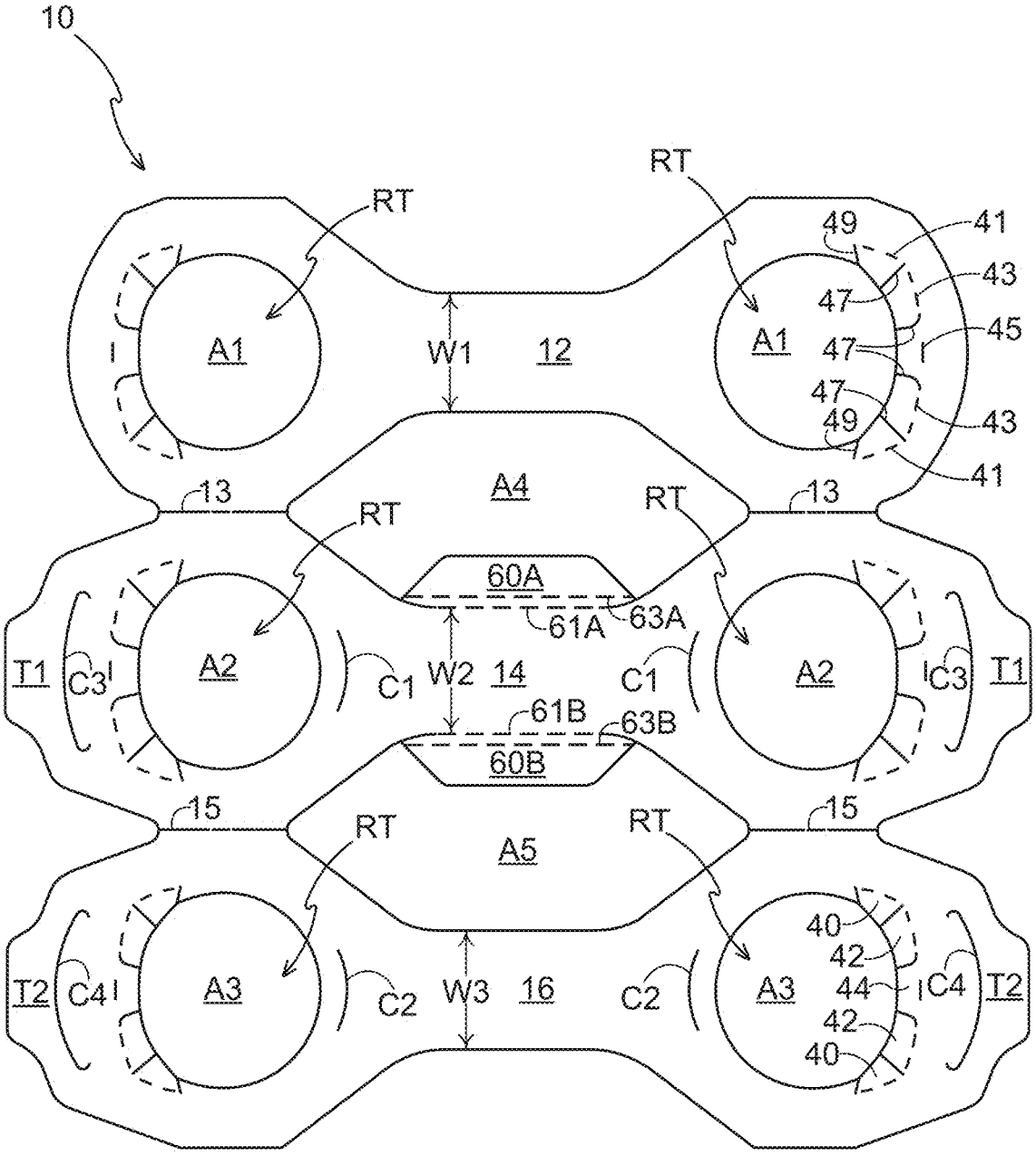

10
RT
RT
RT
49
41
43
47
45
A1
W1
12
A1
47
47
49
43
41
13
A4
13
RT
RT
60A
61A
63A
T1
C3
A2
C1
W2
14
C1
A2
C3
T1
61B
63B
60B
15
RT
A5
RT
15
40
42
T2
C4
A3
C2
W3
16
C2
A3
44
C4
T2
42
40

