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

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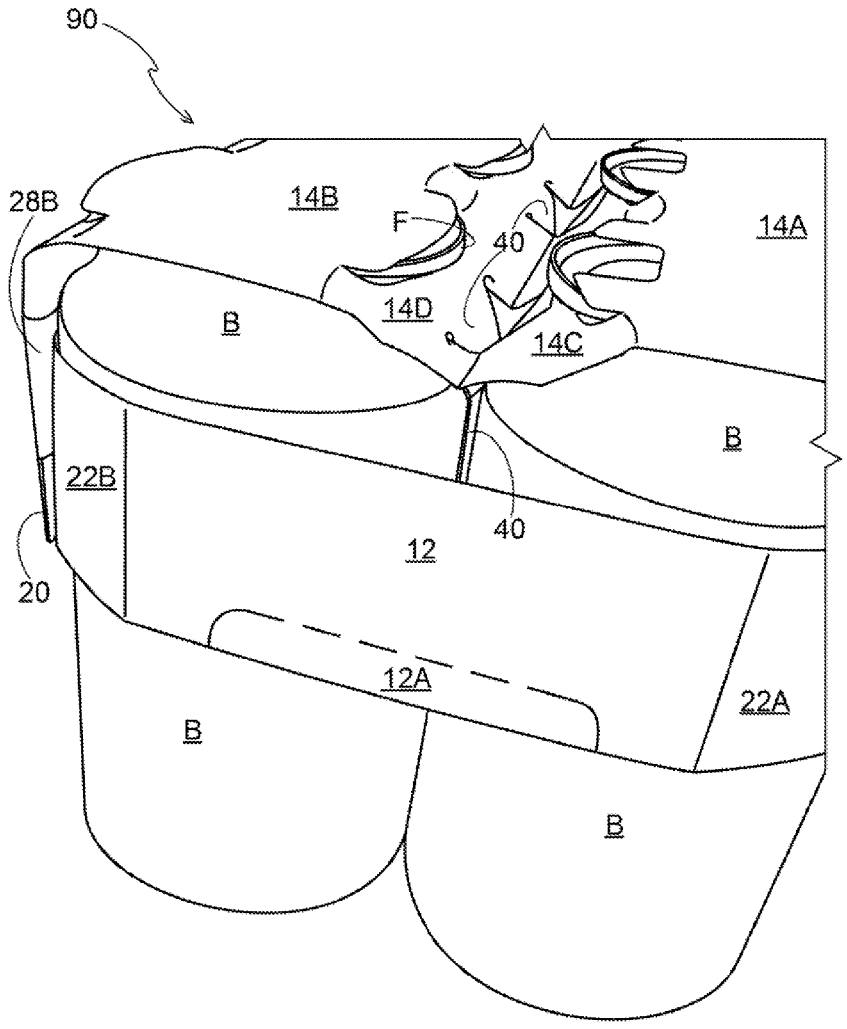
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(57) **ABSTRACT**

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.



