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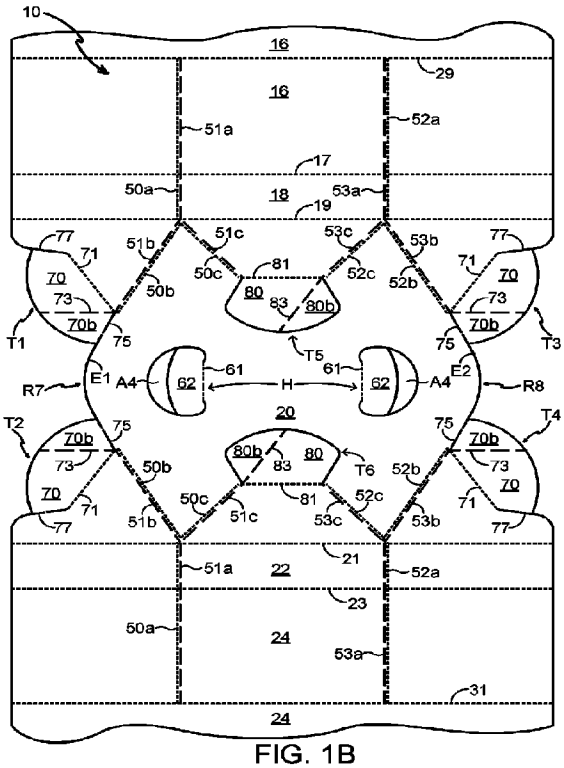


FIG. 1B

(57) Abrégé/Abstract:
Aspects of the disclosure relate to a package, an article carrier for packaging a plurality of articles and to a blank for forming the article carrier. The article carrier comprises a plurality of panels forming a tubular structure for surrounding at least two articles each having a recess. The article carrier comprises a pair of article retention devices each comprising a flap (80) for engaging the recess of a respective one of said at least two articles to inhibit movement thereof. The flaps are hingedly connected by a respective hinged connection to one of the plurality of panels in opposition to each other. The article carrier comprises a pair of handle openings (A4) defined in said one of the plurality of panels. The handle openings and the flaps define a handle in said one of the plurality of panels.

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Abstract:

Aspects of the disclosure relate to a package, an article carrier for packaging a plurality of articles and to a blank for forming the article carrier. The article carrier comprises a plurality of panels forming a tubular structure for surrounding at least two articles each having a recess. The article carrier comprises a pair of article retention devices each comprising a flap (80) for engaging the recess of a respective one of said at least two articles to inhibit movement thereof. The flaps are hingedly connected by a respective hinged connection to one of the plurality of panels in opposition to each other. The article carrier comprises a pair of handle openings (A4) defined in said one of the plurality of panels. The handle openings and the flaps define a handle in said one of the plurality of panels.

ARTICLE CARRIER AND BLANK THERFOR

TECHNICAL FIELD

The present invention relates to article carriers and to blanks for forming the same. More specifically, but not exclusively, the invention relates to a wraparound carrier having a carrying handle. Aspects of the invention relate to an article retention structure including an engagement device for securing an upper end of an article. Additionally or alternatively the invention relates to a wraparound carrier having a dispenser feature for gaining access to the contents of the carrier.

BACKGROUND

In the field of packaging it is known to provide cartons or article carriers 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 carton comprises a carrying handle sufficiently strong enough to bear the load of the carton and its contents.

It is desirable that the articles held within a carton are securely held and protected during transportation. It is also desirable that the articles within a carton can be readily accessed.

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 two articles each having a recess. The article carrier comprises a plurality of panels forming a tubular structure for surrounding the at least two articles and a pair of article retention devices each comprising a flap for engaging a recess of a respective one of said at least two articles to inhibit movement of the articles within the tubular structure. The flaps are hingedly connected by a respective hinged connection to one of the plurality of panels in opposition to each other. The article carrier comprises a pair of handle openings defined in said one of the plurality of panels. The handle openings and the flaps define a handle in said one of the plurality of panels. The handle is coupled or connected to said one of the plurality of panels by four arms. Each arm is

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provided by a region of said one of the plurality of panels disposed or defined between one of the handle openings and one of the flaps.

Optionally, the tubular structure is at least partially open at each end and a tubular axis is defined between said ends and wherein the hinged connection between the flaps and the one of the plurality of panels is parallel to the tubular axis.

Optionally, the tubular structure is at least partially open at each end and a tubular axis is defined between said ends and wherein the hinged connection between the flaps and the one of the plurality of panels is oblique to the tubular axis.

Optionally, said one of the plurality of panels is a top panel.

Optionally, the flaps are hingedly connected to said one of the plurality of panels by a hinged connection in the form of a first fold line.

Optionally, the plurality of panels include a pair of opposed side walls and the flaps fold towards a respective one of the opposed side walls.

A second aspect of the invention provides an article carrier for packaging one or more articles each having a recess, the article carrier comprising a plurality of panels forming a tubular structure for surrounding the one or more articles and an article retention device for engaging a recess of one of the one or more articles to inhibit movement of said article within the tubular structure, wherein the article retention device comprises a flap hingedly connected to one of the plurality of panels, the article carrier further comprises a dispenser feature having an access panel, and wherein the flap is hingedly connected to the access panel so as to provide a tear initiation device for the dispenser.

Optionally, the access panel is defined at an end of the article carrier, the access panel is defined in part by a free end edge of the article carrier and in part by a severable line extending from the flap.

Optionally, the access panel is defined in an intermediate portion of the article carrier, the access panel is defined at least in part by a pair of severable lines extending from the flap, the pair of severable lines are spaced apart from each end of the article carrier.

A third aspect of the invention provides an article carrier for packaging one or more articles each having a recess, the article carrier comprising a plurality of panels forming a tubular structure for surrounding the one or more articles and an article retention device for engaging a recess of one of the one or more articles to inhibit movement of said article within the tubular structure, the article retention device comprising a flap hingedly connected by a hinged connection to one of the plurality of panels, the flap comprising a hinged edge defined by the hinged connection and a free edge, wherein the free edge extends from a first end of the hinged connection to a second end of the hinged connection, and wherein the free edge is arcuate or curved across or along its entire extent.

Optionally, the hinged edge of the flap is disposed closer to one of a pair of opposed side walls than the free edge in an unfolded condition.

Optionally, the flap, in an operative condition, is reverse folded into face to face relationship with an inner surface of the panel to which it is hinged, when the flap is in the operative position the free edge of the flap is disposed closer to one of a pair of opposed side walls than the hinged edge.

Optionally, the hinged connection is oriented non-parallel to an open end of the tubular structure.

Optionally, the hinged connection is obliquely oriented to an open end of the tubular structure.

Optionally, the hinged connection is perpendicularly oriented with respect to an open end of the tubular structure.

Optionally, the article retention device is located in a recess defined in an end of said one of the plurality of panels.

Optionally, the top panel comprises at least one recessed end edge to which article retention device is hingedly connected.

Optionally, the flap partially defines the at least one recessed end edge of the top panel in an unfolded condition.

Optionally, the article carrier comprises a pair of article retention devices at an end of said one of the plurality of panels, and wherein the pair of article retention devices are spaced apart from each other by a recess struck from or defined in an end edge of the top panel.

Optionally, the pair of article retention devices are hingedly connected to the top panel by a respective fold line, said fold lines being divergently arranged with respect to each other.

Optionally, the flap is folded inwardly about a hinged connection to said one of the plurality of panels more than 90 degrees so as to be substantially in face to face relationship with the panel to which it is hinged.

Optionally, the article retention device comprises a fold line defined in the flap and forming a keel for increasing the security of the article within the article carrier.

Optionally, the fold line defines in part a wing tab, the wing tab coupled to the said one of the plurality of panels only through its hinged connection to the flap.

Optionally, the fold line is arranged to converge at an end of the hinged connection to form a vertex, and wherein a cutaway separates the wing tab from the said one of the plurality of panels, the cutaway intersects with the vertex between the hinged connection and fold line.

Optionally, the article carrier is of the wrap-around type, comprising a composite wall formed from two panels secured together.

Optionally, the composite wall is a bottom wall of the tubular structure.

Optionally, the flap of the article retention device is contained entirely within the footprint of said one of the plurality of panels.

Optionally, the flaps of the pair of article retention devices are contained entirely within the footprint of the top panel.

A fourth aspect of the invention provides a blank for forming an article carrier, the blank comprising a plurality of panels for forming a tubular structure for surrounding at least two articles each having a recess, the blank comprising a pair of article retention devices each comprising a flap for engaging a recess of a respective one of said at least two articles to inhibit movement of the articles within the tubular structure, wherein the flaps are hingedly

connected by a respective hinged connection to one of the plurality of panels in opposition to each other, the blank comprising a pair of handle openings defined in said one of the plurality of panels, the handle openings and the flaps define a handle in said one of the plurality of panels, the handle is coupled or connected to said one of the plurality of panels by four arms, each arm is provided by a region of said one of the plurality of panels disposed or defined between one of the handle openings and one of the flaps.

Optionally, the tubular structure, in a setup condition, is at least partially open at each end and a tubular axis is defined between said ends and wherein the hinged connection between the flaps and the one of the plurality of panels is parallel to the tubular axis.

Optionally, the tubular structure, in a setup condition, is at least partially open at each end and a tubular axis is defined between said ends and wherein the hinged connection between the flaps and the one of the plurality of panels is oblique to the tubular axis.

Optionally, the flaps are hingedly connected to said one of the plurality of panels by a hinged connection in the form of a first fold line.

Optionally, the plurality of panels include a pair of opposed side walls hingedly connected to a top panel along hinged edges thereof and the flaps fold towards a respective one of the hinged edges.

A fifth aspect of the invention provides a blank for forming an article carrier, the blank comprising a plurality of panels forming a tubular structure for surrounding one or more articles having a recess and an article retention device for engaging the recess of one of the one or more articles to inhibit movement of said article within the tubular structure, wherein the article retention device comprises a flap hingedly connected to one of the plurality of panels, the blank further comprises a dispenser feature having an access panel, and wherein the flap is hingedly connected to the access panel so as to provide a tear initiation device for the dispenser.

A sixth aspect of the invention provides a blank for forming an article carrier, the blank comprising a plurality of panels forming a tubular structure for surrounding one or more articles having a recess and an article retention device for engaging the recess of the one of one or more articles to inhibit movement of said article within the tubular structure, the article retention device comprising a flap hingedly connected by a hinged connection to one of the plurality of panels, the flap comprising a hinged edge defined by the hinged connection and a free edge,

wherein the free edge extends from a first end of the hinged connection to a second end of the hinged connection, and wherein the free edge is arcuate or curved across or along its entire extent.

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

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 an article carrier according to embodiments of the disclosure;

Figure 1B is an enlarged view of a portion of the blank of Figure 1;

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

Figure 3 is a perspective view of the article carrier of Figure 2 showing a dispenser in a deployed condition; and

Figure 4 is a plan view from above of a blank for forming an article carrier according to further embodiments of the disclosure.

DETAILED DESCRIPTION OF EMBODIMENTS

Detailed descriptions of specific embodiments of the package, blanks and article 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 article 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 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, beverage cans, hereinafter referred to as articles B, as shown in Figure 2. The blank 10 can be assembled to form a secondary package for packaging at least one primary product container or package.

Referring to Figure 4, there is shown a plan view of another blank 110 capable of forming a carton or carrier (not shown) for containing and carrying a group of primary products such as, but not limited to, beverage cans. The blank 110 can be assembled to form 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 90 for engaging and carrying articles B, such as primary product containers B. It is contemplated that the teachings of the invention can be applied to various product containers B, which may or may not be tapered and/or cylindrical. Other exemplary containers include bottles (for example metallic, glass or plastics bottles), cans (for example aluminium cans), tins, cups, pots, pouches, packets and the like.

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

The packaging structures or carton 90 described herein may be formed from a sheet material such as paperboard. Typically, one surface of the sheet material may have different

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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 no coating or a coating. If coated, the coating layer or treatment may provide properties such as one or more of tear-resistance, good glue-ability, heat sealability, or other desired functional properties.

In the embodiments illustrated in Figures 1 and 4, the blanks 10, 110 are configured to form a carton or carrier 90 for packaging an exemplary arrangement of exemplary articles B. In the illustrated embodiments the arrangement is an m x n matrix or array, having two rows (m=2) and three columns (n=3); in the illustrated embodiments two rows of three articles B are provided, and the articles B are 330ml beverage cans.

Alternatively, the blanks 10, 110 can be configured to form a carrier for packaging other types, number and size of articles B and/or for packaging articles B in a different arrangement or configuration for example, but not limited to, fully enclosed cartons or basket carriers, the articles B may be bottles or cans.

Turning to Figure 1, there is illustrated a blank 10 for forming an article carrier 90 (see Figure 2) according to an embodiment of the disclosure. The blank 10 comprises a plurality of main panels 12, 14, 16, 18, 20, 22, 24, 26, 28 for forming a tubular structure. The plurality of main panels 12, 14, 16, 18, 20, 22, 24, 26, 28 comprises: a first base panel 12, a first corner or bevel panel 14, a first side panel 16, a second corner or bevel panel 18, a top panel 20, a third corner or bevel panel 22, a second side panel 24, a fourth corner or bevel panel 26 and a second base panel 28. The plurality of panels 12, 14, 16, 18, 20, 22, 24, 26, 28 may be arranged in a linear series hinged one to the next by corresponding fold lines 13, 15, 17, 19, 21, 23, 25, 27.

