US011827436B2

(12) **United States Patent**
Shibuya

(10) **Patent No.: US 11,827,436 B2**
(45) **Date of Patent: Nov. 28, 2023**

(54) **CARTON AND BLANK THEREFOR**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 584 days.

(21) Appl. No.: **16/764,581**

(22) PCT Filed: **Oct. 25, 2018**

(86) PCT No.: **PCT/US2018/057509**
§ 371 (c)(1),
(2) Date: **May 15, 2020**

(87) PCT Pub. No.: **WO2019/099162**
PCT Pub. Date: **May 23, 2019**

(65) **Prior Publication Data**

US 2020/0385186 A1 Dec. 10, 2020

Related U.S. Application Data

(60) Provisional application No. 62/587,007, filed on Nov. 16, 2017.

(51) **Int. Cl.**
B65D 71/20 (2006.01)

(52) **U.S. Cl.**
CPC ***B65D 71/20*** (2013.01); *B65D 2301/10* (2013.01); *B65D 2571/0066* (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC B65D 71/20; B65D 2571/00925; B65D 2571/00913; B65D 2571/0087;
(Continued)

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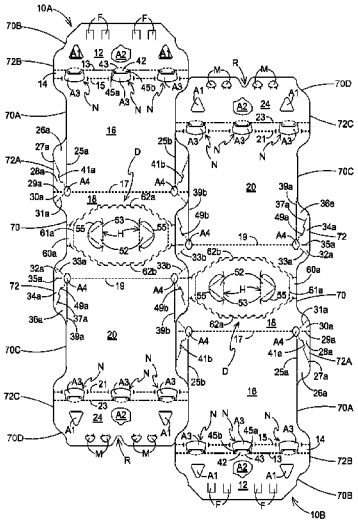
(57) **ABSTRACT**

An elongate blank for forming a tubular carton, comprising a plurality of panels including a top panel (**18**), a first side panel (**16**), a second side panel (**20**), a first base panel (**12**) and a second base panel (**24**), said each panel being formed along either free end edge thereof with a cut-out so that said blank is provided along either longitudinal edge thereof with a plurality of tabs each interposed between adjacent ones of said cut-outs, said cut-outs including; a first major cut-out (**70**) struck from each of the opposed free end edges of the top panel, a second major cut-out (**70**A) struck from each of the opposed free end edges of the first side panel, a third major cut-out (**70**C) struck from each of the opposed free end edges of the second side panel, a first minor cut-out (**70**B) struck from each of the opposed free end edges of the first base panel, a second minor cut-out (**70**D) struck from each of the opposed free end edges of the second base panel, wherein the length (A2) of a portion of one of the free end edges of the first side panel defined by one of the second major cut-outs (**70**A) is less than the length (C2) of a portion of one of the free end edges of the second side panel defined by one of the third major cut-outs (**70**C).

14 Claims, 9 Drawing Sheets



(52) **U.S. Cl.**
CPC *B65D 2571/0087* (2013.01); *B65D 2571/00277* (2013.01); *B65D 2571/00444* (2013.01); *B65D 2571/00561* (2013.01); *B65D 2571/00759* (2013.01)

(58) **Field of Classification Search**
CPC .. B65D 2571/00753; B65D 2571/0066; B65D 2571/00543
USPC 206/154, 141, 140, 434; 229/40
See application file for complete search history.

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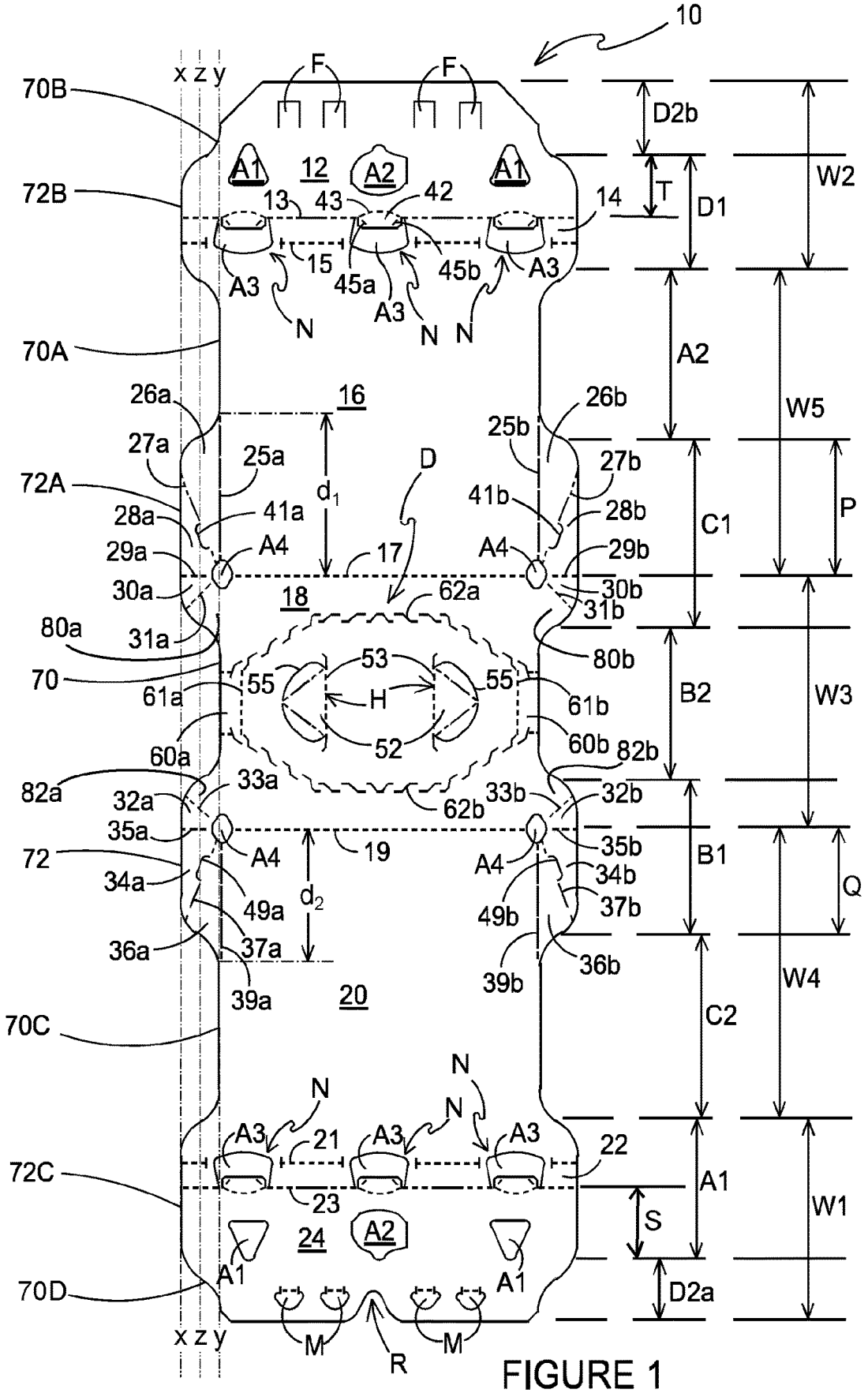
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x z y
70B
72B
70A
72A
70
72
70C
72C
70D
F
A1
A2
A3
A4
12
13
14
15
16
17
18
19
20
21
22
23
24
42
43
45a
45b
N
D2b
T
D1
W2
A2
W5
C1
P
B2
W3
B1
Q
W4
C2
A1
S
W1
D2a
26a
27a
25a
28a
41a
29a
30a
31a
80a
61a
60a
82a
32a
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36a
37a
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25b
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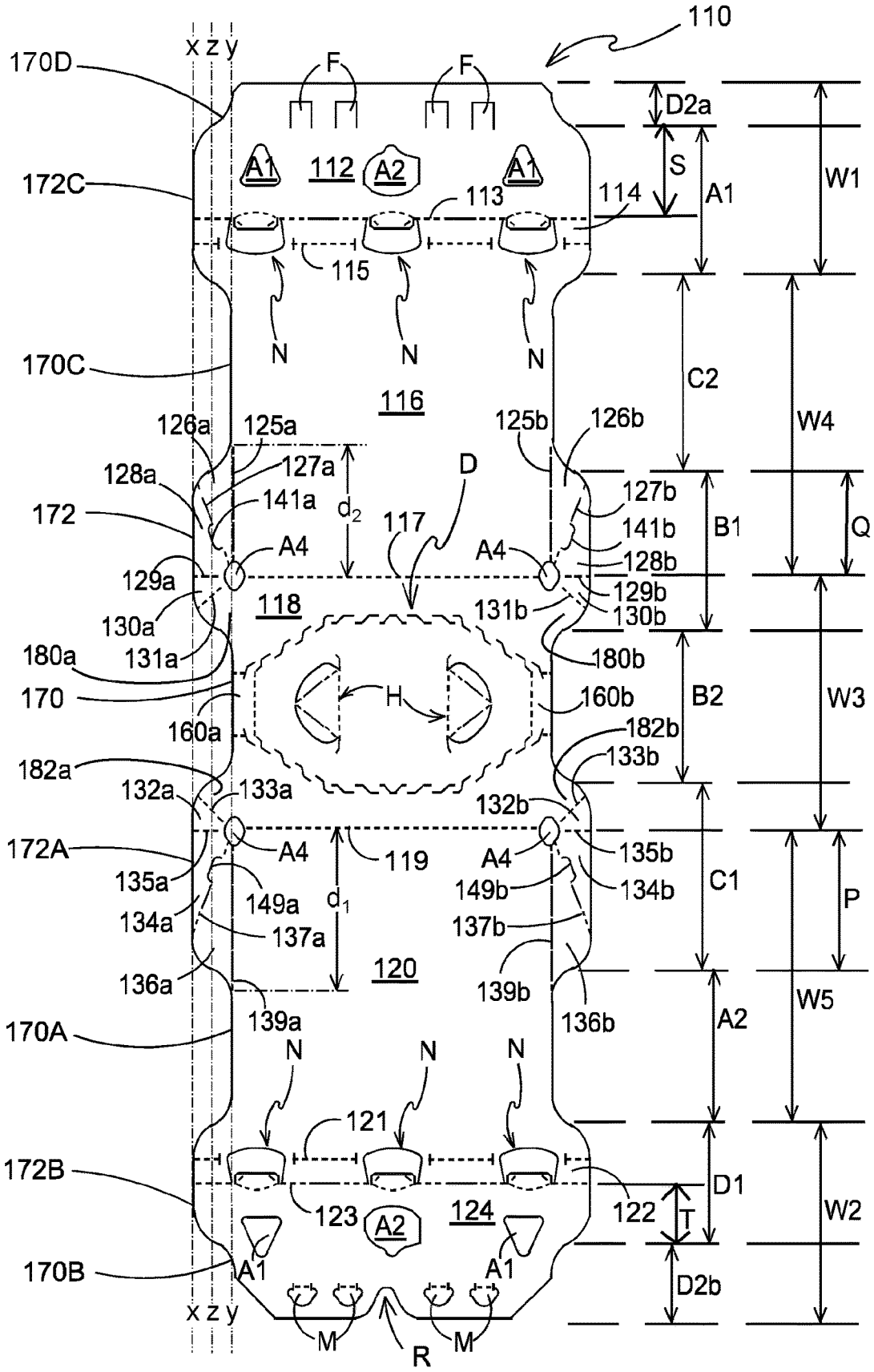
28b
29b
30b
31b
80b
61b
60b
82b
32b
33b
35b
34b
49b
37b
39b
36b
d1
d2
D
H
53
55
52
62a
62b
M
R

FIGURE 1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F
F
D2a
A1
112
A2
A1
S
A1
W1
172C
113
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N
N
N
170C
C2
116
W4
126a
125a
125b
126b
127a
D
128a
141a
d2
127b
172
117
141b
B1
Q
A4
A4
128b
129a
129b
118
131b
130b
130a
131a
180a
180b
170
H
160b
B2
W3
160a
182b
133b
182a
132a
133a
132b
172A
A4
119
A4
135b
135a
149a
d1
149b
134b
C1
P
134a
137a
137b
136a
120
139b
W5
139a
136b
A2
170A
N
N
N
121
172B
D1
123
A2
124
122
T
W2
170B
A1
A1
D2b
x z y
M
R
M

