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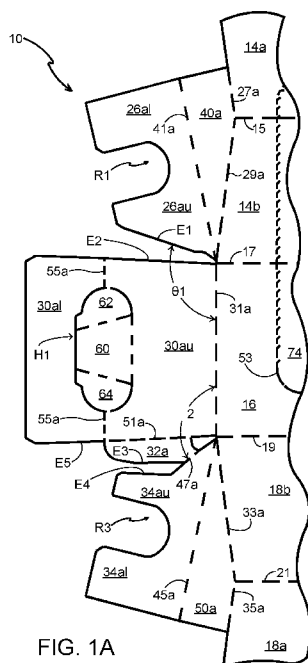
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(54) Title: CARTON AND BLANK THEREFOR



(57) Abstract: Aspects of the disclosure relate to a carton (90) for packaging one or more articles B and a blank (10) for forming the carton. The carton may have at least one display window W for presentation of an article therein. The carton comprises a plurality of panels defining a tubular structure and including a top panel (16), a first side panel (14), a second side panel (18), a first base panel (12) hingedly connected to the first side panel and second base panel (20) hingedly connected to the second side panel. The carton further comprises at least one end closure structure including a top end flap (30a) hingedly connected to the top panel (16) by a first fold line (31a), a first side end flap (26a) hingedly connected to the first side panel (14) and a second side end flap (34a) hingedly connected to the second side panel (18).

CARTON AND BLANK THEREFOR

TECHNICAL FIELD

5 The present invention relates to cartons and to blanks for forming the same. More specifically, but not exclusively, the invention relates to a carrier of the wrap-around type having a display window for presentation of an article therein.

BACKGROUND

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

It is an object of the present disclosure to provide an article carrier having a display window for displaying an article within the carrier in which an orientation device enables the orientation of the article to be adjusted whilst within the carrier.

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It is also desirable to provide the article carrier with an end closure structure which is strong and robust whilst also being readily assembled in an automated fashion in a packaging machine.

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

SUMMARY

30 An aspect of the invention provides a carton for packaging one or more articles. The carton comprises a plurality of panels connected together to define an interior of the carton. The plurality of panels defines a tubular structure and includes: a top panel; a first side panel; a second side panel; a first base panel, hingedly connected to the first side panel; and a second base panel, hingedly connected to the second side panel. The first and second base panels are disposed in at least partially overlapping relationship with each other. The first base panel
35 is disposed a flat face-contacting arrangement with an outer surface of the second base panel. The carton further comprises at least one end closure structure. The at least one end closure structure comprises: a top end flap, hingedly connected to the top panel by a first fold line; a

first side end flap, hingedly connected to the first side panel; and a second side end flap, hingedly connected to the second side panel. The top end flap is secured to an outer surface of each of the first and second side end flaps to at least partially close an end of the tubular structure. The first side end flap has a free upper edge which is separate and spaced apart
5 from an adjacent free side edge of the top end flap. The free upper edge and the first fold line define a first obtuse angle therebetween when the carton is a blank form.

Advantageously, a glueable region provided by the first and second side end flaps may be increased in area over cartons or carriers having a gusset on both the side edges of the top
10 or major end flap.

Optionally, a free upper edge of the first side end flap is disposed below the first fold line.

Optionally, the second base panel has a female locking feature comprising a locking aperture,
15 the first base panel has a male locking feature comprising a locking tab, wherein in use the locking tab is received in the locking aperture such that the first and second base panels are secured together to provide a base wall.

Optionally, the second side end flap is connected or coupled to the top end flap through, by
20 or via a gusset panel. The gusset panel may be folded with respect to the second side end flap and the top end flap such that the gusset panel is tucked between the top end flap and the second side end flap.

Optionally, the top end flap comprises an upper portion hingedly connected to the top panel
25 by a first fold line and a lower portion hingedly connected to the upper portion by a second fold line. The gusset panel is not directly connected to the lower portion (for example a hinged connection between the upper portion of the top end flap and the gusset panel terminates at or before the second fold line). The upper portion of the top end flap interconnects the lower portion and the gusset panel, the upper portion of the top end flap couples the lower portion
30 of the top end flap to the gusset panel.

Optionally, the one of the first and second side panels has a window opening for exposing to view an article disposed in the interior of the carton.

Optionally, the top end flap has a handle opening and the first side end flap has a cutout which
35 is disposed in alignment with the handle opening.

Optionally, a free upper edge of the first side end flap is disposed above a handle opening.

Optionally, the gusset panel is hingedly connected to the second side end flap by a third fold line which defines a second obtuse angle with respect to the first fold line when the carton is in the blank form, the second obtuse angle may be greater than the first obtuse angle.

Optionally, the top end flap has a handle opening and the second side end flap has a cutout which is disposed in alignment with the handle opening. The gusset panel is hingedly connected to a side edge of an upper portion of the top end flap. The gusset panel is disposed between the side edge of the upper portion of the top end flap and the handle opening.

The gusset panel may be disposed above a hinged connection between an upper portion of the top end flap and a lower portion of the top end flap (that is to say the gusset panel may be located between the first fold line and the second fold line).

Optionally, the top end flap has a handle opening and the second side end flap has a cutout which is disposed in alignment with the handle opening. The gusset panel is hingedly connected to a side edge of an upper portion of the top end flap. The gusset panel is disposed between the side edge of the upper portion of the top end flap and the cutout.

Optionally, the top end flap has a handle opening and the second side end flap has a cutout which is disposed in alignment with the handle opening. The gusset panel is hingedly connected to a side edge of an upper portion of the top end flap by a hinged connection. The gusset panel comprises a width dimension defined between the hinged connection to the top end flap and an opposing edge. The cutout is spaced apart from the side edge of the upper portion of the top end flap by a first linear dimension, the first linear dimension being greater than or equal to the width dimension of the gusset panel.

Optionally, the top end flap has a handle opening and the second side end flap has a cutout which is disposed in alignment with the handle opening. The gusset panel is hingedly connected to a side edge of an upper portion of the top end flap. The gusset panel comprises a width dimension defined between a hinged connection to the top end flap and an opposing free edge. The handle opening is spaced apart from the side edge of the upper portion of the top end flap by a second linear dimension, the second linear dimension being greater than or equal to the width dimension of the gusset panel.

Optionally, the top end flap has a handle opening and the second side end flap has a cutout which is disposed in alignment with the handle opening. The gusset panel is hingedly connected to a side edge of an upper portion of the top end flap. The third fold line comprises a first end and second end. The first and second ends of the third fold line are disposed in closer proximity to the side edge of the upper portion of the top end flap than the cutout.

Optionally, the top end flap has a handle opening and the second side end flap has a cutout which is disposed in alignment with the handle opening. The gusset panel is hingedly connected to a side edge of an upper portion of the top end flap. The third fold line comprises a first end and second end. The first and second ends of the third fold line are disposed in closer proximity to the side edge of the upper portion of the top end flap than the handle opening.

Another aspect of the invention provides a blank for forming a carton. The blank comprises a plurality of panels for forming walls of a tubular structure. The plurality of panels includes a top panel, a first side panel, a second side panel, a first base panel hingedly connected to the first side panel and second base panel hingedly connected to the second side panel. The first and second base panels may be arranged to be disposed in at least partially overlapping relationship with each other in a setup carton. The first base panel may be disposed a flat face-contacting arrangement with an outer surface of the second base panel. The blank further comprises at least one end closure structure. The at least one end closure structure comprises a top end flap hingedly connected to the top panel by a first fold line, a first side end flap hingedly connected to the first side panel and a second side end flap hingedly connected to the second side panel. The top end flap is arranged to be secured to an outer surface of each of the first and second side end flaps to at least partially close an end of the tubular structure when the end closure structure is in a setup condition. The first side end flap has a free upper edge which is separate and spaced apart from an adjacent free side edge of the top end flap. The free upper edge and the first fold line may define a first obtuse angle therebetween.

Optionally, the second side end flap is connected to the top end flap through a gusset panel. The gusset panel may be arranged to be folded with respect to the second side end flap and the top end flap such that the gusset panel is tucked between the top end flap and the second side end flap in a setup carton.

Optionally, the gusset panel is hingedly connected to the second side end flap by a third fold line which defines a second obtuse angle with respect to the first fold line. The second obtuse angle is greater than the first obtuse angle.

- 5 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.
- 10 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
- 15 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.

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BRIEF DESCRIPTION OF THE DRAWINGS

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

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

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

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

Figure 3 is an end view of a carton formed from the blank of Figure 1.