In alternative embodiments, the first, second, third and fourth corner panels 14, 18, 22, 26 may be omitted.

Fold line 13 and fold line 27 optionally comprise cut lines or severance lines (not shown) which are collinear with the respective one of fold line 13 and fold line 27 so as to interrupt said fold line 13, 27 or be coincident therewith. Severance lines may provide shock absorbing or damping devices proximate the base of the carton 90.

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The first and fourth corner panels 14, 26 may be considered to form lower portions of the respective one of the first or second side panels 16, 24, or alternatively form part of the first or second base panels 12, 28, to which they are hingedly connected.

The second and third corner panels 18, 22 may be considered to form upper portions of the respective one of the first or second side panels 16, 24, or alternatively form part of the top panel 20.

The blank 10 is foldable to form a package 90 as illustrated in Figures 3 and 4. The first and second base panels 12, 28 are engageable with one another in an overlapping relationship to form a composite base wall 12/28 of the carton 90. The blank 10 may comprise a complementary locking mechanism for securing the second base panel 28 to the first base panel 12. The second base panel 28 may comprise at least one first part F of the complementary locking mechanism. The first base panel 12 may comprise at least one second part M of the complementary locking mechanism. In the illustrated embodiment, the second base panel 28 comprises a plurality of female tabs F defining openings in the second base panel 28. The first base panel 12 comprises a plurality of male tabs M; and the openings in the second base panel 28 are configured to receive a respective one of the male tabs M. The female tabs F are arranged to be displaced out of the second base panel 28 to form the opening and to bear against the male tabs M when received therein. In some embodiments the complementary locking mechanism M/F may be omitted; and the first and second base panels 12, 28 may be secured to each other by other means such as but not limited to adhesive or staples.

The complementary locking mechanism illustrated and described is entirely optional.

Optionally, the first and second base panels 12, 28 may comprise at least one first aperture A1. In the illustrated embodiment, each of the first and second base panels 12, 28 comprises two first apertures A1. Optionally, the first and second base panels 12, 28 may comprise at least one second aperture A2. In the illustrated embodiment, each of the first and second base panels 12, 28 comprises one second aperture A2. The first and second apertures A1, A2 may be employed to facilitate construction of the carton 90. A packaging machine component may engage with the first and second apertures A1, A2 to enable the plurality of panels 12, 14, 16, 18, 20, 22, 24, 26, 28 to be tightened about a group of articles B. The first and second apertures A1, A2 may also be employed to facilitate alignment of the first and second base panels 12, 28 with respect to each other or to align the first part F of the complementary locking mechanism with the second part M of the complementary locking mechanism.

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The blank 10 comprises at least one first article retention device or article engagement structure (also referred to herein as end article retention devices or article engagement structures) T1, T2, T3, T4 for engaging an upper end of the articles B. The blank 10 illustrated in Figures 1 and 1B comprises four first article engagement structures T1, T2, T3, T4.

Each of the first article engagement structures T1, T2, T3, T4 comprises a flap 70 hingedly connected to the top panel 20. A first and a second one of the first article engagement structures T1, T2 each comprise a flap 70 hingedly connected to the top panel 20 to a first end of the top panel 20. A third and a fourth one of the first article engagement structures T3, T4 each comprise a flap 70 hingedly connected to the top panel 20 to a second end of the top panel 20.

The flaps 70 of the first and second first article engagement structures T1, T2 are inset from a first outer edge of the blank 10.

The first and second first article engagement structures T1, T2 may be inset with respect to a first end edge of the first or second side panels 14, 24.

The first and second first article engagement structures T1, T2 may be inset with respect to marginal edge portions of the top panel 20.

The flaps 70 of the first and second first article engagement structures T1, T2 may be inset from a first free end edge of the top panel 20.

The flaps 70 of the third and fourth first article engagement structures T3, T4 are inset from a second outer edge of the blank 10.

The third and fourth article first engagement structures T3, T4 may be inset with respect to a second end edge of the first or second side panels 14, 24.

The third and fourth first article engagement structures T3, T4 may be inset with respect to marginal edge portions of the top panel 20.

The flaps 70 of the third and fourth first article engagement structures T3, T4 may be inset from a second free end edge of the top panel 20.

The flaps 70 of the first article engagement structures T1, T2, T3, T4 do not extend beyond the footprint of the top panel 20. The flaps 70 of the first article engagement structures T1, T2, T3, T4 are contained entirely within the footprint of the top panel 20.

The flaps 70 do not extend beyond the ends of the top panel 20.

The flaps 70 of the first article engagement structures T1, T2, T3, T4 do not extend beyond edges of the blank 10 defined, at least in part, by the first and second side panels 16, 24.

Marginal portions of the top panel 20 hingedly connected to each of the first and second side panels 16, 24, or second and third bevel panels 18, 22 when present, are equal in length to the first and second side panel 16, 24 (or second and third bevel panels 18, 22) and to the bottom panels 12, 28 or at least portions of the bottom panels 12, 28; said at least portions of the bottom panels 12, 28 may be marginal portions each being hingedly to one of the first and second side panels 16, 24, or first and fourth bevel panels 14, 26 when present.

A first recess R7 is provided in the first end of the top panel 20, the flaps 70 of the first and second first article engagement structures T1, T2 can be considered to be located in the first recess R7. The flaps 70 of the first and second first article engagement structures T1, T2 define in part the first recess R7 and when folded out of the plane of the top panel 20 increase the size of the first recess R7.

The first recess R7 is arranged to accommodate the entirety of the flaps 70 and wing tabs 70b when present.

The first recess R7 is defined only in the top panel 20 and does not extend into the first and second side panel 16, 24 or second and third bevel panels 18, 22.

The flap 70 of the first one of the first article engagement structures T1 is hingedly connected to the top panel 20 by a hinged connection in the form of a fold line 71 which is obliquely oriented with respect to the fold line 19 hinging the top panel 20 to the second corner panel 18. The fold line 71 is spaced apart from a first end edge of one of the marginal portions of the top panel 20.

The flap 70 of the second one of the first article engagement structures T2 is hingedly connected to the top panel 20 by a hinged connection in the form of a fold line 71 which is obliquely oriented with respect to the fold line 21 hinging the top panel 20 to the third corner

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panel 22. The fold line 71 is spaced apart from a first end edge of the other one of the marginal portions of the top panel 20.

The fold line 71 hinging the flap 70 of the first one of the first article engagement structures T1 to the top panel 20 is divergently arranged with respect to the fold line 71 hinging the flap 70 of the second one of the first article engagement structures T2 to the top panel 20. The fold line 71 hinging the flap 70 of the first one of the first article engagement structures T1 to the top panel 20 and the fold line 71 hinging the flap 70 of the second one of the first article engagement structures T2 to the top panel 20 define an angle therebetween the angle may be less than 120° and in some embodiments may be around 110°. The angle may be greater than 80° and may be greater than 90°.

The fold line 71 hinging the flap 70 of the first one of the first article engagement structures T1 to the top panel 20 and the fold line 71 hinging the flap 70 of the second one of the first article engagement structures T2 to the top panel 20 are arranged to diverge towards the first end of the top panel 20.

The fold line 71 hinging the flap 70 of the first one of the first article engagement structures T1 to the top panel 20 and the fold line 71 hinging the flap 70 of the second one of the first article engagement structures T2 to the top panel 20 are arranged to converge towards the centre or middle of the top panel 20.

In this way the flap 70 of the first one of the first article engagement structures T1 and the flap 70 of the second one of the first article engagement structures T2 fold away from each other.

A second recess R8 is provided in the second end of the top panel 20, the flaps 70 of the third and fourth first article engagement structures T3, T4 can be considered to be located in the second recess R8. The flaps 70 of the third and fourth first article engagement structures T3, T4 define in part the second recess R8 and when folded out of the plane of the top panel 20 increase the size of the second recess R8.

The second recess R8 is defined only in the top panel 20 and does not extend into the first and second side panel 16, 24 or second and third bevel panels 18, 22.

The second recess R8 is arranged to accommodate the entirety of the flaps 70 and wing tabs 70b when present.

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The flap 70 of the third one of the first article engagement structures T3 is hingedly connected to the top panel 20 by a hinged connection in the form of a fold line 71 which is obliquely oriented with respect to the fold line 19 hinging the top panel 20 to the second corner panel 18. The fold line 71 is spaced apart from a second end edge of said one of the marginal portions of the top panel 20.

The flap 70 of the fourth one of the first article engagement structures T4 is hingedly connected to the top panel 20 by a hinged connection in the form of a fold line 71 which is obliquely oriented with respect to the fold line 21 hinging the top panel 20 to the third corner panel 22. The fold line 71 is spaced apart from a second end edge of said other one of the marginal portions of the top panel 20.

The fold line 71 hinging the flap 70 of the third one of the first article engagement structures T3 to the top panel 20 is divergently arranged with respect to the fold line 71 hinging the flap 70 of the fourth one of the first article engagement structures T4 to the top panel 20.

The fold line 71 hinging the flap 70 of the third one of the first article engagement structures T3 to the top panel 20 and the fold line 71 hinging the flap 70 of the fourth one of the first article engagement structures T4 to the top panel 20 are arranged to diverge towards the first end of the top panel 20.

The fold line 71 hinging the flap 70 of the third one of the first article engagement structures T3 to the top panel 20 and the fold line 71 hinging the flap 70 of the fourth one of the first article engagement structures T4 to the top panel 20 are arranged to converge towards the centre or middle of the top panel 20.

In the blank form the flaps 70 define in part free end edges of the top panel 20. The edge portions of the top panel 20 defined by the flaps 70 are arcuate or curvilinear in shape.

The flap 70 of each of the first, second, third and fourth first article engagement structures T1, T2, T3, T4 is partially defined by at least one cut 75, 77 which separates that flap 70 from the top panel 20.

A first cut 75 extends from a first or inner end of the fold line 71 to the respective one of the first and second recesses R7, R8.

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A second cut 77 is disposed between the flap 70 and a respective one of the adjacently disposed fold lines 19, 21 hinging the top panel 20 to the first or second side panel 16, 24 (or second or third bevel panel 18, 22 when present).

The first and second cut lines 75, 77 are divergently arranged with respect to each other.

A first end edge E1/75 of the top panel 20 which extends between the fold lines 71 of the flaps 70 of the first and second first article engagement structures T1, T2 is non-linear. It may be arcuate or curvilinear. The end edge E1/75 is convex such that it can be considered to define a portion of the top panel 20 protruding into the first recess R7.

At least part of the first end edge E1 of the top panel 20 extending between the flaps 70 of the first and second first article engagement structures T1, T2 is disposed at a position further from the centre or middle of the top panel 20 than the inner ends 71a of the fold lines 71 of those flaps 70.

A second end edge E2/75 of the top panel 20 which extends between the fold lines 71 of the flaps 70 of the third and fourth first article engagement structures T3, T4 is non-linear. It may be arcuate or curvilinear. The end edge E2/75 is convex such that it can be considered to define a portion of the top panel 20 protruding into the second recess R8.

At least part of the second end edge E2 of the top panel 20 extending between the flaps 70 of the third and fourth first article engagement structures T3, T4 is disposed at a position further from the centre or middle of the top panel 20 than the inner ends 71a of the fold lines 71 of those flaps 70.

Each of the first article engagement structures T1, T2, T3, T4 comprises a wing tab 70b hingedly connected to the flap 70 by a hinged connection in the form of a fold line 73.

The fold line 73 may form a keel when the first article engagement structures T1, T2, T3, T4 are in use engaging an article B. The keel may form a ridge to increase stability or rigidity of the first article engagement structures T1, T2, T3, T4. The flap 70 and the wing tab 70b may adopt a non-coplanar arrangement, for example, but not limited to, when an article moves outwardly through the open end of the tubular structure forming the article carrier B. The wing tab 70b may fold with respect to the flap 70.

The fold line 73 may be obliquely oriented with respect to the fold line 71 and may define an acute angle therebetween.

The wing tabs 70b are connected only to the flaps 70 and are free from connection to the top panel 20 other than the indirect connection by virtue of being coupled to the flaps 70, that is to say there is no direct connection of the wing tabs 70b to the top panel 20. The flaps 70 interconnect the wing tabs 70b and the top panel 20.

In the unfolded condition in the blank 10 the fold lines 73 are oriented substantially parallel with the fold lines 19, 21 hinging the side or upper corner panels 14, 24; 18, 22 to the top panel 20.

When the flaps 70 are folded about their respective fold line 71 into face to face relationship with the top panel 20 the fold lines 73 may be obliquely oriented with respect to the fold lines 19, 21.

The blank 10 may comprise at least one second article retention device or article engagement structure (also referred to herein as intermediate article retention devices or article engagement structures) T5, T6 for engaging an upper end of the articles B. The blank 10 illustrated in Figure 1 and 1B comprises two second article engagement structures T5, T6.