FIGURE 2

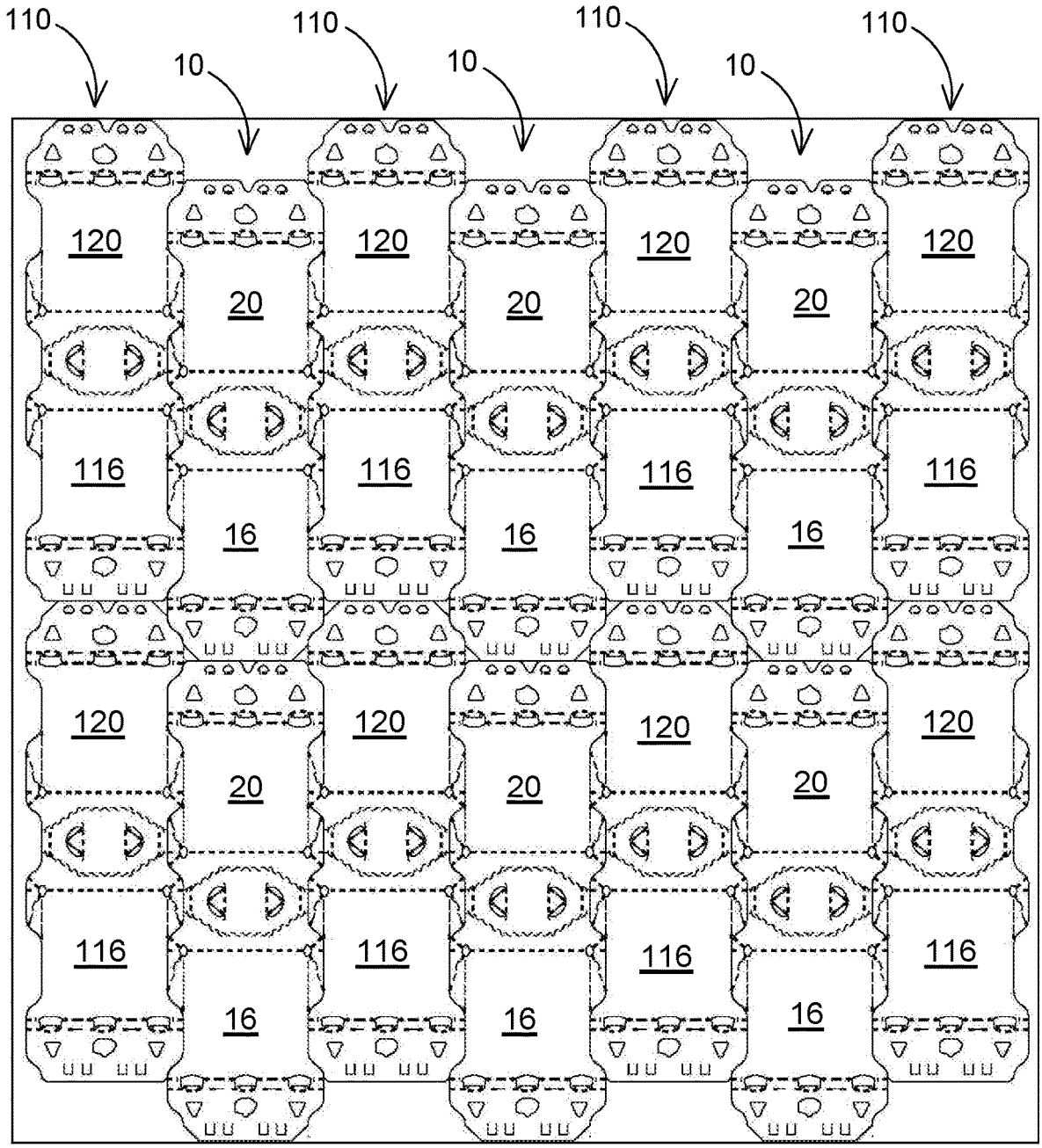


FIGURE 3

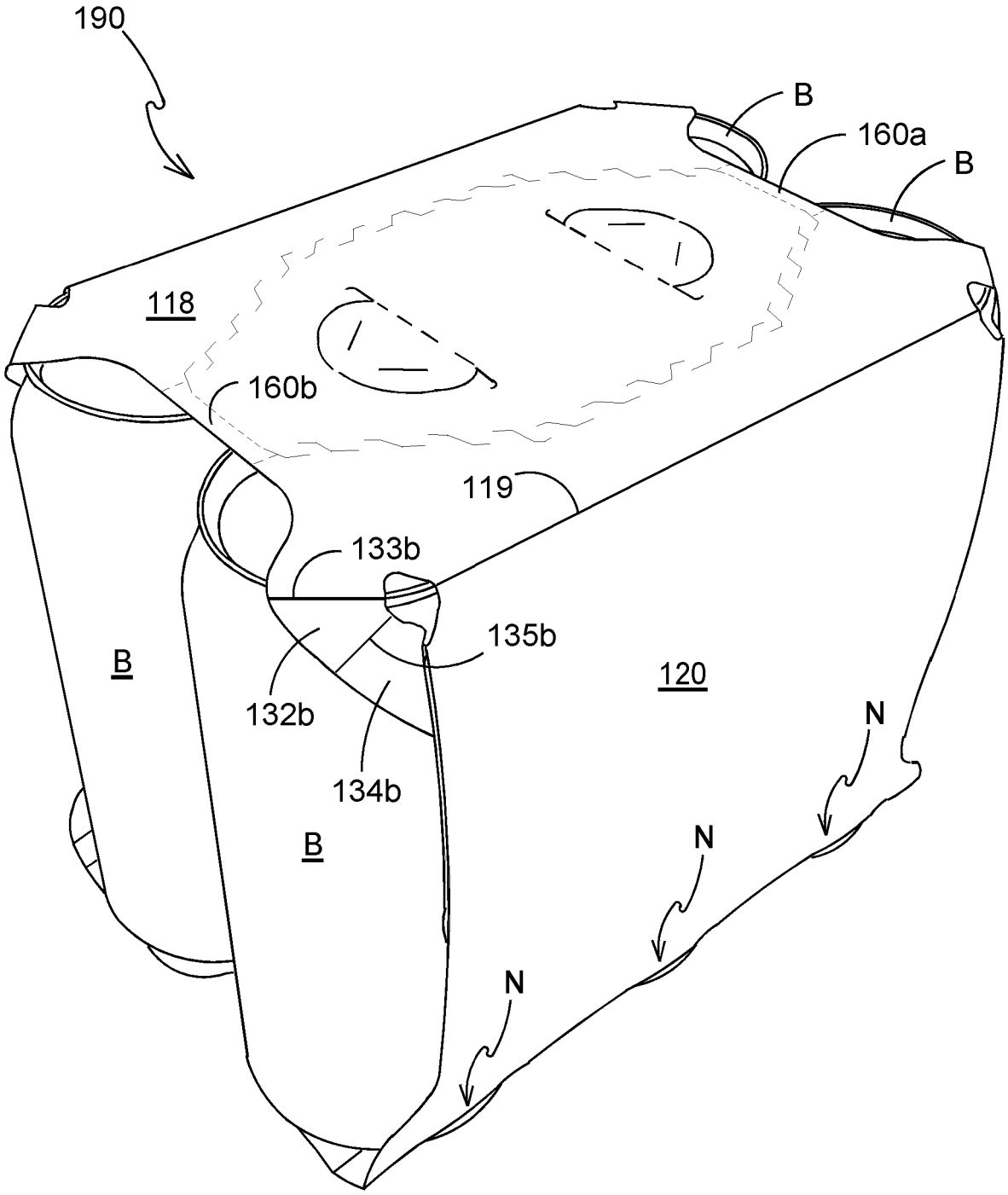


FIGURE 4

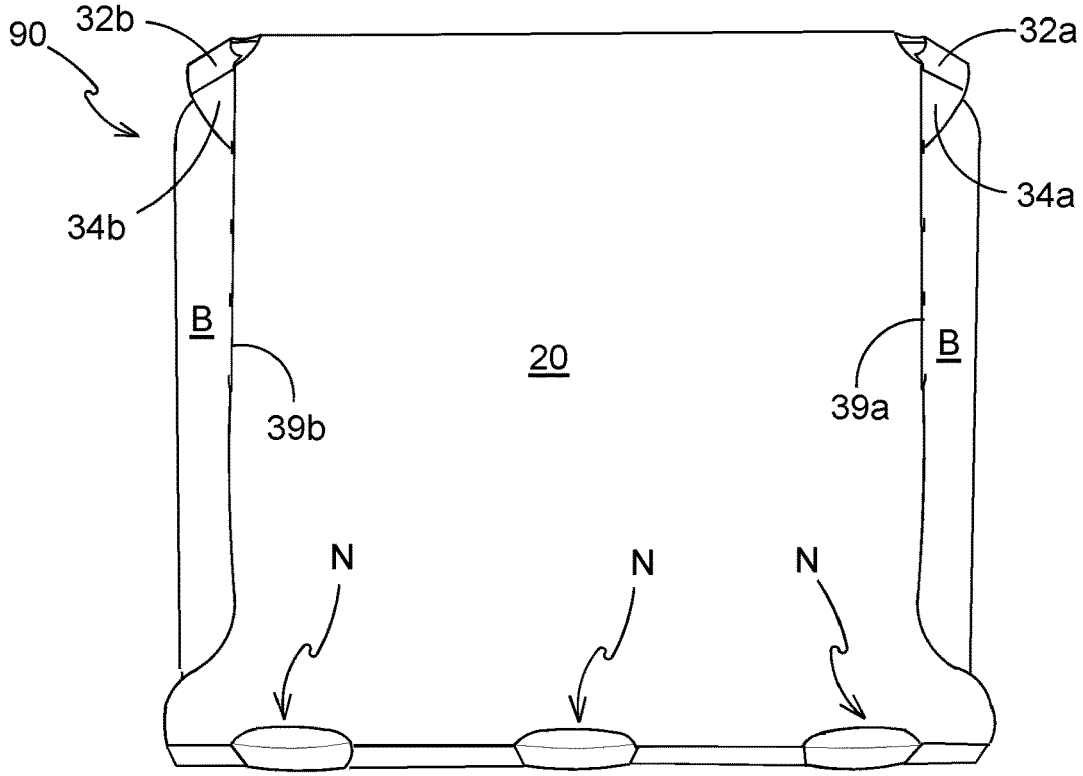


FIGURE 5A

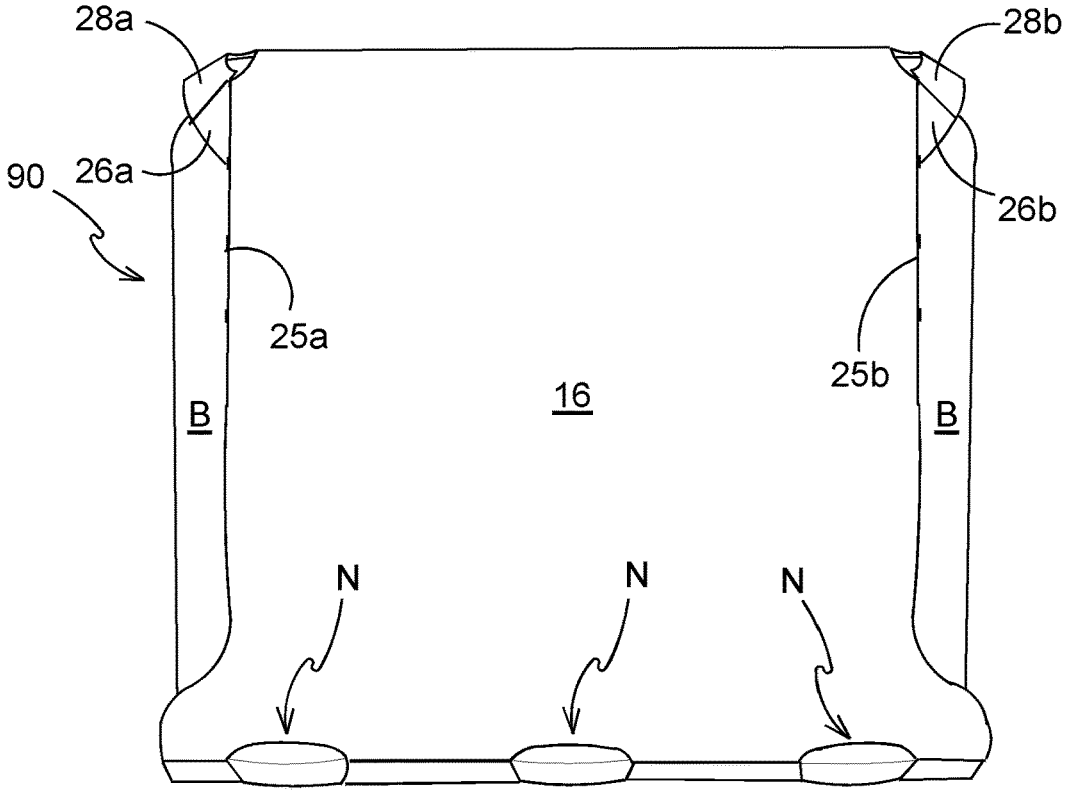


FIGURE 5B

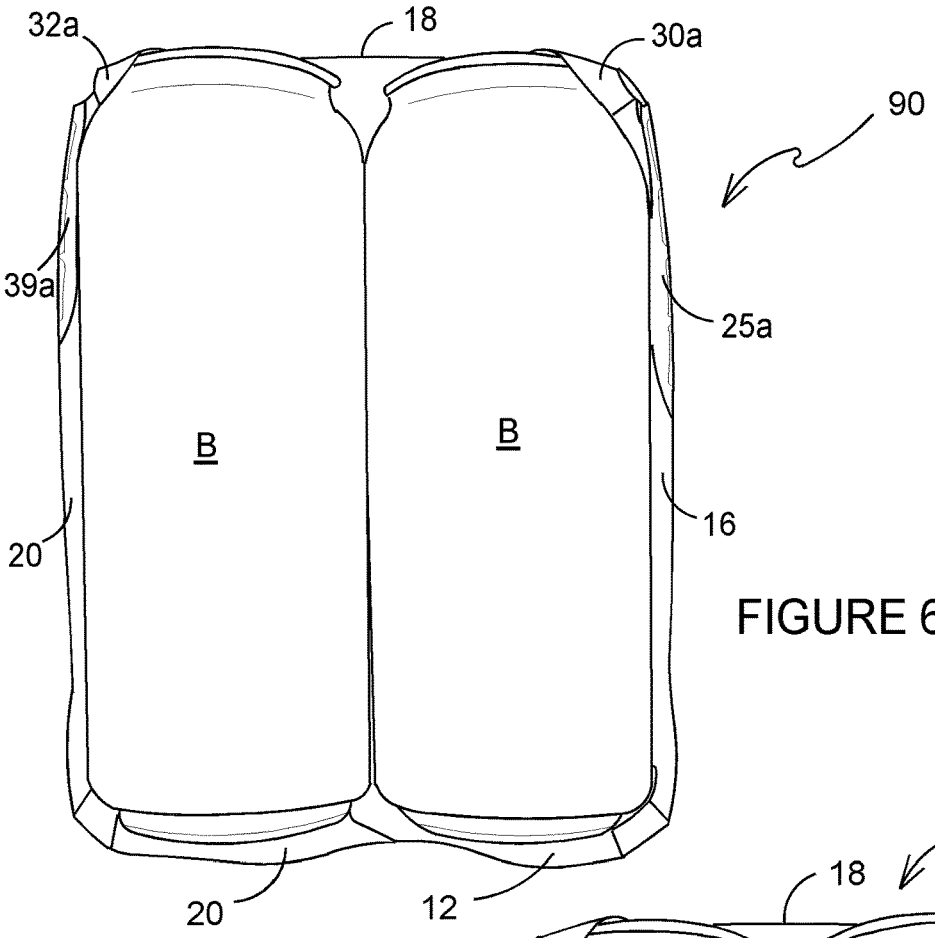


FIGURE 6A

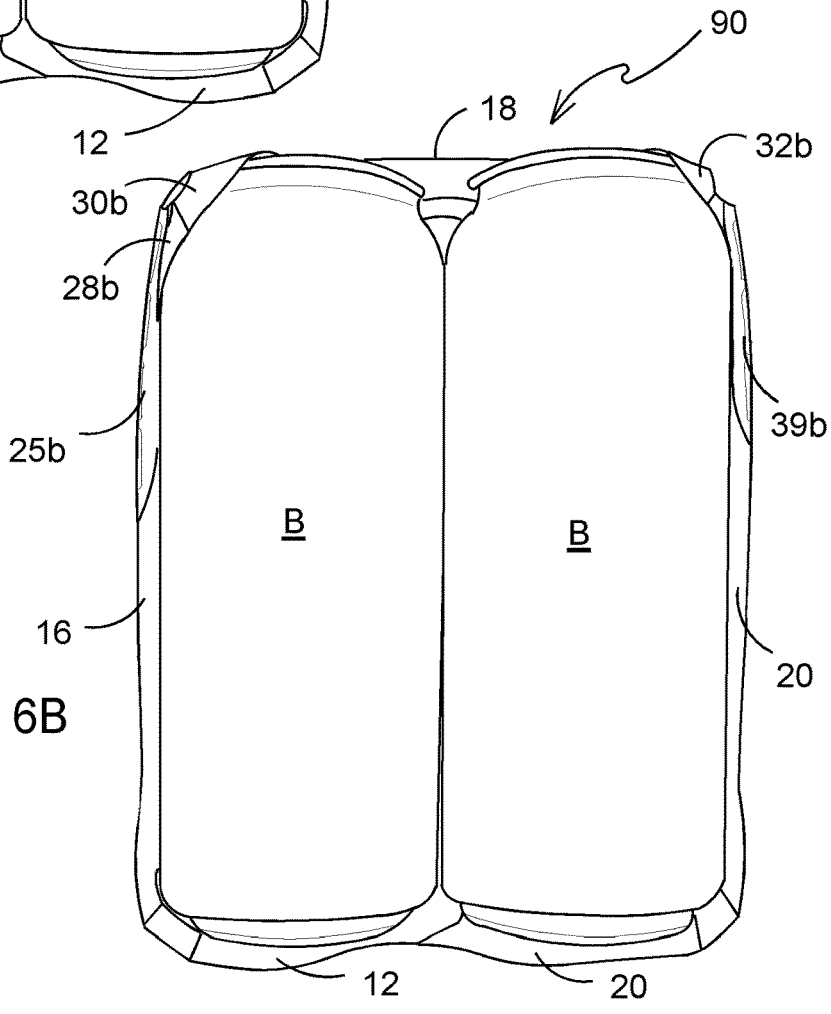
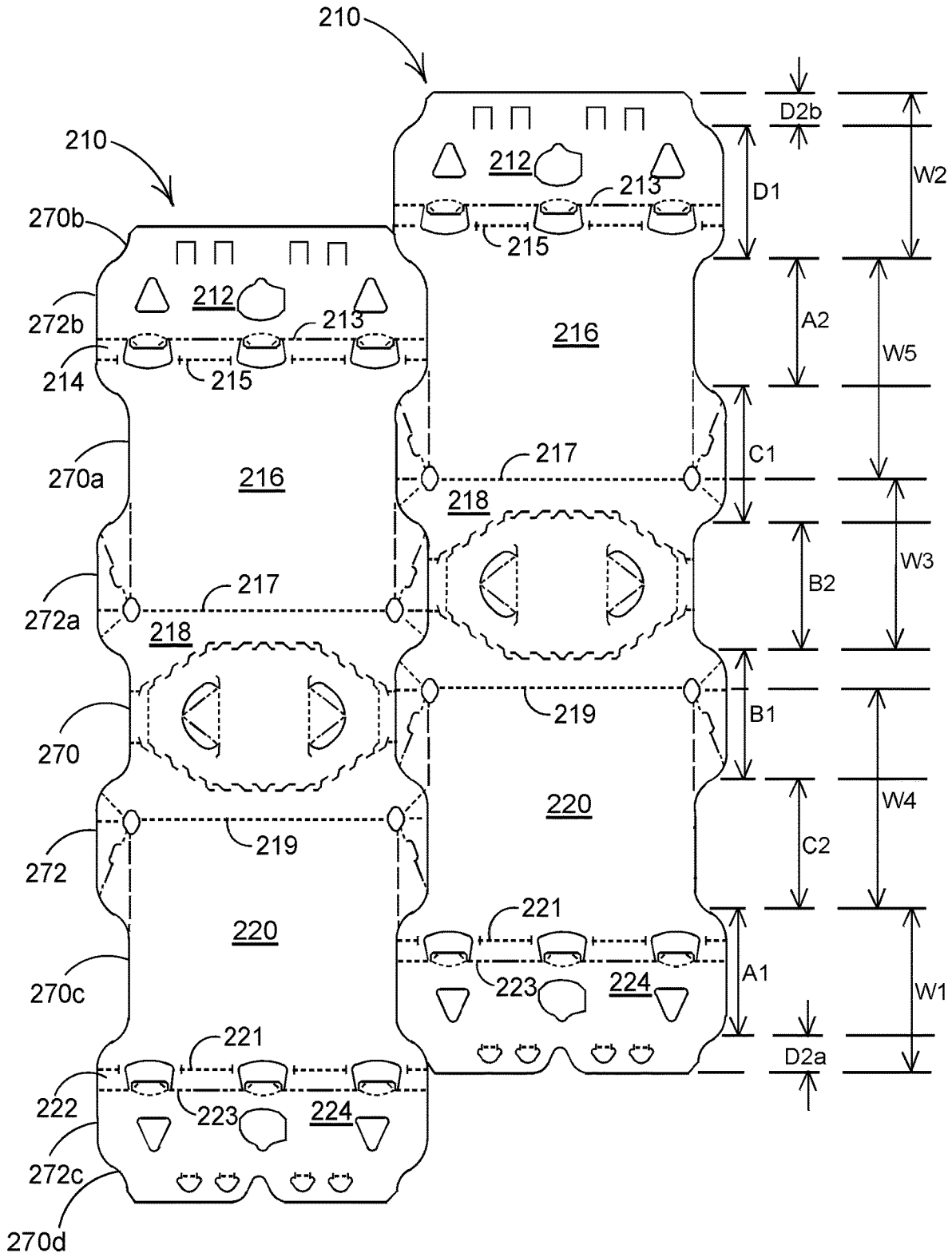


FIGURE 6B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214
270a
272a
270
272
270c
222
272c
270d
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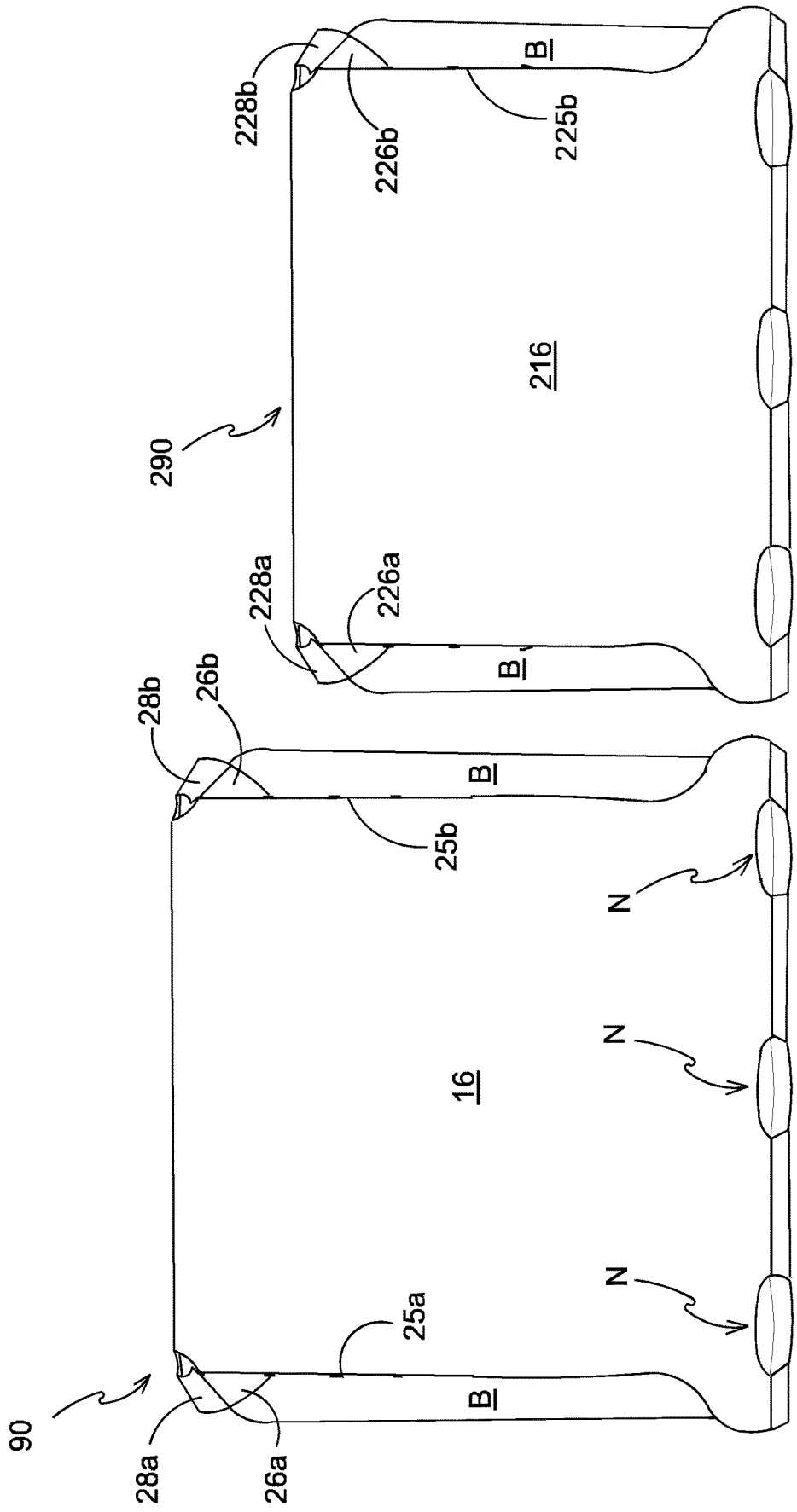
219
220
221
223
224
D2b
D1
A2
C1
B2
B1
C2
A1
D2a
W2
W5
W3
W4
W1

FIGURE 7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B
216
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228a
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28b
26b
B
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N