FIG. 1

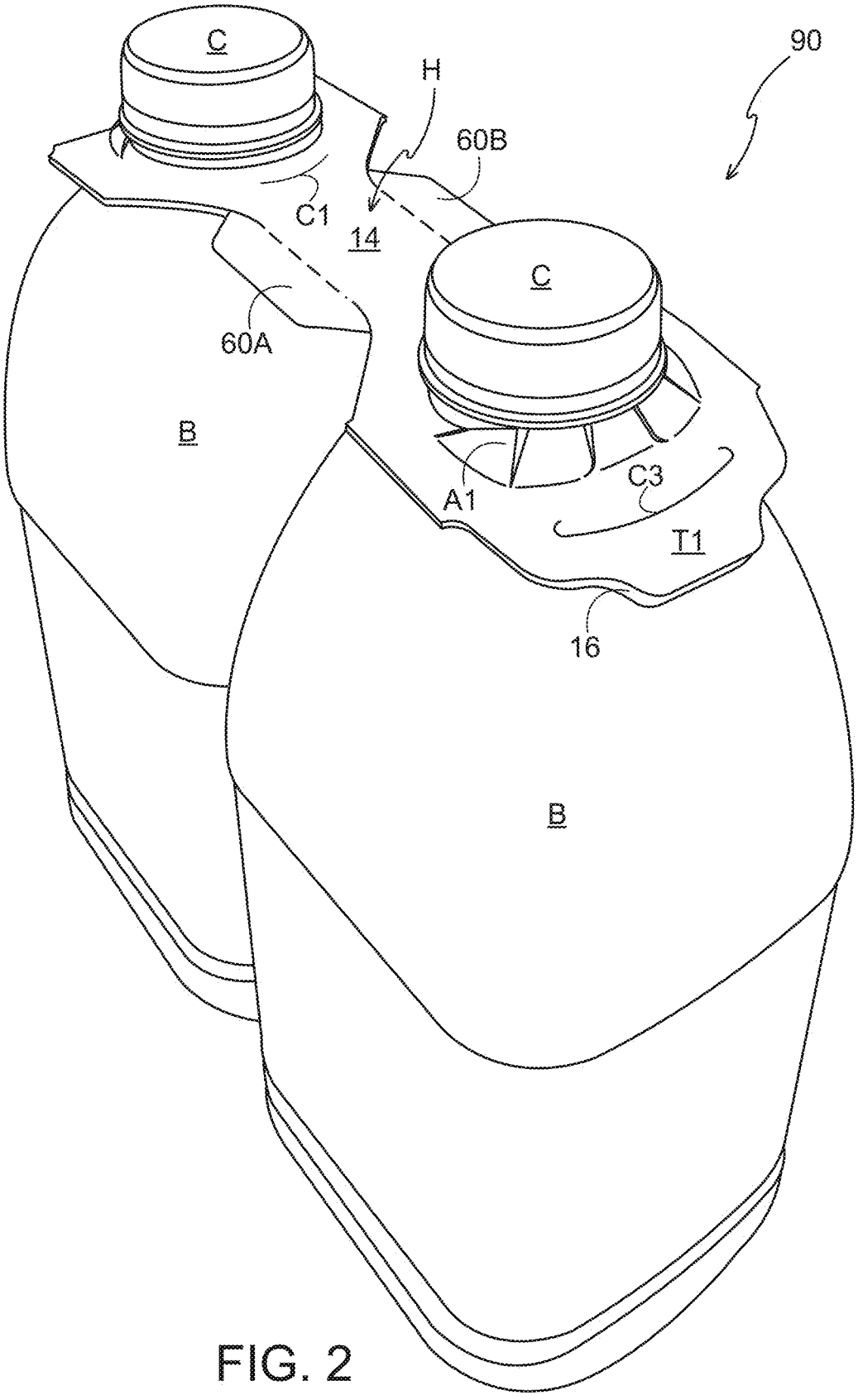


FIG. 2

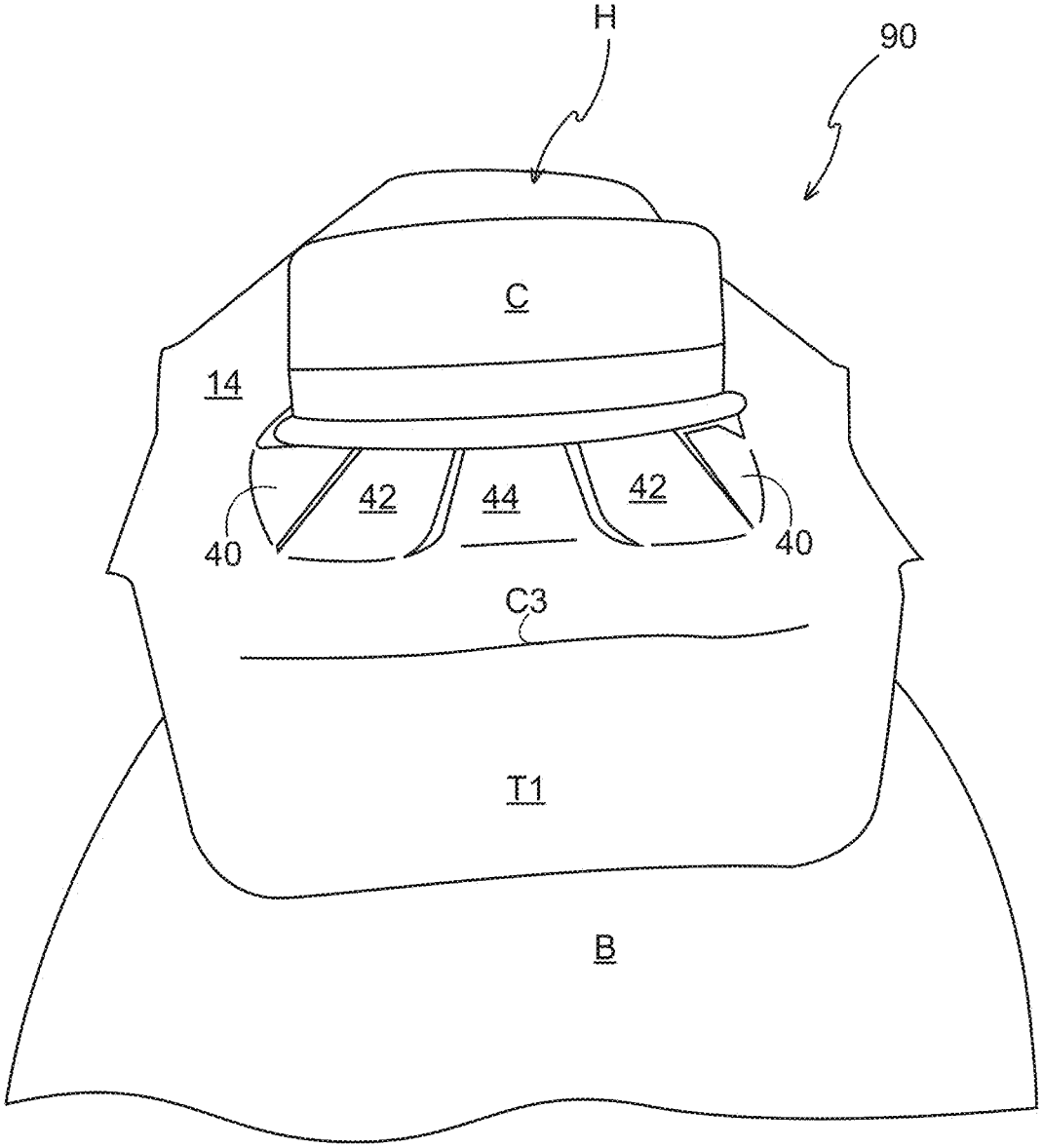


FIG. 3

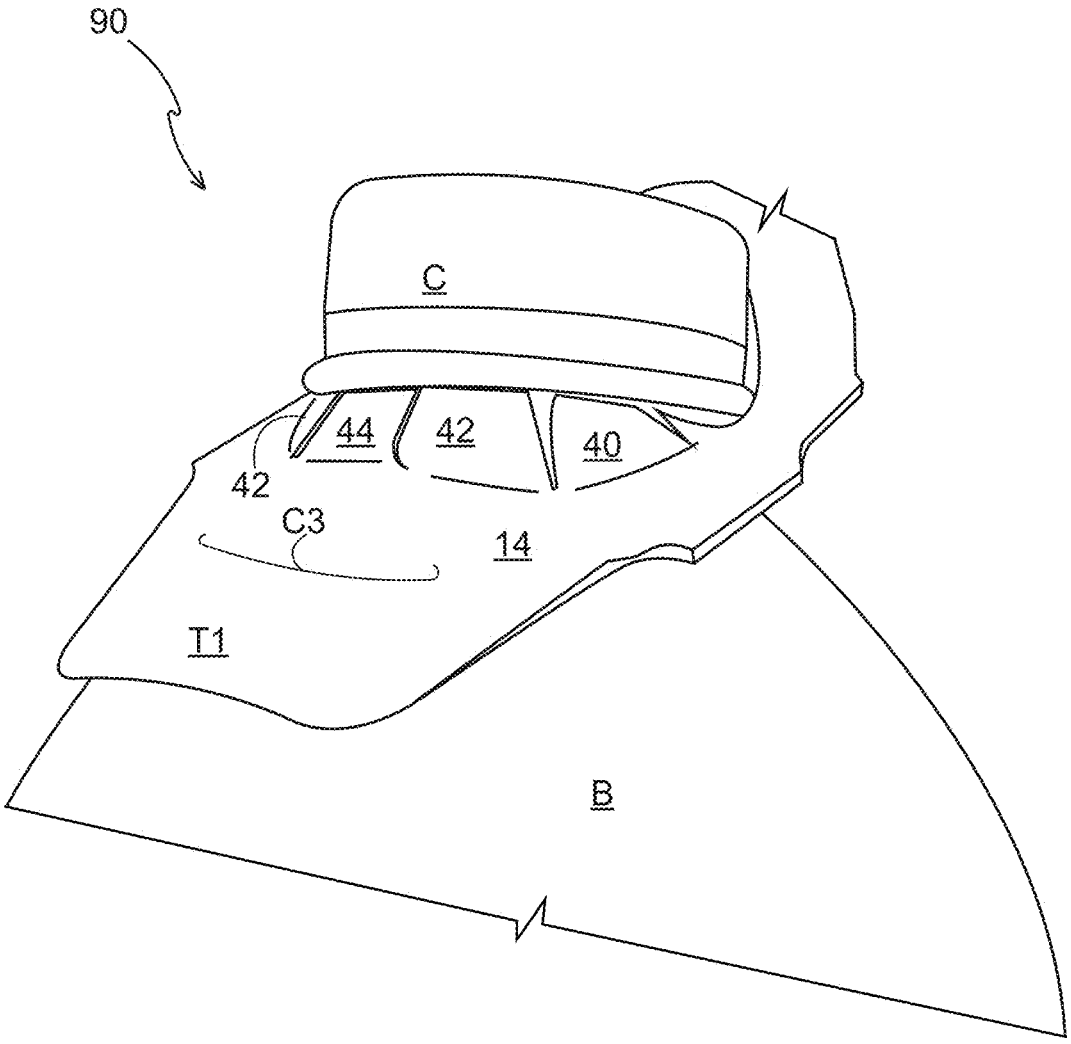


FIG. 4

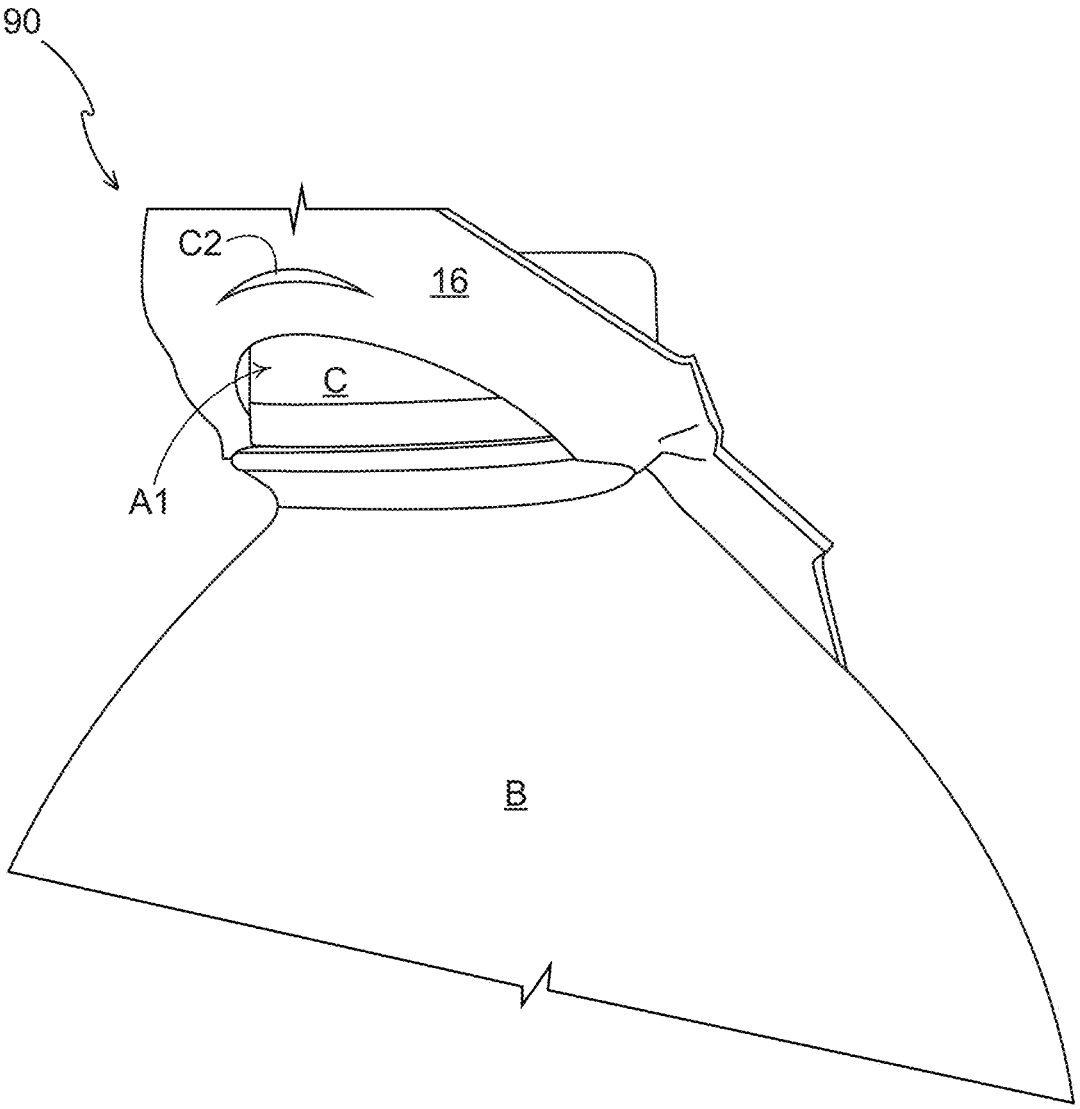


FIG. 5

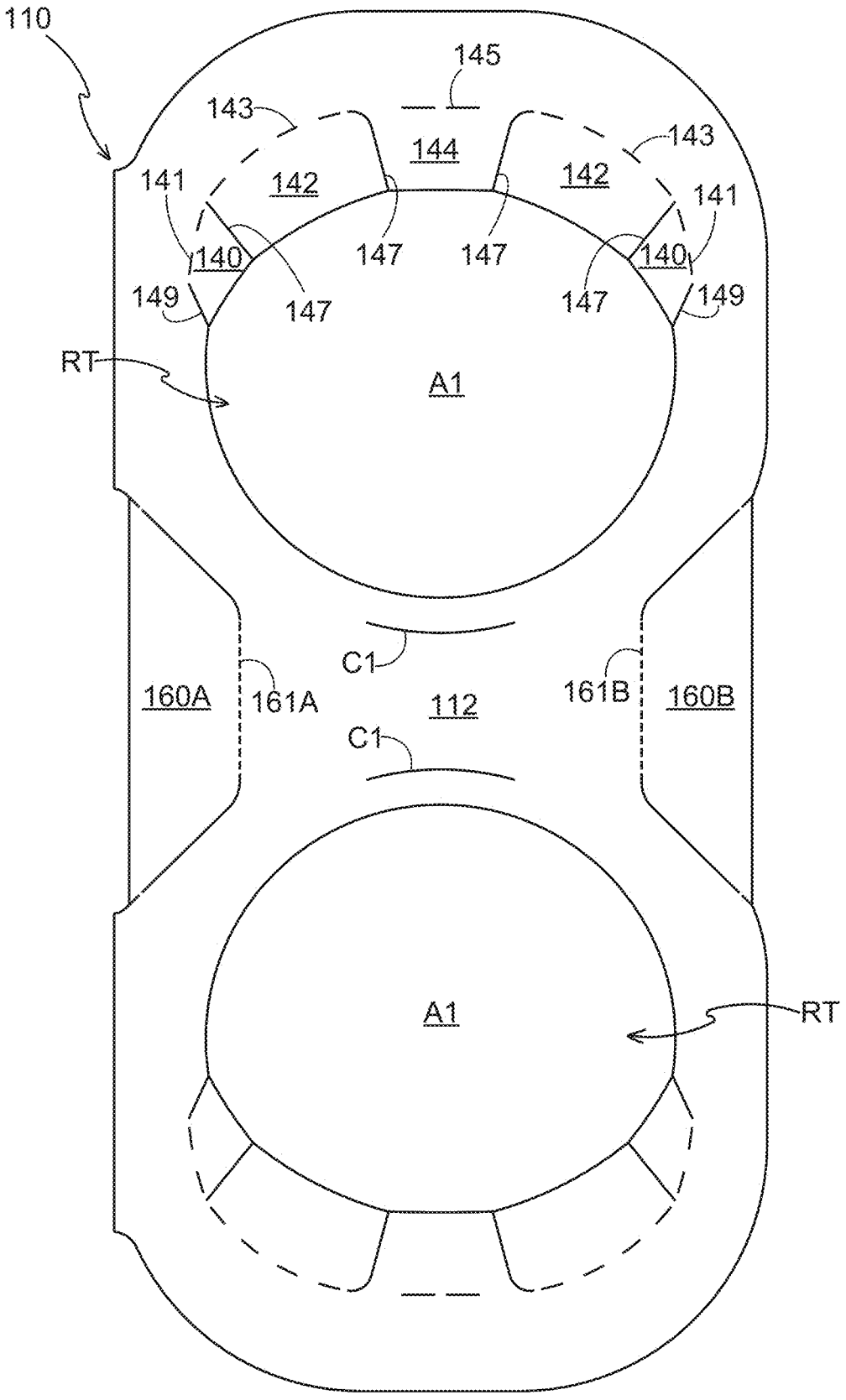

110
145
143
144
143
141
142
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141
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147
147
140
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147
147
149
RT
A1
C1
160A
161A
112
161B
160B
C1
A1
RT

FIG. 6

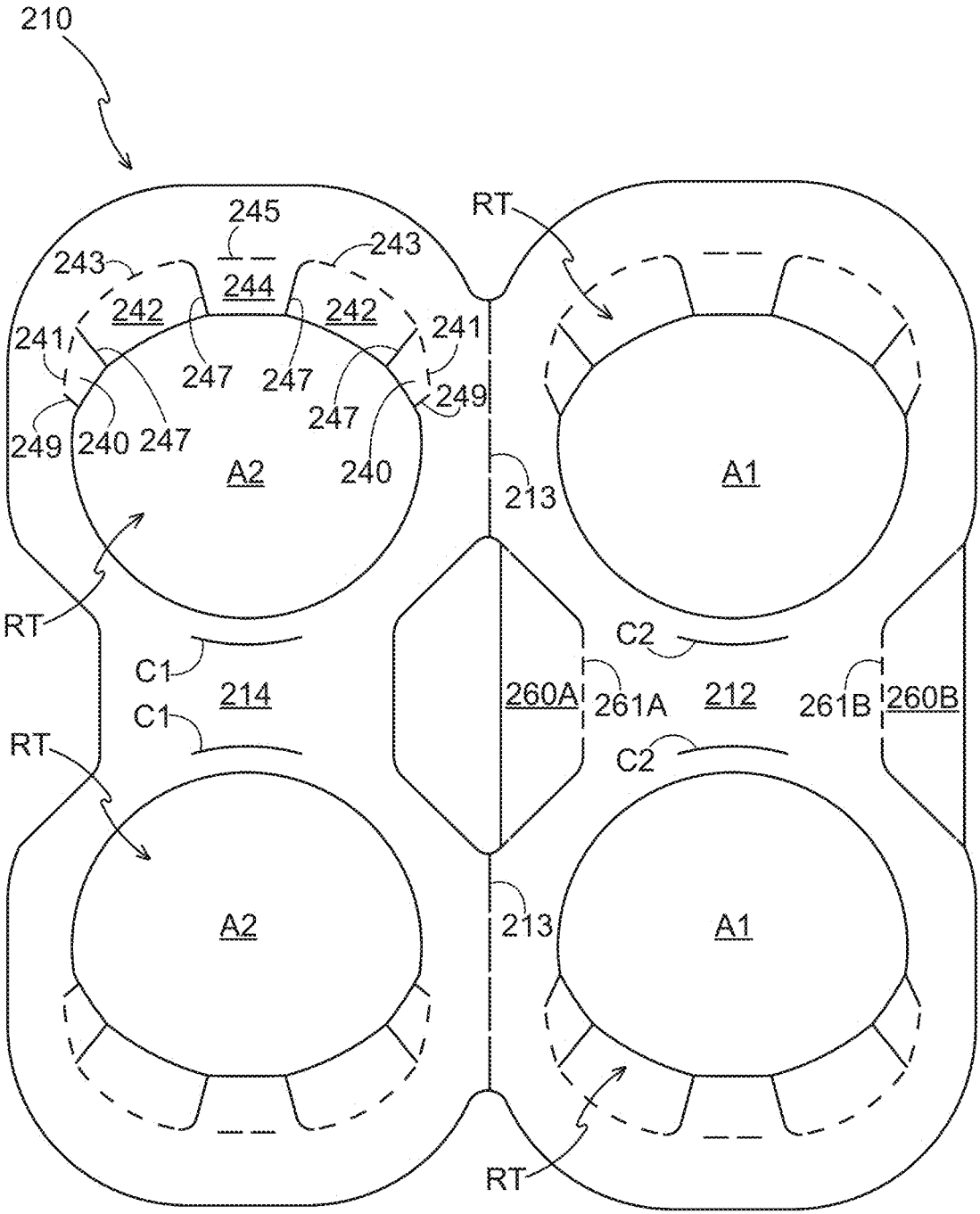

210
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243
243
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241
241
247
247
247
249
249
240
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240
A2
A1
213
RT
RT
C1
214
C1
C2
260A
261A
212
261B
260B
C2
RT
A2
A1
213
RT