Each of the second article engagement structures T5, T6 comprises a flap 80 hingedly connected to the top panel 20.

The flap 80 of the first one of the second article engagement structures T5 is hingedly connected to the top panel 20 by a hinged connection in the form of a fold line 81 which is oriented parallel with respect to the fold line 19 hinging the top panel 20 to the second corner panel 18.

The fold line 81 of the first one of the second article engagement structures T5 defines a hinged edge of the flap 80, in the unfolded condition the hinged edge is disposed closer to the fold line 19 than a free edge defined by a cut or severance line. In the folded, operable, condition the free edge of the flap 80 is disposed closer to the first side panel 16 than the hinged edge defined by the fold line 81.

The flap 80 of the second one of the second article engagement structures T6 is hingedly connected to the top panel 20 by a hinged connection in the form of a fold line 81 which is

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oriented parallel with respect to the fold line 21 hinging the top panel 20 to the third corner panel 22.

The fold line 81 of the second one of the second article engagement structures T6 defines a hinged edge of the flap 80, in the unfolded condition the hinged edge is disposed closer to the fold line 21 than a free edge defined by a cut or severance line. In the folded, operable, condition the free edge of the flap 80 is disposed closer to the second side panel 16 than the hinged edge defined by the fold line 81.

The fold line 81 hinging the flap 80 of the first one of the second article engagement structures T5 to the top panel 20 is arranged parallel with respect to the fold line 81 hinging the flap 80 of the second one of the second article engagement structures T6 to the top panel 20.

Each of the second article engagement structures T5, T6 comprises a wing tab 80b hingedly connected to the flap 80 by a hinged connection in the form of a fold line 83.

The fold line 83 may form a keel when the second article engagement structures T5, T6 are in use engaging an article B. The keel may form a ridge to increase stability or rigidity of the second article engagement structures T5, T6. The flap 80 and the wing tab 80b may adopt a non-coplanar arrangement, for example, but not limited to, when an article moves outwardly through the open end of the tubular structure forming the article carrier B. The wing tab 80b may fold with respect to the flap 80.

The fold line 83 may be obliquely oriented with respect to the fold line 81 and may define an acute angle therebetween.

The wing tabs 80b are connected only to the flaps 80 and are free from connection to the top panel 20 other than the indirect connection by virtue of being coupled to the flaps 80, that is to say there is no direct connection of the wing tabs 80b to the top panel 20. The flaps 80 interconnect the wing tabs 80b and the top panel 20.

In the illustrated embodiment the wing tab 80b of the first one of the second article engagement structures T5 is hingedly connected to an end of the flap 80 proximate the second end of the top panel 20. The wing tab 80b of the second one of the second article engagement structures T6 is hingedly connected to an end of the flap 80 proximate the first end of the top panel 20. In this way the wing tab 80b are diagonally opposed. In other embodiments the wing tabs 80b

may be arranged differently for example they may be disposed proximate the same end of the top panel 20.

The blank 10 may comprise at least one heel engagement structure R1, R2, R3, R4, R5, R6 for engaging with a heel or lower portion of an article B. The blank 10 illustrated in Figure 1 comprises six heel engagement structures R1, R2, R3, R4, R5, R6 each for engaging a respective article B. Each of the heel engagement structures R1, R2, R3, R4, R5, R6 is substantially similar in construction and will be described only by reference to a first heel engagement structure R1 provided in part in the first side panel 16 as shown in Figure 1.

The first heel engagement structure R1 may comprise an opening. The opening is defined in part by a heel aperture A3 and in part by a heel tab 40. The heel tab 40 is hingedly connected to the first base panel 12 by fold line 41. The heel tab 40 is struck, at least in part, from the first corner panel 14.

The fold line 41 interrupts the fold line 13 hingedly connecting the first base panel 12 to the first corner panel 14. The fold line 41 may be non-linear, in the illustrated embodiment the fold line 41 is curved or arcuate in shape, in other embodiments it may be formed from at least two linear fold lines divergently arranged with respect to each other and contiguous with each other.

The heel tab 40 may comprise a pair of divergently arranged fold lines 43a, 43b which may define foldable corner portions of the heel tab 40.

The first heel engagement structure R1 may comprise a pair of cut lines 45a, 45a disposed on opposing sides of the heel aperture A3. Each of the cut lines 45a, 45a is spaced apart from the heel aperture A3. The cut lines 45a, 45a may be oriented perpendicularly with respect the fold line 15. The cut lines 45a, 45a may cross or intersect with the fold line 15. The cut lines 45a, 45a may be bisected by the fold line 15.

During the erection and packaging of articles B, the blank 10 is manipulated so that each heel aperture A3 receives the bottom of a respective article B to retain said article B within the carton 90. The heel tabs 40 are also folded to assist in retaining the articles B. This may be achieved by folding the first and second base panels 12, 28 outwardly such that the heel tabs 40 extend inwardly, the heel tabs 40 being disposed below a respective article B as the first and second side panels 16, 24 are folded about an article group. The first and second base panels 12, 28 are then subsequently folded about the base of the article group, and in doing

so the heel tabs 40 engage with said respective article B and are folded with respect to the respective one of the first and second base panels 12, 28 to which they are hingedly connected by fold line 41.

The heel tabs 40 facilitate securing or locking the heel or base of an article B in position.

The top panel 20 may comprise an optional handle structure H. The handle structure H comprises a pair of openings. The openings may be defined at least in part by a tab 62. In the illustrated embodiment the opening is defined in part by a handle aperture A4 and in part by a tab 62. The illustrated embodiment comprises a pair of tabs 62 spaced apart from each other. The tabs 62 are hingedly connected to the top panel 20 by fold lines 61 and are defined in part by a cut line or severance line. A first one of the tabs 62 is hingedly connected to the top panel 20 in opposition to a second one of the tabs 62.

The first one of the tabs 62 is arranged to be disposed above a void or gap between a first group of four adjacently disposed articles B. The second one of the tabs 62 is arranged to be disposed above a void or gap between a second group of four adjacently disposed articles B.

The first and second groups may comprise a pair of common articles B disposed adjacent to each other.

The first one of the second article engagement structures T5 may be arranged to be disposed above a first one of the pair of common articles B. The second one of the second article engagement structures T6 may be arranged to be disposed above a second one of the pair of common articles B.

The tabs 62 and the flaps 80 of the second article engagement structures T5, T6 define a handle or grip region in the top panel 20. The grip region is coupled to a surrounding region by a plurality of arms or bridging regions. The illustrated embodiment comprises four arms or bridging regions. Each arm or bridging region is defined between one of the tabs 62 and an adjacent one of the flaps 80.

The grip region may be coupled to the outer or end portions of the top panel 20 by the arms or bridging regions. In this way the handle is connected to the top panel through the arms.

The handle is defined by a pair of spaced apart handle openings and by a pair of spaced apart article engaging flaps 80.

The blank 10 may comprise a dispenser, the dispenser may comprise one or more access panels D1, D2, D3, D4, D5, D6. The embodiment shown in Figures 1 and 1B comprises six access panels D1, D2, D3, D4, D5, D6. Each access panel D1, D2, D3, D4, D5, D6 comprises a portion of the first or second side panel 16, 24, a portion of the second or third corner panel 18, 22 and a portion of the top panel 20.

Each access panel D1, D2, D3, D4, D5, D6 is defined in part by a severable line. Each access panel D1, D2, D3, D4, D5, D6 may be defined in part by a hinged connection in the form of a fold line 29, 31. Optionally, the first side panel 16 comprises a first access panel fold line 29 extending transversely across the blank 10, in a setup condition the first access panel fold line 29 extends longitudinally of the carton 90, that is to say in a direction parallel with a tubular axis of the tubular structure formed by the plurality of main panels 12, 14, 16, 18, 20, 22, 24, 26, 28. Optionally, the second side panel 24 comprises a second access panel fold line 31 extending transversely across the blank 10, in a setup condition the second access panel fold line 31 extends longitudinally of the carton 90, that is to say in a direction parallel with a tubular axis of the tubular structure formed by the plurality of main panels 12, 14, 16, 18, 20, 22, 24, 26, 28.

A first access panel D1 (also referred to herein as an end access panel) is arranged to disposed at a first end of the carton 90 on a first side thereof and is defined by a first severance line 51a provided in the first side panel 16. The first severance line 51a extends from the first access panel fold line 29 (when present) into the second corner panel 18 to the fold line 19 between second corner panel 18 and the top panel 20. A second severance line 51b provided in the top panel 20 is continuously arranged with the first severance line 51a. The second severance line 51b may be divergently arranged with respect to the first severance line 51a. The second severance line 51b extends from the point of intersection between the first severance line 51a and the fold line 19 to the first end edge E1 of the top panel 20. The second severance line 51b may extend from the point of intersection between the first severance line 51a and the fold line 19 to an innermost end of the fold line 71 of the flap 70 of the first one of the first article engagement structures T1. In this way the flap 70 of the first one of the first article engagement structures T1 is coupled to the first access panel D1 and is at least partially removable or detachable.

The first access panel D1 may be defined in part by a first partial depth cut 50a. The first partial depth cut 50a is arranged in parallel to the first severance line 51a and extends from the first access panel fold line 29 (when present) into the second corner panel 18 to the fold line 19

between second corner panel 18 and the top panel 20. The first partial depth cut 50a is disposed on a first side of the first severance line 51a and may be closer to the first end of the first side panel 16 than the first severance line 51a. The first access panel D1 may be defined in part by a second partial depth cut 50b. The second partial depth cut 50b is arranged in parallel to the second severance line 51b and may extend substantially from the point of intersection between the first severance line 51a and the fold line 19 to an innermost end of the fold line 71 of the flap 70 of the first one of the first article engagement structures T1. The second partial depth cut 50b is disposed on a second side of the second severance line 51b and may be closer to the second end of the top panel 20 than the second severance line 51b. In this way the first and second partial depth cuts 50a, 50b are disposed on opposing sides of the severable line comprising the first and second severance lines 51a, 51b.

A second access panel D2 (also referred to herein as an end access panel) is arranged to disposed at a first end of the carton 90 on a second side thereof and is defined by a first severance line 51a provided in the second side panel 24. The first severance line 51a extends from the second access panel fold line 31 (when present) into the third corner panel 22 to the fold line 21 between third corner panel 22 and the top panel 20. A second severance line 51b provided in the top panel 20 is continuously arranged with the first severance line 51a. The second severance line 51b may be divergently arranged with respect to the first severance line 51a. The second severance line 51b extends from the point of intersection between the first severance line 51a and the fold line 21 to the first end edge E1 of the top panel 20. The second severance line 51b may extend from the point of intersection between the first severance line 51a and the fold line 21 to an innermost end of the fold line 71 of the flap 70 of the second one of the first article engagement structures T2. In this way the flap 70 of the second one of the first article engagement structures T2 is coupled to the second access panel D2 and is at least partially removable or detachable.

The second access panel D2 may be defined in part by a first partial depth cut 50a. The first partial depth cut 50a is arranged in parallel to the first severance line 51a and extends from the second access panel fold line 31 (when present) into the third corner panel 22 to the fold line 21 between third corner panel 22 and the top panel 20. The first partial depth cut 50a is disposed on a first side of the first severance line 51a and may be closer to the first end of the second side panel 24 than the first severance line 51a. The second access panel D2 may be defined in part by a second partial depth cut 50b. The second partial depth cut 50b is arranged in parallel to the second severance line 51b and may extend substantially from the point of intersection between the first severance line 51a and the fold line 21 to an innermost end of the fold line 71 of the flap 70 of the second one of the first article engagement structures T2.

The second partial depth cut 50b is disposed on a second side of the second severance line 51b and may be closer to the second end of the top panel 20 than the second severance line 51b. In this way the first and second partial depth cuts 50a, 50b are disposed on opposing sides of the severable line comprising the first and second severance lines 51a, 51b.

A third access panel D3 (also referred to herein as an end access panel) is arranged to disposed at a second end of the carton 90 on a first side thereof and is defined by a third severance line 53a provided in the first side panel 16. The third severance line 53a extends from the first access panel fold line 29 (when present) into the second corner panel 18 to the fold line 19 between second corner panel 18 and the top panel 20. A fourth severance line 53b provided in the top panel 20 is continuously arranged with the third severance line 53a. The fourth severance line 53b may be divergently arranged with respect to the third severance line 53a. The fourth severance line 53b extends from the point of intersection between the third severance line 53a and the fold line 19 to the second end edge E2 of the top panel 20. The fourth severance line 53b may extend from the point of intersection between the third severance line 53a and the fold line 19 to an innermost end of the fold line 71 of the flap 70 of the third one of the first article engagement structures T3. In this way the flap 70 of the third one of the first article engagement structures T3 is coupled to the third access panel D3 and is at least partially removable or detachable.

