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(54) **Title: ARTICLE CARRIER AND BLANK THEREFOR**

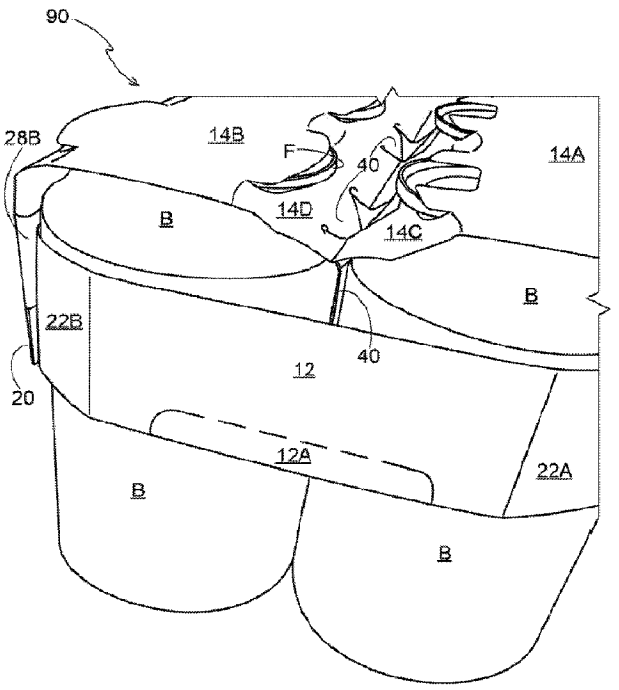



FIG. 3

(57) **Abrégé/Abstract:**
Aspects of the disclosure relate to a package, a carrier for packaging two or more articles and a blank for forming the carrier. The carrier comprises a main panel having at least one top-engaging article device for receiving and securing the main panel to a respective article. The carrier further comprises a keel structure. The keel structure comprises at least two keel panels arranged to be disposed between a first one of the at least two articles and a second one of the at least two articles. The keel structure comprises at least one keel tab struck from at least one of at least two keel panels. The at least one keel tab is arranged to be disposed between the first one of the at least two articles and the second one of the at least two articles.

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**Abstract:**

Aspects of the disclosure relate to a package, a carrier for packaging two or more articles and a blank for forming the carrier. The carrier comprises a main panel having at least one top-engaging article device for receiving and securing the main panel to a respective article. The carrier further comprises a keel structure. The keel structure comprises at least two keel panels arranged to be disposed between a first one of the at least two articles and a second one of the at least two articles. The keel structure comprises at least one keel tab struck from at least one of at least two keel panels. The at least one keel tab is arranged to be disposed between the first one of the at least two articles and the second one of the at least two articles.

# ARTICLE CARRIER AND BLANK THEREFOR

## TECHNICAL FIELD

The present invention relates to packages, article carriers and to blanks for forming the same. More specifically, but not exclusively, the invention relates to a carrier of the top-gripping type having one or more apertures for receiving and retaining an article therein.

## BACKGROUND

In the field of packaging it is known to provide 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.

It is well known to provide top gripping article carriers in which apertures are provided in a panel of the carrier for receiving and engaging an article. The carrier may comprise a keel structure disposed between a first row of articles and a second row of articles.

It is desirable to provide a handle structure for carrying the carton which handle structure has sufficient strength to retain carton integrity in use.

The present invention seeks to provide an improvement in the field of cartons, typically formed from paperboard or the like.

## SUMMARY

A first aspect of the invention provides an article carrier for packaging at least one article. The carrier comprises a main panel having at least one top-engaging article device for receiving and securing the main panel to a respective article. The carrier further comprises a keel structure. The keel structure comprises at least two keel panels for being disposed between a first one of the at least two articles and a second one of the at least two articles. The keel structure comprises at least one keel tab struck from at least one of at least two keel panels. The at least one keel tab is

arranged to be disposed between the first one of the at least two articles and the second one of the at least two articles.

Optionally, the keel structure is formed from a pair of hinged panels, the pair of hinged panels being medially located in the main panel.

Optionally, the carrier comprises a pair of opposing side panels hingedly connected to the main panel.

Optionally, the carrier comprises an end strap hingedly connected between the pair of opposing side panels and being free of direct connection to the main panel.

Optionally, the keel structure comprises a plurality of keel tabs.

Optionally, the at least one keel tab is struck from both of the at least two keel panels.

Optionally, the at least one keel tab comprises a fold line defining at least in part an upper and lower portion thereof.

Optionally, the fold line is offset with respect to a hinged connection between the pair of panels of the keel structure.

Optionally, the at least two keel panels are provided by portion of the main panel and are disposed between a pair of top panels.

Optionally, the pair of top panels are disposed over upper ends of the at least two articles.

Optionally, each cover panel is arranged to be disposed over an upper end of at least one article.

Optionally, the at least one keel tab is struck in part from one of the pair of top panels.

Optionally, each of the pair of opposing side panels is hingedly connected to the main panel by a shoulder panel.

Optionally, the carrier comprises a cutaway that separates the end strap from the main panel.

Optionally, the cutaway is one of the elements selected from the following group of elements; a cutline, a severable line, a recess, a slot, and an aperture.

Optionally, the at least one top-engaging article device comprises a plurality of top-engaging article devices, and the keel structure is disposed between a first row of the top-engaging article devices and a second row of the top-engaging article devices.

A second aspect of the invention provides a blank for forming an article carrier. The blank comprises a main panel having at least one top-engaging article device for receiving and securing the main panel to a respective one of at least two articles. The blank further comprises at least two keel panels for forming a keel structure. The keel structure is arranged to be disposed between a first one of the at least two articles and a second one of the at least two articles. The keel structure comprises at least one keel tab struck from at least one of at least two keel panels. The at least one keel tab is arranged to be disposed between the first one of the at least two articles and the second one of the at least two articles.

Optionally, the at least one top-engaging article device comprises a plurality of top engaging article devices, and the at least one keel tab extends away from a first row of the top-engaging article devices.

Optionally, the at least one keel tab extends toward a second row of the top-engaging article devices.

Optionally, each of the top-engaging article devices comprises at least one slit, and the at least one keel tab interrupts the at least one slit of at least one of the top-engaging article devices.

A third aspect of the invention provides a package comprising an article carrier and a plurality of articles. The carrier comprises a main panel having a plurality of top-engaging article devices for receiving and securing the main panel to a respective article. The plurality of top-engaging article devices is arranged in rows and comprise a first row and a second row. The carrier further comprises a keel structure. The keel structure comprises at least two keel panels disposed between the first and second rows of top-engaging article devices. The keel structure comprises

at least one keel tab struck from at least one of at least two keel panels. The at least one keel tab is disposed between a pair of adjacently disposed articles. A first one of the pair of adjacently disposed articles is engaged by a top-engaging article device in the first row and a second one of the pair of adjacently disposed articles is engaged by a top-engaging article device in the second row.

