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**Ayerst**

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(54) **CARTON WITH EXPANSION FEATURES**

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***B65D 5/10*** (2006.01)
***B65D 5/40*** (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC ..... ***B65D 5/0005*** (2013.01); ***B65D 5/10*** (2013.01); ***B65D 5/40*** (2013.01); ***B65D 5/4266*** (2013.01); ***B65D 5/4608*** (2013.01); ***B65D 5/54*** (2013.01); ***B65D 5/62*** (2013.01); ***B65D 71/36*** (2013.01); *B31B 50/26* (2017.08); *B31B 50/81* (2017.08); *B31B 2100/00* (2017.08); *B31B 2110/35* (2017.08); *B65D 5/563* (2013.01); *B65D 81/18* (2013.01); *B65D 2571/0045* (2013.01); *B65D 2571/0066* (2013.01); *B65D 2571/00141* (2013.01); *B65D 2571/00561* (2013.01); *B65D 2571/00728* (2013.01)

(58) **Field of Classification Search**
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USPC ..... 229/101, 243
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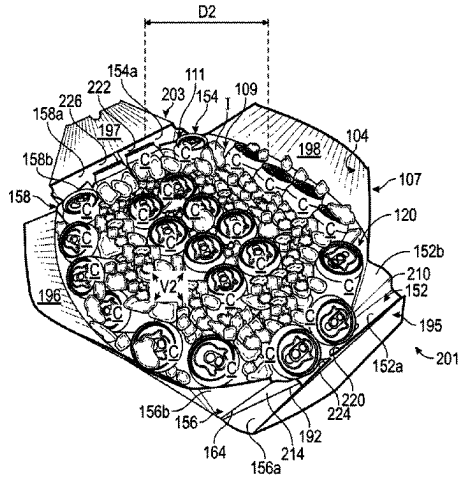
(57) **ABSTRACT**

A carton for holding one or more containers includes a plurality of panels that extend at least partially around an interior of the carton, a plurality of end flaps foldably connected to the respective plurality of panels to form at least one closed end of the carton, and at least one gusset foldably connected between the at least one side panel and the at least one closed end of the carton. The plurality of panels