The third access panel D3 may be defined in part by a third partial depth cut 52a. The third partial depth cut 52a is arranged in parallel to the third severance line 53a and extends from the first access panel fold line 29 (when present) into the second corner panel 18 to the fold line 19 between second corner panel 18 and the top panel 20. The third partial depth cut 52a is disposed on a first side of the third severance line 53a and may be closer to the second end of the first side panel 16 than the third severance line 53a. The third access panel D3 may be defined in part by a fourth partial depth cut 52b. The fourth partial depth cut 52b is arranged in parallel to the fourth severance line 53b and may extend substantially from the point of intersection between the third severance line 53a and the fold line 19 to an innermost end of the fold line 71 of the flap 70 of the third one of the first article engagement structures T3. The fourth partial depth cut 52b is disposed on a second side of the fourth severance line 53b and may be closer to the first end of the top panel 20 than the fourth severance line 53b. In this way the third and fourth partial depth cuts 52a, 52b are disposed on opposing sides of the severable line comprising the third and fourth severance lines 53a, 53b.

A fourth access panel D4 (also referred to herein as an end access panel) is arranged to disposed at a second end of the carton 90 on a second side thereof and is defined by a third

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severance line 53a provided in the second side panel 24. The third severance line 53a extends from the second access panel fold line 31 (when present) into the third corner panel 22 to the fold line 21 between third corner panel 22 and the top panel 20. A fourth severance line 53b provided in the top panel 20 is continuously arranged with the third severance line 53a. The fourth severance line 53b may be divergently arranged with respect to the third severance line 53a. The fourth severance line 53b extends from the point of intersection between the third severance line 53a and the fold line 21 to the second end edge E2 of the top panel 20. The fourth severance line 53b may extend from the point of intersection between the third severance line 53a and the fold line 21 to an innermost end of the fold line 71 of the flap 70 of the fourth one of the first article engagement structures T4. In this way the flap 70 of the fourth one of the first article engagement structures T4 is coupled to the fourth access panel D4 and is at least partially removable or detachable.

The fourth access panel D4 may be defined in part by a third partial depth cut 52a. The third partial depth cut 52a is arranged in parallel to the third severance line 53a and extends from the second access panel fold line 31 (when present) into the third corner panel 22 to the fold line 21 between third corner panel 22 and the top panel 20. The third partial depth cut 52a is disposed on a first side of the third severance line 53a and may be closer to the second end of the second side panel 24 than the third severance line 53a. The fourth access panel D4 may be defined in part by a fourth partial depth cut 52b. The fourth partial depth cut 52b is arranged in parallel to the fourth severance line 53b and may extend substantially from the point of intersection between the third severance line 53a and the fold line 21 to an innermost end of the fold line 71 of the flap 70 of the fourth one of the first article engagement structures T4. The fourth partial depth cut 52b is disposed on a second side of the fourth severance line 53b and may be closer to the first end of the top panel 20 than the fourth severance line 53b. In this way the third and fourth partial depth cuts 52a, 52b are disposed on opposing sides of the severable line comprising the third and fourth severance lines 53a, 53b.

The blank 10 may comprise a fifth access panel D5 (also referred to herein as an intermediate access panel) is arranged to disposed at intermediate the opposed ends of the carton 90 on a first side thereof. The fifth access panel D5 may be disposed medially between the opposed ends of the carton 90.

The fifth access panel D5 is defined in part by the first severance line 51a provided in the first side panel 16. The fifth access panel D5 is defined in part by the third severance line 53a provided in the first side panel 16.

The first severance line 51a extends from the first access panel fold line 29 (when present) into the second corner panel 18 to the fold line 19 between second corner panel 18 and the top panel 20.

The third severance line 53a extends from the first access panel fold line 29 (when present) into the second corner panel 18 to the fold line 19 between second corner panel 18 and the top panel 20.

A fifth severance line 51c provided in the top panel 20 is continuously arranged with the first severance line 51a. The fifth severance line 51c may be divergently arranged with respect to the first severance line 51a. The fifth severance line 51c may be divergently arranged with respect to the second severance line 51b. The fifth severance line 51c extends from the point of intersection between the first severance line 51a and the fold line 19 to a first end of the fold line 81 of the flap 80 of the first one of the second article engagement structures T5.

A sixth severance line 53c provided in the top panel 20 is continuously arranged with the third severance line 53a. The sixth severance line 53c may be divergently arranged with respect to the third severance line 53a. The sixth severance line 53c may be divergently arranged with respect to the fourth severance line 53b. The sixth severance line 53c extends from the point of intersection between the third severance line 53a and the fold line 19 to a second end of the fold line 81 of the flap 80 of the first one of the second article engagement structures T5.

In this way the flap 80 of the first one of the second article engagement structures T5 is coupled to the fifth access panel D5 and is at least partially removable or detachable therewith.

The flap 80 of the first one of the second article engagement structures T5 or the opening created upon folding of the flap 80 may serve as a tear initiation device facilitating deployment of the fifth access panel D5. A user may readily engage the hinged edge of the flap 80 defined by the fold line 81. The hinged edge of the flap 80 may be disposed above a recess in the upper end of the article B with which the flap 80 is in engagement.

The fifth access panel D5 may be defined in part by the first partial depth cut 50a. The fifth access panel D5 may be defined in part by the third partial depth cut 52a.

The fifth access panel D5 may be defined in part by a fifth partial depth cut 50c. The fifth partial depth cut 50c is arranged in parallel to the fifth severance line 51c and may extend substantially from the point of intersection between the first severance line 51a and the fold

line 19 to a first end of the fold line 81 of the flap 80 of the first one of the second article engagement structures T5.

The fifth access panel D5 may be defined in part by a sixth partial depth cut 52c. The sixth partial depth cut 52c is arranged in parallel to the sixth severance line 53c and may extend substantially from the point of intersection between the third severance line 53a and the fold line 19 to a second end of the fold line 81 of the flap 80 of the first one of the second article engagement structures T5.

The fifth partial depth cut 50c is disposed on a first side of the fifth severance line 51c and may be closer to the first end of the top panel 20 than the fifth severance line 51c. In this way the first and fifth partial depth cuts 50a, 50c are disposed the same side of a severable line comprising the first and fifth severance lines 51a, 51c.

The second and fifth partial depth cuts 50b, 50c may intersect proximate the fold line 19. The second and fifth partial depth cuts 50b, 50c may define a "V" shape. The second and fifth partial depth cuts 50b, 50c may be divergently arranged with respect each other.

The sixth partial depth cut 52c is disposed on a first side of the fifth severance line 51c and may be closer to the second end of the top panel 20 than the fifth severance line 51c. In this way the third and sixth partial depth cuts 52a, 52c are disposed the same side of a severable line comprising the third and sixth severance lines 53a, 53c.

The fourth and sixth partial depth cuts 52b, 52c may intersect proximate the fold line 19. The fourth and sixth partial depth cuts 52b, 52c may define a "V" shape. The fourth and sixth partial depth cuts 52b, 52c may be divergently arranged with respect each other.

The blank 10 may comprise a sixth access panel D6 (also referred to herein as an intermediate access panel) is arranged to disposed at intermediate the opposed ends of the carton 90 on a second side thereof. The sixth access panel D6 may be disposed medially between the opposed ends of the carton 90.

The sixth access panel D6 is defined in part by the first severance line 51a provided in the second side panel 24. The sixth access panel D6 is defined in part by the third severance line 53a provided in the second side panel 24.

The first severance line 51a extends from the second access panel fold line 31 (when present) into the third corner panel 22 to the fold line 21 between third corner panel 22 and the top panel 20.

The third severance line 53a extends from the second access panel fold line 31 (when present) into the third corner panel 22 to the fold line 21 between third corner panel 22 and the top panel 20.

A fifth severance line 51c provided in the top panel 20 is continuously arranged with the first severance line 51a. The fifth severance line 51c may be divergently arranged with respect to the first severance line 51a. The fifth severance line 51c may be divergently arranged with respect to the second severance line 51b. The fifth severance line 51c extends from the point of intersection between the first severance line 51a and the fold line 21 to a first end of the fold line 81 of the flap 80 of the second one of the second article engagement structures T6.

A sixth severance line 53c provided in the top panel 20 is continuously arranged with the third severance line 53a. The sixth severance line 53c may be divergently arranged with respect to the third severance line 53a. The sixth severance line 53c may be divergently arranged with respect to the fourth severance line 53b. The sixth severance line 53c extends from the point of intersection between the third severance line 53a and the fold line 21 to a second end of the fold line 81 of the flap 80 of the second one of the second article engagement structures T6.

In this way the flap 80 of the second one of the second article engagement structures T6 is coupled to the sixth access panel D6 and is at least partially removable or detachable therewith.

The flap 80 of the second one of the second article engagement structures T6 or the opening created upon folding of the flap 80 may serve as a tear initiation device facilitating deployment of the sixth access panel D6. A user may readily engage the hinged edge of the flap 80 defined by the fold line 81. The hinged edge of the flap 80 may be disposed above a recess in the upper end of the article B with which the flap 80 is in engagement.
Similarly, the flaps 70 of the first article engagement structures T1, T2, T3, T4 or the recesses R7, R8 may serve as a tear initiation devices facilitating deployment of the access panels D1, D1, D3, D4. A user may readily engage the hinged edge of the flap 70 defined by the fold line 71. The hinged edge of the flap 70 may be disposed above a recess in the upper end of the article B with which the flap 70 is in engagement.

The sixth access panel D6 may be defined in part by the first partial depth cut 50a. The sixth access panel D6 may be defined in part by the third partial depth cut 52a.

The sixth access panel D6 may be defined in part by a fifth partial depth cut 50c. The fifth partial depth cut 50c is arranged in parallel to the fifth severance line 51c and may extend substantially from the point of intersection between the first severance line 51a and the fold line 21 to a first end of the fold line 81 of the flap 80 of the second one of the second article engagement structures T6.

The sixth access panel D6 may be defined in part by a sixth partial depth cut 52c. The sixth partial depth cut 52c is arranged in parallel to the sixth severance line 53c and may extend substantially from the point of intersection between the third severance line 53a and the fold line 21 to a second end of the fold line 81 of the flap 80 of the second one of the second article engagement structures T6.

The fifth partial depth cut 50c is disposed on a first side of the fifth severance line 51c and may be closer to the first end of the top panel 20 than the fifth severance line 51c. In this way the first and fifth partial depth cuts 50a, 50c are disposed the same side of a severable line comprising the first and fifth severance lines 51a, 51c.

The second and fifth partial depth cuts 50b, 50c may intersect proximate the fold line 21. The second and fifth partial depth cuts 50b, 50c may define a "V" shape. The second and fifth partial depth cuts 50b, 50c may be divergently arranged with respect each other.

The sixth partial depth cut 52c is disposed on a first side of the fifth severance line 51c and may be closer to the second end of the top panel 20 than the fifth severance line 51c. In this way the third and sixth partial depth cuts 52a, 52c are disposed the same side of a severable line comprising the third and sixth severance lines 53a, 53c.

The fourth and sixth partial depth cuts 52b, 52c may intersect proximate the fold line 21. The fourth and sixth partial depth cuts 52b, 52c may define a "V" shape. The fourth and sixth partial depth cuts 52b, 52c may be divergently arranged with respect each other.

Turning to the construction of the carton 90 as illustrated in Figure 2, the carton 90 can be formed by a series of sequential folding operations in a straight line machine so that the carton 90 is not required to be rotated or inverted to complete its construction. The folding process is

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not limited to that described below and may be altered according to particular manufacturing requirements.

A group of articles B is assembled; in the embodiment illustrated in Figure 2 six articles B are arranged in a 2 x 3 array. The top panel 20 of the blank 10 is disposed above the group of articles B to provide a top wall 20 of the carton 90.

The flaps 70 of the first article engagement structures T1, T2, T3, T4 are folded into face to face relationship with the top panel 20. A first pair of flaps 70 at a first one of the first and second ends of the top panel 20 may be folded prior to folding a second pair of flaps 70 at the other one of the first and second ends of the top panel 20.

The flaps 80 of the second article engagement structures T5, T6 are folded into face to face relationship with the top panel 20.

The flaps 70, 80 may be folded by a part of a packaging machine such as but not limited to a passive device such as a static guide or an active device such as a folding wheel or by a combination of active and passive devices.

In one example the blank 10 is oriented transversely with respect to a conveyor, such that the flaps 70 of the first and second article engagement structures T1, T2 lead (are downstream of) the flaps 70 of the third and fourth article engagement structures T3, T4.

The leading flaps 70 may be folded by a static guide which retards movement of the flaps 70 with respect to the blank 10 to effect folding of the flaps 70.

The trailing (upstream) flaps 70 may be folded by an active device which accelerates movement of the flaps 70 with respect to the blank 10 to effect folding of the flaps 70.

The flaps 80 may be folded by a combination of an active device and a static guide initial folding out of the plane of the top panel 20 may be executed by an active device, subsequent folding into face to face relationship with an inner surface of the top panel 20 may be completed by a static guide.

Once the flaps 70 of the first article engagement structures T1, T2, T3, T4 and the flaps 80 of the second article engagement structures T5, T6 are folded into face to face relationship with

the top panel 20 the blank 10 is moved relative to the group of articles B so as to be disposed over upper ends of the articles B.

The flaps 70, 80 may be received in a recess or void in the upper end of the articles B.

The flaps 70, 80 may be arranged to abut a portion of the articles B providing an abutment face or be located in close proximity to the abutment face so as to inhibit movement of the articles B with respect to the article carrier 90.