FIG. 7

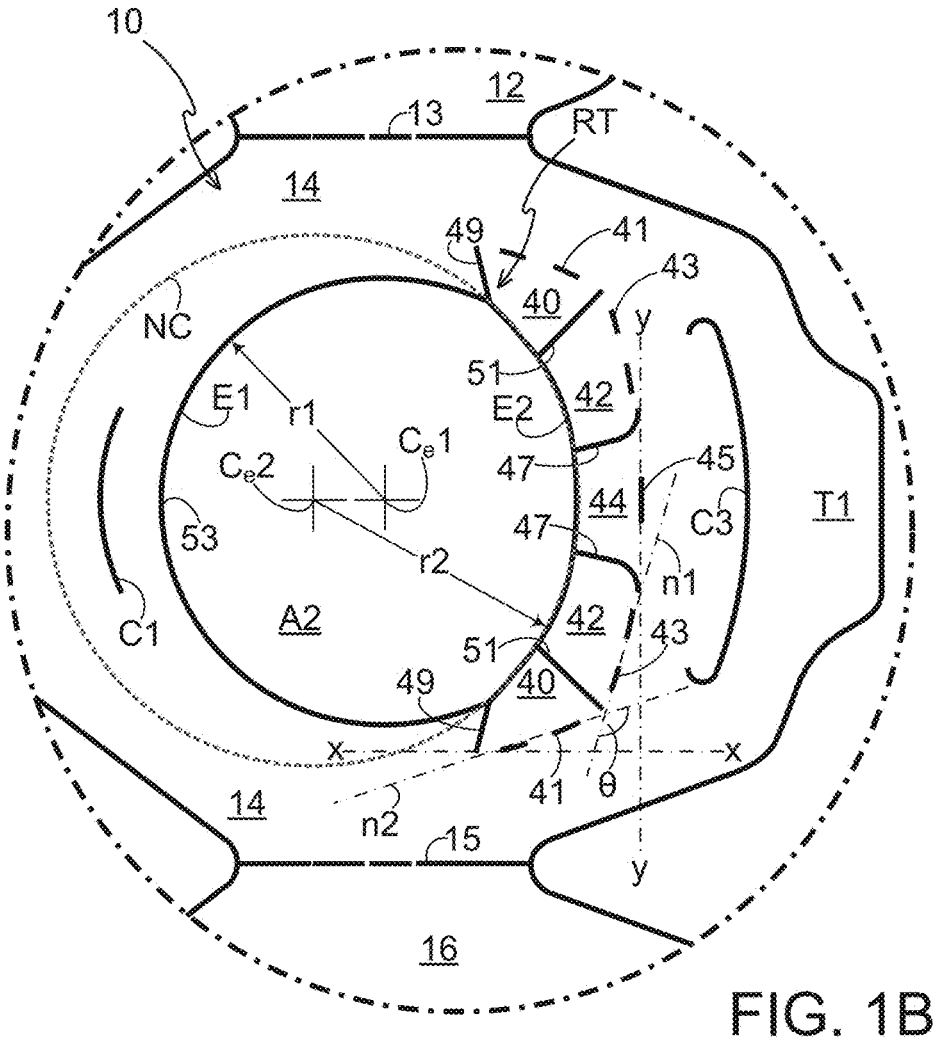


FIG. 1B

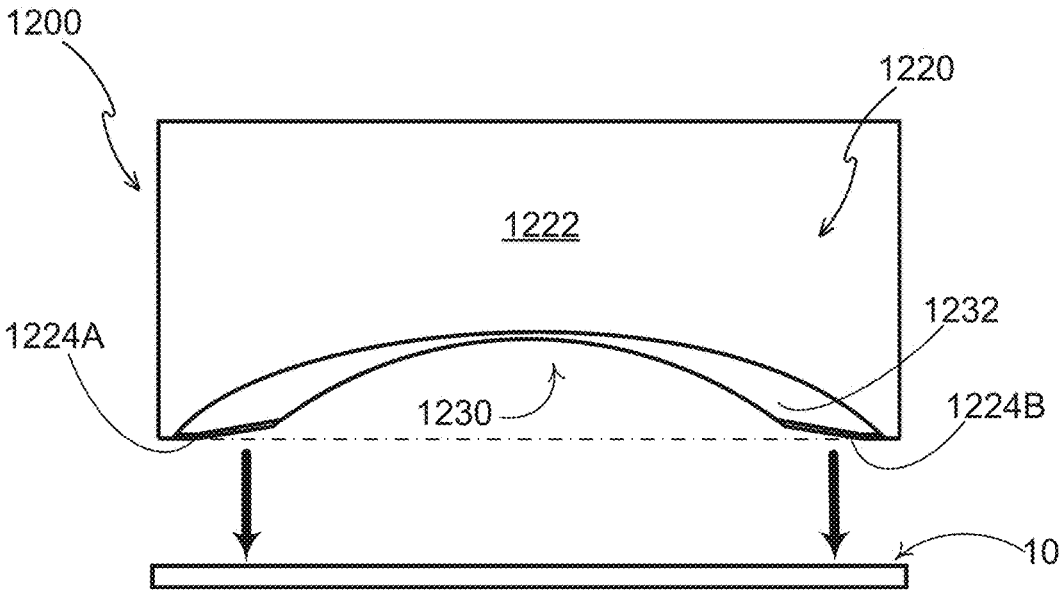


FIG. 16B

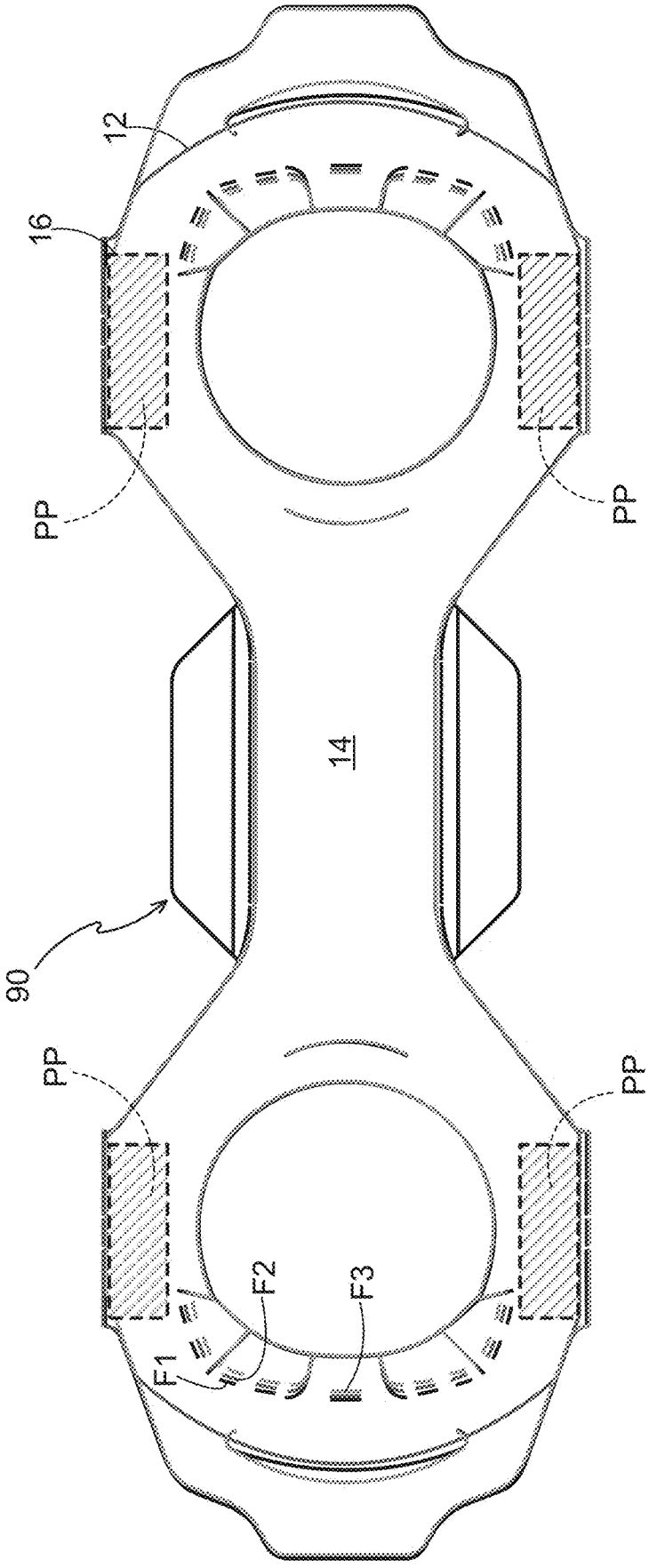


FIG. 1C

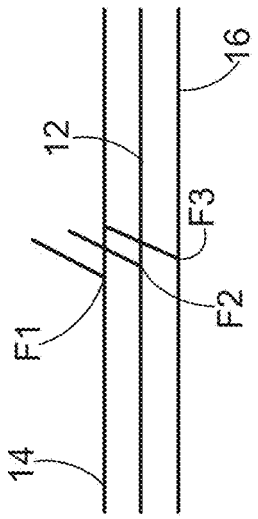


FIG. 1D

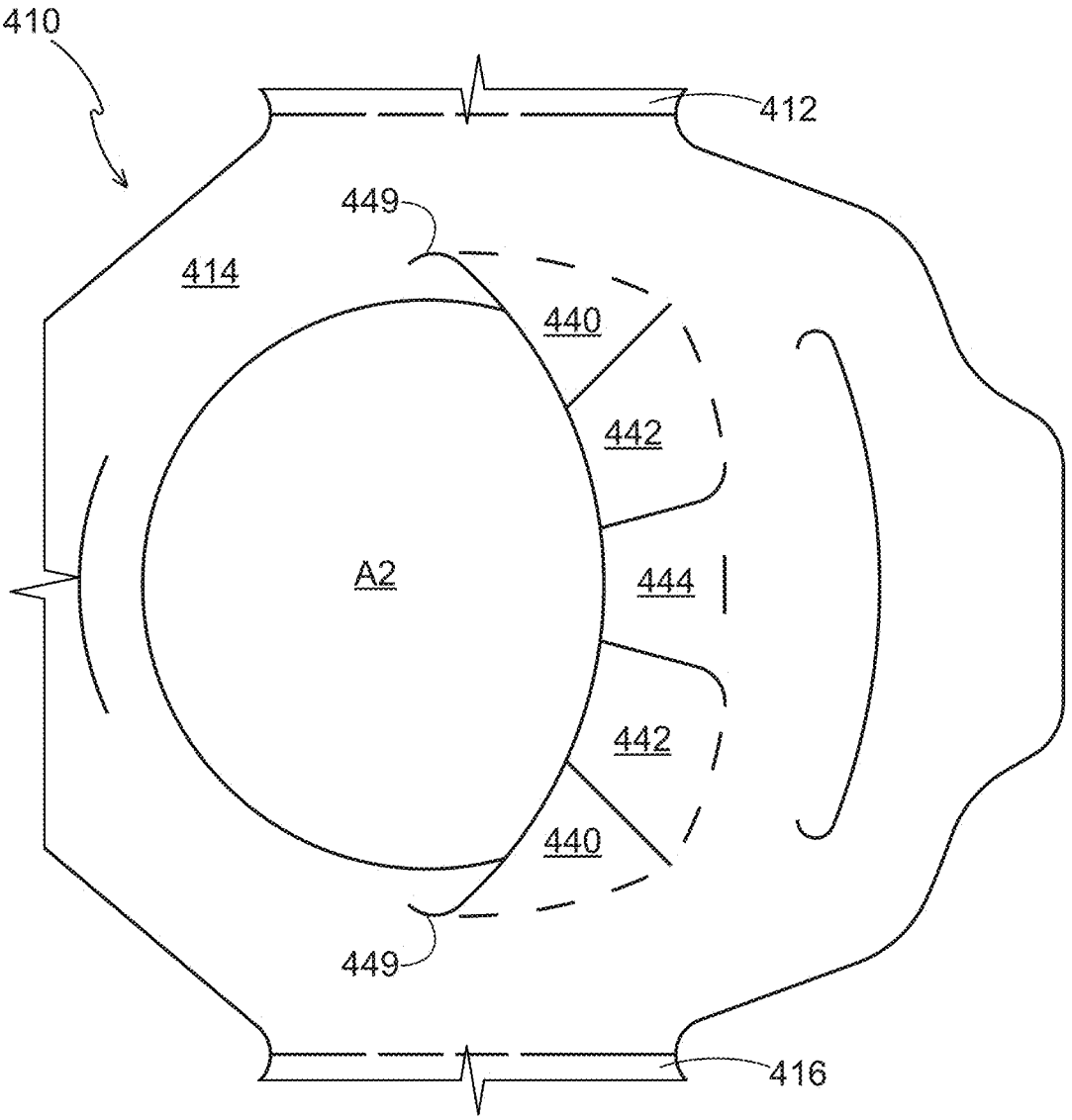


FIG. 8

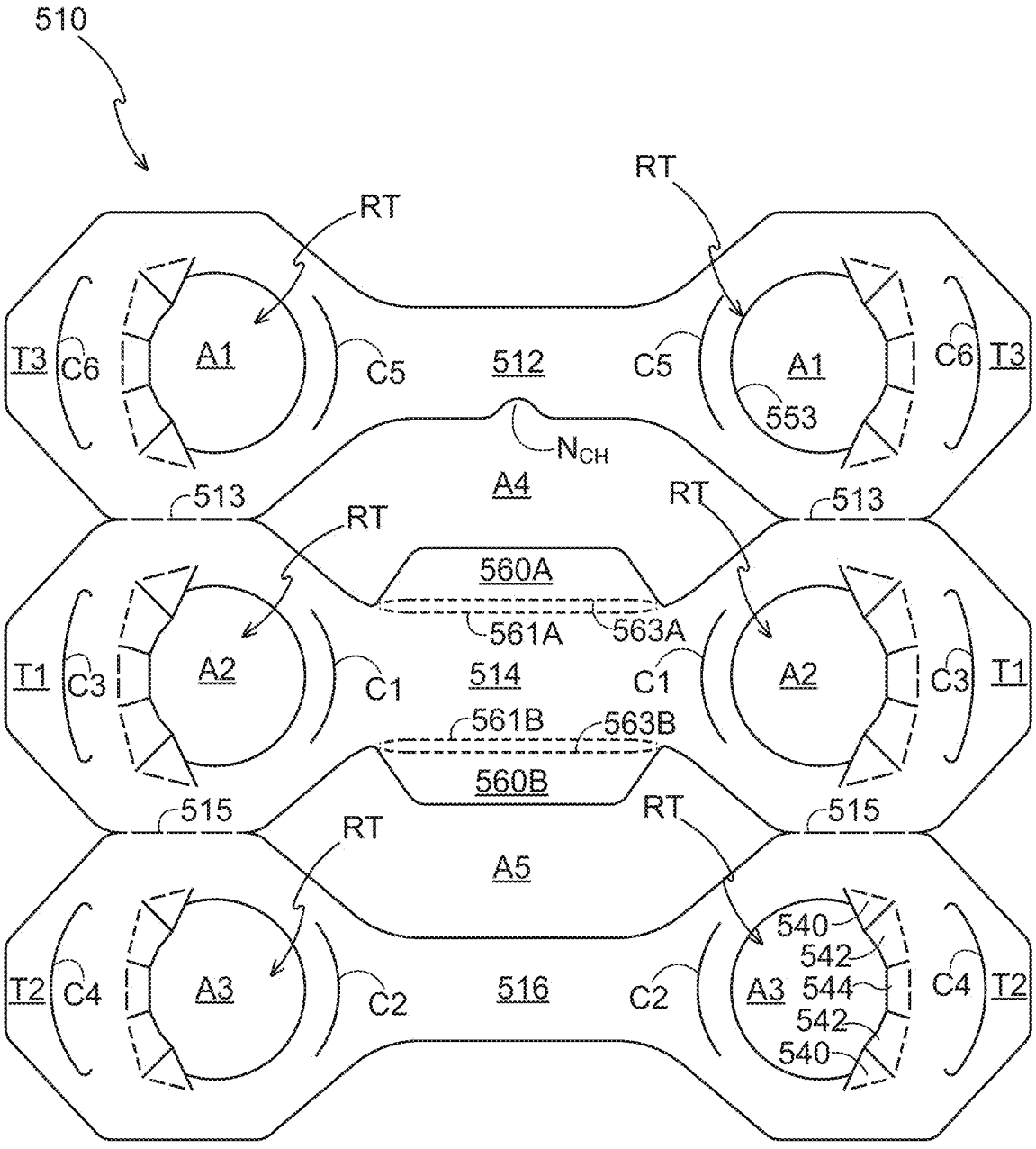

510
RT
RT
RT
T3
C6
A1
C5
512
C5
A1
C6
T3
553
N_{CH}
A4
513
513
RT
RT
560A
561A
563A
T1
C3
A2
C1
514
C1
A2
C3
T1
561B
563B
560B
515
515
RT
RT
A5
540
542
T2
C4
A3
C2
516
C2
A3
544
C4
T2
542
540

FIG. 9

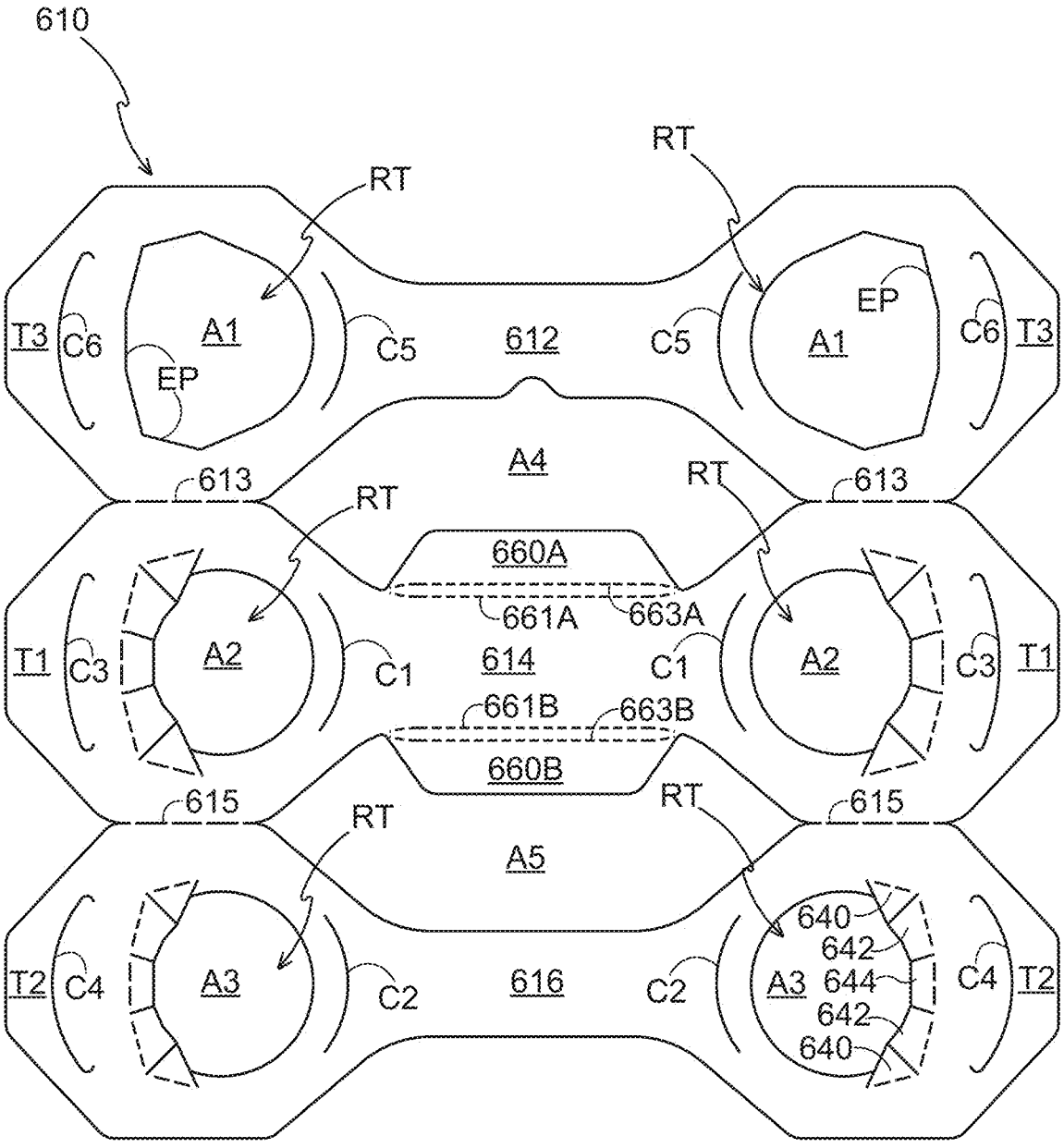

610
RT
RT
RT
T3
C6
A1
EP
C5
612
C5
A1
EP
C6
T3
A4
613
613
RT
RT
660A
661A
663A
T1
C3
A2
C1
614
C1
A2
C3
T1
661B
663B
660B
615
615
RT
RT
A5
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T2
C4
A3
C2
616
C2
A3
644
C4
T2
642
640

FIG. 10

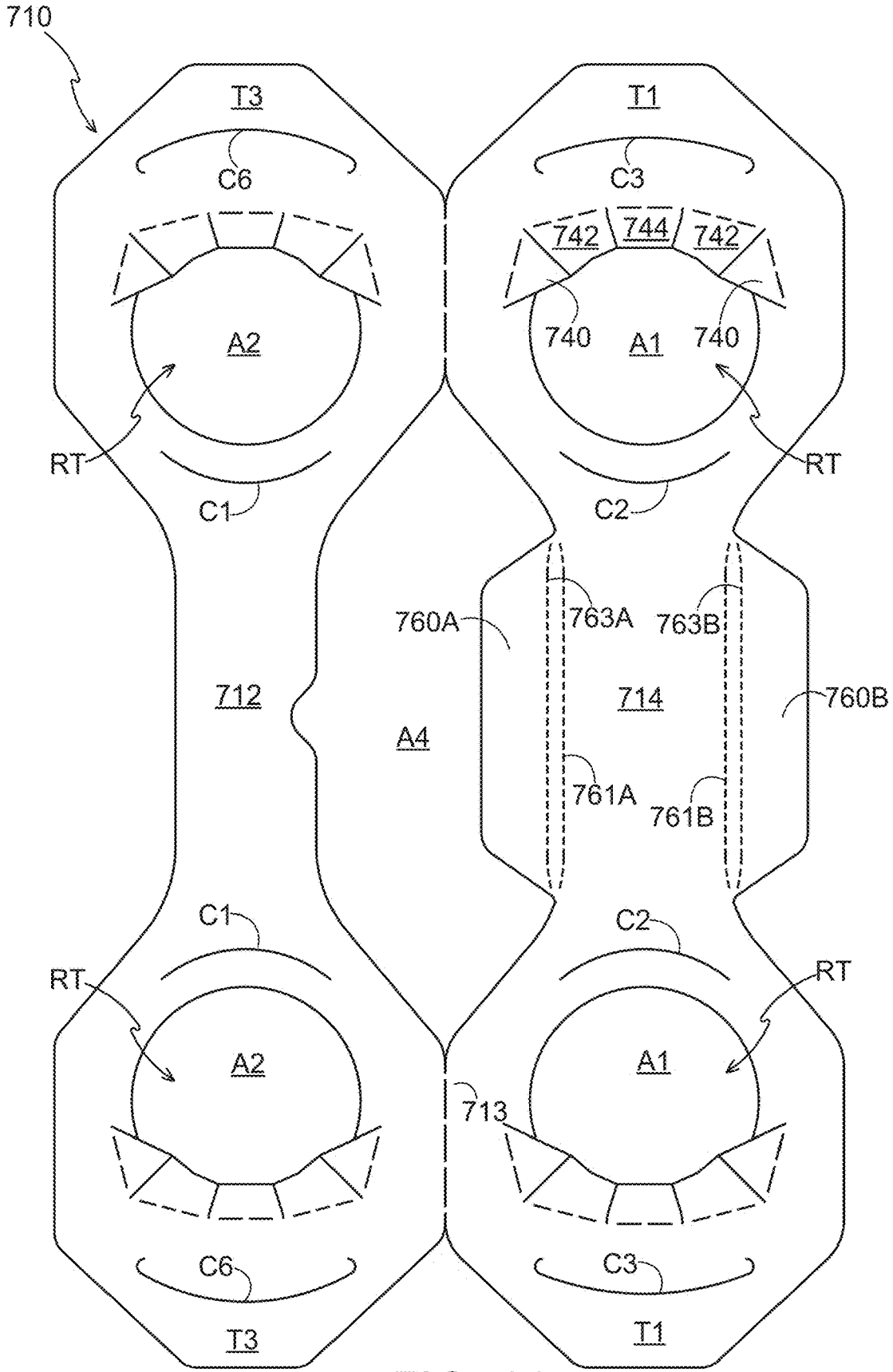

710
T3
C6
A2
RT
C1
T1
C3
742
744
742
740
A1
740
RT
C2
760A
763A
763B
712
714
760B
A4
761A
761B
C1
RT
A2
C2
RT
A1
713
C6
C3
T3
T1