includes a bottom panel, a top panel, and at least one side panel. The at least one gusset is positionable between a first position and a second position wherein the interior of the carton is expanded.

**48 Claims, 8 Drawing Sheets**



(51) **Int. Cl.**

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| ***B65D 81/18*** | (2006.01) |
| ***B65D 5/355*** | (2006.01) |
| ***B65D 5/42*** | (2006.01) |
| ***B65D 5/468*** | (2006.01) |
| ***B65D 5/54*** | (2006.01) |
| ***B65D 5/62*** | (2006.01) |
| ***B65D 71/36*** | (2006.01) |
| *B65D 5/56* | (2006.01) |
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| *B31B 50/81* | (2017.01) |
| *B31B 100/00* | (2017.01) |
| *B31B 110/35* | (2017.01) |

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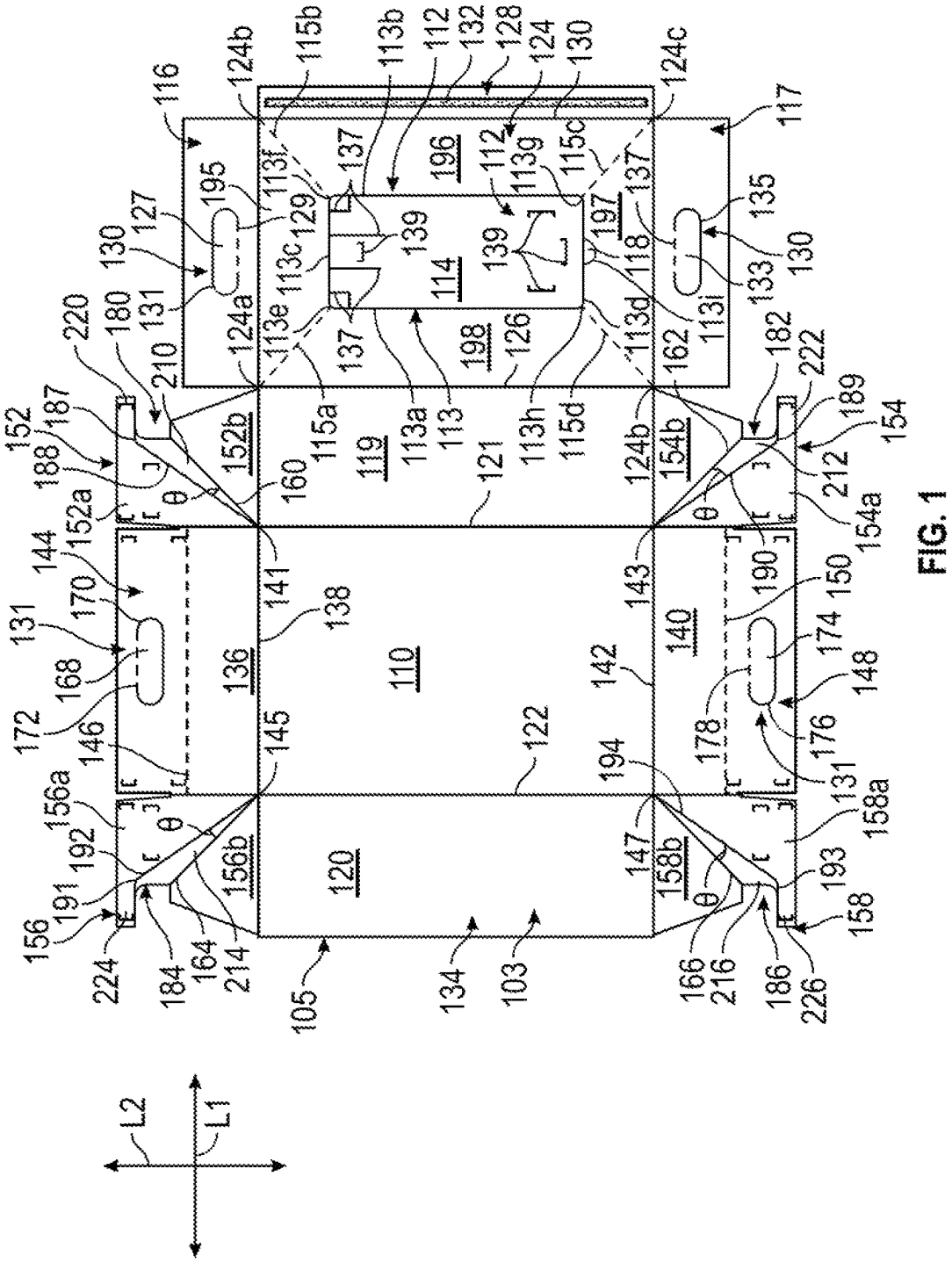
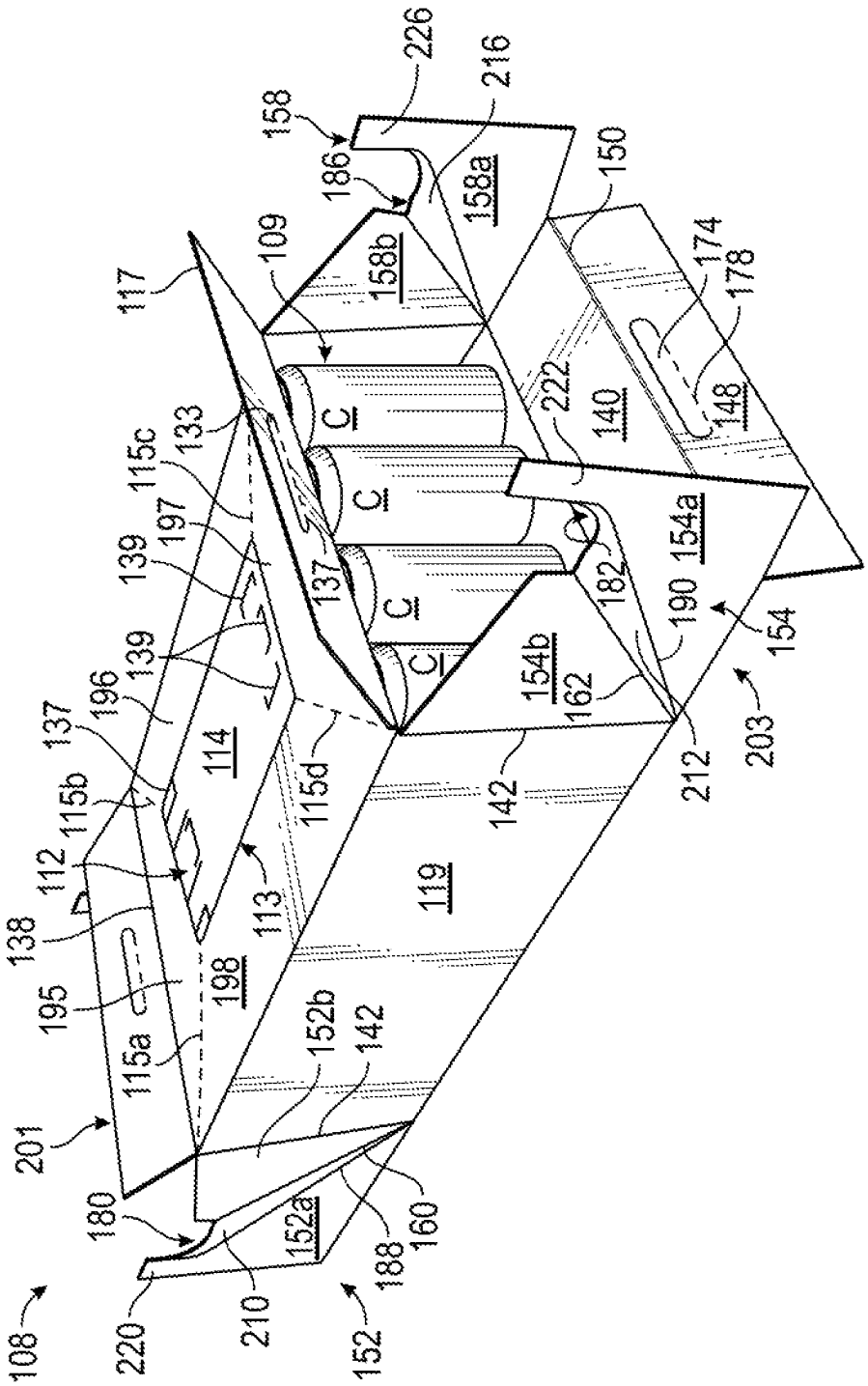



FIG. 1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197
139
137
154a
182
190
154
139
196
154b
162
137
114
115d
142
212
203
115b
112
113