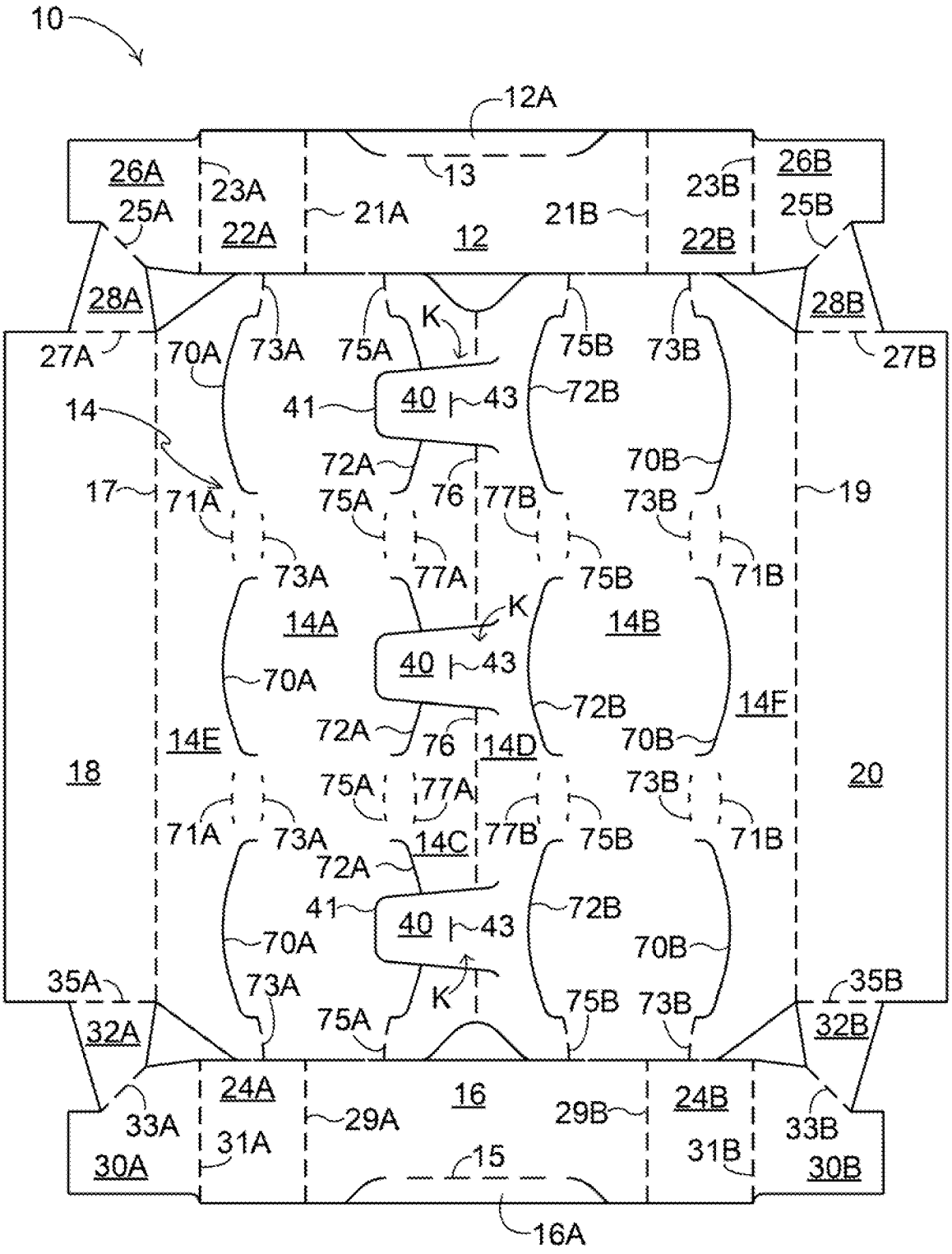

10
12A
13
26A
23A
25A
22A
21A
12
21B
23B
22B
26B
25B
28A
28B
27A
27B
K
70A
73A
75A
75B
73B
14
41
40
43
72B
72A
70B
17
71A
76
77B
19
73A
77A
71B
14A
14B
14E
14F
14D
18
20
14C
35A
35B
32A
32B
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24B
33A
29A
29B
33B
31A
31B
30A
15
30B
16A