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DETAILED DESCRIPTION OF EMBODIMENTS

- Detailed descriptions of specific embodiments of the package, blanks and cartons are disclosed herein. It will be understood that the disclosed embodiments are merely examples of the way in which certain aspects of the invention can be implemented and do not represent
- 35 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

cartons described herein may be embodied in various and alternative forms. The Figures are not necessarily to scale and some features may be exaggerated or minimised to show details of particular components. Well-known components, materials or methods are not necessarily described in great detail in order to avoid obscuring the present disclosure. Any specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a basis for the claims and as a representative basis for teaching one skilled in the art to variously employ the invention.

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 Figures 2 and 3, for containing and carrying a group of primary products such as, but not limited to, bottles or cans, hereinafter referred to as articles B, as shown in Figure 2. The blank 10 forms a secondary package for packaging at least one primary product container or package.

In the embodiments detailed herein, the terms “carton” and “carrier” refer, for the non-limiting purpose of illustrating the various features of the invention, to a container 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. Exemplary containers include bottles B (for example metallic, glass or plastics bottles), cans (for example aluminium cans), tins, pouches, packets and the like.

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

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

such as one or more of tear-resistance, good glue-ability, heat sealability, or other desired functional properties.

In the embodiment illustrated in Figure 1, the blank 10 is configured to form a carton or carrier 90 for packaging an exemplary arrangement of exemplary articles B. In the embodiment illustrated the arrangement is a 4 x 2 matrix or array; in the illustrated embodiment two rows of four articles B are provided, and the articles B are 12oz (approx. 355ml) glass bottles.

Alternatively, the blank 10 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.

The present invention relates generally to a carton 90 for packaging articles B which carton 90 comprises an article engaging arrangement for engaging an article B. The embodiments described herein further comprise a viewing window arrangement or display window W struck from a side wall 18a/18b of the carton 90. The window presents, for view, a substantial portion of an article B contained within the carton 90, adjacent to that side wall 18a/18b. The embodiments described herein may also comprise a viewing window arrangement or display window in at least one end wall.

Turning to Figure 1, there is illustrated a blank 10 for forming a carton 90 according to a first embodiment. The blank 10 comprises a plurality of main panels 12, 14a, 14b, 16, 18b, 18a, 20 for forming a tubular structure. The plurality of main panels 12, 14a, 14b, 16, 18b, 18a, 20 comprises; a first base panel 12, a first lower side panel 14a, a first upper side panel 14b, a top panel 16, a second upper side panel 18b, a second lower side panel 18a and a second base panel 20. The plurality of panels 12, 14a, 14b, 16, 18b, 18a, 20 may be arranged in a linear series hinged one to the next by corresponding fold lines 13, 15, 17, 19, 21, 23. The first upper side panel 14b and the first lower side panel 14a form a first side wall 14a/14b of a carton 90. The second upper side panel 18b and the second lower side panel 18a form a second side wall 18a/18b of a carton 90.

The blank 10 is foldable to form a package 90 as illustrated in Figures 2 and 3. The first and second base panels 12, 20 are engageable with one another in an overlapping relationship to form a composite base wall 12/20 of the carton 90. The blank 10 may comprise a complementary locking mechanism for securing the second base panel 20 to the first base panel 12.

The first base panel 12 may comprise at least one first part M (also referred to herein as male locking feature M) of the complementary locking mechanism. The second base panel 20 may comprise at least one second part F (also referred to herein as female locking feature F) of the complementary locking mechanism. In the illustrated embodiment, the first base panel 12 comprises a plurality of male tabs M (also referred to herein as locking tabs M). The second base panel 20 comprises a plurality of female tabs F defining openings (also referred to herein as locking apertures) in the second base panel 20, the openings in the second base panel 20 being 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 20 to form the openings and to bear against the male tabs M when received therein. The openings form a receiver for receiving the male tabs M. In some embodiments the female tabs F may be omitted.

The first and second base panels 12, 20 may comprise at least one first aperture A1. In the illustrated embodiment, the first base panel 12 comprises four first apertures A1, the second base panel 20 comprise three first apertures A1. The second base panel 20 may comprise at least one second aperture A5. In the illustrated embodiment, the second base panel 20 comprise one second aperture A5. The first and second apertures A1, A5 may be employed to facilitate construction of the carton 90. A packaging machine component may engage with the first and second apertures A1, A5 to enable the plurality of panels 12, 14a, 14b, 16, 18b, 18a, 20 to be tightened about a group of articles B. The first and second apertures A1, A5 may also be employed to facilitate alignment of the first and second base panels 12, 20 with respect to each other or to align the first part of the complementary locking mechanism with the second part of the complementary locking mechanism.

The complementary locking mechanism illustrated and described is entirely optional. Stated more specifically, the complementally locking mechanism may be omitted and the first and second base panels 12, 20 may be secured together in a flat face-contacting arrangement by means of glue or any other adhesive.

The blank 10 may comprise at least one first display window W for presentation of an article B.

Optionally, the blank 10 comprises a first display window W formed in each of the second upper and second lower side panels 18b, 18a.

The first display window W comprises an opening in defined in part in the second upper wall or panel 18b and in part in the second lower side wall or panel 18a. The opening is defined in

part by: a first displaceable tab or flap 50a; in part by a second displaceable tab or flap 50b; in part by a first window aperture A2 struck in part from the second upper side wall 18b and the second lower side wall 18a; and in part by a second window aperture A3 struck from the second upper side wall 18b. The first and second displaceable flaps 50a, 50b are separated from each other in part by the first window aperture A2 and in part by a severable line in the form of a cutline. The second window aperture A3 defines upper edges of each of the first and second displaceable flaps 50a, 50b. The cutline extends between the first window aperture A2 and the second window aperture A3. The first and second displaceable flaps 50a, 50b are hinged to the second lower side panel 18a by fold lines 51c, 51d respectively. The first and second displaceable flaps 50a, 50b are hinged to the second upper side panel 18b by fold lines 51a, 51b respectively. The fold line 51a is contiguously arranged with the fold line 51c and the fold line 51b is convergently arranged with respect to the fold line 51d. The fold line 51a and the fold line 51c define an oblique angle therebetween. The fold line 51b is contiguously arranged with the fold line 51d and the fold line 51b is convergently arranged with respect to the fold line 51d. The fold line 51b and the fold line 51d define an oblique angle therebetween.

The first and second displaceable flaps 50a, 50b are hingedly connected to the second upper and second lower side walls 18b, 18a and are positioned opposite to one another.

In this way the fold lines 51a, 51b, 51c, 51d, in the illustrated embodiment, form non-linear hinged connections. In other embodiments the hinged connections, fold lines, may be curvilinear or arcuate or may be comprised of two or more linear portions arranged contiguously and divergently with respect to each other.

When the tabs 50a, 50b are displaced or folded with respect to the second side wall 18a/18b to display an article B as shown in Figure 2, the non-linear hinged connection increases or encourages the tendency of the displaceable tabs 50a, 50b to return to their original, unfolded, planar position. In this way the tabs 50a, 50b, when displaced, are biased towards the article B displayed within the window W. The tabs 50a, 50b form a frame about the displayed article B and may at least partially separate the displayed article B from adjacent articles B in the row of articles B proximate the second side panel 18a/18b. The tabs 50a, 50b may at least partially conceal aforesaid adjacent articles B.

The tabs 50a, 50b are visible through the display window W in a set up carton 90.

At least a portion of the display window is larger in dimension, wider, than an adjacent portion of the article B such that the full width of a portion of the article B is visible through the display window W.

- 5 Optionally, the blank 10 comprises a carrying handle structure H1, H2 in each of the top end closure flaps 30a, 30b. The carrying handle structures H1, H2 may be employed by a user to carry the carton 90. The first top end closure flap 30a comprises a first carrying handle structure H1 having a first handle opening defined at least in part by a handle flap 60 struck from the first top end closure flap 30a. The handle flap 60 is hinged to the first top end closure
- 10 flap 30a by a hinged connection in the form of a fold line 61. The handle flap 60 comprises a pair of fold lines 63, 65 extending from the fold line 61 to an opposing side edge of the handle flap 60 so as to define a pair of foldable end portions 62, 64. The pair of fold lines are arranged so as to diverge towards the fold line 61.
- 15 The second top end closure flap 30b comprises a second carrying handle structure H2 which is substantially the same in construction as the first carrying handle structure H1 and will not be described in further detail.

The blank 10 comprises at least one end closure structure for at least partially closing an end

20 of a tubular structure defined by the plurality of panels 12, 14a, 14b, 16, 18b, 18a, 20.

In the illustrated embodiment an end closure structure is provided for partially closing each end of the tubular structure.