Optionally, the at least one keel tab is adhesively secured to said first and second ones of the pair of adjacently disposed articles.

Optionally, the carrier further comprising a pair of opposing side panels hingedly connected to the main panel, and an end strap hingedly connected between the pair of opposing side panels and being free of direct connection to the main panel.

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.

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.

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

Exemplary embodiments of the invention will now be described with reference to the accompanying drawings, in which:

Figure 1 is a plan view from above of a blank for forming a carrier according to a first embodiment;

Figure 2 is a perspective view from above of a carrier formed from the blank of Figure 1;

Figure 3 is an alternative perspective view from above of a portion of the carrier of Figure 2; and

Figure 4 is an alternative perspective view from above of a portion of the carrier of Figure 2 showing a handle feature in a deployed condition.

## DETAILED DESCRIPTION OF EMBODIMENTS

Detailed descriptions of specific embodiments of the package, blanks and carriers 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 packages, blanks and carriers 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.

Referring to Figure 1, there is shown a plan view of a blank 10 which is capable of forming a carton or carrier 90, as shown in Figure 2, for containing and carrying a group of primary products such as, but not limited to, bottles or cans, hereinafter referred to as articles B, as shown in Figure 2. The blank 10 forms a secondary package for packaging at least one primary product container or package.

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 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. Exemplary containers include bottles (for example metallic, glass or plastics bottles), cans (for example aluminium cans), tins, pouches, packets and the like.

The blank 10 is 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.

The packaging structures or cartons 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.

In the illustrated embodiment, the blank 10 is configured to form a carton or carrier 90 for packaging an exemplary arrangement of exemplary articles B. In the illustrated embodiment, the arrangement is a 2 x 3 matrix or array; two rows of three articles B are provided, and the articles B are beverage cans. Alternatively, the blank 10 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.

Referring to Figure 1 there is shown a blank 10 comprising a plurality of panels 12, 14, 16, 18, 20, including a main panel 14 for forming a top wall or an engaging panel of a carrier 90 (see Figure 2).

The blank 10 includes a first side panel 18 hingedly connected to a first side of the main panel 14 by a hinged connection in the form of a fold line 17; more specifically, the first side panel 18 is hingedly connected to a first outer shoulder panel 14E forming part of the main panel 14. The blank 10 includes a second side panel 20 hingedly connected to a second side of the main panel

14 by a hinged connection in the form of a fold line 19; more specifically, the second side panel 20 is hingedly connected to a second outer shoulder panel 14F forming part of the main panel 14.

The first outer shoulder panel 14E is hinged to a first top panel 14A by a hinged connection in the form of a fold line 73A. The second outer shoulder panel 14F is hinged to a second top panel 14B by a hinged connection in the form of a fold line 73B. The main panel 14 further comprises a first inner shoulder panel 14C and a second inner shoulder panel 14D. The first inner shoulder panel 14C is hinged to a first top panel 14A by a hinged connection in the form of a fold line 75A. The first inner shoulder panel 14C is hinged to the second inner shoulder panel 14D by a hinged connection in the form of a fold line 76. The second inner shoulder panel 14D is hinged to the second top panel 14B by a hinged connection in the form of a fold line 75B.

The first inner shoulder panel 14C and the second inner shoulder panel 14D form a keel structure 14C/14D disposed between two rows of articles B, see Figure 2.

Each of the first and second top panels 14A, 14B includes opposed pairs of article-engaging devices 70A, 72A (and 70B, 72B) formed therein and generally along respective fold lines 73A, 75A (and 73B, 75B). Fold lines 73A, 75A hingedly interconnect the respective series of article-engaging devices 70A, 72A. Fold lines 73B, 75B hingedly interconnect the respective series of article-engaging devices 70B, 72B. In the illustrated embodiment, each of the article-engaging devices 70A, 72A, 70B, 72B takes the form of a curved slit. The article engaging devices 72A disposed between the first top panel 14A and the first inner shoulder panel 14C are defined at least in part by a pair of slit or cuts. The pair of slit or cuts are spaced apart by a keel tab 40 (described in further detail below). The slits may be considered to interrupt a respective one of the fold lines 73A, 75A, 73B, 75B, between the first and second top panels 14A, 14B and the inner and outer shoulder panels 14C, 14D, 14E, 14F. In other embodiments, each of the article-engaging devices may be formed by a series of curved frangible lines. In other embodiments, the article-engaging devices 70A, 72A, 70B, 72B may comprise apertures for receiving upper parts of articles B held by the carrier 90. It will be understood that many mechanisms exist for clipping, locking, or engaging the tops or other portions of articles B (such as radially protruding portions or flanges) for holding the articles B in an assembled and secure group so that a number of articles B may easily be purchased and transported at the same time. In the illustrated embodiment, the article-engaging devices 70A, 72A, 70B, 72B take the form of C-shaped slits which form openings when the top panels 14A, 14B are folded about the fold lines 73A, 75A, 73B, 75B, each thereby

providing an article-engaging edge. Once opened, the slits are sized similarly to or substantially equal to the rim edge of an article B. Each article-engaging device 70A, 72A, 70B, 72B provides a pair of openings for receiving a portion of an article B.

In the illustrated embodiment, the fold lines 73A, 75A (and 73B, 75B) that hingedly interconnect the series of article-engaging devices 70A, 72A (and 70B, 72B) are slightly arcuate in shape (in other embodiments they may be linear or straight) with their convex sides disposed toward the interiors of respective adjacent top panels 14A, 14B.

First and second outer shoulder panels 14E, 14F each include one or more second or stress-reducing fold lines 71A, 71B that extend alongside at least part of respective fold lines 73A, 73B. In the illustrated embodiment, stress-reducing fold lines 71A, 71B are generally arcuate (in other embodiments they may be linear or straight) with their concave sides disposed toward the interiors of respective adjacent top panels 14A, 14B. The stress-reducing fold lines 71A, 71B can be disposed between two adjacent ones of cut lines 70A, 70B.

In the illustrated embodiment, first and second inner shoulder panels 14C, 14D also include one or more second or stress-reducing fold lines 77A, 77B that extend alongside at least part of respective fold lines 75A, 75B. Stress-reducing fold lines 77A, 77B may generally mirror the stress-reducing fold lines 71A, 71B disposed on the first and second outer shoulder panels 14E, 14F. Stress-reducing fold lines 77A, 77B may facilitate the contouring of inner shoulder panels 14C, 14D to corresponding portions of the necks of adjacent articles.