FIG. 1

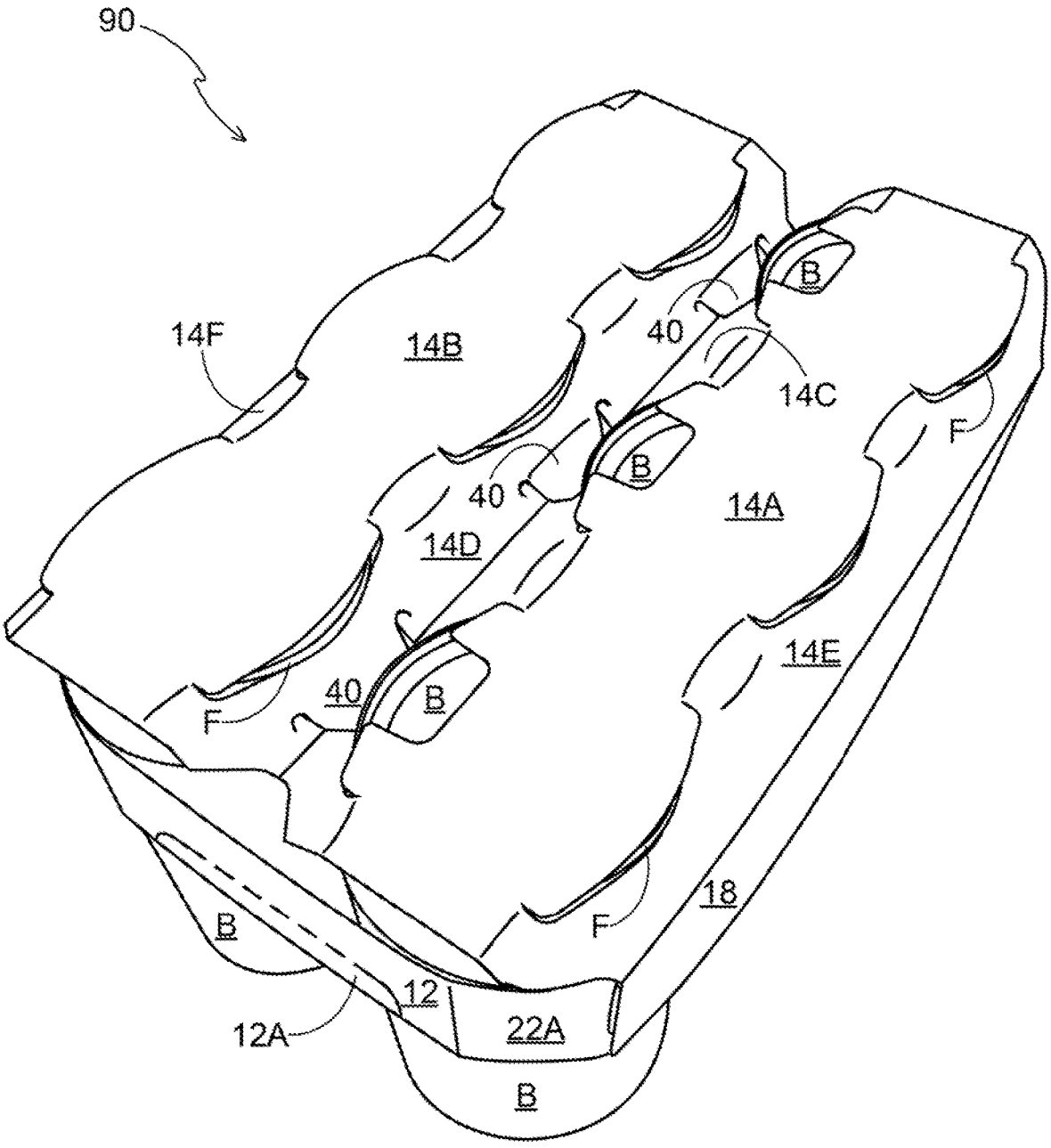


FIG. 2

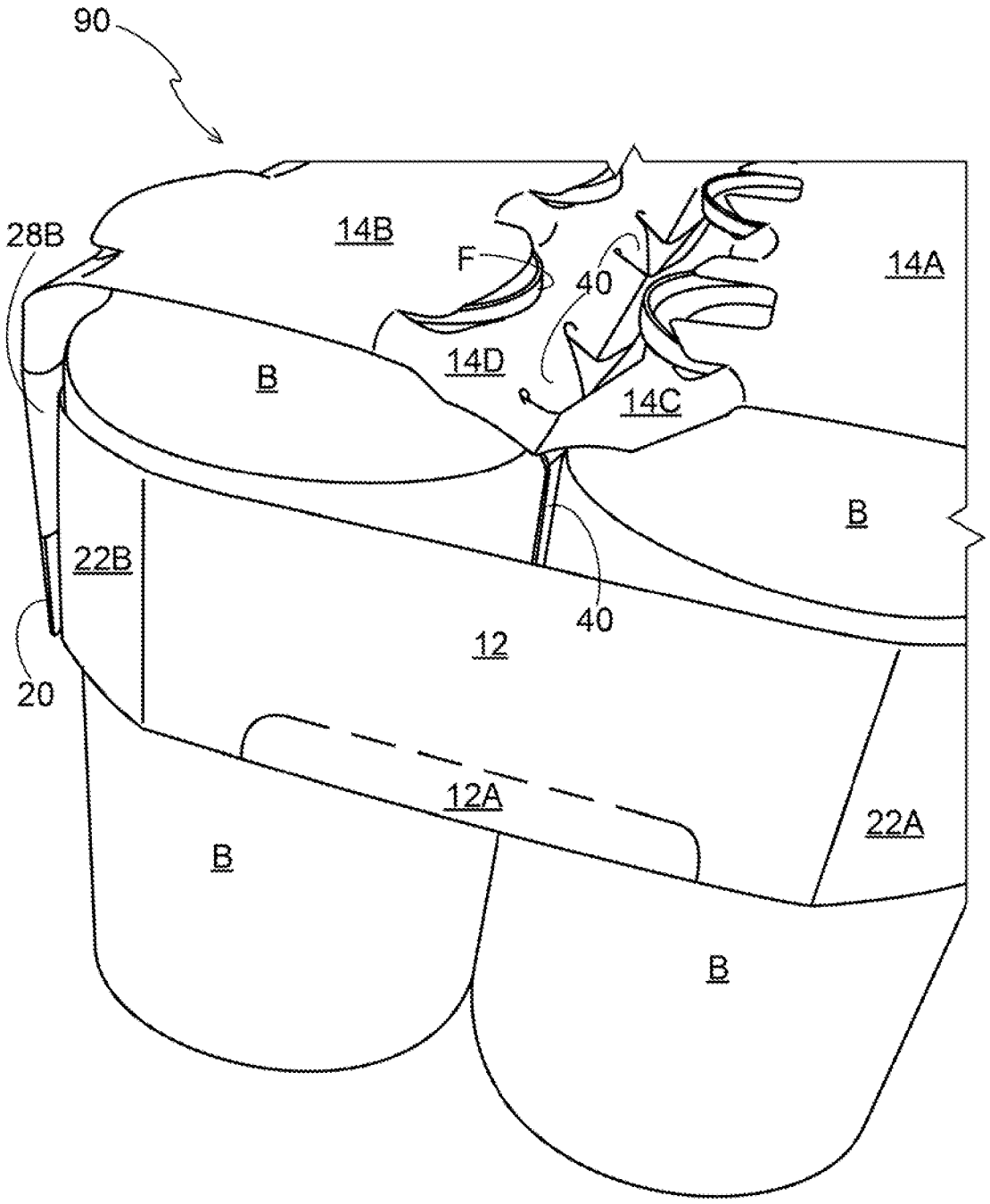


FIG. 3

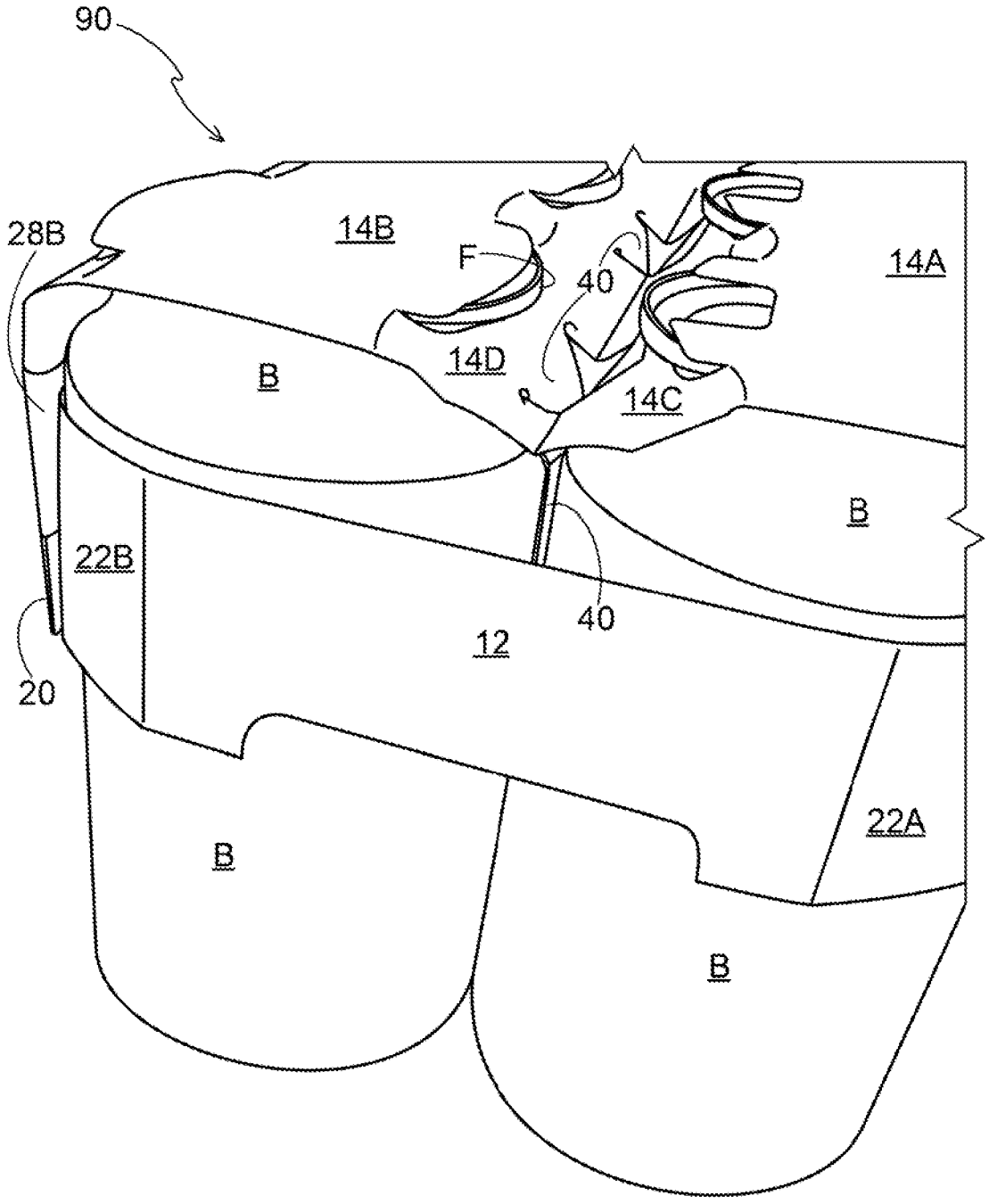


FIG. 4

ARTICLE CARRIER AND BLANK THEREFOR

TECHNICAL FIELD

[0001] 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

[0002] 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.

[0003] 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.

[0004] It is desirable to provide a handle structure for carrying the carton which handle structure has sufficient strength to retain carton integrity in use.

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

SUMMARY

[0006] 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.

[0007] Optionally, the keel structure is formed from a pair of hinged panels, the pair of hinged panels being medially located in the main panel.

[0008] Optionally, the carrier comprises a pair of opposing side panels hingedly connected to the main panel.

[0009] 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.

[0010] Optionally, the keel structure comprises a plurality of keel tabs.

[0011] Optionally, the at least one keel tab is struck from both of the at least two keel panels.