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138
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195
115a
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142
201
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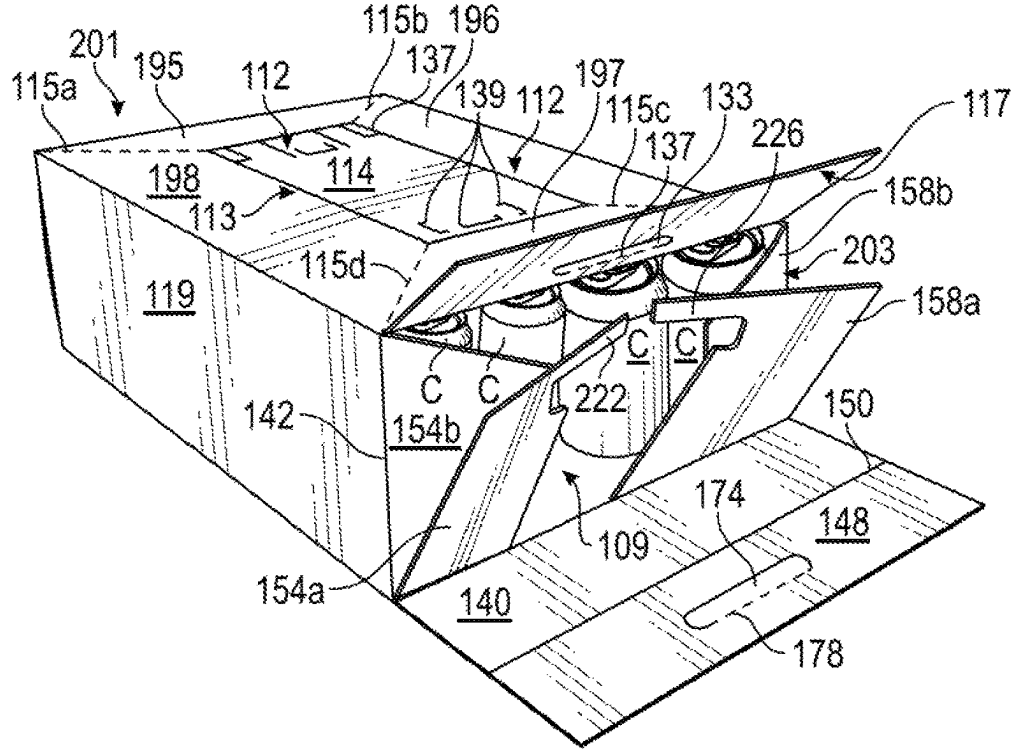
152a
160
188
210
220
152
108

FIG. 2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115d
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C
C
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154a