- 25 Each of the end closure structures may comprise a second display window for the display of one or more articles B disposed adjacent thereto. In other embodiments, one of the second display windows may be omitted such that a display window is provided at only one end of the tubular structure, in still other embodiments both the second display windows may be omitted.

- 30 The blank 10 comprises a first end closure structure, see Figures 1 and 1A, comprising a plurality of end closure panels 24a, 26a, 30a, 32a, 34a, 36a, 38a, 40a, 42a, 48a, 50a.

The first end closure structure comprises a top end closure flap 30a hingedly connected to the top panel 16 by a fold line 31a.

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The first top end closure flap 30a may comprise a fold line 55a extending transversely thereacross.

The fold line 55a may be interrupted by the first handle opening or the handle flap 60.

The first top end closure flap 30a comprises an upper portion 30au and a lower portion 30al.

5

The upper portion 30au of the first top end closure flap 30a is hingedly connected to the lower portion 30al of the first top end closure flap 30a by the fold line 55a.

10 The first top end closure flap 30a (also referred to herein as top end flap 30a) comprises a first side edge E2, the first side edge E2 is a free edge along its entire length, that is to say the first side edge E2 of upper portion 30au is a free edge (free from connection to other panels) and the first side edge E2 of lower portion 30al is a free edge.

15 A first upper end closure flap 26a (also referred to herein as first side end flap 26a) is hingedly connected to a first upper corner panel 40a by a fold line 41a. The first upper corner panel 40a is hingedly connected to the first upper side panel 14b in part by fold line 29a and in part by fold line 27a. Fold line 27a and fold line 29a may be contiguous with each other and may be divergently arranged with respect to each other.

20 The first upper end closure flap 26a comprises an upper portion 26au and a lower portion 26al. The upper portion 26au comprises an upper edge E1. The upper free edge E1 is a free edge and is spaced apart from the adjacent first side edge E2 of the top end closure flap 30a. Upper edge E1 and first side edge E2 define an acute angle therebetween in the blank form shown in Figure 1. Upper edge E1 and first side edge E2 are each divergently arranged with respect
25 to the fold line 17 between the top panel 16 and the first upper side panel 14b.

Upper edge E1 and first side edge E2 are convergently arranged with respect each other and are arranged to converge towards the top panel 16.

30 The free, upper, edge E1 of the upper portion 26au of the first upper end closure flap 26a and the fold line 31a which hinges the top end closure flap 30a to the top panel 16 define a first angle θ_1 therebetween. The first angle θ_1 is an oblique angle and may be an obtuse angle. The first angle θ_1 may be in the range 90° to 120° , may be in the range 90° to 110° , and in some embodiments may be in the range 100° to 110° .

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A second upper end closure flap 34a (also referred to herein as second side end flap 34a) is hingedly connected to a second upper corner panel 50a by a fold line 45a, the second upper

corner panel 50a is hingedly connected to the second upper side panel 18b by a fold line 33a and by a fold line 35a. Fold line 33a and fold line 35a may be contiguous with each other and may be divergently arranged with respect to each other.

5 The second upper end closure flap 34a is hingedly connected to the top end closure flap 30a by a first gusset panel 32a. The second upper end closure flap 34a is hingedly connected to the first gusset panel 32a by a hinged connection in the form of a fold line 47a. The first gusset panel 32a is hingedly connected to the top end closure flap 30a by a hinged connection in the form of a fold line 51a.

10

The first top end closure flap 30a comprises a second side edge E5/51a, the second side edge E5/51a is in part a free edge E5 and in part a hinged edge 51a. That is to say an upper second side edge portion 51a provided by the upper portion 30au is substantially a hinged edge 51a, defined by the hinged connection 51a to the first gusset panel 32a; the second side edge
15 portion E5 provided by the lower portion 30al of the first top end closure flap 30a is a free edge E5.

15

A relief aperture A4 may be struck from, or defined in, the first gusset panel 32a. The relief aperture A4 may interrupt the hinged connection 51a between the first gusset panel 32a and
20 the first top end closure flap 30a proximate the fold line 31a. In such embodiments the majority (greater than 50%) of the second side edge portion E5 provided by the upper portion 30au is a hinged edge 51a.

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The second upper end closure flap 34a comprises an upper portion 34au and a lower portion
25 34al.

25

A lower portion of the handle flap 60 is disposed in overlapping relationship with each of the lower portions 26al, 34al of the first and second upper end closure flaps 26a, 34a, best shown
In Figure 3.

30

The upper portion 34au comprises a first upper edge portion E4. The first upper edge portion E4 is a free edge, which is to say it is free from hinged connections to other panels. The first upper edge portion E4 is spaced apart from an adjacent free side edge E3 of the first gusset panel 32a.

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The upper portion 34au of the second upper end closure flap 34a comprises a second upper edge portion. The second upper edge portion is defined in part by a free edge and in part by the hinged connection, fold line 47a, to the first gusset panel 32a.

- 5 The relief aperture A4 may interrupt the hinged connection 47a between the first gusset panel 32a and the upper portion 34au of the second upper end closure flap 34a proximate the fold line 31a.

- 10 The second side edge E5/51a and the first upper edge portion E4 may define an acute angle therebetween in the blank form as shown in Figure 1. The second side edge E5/51a and first upper edge portion E4 are each divergently arranged with respect to each other and are arranged to diverge towards the top panel 16.

- 15 Second side edge E5/51a and fold line 47a are convergently arranged with respect each other and are arranged to converge towards the top panel 16.

- 20 The fold line 47a, hinging the first gusset panel 32a and the second upper end closure flap 34a, and the fold line 31a, which hinges the top end closure flap 30a to the top panel 16, define a second angle θ_2 therebetween. The second angle θ_2 is an oblique angle and may be an obtuse angle. The second angle θ_2 may be in the range 90° to 135° , may be in the range 90° to 130° , in some embodiments is in the range 120° to 135° and in other embodiments is in the range 120° to 130° .

- 25 In the illustrated embodiment the second angle θ_2 is greater than the first angle θ_1 , ($\theta_2 > \theta_1$).

The free side edge E3 of the first gusset panel 32a intersects with the fold line 47a hinging first gusset panel 32a and the upper portion 34au of the second upper end closure flap 34a.

- 30 The first gusset panel 32a is shaped and arranged such that it does not extend over or about the handle structure, in particular handle opening or the handle flap 60, best illustrated in Figure 3. The first gusset panel 32a may be elongate in shape and narrow enough to be disposed between the handle flap 60 and the hinged edge 51 of the top end closure flap 30a. This may increase the area of the region of the second upper end closure flap 34a available
35 to be secured to the top end closure flap 30a. It may also reduce the risk of the first gusset panel 32a interfering with operation of the carrying handle.

Optionally, the first end closure structure comprises a first lower side end closure flap 24 hingedly connected to the first lower side panel 14a by a first lower corner panel 42a. The first lower side end closure flap 24 is hingedly connected to the first lower corner panel 42a by a hinged connection in the form of a fold line 25a. The first lower corner panel 42a is hingedly connected to the first lower side panel 14a by a hinged connection in the form of a fold line 57a.

Optionally, a second lower side end closure flap 36a is hinged to the second lower side panel 18a by a second lower corner panel 48a. The second lower side end closure flap 36a is hinged to the second lower corner panel 48a by a hinged connection in the form of a fold line 37a.

The second lower corner panel 48a is hinged to the second lower side panel 18a by a hinged connection in the form of a fold line 59a.

Optionally, a bottom end closure flap 38a is hinged to the first base panel 12 by hinged connection in the form of a fold line 39a. The first lower side end closure flap 24a, second lower side end closure flap 36a and bottom end closure flap 38a are arranged to partially close a lower region of an open end of the tubular structure.

The blank 10 comprises a second end closure structure comprising a plurality of end closure panels 24b, 26b, 30b, 32b, 34b, 36b, 38b, 40b, 42b, 48b, 50b. The second end closure structure is substantially the same in construction as the first end closure structure and will not be described in further detail.

Optionally, the blank 10 comprises a dispensing or access feature A for facilitating access to the contents of the carton 90. The access feature A comprises an access panel 72/74 struck in part 74 from the top panel 16 and in part 72 from the first upper side panel 14b. The access panel 72/74 is defined by a weakened line of severance 53 formed as a continuous loop such that the access panel 72/74 is at least partially severable from the carton 90. The access feature A may comprise a tear initiation feature I comprising a pair of tabs T1, T2 hingedly connected to the first upper side panel 14b by respective fold lines and defined by a cutline interrupted by connecting portions or nicks so as to be readily severable. The tear initiation feature I defines a finger opening to enable engagement with the access panel 72/74 for removal thereof.