The blank 10 comprises a first end strap 26A/22A/12/22B/26B and a second end strap 30A/24A/-16/24B/30B.

The first end strap 26A/22A/12/22B/26B. The first end strap 26A/22A/12/22B/26B comprises a first end panel 12. A first corner panel 22A is hingedly connected to a first end of the first end panel 12 by a hinged connection in the form of a fold line 21A. Fold line 21A may comprise a plurality of fold lines, the illustrated embodiment comprises a single fold line, the plurality of fold lines may be parallel with each other. A first securing panel 26A is hingedly connected to an end of the first corner panel 22A by a hinged connection in the form of a fold line 23A. Fold line 23A may comprise a plurality of fold lines, the illustrated embodiment comprises a single fold line, the plurality of fold lines may be parallel with each other. A first gusset panel 28A is hingedly

interconnected between the first securing panel 26A and a first end of the first side panel 18 by fold lines 25A, 27A. Fold line 27A may comprise a plurality of fold lines, the illustrated embodiment comprises a single fold line, the plurality of fold lines may be parallel with each other.

A second corner panel 22B is hingedly connected to a second end of the first end panel 12 by a hinged connection in the form of a fold line 21B. Fold line 21B may comprise a plurality of fold lines, the illustrated embodiment comprises a single fold line, the plurality of fold lines may be parallel with each other. A second securing panel 26B is hingedly connected to an end of the second corner panel 22B by a hinged connection in the form of a fold line 23B. Fold line 23B may comprise a plurality of fold lines, the illustrated embodiment comprises a single fold line, the plurality of fold lines may be parallel with each other. A second gusset panel 28B is hingedly interconnected between the second securing panel 26B and a first end of the second side panel 20 by fold lines 25B, 27B. Fold line 27B may comprise a plurality of fold lines, the illustrated embodiment comprises a single fold line, the plurality of fold lines may be parallel with each other.

The first end strap 26A/22A/12/22B/26B is partially separated from, or severable from, the main panel 14. The first end panel 12 is partially separated from, or severable from, the main panel 14. The blank 10 may comprise at least two cut lines, or frangible lines for severing, separating the first end panel 12 from the main panel 14.

The first corner panel 22A is separated from the main panel 14. The blank 10 may comprise an aperture separating, at least in part, the first corner panel 22A from the main panel 14. The first corner panel 22A may be separated, at least in part, from the main panel 14 by a cut line or frangible line.

The second corner panel 22B is separated from the main panel 14. The blank 10 comprises an aperture separating, at least in part, the second corner panel 22B from the main panel 14. The second corner panel 22B may be separated, at least in part, from the main panel 14 by a cut line or frangible line.

The first end strap 26A/22A/12/22B/26B forms a first end wall of the carrier 90.

The blank comprises a second end strap 30A/24A/16/24B/30B. The second end strap 30A/24A/-16/24B/30B comprises a second end panel 16. A third corner panel 24A is hingedly connected to

a first end of the second end panel 16 by a hinged connection in the form of a fold line 29A. Fold line 29A may comprise a plurality of fold lines, the illustrated embodiment comprises a single fold line, the plurality of fold lines may be parallel with each other. A third securing panel 30A is hingedly connected to an end of the third corner panel 24A by a hinged connection in the form of a fold line 31A. Fold line 31A may comprise a plurality of fold lines, the illustrated embodiment comprises a single fold line, the plurality of fold lines may be parallel with each other. A third gusset panel 32A is hingedly interconnected between the third securing panel 30A and a second end of the first side panel 18 by fold lines 33A, 35A. Fold line 35A may comprise a plurality of fold lines, the illustrated embodiment comprises a single fold line, the plurality of fold lines may be parallel with each other.

A fourth corner panel 24B is hingedly connected to a second end of the second end panel 16 by a hinged connection in the form of a fold line 29B. Fold line 29B may comprise a plurality of fold lines, the illustrated embodiment comprises a single fold line, the plurality of fold lines may be parallel with each other. A fourth securing panel 30B is hingedly connected to an end of the fourth corner panel 24B by a hinged connection in the form of a fold line 31B. Fold line 31B may comprise a plurality of fold lines, the illustrated embodiment comprises a single fold line, the plurality of fold lines may be parallel with each other. A fourth gusset panel 32B is hingedly interconnected between the fourth securing panel 30B and a second end of the second side panel 20 by fold lines 33B, 35B. Fold line 35B may comprise a plurality of fold lines, the illustrated embodiment comprises a single fold line, the plurality of fold lines may be parallel with each other.

The second end strap 30A/24A/16/24B/30B is partially separated from, or severable from, the main panel 14. The second end panel 16 is partially separated from, or severable from, the main panel 14. The blank 10 may comprise at least two cut lines, or frangible lines severing, separating the second end panel 16 from the main panel 14.

The third corner panel 24A is separated from the main panel 14. The blank 10 comprises an aperture separating, at least in part, the third corner panel 24A from the main panel 14. The third corner panel 24A may be separated, at least in part, from the main panel 14 by a cut line or frangible line.

The fourth corner panel 24B is separated from the main panel 14. The blank 10 comprises an aperture separating, at least in part, the fourth corner panel 24B from the main panel 12. The

fourth corner panel 24B may be separated, at least in part, from the main panel 14 by a cut line or frangible line.

The second end strap 30A/24A/16/24B/30B forms a second end wall of the carrier 90.

The blank 10 may comprise at least one handle feature. The blank 10 comprises a first handle flap 12A struck from the first end panel 12. The first handle flap 12A defines a recess or cutaway in a lower edge of the first end panel 12. The recess or cutaway may be substantially an inverted "U" shape. The first handle flap 12A is struck from, or defined in, the first end panel 12 and is hingedly connected thereto by a fold line 13.

The blank 10 may comprise a second handle flap 16A struck from the second end panel 16. The second end panel 16A defines a recess or cutaway in a lower edge of the second end panel 16. The recess or cutaway may be substantially an inverted "U" shape. The second end panel 16A is struck from, or defined in, the second end panel 16 and is hingedly connected thereto by a fold line 15.

The blank 10 may comprise at least one partition or divider K. The partition or divider K comprises at least one keel tab 40. The illustrated embodiment comprises a plurality of keel tabs 40, specifically three keel tabs 40, although in other embodiments more or less keel tabs 40 may be provided. The blank 10 may comprise a keel tab 40 for placement between each adjacent pair of articles B being packaged.