16
N
25a
B
90
28a
26a

FIGURE 8

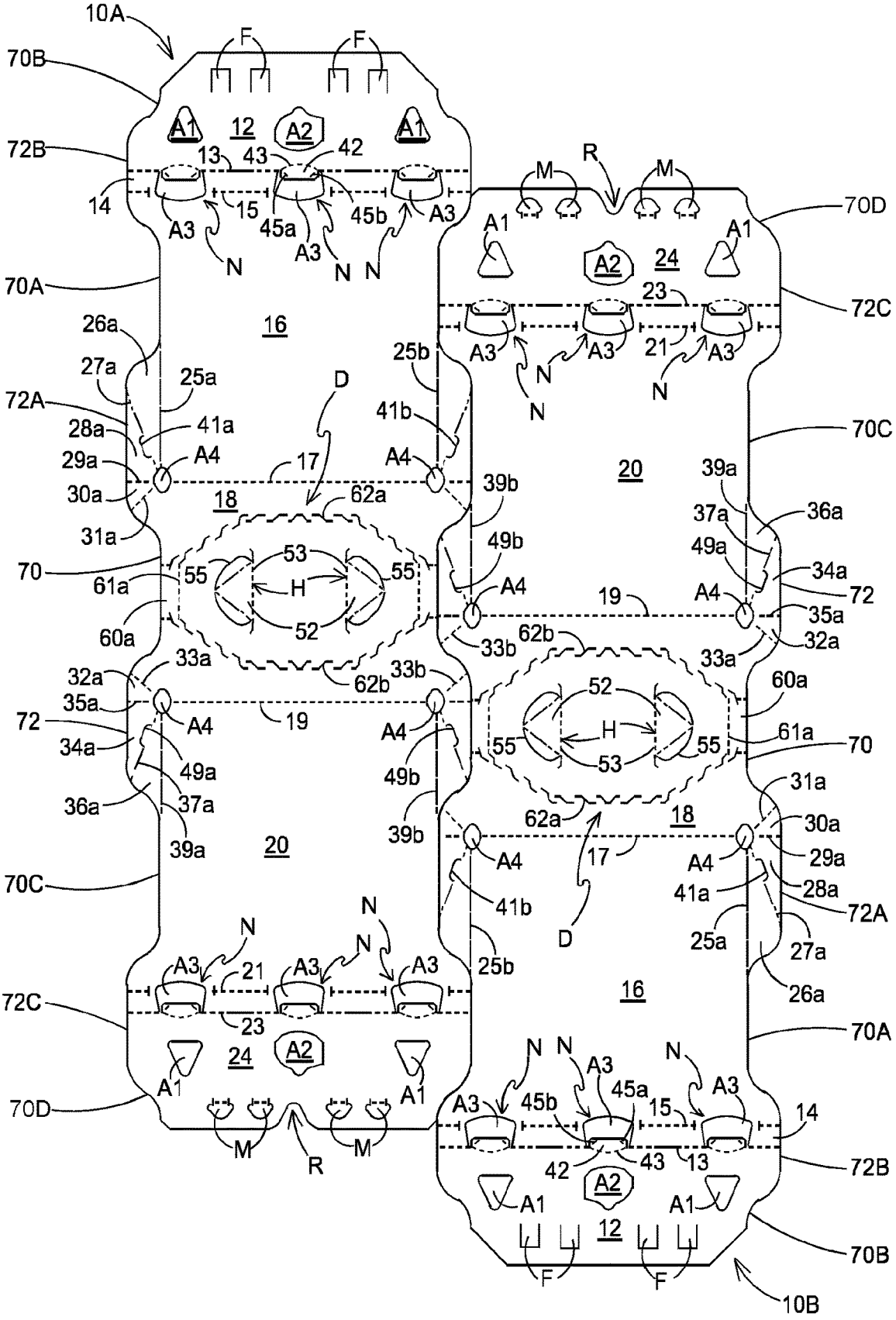
10A
70B
72B
14
70A
26a
27a
72A
28a
29a
30a
31a
70
61a
60a
32a
35a
72
34a
36a
70C
72C
70D
F
A1
12
A2
13
43
42
15
45a
45b
A3
N
M
R
16
25a
D
41a
A4
17
18
62a
55
53
H
52
33a
62b
33b
19
49a
37a
39a
20
21
23
24
25b
41b
39b
49b
70D
72C
70C
72A
70A
72B
14
10B

FIGURE 9

CARTON AND BLANK THEREFOR

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a National Phase application of PCT Application PCT/US18/57509, filed Oct. 25, 2018, which claims the benefit of U.S. Provisional Patent Application No. 62/587,007, filed Nov. 16, 2017, which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

The present invention relates to cartons and to blanks for forming the same. More specifically, but not exclusively, the invention relates to a wraparound carrier formed from nestable blanks.