FIG. 11

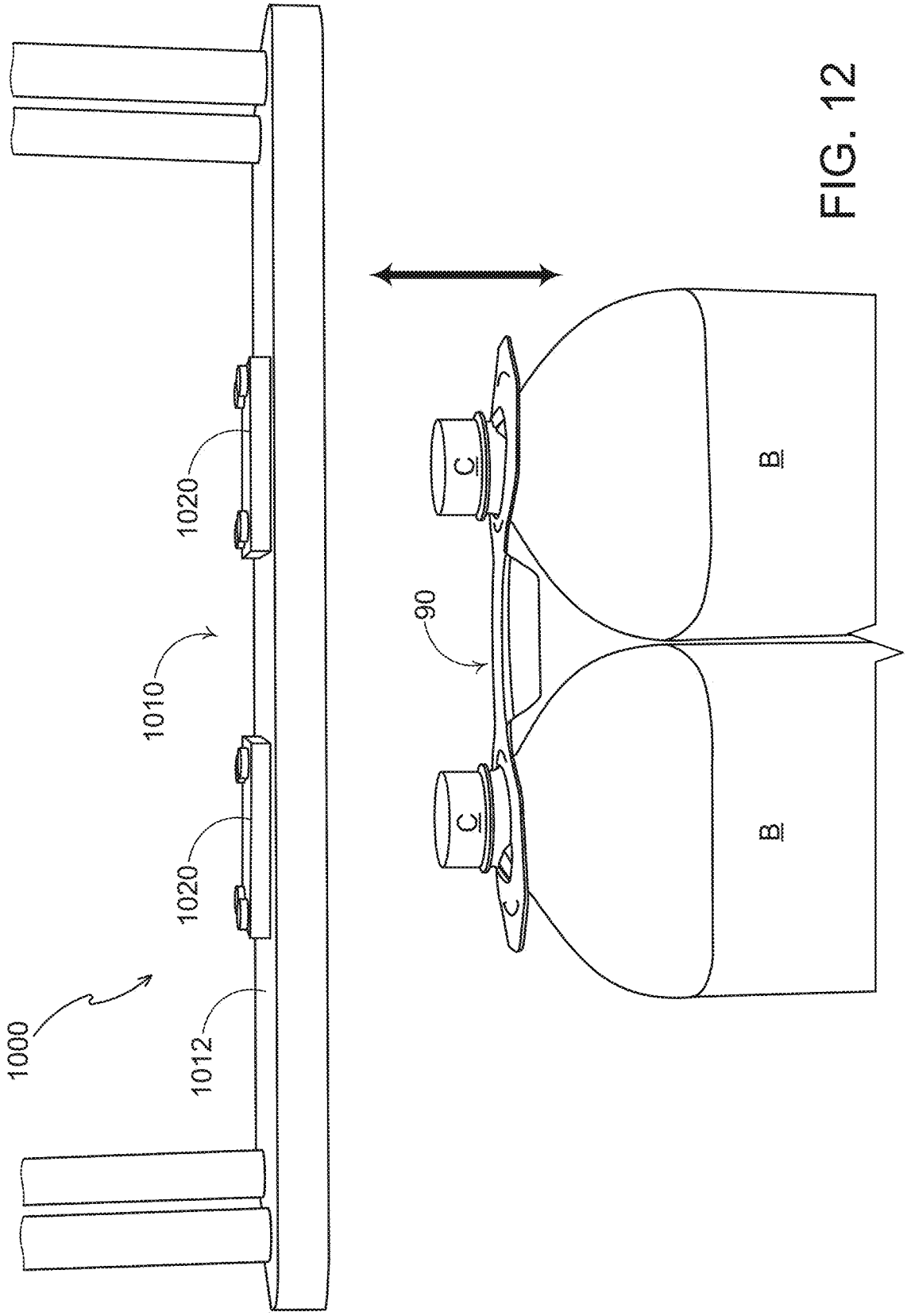


FIG. 12

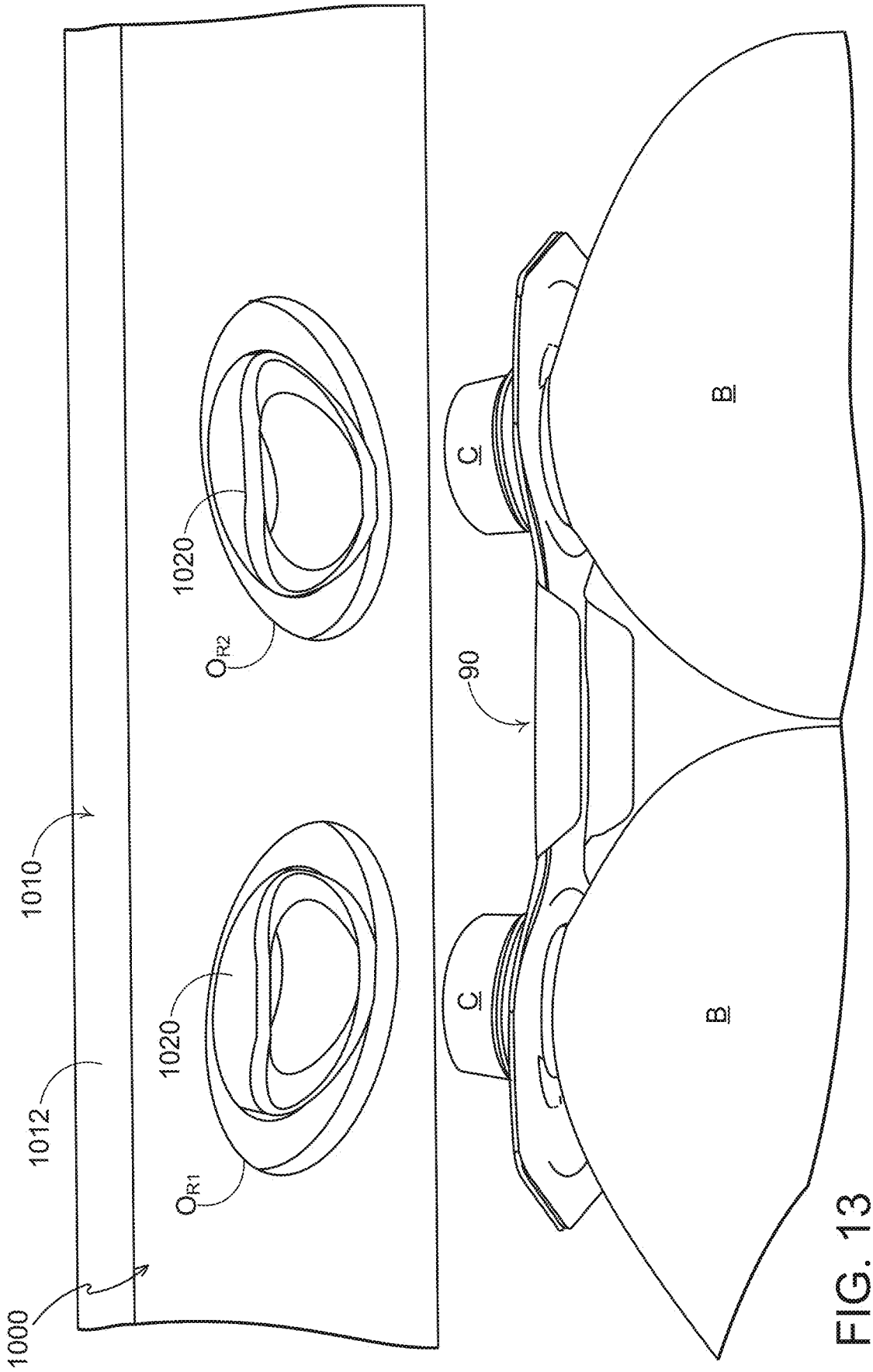


FIG. 13

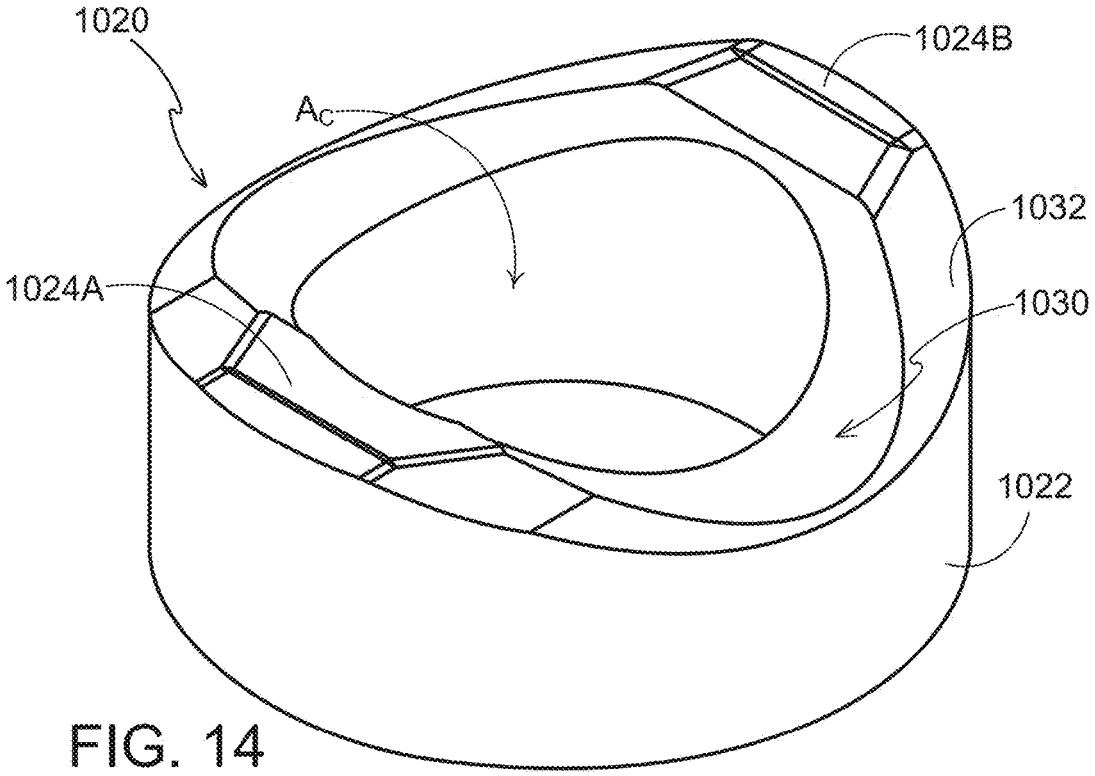


FIG. 14

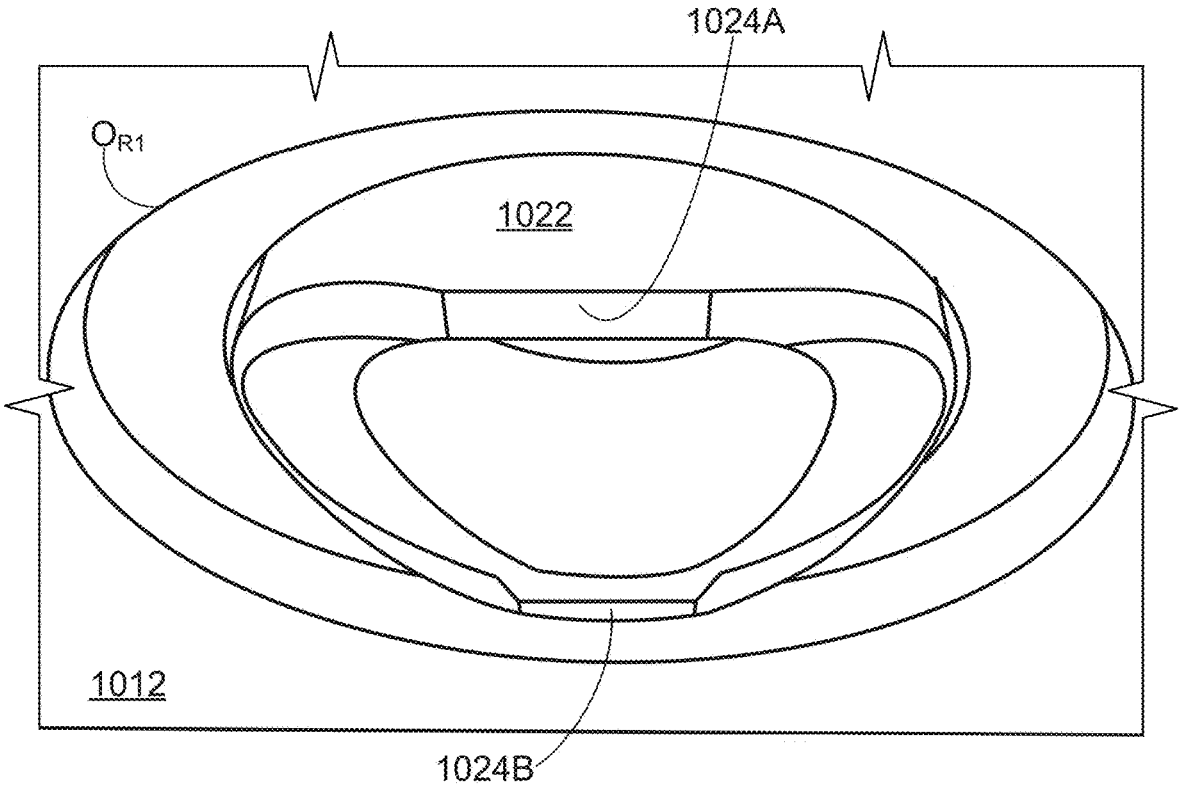


FIG. 15

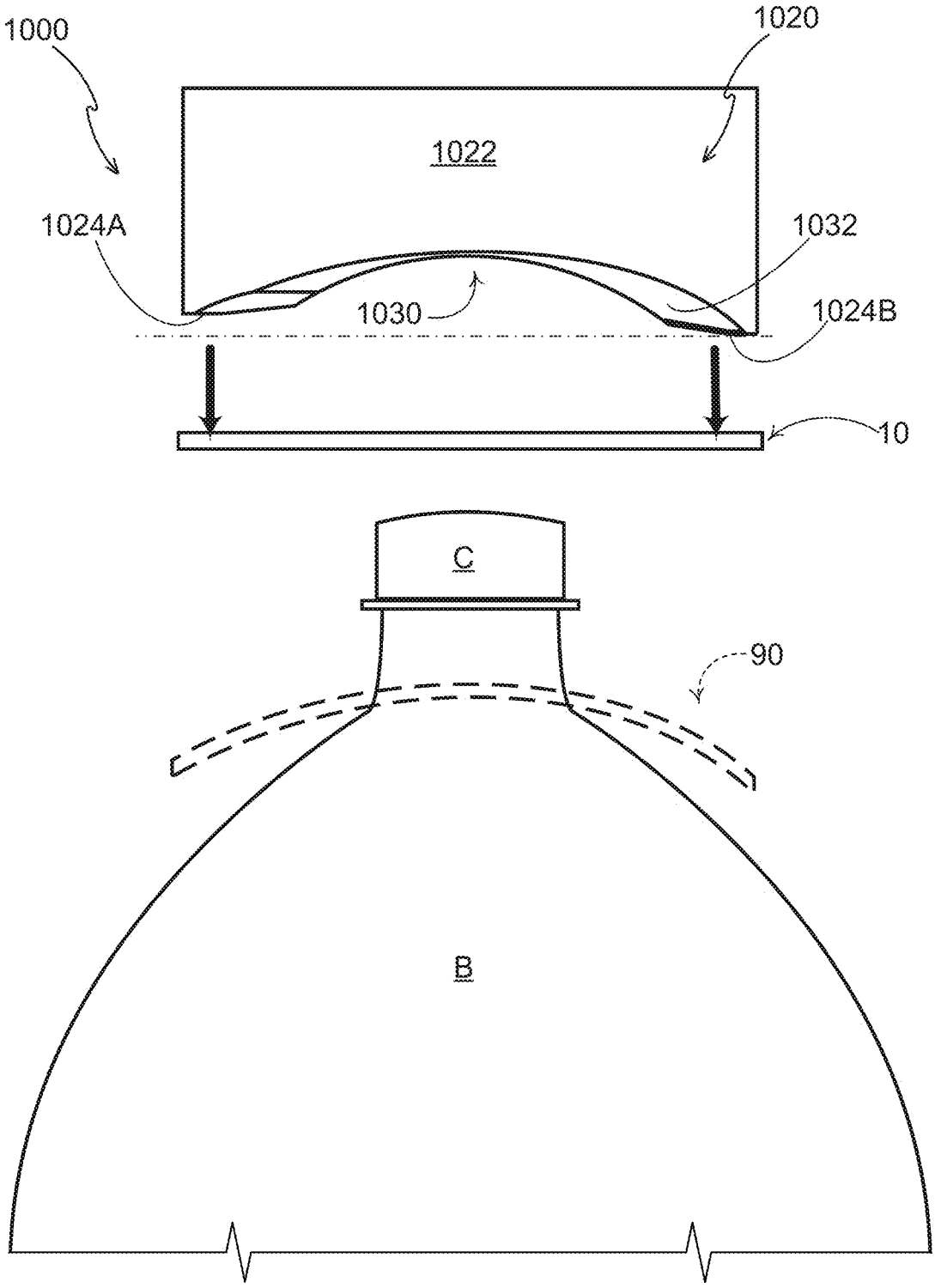


FIG. 16

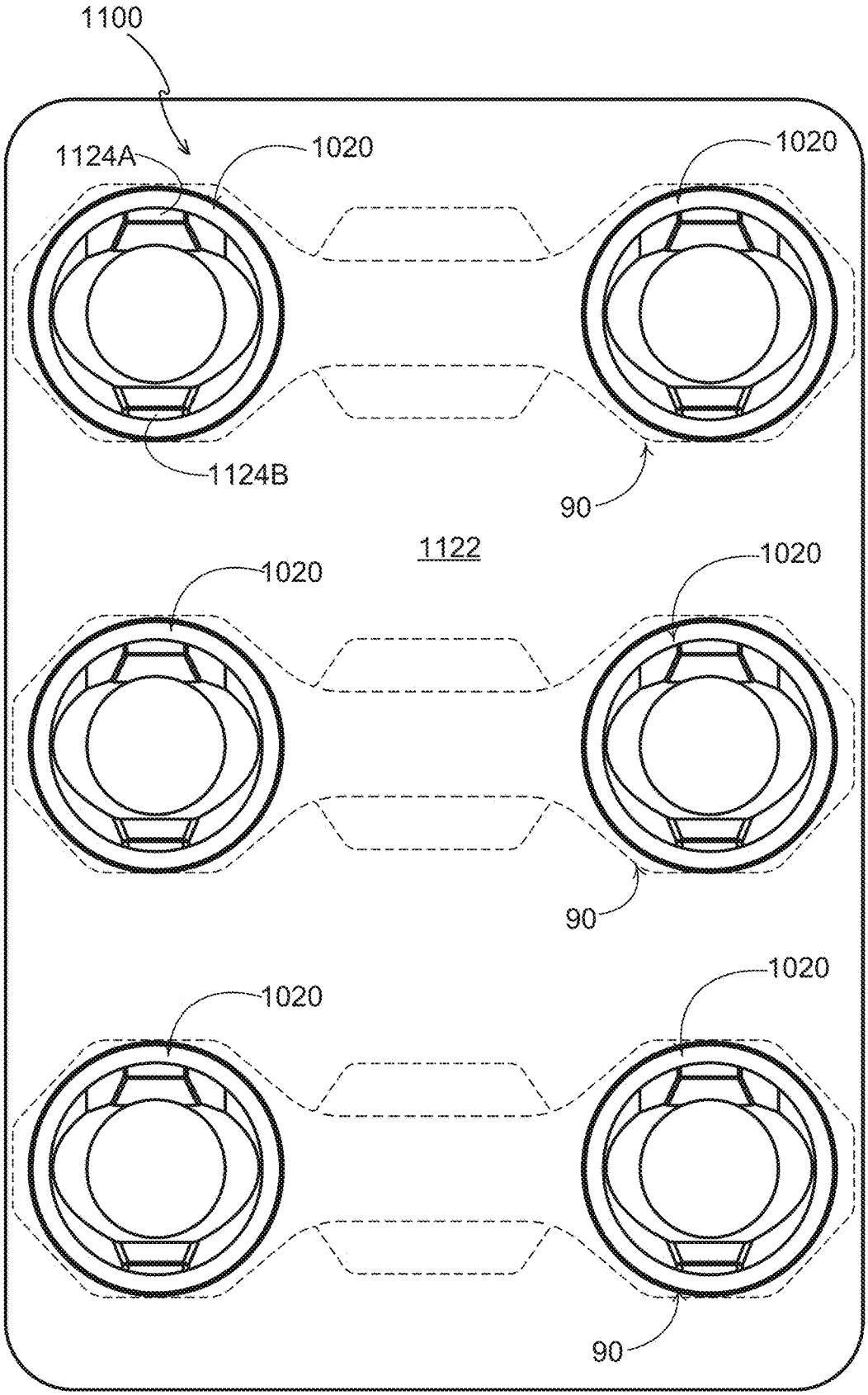


FIG. 17

PACKAGING SYSTEM

TECHNICAL FIELD

[0001] The present invention relates to a packaging system, to an apparatus, to a method for forming handle structures, to article carriers and to blanks for forming the same. More specifically, but not exclusively, the invention relates to an apparatus for applying a carrier of the top gripping style to one, two or more articles to provide a carrying handle for transportation of the articles.