[0012] Optionally, the at least one keel tab comprises a fold line defining at least in part an upper and lower portion thereof.

[0013] Optionally, the fold line is offset with respect to a hinged connection between the pair of panels of the keel structure.

[0014] Optionally, the at least two keel panels are provided by portion of the main panel and are disposed between a pair of top panels.

[0015] Optionally, the pair of top panels are disposed over upper ends of the at least two articles.

[0016] 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.

[0017] Optionally, each of the pair of opposing side panels is hingedly connected to the main panel by a shoulder panel.

[0018] Optionally, the carrier comprises a cutaway that separates the end strap from the main panel.

[0019] 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.

[0020] 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.

[0021] 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.

[0022] 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.

[0023] 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.

[0024] Optionally, the at least one keel tab extends toward a second row of the top-engaging article devices.

[0025] 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.

[0026] 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.

[0027] Optionally, the at least one keel tab is adhesively secured to said first and second ones of the pair of adjacently disposed articles.

[0028] 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.

[0029] 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.

[0030] 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.

[0031] 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

[0032] Exemplary embodiments of the invention will now be described with reference to the accompanying drawings, in which:

[0033] FIG. **1** is a plan view from above of a blank for forming a carrier according to a first embodiment;

[0034] FIG. **2** is a perspective view from above of a carrier formed from the blank of FIG. **1**;

[0035] FIG. **3** is an alternative perspective view from above of a portion of the carrier of FIG. **2**; and

[0036] FIG. **4** is an alternative perspective view from above of a portion of the carrier of FIG. **2** showing a handle feature in a deployed condition.

DETAILED DESCRIPTION OF EMBODIMENTS

[0037] 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.