Each keel tab 40 is struck from the main panel 14. A portion of each keel tab 40 is struck from, or defined in, the second inner shoulder panel 14D, a portion of each keel tab 40 is struck from, or defined in, the first inner shoulder panel 14C. A further portion of the keel tabs 40 may be provided by material which would otherwise form the first top panel 14A, that is to say an optional portion of the keel tab 40 may be struck from, or defined in the first top panel 14A and may interrupt the adjacent one of the curved slits 72A.

Each keel tab 40 is defined, at least in part, by a cut line 41. Cutline 41 is substantially 'U' or "C" shaped. The cut line 41 comprises a pair or terminal ends disposed in the second inner shoulder panel 14D. The cut line 41 extends into the first inner shoulder panel 14C. The cut line 41 may extends into the first top panel 14A. The cut line 41 and/or tab may be considered to interrupt the

slit forming the article engaging devices 72A disposed between the first top panel 14A and the first inner shoulder panel 14C

The keel tabs 40 may be arranged to be integral with the second inner shoulder panel 14D. In other embodiments, the keel tabs 40 may be hingedly connected to the second inner shoulder panel 14D by hinged connection in the form of a fold line.

In the illustrated embodiment, the cut line 41 is defined in part in the second inner shoulder panel 14D. In other embodiments the cut line 41 may terminate at or proximate the fold line 76 between the first and second inner shoulder panels 14C, 14D; in such embodiments the keel tabs 40 may be considered to extend from the second inner shoulder panel 14D.

Each keel tab 40 may comprise a fold line 43 extending transversely thereacross. The fold line 43 may be arranged to disposed in alignment with an upper end of a main body of the articles B being packaged. The fold line 43 may be arranged to be aligned with a joint or transition between main body of the articles B and a shoulder or neck portion of the articles B.

In the illustrated embodiment, the keel tab 40 interrupts an engaging or support edge of the first inner shoulder panel 14C; the portion of the first inner shoulder panel 14C which the keel tab 40 removes would otherwise form a part of the support edge defined by the cutline or slit forming the article engaging device 72A. It has been found that portions of the first inner shoulder panel 14C disposed on opposing sides of the keel tab 40 provide engaging or support edges which are sufficient to retain the article B within article engaging device 72A or carrier 90.

Figure 2 illustrates a carrier 90, formed from the blank 10, engaged with a group of articles B. Each of the article-engaging devices 70A, 72A, 70B, 72B of the blank 10 engages an upper end of an article B of the group of articles B. Portions of the articles B pass through the main panel 14 and engage therewith. The side panels 18, 20 are folded about sides of the group of articles B and the end straps 26A/22A/12/22B/26B, 30A/24A/16/24B/30B are folded about ends of the group of articles B.

The keel tabs 40 are folded out of the main panel 14 and extend inwardly or downwardly. Each keel tab 40 is disposed between a pair of articles B, best shown in Figures 3 and 4. The keel tabs 40 inhibit the pair of articles B from contacting each other directly – at least at an upper end.

Adhesive may be applied to the keel tabs 40 (or to corresponding regions of the articles B) such that each article B adjacent to a keel tab 40 may be adhesively secured thereto. An article B may be adhesively secured to both or opposing faces of the keel tabs 40 -that is to say one article may be adhesively secured to one of the opposing faces of a keel tab 40 and another article may be adhesively secured to the other one of the opposing faces of said keel tab 40. This may improve security of the articles B with in the carrier 90. A fugitive glue may be employed to secure the keel tabs 40 to the articles B. An example of a specific glue is Swift®melt 7044 manufactured by HB Fuller. Use of a fugitive glue is optional, an advantage of a fugitive glue is its tendency to remain attached to the carrier 90 when the articles B are disengaged from the carrier 90 (this may be more desirable than having the glue remain attached to the articles B). In alternative embodiments other adhesives maybe employed such as, but not limited to, hot-melt glue.

The keel tabs 40 may inhibit or prevent damage to the articles B from impact or contact between the pair of articles B. The keel tab 40 may also suppress noise when the carrier 90 is transported.

The keel tab 40 may also improve security of the keel structure formed by the inner shoulder panels 14C, 14D.

Figure 4 shows the carrier 90 with the first handle flap 12A forming a cushioning flap. The first handle flap 12A is in a deployed or use condition, the cushioning flap 12A has been folded internally of the carrier 90 to provide a folded edge for carrying the carrier 90; the folded edge may be more comfortable and/or safer for the user.

The blank 10 includes at least a paperboard substrate. The material of the paperboard substrate may be selected from any conventional paperboard, for example, ranging in weight upwardly from about 10pt., preferably from about 16pt. to about 28pt. (0.028"/~0.7mm). An example of such a substrate is an 18 point (pt.) SBS board (solid bleached sulfate paperboard coated on one side, trade name PrintKote®) or CNK® board (Coated Natural Kraft® -an unbleached kraft paperboard having a clay coating on one side, trade name CarrierKoteTM) manufactured by WestRock® Company. The paperboard substrate may be a bleached or unbleached board. The board may be coated on at least one side, optionally the side opposite the lamination, with a conventional coating selected for compatibility with the printing method and board composition.

The blank 10 may include a tear resistant layer laminated to the paperboard layer. It optionally includes an adhesive layer between the paperboard substrate and the tear resistant layer. The tear resistant layer may be disposed over the uncoated side of the paperboard substrate and may be formed of polymeric material and secured to the substrate. The tear resistant layer imparts toughness to the laminate structure. Suitable tear resistant materials may include, but not be limited to, tear resistant laminated sheet material, e.g., NATRALOCK®, which may include a layer of an n-axially oriented film, e.g. MYLAR®, which is a bi-axially oriented polyester, oriented nylon, cross-laminated polyolefin or high density polyolefin. The orientation and cross-laminated structure of these materials contribute to the tear resistant characteristic. Also, tear resistance may be attributed to the chemical nature of the tear resistant material such as extruded metallocene-catalyzed polyethylene (mPE).

Alternatively, the tear resistant layer may be a layer of linear low-density polyethylene (LLDPE). In embodiments where linear low-density polyethylene (LLDPE) or mPE is used, it is not necessary to incorporate an adhesive layer. Other suitable materials having a high level of tear resistance may also be used.

The adhesive layer may be formed of polyolefin material such as a low-density polyethylene (LDPE). The adhesive layer may be placed between the substrate and the tear resistant layer to secure the tear resistant layer to the substrate.

The present disclosure provides a carrier 90 of the top engaging type having article retention structures or article top engaging devices 70A, 70B, 72A, 72B for engaging articles B.

The carrier 90 comprises a main panel 14 having one or more article top engaging devices 70A, 70B, 72A, 72B for receiving and securing the main panel 14 to a respective article B. The carrier 90 may comprise a pair of opposing side panels 18, 20 hingedly connected to the main panel 14. Each of the pair of opposing side panels 18, 20 may be hingedly connected to the main panel 14 by a shoulder panel 14E, 14F.