BACKGROUND

[0002] In the field of packaging, it is known to provide article carriers or cartons for carrying multiple articles. Cartons are well known in the art and are useful for enabling consumers to transport, store and access a group of articles for consumption. For cost and environmental considerations, such cartons or carriers need to be formed from as little material as possible and cause as little wastage in the materials from which they are formed as possible. Further considerations are the strength of the carton and its suitability for holding and transporting large weights of articles. It is desirable that the contents of the carton are secure within the carton.

[0003] It is an object of the present invention to provide a carrier having a carrying handle to enable two or more articles to be transported; in particular for large, or heavy articles.

[0004] It is another object of the present invention to provide a system and apparatus for automatically applying a carrier to at least one article.

[0005] The present invention seeks to provide an improvement in the field of packaging apparatus and cartons, typically formed from paperboard or the like.

SUMMARY

[0006] An aspect of the invention provides a method of packaging at least one article comprising;

[0007] applying an article carrier to at least one article with an applicator comprising:

[0008] displacing a first side of a primary panel from a planar condition by a first distance;

[0009] displacing a second opposing side of a primary panel from the planar condition by a second distance, wherein the second distance is less than the first distance;

[0010] engaging the article carrier with at least one article;

[0011] receiving the at least one article in an opening in the primary panel.

[0012] Another aspect of the invention provides a method of packaging at least one article comprising:

[0013] engaging an article carrier with an applicator;

[0014] bringing a first limb of the applicator into contact with a first side of a primary panel of the article carrier and applying a force to the first side of a primary panel of the article carrier, adjacent to an article retention structure comprising an opening for receiving the at least one article, so as to displace the first side of a primary panel from a planar condition by a first distance;

[0015] bringing a second limb of the applicator into contact with a second, opposing, side of a primary panel of the article carrier and applying a force to the second side of a primary panel of the article carrier, adjacent to an article retention structure comprising an opening for receiving the at least one article, so as to displace the second side of a primary panel from a planar condition by a second distance, wherein the second distance is less than the first distance.

[0016] bringing the article carrier into contact with at least one article;

[0017] receiving the at least one article in the opening in the primary panel.

[0018] Optionally, the method of packaging further comprises folding one or more engaging teeth outwardly of the primary panel to engage a flange of the at least one article.

[0019] Optionally, the one or more engaging teeth are disposed about an end edge of the opening adjacent to the first and second sides.

[0020] Optionally, the one or more engaging teeth are folded between a pair of spaced apart limbs each of which is in contact with one of the first and second sides of the primary panel.

[0021] A further aspect of the invention provides a method of packaging at least one article comprising;

[0022] bringing an article carrier into contact with at least one article;

[0023] applying a force to a first side of a primary panel of the article carrier, adjacent to an article retention structure comprising an opening for receiving the at least one article;

[0024] receiving a first side of the at least one article in the opening adjacent to the first side of the primary panel;

[0025] applying a force to a second, opposing, side of the primary panel of the article carrier, adjacent to an article retention structure comprising an opening for receiving the at least one article;

[0026] receiving a second, opposing, side of the at least one article in the opening adjacent to the second side of the primary panel.

[0027] Optionally, the method of packaging further comprises folding one or more engaging teeth outwardly of the primary panel to engage a flange of the at least one article.

[0028] Optionally, the one or more engaging teeth are disposed about an end edge of the opening adjacent to the first and second sides.

[0029] Optionally, the one or more engaging teeth are folded between a pair of spaced apart limbs each of which is in contact with one of the first and second sides of the primary panel.

[0030] Still another aspect of the invention provides a component for an applicator device. The component comprises a first limb having a first end and a second, opposing, end disposed a first distance from the first end. The first end provides a first abutment surface. The component comprises a second limb having a first end and a second, opposing, end disposed a second distance from the first end. The first end provides a second abutment surface. The first limb is spaced apart from the second limb and the second distance is less than the first distance.

[0031] Yet another aspect of the invention provides an apparatus for forming a package. The apparatus includes an applicator comprising an applicator plate for engaging an article carrier. The applicator plate has a component mounted thereto that comprises a first limb having a first end

and a second, opposing, end disposed a first distance from the first end. The first end provides a first abutment surface. The component comprises a second limb having a first end and a second, opposing, end disposed a second distance from the first end. The first end provides a second abutment surface. The first limb is spaced apart from the second limb and the second distance is less than the first distance.

[0032] Still yet another aspect of the invention provides a bushing for mounting in an opening of an applicator device. The bushing comprises an annular wall having opposed ends. A first end provides a pair of spaced apart abutment regions diametrically opposed to each other. A first one of the abutment regions is disposed a first distance from the second end of the annular wall. The second end of the annular wall opposes the first end. A second one of the abutment regions is disposed a second distance from the second end of the annular wall. The second distance is less than the first distance.

[0033] An aspect of the invention provides an apparatus for forming a package. The apparatus comprises an applicator including an applicator plate for engaging an article carrier. The applicator plate has at least one aperture and a bushing mounted in the at least one aperture. The bushing comprises an annular wall having opposed ends. A first end provides a pair of spaced apart abutment regions diametrically opposed to each other. A first one of the abutment regions is disposed a first distance from the second end of the annular wall. The second end of the annular wall opposes the first end. A second one of the abutment regions is disposed a second distance from the second end of the annular wall. The second distance is less than the first distance.

[0034] Optionally, the bushing comprises a saddle disposed between the pair of abutment regions comprising a recess defining at least in part void for receiving a portion of an article carrier.

[0035] Optionally, the apparatus further comprises an engagement device for holding at least one article carrier in engagement with the applicator plate.

[0036] Optionally, the engagement device comprises a vacuum system.

[0037] Optionally, the saddle is defined by portions of the annular wall disposed between the pair of abutment regions and wherein said portions of the of the annular wall are chamfered.

[0038] Optionally, the saddle is defined by portions of the annular wall disposed between the pair of abutment regions and wherein said portions of the of the annular wall are filleted.

[0039] Optionally, the saddle is defined by portions of the annular wall disposed between the pair of abutment regions and wherein said portions of the of the annular wall are inclined with respect to surfaces of the pair of abutment regions.

[0040] An aspect of the invention provides an article carrier for packaging a plurality of articles. The article carrier comprises at least one primary panel forming a handle structure. The at least one primary panel comprises a handle portion and at least one article retention structure for engaging an article so as to provide a top gripping article carrier. The at least one article retention structure comprises a receiving opening having a boundary including a first edge and second opposing edge. The second edge is defined by a series of distal ends of the engaging teeth providing engaging edges thereof. The first edge is arranged to be closer to the handle portion than the second edge. The first edge is curved such that the centre of curvature of the first edge is located closer to the second edge than to the first edge. The boundary further includes a pair of third and fourth opposing edges which continuously connect the first and second edges such that each of the third and fourth edges provides a smooth transition between the first and second edges.

[0041] Optionally, the radius of curvature of the first edge is less than the radius of curvature of the second edge.

[0042] Optionally, the article carrier comprises a release device, the release device may comprise a pull tab.

[0043] Optionally, the release device comprises a cut disposed between the pull tab and the receiving opening of the at least one article retention structure.

[0044] Optionally, the release device comprises a cut disposed on an outer side of the top-receiving opening.

[0045] Optionally, the cut is arcuate.

[0046] Optionally, the article carrier comprises a relief device, the relief device includes a relief cut, the relief cut being arcuate, the relief cut is disposed between the handle portion and the receiving opening of the at least one article retention structure.

[0047] Optionally, the relief cut is disposed on an inner side of the receiving opening, the inner side of the receiving opening opposes the outer side.

[0048] Optionally, the article carrier is formed from at least two layers of sheet material in face contacting arrangement, the at least two layers of sheet material includes a first layer and a second layer, the first layer is greater in alongitudinal dimension than the second layer to provide an accessing tab at an end of the first layer projecting outwards beyond the adjacent end of the second layer.

[0049] Another aspect of the invention provides an article carrier for packaging a plurality of articles. The article carrier comprises at least one primary panel forming a handle structure. The at least one primary panel comprises a handle portion and at least one article retention structure for engaging an article so as to provide a top gripping article carrier. The at least one article retention structure comprises a top-receiving opening. The article carrier comprises a release device including a pull tab and cut. The cut is disposed between the pull tab and the top-receiving opening of the at least one article retention structure.

[0050] Optionally, the cut is disposed on an outer side of the top-receiving opening.

[0051] Optionally, the cut is curvilinear.

[0052] Yet another aspect of the invention provides an article carrier for packaging a plurality of articles. The article carrier comprises at least one primary panel forming a handle structure. The at least one primary panel comprises a handle portion and at least one article retention structure for engaging an article so as to provide a top gripping article carrier. The at least one article retention structure comprises a top-receiving opening. The article carrier comprises a relief device, the relief device comprising a relief cut. The relief cut is disposed between the handle portion and the top-receiving opening of the at least one article retention structure.

[0053] Optionally, the relief cut is disposed on an inner side of the top-receiving opening.

[0054] Optionally, the relief cut is curved.

[0055] Still yet another aspect of the invention provides an article carrier for packaging a plurality of articles. The

article carrier comprises at least one primary panel and a top engaging feature, including a top-receiving opening, in the at least one primary panel. The top engaging feature comprises a series of engaging tabs disposed along an outer section of the perimeter of the top-receiving opening. The outer section generally opposes an inner section adjacent to the handle portion of the at least one primary panel. The radius of curvature of the inner section of the top-receiving opening perimeter is less than the radius of the curvature of the outer section defined by distal ends of the engaging tabs. The distal ends of the engaging tabs provide engaging edges for engaging with an article.

[0056] A further aspect of the invention provides a top engaging article carrier for packaging a plurality of articles. The article carrier comprises a pair of engaging portions and a handle portion bridging between the engaging portions. The article carrier is formed from at least two layers of sheet material in face contacting arrangement. The at least two layers of sheet material includes a first layer and a second layer. The first layer is greater in a longitudinal dimension than the second layer to provide an accessing tab at an end of the first layer projecting outwards beyond the adjacent end of the second layer.

[0057] Optionally, the at least two layers of sheet material are secured together.

[0058] Optionally, the at least two layers of sheet material are secured together by glue or other adhesive treatment.

[0059] Optionally, the at least two layers of sheet material are secured together by mechanical fasteners.

[0060] Optionally, the mechanical fasteners are provided by article retention structures in each of the at least two layers of sheet material and disposed in vertical registry with each other, the at least two layers of sheet material being secured together when an article is received in the article retention structure in each of the at least two layers of sheet material.

[0061] Yet a further aspect of the invention provides an article carrier comprising a primary panel having top engaging feature including a top-receiving opening and a series of engaging tabs disposed along an outer section of the top-receiving opening perimeter. The series of engaging tabs includes a pair of end tabs at each end of the series. Each of the end tabs is defined in part by a tear stopper.

[0062] Optionally, the tear stopper takes the form of cutaway selected from the following group of cutaways: a recess and a "J" shaped cut line.

[0063] Still yet a further aspect of the invention provides an article carrier comprising a primary panel having a top engaging feature comprising a top-receiving opening and a series of engaging tabs disposed along an outer section of the opening perimeter. At least one medial tab is adjoined at its proximal end by an accessing feature which may be employed by a user to disengage the top engaging feature from the associated article.

[0064] Another aspect of the invention provides an article carrier comprising a primary panel having a top engaging feature comprising a top-receiving opening and a series of engaging tabs. A first one of the series of engaging tabs is hinged to the primary panel by a first fold line. A second one of the series of engaging tabs is hinged to the primary panel by a second fold line. The first and second fold lines define an obtuse angle therebetween.

[0065] Optionally, the obtuse angle is in the range 115° to 135°.

[0066] Optionally, the obtuse angle about 125°.

[0067] Optionally, the first fold line defines an angle of about 20° with respect to a first notional line, the first notional line is parallel to the longitudinal axis of the primary panel.

[0068] Optionally, the second fold line defines an angle of about 15° with respect to a second notional line, second notional line is perpendicular to the first notional line.

[0069] A further aspect of the invention provides a blank for forming an article carrier. The blank comprises at least one primary panel for forming a handle structure. The at least one primary panel comprises a handle portion and at least one article retention structure for engaging an article so as to provide a top gripping article carrier. The at least one article retention structure comprises a receiving opening having a boundary including a first edge and second opposing edge. The second edge is defined by a series of distal ends of the engaging teeth providing engaging edges thereof. The first edge is arranged to be closer to the handle portion than the second edge. The first edge is curved such that the centre of curvature of the first edge is located closer to the second edge than to the first edge. The boundary further includes a pair of third and fourth opposing edges which continuously connect the first and second edges such that each of the third and fourth edges provides a smooth transition between the first and second edges.

[0070] Still another aspect of the invention provides a blank for forming an article carrier, the blank comprises at least one primary panel forming a handle structure. The at least one primary panel comprises a handle portion and at least one article retention structure for engaging an article so as to provide a top gripping article carrier. The at least one article retention structure comprises a top-receiving opening. The blank comprises a release device including a pull tab and cut. The cut is disposed between the pull tab and the top-receiving opening of the at least one article retention structure.

[0071] Still a further aspect of the invention provides a blank for forming an article carrier. The blank comprises at least one primary panel forming a handle structure. The at least one primary panel comprises a handle portion and at least one article retention structure for engaging an article so as to provide a top gripping article carrier. The at least one article retention structure comprises a top-receiving opening. The blank comprises a relief device. The relief device comprises a relief cut. The relief cut is disposed between the handle portion and the top-receiving opening of the at least one article retention structure.

[0072] Yet still a further aspect of the invention provides a blank for forming an article carrier. The blank comprises at least one primary panel and a top engaging feature, including a top-receiving opening, in the at least one primary panel. The top engaging feature comprises a series of engaging tabs disposed along an outer section of the perimeter of the top-receiving opening. The outer section generally opposes an inner section adjacent to the handle portion of the at least one primary panel. The radius of curvature of the inner section of the top-receiving opening perimeter is less than the radius of the curvature of the outer section defined by distal ends of the engaging tabs. The distal ends of the engaging tabs providing engaging edges for engaging with an article.

[0073] Another aspect of the invention provides a blank for forming a top engaging article carrier. The blank com-

prises at least two panels for providing respective layers of sheet material disposed in face contacting arrangement in a setup carrier. The at least two panels provides a first layer and a second layer. Each of the at least two panels comprises a pair of engaging portions and a handle portion bridging between the engaging portions. The panel providing the first layer is greater in a longitudinal dimension than the panel providing second layer so as to provide an accessing tab at an end of the first layer projecting outwards beyond the adjacent end of the second layer.

[0074] Still another aspect of the invention provides a blank for forming an article carrier. The blank comprises a primary panel having a top engaging feature comprising a top-receiving opening and a series of engaging tabs disposed along an outer section of the top-receiving opening perimeter. The series of engaging tabs includes a pair of end tabs at each end of the series. Each of the end tabs is defined in part by a tear stopper.

[0075] A further aspect of the invention provides a blank for forming an article carrier. The blank comprises a primary panel having a top engaging feature including a top-receiving opening and a series of engaging tabs disposed along an outer section of the opening perimeter. At least one medial tab is adjoined at its proximal end by an accessing feature which may be employed by a user in a setup carrier to disengage the top engaging feature from the associated article.

[0076] Yet still a further aspect of the invention provides a blank for forming an article carrier. The blank comprises a primary panel having a top engaging feature comprising a top-receiving opening and a series of engaging tabs. A first one of the series of engaging tabs is hinged to the primary panel by a first fold line. A second one of the series of engaging tabs is hinged to the primary panel by a second fold line. The first and second fold lines define an obtuse angle therebetween.

[0077] Yet further aspect of the invention provides a package. The package comprises at least one article and an article carrier. The article carrier comprises at least one primary panel forming a handle structure. The at least one primary panel comprises a handle portion and at least one article retention structure in engagement with the at least one article. The at least one article retention structure comprises a receiving opening having a boundary including a first edge and second opposing edge. The second edge is defined by a series of distal ends of engaging teeth providing engaging edges which are in engagement with the at least one article below a radially protruding portion of the at least one article. The first edge is arranged to be closer to the handle portion than the second edge. The boundary further includes a pair of third and fourth opposing edges which continuously connect the first and second edges. The third and fourth edges are spaced apart such that the maximum distance therebetween is less than the lateral dimension of the radially protruding portion of the at least one article.

[0078] In the package of the above aspect, each of the first, second, third and fourth edges may be curved such that each of the third and fourth edges provides a smooth transition between the first and second edges. Optionally, the first edge may be curved such that the centre of curvature of the first edge is located closer to the second edge than to the first edge. In the same optional arrangement, the radius of curvature of the first edge may be less than the radius of curvature of the second edge. The at least one article may be at least one bottle having a neck flange, the radially protruding portion may be the neck flange of the at least one bottle, and the lateral dimension may be the diameter of the neck flange.

[0079] Further features and advantages of the present invention will be apparent from the specific embodiments illustrated in the drawings and discussed below.