The first and second upper end closure flaps 26a, 34a may comprise a recessed or contoured free side edge R1, R3 opposing the respective hinged connection 41a, 45a to the first or second upper corner panel 40a, 50a. The contoured free side edges of the first and second upper end closure flaps 28a, 32a are shaped to facilitate the handle flap 60 being folded inwardly of the carton 90. The upper end closure flaps 26b, 34b of the second end closure structure may be similarly arranged.

Optionally, the blank 10 comprises at least one orientation adjustment device 70 for enabling the orientation of an article B.

The orientation adjustment device 70 is arranged such that the article B displayed in the first display window W in the second side wall 18a/18b can be controlled or adjusted. It will be appreciated that the orientation adjustment device 70 may be located such that one or both articles B presented in the second display windows in the end walls of the carton 90 can be controlled or adjusted.

The orientation adjustment device 70 comprises a bottom cutaway or opening (also referred to herein as a second opening) in the form of the second aperture A5 provided in second base panel 20. In the illustrated embodiment the second aperture A5 forms a lower aperture of the orientation adjustment device 70. In other embodiments a lower aperture may be provided is provided in the first base panel 12. In still other embodiments a lower aperture may be provided is provided in each of the first and second base panels 12, 20.

The lower aperture A5 is arranged to be in vertical registry with the article B which is disposed in the first display window W.

In the illustrated embodiment, the lower aperture A5 is arranged to be vertically aligned substantially with the display window W.

The lower aperture A5 may be shaped so as to comprise a "V" or "U" shaped cutaway portion which provides an alignment or assembly guide. This cutaway portion may be engaged by a tool, for example of a packaging machine. The cutaway portion may facilitate alignment of the first base panel 12 with the second base panel 20 when the carton 90 is assembled about a group of articles B. Additionally or alternatively the cutaway portion may facilitate tightening or wrapping of the carton 90 about the group of articles B. It may facilitate pulling the second base panel 20 towards the first side panel 14a/14b so as to increase the degree of overlap

between the first and second base panels 12, 20 such that the complementary locking mechanism may be employed.

5 The orientation adjustment device 70 comprises a top cutaway or opening (also referred to herein as a first opening) in the form of an upper aperture A6 provided at least in part in the top panel 16. In the embodiment of Figure 1 the upper aperture A6 is provided in part in the top panel 16 and in part in the second upper side panel 18b. Extending the aperture A6 into the the first upper side panel 14b may facilitate folding the top panel 16 with respect to the second upper side panel 18b along the fold line 19.

10 In other embodiments, the upper aperture A6 may be provided solely in the top panel 16, so as to be struck from only material forming the top panel 16. Such an arrangement may be advantageous when the article B is returned or lowered to a rest position within the interior chamber of the carton 90.

15 The upper aperture A6 is spaced apart from the display window W (for example from the second window aperture A3) by a portion of the second upper side panel 18b. The region of the second upper side panel 18b separating the upper aperture A6 from the display window W may serve as a retainer to prevent or inhibit removal or egress of the display article B from the carton 90.

20 In such alternative embodiments, a front or outer edge of the upper aperture A6 is provided by the top panel 16 and therefore is oriented horizontally or perpendicularly with respect to direction of travel of the article B as it moves, or descends, into the carton 90. This may reduce the likelihood of a portion of the article B, such as a flange or cap or other closure, from being caught or snagged upon material defining an edge of the upper aperture A6.

25 The upper aperture A6 is arranged to be in vertical registry with the upper end of the article B which is disposed in the display window W. The upper aperture A6 is dimensioned such that an upper portion of said article B can pass through the top panel 16.

The upper aperture A6 is arranged to be vertically aligned with the first display window W.

30 The upper aperture A6 may be dimensioned so as to be smaller than a shoulder portion of the article B. In this way an upper end portion of the article B may pass through the upper aperture A6 but is prevented from being fully withdrawn through the upper aperture A6. The upper aperture A6 may be dimensioned so as to be larger than an upper portion of the article B, this

upper portion may include a cap/closure C of the article B, when the article B is a bottle, the upper portion may include the “finish” and at least some of the “neck” N. The upper portion may be positioned externally of the carton 90. The “shoulder” S, “body” and “heel” of the bottle, being retained within the carton 90.

5

In embodiments having a dispensing or access feature A the upper aperture A6 may interrupt the weakened line of severance 53. The upper aperture A6 may serve to facilitate removal of the access panel.

10 Turning to the construction of the carton 90 as illustrated in Figures 2 and 3, the carton 90 can be formed by a series of sequential folding operations in a packaging machine. The folding process is not limited to that described below and may be altered according to particular manufacturing requirements.

15 A group of articles B is assembled; in the preferred embodiment eight articles B are arranged in a 4 x 2 array. The top panel 16 of the blank 10 is disposed above the group of articles B to provide a top wall 16 of the carton 90. The blank 10 may be orientated with respect to the packaging machine such that the direction arrow F1 indicates the flow direction (downstream direction) of the blank 10. In this first orientation the blank 10 may be wrapped about the group
20 of articles B.

The window panels 50a, 50b are folded inwardly of the carton 90 either prior to or simultaneously with the first and second side walls 14a/14b, 18a/18b being folded about the fold lines 17, 19 so as to be disposed on opposing sides of the group of articles B. The window
25 panels 50a, 50b are disposed such that they are interposed between a pair of adjacent articles B. Folding the window panels 50a, 50b in this manner warps the corresponding one of the first or second side walls 14a/14b, 18a/18b to which they are attached due to the non-linear nature of the fold lines 51a, 51b, 51c, 51d connecting the window panels 50a, 50a to the first side wall 14a/14b. The warping of the first side wall 14a/14b urges the window panels 50a, 50b
30 against the article B.

In other embodiments, the warping or folding of the first and second side walls 14a/14b, 18a/18b may be achieved by other means and need not be as a consequence of folding the window panels 50a, 50b.

35

The first and second side walls 14a/14b, 18a/18b may be planar in alternative embodiments, the window panels may be adapted to form a frame about the display article B.

Once the first and second sidewalls 14a/14b, 18a/18b are folded about the opposing sides of the group of articles B; the second base panel 20 is folded about the fold line 23 so as to be disposed adjacent the base of the group of articles B. The first base panel 12 is then folded
5 about the fold line 13 so as to be in at least partial overlapping relationship with the second base panel 20. The first and second base panels 12, 20 are secured together. Each of the male tabs M is displaced inwardly out of the plane of the first base panel 12. In so doing, each of the female tabs F is displaced inwardly creating a corresponding opening in the second base panel 20. The male tabs M are received in respective ones of the openings so as to lock
10 the first and second base panels 12, 20 together. In this way a tubular structure is formed about the group of articles B.

In some embodiments, the blank 10 may be formed into a tubular structure and subsequently loaded with articles B through at least one open end thereof.

15 The partially assembled carton 90 may be rotated with respect a flow direction of a packaging machine prior to assembling the first and second end closure structures. Direction arrow F2 in Figure 1 shows the flow direction (arrow points in the downstream direction) of the packaging machine relative to the blank 10. In this second orientation the first and second end
20 closure structures may be erected.

The first and second end closure structures are folded about the open ends of the tubular structure. The folding sequence for each of the first and second end closure structures is substantially the same and will be described in more detail by reference to the first end closure
25 structure only.

The first and second upper side end closure flaps 26a, 34a and the first and second upper corner panels 40a, 50a are folded about the fold lines 27a, 29a, 33a, 35a, 41a, 45a so as to partially close a first open end of the tubular structure.

30 The first upper side end closure flap 26a may be folded in a packaging machine by a first tool such as but not limited to a static guide. The first tool slows or retards the first upper side end closure flap 26a with respect to the first side panel 14a/14b to effect a folding operation. The second upper side end closure flap 34a may be folded in a packaging machine by a folding
35 tool such as but not limited to a rotating disc shaped to engage second upper side end closure flap 34a. The folding tool accelerates the second upper side end closure flap 34a with respect to the second side panel 18a/18b to effect a folding operation.

The first gusset panel 32a may facilitate holding the second upper side end closure flap 34a in the correct position for being folded.

- 5 The first gusset panel 32a may prevent or inhibit the second upper side end closure flap 34a from unfolding with respect to the second side panel 18a/18b.

- 10 The first gusset panel 32a may facilitate folding of the second upper side end closure flap 34a with respect to the second side panel 18a/18b when a further folding tool such as a static guide engages the first top end closure panel 30a to fold the first top end closure panel 30a with respect to the top panel 16.

- 15 The first gusset panel 32a at least partially folds in response to folding the second upper side end closure flap 34a. The first top end closure panel 30a may fold, at least partially, in response to folding of the first gusset panel 32a.