The carrier 90 may comprise an end strap 26A/22A/12/22B/26B, 30A/24A/16/24B/30B hingedly connected between the pair of opposing side panels 18, 20 and free of direct connection to the main panel 14. A cutaway, in the form of a cutline, severable line, recess, slot or aperture, separates the end strap 26A/22A/12/22B/26B, 30A/24A/16/24B/30B from the main panel 14.

The carrier 90 comprises a keel structure, the keel structure may comprise at least two panels 14C, 14D. The keel structure may be formed from a pair of hinged panels, the pair of hinged panels 14C, 14D may be medially located in the main panel 14 and may extend longitudinally of the main panel 14.

The keel structure may comprise at least one keel tab 40 struck from, defined in, or extending from at least one of the pair of panels 14C, 14D of the keel structure. The keel structure may comprise a plurality of keel tabs 40.

The at least one keel tab 40 may be struck from each or both of the panels forming the keel structure. The at least one keel tab 40 may comprise a fold line defining at least in part an upper and lower portion of the keel tab 40. The fold line may be offset with respect to a hinged connection or fold line between the pair of panels 14C, 14D of the keel structure.

The at least two keel panels 14C, 14D may be provided by portion of the main panel 14 and may be disposed between a pair of cover or top panels 14A, 14B. The pair of cover or top panels 14A, 14B may be arranged to be disposed over upper ends of two or more articles B. Each cover or top panel 14A, 14B is arranged to be disposed over an upper end of at least one article B.

In other embodiments, the main panel may comprise a plurality of article retention devices arranged in rows, the article retention devices may comprise an opening with a plurality of hinged tabs disposed thereabout. Each article retention devices receives an article, the tabs folding out of the main panel and being disposed below a flange, rim or other protrusion or undercut provided by the article.

The at least one keel tab 40 may be struck in part from, or partially defined in, one of the pair of cover or top panels 14A, 14B.

A fugitive glue may be employed to secure the side panels 18, 20 and/or end panels 12, 16 to the articles B. An example of a specific glue is Swift®melt 7044 manufactured by HB Fuller. Use of a fugitive glue is optional, an advantage of a fugitive glue is its tendency to remain attached to the carrier 90 when the articles B are disengaged from the carrier 90 (this may be more desirable

than having the glue remain attached to the articles B). In alternative embodiments other adhesives maybe employed such as, but not limited to, hot-melt glue.

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. The inner and/or outer shoulder panels may be omitted entirely or may be included in any desired combination. The present invention is not limited to cartons of the top-engaging type, the invention may be employed with other carton styles such as, but not limited to, open top crates, lidded or closed top crates and fully enclosed cartons.

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.

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.

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.

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, embossed lines, debossed lines, 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 and/or a severance line. 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.

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.

CLAIMS

1. An article carrier for packaging at least two articles, the carrier comprising a main panel having at least one top-engaging article device for receiving and securing the main panel to a respective article, the carrier further comprising a keel structure, the keel structure comprising at least two keel panels arranged to be disposed between a first one of the at least two articles and a second one of the at least two articles, wherein the keel structure comprises at least one keel tab struck from at least one of at least two keel panels, the at least one keel tab arranged to be disposed between the first one of the at least two articles and the second one of the at least two articles.

2. An article carrier according to claim 1, wherein the keel structure is formed from a pair of hinged panels, the pair of hinged panels being medially located in the main panel.

3. An article carrier according to claim 1, wherein the carrier comprises a pair of opposing side panels hingedly connected to the main panel.

4. An article carrier according to claim 3, wherein the carrier comprises an end strap hingedly connected between the pair of opposing side panels and being free of direct connection to the main panel.

5. An article carrier according to claim 1, wherein the keel structure comprises a plurality of keel tabs.

6. An article carrier according to claim 1, wherein the at least one keel tab is struck from both of the at least two keel panels.

7. An article carrier according to claim 1, wherein the at least one keel tab comprises a fold line defining at least in part an upper and lower portion thereof.

8. An article carrier according to claim 7, wherein the fold line is offset with respect to a hinged connection between the pair of panels of the keel structure.

9. An article carrier according to claim 1, wherein the at least two keel panels are provided by portion of the main panel and are disposed between a pair of top panels.

10. An article carrier according to claim 9, wherein the pair of top panels are disposed over upper ends of the at least two articles.

11. An article carrier according to claim 9, wherein each cover panel is arranged to be disposed over an upper end of at least one article.

12. An article carrier according to claim 1, wherein the at least one keel tab is struck in part from one of the pair of top panels.

13. An article carrier according to claim 3, wherein each of the pair of opposing side panels is hingedly connected to the main panel by a shoulder panel.

14. An article carrier according to claim 4, wherein the carrier comprises a cutaway that separates the end strap from the main panel.

15. An article carrier according to claim 14, wherein the cutaway is one of the elements selected from the following group of elements; a cutline, a severable line, a recess, a slot, and an aperture.

16. An article carrier according to claim 1, wherein the at least one top-engaging article device comprises a plurality of top-engaging article devices, and wherein the keel structure is disposed between a first row of the top-engaging article devices and a second row of the top-engaging article devices.

17. A blank for forming an article carrier, the blank comprising a main panel having at least one top-engaging article device for receiving and securing the main panel to a respective one of at least two articles, the blank further comprising at least two keel panels for forming a keel structure, the keel structure arranged to be disposed between a first one of the at least two articles and a second one of the at least two articles, wherein the keel structure comprises at least one keel tab struck from at least one of at least two keel panels, the at least one keel tab arranged to be disposed between the first one of the at least two articles and the second one of the at least two articles.

18. A blank according to claim 17, wherein the at least one top-engaging article device comprises a plurality of top engaging article devices and wherein the at least one keel tab extends away from a first row of the top-engaging article devices.

19. A blank according to claim 18, wherein the at least one keel tab extends toward a second row of the top-engaging article devices.

20. A blank according to claim 19, wherein each of the top-engaging article devices comprises at least one slit and wherein the at least one keel tab interrupts the at least one slit of at least one of the top-engaging article devices.

21. A package comprising an article carrier and a plurality of articles, the carrier comprising a main panel having a plurality of top-engaging article devices for receiving and securing the main panel to a respective article, the plurality of top-engaging article devices arranged in rows and comprising a first row and a second row, the carrier further comprising a keel structure, the keel structure comprising at least two keel panels disposed between the first and second rows of top-engaging article devices, wherein the keel structure comprises at least one keel tab struck from at least one of at least two keel panels, the at least one keel tab being disposed between a pair of adjacently disposed articles, a first one of the pair of adjacently disposed articles being engaged by a top-engaging article device in the first row and a second one of the pair of adjacently disposed articles being engaged by a top-engaging article device in the second row.