BACKGROUND

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

It is desirable to produce cartons from blanks which are nestable, this provides environmental and economic benefits. In packaging systems, it is desirable to automate, with packaging machines, the packaging of the primary product containers into cartons, it is also desirable that the packaging machines are capable of packaging a variety of different primary product containers or carton configurations.

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 elongate blank for forming a tubular carton. The blank comprises a plurality of panels including; a top panel, a first side panel, a second side panel, a first base panel and a second base panel. The plurality of panels is arranged in a row along a length of the blank. The plurality of panels is hingedly connected one to another in series. Each of the plurality of panels have a pair of opposed free end edges disposed generally along the length of the blank. Each of the plurality of panels is formed along either free end edge thereof with a cut-out so that said blank is provided along either longitudinal edge thereof with a plurality of tabs each interposed between adjacent ones of said cut-outs. The cut-outs include; a first major cut-out struck from each of the opposed free end edges of the top panel, a second major cut-out struck from each of the opposed free end edges of the first side panel, a third major cut-out struck from each of the opposed free end edges of the second side panel, a first minor cut-out struck from each of the opposed free end edges of the first base panel and a second minor cut-out struck from each of the opposed free end edges of the second base panel. The length of a portion of one of the free end edges of the first side panel defined by one of the second major cut-outs is less than the length of a portion of one of the free end edges of the second side panel defined by one of the third major cut-outs.

Optionally, a first upper tab is hingedly connected in part to one of the first and second side panels and in part to the top panel.

Optionally, a second upper tab is hingedly connected in part to the other one of the first and second side panels and in part to the top panel.

Optionally, a first lower tab is hingedly connected in part to one of the first and second side panels and in part to one of the first and second base panels.

Optionally, a second lower tab is hingedly connected in part to the other one of the first and second side panels and in part to the other one of the first and second base panels.

Optionally, a portion of the first upper tab hinged to one of the first and second side panels is smaller than a portion of the second upper tab is hingedly connected in part to the other one of the first and second side panels.

Optionally, a portion of the first lower tab hingedly connected one of the first and second base panels is smaller than a portion of the second lower tab hingedly connected to the other one of the first and second base panels.

Optionally, the second cut-outs each comprise an upper edge and a lower edge and the third cut-outs each comprise an upper edge and a lower edge, the lower edges of the second cut-outs being disposed at a first distance from an adjacent one of the first and second base panels, the lower edges of the third cut-outs being disposed at a second distance from an adjacent other one of the first and second base panels, the first distance being equal to the second distance.

A second aspect of the invention provides an elongate blank for forming a tubular carton. The blank comprises a plurality of panels including; a top panel, a first side panel hinged to a first side of the top panel, a second side panel hinged to a second side of the top panel, a first base panel hinged to the first side panel and a second base panel hinged to the second side panel. The plurality of panels is arranged in a row along a length of the blank. The plurality of panels are hingedly connected one to another in series. Each of said plurality of panels have a pair of opposed free end edges disposed generally along the length of the blank. Each of said plurality of panels are formed along either free end edge thereof with a cut-out so that said blank is provided along either longitudinal edge thereof with a plurality of tabs each interposed between adjacent ones of said cut-outs. The arrangement of cut-outs and tabs is asymmetrical about a notional line which is transverse to the longitudinal edges and bisects the top panel.

A third aspect of the invention provides a carton for packaging one or more articles. The carton comprises a plurality of walls including; a top wall, a first side wall, a second side wall and a base wall. The carton comprises an article retention structure comprising a first top engaging structure and a second top engaging structure. The first top engaging structure comprises a first upper tab hingedly connected in part to one of the first and second side walls and includes; a first anchoring portion hingedly connected to said one side wall, a first gusset portion hingedly connected to the first anchoring portion, a first web portion hingedly connected to the first gusset portion and a first covering portion provided by a part of the top panel and hingedly connected to the first web portion. The second top engaging structure comprises a second upper tab hingedly connected in part to the other one of the first and second side walls and includes; a second anchoring portion hingedly connected to said other side wall, a second gusset portion hingedly

connected to the second anchoring portion, a second web portion hingedly connected to the second gusset portion and a second covering portion provided by a part of the top panel and hingedly connected to the second web portion. The second anchoring portion is larger in dimension than the first anchoring portion.

Optionally, a hinged connection connecting the second anchoring portion to said other side wall is longer than a hinged connection connecting the first anchoring portion to said one side wall.

A fourth aspect of the invention provides a carton for packaging one or more articles. The carton comprises a plurality of walls including; a top wall, a first side wall, a second side wall and a base wall. The carton comprises a cut-out formed along a free end edge of one of the first and second side panels and a further cut-out formed along a free end edge of the other one of the first and second side panels. The further cut-out in said other sidewall has a second height dimension which is greater than a first height dimension of the cut-out in said one sidewall.

A fifth aspect of the invention provides a nested arrangement of blanks, each blank suitable for forming a tubular carton. The nested arrangement comprises at least one column of first blanks and at least one column of second blanks. The first blanks comprise a plurality of panels arranged in a row along a length of the blank and being hingedly connected one to another in series, each of said panels having a pair of opposed free end edges disposed generally along the length of the blank, the plurality of panels including;

a top panel;

a first side panel hinged to a first side of the top panel;

a second side panel hinged to a second side of the top panel;

a first base panel hinged to the first side panel; and

a second base panel hinged to the second side panel,

a cut-out formed along each of the free end edge of each of said panels so that said blank is provided along each longitudinal edge thereof with a plurality of tabs each interposed between adjacent ones of said cut-outs to form a first arrangement of cut-outs and tabs;

wherein the first arrangement of cut-outs and tabs is asymmetrical about a notional line which is transverse to the longitudinal edges and bisects the top panel. The second blanks comprise a plurality of panels arranged in a row along a length of the blank and being hingedly connected one to another in series, each of said panels having a pair of opposed free end edges disposed generally along the length of the blank, the plurality of panels including;

a top panel;

a first side panel hinged to a first side of the top panel;

a second side panel hinged to a second side of the top panel;

a first base panel hinged to the first side panel; and

a second base panel hinged to the second side panel,

a cut-out formed along each of the free end edge of each of said panels so that said blank is provided along each longitudinal edge thereof with a plurality of tabs each interposed between adjacent ones of said cut-outs to form a second arrangement of cut-outs and tabs;

wherein the second arrangement of cut-outs and tabs is asymmetrical about a notional line which is transverse to the longitudinal edges and bisects the top panel. In the nested arrangement of blanks the second arrangement of cut-outs and tabs of the second blanks is inverted with respect to the first arrangement of cut-outs and tabs of the first blanks.

A sixth aspect of the invention provides an elongate blank for forming a tubular carton. The blank comprises a plurality of panels including; a top panel, a first side panel, a second side panel, a first base panel and a second base panel, the plurality of panels arranged in a row along a length of the blank. The plurality of panels is hingedly connected one to another in series. Each of the plurality of panels has a pair of opposed free end edges disposed generally along the length of the blank. Each of the plurality of panels is formed along either free end edge thereof with a cut-out so that said blank is provided along either longitudinal edge thereof with a plurality of tabs each interposed between adjacent ones of said cut-outs. The tabs and cut-outs include;

a first minor cut-out struck from each of the opposed free end edges of the first base panel and having a first linear dimension (D2b);

a first lower tab formed in part from the first base panel and in part from the first side panel and having a second linear dimension (D1);

a second major cut-out struck from each of the opposed free end edges of the first side panel and having a third linear dimension (A2);

a second upper tab formed in part from the first side panel and in part from the top panel and having a fourth linear dimension (C1);

a first major cut-out struck from each of the opposed free end edges of the top panel and having a fifth linear dimension (B2);

a first upper tab formed in part from the second side panel and in part from the top panel and having a sixth linear dimension (E1);

a third major cut-out struck from each of the opposed free end edges of the second side panel and having a seventh linear dimension (C2);

a second lower tab formed in part from the second base panel and in part from the second side panel and having an eighth linear dimension (A1);

a second minor cut-out struck from each of the opposed free end edges of the second base panel and having a ninth linear dimension (D2a);

wherein the length of the blank is given by:

$$\text{length}=A1+A2+C1+C2+B1+B2+D2a+D2b+D1$$

and wherein

A1=A2

B1=B2

D1=D2a+D2b

C1=C2

C1>A2

C1>B1

(D2a+A1)=(D2b+D1).

Optionally, the top panel comprises a width dimension (W3), the first minor cut-out and the first lower tab together define a tenth linear dimension (W2), where W2=D2b+D1, the second minor cut-out and the second lower tab together define an eleventh linear dimension (W1), where W1=D2a+A1, the distance between the midpoint of the upper edge of the first lower tab and the fold line coupling the first side panel to the top panel defines a twelfth linear dimension (W5), the distance between the midpoint of the upper edge of the second lower tab and the fold line coupling the second

side panel to the top panel defines a thirteenth linear dimension (W4), wherein the length of the blank is given by:

$$length = W1+W2+W3+W4+W5$$

and where:

$$W4=W5$$

$$W3+W4+W5=C2+B1+B2+C1+A2.$$

Optionally,

$$C2+B1=C1+A2$$

and

$$B2<W3.$$

Within the scope of this application it is envisaged 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 taken independently or in any combination thereof. For example, features described in connection with one embodiment are applicable to all embodiments unless there is incompatibility of features.

BRIEF DESCRIPTION OF THE DRAWINGS

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

FIG. **1** is a plan view from above of a blank for forming a first carton according to a first embodiment;

FIG. **2** is a plan view from above of a blank for forming a second carton according to a second embodiment;

FIG. **3** is a plan view from above of a nested arrangement of first blanks according to FIG. **1** with second blanks according to FIG. **2**;

FIG. **4** is a perspective view from above of the second carton formed from the blank of FIG. **2**;

FIG. **5**A is a side view of a first side of the first carton formed from the blank of FIG. **1**;

FIG. **5**B is a side view of a second side of the first carton formed from the blank of FIG. **1**;

FIG. **6**A is an end view of a first end of the first carton formed from the blank of FIG. **1**;

FIG. **6**B is an end view of a second end of the first carton formed from the blank of FIG. **1**;

FIG. **7** is a plan view from above of a nested arrangement of a pair of blanks according to a third embodiment;

FIG. **8** is a side view of a second side of the first carton formed from the blank of FIG. **1** and a second side of a third carton formed from a blank according to FIG. **7**; and

FIG. **9** is a plan view from above of a nested arrangement of a pair of blanks according to the first embodiment of FIG. **1**, wherein one of the blanks is inverted with respect to the other blank.

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 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 FIG. **1**, there is shown a plan view of a blank **10** capable of forming a carton or carrier **90**, as shown in FIG. **5**A, 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 FIG. **5**A. The blank **10** forms a secondary package for packaging at least one primary product container or package.

Referring to FIG. **2**, there is shown a plan view of a blank **110** capable of forming a carton or carrier **190**, as shown in FIG. **4**, for containing and carrying a group of primary products such as, but not limited to, beverage cans, hereinafter referred to as articles B. The blank **110** forms a secondary package for packaging at least one primary product container or package.

Referring to FIG. **7**, there is shown a plan view of a pair of blanks **210** capable of forming a carton or carrier **290** (see FIG. **8**) for containing and carrying a group of alternative primary products or alternative articles, wherein the alternative articles comprise a smaller volume capacity or height dimension than the articles B being packaged by the blanks **10**; **110** of FIGS. **1** and **2**.

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**, **190** 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**; **210** 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 structure or carton **90**; **190**; **290** described herein may be formed from a sheet material such as paperboard, which may be made of or coated with materials to increase its strength. An example of such a sheet material is tear-resistant NATRALOCK® paperboard made by WestRock Company. It should be noted that the tear resistant materials may be provided by more than one layer, to help improve the tear-resistance of the package. Typically, one surface of the sheet material may have different characteristics to the other surface. For example, the surface of the sheet material that faces outwardly from a finished package may be particularly smooth and may have a coating such as a clay coating or other surface treatment to provide good printability. The surface of the sheet material that faces inwardly may, on the other hand, be provided with a coating, a layer, a treatment or be otherwise prepared to provide

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

In the illustrated embodiment, the blanks **10**; **110** are configured to form a carton or carrier **90**; **190** for packaging an exemplary arrangement of exemplary articles B. In the illustrated embodiments the arrangement is an m×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 500 ml beverage cans. The blank **210** is configured to form a carton or carrier for packaging an exemplary arrangement of exemplary articles, in two rows of three articles B, and wherein the articles are 330 ml beverage cans. Alternatively, the blanks **10**; **110**; **210** 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.

Beverage cans are typically produced in standard sizes, the cans are typically defined by their volume and/or by their diameter. For example, commonly used sizes include, but are not limited to, those shown in Table 1 below.

TABLE 1

Can Sizes		
Volume Metric	Volume Imperial	Can Body Diameter
222 ml	7.5 oz	58 mm
237 ml	8 oz	58 mm
269 ml	9.1 oz	58 mm
290 ml	9.8 oz	58 mm
296 ml	10 oz	58 mm
300 ml	10.1 oz	58 mm
310 ml	10.4 oz	58 mm
330 ml	11.3 oz	58 mm
355 ml	12 oz	58 mm
425 ml	14.4 oz	58 mm
237 ml	8 oz	66 mm
250 ml	8.4 oz	66 mm
300 ml	10.1 oz	66 mm
310 ml	10.4 oz	66 mm
330 ml	11.2 oz	66 mm
375 ml	12.7 oz	66 mm
440 ml	14.9 oz	66 mm
500 ml	16.9 oz	66 mm
333 ml	11.3 oz	66 mm
355 ml	12 oz	66 mm
473 ml	16 oz	66 mm
500 ml	16.9 oz	66 mm
550 ml	18.6 oz	66 mm
568 ml	19.2 oz	66 mm

As Table 1 shows a beverage cans of different volumes may have a common diameter dimension. In order to increase or decrease the volume of a beverage can of a given diameter the height of the beverage can is adjusted—taller cans providing a larger volume.