The second and third bevel panels 18, 22 (when present) are folded, with respect to the top panel 20 about fold lines 19, 21 respectively, about shoulders of the group of articles B.

The first and second side panels 16, 24 are folded, with respect to the second and third bevel panels 18, 22 to which they are hinged about fold lines 17, 23 respectively, about opposing sides of the group of articles B so as to be disposed about the opposing sides of the group of articles B to form first and second side walls 16, 24 of the carton 90.

The first and fourth corner panels 14, 26 (when present) are folded, with respect to the respective one of the first and second side panels 16, 24 about fold lines 15, 25 respectively, about the heels or lower portions of adjacently disposed articles B.

The heel tabs 40 may folded out of the plane of the first and fourth corner panels 14, 26, about fold lines 41, prior to folding the first and fourth corner panels 14, 26 the respective one of the first and second side panels 16, 24.

In some embodiments this is achieved by folding the first and second base panels 12, 28 outwardly such that the heel tabs 40 extend inwardly below the article group to engage one of the articles B, the first and second base panels 12, 28 are then folded in the opposite direction below the base of the article group.

The second base panel 28 is folded about the fold line 27 so as to be disposed adjacent to the base of the group of articles B. The first base panel 12 is then folded about the fold line 13 so as to be in at least partial overlapping relationship with the second base panel 28; in doing so each of the heel tabs 42 may be brought into engagement with a base of a respective article B.

The first and second base panels 12, 28 are secured together. Each of the male tabs M is displaced inwardly out of the plane of the second base panel 28. In so doing, each of the female tabs F is displaced inwardly creating a corresponding opening in the first base panel 12. The male tabs M are received in respective ones of the openings so as to lock the first and second base panels 12, 28 together. In this way a tubular structure is formed about the group of articles B.

The assembled carton 90 is shown in Figures 2 and 3.

The flaps 70, 80 engage a rim, chime or upstanding wall or other projection of the article B. When the articles B are cans the top wall of the can may be countersunk, disposed below the upper end of the side wall or end seam of the article B. The top wall of the can is connected to the side walls by a can chime or end seam.

The flaps 70, 80 engage an internal surface or abutment face of the rim. The flaps 70, 80 may be disposed in the recess or void provided by a countersunk top wall of the article B.

The flaps 70, 80 remain in engagement with the articles B when the carrying handle H is in use, the flaps 70. 80 may unfold, due to the inherent resilience or elasticity of the carrier substrate, upon upward displacement of the top panel 20 with respect to the group of articles B.

The flaps 70, 80 are folded inwardly about a hinged connection 71, 81 to the top panel 20 more than 90 degrees so as to be substantially in face to face relationship with the top panel 20. In this way the flaps 70, 80 are held in the folded condition by the respective article B which they engage. Due to the close proximity of the top panel 20 to the upper ends of the articles B there is insufficient space to allow the flap 70, 80 to unfold.

Referring now to Figure 4, there is shown an additional embodiment of the present disclosure. In the second illustrated embodiment like numerals have, where possible, been used to denote like parts, albeit with the addition of the prefix "100" to indicate that these features belong to the second embodiment. The additional embodiment shares many common features with the first embodiment and therefore only the differences from the embodiment illustrated in Figures 1 to 3 will be described in detail.

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Figure 4 illustrates a blank 110 for forming an article carrier (not shown) according to another embodiment of the disclosure. The blank 110 comprises a plurality of main panels 112, 114, 116, 118, 120, 122, 124, 126, 128 for forming a tubular structure. The plurality of main panels 112, 114, 116, 118, 120, 122, 124, 126, 128 comprises: a first base panel 112, an optional first corner or bevel panel 114, a first side panel 116, an optional second corner or bevel panel 118, a top panel 120, an optional third corner or bevel panel 122, a second side panel 124, an optional fourth corner or bevel panel 126 and a second base panel 128. The plurality of panels 112, 114, 116, 118, 120, 122, 124, 126, 128 may be arranged in a linear series hinged one to the next by corresponding fold lines 113, 115, 117, 119, 121, 123, 125, 127.

The blank 110 comprise upper article receiving apertures A5 defined in at least the second or third corner panel 118, 122. The blank 110 comprises six upper article receiving apertures A5; three provided in the second corner panel 118 and three provided in the third corner panel 122. Each of the upper article receiving apertures A5 may be defined in the top panel 120 and may be defined in a respective one of the first and second side panel 116, 124.

The upper article receiving apertures A5 are shown in a substantially triangular form, however in other embodiments other shapes may be employed.

It will be appreciated that the blank 10 of the embodiment of Figure 1 may be modified to incorporate the upper receiving apertures A5 shown in Figure 4.

The blank 110 comprises at least one article retention device or article engagement structure T1, T2, T3, T4, T5, T6 for engaging an upper end of the articles B. The blank 110 illustrated in Figure 4 comprises six article engagement structures T1, T2, T3, T4, T5, T6.

The blank 110 comprises four end article engagement structures T1, T2, T3, T4 and two intermediate article engagement structures T5, T6 disposed between pairs of end article engagement structures T1, T2, T3, T4.

Each of the end article engagement structures T1, T2, T3, T4 comprises a flap 170 hingedly connected to the top panel 120 by a fold line 171. First and second end article engagement structures T1, T2 each comprise a flap 170 hingedly connected to the top panel 120 to a first end thereof. Third and fourth end article engagement structures T3, T4 each comprise a flap 170 hingedly connected to the top panel 120 to a second end thereof.

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Each of the intermediate article engagement structures T5, T6 comprises a flap 180 hingedly connected to the top panel 120 by a fold line 181.

The flaps 170 of the end article engagement structures T1, T2, T3, T4 do not extend beyond the footprint of the top panel 120. The flaps 170 of the end article engagement structures T1, T2, T3, T4 are contained entirely within the footprint of the top panel 120.

The flaps 170 do not extend beyond the ends of the top panel 120.

The flaps 170 of the end article engagement structures T1, T2, T3, T4 do not extend beyond edges of the blank 110 defined, at least in part, by the first and second side panels 116, 124.

Marginal portions of the top panel 120 hingedly connected to each of the first and second side panels 116, 124, or second and third bevel panels 118, 122 when present, are equal in length to the first and second side panel 116, 124 (or second and third bevel panels 118, 122) and to the bottom panels 112, 128 or at least portions of the bottom panels 112, 128; said at least portions of the bottom panels 112, 128 may be marginal portions each being hingedly to one of the first and second side panels 116, 124, or first and fourth bevel panels 114, 126 when present.

A first recess R7 is provided in the first end of the top panel 120, the flaps 170 of first and second end article engagement structures T1, T2 can be considered to be located in the first recess R7. The flaps 170 of the first and second end article engagement structures T1, T2 define in part the first recess R7 and when folded out of the plane of the top panel 120 increase the size of the first recess R7.

The first recess R7 is arranged to accommodate the entirety of the flaps 170.

The first recess R7 is defined only in the top panel 120 and does not extend into the first and second side panel 116, 124 or second and third bevel panels 118, 122.

The flap 170 of the first end article engagement structure T1 is hingedly connected to the top panel 120 by a hinged connection in the form of a fold line 171 which is oriented parallel with respect to the fold line 119 hinging the top panel 120 to the second corner panel 118. The fold line 171 is spaced apart from the fold line 119.

The flap 170 of the second end article engagement structure T2 is hingedly connected to the top panel 120 by a hinged connection in the form of a fold line 171 which is oriented parallel with respect to the fold line 121 hinging the top panel 120 to the third corner panel 122. The fold line 171 is spaced apart from the fold line 121.

The flap 170 of the first end article engagement structure T1 and the flap 170 of the second end article engagement structures T2 fold away from each other, they are hinged in opposition to each other. The flap 170 of the first end article engagement structure T1 folds towards the first side panel 116. The flap 170 of the second end article engagement structure T2 folds towards the second side panel 124. A hinged edge of the flap 170 of the first end article engagement structure T1 defined by the fold line 171 is disposed in closer proximity to the fold line 119 than a free edge of the flap 170. A hinged edge of the flap 170 of the second end article engagement structure T2 defined by the fold line 171 is disposed in closer proximity to the fold line 121 than a free edge of the flap 170.

A second recess R8 is provided in the second end of the top panel 120, the flaps 170 of third and fourth end article engagement structures T3, T4 can be considered to be located in the second recess R8. The flaps 170 of the third and fourth first article engagement structures T3, T4 define in part the second recess R8 and when folded out of the plane of the top panel 120 increase the size of the second recess R8.

The second recess R8 is defined only in the top panel 120 and does not extend into the first and second side panel 116, 124 or second and third bevel panels 118, 122.

The second recess R8 is arranged to accommodate the entirety of the flaps 170.

The flap 170 of the third end article engagement structure T3 is hingedly connected to the top panel 120 by a hinged connection in the form of a fold line 171 which is oriented parallel with respect to the fold line 119 hinging the top panel 120 to the second corner panel 118. The fold line 171 is spaced apart from the fold line 119.

The flap 170 of the fourth end first article engagement structure T4 is hingedly connected to the top panel 120 by a hinged connection in the form of a fold line 171 which is oriented parallel with respect to the fold line 121 hinging the top panel 120 to the third corner panel 122. The fold line 171 is spaced apart the fold line 121.

The flap 170 of the third end article engagement structure T3 and the flap 170 of the fourth end first article engagement structure T4 fold away from each other, they are hinged in opposition to each other. The flap 170 of the third end article engagement structure T3 folds towards the first side panel 116. The flap 170 of the fourth end first article engagement structure T4 folds towards the second side panel 124. A hinged edge of the flap 170 of the third end article engagement structure T3 defined by the fold line 171 is disposed in closer proximity to the fold line 119 than a free edge of the flap 170. A hinged edge of the flap 170 of the fourth end first article engagement structure T4 defined by the fold line 171 is disposed in closer proximity to the fold line 121 than a free edge of the flap 170.

In the blank form the flaps 170 define in part free end edges of the top panel 120. The edge portions of the top panel 120 defined by the flaps 170 are arcuate or curvilinear in shape.

The flap 180 of a first intermediate article engagement structure T5 is hingedly connected to the top panel 120 by a hinged connection in the form of the fold line 181 which is oriented parallel with respect to the fold line 119 hinging the top panel 120 to the second corner panel 118. The fold line 181 is spaced apart from the fold line 119.

The flap 180 of a second intermediate article engagement structure T6 is hingedly connected to the top panel 120 by a hinged connection in the form of a fold line 181 which is oriented parallel with respect to the fold line 121 hinging the top panel 120 to the third corner panel 122. The fold line 181 is spaced apart the fold line 121.

The flap 180 of the first intermediate article engagement structure T5 and the flap 180 of the second intermediate article engagement structure T6 fold away from each other, they are hinged in opposition to each other. The flap 180 of the first intermediate article engagement structure T5 folds towards the first side panel 116. The flap 180 of the second intermediate article engagement structure T6 folds towards the second side panel 124. A hinged edge of the flap 180 of the first intermediate article engagement structure T5 defined by the fold line 181 is disposed in closer proximity to the fold line 119 than a free edge of the flap 180. A hinged edge of the flap 180 of the second intermediate article engagement structure T6 defined by the fold line 181 is disposed in closer proximity to the fold line 121 than a free edge of the flap 180.

The fold lines 171, 181 are oriented substantially perpendicular to open ends of the tubular structure formed by the plurality of panels 112, 114, 116, 118, 120, 122, 124, 126, 128.

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The flap 170, 180 of each of the article engagement structures T1, T2, T3, T4, T5, T6 is defined in part by a cut and/or by a cutline which separates that flap 170,180 from the top panel 120.

The flap 170, 180 of each of the article engagement structures T1, T2, T3, T4, T5, T6 comprises a hinged edge defined by the fold line 171, 181 and free edge defined by the cut or cutline. The free edge extends from a first end of the hinged edge to a second end of the hinged edge. The free edge is arcuate or curved across its entire extent.

It will be appreciated that features of the embodiment of Figure 1 may be incorporated in the embodiment of Figure 4, for example but not limited to the blank 110 may be modified to include the dispenser access panels D1, D2, D3, D4, D5, D6, handle apertures A4 or the wing tabs 70b, 80b of the embodiment of Figure 1.

The present disclosure provides an article carrier 90 for packaging at least one article B each having a recess. The article carrier 90 comprises a plurality of panels 12, 14, 16, 18, 20, 22, 24, 26, 28 forming a tubular structure for surrounding at least one article B and an article retention device T1, T2, T3, T4, T5, T6 for engaging a recess of one of said at least one article B to prevent or inhibit dislodgement or unintentional egress of the article B from at least one of opposite open ends of the tubular structure. The article retention device T1, T2, T3, T4, T5, T6 comprises a flap 70, 80 hingedly connected to one of the plurality of panels 12, 14, 16, 18, 20, 22, 24, 26, 28, said one of the plurality of panels 12, 14, 16, 18, 20, 22, 24, 26, 28 may be a top panel 20. The article carrier 90 further comprises a dispenser feature having an access panel D1, D2, D3, D4, D5, D6. The flap 70, 80 is hingedly connected to the access panel D1, D2, D3, D4, D5, D6 so as to provide a tear initiation device for the dispenser.