22. A package according to claim 21, wherein the at least one keel tab is adhesively secured to said first and second ones of the pair of adjacently disposed articles.

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23. A package according to claim 21, wherein the carrier further comprising a pair of opposing side panels hingedly connected to the main panel, and an end strap hingedly connected between the pair of opposing side panels and being free of direct connection to the main panel.

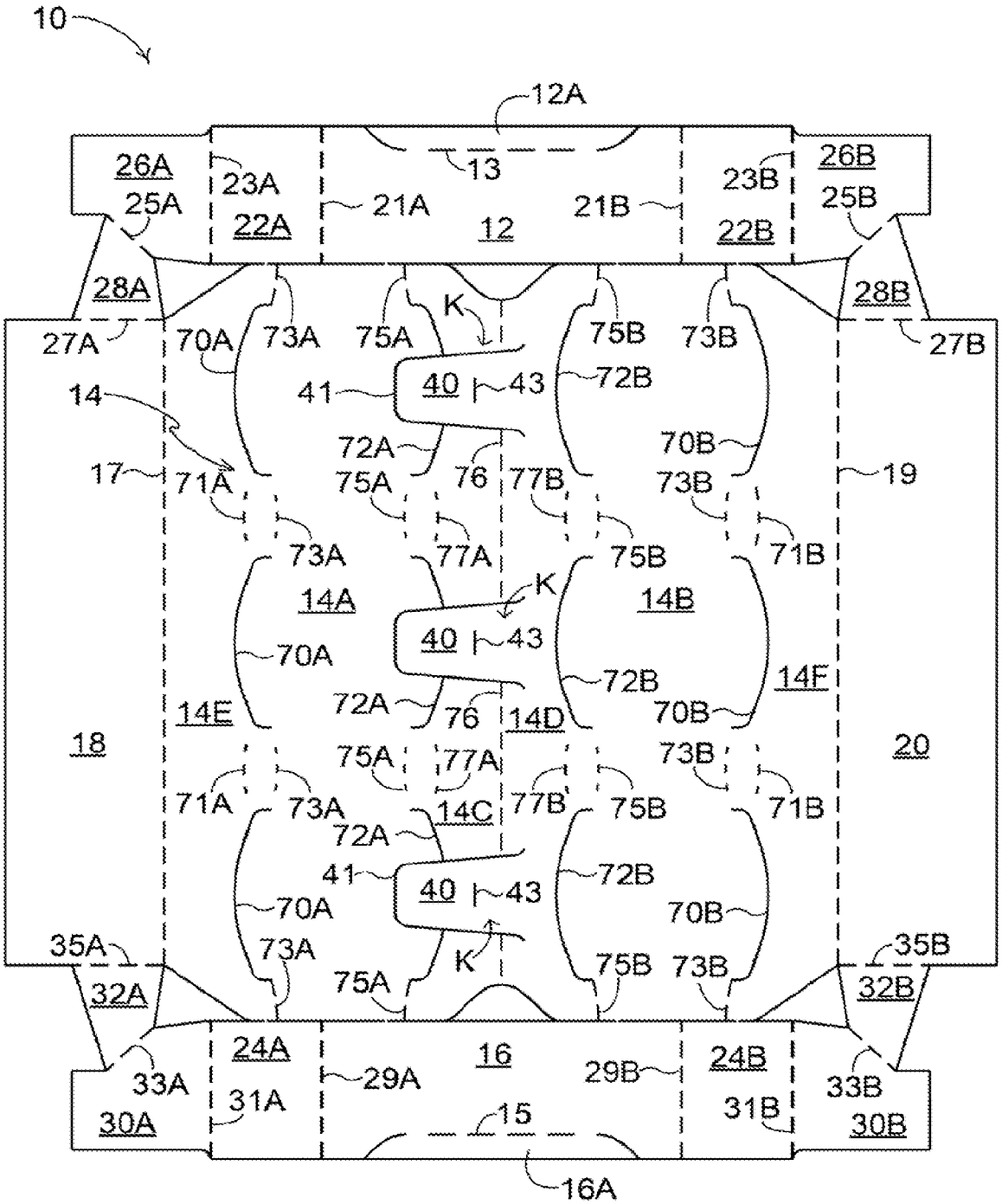

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13
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21B
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73A
75A
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77A
14A
14B
14F
14E
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14D
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14C
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FIG. 1