The first gusset panel 32a is folded between the first top end closure panel 30a and the second upper side end closure flap 34a to which it is coupled.

- 20 The first top end closure panel 30a is folded about fold line 31a to be brought in to face to face relationship with first and second upper side end closure flaps 26a, 34a and the first gusset panel 32a. On a high-speed packaging machine, folding of the upper side end closure flaps 26a, 34a and the first top end closure flap 30a are achieved almost at the same time. During such a high-speed folding process, the free upper edge E1 of the first upper side end closure
25 flap 26a is brought into sliding contact with the inside surface of the first top end closure flap 30a such that the inward folding movement of the first side end closure flap 26a is guided and assisted by the first top end closure flap 30a which itself is being folded downward.

- 30 An outer or lower region 30al of the first top end closure panel 30a is folded outwardly (or upwardly) with respect to an inner or upper region of the first top end closure panel 30a by folding about fold line 55a.

- 35 It will be appreciated that the outward folding of the lower region 30al of the first top end closure panel 30a may be achieved by inhibiting movement or inward folding of the lower region 30al of the first top end closure panel 30a whilst the upper region 30au of the first top end closure panel 30a is folded inwardly/downwardly about fold line 31a.

Glue or other adhesive treatment is applied to each of the first and second upper side end closure flaps 26a/44a, 34a/46a. In other embodiments the glue may be applied to a corresponding regions of an inner surface of the lower region of the first top end closure panel 30a.

5

The lower region of the first top end closure panel 30a is unfolded with respect to the upper region of the first top end closure panel 30a by folding about fold line 55a to bring the lower region of the first top end closure panel 30a into face contacting relationship with the first and second upper side end closure flaps 26a, 34a.

10

The first top end closure panel 30a is secured to the first and second upper side end closure flaps 26a, 34a.

The first and second lower side end closure flaps 24a, 36a and the first and second lower corner panels 42a, 48a, are folded about the fold lines 25a, 37a, 57a, 59a.

15

The first lower side end closure flap 24a may be secured to the second lower side end closure flap 36a. In some embodiments the first and second lower side end closure flaps 24a, 36a may be dimensioned so as to be arranged in an at least partial overlapping arrangement. Glue or other adhesive treatment may be applied to one of the first and second lower side end closure flaps 24a, 36a so as to secure them together.

20

Glue or other adhesive treatment is applied to each of the first and second lower side end closure flaps 24a, 36a. In other embodiments the glue may be applied to corresponding regions of an inner surface of the bottom end closure flap 38a.

25

The bottom end closure flap 38a is folded about fold line 39a so as to be brought up into face contacting relationship with the first and second lower side end closure flaps 24a, 36a.

The bottom end closure flap 38a is secured to the first and second lower side end closure flaps 24a, 36a.

30

Figures 2 and 3 illustrate a carton 90 in which a second side wall 18a/18b comprises a first display window W exposing to view an article B. The pair of displaceable flaps 50a, 50b form a frame about the article B, best shown in Figure 2. The article B is shown in a first, rest, position in Figure 2.

35

The carton 90 may comprise a second display window provided at one or both ends of the tubular structure forming the carton 90.

5 The second display window is defined in part by free side edge portions of each of the first and second side walls 14a, 18a. The second display window may be defined in part by panels forming an end closure structure partially closing an end the tubular structure forming the carton 90.

10 In this way branding or other indicia provided upon the articles B may be displayed through the first display window W or the second display window provided in one or both ends of the tubular structure. Orientation devices may be provided to enable adjustment of articles B displayed in the first display window W or in the second display window.

15 The article B which is presented in the first display window W in the second side wall 18a/18b is moveable or translatable within the assembled carton 90. A finger or tool (not shown) may be inserted through an opening in the base wall 12/20 formed by the first and second base panels 12, 20.

20 When the article B is moved an upper portion of the article B passes through the upper aperture A6 and is external of the carton 90 as shown in Figures 3 and 6. In this second, deployed, position the article B is readily accessible. The upper portion of the article B may be engaged by a tool or user. The orientation of the article B may be adjusted in the deployed position upon reaching the desired orientation the article B may be returned to the rest position.

A lower portion of the article B is restricted from passing through the opening in the top panel 16 formed from the upper aperture A6; the lower portion has a dimension greater than the first opening.

The package or carton 90 is arranged such that the height of the article B is no greater than the height of the carton 90, wherein the height of the carton 90 is defined by the distance between the top and base walls 16, 12/20.

25

The articles B comprise a main body and a neck portion disposed above the main body; the neck portion comprises a smaller dimension or diameter than the main body. A shoulder region provides a transition between the main body and the neck portion. The top end closure flap 30a may be configured to obscure from view at least the neck portion. In some embodiments,

the shoulder region or an upper portion of the main body or both may be obscured from view by the top end closure flap 30a, 30b.

5 The articles B may be arranged in a desired orientation. The displaceable flaps 50a, 50b may bear against an article B so as to prevent or inhibit rotation of the article B away from the desired orientation.

10 The first and second end closure structures may be tightened so as to bear against the endmost articles B, with frictional forces, so as to prevent or inhibit rotation of the articles B away from a predefined orientation.

15 The present disclosure provides a carton 90 for packaging articles B, as shown in Figures 2 and 3; the carton 90 may have at least one display window for presentation of an article B therein. The carton 90 comprises a plurality of panels forming walls of a tubular structure including a top wall, a first side wall, a base wall, and a second side wall, optionally hingedly connected to each other in a linear series.

20 The plurality of panel including a top panel 16, a pair of first and second opposed side panels 14a/14b, 18a/18b and a pair of inner and outer base panels 12, 20 which are hingedly connected to the first 14a/14b and second 18a/18b side panels respectively.

The first or outer base panel 12 is disposed a flat face-contacting arrangement with an outer surface of the second or inner base panel 20.

25 The carton 90 further comprises at least one end closure structure, the at least one end closure structure comprising a top end flap 30a hingedly connected to the top panel 16 by a first fold line 31a and a pair of first and second side end flaps 26a, 34a hingedly connected to first and second side panels 14a/14b, 18a/18b respectively.

30 The top end flap 30a is secured to an outer surface of each of the side end flaps 26a, 34a to form the at least one end closure structure. The first side end flap 34a has a free upper edge E1 which is separate and spaced apart from an adjacent free side edge E2 of the top end flap 30a.

35 The free upper edge E1 may be disposed below the first fold line 31a.

When the carton is in a blank form, the free upper edge E1 and the first fold line 31a define a first obtuse angle $\theta 1$ therebetween.

5 The inner base panel 20 has a female locking feature F comprising a locking aperture, the outer base panel 12 has a male locking feature M comprising a locking tab. The locking tab is received in the locking aperture such that the inner and outer base panels 20, 12 are interconnected to provide a single bottom wall.

10 The second side end flap 34a is connected to the top end flap 30a through a gusset panel 32a and wherein the gusset panel 32a is folded with respect to the second side end flap 34a and the top end flap 30a such that the gusset panel 32a is tucked between the top end flap 30a and the second side end flap 34a.

15 The gusset panel 32a may be disposed upon the same side of the top end flap 30a as the inner base panel. The gusset panel 32a may be disposed upon the same side of the top end flap 30a as the female locking feature F. Said side of the top end flap 30a may be a trailing side (an upstream side) when the end closure structure is being assembled in a packaging machine.

20 The first side end flap 26a may be disposed upon a leading side (a downstream side) of the top end flap 30a when the end closure structure is being assembled in a packaging machine.

25 The top end flap comprises an upper portion 30au hingedly connected to the top panel 16 by a first fold line 31a and a lower portion 30al hingedly connected to the upper portion 30au by a second fold line 55a and wherein the gusset panel 32a is not directly connected to the lower portion 30al but is connected the lower portion 30al through or via the upper portion 30au.

30 The gusset panel 32a is hingedly connected to the second side end flap 34a by a third fold line 47a which defines a second obtuse angle $\theta 2$ with respect to the first fold line 31a when the carton is in the blank form and wherein the second obtuse angle $\theta 2$ is greater than the first obtuse angle $\theta 1$.

35 Referring in particular to Figure 3, the top end flap 30a has a handle opening and the second side end flap has a recess or cutout R3 which is disposed in alignment with the handle opening. The gusset panel 32a is hingedly connected to a side edge, defined by fold line 51a, of an upper portion 30au of the top end flap 30a. The gusset panel 32a is disposed between

the side edge, defined by fold line 51a, of the upper portion 30au of the top end flap 30a and the handle opening.