[0038] Referring to FIG. **1**, there is shown a plan view of a blank **10** which is capable of forming a carton or carrier **90**, as shown in FIG. **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 FIG. **2**. The blank **10** forms a secondary package for packaging at least one primary product container or package.

[0039] 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.

[0040] 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.

[0041] 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.

[0042] 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 2×3 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.

[0043] Referring to FIG. **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 FIG. **2**).

[0044] 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 **14**E 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 is hingedly connected to a second outer shoulder panel **14**F forming part of the main panel **14**.

[0045] The first outer shoulder panel **14**E is hinged to a first top panel **14**A by a hinged connection in the form of a fold line **73**A. The second outer shoulder panel **14**F is hinged to a second top panel **14**B by a hinged connection in the form of a fold line **73**B. The main panel **14** further comprises a first inner shoulder panel **14**C and a second inner shoulder panel **14**D. The first inner shoulder panel **14**C is hinged to a first top panel **14**A by a hinged connection in the form of a fold line **75**A. The first inner shoulder panel **14**C is hinged to the second inner shoulder panel **14**D by a hinged connection in the form of a fold line **76**. The second inner shoulder panel **14**D is hinged to the second top panel **14**B by a hinged connection in the form of a fold line **75**B.

[0046] The first inner shoulder panel **14**C and the second inner shoulder panel **14**D form a keel structure **14**C/**14**D disposed between two rows of articles B, see FIG. **2**.

[0047] Each of the first and second top panels **14**A, **14**B includes opposed pairs of article-engaging devices **70**A, **72**A (and **70**B, **72**B) formed therein and generally along respective fold lines **73**A, **75**A (and **73**B, **75**B). Fold lines **73**A, **75**A hingedly interconnect the respective series of article-engaging devices **70**A, **72**A. Fold lines **73**B, **75**B hingedly interconnect the respective series of article-engaging devices **70**B, **72**B. In the illustrated embodiment, each of the article-engaging devices **70**A, **72**A, **70**B, **72**B takes the form of a curved slit. The article engaging devices **72**A disposed between the first top panel **14**A and the first inner shoulder panel **14**C 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 **73**A, **75**A, **73**B, **75**B, between the first and second top panels **14**A, **14**B and the inner and outer shoulder panels **14**C, **14**D, **14**E, **14**F. 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 **70**A, **72**A, **70**B, **72**B 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 **70**A, **72**A, **70**B, **72**B take the form of C-shaped slits which form openings when the top panels **14**A, **14**B are folded about the fold lines **73**A, **75**A, **73**B, **75**B, 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 **70**A, **72**A, **70**B, **72**B provides a pair of openings for receiving a portion of an article B.

[0048] In the illustrated embodiment, the fold lines **73**A, **75**A (and **73**B, **75**B) that hingedly interconnect the series of article-engaging devices **70**A, **72**A (and **70**B, **72**B) 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 **14**A, **14**B.

[0049] First and second outer shoulder panels **14**E, **14**F each include one or more second or stress-reducing fold lines **71**A, **71**B that extend alongside at least part of respective fold lines **73**A, **73**B. In the illustrated embodiment, stress-reducing fold lines **71**A, **71**B 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 **14**A, **14**B. The stress-reducing fold lines **71**A, **71**B can be disposed between two adjacent ones of cut lines **70**A, **70**B.

[0050] In the illustrated embodiment, first and second inner shoulder panels **14**C, **14**D also include one or more second or stress-reducing fold lines **77**A, **77**B that extend alongside at least part of respective fold lines **75**A, **75**B. Stress-reducing fold lines **77**A, **77**B may generally mirror the stress-reducing fold lines **71**A, **71**B disposed on the first and second outer shoulder panels **14**E, **14**F. Stress-reducing fold lines **77**A, **77**B may facilitate the contouring of inner shoulder panels **14**C, **14**D to corresponding portions of the necks of adjacent articles.

[0051] The blank **10** comprises a first end strap **26**A/**22**A/**12**/**22**B/**26**B and a second end strap **30**A/**24**A/-**16**/**24**B/**30**B.