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FIG. 3

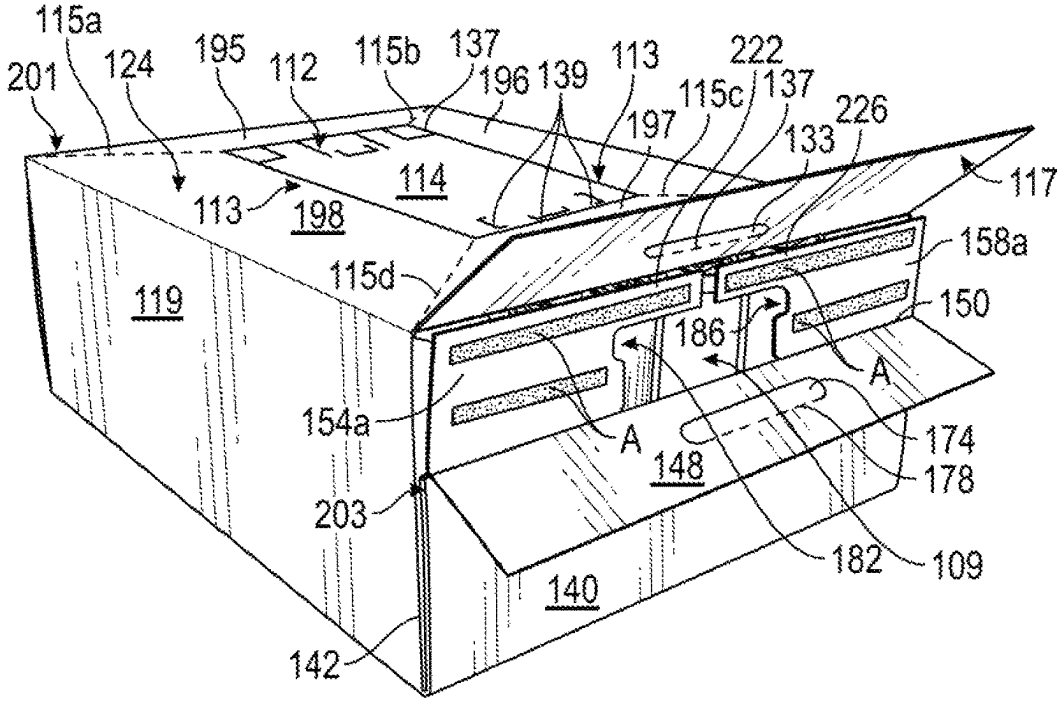
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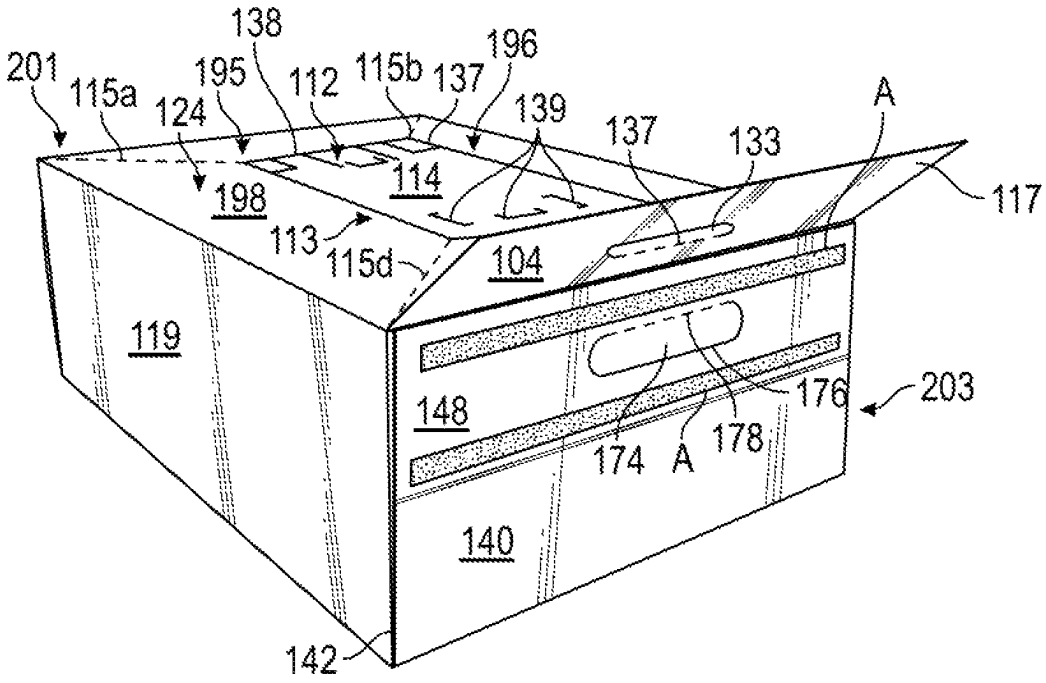
FIG. 4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148
176
203
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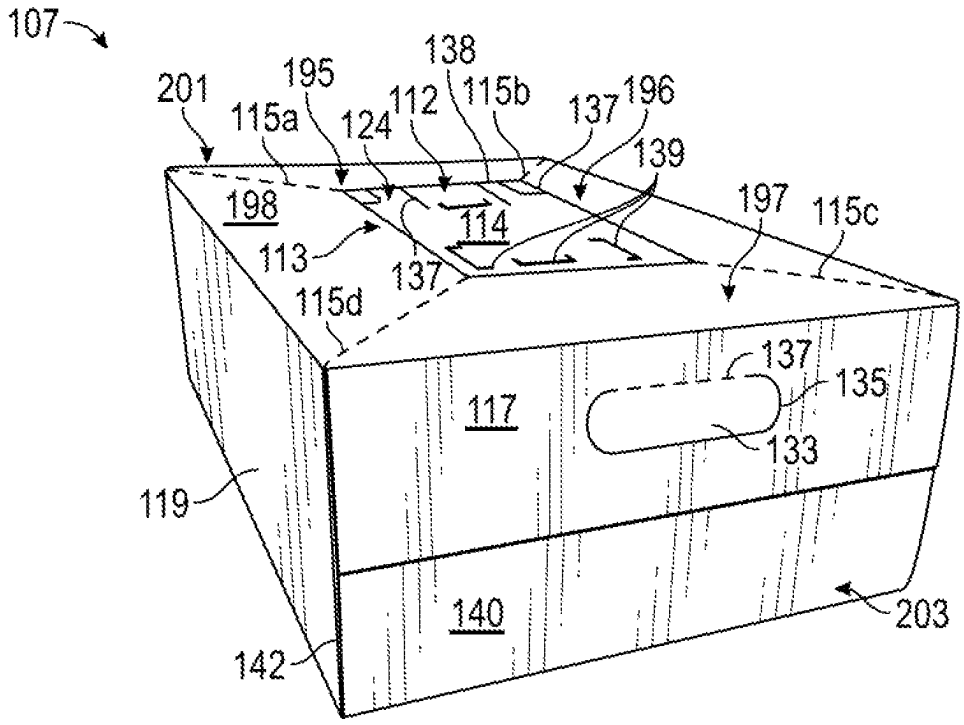
140
142

FIG. 5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203
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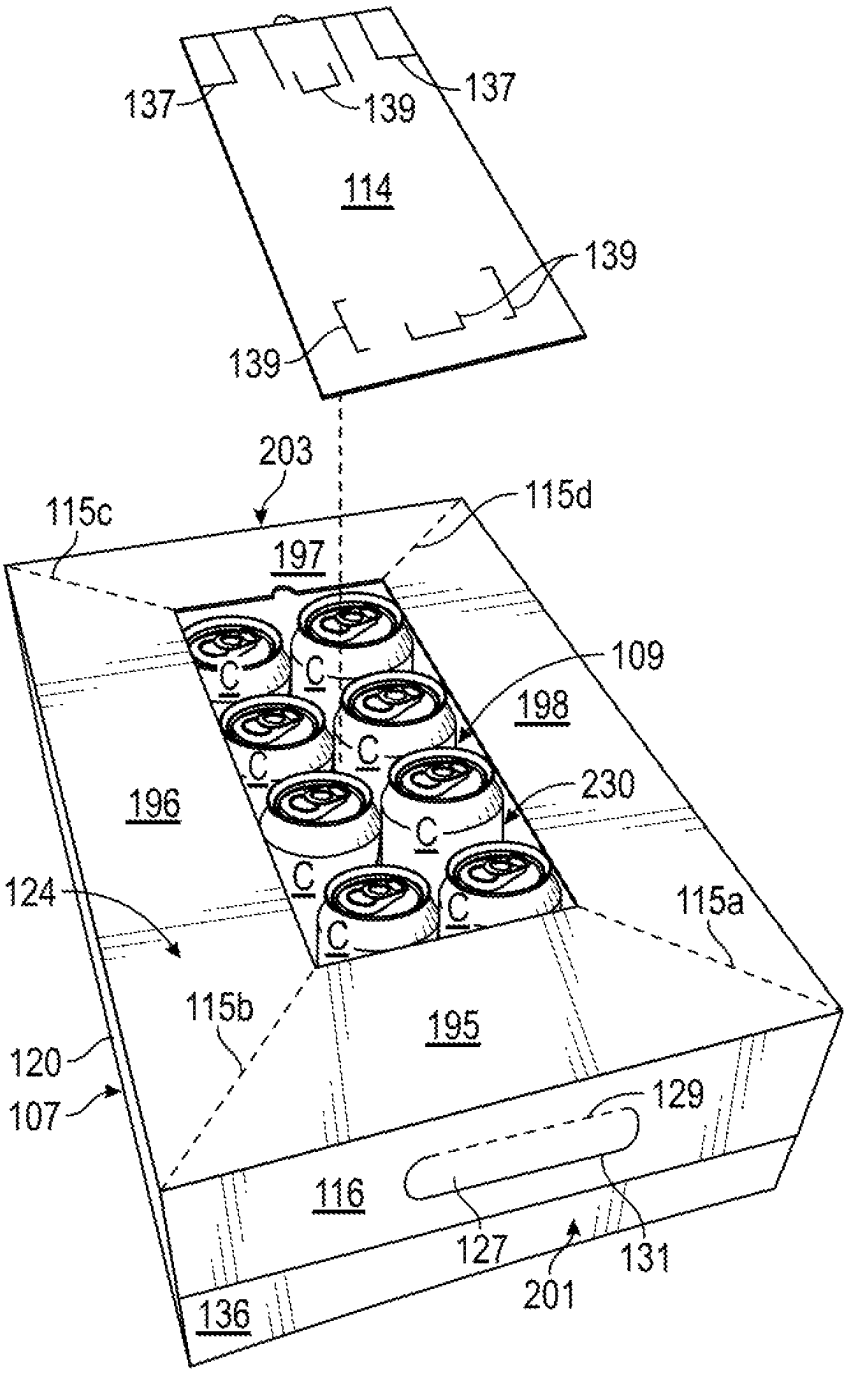