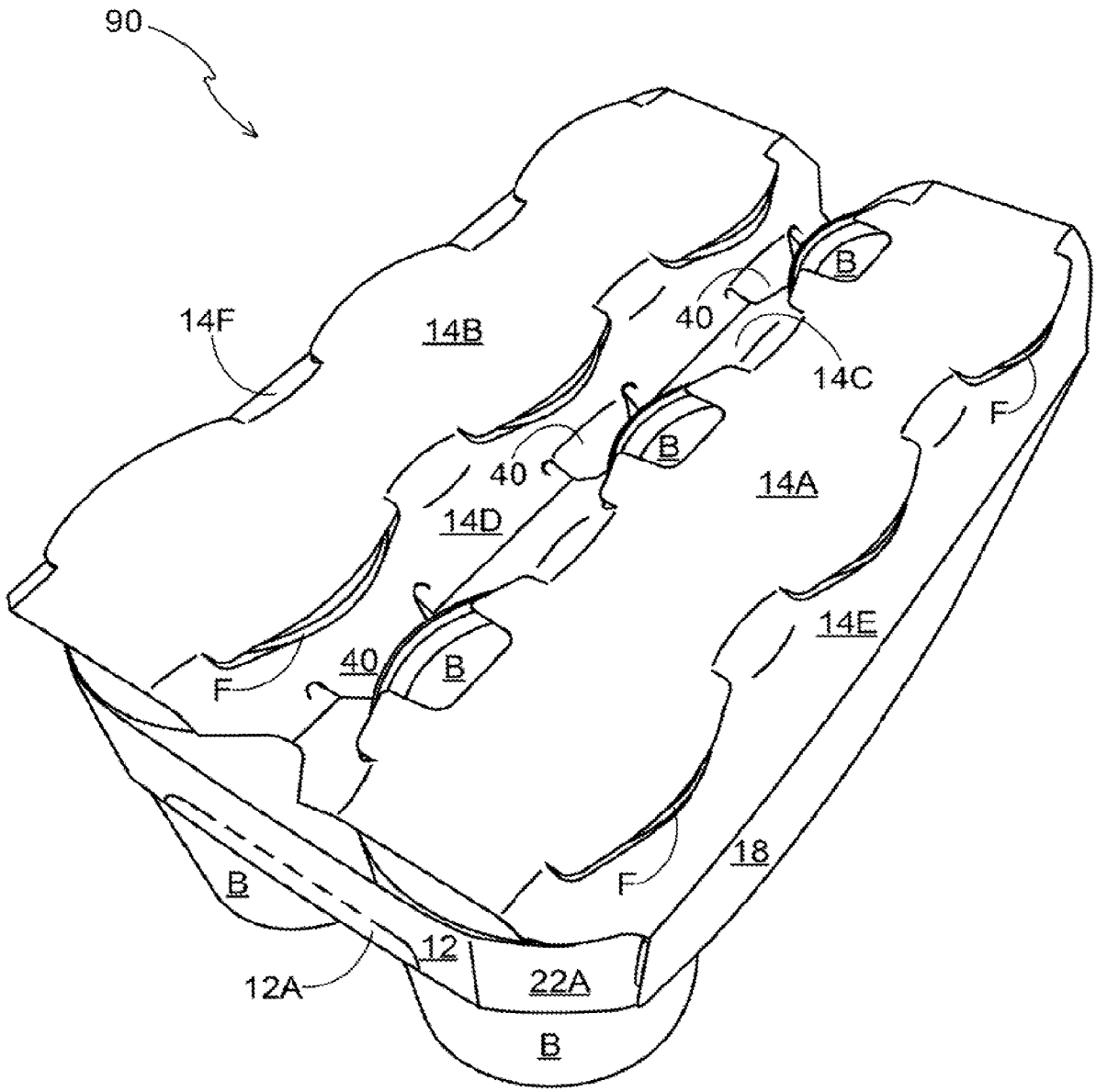



FIG. 2

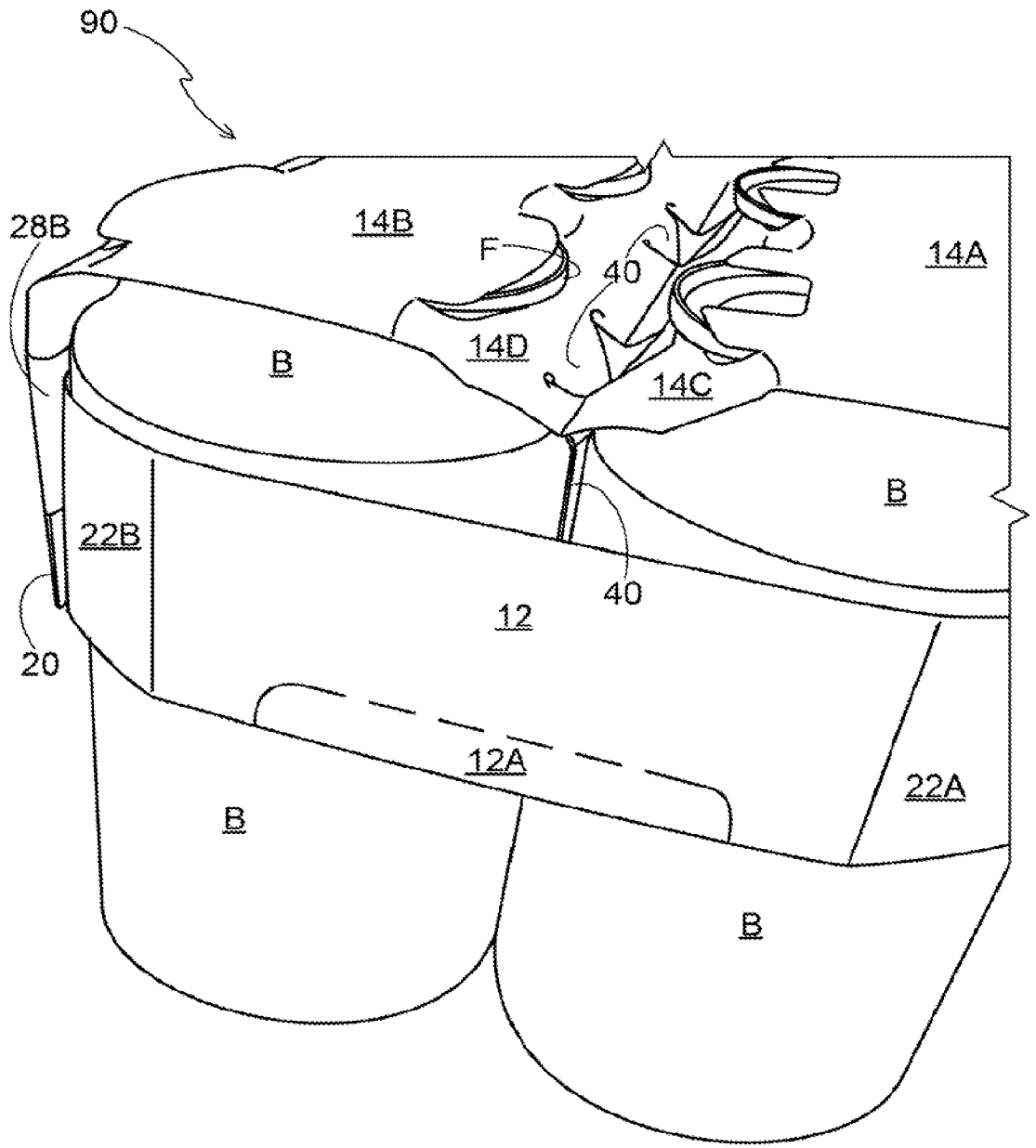



FIG. 3