[0052] The first end strap **26**A/**22**A/**12**/**22**B/**26**B. The first end strap **26**A/**22**A/**12**/**22**B/**26**B comprises a first end panel **12**. A first corner panel **22**A is hingedly connected to a first end of the first end panel **12** by a hinged connection in the form of a fold line **21**A. Fold line **21**A 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 **26**A is hingedly connected to an end of the first corner panel **22**A by a hinged connection in the form of a fold line **23**A. Fold line **23**A 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 **28**A is hingedly interconnected between the first securing panel **26**A and a first end of the first side panel **18** by fold lines **25**A, **27**A. Fold line **27**A 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.

[0053] A second corner panel **22**B is hingedly connected to a second end of the first end panel **12** by a hinged connection in the form of a fold line **21**B. Fold line **21**B 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 **26**B is hingedly connected to an end of the second corner panel **22**B by a hinged connection in the form of a fold line **23**B. Fold line **23**B 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 **28**B is hingedly interconnected between the second securing panel **26**B and a first end of the second side panel by fold lines **25**B, **27**B. Fold line **27**B 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.

[0054] The first end strap **26**A/**22**A/**12**/**22**B/**26**B 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**.

[0055] The first corner panel **22**A is separated from the main panel **14**. The blank **10** may comprise an aperture separating, at least in part, the first corner panel **22**A from the main panel **14**. The first corner panel **22**A may be separated, at least in part, from the main panel **14** by a cut line or frangible line.

[0056] The second corner panel **22**B is separated from the main panel **14**. The blank **10** comprises an aperture separating, at least in part, the second corner panel **22**B from the main panel **14**. The second corner panel **22**B may be separated, at least in part, from the main panel **14** by a cut line or frangible line.

[0057] The first end strap **26**A/**22**A/**12**/**22**B/**26**B forms a first end wall of the carrier **90**.

[0058] The blank comprises a second end strap **30**A/**24**A/**16**/**24**B/**30**B. The second end strap **30**A/**24**A/-**16**/**24**B/**30**B comprises a second end panel **16**. A third corner panel **24**A is hingedly connected to a first end of the second end panel **16** by a hinged connection in the form of a fold line **29**A. Fold line **29**A 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 **30**A is hingedly connected to an end of the third corner panel **24**A by a hinged connection in the form of a fold line **31**A. Fold line **31**A 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 **32**A is hingedly interconnected between the third securing panel **30**A and a second end of the first side panel **18** by fold lines **33**A, **35**A. Fold line **35**A 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.

[0059] A fourth corner panel **24**B is hingedly connected to a second end of the second end panel **16** by a hinged connection in the form of a fold line **29**B. Fold line **29**B 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 **30**B is hingedly connected to an end of the fourth corner panel **24**B by a hinged connection in the form of a fold line **31**B. Fold line **31**B 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 **32**B is hingedly interconnected between the fourth securing panel **30**B and a second end of the second side panel **20** by fold lines **33**B, **35**B. Fold line **35**B 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.

[0060] The second end strap **30**A/**24**A/**16**/**24**B/**30**B 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**.

[0061] The third corner panel **24**A is separated from the main panel **14**. The blank **10** comprises an aperture separating, at least in part, the third corner panel **24**A from the main panel **14**. The third corner panel **24**A may be separated, at least in part, from the main panel **14** by a cut line or frangible line.

[0062] The fourth corner panel **24**B is separated from the main panel **14**. The blank **10** comprises an aperture separating, at least in part, the fourth corner panel **24**B from the main panel **12**. The fourth corner panel **24**B may be separated, at least in part, from the main panel **14** by a cut line or frangible line.

[0063] The second end strap **30**A/**24**A/**16**/**24**B/**30**B forms a second end wall of the carrier **90**.

[0064] The blank **10** may comprise at least one handle feature. The blank **10** comprises a first handle flap **12**A struck from the first end panel **12**. The first handle flap **12**A 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 **12**A is struck from, or defined in, the first end panel **12** and is hingedly connected thereto by a fold line **13**.

[0065] The blank **10** may comprise a second handle flap **16**A struck from the second end panel **16**. The second end panel **16**A 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 **16**A is struck from, or defined in, the second end panel **16** and is hingedly connected thereto by a fold line **15**.

[0066] 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.

[0067] 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 **14**D, a portion of each keel tab **40** is struck from, or defined in, the first inner shoulder panel **14**C. A further portion of the keel tabs **40** may be provided by material which would otherwise form the first top panel **14**A, that is to say an optional portion of the keel tab **40** may be struck from, or defined in the first top panel **14**A and may interrupt the adjacent one of the curved slits **72**A.