The access panel D1, D2, D3, D4 is defined at an end of the article carrier 90. The access panel D1, D2, D3, D4 is defined in part by a free end edge of the article carrier 90 and in part by a severable line extending from the flap 70, 80.

The access panel D5, D6 is defined in an intermediate portion of the article carrier 90. The access panel D5, D6 is defined at least in part by a pair of severable lines extending from the flap 70, 80. The pair of severable lines are spaced apart from each end of the article carrier 90.

The present disclosure also provides an article carrier for packaging at least one article B each having a recess. The article carrier comprises a plurality of panels 112, 114, 116, 118, 120, 122, 124, 126, 128 forming a tubular structure for surrounding at least one article B and an

article retention device T1, T2, T3, T4, T5, T6 for engaging a recess of one of said at least one article B to prevent or inhibit dislodgement or unintentional egress of the article B from at least one of opposite open ends of the tubular structure. The article retention device T1, T2, T3, T4, T5, T6 comprises a flap 170, 180 hingedly connected by a hinged connection to one of the plurality of panels 112, 114, 116, 118, 120, 122, 124, 126, 128, said one of the plurality of panels 112, 114, 116, 118, 120, 122, 124, 126, 1288 may be a top panel 120. The flap 170, 180 comprises a hinged edge defined by the hinged connection and a free edge, the free edge extending from a first end of the hinged connection to a second end of the hinged connection, the free edge being arcuate or curved across or along its entire extent.

The hinged edge of the flap 70, 80; 170, 180 is disposed closer to one of a pair of opposed side walls than the free edge in an unfolded condition. The flap 70, 80; 170, 180 in an operative condition folded reverse folded into face to face relationship with an inner surface of the panel to which it is hinged. In the operative position the free edge of the flap 70, 80; 170, 180 is disposed closer to one of a pair of opposed side walls than the hinged edge. The hinged connection 71, 81, 171, 181 is oriented non-parallel to an open end of the tubular structure. The hinged connection 71, 81, 171, 181 may be obliquely oriented to an open end of the tubular structure. The hinged connection 71, 81, 171, 181 is perpendicularly oriented with respect to an open end of the tubular structure.

The present disclosure also provides an article carrier 90 for packaging at least two articles B each having a recess. The article carrier 90 comprises a plurality of panels 12, 14, 16, 18, 20, 22, 24, 26, 28; 112, 114, 116, 118, 120, 122, 124, 126, 128 forming a tubular structure for surrounding the at least two articles B and a pair of article retention devices T5, T6 each comprising a flap 80, 180 for engaging a recess in of a respective one of said at least two articles B to prevent or inhibit movement of the articles B within the tubular structure. Each flap 80; 180 is hingedly connected by a hinged connection to one of the plurality of panels 12, 14, 16, 18, 20, 22, 24, 26, 28; 112, 114, 116, 118, 120, 122, 124, 126, 128 in opposition to each other, said one of the plurality of panels 12, 14, 16, 18, 20, 22, 24, 26, 28; 112, 114, 116, 118, 120, 122, 124, 126, 128 may be a top panel 20; 120. The article carrier 90 comprises a pair of handle openings defined in said one of the plurality of panels 12, 14, 16, 18, 20, 22, 24, 26, 28; 112, 114, 116, 118, 120, 122, 124, 126, 128. Each handle opening may be defined at least in part by a tab 62. The tabs 62 may be hingedly connected in opposition to each other. The tabs 62 and the flaps 80 defined a handle H said one of the plurality of panels 12, 14, 16, 18, 20, 22, 24, 26, 28; 112, 114, 116, 118, 120, 122, 124, 126, 128. The handle H is coupled or connected to the top panel 20; 120 by a plurality of arms, the plurality of arms may comprise

four arms. Each arm is defined by a region of the top panel 20; 120 disposed between one of the tabs 62 and one of the flaps 80.

Endmost article retention devices T1, T2, T3, T4 may be located in a recess defined in, or struck from, an end of one of the plurality of panels 12, 14, 16, 18, 20, 22, 24, 26, 28; 112, 114, 116, 118, 120, 122, 124, 126, 128. In this way the article retention device T1, T2, T3, T4 does not increase the footprint of the top panel 20; 120 or blank 10; 110.

The top panel 20;120 comprises at least one recessed end edge to which each endmost article retention device T1, T2, T3, T4 is hingedly connected.

In some embodiments the flap 70; 170 partially defines the at least one recessed end edge of the top panel 20; 120. That is to say the flap 70; 170 does not fill or complete the recessed end edge in an unfolded condition.

In some embodiments the article carrier 90 comprises a pair of article retention devices T1, T2, T3, T4 at each end of the one of the plurality of panels 12, 14, 16, 18, 20, 22, 24, 26, 28; 112, 114, 116, 118, 120, 122, 124, 126, 128 or top panel 20; 120. The pair of article retention devices T1, T2, T3, T4 are spaced apart from each other by a recess R7, R8 struck from or defined in an end edge of the top panel 20; 120.

The pair of article retention device T1, T2, T3, T4 may be hingedly connected to the top panel 20 by a respective fold line 71, said fold lines 71 being divergently arranged with respect to each other.

The flap 70; 170 is folded inwardly about a hinged connection to the top panel 20; 120 more than 90 degrees so as to be substantially in face to face relationship with the panel to which it is hinged.

The article retention device T1, T2, T3, T4 may comprises a second fold line 73 defined in the flap 70 and forming a keel for increasing the security of the article B within the article carrier 90.

The second fold line 73 may define in part a wing tab 70b, the wing tab 70b coupled to the top panel 20 only through its hinged connection to the flap 70.

The second fold line 73 may be arranged to converge at an end of the first fold line 71 to form a vertex. A cutaway 75 in the form of a cut line or severance line may separate the wing tab 70b from the article carrier 90. The cut line intersects with the vertex between the first and second fold lines 71, 73. It will be appreciated that in other embodiments the cutaway 75 may be a slot or slit or other recess spacing the wing tab 70b from the top panel 20 of article carrier 90.

The article carrier 90 may be of the wrap-around type, comprising a composite wall formed from two panels secured together. The composite wall may be a bottom wall of the tubular structure.

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 illustrated embodiments show cartons or blanks for forming an article carrier of the wraparound style; in other embodiments, the article carrier may take an alternative format or styles and may employ one or more of the features of the present disclosure.

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

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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, 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 each having a recess, the article carrier comprising a plurality of panels forming a tubular structure for surrounding the at least two article and a pair of article retention devices each comprising a flap for engaging a recess of a respective one of said at least two articles to inhibit movement of the articles within the tubular structure, wherein the flaps are hingedly connected by a respective hinged connection to one of the plurality of panels in opposition to each other, the article carrier comprises a pair of handle openings defined in said one of the plurality of panels, the handle openings and the flaps define a handle in said one of the plurality of panels, the handle is coupled or connected to said one of the plurality of panels by four arms, each arm is defined by a region of said one of the plurality of panels disposed between one of the handle openings and one of the flaps.

2. An article carrier according to claim 1 wherein the tubular structure is at least partially open at each end and a tubular axis is defined between said ends and wherein the hinged connection between the flaps and the one of the plurality of panels is parallel to the tubular axis.

3. An article carrier according to claim 1 wherein the tubular structure is at least partially open at each end and a tubular axis is defined between said ends and wherein the hinged connection between the flaps and the one of the plurality of panels is oblique to the tubular axis.

4. An article carrier according to claim 1 wherein said one of the plurality of panels is a top panel.

5. An article carrier according to claim 1 wherein the flaps are hingedly connected to said one of the plurality of panels by a hinged connection in the form of a first fold line.

6. An article carrier according to claim 5 wherein the plurality of panels include a pair of opposed side walls and the flaps fold towards a respective one of the opposed side walls.

7. An article carrier for packaging one or more articles each having a recess, the article carrier comprising a plurality of panels forming a tubular structure for surrounding the one or more articles and an article retention device for engaging a recess of one of the one or more articles to inhibit movement of said article within the tubular structure, wherein the article retention device comprises a flap hingedly connected to one of the plurality of

panels, the article carrier further comprises a dispenser feature having an access panel, and wherein the flap is hingedly connected to the access panel so as to provide a tear initiation device for the dispenser.

8. An article carrier according to claim 7 wherein the access panel is defined at an end of the article carrier, the access panel is defined in part by a free end edge of the article carrier and in part by a severable line extending from the flap.

9. An article carrier according to claim 7 wherein the access panel is defined in an intermediate portion of the article carrier, the access panel is defined at least in part by a pair of severable lines extending from the flap, the pair of severable lines are spaced apart from each end of the article carrier.

10. An article carrier for packaging one or more articles each having a recess, the article carrier comprising a plurality of panels forming a tubular structure for surrounding the one or more articles and an article retention device for engaging a recess of one of the one or more articles to inhibit movement of said article within the tubular structure, the article retention device comprising a flap hingedly connected by a hinged connection to one of the plurality of panels, the flap comprising a hinged edge defined by the hinged connection and a free edge, wherein the free edge extends from a first end of the hinged connection to a second end of the hinged connection, and wherein the free edge is arcuate or curved across or along its entire extent.

11. An article carrier according to claim 10 wherein the hinged edge of the flap is disposed closer to one of a pair of opposed side walls than the free edge in an unfolded condition.

12. An article carrier according to claim 10 wherein the flap in an operative condition is reverse folded into face to face relationship with an inner surface of the panel to which it is hinged, in the operative position the free edge of the flap is disposed closer to one of a pair of opposed side walls than the hinged edge.

13. An article carrier according to claim 10 wherein the hinged connection is oriented non-parallel to an open end of the tubular structure.

14. An article carrier according to claim 10 wherein the hinged connection is obliquely oriented to an open end of the tubular structure.

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15. An article carrier according to claim 10 wherein the hinged connection is perpendicularly oriented with respect to an open end of the tubular structure.

16. An article carrier according to claim 10 wherein the article retention device is located in a recess defined in an end of said one of the plurality of panels.

17. An article carrier according to claim 16 wherein the top panel comprises at least one recessed end edge to which article retention device is hingedly connected.

18. An article carrier according to claim 17 wherein the flap partially defines the at least one recessed end edge of the top panel in an unfolded condition.

19. An article carrier according to claim 16 wherein the article carrier comprises a pair of article retention devices at an end of said one of the plurality of panels, and wherein the pair of article retention devices are spaced apart from each other by a recess struck from or defined in an end edge of the top panel.

20. An article carrier according to claim 19 wherein the pair of article retention devices are hingedly connected to the top panel by a respective fold line, said fold lines being divergently arranged with respect to each other.

21. An article carrier according to claim 10 wherein the flap is folded inwardly about a hinged connection to said one of the plurality of panels more than 90 degrees so as to be substantially in face to face relationship with the panel to which it is hinged.

22. An article carrier according to claim 10 wherein the article retention device comprises a fold line defined in the flap and forming a keel for increasing the security of the article within the article carrier.

23. An article carrier according to claim 22 wherein the fold line defines in part a wing tab, the wing tab coupled to the said one of the plurality of panels only through its hinged connection to the flap.

24. An article carrier according to claim 22 wherein the fold line is arranged to converge at an end of the hinged connection to form a vertex, and wherein a cutaway separates the wing tab from the said one of the plurality of panels, the cutaway intersects with the vertex between the hinged connection and fold line.

25. An article carrier according to claim 10 wherein the article carrier is of the wrap-around type, comprising a composite wall formed from two panels secured together.

26. An article carrier according to claim 25 wherein the composite wall is a bottom wall of the tubular structure.

27. An article carrier according to claim 10 wherein the flap of the article retention device is contained entirely within the footprint of said one of the plurality of panels.

28. An article carrier according to claim 19 wherein the flaps of the pair of article retention devices are contained entirely within the footprint of the top panel.

29. A blank for forming an article carrier, the blank comprising a plurality of panels for forming a tubular structure for surrounding at least two articles each having a recess, the blank comprising a pair of article retention devices each comprising a flap for engaging a recess of a respective one of said at least two articles to inhibit movement of the articles within the tubular structure, wherein the flaps are hingedly connected by a respective hinged connection to one of the plurality of panels in opposition to each other, the blank comprising a pair of handle openings defined in said one of the plurality of panels, the handle openings and the flaps define a handle in said one of the plurality of panels, the handle is coupled or connected to said one of the plurality of panels by four arms, each arm is defined by a region of said one of the plurality of panels disposed between one of the handle openings and one of the flaps.

30. A blank according to claim 29 wherein in a setup condition the tubular structure is at least partially open at each end and a tubular axis is defined between said ends and wherein the hinged connection between the flaps and the one of the plurality of panels is parallel to the tubular axis.

31. A blank according to claim 29 wherein in a setup condition the tubular structure is at least partially open at each end and a tubular axis is defined between said ends and wherein the hinged connection between the flaps and the one of the plurality of panels is oblique to the tubular axis.

32. A blank according to claim 29 wherein the flaps are hingedly connected to said one of the plurality of panels by a hinged connection in the form of a first fold line.

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33. A blank according to claim 32 wherein the plurality of panels include a pair of opposed side walls hingedly connected to a top panel along hinged edges thereof and the flaps fold towards a respective one of the hinged edges.