5 The gusset panel 32a may be disposed between the side edge of the upper portion 30au of the top end flap 30a and the cutout R3.

10 The gusset panel comprises a width dimension W defined between a free edge E3 and a hinged connection, fold line 51a, to the top end flap 30a. The cutout R3 is spaced apart from the side edge of the upper portion 30au of the top end flap 30a by a first linear dimension x, the first linear dimension x being greater than or equal to the width dimension W of the gusset panel.

15 The handle opening is spaced apart from the side edge of the upper portion 30au of the top end flap 30a by a second linear dimension y, the second linear dimension y may be greater than or equal to the width dimension W of the gusset panel 32a.

20 The third fold line 47a comprises a first end and second end, the first and second ends of the third fold line 47a may be disposed in closer proximity to the side edge of the upper portion 30au of the top end flap 30a than the cutout R3.

The first and second ends of the third fold line 47a may be disposed in closer proximity to the side edge of the upper portion 30au of the top end flap 30a than the handle opening.

25 The carton 90 may comprise an orientation adjustment device for enabling the orientation of an article B which is at least partially exposed to view through the display window. The orientation adjustment device comprises a second cutaway in the form of an aperture or opening in a first panel of the carton. The orientation adjustment device comprises a third cutaway in the form of an aperture or opening in a second panel of the carton 90, wherein the second panel opposes the first panel. The first panel may be a top panel and the second panel may be a base panel. The second cutaway is configured to allow access to a first end, optionally a base portion, of an article B. The third cutaway is configured to prevent the first end of the article B passing therethrough. The second cutaway is configured to allow a second, opposing, end portion of the article (optionally a top or upper portion) of the article to pass through.

35 The article B may comprise a shoulder or other transition region and a main body portion, the second cutaway is configured to prevent or inhibit the article from being fully withdrawn

therethrough. The second cutaway is configured to be smaller in dimension than the transition region or the main body portion or both the transition region and the main body portion.

One or both of the side end flaps 26a, 34a may be hinged to a corner panel 40a, 50a, and the
5 corner panel 40a, 50a may be hinged to one of the first and second side walls 14a/14b, 18a/18b.

The corner panel 40a, 50a may be hinged to said one of the first and second side walls by a non-linear fold line. The non-linear fold line may be configured such that the corner panel 40a,
10 50a bows inwardly so as to be concave when viewed from a viewpoint external of the carton. Advantageously, this may form a biasing device for biasing the corner panel 40a, 50a towards or against an adjacently disposed article.

The top wall 16 of the carton 90 may be shorter than the base wall 12/20 in a longitudinal
15 direction parallel to a tubular axis of the tubular structure formed by the plurality of main panels.

The top wall 16 of the carton 90 may be shorter than the base wall 12/20 in a transverse direction perpendicular to the tubular axis of the tubular structure formed by the plurality of main panels.

20

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.

25 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.

30 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
35 two or more fold lines may be either straight/linear or curved/curvilinear in shape. When linear fold lines form a hinged connection, they may be disposed parallel with each other or be slightly angled with respect to each other. When curvilinear fold lines form a hinged

connection, they may intersect each other to define a shaped panel within the area surrounded by the curvilinear fold lines. A typical example of such a hinged connection may comprise a pair of arched or arcuate fold lines intersecting at two points such that they define an elliptical panel therebetween. A hinged connection may be formed from one or more linear fold lines and one or more curvilinear fold lines. A typical example of such a hinged connection may comprise a combination of a linear fold line and an arched or arcuate fold line which intersect at two points such that they define a half moon-shaped panel therebetween.

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

It should be understood that hinged connections and fold lines can each include elements that are formed in the substrate of the blank including perforations, a line of perforations, a line of short slits, a line of half-cuts, a single half-cut, a cutline, an interrupted cutline, slits, scores, 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. A carton for packaging one or more articles, the carton comprising a plurality of panels connected together to define an interior of the carton, the plurality of panels defining a tubular structure and including a top panel, a first side panel, a second side panel, a first base panel hingedly connected to the first side panel and second base panel hingedly connected to the second side panel, wherein the first and second base panels are disposed in at least partially overlapping relationship with each other, the first base panel being disposed a flat face-contacting arrangement with an outer surface of the second base panel, the carton further comprises at least one end closure structure, wherein the at least one end closure structure comprises a top end flap hingedly connected to the top panel by a first fold line, a first side end flap hingedly connected to the first side panel and a second side end flap hingedly connected to the second side panel, the top end flap is secured to an outer surface of each of the first and second side end flaps to at least partially close an end of the tubular structure, wherein the first side end flap has a free upper edge which is separate and spaced apart from an adjacent free side edge of the top end flap and wherein the free upper edge and the first fold line define a first obtuse angle therebetween when the carton is a blank form.
2. The carton of claim 1 wherein the free upper edge of the first side end flap is disposed below the first fold line.
3. The carton of claim 1 wherein the second base panel has a female locking feature comprising a locking aperture, the first base panel has a male locking feature comprising a locking tab, wherein the locking tab is received in the locking aperture such that the first and second base panels are secured together to provide a base wall.
4. The carton of claim 1 wherein the second side end flap is connected to the top end flap through a gusset panel and wherein the gusset panel is folded with respect to the second side end flap and the top end flap such that the gusset panel is tucked between the top end flap and the second side end flap.
5. The carton of claim 4 wherein the top end flap comprises an upper portion hingedly connected to the top panel by a first fold line and a lower portion hingedly connected to the upper portion by a second fold line and wherein the gusset panel is not directly connected to the lower portion and wherein the upper portion interconnects the lower portion and the gusset panel.

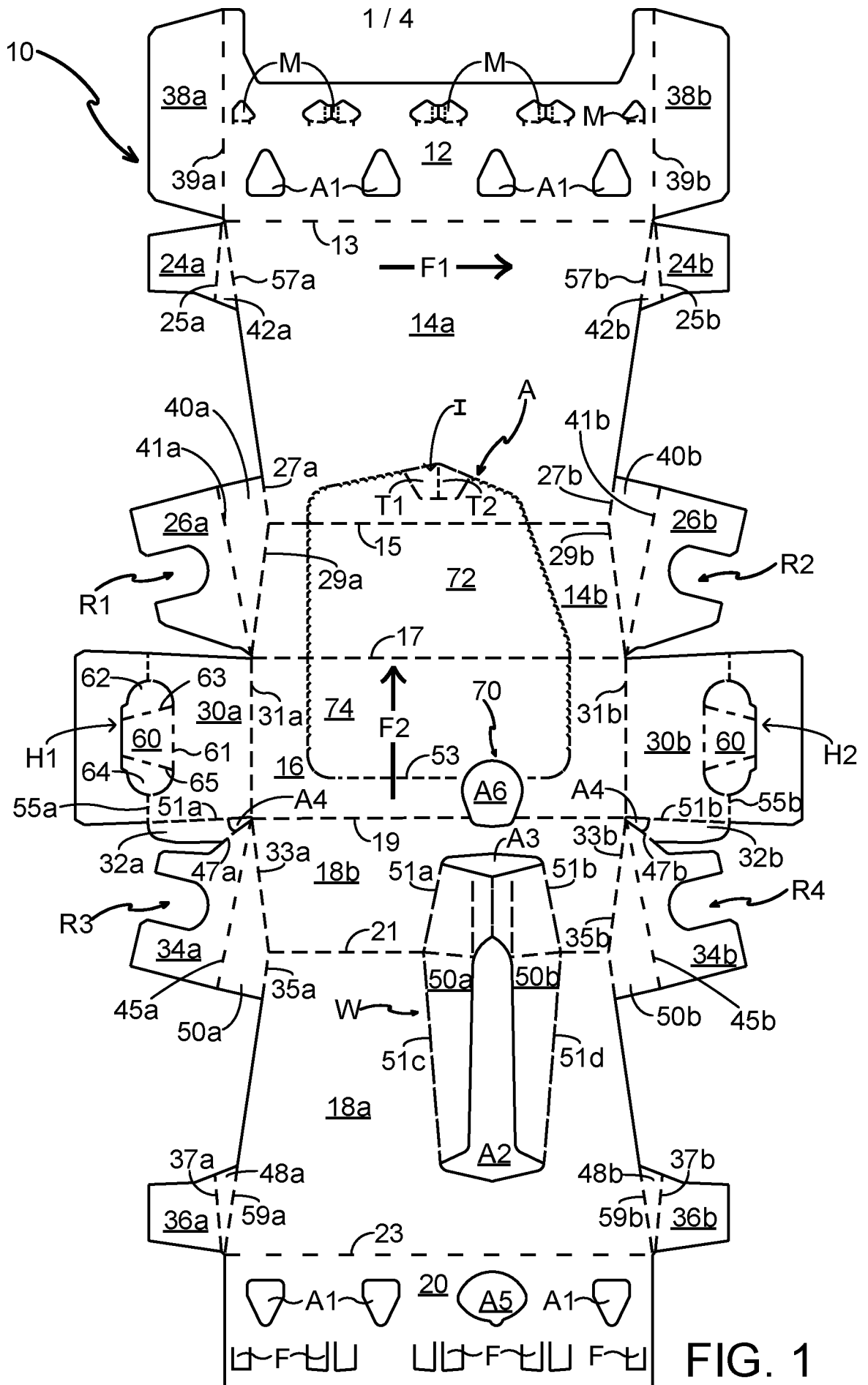
6. The carton of claim 1 wherein the one of the first and second side panels has a window opening for exposing to view an article disposed in the interior of the carton.
7. The carton of claim 1 wherein the top end flap has a handle opening and the first side end flap has a cutout which is disposed in alignment with the handle opening.
8. The carton of claim 7 wherein the free upper edge of the first side end flap is disposed above the handle opening.
9. The carton of claim 4 wherein the gusset panel is hingedly connected to the second side end flap by a third fold line which defines a second obtuse angle with respect to the first fold line when the carton is in the blank form and wherein the second obtuse angle is greater than the first obtuse angle.
10. The carton of claim 4 wherein the top end flap has a handle opening and the second side end flap has a cutout which is disposed in alignment with the handle opening, and wherein the gusset panel is hingedly connected to a side edge of an upper portion of the top end flap and wherein the gusset panel is disposed between the side edge of the upper portion of the top end flap and the handle opening.
11. The carton of claim 4 wherein the top end flap has a handle opening and the second side end flap has a cutout which is disposed in alignment with the handle opening, and wherein the gusset panel is hingedly connected to a side edge of an upper portion of the top end flap and wherein the gusset panel is disposed between the side edge of the upper portion of the top end flap and the cutout.
12. The carton of claim 4 wherein the top end flap has a handle opening and the second side end flap has a cutout which is disposed in alignment with the handle opening, wherein the gusset panel is hingedly connected to a side edge of an upper portion of the top end flap, wherein the gusset panel comprises a width dimension defined between a free edge and a hinged connection to the top end flap, the cutout is spaced apart from the side edge of an upper portion of the top end flap by a first linear dimension, the first linear dimension being greater than or equal to the width dimension of the gusset panel.
13. The carton of claim 4 wherein the top end flap has a handle opening and the second side end flap has a cutout which is disposed in alignment with the handle opening, wherein the gusset panel is hingedly connected to a side edge of an upper portion of the top end flap, wherein the gusset panel comprises a width dimension defined between a free edge and