[0068] Each keel tab **40** is defined, at least in part, by a cut line **41**. Outline **41** is substantially 'U' or "C" shaped. The cut line **41** comprises a pair or terminal ends disposed in the second inner shoulder panel **14**D. The cut line **41** extends into the first inner shoulder panel **14**C. The cut line **41** may extends into the first top panel **14**A. The cut line **41** and/or tab may be considered to interrupt the slit forming the article engaging devices **72**A disposed between the first top panel **14**A and the first inner shoulder panel **14**C

[0069] The keel tabs **40** may be arranged to be integral with the second inner shoulder panel **14**D. In other embodiments, the keel tabs **40** may be hingedly connected to the second inner shoulder panel **14**D by hinged connection in the form of a fold line.

[0070] In the illustrated embodiment, the cut line **41** is defined in part in the second inner shoulder panel **14**D. In other embodiments the cut line **41** may terminate at or proximate the fold line **76** between the first and second inner shoulder panels **14**C, **14**D; in such embodiments the keel tabs **40** may be considered to extend from the second inner shoulder panel **14**D.

[0071] 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.

[0072] In the illustrated embodiment, the keel tab **40** interrupts an engaging or support edge of the first inner shoulder panel **14**C; the portion of the first inner shoulder panel **14**C 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 **72**A. It has been found that portions of the first inner shoulder panel **14**C 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 **72**A or carrier **90**.

[0073] FIG. **2** illustrates a carrier **90**, formed from the blank **10**, engaged with a group of articles B. Each of the article-engaging devices **70**A, **72**A, **70**B, **72**B 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 **26**A/**22**A/**12**/**22**B/**26**B, **30**A/**24**A/**16**/**24**B/**30**B are folded about ends of the group of articles B.

[0074] 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 FIGS. **3** and **4**. The keel tabs inhibit the pair of articles B from contacting each other directly—at least at an upper end.

[0075] 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.

[0076] 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.

[0077] The keel tab **40** may also improve security of the keel structure formed by the inner shoulder panels **14**C, **14**D.

[0078] FIG. **4** shows the carrier **90** with the first handle flap **12**A forming a cushioning flap. The first handle flap **12**A is in a deployed or use condition, the cushioning flap **12**A 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.

[0079] 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 10 pt., preferably from about 16 pt. to about 28 pt. (0.028"/~0.7 mm). 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 CarrierKote™) 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.

[0080] 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 (m PE).

[0081] 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.

[0082] 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.

[0083] The present disclosure provides a carrier **90** of the top engaging type having article retention structures or article top engaging devices **70**A, **70**B, **72**A, **72**B for engaging articles B.

[0084] The carrier **90** comprises a main panel **14** having one or more article top engaging devices **70**A, **70**B, **72**A, **72**B 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 **14**E, **14**F.

[0085] The carrier **90** may comprise an end strap **26**A/**22**A/**12**/**22**B/**26**B, **30**A/**24**A/**16**/**24**B/**30**B 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 **26**A/**22**A/**12**/**22**B/**26**B, **30**A/**24**A/**16**/**24**B/**30**B from the main panel **14**.

[0086] The carrier **90** comprises a keel structure, the keel structure may comprise at least two panels **14**C, **14**D. The keel structure may be formed from a pair of hinged panels, the pair of hinged panels **14**C, **14**D may be medially located in the main panel **14** and may extend longitudinally of the main panel **14**.

[0087] 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 **14**C, **14**D of the keel structure. The keel structure may comprise a plurality of keel tabs **40**.

[0088] 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 **14**C, **14**D of the keel structure.

[0089] The at least two keel panels **14**C, **14**D may be provided by portion of the main panel **14** and may be disposed between a pair of cover or top panels **14**A, **14**B. The pair of cover or top panels **14**A, **14**B may be arranged to be disposed over upper ends of two or more articles B. Each cover or top panel **14**A, **14**B is arranged to be disposed over an upper end of at least one article B.

[0090] 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.

[0091] 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 **14**A, **14**B.

[0092] 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.

[0093] 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.

[0094] 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.

[0095] 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.

[0096] 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.

[0097] 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.

[0098] 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. 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. (canceled)

11. (canceled)

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. (canceled)

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.

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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