It is desirable to package beverage cans of different volume dimensions upon a single packaging machine. It will be appreciated that a blank adapted for packaging cans of a first volume will be differently sized compared to a blank adapted for packaging cans of a second different volume.

Such changes in dimension of the blank have in the past required reconfiguration of a packaging machine in order to package cartons that vary in size. Or alternatively have required a separate machine for each can or carton size. Given the size, cost, and complexity of these machines, this undesirable.

Therefore, it is advantageous to design carton and/or carton blanks for packaging cans or articles which vary in size but which cartons/blanks do not require reconfiguration of the packaging machine or provision of a separate packaging machine.

It is also desirable that the blanks comprise a footprint which can be nested or tessellated, such that the blanks can be cut from sheet material, minimising waste. When doing so it is desirable to be able to minimise the number of cutting blades required for cutting the blanks from the sheet material, it is therefore desirable to employ a single blade to separate a first blank from an adjacent neighbour; it is therefore desirable to tessellate the first blank with its neighbours.

Turning to FIG. **1**, there is illustrated a blank **10** for forming a carton **90** (see FIG. **5**A) according to a first embodiment. The blank **10** comprises a plurality of main panels **12**, **14**, **16**, **18**, **20**, **22**, **24** for forming a tubular structure. The plurality of main panels **12**, **14**, **16**, **18**, **20**, **22**, **24** comprises; a first base panel **12**, a first corner panel **14**, a first side panel **16**, a top panel **18**, a second side panel **20**, a second corner panel **22** and a second base panel **20**. The plurality of panels **12**, **14**, **16**, **18**, **20**, **22**, **24** may be arranged in a linear series hinged one to the next by corresponding fold lines **13**, **15**, **17**, **19**, **21**, **23**.

In alternative embodiments, the first and second corner panels **14**, **22** may be omitted, the fold lines **15**, **21** may be omitted.

The first and second corner panels **14**, **22** may be considered to form lower portions of the respective one of the first or second side panels **16**, **20** to which they are hingedly connected.

The blank **10** is foldable to form a package **90** as illustrated in FIG. **5**A. The first and second base panels **12**, **24** are engageable with one another in an overlapping relationship to form a composite base wall **12**/**24** of the carton **90**. The blank **10** may comprise a complementary locking mechanism for securing the second base panel **24** to the first base panel **12**. The first base panel **12** may comprise at least one first part F of the complementary locking mechanism. The second base panel **24** may comprise at least one second part M of the complementary locking mechanism. In the illustrated embodiment, the first base panel **12** comprises a plurality of female tabs F defining openings in the first base panel **12**. The second base panel **24** comprises a plurality of male tabs M, the openings in the first base panel **12** being configured to receive a respective one of the male tabs M. The female tabs F are arranged to be displaced out of the first base panel **12** 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, the first and second base panels **12**, **24** may be secured to each other by other means such as but not limited to adhesive or staples.

Optionally, the first and second base panels **12**, **24** may comprise at least one first aperture A1. In the illustrated embodiment, each of the first and second base panels **12**, **24** comprises two first apertures A1. Optionally, the first and second base panels **12**, **24** may comprise at least one second aperture A2. In the illustrated embodiment, each of the first and second base panels **12**, **24** 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** 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**, **24** 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.

The blank **10** may comprise at least one heel engagement structure N for engaging with a heel or lower portion of an article B. The blank **10** illustrated in FIG. **1** comprises six heel engagement structures N each is provided for engaging a respective article B. Each of the heel engagement structures N is substantially similar in construction and will be described by reference to a heel engagement structure N provided in the first side panel **16**.

The heel engagement structure N may comprise an opening. The opening is defined in part by a heel aperture A3 and in part by a heel tab **42**. The heel tab **42** is hingedly connected to the first base panel by fold line **43**. The heel tab **42** is struck from the first corner panel **14**.

The fold line **43** interrupts the fold line **13** hingedly connecting the first base panel **12** to the first corner panel **14**. The fold line **43** may be non-linear, in the illustrated embodiment the fold line **43** is curved or arcuate in shape, in other embodiments it may be formed from at least two linear cut lines divergently arranged with respect to each other and contiguous with each other.

The heel tab **42** may comprise a pair of divergently arranged fold lines **45***a*, **45***b* which may define foldable corner portions of the heel tab **42**.

The top panel **18** may comprise an optional handle structure H. The handles structure H comprises a pair of foldable finger tabs **52**. The finger tabs **52** are spaced apart from each other. The finger tabs **52** are hingedly connected to the top panel **18** by fold lines **53** and are defined in part by a cut line or severance line **55**. A first one of the finger tabs **52** is hingedly connected to the top panel **18** in opposition to a second one of the finger tabs **52**.

The top panel **18** may comprise a detachable portion D in the form of a tear strip. The detachable portion D is defined by a first tear or severance line **62***a* and by a second tear or severance line **62***b*. The first and second severance lines **62***a*, **62***b* extend generally longitudinally across the top panel **18** from a first free end edge to a second, opposing, free end edge. The second severance line **62***b* is laterally spaced apart from the first severance line **62***a*. A tear initiation device in the form of a pull tab **60***a*, **60***b* may be provided at each end of the tear strip. The pull tabs **60***a*, **60***b* are hingedly connected to the tear strip by respective fold lines **61***a*, **61***b*, and may be defined in part by weakened lines which are more readily torn than the first and second severance lines **62***a*, **62***b*, that is to say the weakened lines offer less tear resistance than the first and second severance lines **62***a*, **62***b*.

The detachable portion D may facilitate access to the contents, articles B, of the carton **90** upon removal thereof.

Each of the panels **12**, **16**, **18**, **20**, **24** is formed with a pair of cut-outs or recesses. The cut-outs are defined in opposed end edges of the blank **10**. The cut-outs comprise full, major cut-outs **70**, **70**A, **70**C and partial or minor cut-outs **70**B, **70**D.

A first cut-out **70** is defined in the top panel **18** around the midway along each of its opposed end edges. A second cut-out **70**A is defined in each end edge of the first side panel **16**. A third cut-out **70**C is defined in each end edge of the second side panel **20**.

A partial or minor cut-out **70**B/**70**D is defined in each of the opposed end edges of each of the first and second base panels **12**, **24**.

As a result, the blank **10** is provided along either longitudinal edge thereof with four tabs **72**, **72**A, **72**B, **72**C each interposed between adjacent ones of the cut-outs **70**, **70**A, **70**B, **70**C, **70**D.

As illustrated in FIG. **1**, a first upper tab **72** is sandwiched and defined by the adjacently disposed first and third cut-outs **70**, **70**C. A second upper tab **72**A is sandwiched and defined by the first and second cut-outs **70**, **70**A. A first lower tab **72**B is sandwiched and defined by the second cut-out **70**A and by a first one of the partial cut-outs **70**B, defined in the first base panel **12**. A second lower tab **72**C is sandwiched and defined by the third cut-out **70**C and by a second one of the partial cut-outs **70**D, defined in the second base panel **24**.

The first upper tab **72** is positioned astride the adjacent fold line **19**. The second upper tab **72**A is positioned astride the adjacent fold line **17**.

The first lower tab **72**B is positioned astride the adjacent fold lines **13**, **15**. The second lower tab **72**C is positioned astride the adjacent fold lines **21**, **23**.

The first partial cut-out **70**B, in the first base panel **12**, comprises a first linear dimension D2b, wherein the first linear dimension D2b is defined between a free side edge (a shorter, transverse, edge of the blank **10**) of the first base panel **12** and a midpoint on a shoulder or a lower edge of the first lower tab **72**B.

The aforementioned midpoint or lower edge is defined as the point at which a first notional line z-z shown in FIG. **1** intersects the outline of the first lower tab **72**B.

The first notional line z-z is parallel to a second notional line x-x and a third notional line y-y; the first notional line z-z is disposed equidistant from the second notional line x-x and from the third notional line y-y. The second notional line x-x lies on or is defined by the free end of each of the four tabs **72**, **72**A, **72**B, **72**C. The third notional line y-y lies on or is defined by the end or bottom of each of the cut-outs **70**, **70**A, **70**B, **70**C, **70**D. The first, second and third notional lines z-z, x-x, y-y are shown in FIGS. **1** and **2**. The length, length dimension or linear dimension of each of the tabs **72**, **72**A, **72**B, **72**C and cut-outs is measured along the first notional line z-z. The length, length dimension or linear dimension E1, C1, D1, A1 of each tab **72**, **72**A, **72**B, **72**C is defined between the opposite shoulders of the respective tab, each shoulder being defined as the point at which the first notional line z-z intersects the outline of the respective tab. The length, length dimension or linear dimension B2, A2, C2 of each of the first, second and third cut-outs **70**, **70**A, **70**C is defined between the shoulders of the respective two sandwiching tabs whereas the length or length dimension D2b, D2a of each partial cut-out **70**B, **70**D is defined between the adjacent free end edge of the blank **10** and the adjacent shoulder or lower edge of the respective lower tab **72**B, **72**C.

The first lower tab **72**B comprises a second linear dimension D1, wherein the second linear dimension D1 is defined between the midpoint of the lower edge of the first lower tab **72**B and a midpoint on a shoulder or an upper edge of the first lower tab **72**B.

The second cut-out **70**A comprises a third linear dimension A2, wherein the third linear dimension A2 is defined between the midpoint of the upper edge of the first lower tab **72**B and a midpoint on a shoulder or a lower edge of the second upper tab **72**A.

The second upper tab **72**A comprises a fourth linear dimension C1, wherein the fourth linear dimension C1 is defined between the midpoint of the lower edge of the

second upper tab **72**A and a midpoint on a shoulder or an upper edge of the second upper tab **72**A.

The first cut-out **70** comprises a fifth linear dimension B2, wherein the fifth linear dimension B2 is defined between the midpoint of the upper edge of the second upper tab **72**A and a midpoint on a shoulder or an upper edge of the first upper tab **72**.

The first upper tab **72** comprises a sixth linear dimension E1, wherein the sixth linear dimension **1** is defined between the midpoint of the upper edge of the first upper tab **72** and a midpoint on a shoulder or a lower edge of the first upper tab **72**.

The third cut-out **70**C comprises a seventh linear dimension C2, wherein the seventh linear dimension C2 is defined between the midpoint of the lower edge of the first upper tab **72** and a midpoint on a shoulder or an upper edge of the second lower tab **72**C.

The second lower tab **72**C comprises an eighth linear dimension A1, wherein the eighth linear dimension A1 is defined between the midpoint of the upper edge of the second lower tab **72**C and a midpoint on a shoulder or a lower edge of the second lower tab **72**C.

The second partial cut-out **70**D, in the second base panel **24**, comprises a ninth first linear dimension D2a, wherein the ninth linear dimension D2a is defined between a midpoint on a shoulder or a lower edge of the second lower tab **72**C and a free side edge of the second base panel **24**.

The full or major cut-outs **70**, **70**A, **70**C are capable of accommodating an appropriately sized one of the tabs **72**, **72**A, **72**C. For example, the first cut-out **70** is complementary to first upper tab **72**, the second cut-out **70**A is complementary to second lower tab **72**C and the third cut-out **70**C is complementary to second upper tab **72**A.

Each of the partial or minor cut-outs **70**B, **70**D cooperates with a partial or minor cut-outs **70**B, **70**D of an adjacent blank **10** so as to provide a void capable of accommodating an appropriately sized tab **72**B. A first partial cut-out **70**B from a first blank **10** and a second partial cut-out **70**D from a second adjacent blank **10** are required to accommodate a single tab **72**B. In this way two partial cut-outs **70**B, **70**D may be considered to form a full cut-out that is complementary to first lower tab **72**B.

Each of the first and second upper tabs **72** and **72**A forms, or assists in forming of, an end retention structure for preventing the contents of the carton **90** from dislodging from the carton **90** when said blank **10** is erected into the carton **90**. Each of the first and second upper tabs **72** and **72**A is provided with cut and fold lines to form a top-engaging structure when it is folded along the fold lines.

More specifically, each upper tab **72**, **72**A comprises an anchoring portion **26***a*, **26***b*, **36***a*, **36***b* hingedly connected to the adjacent side panel **16**, **20** along a fold line **25***a*, **35***b*, **39***a*, **39***b*. Each upper tab **72**, **72**A comprises a gusset portion **28***a*, **28***b*, **34***a*, **34***b* hingedly connected to the anchoring portion **26***a*, **26***b*, **36***a*, **36***b* along a fold line **27***a*, **27***b*, **37***a*, **37***b*.

Each upper tab **72**, **72**A comprises a web portion **30***a*, **30***b*, **32***a*, **32***b* hingedly connected to the gusset portion **28***a*, **28***b*, **34***a*, **34***b* along an extension **29***a*, **29***b*, **35***a*, **35***b* of respective one of the fold lines **17**, **19**. Each upper tab **72**, **72**A comprises a covering portion **80***a*, **80***b*, **82***a*, **82***b* that is integrally formed with the top panel **18**. Each web portion **30***a*, **30***b*, **32***a*, **32***b* is hingedly connected to the respective covering portion **80***a*, **80***b*, **82***a*, **82***b* by a fold line **31***a*, **31***b*, **33***a*, **33***b*.

An optional aperture A4 may be struck in part from the top panel **18**, in part from one of the first or second side panels **16**, **20** and in part from one of the upper tabs **72**, **72**A. The apertures A4 define a terminus of the fold lines **17**, **19**; **29***a*, **29***b*, **35***a*, **35***b*; **31***a*, **31***b*, **33***a*, **33***b*; **27***a*, **27***b*, **37***a*, **37***b*; **25***a*, **35***b*, **39***a*, **39***b* and wherein apertures A4 are disposed at a vertex of aforesaid fold lines **17**, **19**; **29***a*, **29***b*, **35***a*, **35***b*; **31***a*, **31***b*, **33***a*, **33***b*; **27***a*, **27***b*, **37***a*, **37***b*; **25***a*, **35***b*, **39***a*, **39***b*.