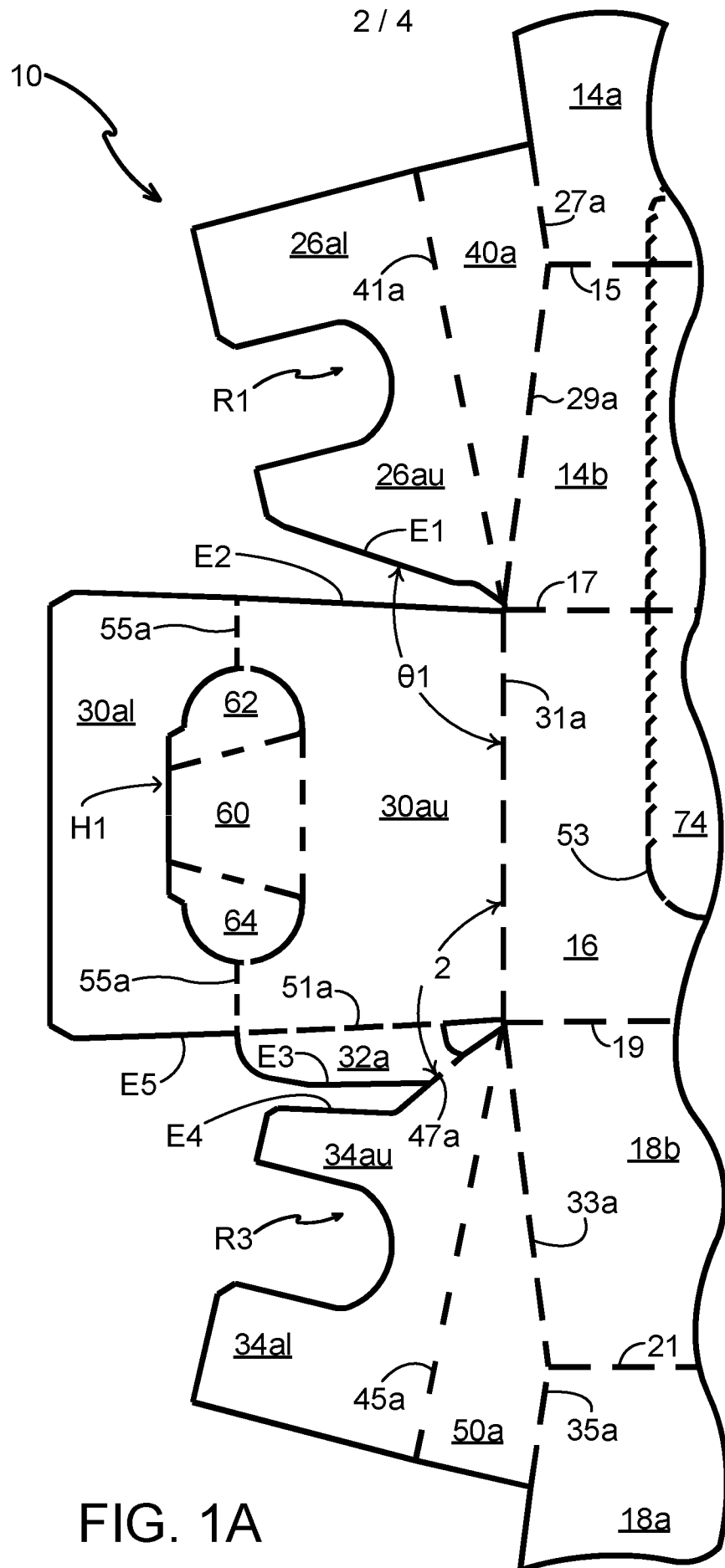
a hinged connection to the top end flap, the handle opening is spaced apart from the side edge of an upper portion of the top end flap by a second linear dimension, the second linear dimension being greater than or equal to the width dimension of the gusset panel.

14. The carton of claim 9 wherein the top end flap has a handle opening and the second side end flap has a cutout which is disposed in alignment with the handle opening, wherein the gusset panel is hingedly connected to a side edge of an upper portion of the top end flap, wherein the third fold line comprises a first end and second end, the first and second ends of the third fold line being disposed in closer proximity to the side edge of the upper portion of the top end flap than the cutout.
15. The carton of claim 9 wherein the top end flap has a handle opening and the second side end flap has a cutout which is disposed in alignment with the handle opening, wherein the gusset panel is hingedly connected to a side edge of an upper portion of the top end flap, wherein the third fold line comprises a first end and second end, the first and second ends of the third fold line being disposed in closer proximity to the side edge of the upper portion of the top end flap than the handle opening.
16. A blank for forming a carton, the blank comprising a plurality of panels for forming walls of a tubular structure, the plurality of panels including a top panel, a first side panel, a second side panel, a first base panel hingedly connected to the first side panel and second base panel hingedly connected to the second side panel, wherein the first and second base panels are arranged to be disposed in at least partially overlapping relationship with each other in a setup carton, the first base panel being disposed a flat face-contacting arrangement with an outer surface of the second base panel, the blank further comprises at least one end closure structure, wherein the at least one end closure structure comprises a top end flap hingedly connected to the top panel by a first fold line, a first side end flap hingedly connected to the first side panel and a second side end flap hingedly connected to the second side panel, the top end flap is arranged to be secured to an outer surface of each of the first and second side end flaps to at least partially close an end of the tubular structure in a setup condition, wherein the first side end flap has a free upper edge which is separate and spaced apart from an adjacent free side edge of the top end flap and wherein the free upper edge and the first fold line define a first obtuse angle therebetween.
17. The blank of claim 16 wherein the second side end flap is connected to the top end flap through a gusset panel and wherein the gusset panel is arranged to be folded with respect

to the second side end flap and the top end flap such that the gusset panel is tucked between the top end flap and the second side end flap in a setup carton.