34. A blank for forming an article carrier, the blank comprising a plurality of panels forming a tubular structure for surrounding one or more articles having a recess and an article retention device for engaging the recess of one of the one or more articles to inhibit movement of said article within the tubular structure, wherein the article retention device comprises a flap hingedly connected to one of the plurality of panels, the blank further comprises a dispenser feature having an access panel, and wherein the flap is hingedly connected to the access panel so as to provide a tear initiation device for the dispenser.

35. A blank for forming an article carrier, the blank comprising a plurality of panels forming a tubular structure for surrounding the one or more articles having a recess and an article retention device for engaging the recess of one of the one or more articles to inhibit movement of said article within the tubular structure, the article retention device comprising a flap hingedly connected by a hinged connection to one of the plurality of panels, the flap comprising a hinged edge defined by the hinged connection and a free edge, wherein the free edge extends from a first end of the hinged connection to a second end of the hinged connection, and wherein the free edge is arcuate or curved across or along its entire extent.

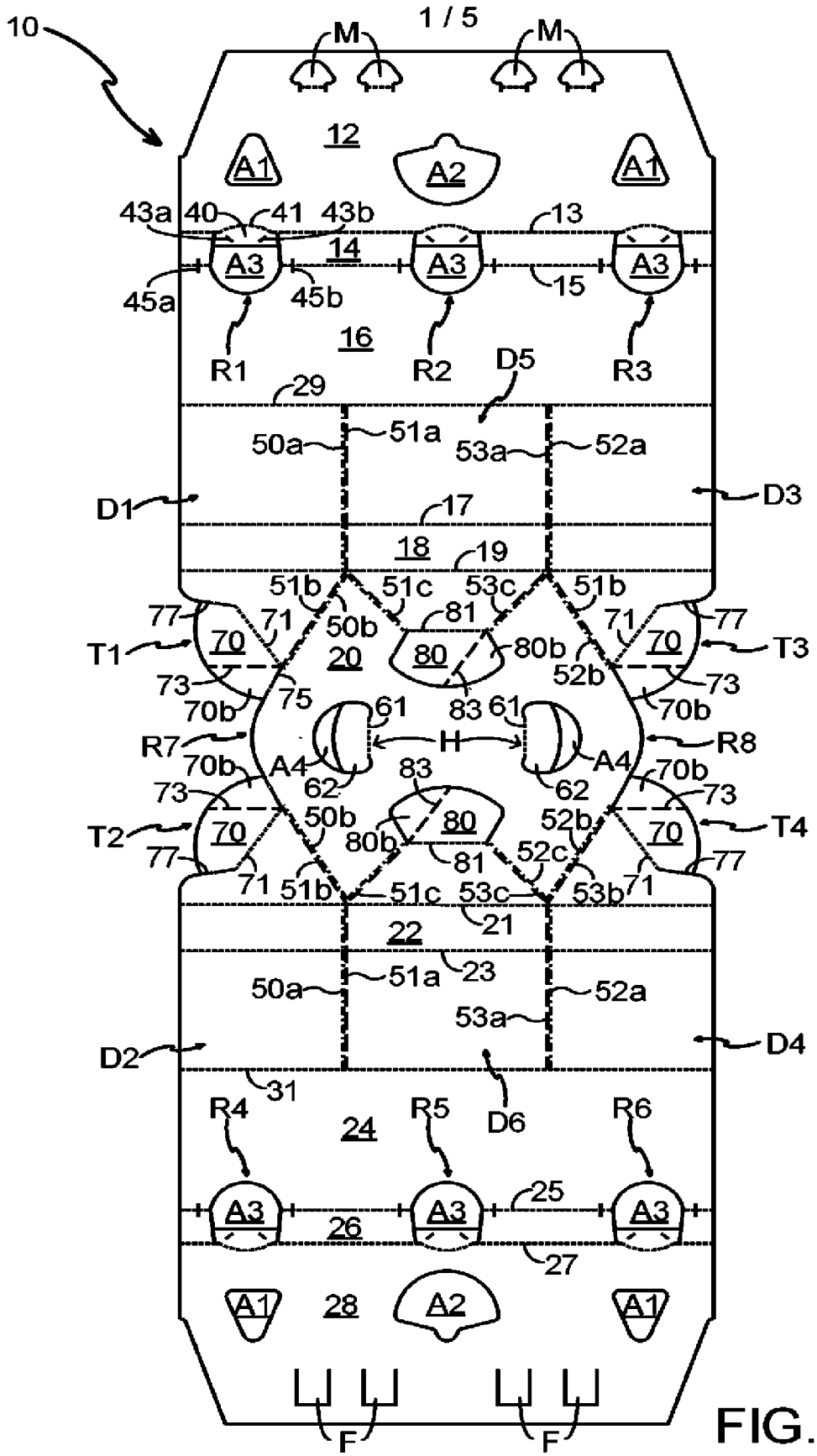

10
M
M
12
A1
A2
A1
43a
40
41
43b
13
A3
14
A3
A3
15
45a
45b
16
R1
R2
D5
R3
29
50a
51a
53a
52a
D1
D3
17
18
19
51b
51c
53c
51b
77
71
50b
81
71
77
T1
70
20
80
80b
70
T3
52b
73
73
70b
75
70b
61
83
61
R7
H
R8
70b
A4
A4
70b
62
83
62
73
73
T2
70
50b
80
52b
70
T4
77
80b
81
52c
77
71
51b
51c
53c
53b
71
21
22
23
50a
51a
52a
53a
D2
D4
31
R4
R5
D6
R6
24
A3
A3
25
A3
26
27
A1
28
A2
A1
F
F

FIG. 1

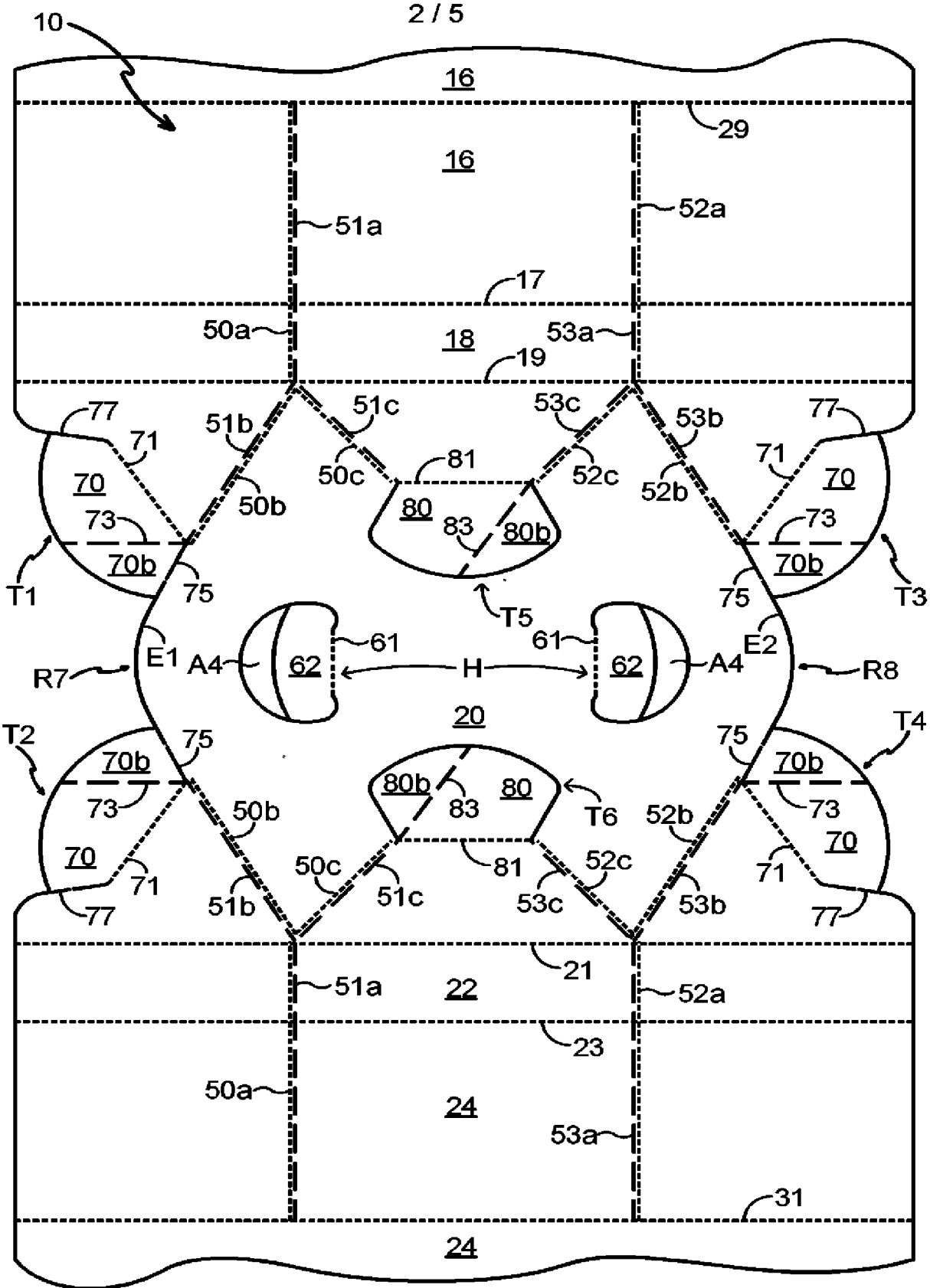

10
16
16
29
51a
52a
17
50a
18
53a
19
77
71
51b
51c
53c
53b
77
71
70
50b
50c
81
52c
52b
70
80
83
80b
73
73
70b
70b
T1
75
75
T3
T5
E1
61
61
E2
R7
A4
62
H
62
A4
R8
20
T2
75
75
T4
70b
70b
80b
80
73
83
T6
73
50b
52b
70
70
50c
81
52c
71
71
51b
51c
53c
53b
77
77
21
51a
22
52a
23
50a
24
53a
31
24