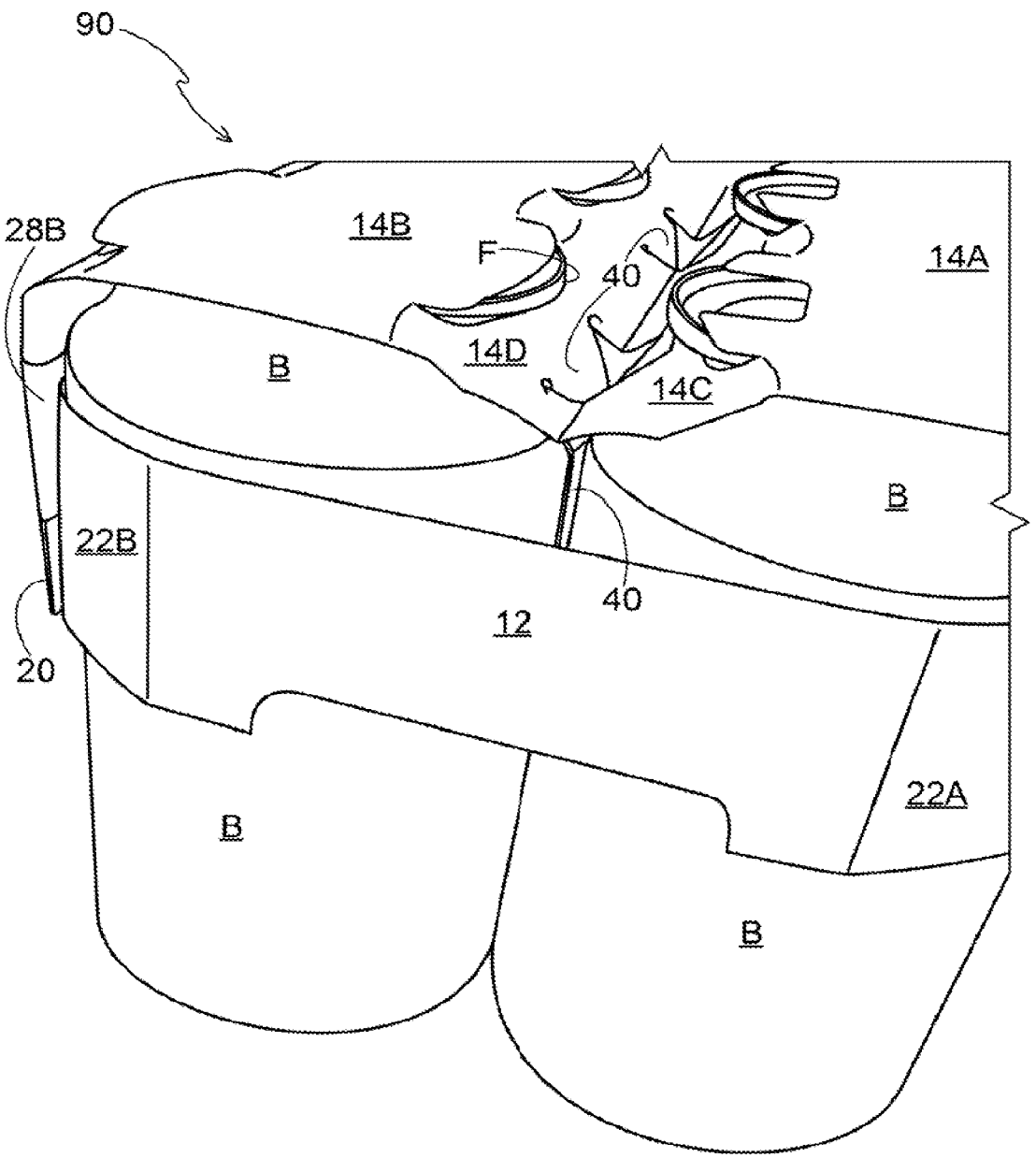



FIG. 4

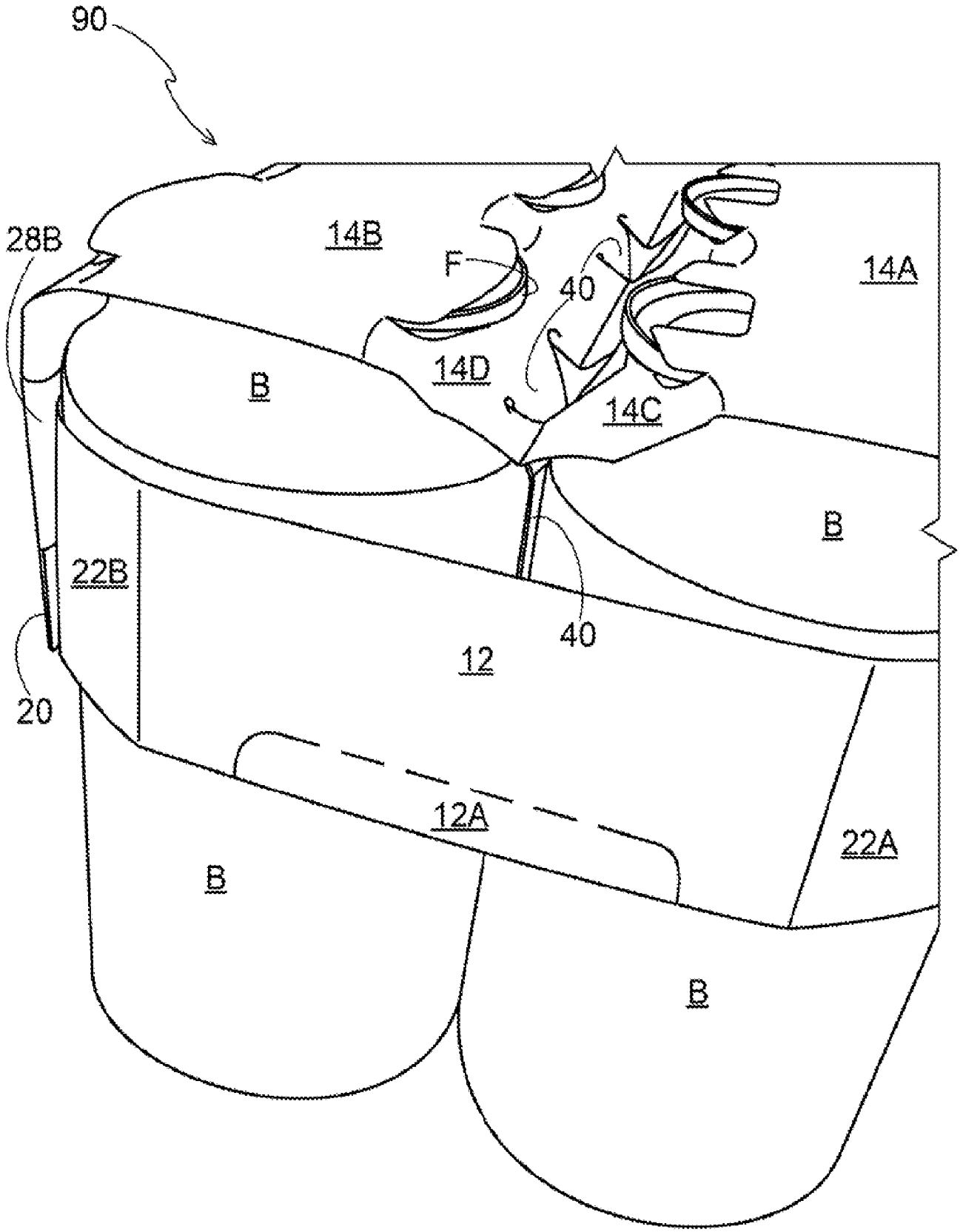



FIG. 3