Folding of each upper tab **72**, **72**A is achieved during the erection of the carton. To form a top engaging structure out of each upper tab **72**, **72**A, the anchoring portion **26***a*, **26***b*, **36***a*, **36***b* is folded about 180 degrees to bring it into a face-contacting relationship with the inside surface of the adjacent side panel **16**, **20**. The anchoring portion **26***a*, **26***b*, **36***a*, **36***b* is held in the folded position by being pressed by one of the packaged articles B against the adjacent side panel **16**, **20**. The folding of the anchoring portion **26***a*, **26***b*, **36***a*, **36***b* causes the gusset portion **28***a*, **28***b*, **34***a*, **34***b* to be folded outwardly about the fold line **27***a*, **27***b*, **37***a*, **37***b* so that the gusset portion **28***a*, **28***b*, **34***a*, **34***b* extends outwardly from the fold line **27***a*, **27***b*, **37***a*, **37***b* along the side wall of the one packaged article B. At the same time, the web portion **30***a*, **30***b*, **32***a*, **32***b* is caused to fold downwardly along the fold line **31***a*, **31***b*, **33***a*, **33***b* and is thereby brought to a folded position where it extends between the fold line **31***a*, **31***b*, **33***a*, **33***b* and the outer edge of the gusset portion **28***a*, **28***b*, **34***a*, **34***b*. The top-engaging structure thus completed is illustrated in FIG. **5**A wherein the structure is shown as tightly engaging the top of the one article B.

Each lower tab **72**B, **72**C serves to provide sufficient material in which the adjacent endmost heel aperture A3 is defined. More particularly, the heel aperture A3 adjacent to each lower tab **72**B, **72**C is positioned such that sufficient material surrounds the heel aperture A3 even when the heel aperture A3 extends into that lower tab **72**B, **72**C. 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 **42** are also folded to assist in retaining the articles B.

The top panel **18** comprises a width dimension W3 defined between fold line **17** and fold line **19**.

The first partial cut-out **70**B and the first lower tab **72**B together define a tenth linear dimension W2 where W2=D2b+D1.

The second partial cut-out **70**D and the second lower tab **72**C together define an eleventh linear dimension W1 where W1=D2a+A1.

The tenth linear dimension W2 is equal to the eleventh linear dimension W1.

The distance between the midpoint of the shoulder or upper edge of the first lower tab **72**B and the fold line **17**, coupling the first side panel **16** to the top panel **18**, defines a twelfth linear dimension W5.

The distance between the midpoint of the shoulder or upper edge of the second lower tab **72**C and the fold line **19**, coupling the second side panel **20** to the top panel **18**, defines a thirteenth linear dimension W4.

The thirteenth linear dimension W4 is equal to the twelfth linear dimension W5.

The length of the blank **10** defined between the free side edge of the first base panel **12** and the free side edge of the second base panel **24**, that is to say between the short, transverse, edges of the blank **10**, is given by Equation 1 below:

$$\text{length}=A1+A2+C1+C2+B1+B2+D2a+D2b+D1 \quad \text{Equation 1}$$

where,

A1=A2=B1=B2

D2a+D2b=D1

C1=C2
C1>A2
C1>B1
C2>A2
C2>B1

The length of the blank **10**, between the free side edge of the first base panel **12** and the free side edge of the second base panel **24**, is alternatively defined by Equation 2 below:

$$\text{length}=W1+W2+W3+W4+W5 \quad \text{Equation 2}$$

where,

W4=W5
W1=(D2a+A1)=(D2b+D1)=W2
W4=W5
W3+W4+W5=C2+B1+B2+C1+A2
C2+B1=C1+A2
B2<W3

Turning to FIG. **2**, there is illustrated a blank **110** for forming a carton **190** (see FIG. **4**) according to a second embodiment. The blank **110** comprises a plurality of main panels **112**, **114**, **116**, **118**, **120**, **122**, **124** for forming a tubular structure. The plurality of main panels **112**, **114**, **116**, **118**, **120**, **122**, **124** comprises; a first base panel **112**, a first corner panel **114**, a first side panel **116**, a top panel **118**, a second side panel **120**, a second corner panel **122** and a second base panel **20**. The plurality of panels **112**, **114**, **116**, **118**, **120**, **122**, **124** may be arranged in a linear series hinged one to the next by corresponding fold lines **113**, **115**, **117**, **119**, **121**, **123**.

The blank **110** is foldable to form a package **190** as illustrated in FIG. **4**. The first and second base panels **112**, **124** are engageable with one another in an overlapping relationship to form a composite base wall **112**/**124** of the carton **190**. The blank **110** may comprise a complementary locking mechanism for securing the second base panel **124** to the first base panel **112**. The first base panel **112** may comprise at least one first part F of the complementary locking mechanism. The second base panel **124** may comprise at least one second part M of the complementary locking mechanism. In some embodiments the complementary locking mechanism M/F may be omitted, the first and second base panels **112**, **124** may be secured to each other by other means such as but not limited to adhesive or staples.

Optionally, the first and second base panels **112**, **124** may comprise at least one first aperture A1. In the illustrated embodiment, each of the first and second base panels **112**, **124** comprises two first apertures A1. Optionally, the first and second base panels **112**, **124** may comprise at least one second aperture A2. In the illustrated embodiment, each of the first and second base panels **112**, **124** comprises one second apertures A2. The first and second apertures A1, A2 may be employed to facilitate construction of the carton **190**.

The blank **110** may comprise at least one heel engagement structure N for engaging with a heel or lower portion of an article B. The blank **110** illustrated in FIG. **2** comprises six heel engagement structures N each is provided for engaging a respective article B. Each of the heel engagement structures N is substantially similar in construction to those of the embodiment of FIG. **1** and will not be described in further detail.

The top panel **118** may comprise an optional handle structure H. The handles structure H comprises a pair of foldable finger tabs **152**. The finger tabs **152** are spaced apart from each other. The finger tabs **152** are hingedly connected to the top panel **118** by fold lines **153** and are defined in part by a cut line or severance line **155**. A first one of the finger tabs **152** is hingedly connected to the top panel **118** in opposition to a second one of the finger tabs **152**.

The top panel **118** may comprise a detachable portion D in the form of a tear strip. The detachable portion D is substantially similar in construction to that of the embodiment of FIG. **1** and will not be described in further detail.

Each of the panels **112**, **116**, **118**, **120**, **124** is formed with a pair of cut-outs or recesses. The cut-outs are defined in opposed end edges of the blank **110**.

A first cut-out **170** is defined in the top panel **118** around the midway along each of its opposed end edges. A second cut-out **170**A is defined in each end edge of the second side panel **120**. A third cut-out **170**C is defined in each end edge of the first side panel **116**.

A partial cut-out **170**B, **170**D is defined in each of the opposed end edges of each of the first and second base panels **112**, **124**.

As a result, the blank **110** is provided along either longitudinal edge thereof with four tabs **172**, **172**A, **172**B, **172**C each interposed between adjacent ones of the cut-outs **170**, **170**A, **170**B, **170**C, **170**D.

As illustrated in FIG. **2**, a first upper tab **172** is sandwiched and defined by the adjacently disposed first and third cut-outs **170**, **170**C. A second upper tab **172**A is sandwiched and defined by the first and second cut-outs **170**, **170**A. A first lower tab **172**B is sandwiched and defined by the second cut-out **170**A and by a first partial cut-out **170**B, defined in the second base panel **124**. A second lower tab **172**C is sandwiched and defined by the third cut-out **170**C and by a second partial cut-out **170**D, defined in the first base panel **112**.

The first upper tab **172** is positioned astride the adjacent fold line **117**. The second upper tab **172**A is positioned astride the adjacent fold line **119**.

The first lower tab **172**B is positioned astride the adjacent fold lines **121**, **123**. The second lower tab **172**C is positioned astride the adjacent fold lines **113**, **115**.

The first partial cut-out **170**B, in the second base panel **124**, comprises a first linear dimension D2b, wherein the first linear dimension D2b is defined between a free side edge (a short, transverse, edge of blank **110**) of the second base panel **124** and a midpoint on a shoulder or a lower edge of the first lower tab **172**B.

The first lower tab **172**B comprises a second linear dimension D1, wherein the second linear dimension D1 is defined between the midpoint of the lower edge of the first lower tab **172**B and a midpoint on a shoulder or an upper edge of the first lower tab **172**B.

The second cut-out **170**A comprises a third linear dimension A2, wherein the third linear dimension A2 is defined between the midpoint of the upper edge of the first lower tab **172**B and a midpoint on a shoulder or a lower edge of the second upper tab **172**A.

The second upper tab **172**A comprises a fourth linear dimension C1, wherein the fourth linear dimension C1 is defined between the midpoint of the lower edge of the second upper tab **172**A and a midpoint on a shoulder or an upper edge of the second upper tab **172**A.

The first cut-out **170** comprises a fifth linear dimension B2, wherein the fifth linear dimension B2 is defined between the midpoint of the upper edge of the second upper tab **172**A and a midpoint on a shoulder or an upper edge of the first upper tab **172**.

The first upper tab **172** comprises a sixth linear dimension E1, wherein the sixth linear dimension B1 is defined

between the midpoint of the upper edge of the first upper tab **172** and a midpoint on a shoulder or a lower edge of the first upper tab **172**.

The third cut-out **170**C comprises a seventh linear dimension C2, wherein the seventh linear dimension C2 is defined between the midpoint of the lower edge of the first upper tab **172** and a midpoint on a shoulder or an upper edge of the second lower tab **172**C.

The second lower tab **172**C comprises an eighth linear dimension A1, wherein the eighth linear dimension A1 is defined between the midpoint of the upper edge of the second lower tab **172**C and a midpoint on a shoulder or a lower edge of the second lower tab **172**C.

The second partial cut-out **170**D, in the first base panel **112**, comprises a ninth first linear dimension D2a, wherein the ninth linear dimension D2a is defined between a midpoint on a shoulder or a lower edge of the second lower tab **172**C and a free side edge of the first base panel **112**.

The top panel **118** comprises a width dimension W3 defined between fold line **17** and fold line **19**.

The first partial cut-out **170**B and the first lower tab **172**B together define a tenth linear dimension W2, W2=D2b+D1.

The second partial cut-out **170**D and the second lower tab **172**B together define an eleventh linear dimension W1, W1=D2a+A1.

The tenth linear dimension W2 is equal to the eleventh linear dimension W1.

The distance between the midpoint of the shoulder or upper edge of the first lower tab **172**B and the fold line **119**, coupling the second side panel **120** to the top panel **118**, defines a twelfth linear dimension W5.

The distance between the midpoint of the shoulder or upper edge of the second lower tab **172**C and the fold line **117**, coupling the first side panel **116** to the top panel **118**, defines a thirteenth linear dimension W4.

The thirteenth linear dimension W4 is equal to the twelfth linear dimension W5.

The length of the blank **110** defined between the free side edge of the first base panel **112** and the free side edge of the second base panel **124**, that is to say between the short, transverse, edges of the blank **110**, is given by Equation 3 below:

$$\text{length}=A1+A2+C1+C2+B1+B2+D2a+D2b+D1 \quad \text{Equation 3}$$

where,

A1=A2=B1=B2
D2a+D2b=D1
C1=C2
C1>A2
C1>B1
C2>A2
C2>B1

The length of the blank **110**, between the free side edge of the first base panel **112** and the free side edge of the second base panel **124**, is alternatively defined by Equation 4 below:

$$\text{length}=W1+W2+W3+W4+W5 \quad \text{Equation 4}$$

where,

W4=W5
W1=(D2a+A1)=(D2b+D1)=W2
W4=W5
W3+W4+W5=C2+B1+B2+C1+A2
C2+B1=C1+A2
B2<W3

Each of the first and second upper tabs **172** and **172**A forms, or assists in forming of, an end retention structure for preventing the contents of the carton **190** from dislodging from the carton **190** when said blank **110** is erected into the carton **190**. Each of the first and second upper tabs **172** and **172**A is provided with cut and fold lines to form a top-engaging structure when it is folded along the fold lines.

More specifically, each upper tab **172**, **172**A comprises an anchoring portion **126***a*, **126***b*, **136***a*, **136***b* hingedly connected to the adjacent side panel **116**, **120** along a fold line **125***a*, **135***b*, **139***a*, **139***b*. Each upper tab **172**, **172**A comprises a gusset portion **128***a*, **128***b*, **134***a*, **134***b* hingedly connected to the anchoring portion **126***a*, **126***b*, **136***a*, **136***b* along a fold line **127***a*, **127***b*, **137***a*, **137***b*.

Each upper tab **172**, **172**A comprises a web portion **130***a*, **130***b*, **132***a*, **132***b* hingedly connected to the gusset portion **128***a*, **128***b*, **134***a*, **134***b* along an extension **129***a*, **129***b*, **135***a*, **135***b* of respective one of the fold lines **17**, **19**. Each upper tab **72**, **72**A comprises a covering portion **180***a*, **180***b*, **182***a*, **182***b* that is integrally formed with the top panel **18**. Each web portion **130***a*, **130***b*, **132***a*, **132***b* is hingedly connected to the respective covering portion **180***a*, **180***b*, **182***a*, **182***b* by a fold line **131***a*, **131***b*, **133***a*, **133***b*.

Folding of each upper tab **172**, **172**A is achieved during the erection of the carton **190**. To form a top engaging structure out of each upper tab **172**, **172**A, the anchoring portion **126***a*, **126***b*, **136***a*, **136***b* is folded about 180 degrees to bring it into a face-contacting relationship with the inside surface of the adjacent side panel **116**, **120**. The anchoring portion **126***a*, **126***b*, **136***a*, **136***b* is held in the folded position by being pressed by one of the packaged articles B against the adjacent side panel **116**, **120**. The folding of the anchoring portion **126***a*, **126***b*, **136***a*, **136***b* causes the gusset portion **128***a*, **128***b*, **134***a*, **134***b* to be folded outwardly about the fold line **127***a*, **127***b*, **137***a*, **137***b* so that the gusset portion **128***a*, **128***b*, **134***a*, **134***b* extends outwardly from the fold line **127***a*, **127***b*, **137***a*, **137***b* along the side wall of the one packaged article B. At the same time, the web portion **130***a*, **130***b*, **132***a*, **132***b* is caused to fold downwardly along the fold line **131***a*, **131***b*, **133***a*, **133***b* and is thereby brought to a folded position where it extends between the fold line **131***a*, **131***b*, **133***a*, **133***b* and the outer edge of the gusset portion. The top-engaging structure thus completed is illustrated in FIG. **5**A wherein the structure is shown as tightly engaging the top of the one article B.