[0080] Within the scope of this application, it is envisaged or intended that the various aspects, embodiments, examples, features and alternatives set out in the preceding paragraphs, in the claims and/or in the following description and drawings may be considered or taken independently or in any combination thereof.

[0081] Features or elements described in connection with, or relation to, one embodiment are applicable to all embodiments unless there is an incompatibility of features. One or more features or elements from one embodiment may be incorporated into, or combined with, any of the other embodiments disclosed herein, said features or elements extracted from said one embodiment may be included in addition to, or in replacement of one or more features or elements of said other embodiment.

[0082] A feature, or combination of features, of an embodiment disclosed herein may be extracted in isolation from other features of that embodiment. Alternatively, a feature, or combination of features, of an embodiment may be omitted from that embodiment.

BRIEF DESCRIPTION OF THE DRAWINGS

[0083] Embodiments of the invention will now be described with reference to the accompanying drawings, in which:

[0084] FIG. **1** is a plan view from above of a blank for forming a carrier according to a first embodiment;

[0085] FIG. **1**B is an enlarged view of a portion of the blank of FIG. **1**;

[0086] FIG. **1**C is a plan view from above of the blank of FIG. **1** in a folded condition showing the position of the panels relative to each other;

[0087] FIG. **1**D is a schematic side view of a portion of the carrier showing engagement tabs in an engaging position;

[0088] FIG. **2** is a perspective view of a carton formed from the blank of FIG. **1**;

[0089] FIGS. **3**, **4**, and **5** are alternative perspective views of the carton of FIG. **2**;

[0090] FIG. **6** is a plan view from above of a blank for forming a carrier according to a second embodiment;

[0091] FIG. **7** is a plan view from above of a blank for forming a carrier according to a third embodiment;

[0092] FIG. **8** is an enlarged plan view of a portion of a blank for forming a carrier according to a fourth embodiment;

[0093] FIG. **9** is a plan view from above of a blank for forming a carrier according to a fifth embodiment;

[0094] FIG. **10** is a plan view from above of a blank for forming a carrier according to a sixth embodiment;

[0095] FIG. **11** is a plan view from above of a blank for forming a carrier according to a seventh embodiment;

[0096] FIGS. **12** and **13** illustrate an apparatus for applying the blanks according to various embodiments to a group of articles;

[0097] FIG. **14** is an isometric view from below illustrating a component forming part of the apparatus of FIGS. **12** and **13**;

[0098] FIG. **15** is an enlarged view of a portion of the apparatus shown in FIG. **13**;

[0099] FIG. **16** schematically illustrates application of a blank according to embodiments of the present disclosure to a group of articles;

[0100] FIG. **16**B schematically illustrates an alternative component for application of a blank according to further embodiments of the present disclosure; and

[0101] FIG. **17** is a plan view from below illustrating a component for forming part of an apparatus according to another embodiment of the disclosure.

DETAILED DESCRIPTION OF EMBODIMENTS

[0102] Detailed descriptions of specific embodiments of a packaging system, method and apparatus, handle structures, packages, blanks and cartons are disclosed herein. It will be understood that the disclosed embodiments are merely examples of the way in which certain aspects of the invention can be implemented and do not represent an exhaustive list of all of the ways the invention may be embodied. As used herein, the word "exemplary" is used expansively to refer to embodiments that serve as illustrations, specimens, models, or patterns. Indeed, it will be understood that the packaging system, method and apparatus, handle structures, packages, blanks, and cartons described herein may be embodied in various and alternative forms. The Figures are not necessarily to scale and some features may be exaggerated or minimised to show details of particular components. Well-known components, materials or methods are not necessarily described in great detail in order to avoid obscuring the present disclosure. Any specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a basis for the claims and as a representative basis for teaching one skilled in the art to variously employ the invention.

[0103] Referring to FIG. **1**, there is shown a plan view of a blank **10** capable of forming a carton or carrier **90**, as shown in FIGS. **2** to **5**, for carrying a group of primary products such as, but not limited to, bottles, hereinafter referred to as articles. The blank **10** forms a secondary package or handle structure for packaging at least one primary product container or package. Alternative blanks **110**, **210**, **410**, **510**, **610**, **710** are shown in FIGS. **6** to **11** for forming alternative carriers (not shown).

[0104] In the embodiments detailed herein, the terms "carton" and "carrier" refer, for the non-limiting purpose of illustrating the various features of the invention, to a container **90** for engaging and carrying articles, such as primary product containers. It is contemplated that the teachings of the invention can be applied to various product containers, which may or may not be tapered and/or cylindrical. Other exemplary containers include bottles (for example metallic, glass or plastics bottles), cans (for example aluminium cans), tins, pouches, packets and the like.

[0105] The blanks **10**; **110**; **210**; **410**; **510**; **610**; **710** are formed from a sheet of suitable substrate. It is to be understood that, as used herein, the term "suitable substrate" includes all manner of foldable sheet material such as paperboard, corrugated board, cardboard, plastic, combinations thereof, and the like. It should be recognised that one or other numbers of blanks may be employed, where suitable, for example, to provide the carrier structure described in more detail below.

[0106] The packaging structure or carton **90** described herein may be formed from a sheet material such as paperboard, which may be made of or coated with materials to increase its strength. An example of such a sheet material is tear-resistant NATRALOCK® paperboard made by WestRock Company. It should be noted that the tear resistant materials may be provided by more than one layer, to help improve the tear-resistance of the package. Typically, one surface of the sheet material may have different characteristics to the other surface. For example, the surface of the sheet material that faces outwardly from a finished package may be particularly smooth and may have a coating such as a clay coating or other surface treatment to provide good printability. The surface of the sheet material that faces inwardly may, on the other hand, be provided with a coating, a layer, a treatment or be otherwise prepared to provide properties such as one or more of tear-resistance, good glue-ability, heat sealability, or other desired functional properties.

[0107] In the illustrated embodiment, the blanks **10**; **110**; **210**; **410**; **510**; **610**; **710** are configured to form a carton or carrier **90** for packaging an exemplary arrangement of exemplary articles. In the illustrated embodiments the arrangement is an m×n matrix or array, having one rows (m=1) and two columns (n=2); in the illustrated embodiment one rows of two articles are provided, and the articles are 2.84 L bottles, the bottles may be formed from a suitable material such as, but not limited to, glass, Aluminium or PET (polyester—polyethylene terephthalate). Alternatively, the blanks **10**; **110**; **210**; **410**; **510**; **610**; **710** can be configured to form a carrier for packaging other types, number and size of articles and/or for packaging articles in a different arrangement or configuration for example, but not limited to, fully enclosed cartons or wrap-around carriers, the articles may be cups, pouches, pots or cans.

[0108] Turning to FIG. **1**, there is illustrated a blank **10** for forming a carton **90** (see FIGS. **2** to **4**) according to a first embodiment. The blank **10** comprises a plurality of panels **12**, **14**, **16** arranged in a linear series hinged one to the next by fold lines **13**, **15** respectively.

[0109] The plurality of main panels **12**, **14**, **16** form a top engaging carrier or handle structure. The plurality of panels **12**, **14**, **16** comprises a first panel **12**, a second panel **14**, and a third panel **16**. The second panel **14** is hingedly connected to the first panel **12** by a hinged connection in the form of a fold line **13**. The third panel **16** is hingedly connected to the second panel **14** by a hinged connection in the form of a fold line **15**.

[0110] The second panel **14** forms an upper or outer panel **14**, the third panel **16** forms a lower or inner panel **16** and the first panel **12** forms an intermediate panel **12** disposed between the second panel **14** and the third panel **16**.

[0111] Each of the main panels **12**, **14**, **16** may be generally bow-tie shaped, that is to say the main panels **12**, **14**, **16** comprises a waisted intermediate portion disposed or bridging between opposed flared, widened, or bulbous end portions.

[0112] Intermediate portions of each of the main panels **12**, **14**, **16** provide or define a handle portion.

[0113] The intermediate portion of the first panel **12** comprises a first width or lateral dimension W1. The intermediate portion of the second panel **14** comprises a second

width or lateral dimension W2. The intermediate portion of the third panel **16** comprises a third width or lateral dimension W3.

[0114] The intermediate portion of the first panel **12** is separated from the intermediate portion of the second panel **14** by an aperture A4. The intermediate portion of the second panel **14** is separated from the intermediate portion of the third panel **16** by an aperture A5.

[0115] The first and third width dimensions W1, W3 may be equal to or less than the second width dimension W2. The first and third width dimensions W1, W3 may be equal to each other. In some embodiments, the third width dimension W3 may be less than the first width dimension W1.

[0116] The second or upper panel **14** may comprise a pair of opposed handle flaps **60**A, **60**B hinged to opposing side edges of the intermediate portion of the second or upper panel **14** by respective hinged connections in the form of fold lines **61**A, **61**B.

[0117] Each of the handle flaps **60**A, **60**B may comprise a second fold line **63**A, **63**B, the second fold lines **63**A, **63**B may facilitate folding of the handle flaps **60**A, **60**B about the intermediate and lower panels **12**, **16** to be in face-to-face relationship with the lower panel **16**.

[0118] Each of the main panels **12**, **14**, **16** comprises at least one at least one article retention structure RT. The main panels **12**, **14**, **16** comprises a plurality of article retention structures RT, specifically two article retention structures RT arranged in 1×2 matrix or array. Each of the article retention structures RT comprises an opening or aperture A1, A2, A3.

[0119] The article retention structures RT comprises a toothed region defined by a plurality of teeth or tabs **40**, **42**, **44** and a tooth free or toothless region. The toothed region is disposed in closer proximity to end edges of the main panels **12**, **14**, **16** than the toothless region.

[0120] The toothed region comprises five teeth or engaging tabs **40**, **42**, **44**. A central engaging tab **44** lies on a notional line extending longitudinally of the main panel **12**, **14**, **16** and passing through the centre of the aperture A1, A2, A3.

[0121] The toothed region comprises a pair of outer engaging tabs **40** defining a boundary between the toothed and toothless regions. The toothed region comprises an intermediate engaging tab **42** disposed between the central engaging tab **44** and a respective one of the outer engaging tabs **40**.

[0122] The central engaging tab **44** is hinged to the main panel **12**, **14**, **16** by a hinged connection defined in part by a cut line **45**, the hinged connection and/or cut line **45** lie on a notional transverse line y-y.

[0123] The intermediate engaging tabs **42** are hinged to the main panel **12**, **14**, **16** by a hinged connection defined in part by a pair of cut lines **43**, the hinged connection and/or cut lines **43** lie on a first notional line n1.

[0124] The outer engaging tabs **40** are hinged to the main panel **12**, **14**, **16** by a hinged connection defined in part by a pair of cut lines **41**, the hinged connection and/or cut lines **41** lie on a second notional line n2.

[0125] The second notional line n2 is oriented at a non-zero angle with respect to the first notional line n1. The second notional line n2 may be obliquely oriented with respect to the first notional line n1. The second notional line n2 is oriented at an angle θ with respect to the first notional line n1, the angle θ may be obtuse and may be in the range 115° to 135° and optionally may be about 125°.

[0126] The hinged connection and/or cut lines **41** may be oriented at an angle of about 20° with respect to a notional longitudinal line x-x. The notional longitudinal line x-x is oriented perpendicularly with respect to the notional transverse line y-y. The notional longitudinal line x-x is parallel with a longitudinal axis of the main panel **12**, **14**, **16**.

[0127] The hinged connection and/or cut lines **43** may be oriented at an angle of about 15° with respect to the notional transverse line y-y.

[0128] The toothless region may be defined by a cutline **53**, cut line **53** may define a portion of a circle having a first centre C_e**1** and a first radius r1.

[0129] The plurality of teeth **40**, **42**, **44** each comprise a free engaging edge substantially defining a portion of a notional circle NC. The notional circle NC comprises a second centre C_e**2** and a second radius r2.

[0130] The second radius r2 is greater than the first radius r1. The second centre C_e**2** is offset longitudinally from the first centre C_e**1**. The second centre C_e**2** is disposed in closer proximity to the intermediate portion than the first centre C_e**1**.

[0131] The central engaging tab **44** may be defined, at least in part, by a pair of first cut lines **47**. Each of the pair of first cut lines **47**, or at least a portion thereof, may lie upon a radial line passing through the second centre C_e**2** of the notional circle NC. The pair of first cut lines **47** may be substantially "J" shaped.

[0132] The outer engaging tabs **40** are defined, at least in part, by a second cut line **51** and a third cut line **49**. The second cut line **51** and a third cut line **49** are divergently arranged with respect to each other such that the outer engaging tabs **40** taper or narrow towards their free engaging edge. The third cut line **49** is shorter in length than the second cut line **51**. In some embodiments, the third cut line **49** may comprise a tear stopper, the third cut line **49** may terminate with a non-linear portion such as but not limited to a "J" or "C" shaped cutline portion. This is best shown in FIG. **8** wherein the third cut line **449** comprises a tear stopper, wherein the third cut line **449** terminates with a "J" shaped cutline portion. In other embodiments, the tear stopper may take the form of a recess or cutaway providing a transition between the aperture A1, A2, A3 and a respective one of the outer engaging tabs **40**.

[0133] The second cut line **51** is divergently arranged with respect to a radial line passing through the second centre C_e**2** of the notional circle NC and the vertex or intersection between the second cut line **51** and the cutline defining the free engaging edges of the plurality of teeth **40**, **42**, **44**.

[0134] The third cut line **53** is divergently arranged with respect to a radial line passing through the second centre C_e**2** of the notional circle NC and the vertex or intersection between the third cut line **53** and the cutline defining the free engaging edges of the plurality of teeth **40**, **42**, **44**.

[0135] FIG. **1**C shows the blank **10** in a folded condition, the position of the first panel **12** and third panel **16** has been superimposed on the second panel **14**. An article retention structure RT in the second or upper panel **14** is in vertical alignment with article retention structures RT in the first and third panels **12**, **16**. The engaging tabs **40**, **42**, **44** of the article retention structure RT in the second panel **14** are longer or greater in height than the engaging tabs **40**, **42**, **44** of the article retention structure RT in the first or intermediate panel **12**. The engaging tabs **40**, **42**, **44** of the article retention structure RT in the first panel **12** are longer or

greater in height than the engaging tabs **40**, **42**, **44** of the article retention structure RT in the third or lower panel **16**.

[0136] FIG. **1**D schematically illustrates the engaging tab **44** of the article retention structure RT in the first, second, and third panels **12**, **14**, **16** in a folded condition. The set of teeth or tabs **40**, **42**, **44** in each layer is shorter than set of teeth or tabs **40**, **42**, **44** in the layer above.

[0137] The hinged connections F**1** of the set of teeth or tabs **40**, **42**, **44** in the upper layer **14** is offset with respect to the hinged connections F**2** of the set of teeth or tabs **40**, **42**, **44** in the intermediate layer **12** below. The hinged connections F**2** of the set of teeth or tabs **40**, **42**, **44** in the intermediate layer **12** is offset with respect to the hinged connections F**3** of the set of teeth or tabs **40**, **42**, **44** in the lower layer **16** below.

[0138] The offset relationship between the hinged connections or fold line of the tabs **40**, **42**, **44** in subsequent layers may facilitate easier engagement of the article retention structure RT or carrier **90** with an article B. The first or uppermost layer of tabs **40**, **42**, **44** engages the article B while the subsequent layers reinforce the first or uppermost layer of tabs **40**, **42**, **44**.

[0139] The hinged connections F**1** of the engaging tabs **40**, **42**, **44** of the article retention structure RT in the second or upper panel **14** are offset with respect to the hinged connections F**2** of the engaging tabs **40**, **42**, **44** of the article retention structure RT in the first or intermediate panel **12**.

[0140] The hinged connections F**2** of the engaging tabs **40**, **42**, **44** of the article retention structure RT in the first or intermediate panel **12** are offset with respect to the hinged connections F**3** of the engaging tabs **40**, **42**, **44** of the article retention structure RT in the third or lower panel **16**.

[0141] The article retention structures RT in the second panel **14** may comprise a first relief cut C**1**. The first relief cut C**1** may comprise a circumferential cut line about a portion of the toothless region and spaced apart from the cut line **53** defining the toothless region about the aperture A**2**.

[0142] The second panel **14** may comprise at least one first relief cut C**1**, the second panel **14** may comprise a pair of first relief cuts C**1**. The second panel **14** may comprise a first relief cut C**1** arranged to extend partially about the aperture A**2** or each article retention structure RT provided therein.

[0143] The first relief cuts C**1** may be non-linear in shape and may be arcuate in shape. The first relief cuts C**1** are spaced apart from the cut line **53** defining the aperture A**2**. The first relief cuts C**1**, when circular in shape, may have a radius of curvature greater than the radius of curvature of the cut line **53**, and may be concentrically arranged with respect to the cut line **53**.

[0144] Each of the first relief cuts C**1** may be disposed between the aperture A**2** and the intermediate or waisted portion of the second panel **14**.

[0145] The article retention structures RT in the third panel **16** may comprise a second relief cut C**2**. The second relief cut C**2** may comprise a circumferential cut line about a portion of the toothless region and spaced apart from the cut line **53** defining the toothless region about the aperture A**3**.

[0146] The third panel **16** may comprise at least one second relief cut C**2**, the third panel **16** may comprise a pair of second relief cuts C**2**. The third panel **16** may comprise a second relief cut C**2** arranged to extend partially about the aperture A**3** or each article retention structure RT provided therein.

[0147] The second relief cuts C**2** may be non-linear in shape and may be arcuate in shape. The second relief cuts C**2** are spaced apart from the cut line **53** defining the aperture A**3**. The second relief cuts C**2**, when circular in shape, may have a radius of curvature greater than the radius of curvature of the cut line **53**, and may be concentrically arranged with respect to the cut line **53**.

[0148] Each of the second relief cuts C**2** may be disposed between the aperture A**3** and the intermediate or waisted portion of the third panel **16**.

[0149] The relief cuts C**1**, C**2** may improve or increase the flexibility of the article carrier **90** when using the handle H to remove the package from a shelf or storage device. The relief cuts C**1**, C**2** may allow the article carrier **90** to flex, deform, or bend whilst preventing or inhibiting disengagement of the article retention structures RT from the article B, particularly the inner or toothless edge E**1**.