FIG. 1B

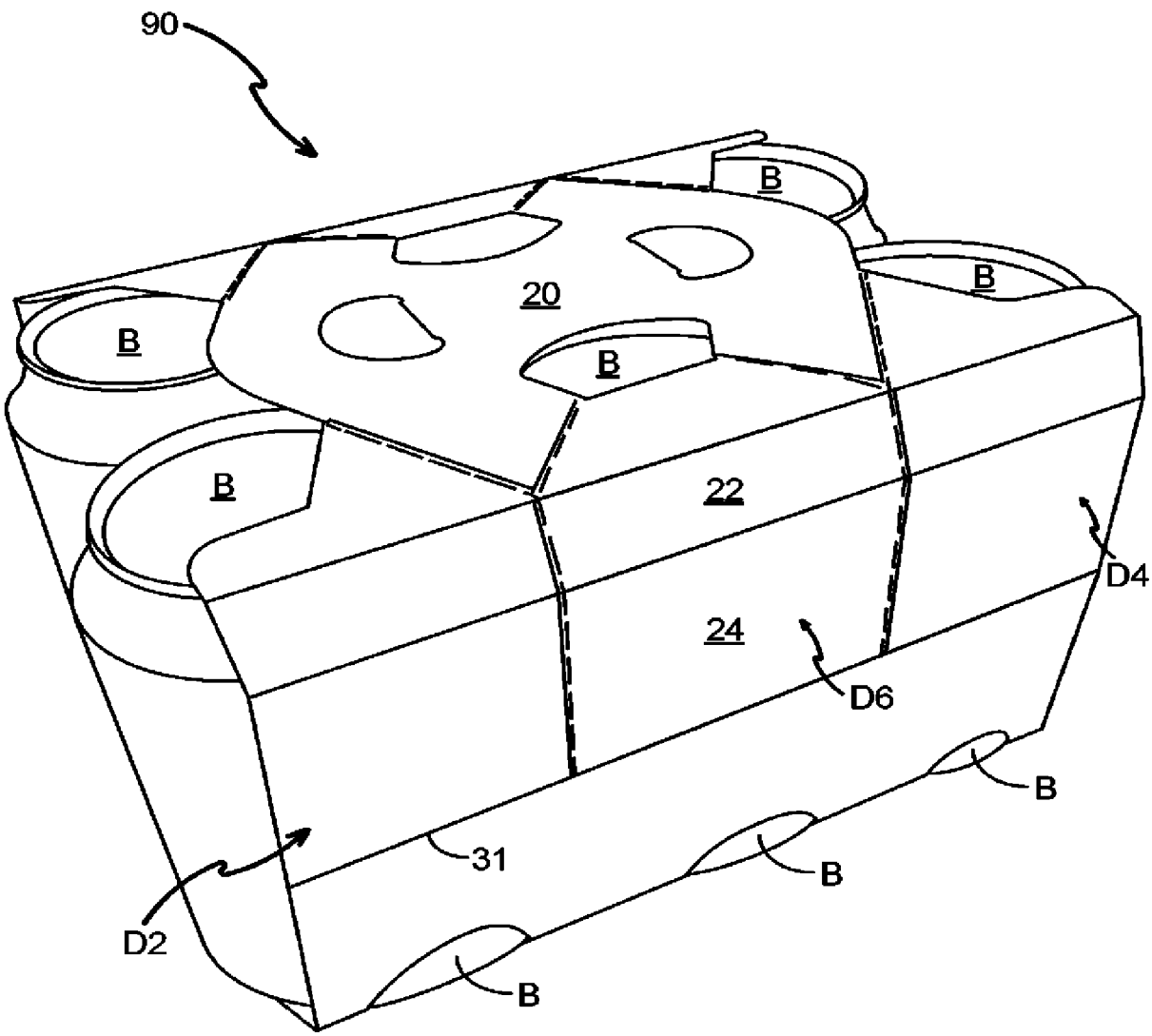


FIG. 2

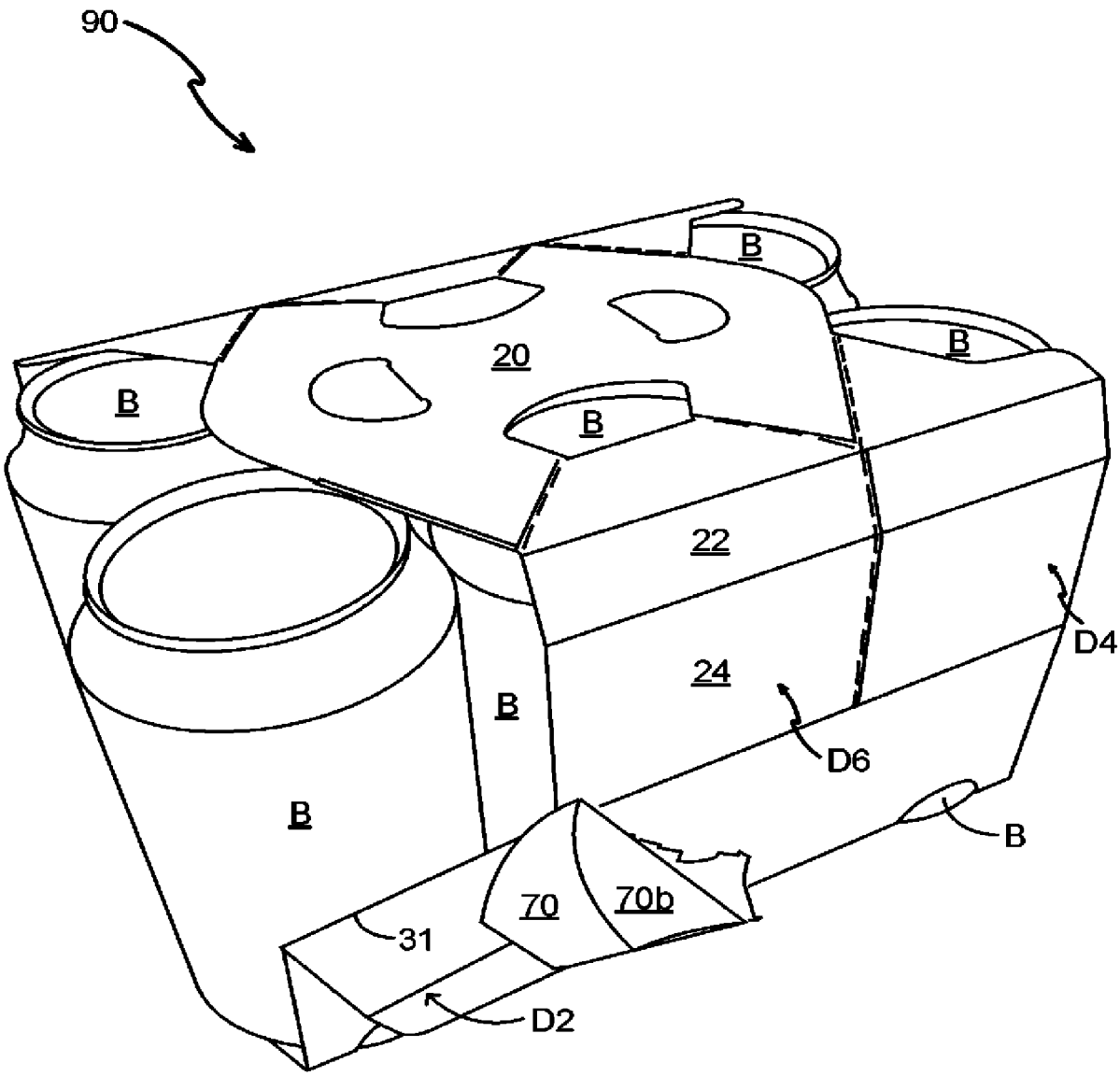


FIG. 3

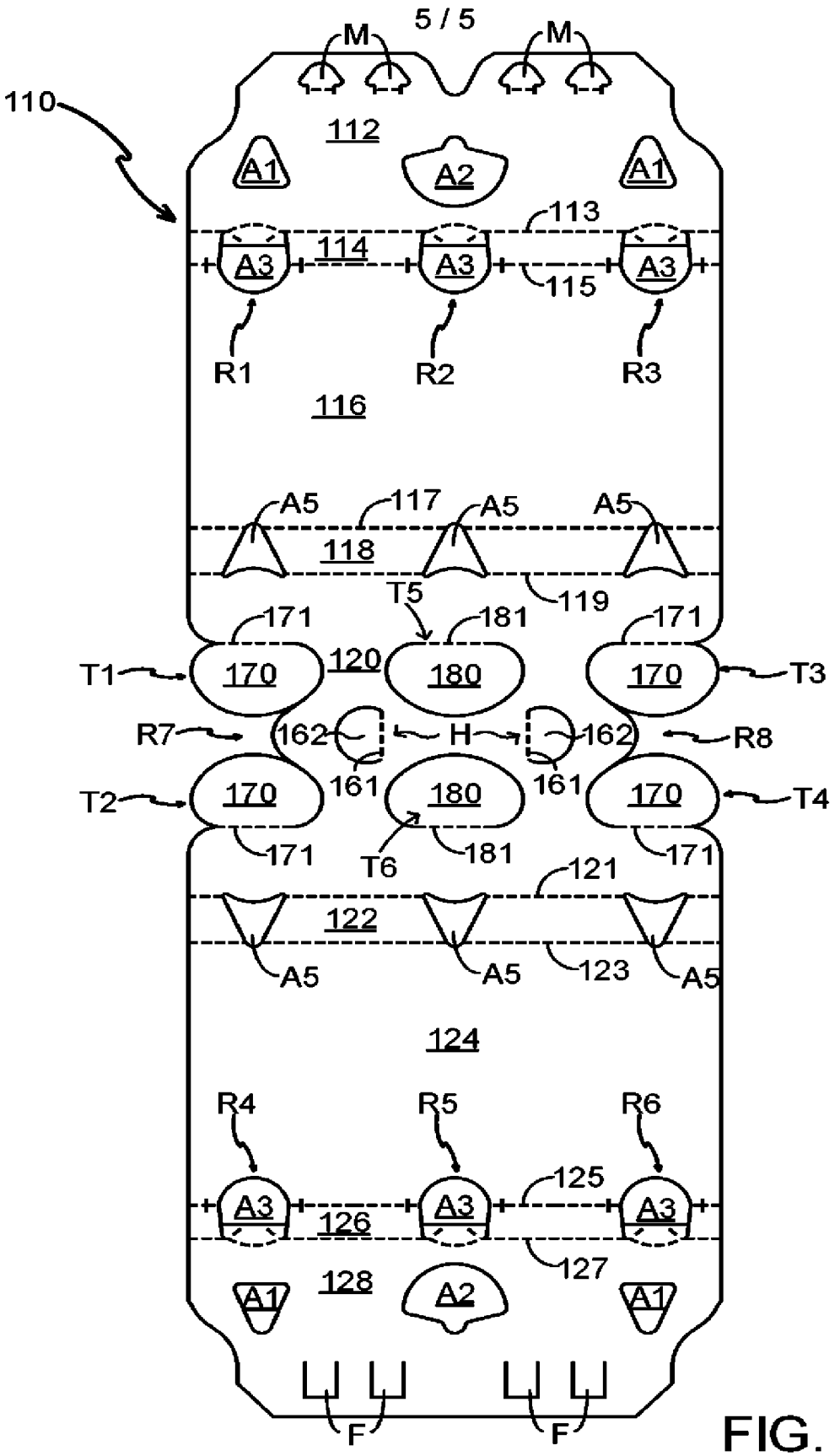

M
M
110
112
A1
A2
A1
113
A3
114
A3
A3
115
R1
R2
R3
116
A5
117
A5
A5
118
T5
119
171
181
171
T1
170
120
180
170
T3
R7
162
H
162
R8
T2
170
161
180
161
170
T4
171
T6
181
171
121
122
A5
A5
123
A5
124
R4
R5
R6
A3
125
A3
A3
126
127
128
A1
A2
A1
F
F

FIG. 4

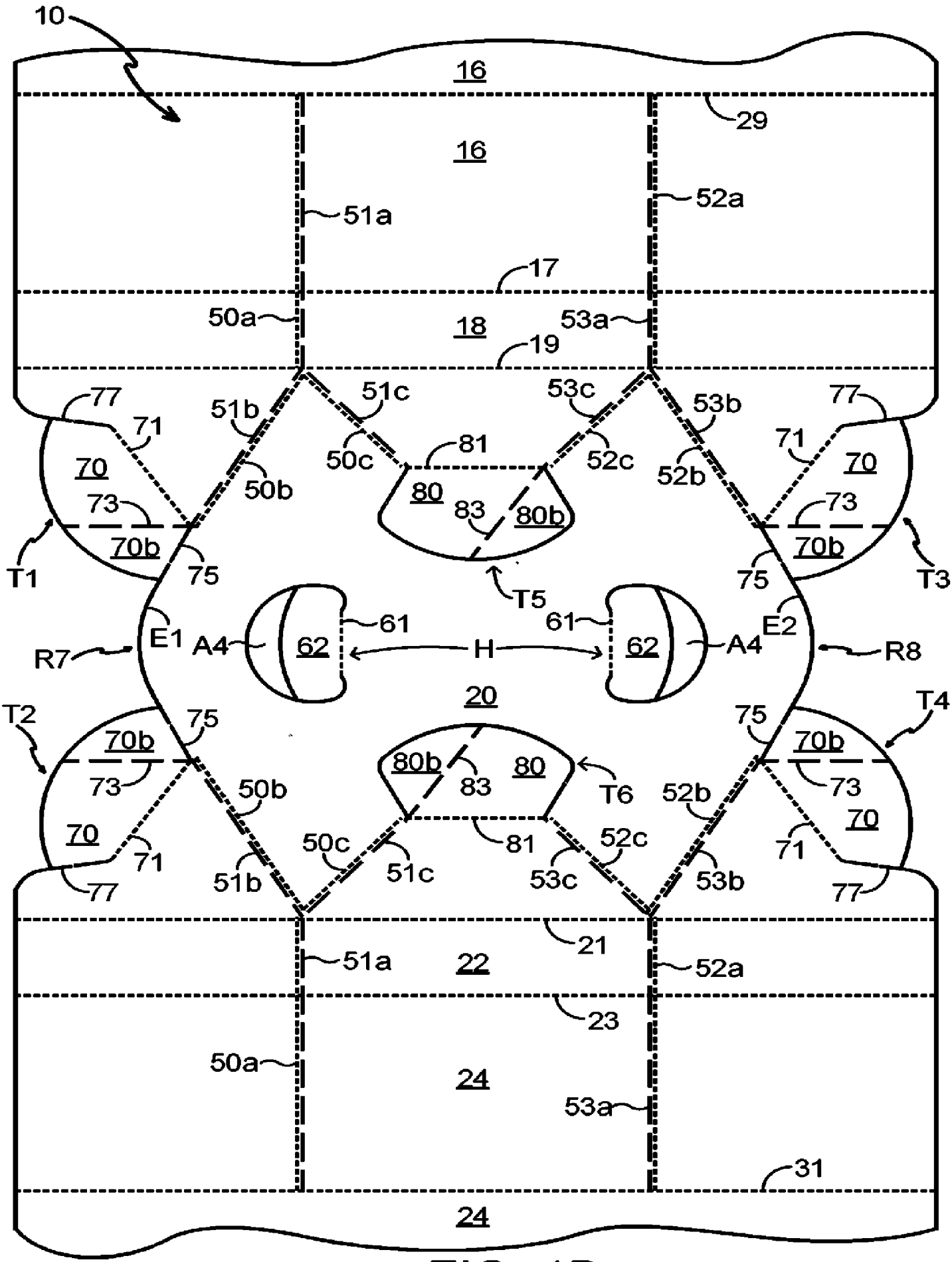

10
16
16
29
51a
52a
17
50a
18
53a
19
77
71
51b
51c
53c
53b
77
70
50b
50c
81
52c
52b
71
70
80
73
83
80b
73
70b
T1
75
T5
75
70b
T3
E1
61
61
E2
R7
A4
62
H
62
A4
R8
20
T2
75
T4
75
70b
80b
83
80
70b
73
T6
73
50b
52b
70
70
50c
81
52c
71
71
51b
51c
53c
53b
77
77
21
51a
22
52a
23
50a
24
53a
31
24

FIG. 1B