Each lower tab **172**B, **172**C serves to provide sufficient material in which the adjacent end most heel aperture A3 is defined. More particularly, the heel aperture A3 adjacent to each lower tab **172**B, **172**C is positioned such that sufficient material surrounds the heel aperture A3 even when the heel aperture A3 extends into that lower tab **172**B, **172**C. During the erection and packaging of articles B, the blank **110** is manipulated so that each heel aperture A3 receives the bottom of a respective article B to retain said article B within the carton **190**. The heel tabs **142** are also folded to assist in retaining the articles B.

The top panel **118** comprises a width dimension W3 defined between fold line **117** and fold line **119**.

The first partial cut-out **170**B and the first lower tab **172**B together define a tenth linear dimension W2 where W2=D2b+D1.

The second partial cut-out **170**D and the second lower tab **172**B together define an eleventh linear dimension W1 where W1=D2a+A1.

The tenth linear dimension W2 is equal to the eleventh linear dimension W1.

The distance between the midpoint of the shoulder or upper edge of the first lower tab **172**B and the fold line **119**, coupling the second side panel **120** to the top panel **118**, defines a twelfth linear dimension W5.

The distance between the midpoint of the shoulder or upper edge of the second lower tab **172**C and the fold line **117**, coupling the first side panel **116** to the top panel **118**, defines a thirteenth linear dimension W4.

The thirteenth linear dimension W4 is equal to the twelfth linear dimension W5.

The arrangement of the cut-outs **170**, **170**A, **170**B, **170**C, **170**D and tabs **172**, **172**A, **172**B, **172**C of the blank **110** of FIG. **2** has been inverted with respect to the arrangement of the cut-outs **70**, **70**A, **70**B, **70**C, **70**D and tabs **72**, **72**A, **72**B, **72**C of the blank **10** of FIG. **1**.

The way the arrangement of the cut-outs **170**, **170**A, **170**B, **170**C, **170**D and tabs **172**, **172**A, **172**B, **172**C of the blank **110** has been inverted may be described differently and more specifically as follows:

The position of the second and third cut-outs **170**A, **170**C has been swapped such that the second cut-out **170**A is now struck from the second side panel **120**, whereas in the embodiment of FIG. **1**, the cut-out **70**A was struck from the first side panel **16**. Similarly, the third cut-out **170**C is now struck from the first side panel **116**, whereas in the embodiment of FIG. **1**, the third cut-out **70**C was struck from the second side panel **20**.

The position of the first and second partial cut-outs **170**B, **170**D has been swapped such that the first partial cut-out **170**B is now struck from the second base panel **124**, whereas in the embodiment of FIG. **1**, the first partial cut-out **70**B was struck from the first base panel **12**. Similarly, the second partial cut-out **170**D is now struck from the first base panel **112**, whereas in the embodiment of FIG. **1**, the second partial cut-out **70**D was struck from the second side panel **24**.

The position of the first cut-out **170** remains unchanged and is struck from the top panel **118** of the blank **110** whereas in the embodiment of FIG. **1**, the first cut-out **70** was struck from the top panel **18**.

The position of the first and second upper tabs **172** and **172**A has also been swapped such that the second upper tab **172**A is now astride the fold line **119** whereas in the embodiment of FIG. **1**, the second upper tab **72**A was astride the fold line **17**. Similarly, the first upper tab **172** is now astride the fold line **117** whereas in the embodiment of FIG. **1**, the first upper tab **72** was astride the fold line **19**. Additionally, the position of the first and second lower tabs **172**B and **172**C has been swapped such that the second lower tab **172**C is now astride the fold lines **113**, **115** whereas in the embodiment of FIG. **1**, the second lower tab **72**C was astride the fold lines **21**, **23**. Similarly, the first lower tab **172**B is now astride the fold lines **121**, **123** whereas in the embodiment of FIG. **1**, the first lower tab **72**B was astride the fold lines **13**, **15**.

Referring to FIG. **7**, there is illustrated a blank **210** for forming a carton **290** (see FIG. **8**) according to another embodiment. The blank **210** comprises a plurality of main panels **212**, **214**, **216**, **218**, **220**, **222**, **224** for forming a tubular structure. The plurality of main panels **212**, **214**, **216**, **218**, **220**, **222**, **224** comprises; a first base panel **212**, a first corner panel **214**, a first side panel **216**, a top panel **218**, a second side panel **220**, a second corner panel **222** and a second base panel **20**. The plurality of panels **212**, **214**, **216**, **218**, **220**, **222**, **224** may be arranged in a linear series hinged one to the next by corresponding fold lines **213**, **215**, **217**, **219**, **221**, **223**.

The blank **210** is substantially similar in construction to those of the embodiments of FIG. **1** and FIG. **2** and only the differences between the blank **210** of FIG. **7** and blanks **10**; **110** of FIGS. **1** and **2** will be described in further detail.

Each of the panels **212**, **214**, **216**, **218**, **220**, **222**, **224** is formed with a pair of cut-outs or recesses. The cut-outs are defined in opposed end edges of the blank **210**.

A first cut-out **270** is defined in the top panel **218** around the midway along each of its opposed end edges. A second cut-out **270***a* is defined in each end edge of the first side panel **216**. A third cut-out **270***c* is defined in each end edge of the second side panel **220**.

A partial cut-out **270***b*, **270***d* is defined in each of the opposed end edges of each of the first and second base panels **212**, **224**.

As a result, the blank **210** is provided along either longitudinal edge thereof with four tabs **272**, **272***a*, **272***b*, **272***c* each interposed between adjacent ones of the cut-outs **270**, **270***a*, **270***b*, **270***c*, **270***d*.

A first upper tab **272** is sandwiched and defined by the adjacently disposed first and third cut-outs **270**, **270***c*. A second upper tab **272**A is sandwiched and defined by the first and second cut-outs **270**, **270***a*. A first lower tab **272***b* is sandwiched and defined by the second cut-out **270***a* and by a first one of the partial cut-outs **270***b*, defined in the first base panel **212**. A second lower tab **272***c* is sandwiched and defined by the third cut-out **270**C and by a second one of the partial cut-outs **270***d*, defined in the second base panel **224**.

The first upper tab **272** is positioned astride the adjacent fold line **219**. The second upper tab **272***a* is positioned astride the adjacent fold line **217**.

The first lower tab **272***b* is positioned astride the adjacent fold lines **213**, **215**. The second lower tab **272***c* is positioned astride the adjacent fold lines **221**, **223**.

The first partial cut-out **270***b*, in the first base panel **212**, comprises a first linear dimension D2b, wherein the first linear dimension D2b is defined between a free side edge (a short, transverse, edge the blank **210**) of the first base panel **212** and a midpoint on a shoulder or a lower edge of the first lower tab **272***b*.

The first lower tab **272***b* comprises a second linear dimension D1, wherein the second linear dimension D1 is defined between the midpoint of the lower edge of the first lower tab **272***b* and a midpoint on a shoulder or an upper edge of the first lower tab **272***b*.

The second cut-out **270***a* comprises a third linear dimension A2, wherein the third linear dimension A2 is defined between the midpoint of the upper edge of the first lower tab **272***b* and a midpoint on a shoulder or a lower edge of the second upper tab **272***a*.

The second upper tab **272***a* comprises a fourth linear dimension C1, wherein the fourth linear dimension C1 is defined between the midpoint of the lower edge of the second upper tab **272***a* and a midpoint on a shoulder or an upper edge of the second upper tab **272***a*.

The first cut-out **270** comprises a fifth linear dimension B2, wherein the fifth linear dimension B2 is defined between the midpoint of the upper edge of the second upper tab **272***a* and a midpoint on a shoulder or an upper edge of the first upper tab **272**.

The first upper tab **272** comprises a sixth linear dimension E1, wherein the sixth linear dimension **1** is defined between the midpoint of the upper edge of the first upper tab **272** and a midpoint on a shoulder or a lower edge of the first upper tab **272**.

The third cut-out **270***c* comprises a seventh linear dimension C2, wherein the seventh linear dimension C2 is defined between the midpoint of the lower edge of the first upper tab **272** and a midpoint on a shoulder or an upper edge of the second lower tab **272***c*.

The second lower tab **272***c* comprises an eighth linear dimension A1, wherein the eighth linear dimension A1 is defined between the midpoint of the upper edge of the second lower tab **272***c* and a midpoint on a shoulder or a lower edge of the second lower tab **272***c*.

The second partial cut-out **270***d*, in the second base panel **224**, comprises a ninth first linear dimension D2a, wherein the ninth linear dimension D2a is defined between a midpoint on a shoulder or a lower edge of the second lower tab **272***c* and a free side edge of the second base panel **224**.

The second, fourth, sixth and eighth linear dimensions D1, C1, E1, A1 are equal in magnitude.

The third, fifth and seventh linear dimensions A2, B2, C2 are equal in magnitude.

The second, fourth, sixth and eighth linear dimensions D1, C1, E1, A1 and the third, fifth and seventh linear dimensions A2, B2, C2 are equal in magnitude, in this way the tabs **272**, **272***a*, **272***b*, **272***c* are complementary to the cut-outs **270**, **270***a*, **270***b*, **270***c*, **270***d*. This enables identical blanks **210** to be nested without being inverted.

The tenth linear dimension W2 and the eleventh linear dimension W1 of blanks **10**; **110**; **210** are maintained at a constant magnitude for beverage cans or articles B having a common body diameter irrespective of their volume capacity. That is to say, the tenth linear dimension W2 of blanks **10**; **110** is equal in magnitude to the tenth linear dimension W2 of blank **210** despite the fact that the blanks **10**; **110** are adapted to accommodate larger articles B. Similarly, the eleventh linear dimension W1 of blanks **10**; **110** is equal in magnitude to the eleventh linear dimension W1 of blank **210**.

In this way the upper shoulders or edges of the first and second lower tabs **72**B, **72**C; **172**B, **172**C; **272***b*, **272***c* are maintained at a constant elevation above the base wall **12**/**24**; **112**/**124**; **212**/**224** of the carton **90**; **190**; **290** irrespective of the volume capacity of the articles B, as illustrated by FIG. **8**.

This is advantageous since a packaging machine can employ a flight bar or lug to engage with a group of articles B to transfer the group of articles B or a package comprising the group of articles B and a carton **90**; **190** in a downstream direction during processing of the group of articles B or package. The height or elevation of the flight bar or lug with respect to the articles B need not be adjusted so that the packaging machine can accommodate articles B of different volume capacities. In one non-limiting example, the packaging machine may be employed to package 330 ml beverage cans having a diameter of 66 mm or to package 500 ml beverage cans having a diameter of 66 mm. The blanks **10**; **110** of FIGS. **1** and **2** may be employed to package the 500 ml beverage cans. The blank **210** of FIG. **7** may be employed to package the 330 ml beverage cans. FIG. **8** illustrates a first carton **90** formed from a blank **10** according to FIG. **1** side by side with a third carton **290** formed from a blank **210** according to FIG. **7**. FIG. **8** clearly shows that a recess in the first side wall **16** of the first carton **90** is arranged to commence at the same elevation above the base wall **12**/**24** as recess in a first side wall **216** of the third carton **290**. In this way the blanks **10**, **210** and/or first and third cartons **90**, **290** can be handled and manipulated to form packages on the same packaging machine.

Similarly, the width dimension W3 of the top panel **18**; **118**; **218** is maintained at a constant magnitude for beverage cans or articles B having a common body diameter irrespective of their volume capacity.

The magnitude of the thirteenth linear dimension W4 and magnitude of the twelfth linear dimension W5 of the blanks **10**; **110**; **210** is adapted, increased or decreased, accordingly in dependence upon the volume capacity or height dimension of the articles B to be packaged by the carton **90**; **190**; **290**.

Whereas the arrangement of the tabs **272**, **272***a*, **272***b*, **272***c* and cut-outs **270**, **270***a*, **270***b*, **270***c*, **270***d* of the blank **210** is symmetrical about an axis bisecting the top panel **218** and extending parallel to the fold lines **217**, **219**. The blanks **10**; **110** are in contrast asymmetrical, about an axis bisecting the top panel **18**; **118** and extending parallel to the fold lines **17**, **19**; **117**, **119**. The first upper tab **72**, **172** is smaller in length or height than the second upper tab **72**A, **172**A. The first lower tab **72**B, **172**B is smaller in length or height than the second lower tab **72**C, **172**C. The second cut-out **70**A, **170**A is smaller in length or height than the third cut-out **70**C, **170**C. The second partial cut-out **70**D, **170**D is smaller in length or height than the first partial cut-out **70**B, **170**B.

FIG. **5**A shows a first side view of the carton **90** formed from the blank **10** of FIG. **1**, FIG. **5**B shows a second side view of the carton **90** formed from the blank **10** of FIG. **1**. The fold lines **39***a*, **39***b* are shorter in length than the fold lines **25***a*, **25***b*.

FIG. **6**A shows a first end view of the carton **90** formed from the blank **10** of FIG. **1**, FIG. **5**B shows a second end view of the carton **90** formed from the blank **10** of FIG. **1**. The anchoring portions **36***a*, **36***b* are hinged to second side panel **20** by fold lines **39***a*, **39***b* respectively, the anchoring portions **26***a*, **26***b* are hinged to first side panel **20** by fold lines **25***a*, **25***b* respectively, are longer in length than the fold lines **25***a*, **25***b*. The anchoring portion **36***a* and the fold line **39***a* are shorter than the anchoring portion **26***a* and the fold line **25***a*. The anchoring portion **36***b* and the fold line **39***b* are shorter than the anchoring portion **26***b* and the fold line **25***b*.

FIGS. **1** and **2** show that each anchoring portion **26***a*, **26***b*, **36***a*, **36***b*; **126***a*, **126***b*, **136***a*, **136***b* and the respective gusset portion **28***a*, **28***b*, **34***a*, **34***b*; **128***a*, **1128***b*, **134***a*, **134***b* to which it is hinged define or form a portion of the respective one of the first and second upper tabs **72**, **72**A, **172**, **172**A which is hingedly connected to a first or second side panel **16**, **20**; **116**, **120** respectively.