[0150] The second panel **14** and/or the third panel **16** may comprise a pull tab T**1**, T**2** at each end thereof. The pull tab T**1**, T**2** may be defined by a tapered tongue portion integral with respective one of the second and third panels **14**, **16**. The pull tab T**1**, T**2** forms a release feature to enable a consumer or user to release the article B being packaged from the article carrier **90**.

[0151] Each release feature may comprise a control cut C**3**, C**4** defined in the second panel **14** and/or the third panel **16**. A first control cut C**3** in the second panel **14** may define, at least in part, a first or upper pull tab T**1**. A second control cut C**4** in the third panel **16** may define, at least in part, a second or lower pull tab T**2**.

[0152] The first control cuts C**3** may be non-linear in shaped and may comprise an arcuate cut line terminated at each end with a "C" shaped cut.

[0153] The second control cuts C**4** may be non-linear in shaped and may comprise an arcuate cut line terminated at each end with a "C" shaped cut. The arcuate cut line of the first control cuts C**3** may comprise a larger radius of curvature than the arcuate cut line of the second control cuts C**4**.

[0154] The first and second control cuts C**3**, C**4** may facilitate release of the article carrier **90** from the articles B. The first and second control cuts C**3**, C**4** may direct or distribute pull forces towards the sides or marginal regions of the main panel **14**, **16** about the article retention structures RT.

[0155] The second panel **12** comprises an end edge which terminates in closer proximity to the article retention structures RT than the first and second control cuts C**3**, C**4**. In other embodiments, the second panel **12** may be increased in length and may comprise additional control cuts in the region of the first and second control cuts C**3**, C**4**.

[0156] The blank **10** is foldable to form a package **90** as illustrated in FIGS. **4** and **5**.

[0157] Turning to the construction of the article carrier **90** as illustrated in FIGS. **2**, the article carrier **90** can be formed by a series of sequential folding operations. The folding process is not limited to that described below and may be altered according to particular manufacturing requirements.

[0158] The first panel **12** is folded, with respect to the second panel **14** about fold line **13**, to be brought into face contacting relationship therewith.

[0159] The third panel **16** is folded, with respect to the second panel **14** about fold line **15**, to be brought into face contacting relationship with the first panel **12**.

[0160] Once the carrier **90** is erected, the carrier **90** may be loaded with a group of articles B; in the embodiment illustrated in FIGS. **2**, **3** and **4** two articles B arranged in a 1×2 matrix or array.

[0161] The group of articles B may be loaded through the third panel **16**, and subsequently through the first and second panels **12**, **14**. Upper portions of the articles B, the upper portion may include a cap or end closure C, are inserted into the carrier **90**, each article retention structure RT receives a portion of a respective article B. The teeth **40**, **42**, **44** are displaced upwardly. The teeth **40**, **42**, **44** engage an article below a flange F (see FIGS. **3** and **4**), projection, under cut or other suitable feature of the article B or its end closure C.

[0162] Referring now to FIGS. **6**, **7** and **9** to **11**, there are shown additional embodiments of the present disclosure. In the second and third illustrated embodiments like numerals have, where possible, been used to denote like parts, albeit with the addition of the prefix "100", "200", "500", "600", "700" to indicate that these features belong to the second, third, fifth, sixth, and seventh embodiments respectively. The additional embodiments share many common features with the first embodiment and therefore only the differences from the embodiment illustrated in FIGS. **1** to **5** will be described in detail.

[0163] Turning to FIG. **6**, there is illustrated a blank **110** for forming a carrier (not shown) according to a second embodiment. The blank **110** comprises a main panel **112**.

[0164] The main panel **112** forms a top engaging carrier or handle structure.

[0165] The main panel **112** comprises at least one at least one article retention structure RT. The main panel **112** comprises a plurality of article retention structures RT, specifically two article retention structures RT arranged in 1×2 matrix or array. Each of the article retention structures RT comprises an opening or aperture A**1**. The article retention structures RT of the embodiment of FIG. **6** are substantially similar in construction to the article retention structures RT of FIG. **1** and will not be described in further detail.

[0166] The main panel **112** comprises a pair of opposed handle flaps **160**A, **160**B hinged to opposing side edges of an intermediate portion of the main panel **112** by respective hinged connections in the form of fold lines **161**A, **161**B.

[0167] The handle flaps **160**A, **160**B may be substantially trapezoidal in shape.

[0168] Each of the handle flaps **160**A, **160**B defines, at least in part, a recess in a side edge of the main panel **112**. When the handle flaps **160**A, **160**B are in a folded condition the main panel may adopt a generally bow-tied shape. That is to say the main panel **112** comprises a waisted intermediate portion disposed the pair of opposed handle flaps **160**A, **160**B and the main panel **112** comprises opposed flared, widened, or bulbous end portions in which an article retention structure RT is provided.

[0169] The intermediate portion of the main panel **112** provides or defines a handle portion.

[0170] In the embodiment illustrated in FIG. **6**, the pull tabs T**1**, T**2** of the previous embodiment have been omitted as have the control cuts C**3**, C**4**. In alternative embodiments, the main panel **112** may comprise pull tabs and/or control cuts C**3**, C**4** substantially similar to those of described above and/or shown in FIG. **1**.

[0171] Turning to FIG. **7**, there is illustrated a blank **210** for forming a carrier (not shown) according to a third embodiment. The blank **210** comprises a first main panel **212** and a second main panel **214**.

[0172] The second main panel **214** is hingedly connected to the first main panel **212** by a hinged connection in the form of a fold line **213**.

[0173] The first main panel **212** is substantially similar in construction to the main panel **112** of the embodiment illustrated in FIG. **6** and described with reference thereto.

[0174] The second main panel **214** is substantially similar in construction to the first main panel **212** albeit with the omission of the handle flaps **260**A, **260**B.

[0175] The intermediate portion of the first main panel **212** is separated from the intermediate portion of the second main panel **214** by an aperture A**4**. The aperture A**4** interrupts the fold line **213**. The aperture A**4** is struck, at least in part, from material which would otherwise form the second main panel **214**. Optionally, the aperture A**4** may be struck, at least in part, from material which would otherwise form the first main panel **212**.

[0176] The first main panel **212** comprises at least one at least one article retention structure RT. The first main panel **212** comprises a plurality of article retention structures RT, specifically two article retention structures RT arranged in 1×2 matrix or array. Each of the article retention structures RT comprises an opening or aperture A**1**. The article retention structures RT of the embodiment of FIG. **6** are substantially similar in construction to the article retention structures RT of FIG. **1** and will not be described in further detail.

[0177] The second main panel **214** comprises at least one at least one article retention structure RT. The second main panel **214** comprises a plurality of article retention structures RT, specifically two article retention structures RT arranged in 1×2 matrix or array. Each of the article retention structures RT comprises an opening or aperture A**2**. The article retention structures RT of the embodiment of FIG. **6** are substantially similar in construction to the article retention structures RT of FIG. **1** and will not be described in further detail.

[0178] Each article retention structure RT in the second main panel **214** is arranged to be disposed in vertical registry or alignment with a respective article retention structure RT in the first main panel **212** when the second main panel **214** is folded into face-to-face relationship with the first main panel **212**. In this way the blank **210** forms a two-ply handle structure.

[0179] Referring to FIG. **9** there is shown a blank **510** for forming a carrier according to a fifth embodiment. The blank **510** is substantially similar in construction to the blank of FIG. **1** albeit with the inclusion of additional pull tabs T**3**, relief cuts C**5**, and control cuts C**6**.

[0180] The article retention structures RT in the first panel **512** comprise a third relief cut C**5**. The third relief cut C**5** may comprise a circumferential cut line about a portion of the toothless region and spaced apart from the cut line **553** defining the toothless region about the aperture A**1**.

[0181] The first panel **512** may comprise at least one third relief cut C**5**, the first panel **512** may comprise a pair of third relief cuts C**5**. The first panel **512** may comprise a third relief cut C**5** arranged to extend partially about the aperture A**1** or each article retention structure RT provided therein.

[0182] The third relief cuts C**5** may be non-linear in shape and may be arcuate in shape. The third relief cuts C**5**, when circular in shape, may have a radius of curvature greater than the radius of curvature of the cut line **553**, and may be concentrically arranged with respect to the cut line **553**.

[0183] Each of the third relief cuts C**5** may be disposed between the aperture A**1** and the intermediate or waisted portion of the first panel **512**.

[0184] The relief cuts C**1**, C**2**, C**5** may improve or increase the flexibility of the article carrier when using the handle H to remove the package from a shelf or storage device. The relief cuts C**1**, C**2**, C**5** may allow the article carrier to flex, deform, or bend whilst preventing or inhibiting disengagement of the article retention structures RT from the article B, particularly the inner or toothless edge.

[0185] The first panel **512** may comprise a pull tab T**3** at each end thereof. The pull tab T**3** may be defined by a tapered tongue portion integral with the first panel **512**. The pull tab T**3** forms a release feature to enable a consumer or user to release the article B being packaged from the article carrier.

[0186] Each release feature may comprise a control cut C**6** defined in the first panel **512**. A third control cut C**6** in the first panel **512** may define, at least in part, a third or intermediate pull tab T**3**.

[0187] The first panel **512** may comprise a cutaway N_{CH} in the form of a recess or notch struck from a portion of the waisted intermediate portion. The cutaway N_{CH} may be struck from a side edge of the waisted intermediate portion of the first panel **512** facing towards the waisted intermediate portion of the second panel **514**. The cutaway N_{CH} may be employed to control the orientation of the blank **510** during assembly of the blank **510** into a carrier, and may be engaged by a tool, during application of glue and folding of the blank **510**. In some embodiments, the cutaway N_{CH} may facilitate gluing of the upper layer, second panel **514** directly to the lower layer, third panel **516**.

[0188] Referring to FIG. **10** there is shown a blank **610** for forming a carrier according to a sixth embodiment. The blank **610** is substantially similar in construction to the blank **510** of FIG. **9** albeit with the engaging teeth **540**, **542**, **544** have been omitted or removed from the article retention structures RT provided in the first panel **512**. The article retention structures RT in the first panel **612** of the embodiment shown in FIG. **10** each comprise a receiving opening configured and arranged to allow the engaging teeth **540**, **542**, **544** of the lower layer, third panel **616**, to pass therethrough.

[0189] The hinged connections F**1** of the set of teeth or tabs **640**, **642**, **644** in the upper layer **614** is offset with respect to the hinged connections F**3** of the set of teeth or tabs **640**, **642**, **644** in the lower layer **16**.

[0190] An edge portion EP of the aperture A**1** of the article retention structures RT in the intermediate layer **12** is configured to lie between hinged connections F**1** and the hinged connections F**3** when the first panel **612** is folded between the second and third panels **614**, **616**.

[0191] Referring to FIG. **11** there is shown a blank **710** for forming a carrier according to a seventh embodiment. The blank **710** is substantially similar in construction to the blank **510** of FIG. **9** albeit arranged to form a carrier of a two-ply construction. The third panel **516** has been omitted from the embodiment of FIG. **11**, the first panel **712** forms a lowermost layer of the carrier.

[0192] Turning now to FIG. **12** there is shown an apparatus **1000** for applying a carrier **90**, such as but not limited to those described herein, to a pair of articles B. The apparatus **1000** and method will be described by way of example with reference to the carrier **90** shown in FIG. **1**C, however the apparatus **1000** and method is not limited to application of the carrier **90** of FIG. **1**C.

[0193] The apparatus **1000** comprises an applicator **1010** including an applicator plate **1012**. The applicator **1010** may be adapted to pick up a carrier **90** from a hopper or magazine (not shown). The applicator may comprise a vacuum system (not shown) including a vacuum cup for engaging and removing the carrier **90** from the hopper. In other embodiments, alternative gripping devices may be employed as known in the art. In still other embodiments, the carrier **90** may be picked up, aligned and placed upon the group of articles B by a separate apparatus (not shown) before entering a working region of the apparatus **1000**.

[0194] FIGS. **13** and **15** illustrate the applicator plate **1012** from below, the applicator plate **1012** comprises at least one orifice O_{R1}, O_{R2}, the illustrated embodiment comprises a pair of orifices O_{R1}, O_{R2}. The orifices O_{R1}, O_{R2} define an open end of a bore in the applicator plate **1012**. The bore may be blind, partially blind or open. In the illustrated embodiment, the bore is partially blind. A bushing **1020** is disposed in the bore and comprises an annular side wall **1022** and provides a saddle **1030**, best shown in FIG. **14**, at a lower end thereof. The saddle **1030** provides a pair of opposed abutment surfaces **1024**A, **1024**B. A "U" shaped recess is provided between the pair of opposed abutment surfaces **1024**A, **1024**B. In alternative embodiments, it will be appreciated that a pair of opposed abutment surfaces may be provided by alternative structures mounted to or integral with the applicator plate **1012**. The pair of opposed abutment surfaces are spaced apart from each other sufficient that a portion of an article B can be received therebetween. In the illustrated embodiment, the portion of the article B received is an end closure C of a bottle.

[0195] The bushing **1020** is oriented with respect to the carrier **90** such that the pair of opposed abutment surfaces **1024**A, **1024**B make contact and apply force or pressure to the second panel **514** at contact points PP, as shown in FIG. **1**C. The carrier **90** comprises a pair of contact points PP on opposing sides of each article retention structure RT. Each saddle **1030** transversely straddles one of the article retention structures RT. The "U" shaped recesses of the saddle **1030** extend in a longitudinal direction, and the U" shaped recess of one saddle **1030** is collinear with the U" shaped recess of the other saddle **1030**.

[0196] One of the pair of opposed abutment surfaces **1024**A, **1024**B is disposed at a different elevation to the other one of the pair of opposed abutment surfaces **1024**A, **1024**B, best illustrated in FIG. **16**, in which the applicator plate **1012** has been omitted for illustrative purposes. In this way the applicator **1010** applies force or pressure unevenly or asynchronously to the side or longitudinal edges of the carrier **90**. The applicator **1010** unevenly or unequally displaces the opposing sides of the carrier **90** from a planar condition. A first abutment surface **1024**A is disposed at a first elevation and is configured to make contact with a contact point PP along a first side of the carrier **90** before a second abutment surface **1024**B, which is disposed at a higher elevation, makes contact with a second contact point PP along a second side of the carrier **90**.

[0197] FIG. **16**B illustrates an alternative bushing **1220**, having an annular wall **1222**, which is substantially similar to the bushing of FIGS. **13** to **16** albeit a pair of opposed abutment surfaces **1024**A, **1024**B are disposed at the same elevation. In this way the bushing **1220** applies force or

pressure evenly or synchronously to the side or longitudinal edges of the blank **10** (or carrier **90**). The bushing **1220** evenly or equally displaces the opposing sides of the blank **10** from a planar condition. The first abutment surface **1024**A makes contact with a contact point along a first side of the blank **10** and a second abutment surface **1024**B makes contact with a second contact point along a second side of the blank **10** at substantially the same time.

[0198] The annular wall **1022** of the bushing **1020** may be inclined downwardly, as viewed in FIG. **14**, (albeit upwardly in normal use as shown in FIG. **16**) from inside to outside, in the region of the "U" shaped recess between the pair of opposed abutment surfaces **1024**A, **1024**B.

[0199] The "U" shaped recesses in the saddles **1030** allow, or provide a void, into which the engaging tabs **40**, **42**, **44** may be displaced when the carrier **90** is applied to the articles B. In this way the bushing **1020** does not interfere or inhibit movement of the engaging tabs **40**, **42**, **44**.

[0200] The carrier **90**, or at least portions thereof surrounding the article retention structures R may adopt an inverted "U" shaped form in response to engagement by the saddles **1030** whilst being applied to the articles B.

[0201] Referring now to FIG. **17** there is shown an alternative embodiment of the applicator **1110** having an applicator plate **1112** configured to apply three carriers **90** (outline positions of the carriers **90** are indicated by dashed lines in FIG. **17**) simultaneously to three groups or pairs of articles B. The applicator plate **1112** comprises six bushings **1120** mounted thereto arranged in a 2×3 matrix or array. In other embodiments, it will be appreciated that other configurations may be employed, to apply a different number of carriers or package a different number of articles as desired.

[0202] In some embodiments, bushings **1020**; **1120** may be retro fitted to an existing applicator plate to adapt an existing packaging machine to apply paperboard carriers to articles B.

[0203] The present disclosure also provides a packaging system including a packaging apparatus **1000**, article carriers **90**, and a method of applying blanks **10**; **110**; **210**; **410**; **510**; **610**; **710** to articles B to form the article carriers **90**.

[0204] The method of applying blanks **10**; **110**; **210**; **410**; **510**; **610**; **710** comprises asynchronously applying force or pressure, first to one side or longitudinal edge and then then the other side or longitudinal edge of the article carrier **90**. The apparatus **1000** is arranged to bring a first abutment surface **1024**A into contact with a first side of the article carrier **90** in a region adjacent to an article retention structure RT provided by the article carrier **90**, and the subsequently bring a second abutment surface **1024**B into contact with a second side of the article carrier **90** in a region adjacent to an article retention structure RT provided by the article carrier **90**.

[0205] Each of the first and second abutment surfaces **1024**A, **1024**B is provided by a limb extending from, or mounted to, an applicator plate **1012**, **1112**. The limbs may have unequal length or height. The limbs are spaced apart from each other sufficient that an upper portion of an article B can be disposed therebetween. The limbs may be provided by an annular wall **1022** having an internal diameter sufficiently larger to accommodate the upper portion of the article B. A gap or void is provided between the limbs such that engaging teeth **40**, **42**, **44** provided on the article carrier **90** can be folded or displaced outwardly without encumbrance. The gap or void may be provided by a recess in the end of the annular wall between the first and second abutment surfaces **1024**A, **1024**B so as to define a saddle **1030**.

[0206] The present disclosure also provides a method of applying blanks **10**; **110**; **210**; **410**; **510**; **610**; **710** comprising displacing a first side or longitudinal edge of one or more primary panels **12**, **14**, **16**; **112**; **212**, **214**; **412**, **414**, **416**; **512**, **514**, **516**; **612**, **614**, **616**; **712**, **714** of the blank **10**; **110**; **210**; **410**; **510**; **610**; **710** a greater extent than the other, opposing, side or longitudinal edge of said one or more primary panels **12**, **14**, **16**; **112**; **212**, **214**; **412**, **414**, **416**; **512**, **514**, **516**; **612**, **614**, **616**; **712**, **714** whilst engaging the blank **10**; **110**; **210**; **410**; **510**; **610**; **710** with one or more articles B.