18. The carton of claim 17 wherein the gusset panel is hingedly connected to the second side end flap by a third fold line which defines a second obtuse angle with respect to the first fold line and wherein the second obtuse angle is greater than the first obtuse angle.





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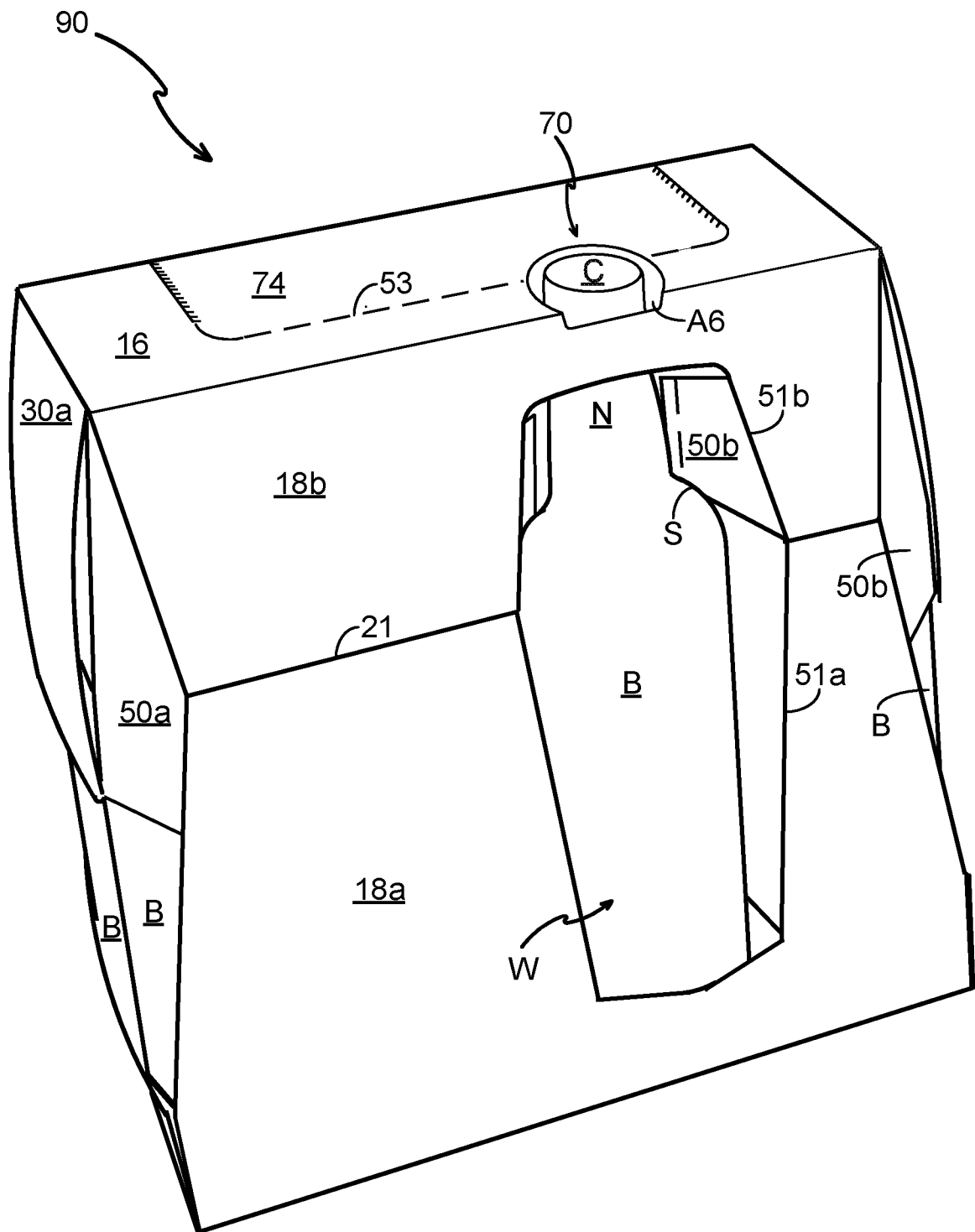


FIG. 2

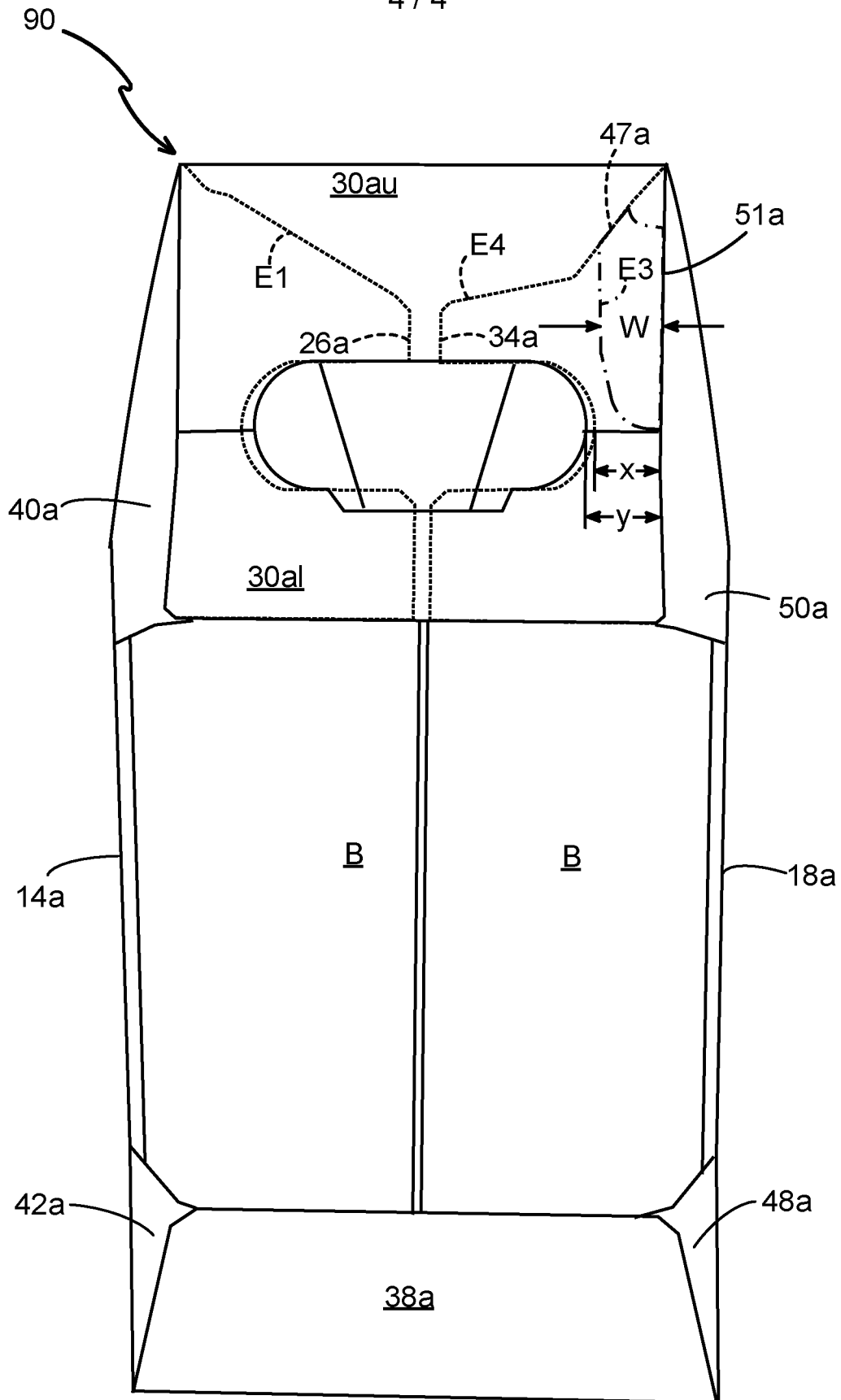


FIG. 3

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2020/014390

A. CLASSIFICATION OF SUBJECT MATTER
 INV. B65D71/14
 ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

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A	abstract; figures 1-5 page 8, line 5 - page 10, line 29 page 15, line 15 - page 16, line 24	12-15
Y	US 2018/297744 A1 (MERZEAU JULIEN D [FR]) 18 October 2018 (2018-10-18)	1-11, 16-18
A	abstract; figures paragraphs [0050], [0058]	12-15
Y	US 7 478 743 B2 (HOLLEY JOHN M [US]) 20 January 2009 (2009-01-20)	1
	column 5, lines 5-5; figure 1	
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Further documents are listed in the continuation of Box C.



See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search

28 April 2020

Date of mailing of the international search report

11/05/2020

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INTERNATIONAL SEARCH REPORT

International application No
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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