The portion of the first upper tab **72**; **172** hinged to the respective side panel **20**; **116** has a length dimension indicated by reference sign "Q" in FIGS. **1** and **2**. The portion of the second upper tab **72**A; **172**A hinged to the respective side panel **16**; **120** has a length dimension indicated by reference sign "P" in FIGS. **1** and **2**.

The fold line **25***a*, **25***b*; **139***a*, **139***b* connecting the anchoring portion **26***a*, **26***b*; **136***a*, **136***b* of the second upper tab **72**A; **172**A to the respective side panel **16**; **120** has a length dimension indicated by reference sign "d_1" in FIGS. **1** and **2**.

The fold line **39***a*, **39***b*; **125***a*, **125***b* connecting the anchoring portion **36***a*, **36***b*; **126***a*, **126***b* of the first upper tab **72**; **172** to the respective side panel **16**; **120** has a length dimension indicated by reference sign "d_2" in FIGS. **1** and **2**.

The length T of a portion of the first lower tab **72**B, **172**B connected to the respective one **12**, **124** of the first and second base panels is less than the length S of a portion of the second lower tab **72**C, **172**C connected to the respective other one **24**, **112** of the first and second base panels.

The second cut-outs **70**A, **170**A each has an upper edge and a lower edge and the third cut-outs **70**C, **170**C each has an upper edge and a lower edge. Each of the lower edges of the second cut-outs **70**A, **170**A is disposed at a first distance (D1−T) from the adjacent one **12**, **124** of the first and second base panels. Each of the lower edges of the third cut-outs

70C, 170C is disposed at a second distance (A1−S) from the adjacent other one **24**, **112** of the first and second base panels. The first distance (D1−T) is equal to the second distance (A1−S).

FIG. **3** shows how the blank **10** of FIG. **1** and the blank **110** of FIG. **2** of the described above allows a plurality of like carton blanks to be arranged in a nested relationship. FIG. **3** shows alternating columns of blanks **10** of FIG. **1** and columns of the blanks **110** of FIG. **2**; a pair of columns of blanks **110** according to FIG. **2** are interposed with a column of blanks **10** according to FIG. **1**.

The second cut-out **70**A of the blank **10** can snugly receive the second lower tab **172**C of the blank **110**. The third cut-out **170**C of the blank **110** can snugly receive the second upper tab **72**C of the blank **10**. The first cut-out **70** of the blank **10** can snugly receive the first upper tab **172** of the blank **110**. The first cut-out **170** of the blank **110** can snugly receive the first upper tab **72** of the blank **10**. The third cut-out **70**C of the blank **10** can snugly receive the second upper tab **172** of the blank **110**. The second cut-out **170**A of the blank **110** can snugly receive the second lower tab **72**C of the blank **10**. The second partial cut-out **70**D of a first one of the blanks **10** and the first partial cut-out **70**B of a second, subsequent or sequential, one of the blanks **10** together can snugly receive the first lower tab **172**B of the blank **110**. The first partial cut-out **170**B of a one of the blanks **110** and the second partial cut-out **170**D of a second, subsequent or sequential, one of the blanks **110** together can snugly receive the first lower tab **72**B of the second one of the blanks **110**.

In this way the blank **10** of FIG. **1** and the blank **110** of FIG. **2** can be nested in a partially, longitudinally offset relationship to each other.

In alternative embodiments, a nested arrangement may be formed solely from a plurality of blanks **10** according to FIG. **1** (see FIG. **9**) or only from a plurality of blanks **110** according to FIG. **2**. In order to do so the alternate columns of blanks **10**A, **10**B are inverted with respect to their adjacent neighbours, as shown in FIG. **9**.

As apparent from FIG. **3** and FIG. **9**, a number of similar blanks **10**; **110** can be horizontally arranged in a similar manner as described above so that they are efficiently taken from paperboard minimising or reducing the amount of waste material or scraps.

Construction of the cartons **90**; **190** as illustrated in FIG. **4**, **5**A will be described with reference to the blank of FIG. **1** and the carton **90** of FIG. **5**A. It will be appreciated the blank of FIG. **2** is constructed into the carton **190** of FIG. **4** in a substantially similar manner. The carton **90**; **190** can be formed by a series of sequential folding operations in a straight-line machine so that the carton **90**; **190** is not required to be rotated or inverted to complete its construction. The folding process is 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 FIG. **5**A six articles B are arranged in a 2×3 array. The top panel **18** of the blank **10** is disposed above the group of articles B to provide a top wall **18** of the carton **90**.

The first and second side walls **16**, **22** are folded, with respect to the top panel **18** about fold lines **17**, **19** 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.

The anchor portions **26***a*, **26***b*, **36***a*, **36** may be folded into face contacting relationship with the respective one of the first and second side panel **16**, **20** substantially simultaneously with folding the first and second side walls **16**, **22** with respect to the top panel **18**, to form the top engaging structures described above.

Alternatively, the top engaging structures may be formed subsequent to erection of the carton **90** into a tubular form. The anchor portions **26***a*, **26***b*, **36***a*, **36** may be tucked between the respective one of the first and second side panels **16**, **20** to which they are hingedly connected and an adjacently disposed article B.

The first and second corner panels **114**, **120** are folded, with respect to the respective one of the first and second side walls **16**, **122** about fold lines **15**, **21** respectively, about the heels or lower portions of adjacently disposed articles B.

The heel tabs **42** may folded out of the plane of the first and second corner panels **14**, **20**, about fold line **43**, prior to folding the first and second corner panels **14**, **20** the respective one of the first and second side walls **16**, **122**.

The first base panel **12** is folded about the fold line **13** so as to be disposed adjacent the base of the group of articles B, the second base panel **24** is then folded about the fold line **23** so as to be in at least partial overlapping relationship with the first base panel **12**; 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**, **24** are secured together. Each of the male tabs M is displaced inwardly out of the plane of the second base panel **24**. 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**, **24** together. In this way a tubular structure is formed about the group of articles B.

The assembled carton **90** is shown in FIGS. **5**A to **6**B.

The present disclosure provides a carton **90**; **190**; **290** for packaging articles B. The carton **90** **190**; **290** is formed from a blank **10**; **110**; **210** which can be nested with like blanks each forming a carton **90**; **190**; **290**.

First cartons **90**; **190** are arranged to accommodate articles of a first dimension, second carton **290** is arranged to accommodate articles of a second different dimension. The cartons **90**; **190**; **290** comprise recessed side walls; the recesses in the side walls **16**,**20**; **116**,**120** of the first cartons **90**; **190** are arranged to commence at the same elevation above the base wall **12**/**24**; **112**/**124** as recesses in the side walls **216**, **220** of the second carton **290**. In this way the blanks **10**; **110**; **210** and first and second cartons **90**; **190**; **290** can be handled and manipulated to form packages on the same packaging machine.

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.

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

As used herein, the terms “hinged connection” and “fold line” refer to all manner of lines that define hinge features of the blank, facilitate folding portions of the blank with respect to one another, or otherwise indicate optimal panel folding locations for the blank. Any reference to “hinged connection” should not be construed as necessarily referring to a single fold line only; indeed, a hinged connection can be formed from two or more fold lines wherein each of the two

or more fold lines may be either straight/linear or curved/curvilinear in shape. When linear fold lines form a hinged connection, they may be disposed parallel with each other or be slightly angled with respect to each other. When curvilinear fold lines form a hinged connection, they may intersect each other to define a shaped panel within the area surrounded by the curvilinear fold lines. A typical example of such a hinged connection may comprise a pair of arched or arcuate fold lines intersecting at two points such that they define an elliptical panel therebetween. A hinged connection may be formed from one or more linear fold lines and one or more curvilinear fold lines. A typical example of such a hinged connection may comprise a combination of a linear fold line and an arched or arcuate fold line which intersect at two points such that they define a half moon-shaped panel therebetween.

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

It should be understood that hinged connections and fold lines can each include elements that are formed in the substrate of the blank including perforations, a line of perforations, a line of short slits, a line of half-cuts, a single half-cut, a cutline, an interrupted cutline, slits, scores, 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.

The invention claimed is:

1. An elongate blank for forming a tubular carton, said blank comprising

a plurality of panels including;

a top panel,

a first side panel,

a second side panel,

a first base panel, and

a second base panel,

the plurality of panels arranged in a row along a length of the blank, said panels being hingedly connected one to another in series, each of said panels having a pair of opposed free end edges disposed generally along the length of the blank, said each panel being formed along either free end edge thereof with cut-outs so that said blank is provided along either longitudinal edge thereof with a plurality of tabs each interposed between adjacent ones of said cut-outs, said cut-outs including;

a first major cut-out struck from each of the opposed free end edges of the top panel,

a second major cut-out struck from each of the opposed free end edges of the first side panel,

a third major cut-out struck from each of the opposed free end edges of the second side panel,

a first minor cut-out struck from each of the opposed free end edges of the first base panel,

a second minor cut-out struck from each of the opposed free end edges of the second base panel,

wherein the length of one of the free end edges of the first side panel defined by one of the second major cut-outs is less than the length of one of the free end edges of the second side panel defined by one of the third major cut-outs.

2. An elongate blank according to claim **1**, wherein a first upper tab is hingedly connected in part to one of the first and second side panels and in part to the top panel.

3. An elongate blank according to claim **2**, wherein a second upper tab is hingedly connected in part to the other one of the first and second side panels and in part to the top panel.

4. An elongate blank according to claim **1**, wherein a first lower tab is hingedly connected in part to one of the first and second side panels and in part to one of the first and second base panels.

5. An elongate blank according to claim **4**, wherein a second lower tab is hingedly connected in part to the other one of the first and second side panels and in part to the other one of the first and second base panels.

6. An elongate blank according to claim **3**, wherein the length of the part of the first upper tab connected to one of the first and second side panels is less than the length of the part of the second upper tab connected to the other one of the first and second side panels.

7. An elongate blank according to claim **5**, wherein the length of the part of the first lower tab connected to one of the first and second base panels is less than the length of the part of the second lower tab connected to the other one of the first and second base panels.

8. An elongate blank according to claim **1**, wherein the second cut-outs each comprise an upper edge and a lower edge and the third cut-outs each comprise an upper edge and a lower edge, each of the lower edges of the second cut-outs being disposed at a first distance from an adjacent one of the first and second base panels, each of the lower edges of the third cut-outs being disposed at a second distance from an adjacent other one of the first and second base panels, the first distance being equal to the second distance.

9. An elongate blank for forming a tubular carton, said blank comprising

a plurality of panels including;

a top panel,

a first side panel hinged to a first side of the top panel,

a second side panel hinged to a second side of the top panel,

a first base panel hinged to the first side panel and

a second base panel hinged to the second side panel,

the plurality of panels arranged in a row along a length of the blank, said panels being hingedly connected one to another in series, each of said panels having a pair of opposed free end edges disposed generally along the length of the blank, said each panel being formed along either free end edge thereof with a cut-out so that said blank is provided along either longitudinal edge thereof with a plurality of tabs each interposed between adjacent ones of said cut-outs,

wherein the arrangement of cut-outs and tabs is asymmetrical about a notional line which is transverse to the longitudinal edges and bisects the top panel.

10. A carton for packaging one or more articles, the carton comprising a plurality of walls including;

a top wall,

a first side wall,

a second side wall,

a base wall,

the carton comprising an article retention structure comprising

a first top engaging structure and

a second top engaging structure,

the first top engaging structure comprising a first upper tab hingedly connected in part to a one of the first and second side walls and including;

a first anchoring portion hingedly connected to said one side wall;

a first gusset portion hingedly connected to the first anchoring portion;

a first web portion hingedly connected to the first gusset portion; and

a first covering portion provided by a part of the top panel and hingedly connected to the first web portion;

the second top engaging structure comprising a second upper tab hingedly connected in part to the other one of the first and second side walls and including;

a second anchoring portion hingedly connected to said other side wall;

a second gusset portion hingedly connected to the second anchoring portion;

a second web portion hingedly connected to the second gusset portion; and

a second covering portion provided by a part of the top panel and hingedly connected to the second web portion;

wherein the second anchoring portion is greater in dimension than the first anchoring portion.

11. A carton according to claim **10**, wherein a hinged connection connecting the second anchoring portion to said other side wall is longer than a hinged connection connecting the first anchoring portion to said one side wall.

12. An elongate blank according to claim **1**, wherein

the first minor cut-out has a first linear dimension (D2b);

a first lower tab of the plurality of tabs is formed in part from the first base panel and in part from the first side panel and has a second linear dimension (D1);

the second major cut-out has a third linear dimension (A2);

a second upper tab of the plurality of tabs is formed in part from the first side panel and in part from the top panel and has a fourth linear dimension (C1);

the first major cut-out has a fifth linear dimension (B2);

a first upper tab of the plurality of tabs is formed in part from the second side panel and in part from the top panel and has a sixth linear dimension (B1);

the third major cut-out has a seventh linear dimension (C2);

a second lower tab of the plurality of tabs is formed in part from the second base panel and in part from the second side panel and has an eighth linear dimension (A1);

the second minor cut-out has a ninth linear dimension (D2a);

wherein the length of the blank is given by:

$$length=A1+A2+C1+C2+B1+B2+D2a+D2b+D1$$

and wherein

A1=A2

B1=B2

D1=D2a+D2b

C1=C2

C1>A2

C1>B1

(D2a+A1)=(D2b+D1).

13. An elongate blank according to claim **12**, wherein the top panel comprises a width dimension (W3); the first minor cut-out and the first lower tab together define a tenth linear dimension (W2), where W2=D2b+D1); the second partial cut-out **70**D and the second lower tab together define an eleventh linear dimension (W1), where W1=D2a+A1; the distance between the midpoint of the upper edge of the first lower tab and the fold line coupling the first side panel to the top panel defines a twelfth linear dimension (W5); the distance between the midpoint of the upper edge of the second lower tab and the fold line coupling the second side panel to the top panel defines a thirteenth linear dimension (W4); wherein the length of the blank is given by:

$$length=W1+W2+W3+W4+W5$$

and where:

$$W4=W5$$

$$W3+W4+W5=C2+B1+B2+C1+A2.$$

14. An elongate blank according to claim **13**, wherein

$$C2+B1=C1+A2$$

and where

$$B2<W3.$$

* * * * *