[0207] The present disclosure also provides an article carrier **90** comprising at least one primary panel **12**, **14**, **16**; **112**; **212**, **214**; **412**, **414**, **416**; **512**, **514**, **516**; **612**, **614**, **616**; **712**, **714** forming a handle structure. The at least one primary panel **12**, **14**, **16**; **112**; **212**, **214**; **412**, **414**, **416**; **512**, **514**, **516**; **612**, **614**, **616**; **712**, **714** comprises at least one, at least two, or more article retention structures RT for engaging an article so as to provide a top gripping article carrier **90**.

[0208] The at least one article retention structure RT comprises a receiving opening having or defined by a boundary including a first edge E**1** and second opposing edge E**2**. The second edge E**2** is defined by a series of distal or engaging ends of the engaging teeth **40**, **42**, **44**; **140**, **142**, **144**; **240**, **242**, **244**; **440**, **442**, **444**; **540**, **542**, **544**; **640**, **642**, **644**; **740**, **742**, **744**.

[0209] The first edge E**1** may be arranged to be closer to the handle H than the second edge E**2**. Either one of the first and second edges E**1**, E**2** may be curved concavely as viewed from the location of the other. The first edge E**1** may be curved such that the centre of curvature C_e**1** of the first edge E**1** is located closer to the second edge E**2** than to the first edge E**1**. The boundary further includes a pair of third and fourth opposing edges E**3**, E**4** which continuously connect the first and second edges E**1**, E**2** such that each of the third and fourth edges E**3**, E**4** provides a smooth transition between the first and second edges E**1**, E**2**. Either one of the third and fourth edges E**3**, E**4** may be curved concavely as viewed from the location of the other.

[0210] The radius of curvature r**1** of the first edge E**1** may be less than the radius of curvature r**2** of the second edge E**2**.

[0211] The third and fourth opposing edges E**3**, E**4** each continuously connects the first and second edges E**1**, E**2**. The third and fourth edges E**3**, E**4** are spaced apart such that the maximum distance therebetween is less than the lateral dimension (e.g., the diameter) of the radially protruding portion (e.g., a bottle neck flange or a bottle cap) of the associated article such as a bottle.

[0212] The present disclosure also provides an article carrier **90** comprising release device, the release device may comprise a pull tab T**1**, T**2**, T**3**. Optionally, the release device comprises a cut C**3**, C**4**, C**6**; the cut C**3**, C**4**, C**6** may be arcuate or curved. The cut C**3**, C**4**, C**6** is disposed between the pull tab T**1**, T**2**, T**3** and a top-receiving opening of the at least one article retention structure RT. The cut C**3**, C**4**, C**6** is disposed is disposed on a first or outer side of the top-receiving opening.

[0213] The present disclosure also provides an article carrier **90** comprising a relief device, the relief device comprises a relief cut C**1**, C**2**, C**5**; the relief cut C**1**, C**2**, C**5** may be arcuate or curved. The relief cut C**1**, C**2**, C**5** is disposed between the handle H and a top-receiving opening

of the at least one article retention structure RT. The relief cut C1, C2, C5 is disposed on a second or inner side of the top-receiving opening. The second side of the top-receiving opening opposes the first side.

[0214] The present disclosure also provides an article carrier **90** comprising a top engaging feature or article retention structure RT comprising a top-receiving opening and a series of engaging tabs **40**, **42**, **44**; **140**, **142**, **144**; **240**, **242**, **244**; **440**, **442**, **444**; **540**, **542**, **544**; **640**, **642**, **644**; **740**, **742**, **744** disposed along an outer section E2 of the perimeter of the opening. The outer section generally opposes an inner section adjacent to the handle H or intermediate portion of the primary panel **12**, **14**, **16**; **112**; **212**, **214**; **412**, **414**, **416**; **512**, **514**, **516**; **612**, **614**, **616**; **712**, **714**. The radius of curvature r1 of the inner section E1 of the opening perimeter is less than the radius of the curvature r2 defined by distal ends of the engaging tabs **40**, **42**, **44**; **140**, **142**, **144**; **240**, **242**, **244**; **440**, **442**, **444**; **540**, **542**, **544**; **640**, **642**, **644**; **740**, **742**, **744**. The distal ends of the engaging tabs **40**, **42**, **44**; **140**, **142**, **144**; **240**, **242**, **244**; **440**, **442**, **444**; **540**, **542**, **544**; **640**, **642**, **644**; **740**, **742**, **744** provide engaging edges for engaging with an article B.

[0215] The present disclosure also provides a top engaging carrier **90** comprising a pair of engaging portions and a handle portion H bridging between the engaging portions. The carrier **90** is formed from at least two layers of sheet material in face contacting arrangement. The at least two layers of sheet material may be secured together for example using glue or other adhesive treatment or mechanical fasteners. The mechanical fasteners may be provided by article retention structure RT in each of the at least two layers of sheet material and disposed in vertical registry with each other; the at least two layers of sheet material being secured together when an article B is received in the article retention structure RT in each of the at least two layers of sheet material. The at least two layers of sheet material may include a first layer **14** and a second layer **12**. The first layer **14** may be greater in longitudinal dimension than the second layer **12** to provide an accessing tab at an end of the first layer **14** projecting outwards beyond the adjacent end of the second layer **12**.

[0216] The present disclosure also provides a top engaging feature or article retention structure RT comprising a top-receiving opening and a series of engaging tabs **40**, **42**, **44**; **140**, **142**, **144**; **240**, **242**, **244**; **440**, **442**, **444**; **540**, **542**, **544**; **640**, **642**, **644**; **740**, **742**, **744** disposed along an outer section of the opening perimeter. The series of engaging tabs **40**, **42**, **44**; **140**, **142**, **144**; **240**, **242**, **244**; **440**, **442**, **444**; **540**, **542**, **544**; **640**, **642**, **644**; **740**, **742**, **744** includes a pair of end tabs **40**; **140**; **240**; **440**; **540**; **640**; **740** at each end of the series. Each of the end tabs **40**; **140**; **240**; **440**; **540**; **640**; **740** is defined in part by a tear stopper, the tear stopper may take the form of a recess or a "J" shaped cut line.

[0217] The present disclosure also provides a top engaging feature or article retention structure RT comprising a top-receiving opening and a series of engaging tabs **40**, **42**, **44**; **140**, **142**, **144**; **240**, **242**, **244**; **440**, **442**, **444**; **540**, **542**, **544**; **640**, **642**, **644**; **740**, **742**, **744** disposed along an outer section of the opening perimeter. At least one of medial tabs **44** is adjoined at its proximal end by an accessing feature which may be accessed by a user to disengage the top engaging feature from the associated article B.

[0218] The present disclosure also provides a top engaging feature or article retention structure RT comprising a top-receiving opening and a series of engaging tabs **40**, **42**, **44**; **140**, **142**, **144**; **240**, **242**, **244**; **440**, **442**, **444**; **540**, **542**, **544**; **640**, **642**, **644**; **740**, **742**, **744**. A first one of the series of engaging tabs **40**, **42**, **44**; **140**, **142**, **144**; **240**, **242**, **244**; **440**, **442**, **444**; **540**, **542**, **544**; **640**, **642**, **644**; **740**, **742**, **744** is hinged to the primary panel **12**, **14**, **16**; **112**; **212**, **214**; **412**, **414**, **416**; **512**, **514**, **516**; **612**, **614**, **616**; **712**, **714** by a first fold line **41**, a second one of the series of engaging tabs **40**, **42**, **44**; **140**, **142**, **144**; **240**, **242**, **244** is hinged to the primary panel **12**, **14**, **16**; **112**; **212**, **214**; **412**, **414**, **416**; **512**, **514**, **516**; **612**, **614**, **616**; **712**, **714** by a second fold line **43**. The first and second fold lines **41**, **43** define therebetween an obtuse angle θ which optionally may be between 115° and 135° and further optionally may be about 125°. The first fold line **41** optionally defines an angle of about 20° with respect to a first notional line x-x while the second fold line **43** optionally defines an angle of about 15° with respect to a second notional line y-y. First notional line x-x is parallel to the longitudinal axis of the primary panel **12**, **14**, **16**; **112**; **212**, **214**; **412**, **414**, **416**; **512**, **514**, **516**; **612**, **614**, **616**; **712**, **714**, and second notional line y-y is perpendicular to first notional line x-x.

[0219] It can be appreciated that various changes may be made within the scope of the present invention. For example, the size and shape of the panels and apertures may be adjusted to accommodate articles of differing size or shape.

[0220] It will be recognised that as used herein, directional references such as "top", "bottom", "base", "front", "back", "end", "side", "inner", "outer", "upper" and "lower" do not necessarily limit the respective panels to such orientation, but may merely serve to distinguish these panels from one another.

[0221] As used herein, the terms "hinged connection" and "fold line" refer to all manner of lines that define hinge features of the blank, facilitate folding portions of the blank with respect to one another, or otherwise indicate optimal panel folding locations for the blank. Any reference to "hinged connection" should not be construed as necessarily referring to a single fold line only; indeed, a hinged connection can be formed from two or more fold lines wherein each of the two or more fold lines may be either straight/linear or curved/curvilinear in shape. When linear fold lines form a hinged connection, they may be disposed parallel with each other or be slightly angled with respect to each other. When curvilinear fold lines form a hinged connection, they may intersect each other to define a shaped panel within the area surrounded by the curvilinear fold lines. A typical example of such a hinged connection may comprise a pair of arched or arcuate fold lines intersecting at two points such that they define an elliptical panel therebetween. A hinged connection may be formed from one or more linear fold lines and one or more curvilinear fold lines. A typical example of such a hinged connection may comprise a combination of a linear fold line and an arched or arcuate fold line which intersect at two points such that they define a half moon-shaped panel therebetween.

[0222] As used herein, the term "fold line" may refer to one of the following: a scored line, an embossed line, a debossed line, a line of perforations, a line of short slits, a line of half-cuts, a single half-cut, an interrupted cutline, a line of aligned slits, a line of scores and any combination of the aforesaid options.

[0223] It should be understood that hinged connections and fold lines can each include elements that are formed in the substrate of the blank including perforations, a line of perforations, a line of short slits, a line of half-cuts, a single half-cut, a cutline, an interrupted cutline, slits, scores, any combination thereof, and the like. The elements can be dimensioned and arranged to provide the desired functionality. For example, a line of perforations can be dimensioned or designed with degrees of weakness to define a fold line or a severance line or both. The line of perforations can be designed to facilitate folding and resist breaking, to facilitate folding and facilitate breaking with more effort, or to facilitate breaking with little effort.

[0224] The phrase "in registry with" as used herein refers to the alignment of two or more elements in an erected carton, such as an aperture formed in a first of two overlapping panels and a second aperture formed in a second of two overlapping panels. Those elements in registry with each other may be aligned with each other in the direction of the thickness of the overlapping panels. For example, when an aperture in a first panel is "in registry with" a second aperture in a second panel that is placed in an overlapping arrangement with the first panel, an edge of the aperture may extend along at least a portion of an edge of the second aperture and may be aligned, in the direction of the thickness of the first and second panels, with the second aperture.

1. A method of packaging at least one article comprising:
applying an article carrier to at least one article with an applicator comprising:
displacing a first side of a primary panel from a planar condition by a first distance;
displacing a second opposing side of a primary panel from the planar condition by a second distance,
wherein the second distance is less than the first distance;
engaging the article carrier with at least one article;
receiving the at least one article in an opening in the primary panel.

2. A method of packaging at least one article comprising;
engaging an article carrier with an applicator;
bringing a first limb of the applicator into contact with a first side of a primary panel of the article carrier and applying a force to the first side of a primary panel of the article carrier, adjacent to an article retention structure comprising an opening for receiving the at least one article, so as to displace the first side of a primary panel from a planar condition by a first distance;
bringing a second limb of the applicator into contact with a second, opposing, side of a primary panel of the article carrier and applying a force to the second side of a primary panel of the article carrier, adjacent to an article retention structure comprising an opening for receiving the at least one article, so as to displace the second side of a primary panel from a planar condition by a second distance, wherein the second distance is less than the first distance,
bringing the article carrier into contact with at least one article;
receiving the at least one article in the opening in the primary panel.

3. A method of packaging at least one article according to claim **2**, further comprising folding one or more engaging teeth outwardly of the primary panel to engage a flange of the at least one article.

4. A method of packaging at least one article according to claim **3**, wherein the one or more engaging teeth are disposed about an end edge of the opening adjacent to the first and second sides.

5. A method of packaging at least one article according to claim **3**, wherein the one or more engaging teeth are folded between a pair of spaced apart limbs each of which is in contact with one of the first and second sides of the primary panel.

6. A method of packaging at least one article comprising;
bringing an article carrier into contact with at least one article;
applying a force to a first side of a primary panel of the article carrier, adjacent to an article retention structure comprising an opening for receiving the at least one article;
receiving a first side of the at least one article in the opening adjacent to the first side of the primary panel;
applying a force to a second, opposing, side of the primary panel of the article carrier, adjacent to an article retention structure comprising an opening for receiving the at least one article;
receiving a second, opposing, side of the at least one article in the opening adjacent to the second side of the primary panel.

7. A method of packaging at least one article according to claim **6**, further comprising folding one or more engaging teeth outwardly of the primary panel to engage a flange of the at least one article.

8. A method of packaging at least one article according to claim **7**, wherein the one or more engaging teeth are disposed about an end edge of the opening adjacent to the first and second sides.

9. A method of packaging at least one article according to claim **7**, wherein the one or more engaging teeth are folded between a pair of spaced apart limbs each of which is in contact with one of the first and second sides of the primary panel.

10. A component for an applicator device comprising a first limb having a first end and a second, opposing, end disposed a first distance from the first end, the first end providing a first abutment surface, and a second limb having a first end and a second, opposing, end disposed a second distance from the first end, the first end providing a second abutment surface, wherein the first limb is spaced apart from the second limb, and wherein the second distance is less than the first distance.

11. An apparatus for forming a package, the apparatus includes an applicator comprising an applicator plate for engaging an article carrier, the applicator plate having a component mounted thereto, the component comprising a first limb having a first end and a second, opposing, end disposed a first distance from the first end, the first end providing a first abutment surface, and a second limb having a first end and a second, opposing, end disposed a second distance from the first end, the first end providing a second abutment surface, wherein the first limb is spaced apart from the second limb, and wherein the second distance is less than the first distance.

12. A bushing for mounting in an opening of an applicator device comprising an annular wall having opposed ends, a first end providing a pair of spaced apart abutment regions diametrically opposed to each other, a first one of the abutment regions being disposed a first distance from the

second end of the annular wall, the second end of the annular wall opposing the first end, wherein a second one of the abutment regions is disposed a second distance from the second end of the annular wall, and wherein the second distance is less than the first distance.

13. An apparatus for forming a package, the apparatus includes an applicator comprising an applicator plate for engaging an article carrier, the applicator plate having at least one aperture and a bushing mounted in the at least one aperture, the bushing comprising an annular wall having opposed ends, a first end providing a pair of spaced apart abutment regions diametrically opposed to each other, a first one of the abutment regions being disposed a first distance from the second end of the annular wall, the second end of the annular wall opposing the first end, wherein a second one of the abutment regions is disposed a second distance from the second end of the annular wall, wherein the second distance is less than the first distance.

14. An apparatus according to claim **13**, wherein the bushing comprises a saddle disposed between the pair of abutment regions providing a recess defining at least in part void for receiving a portion of an article carrier.

15. An apparatus according to claim **12**, further comprising an engagement device for holding at least one article carrier in engagement with the applicator plate.

16. An apparatus according to claim **13**, wherein the engagement device comprises a vacuum system.

17. An apparatus according to claim **13**, wherein the saddle is defined by portions of the annular wall disposed between the pair of abutment regions and wherein said portions of the of the annular wall are chamfered.

18. An apparatus according to claim **13**, wherein the saddle is defined by portions of the annular wall disposed between the pair of abutment regions and wherein said portions of the of the annular wall are filleted.

19. An apparatus according to claim **13**, wherein the saddle is defined by portions of the annular wall disposed between the pair of abutment regions and wherein said portions of the of the annular wall are inclined with respect to surfaces of the pair of abutment regions.

20. An article carrier for packaging at least one article, the article carrier comprising at least one primary panel forming a handle structure, the at least one primary panel comprising a handle portion and at least one article retention structure for engaging an article so as to provide a top gripping article carrier, the at least one article retention structure comprising a receiving opening having a boundary including a first edge and second opposing edge, wherein the second edge is defined by a series of distal ends of engaging teeth providing engaging edges thereof, the first edge is arranged to be closer to the handle portion than the second edge, the first edge is curved such that the centre of curvature of the first edge is located closer to the second edge than to the first edge, the boundary further includes a pair of third and fourth opposing edges which continuously connect the first and second edges such that each of the third and fourth edges provides a smooth transition between the first and second edges.

21. An article carrier for packaging at least one article, the article carrier comprising at least one primary panel forming a handle structure, the at least one primary panel comprising a handle portion and at least one article retention structure for engaging an article so as to provide a top gripping article carrier, the at least one article retention structure comprising a top-receiving opening, the article carrier comprising a release device including a pull tab and cut, wherein the cut is disposed between the pull tab and the top-receiving opening of the at least one article retention structure.

22. A package comprising at least one article and an article carrier, the article carrier comprising at least one primary panel forming a handle structure, the at least one primary panel comprising a handle portion and at least one article retention structure in engagement with the at least one article, the at least one article retention structure comprising a receiving opening having a boundary including a first edge and second opposing edge, wherein the second edge is defined by a series of distal ends of engaging teeth providing engaging edges which are in engagement with the at least one article below an radially protruding portion of the at least one article, the first edge is arranged to be closer to the handle portion than the second edge, the boundary further includes a pair of third and fourth opposing edges which continuously connect the first and second edges, the third and fourth edges being spaced apart such that a maximum distance therebetween is less than a lateral dimension of the radially protruding portion of the at least one article.

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