FIG. 6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139
203
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115b
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120
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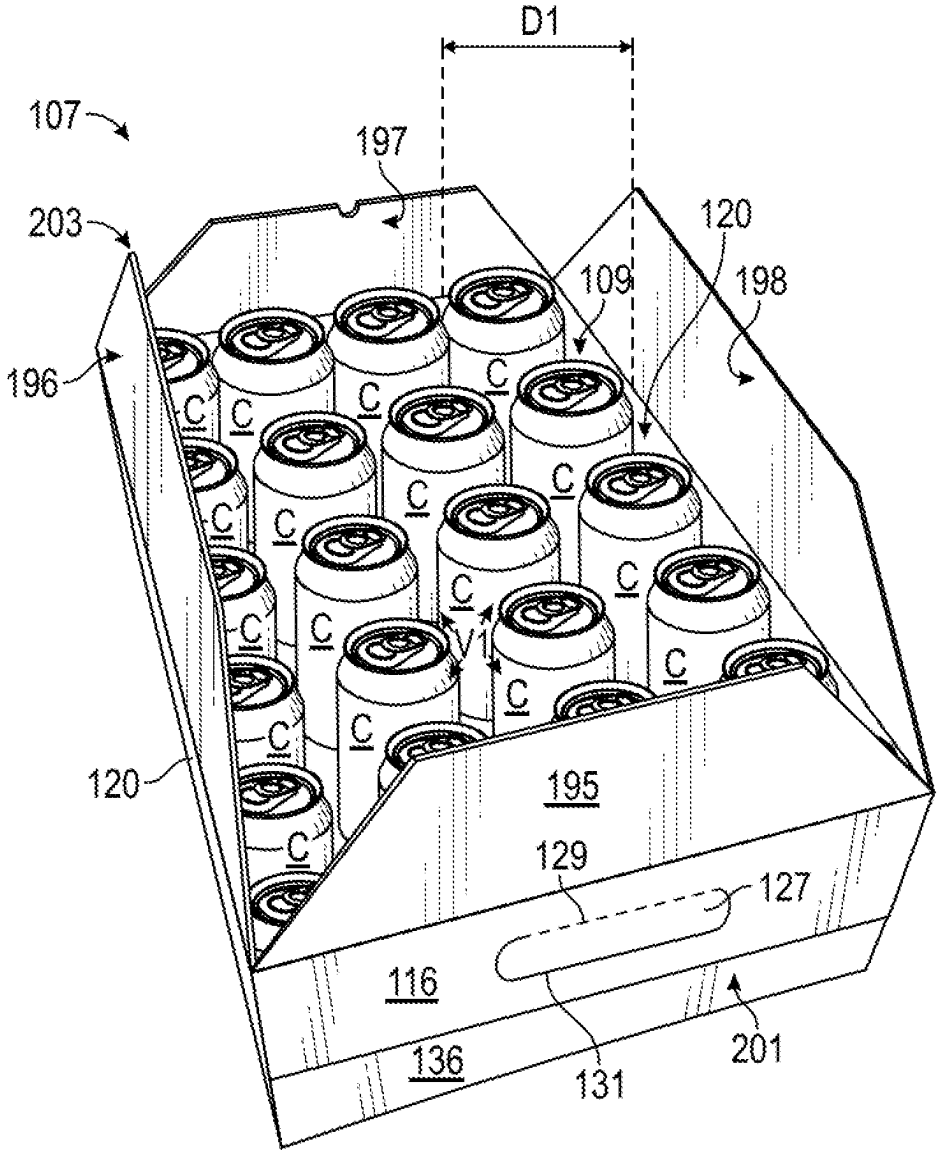
129
116
127
131
201
136

FIG. 7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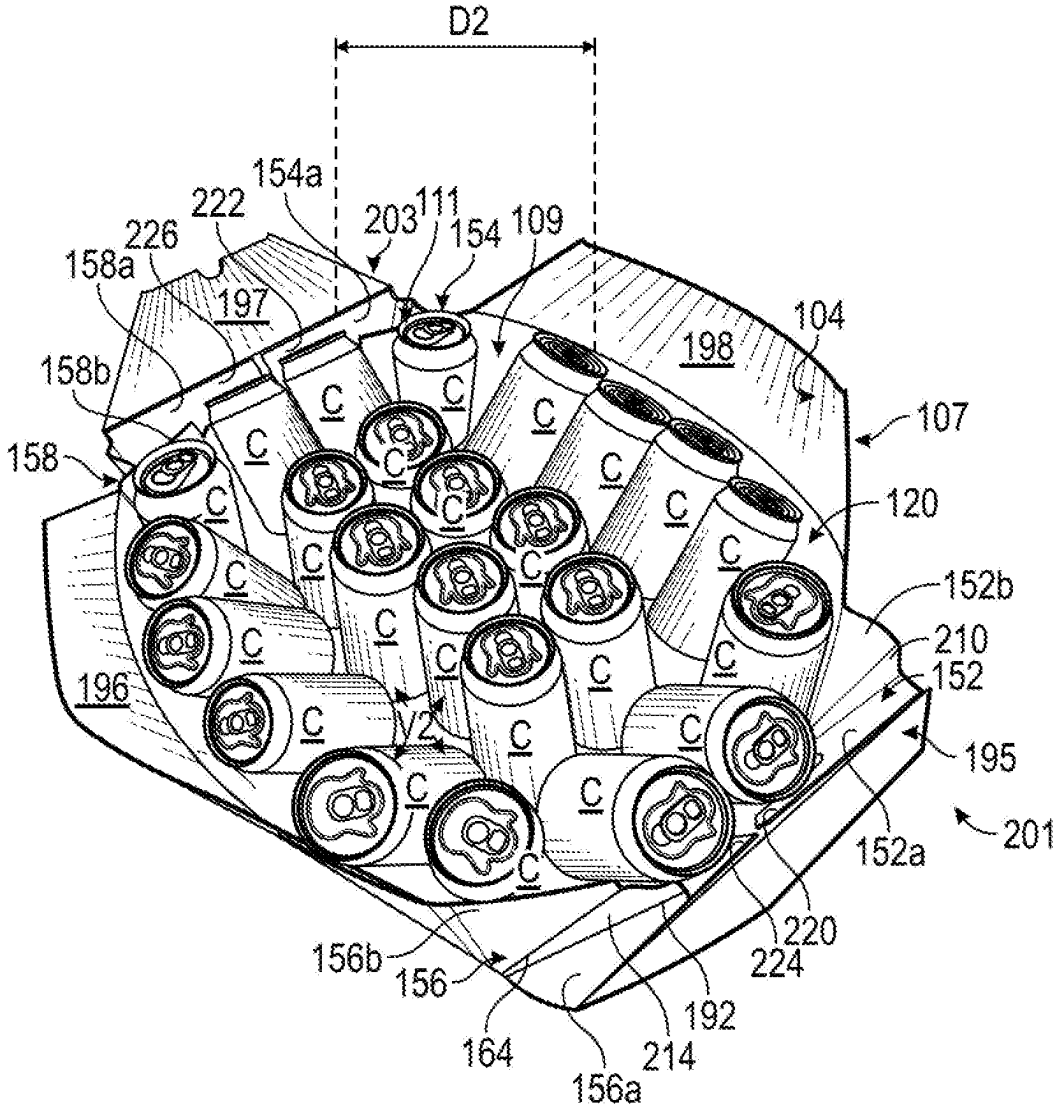
131
201

FIG. 8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201
152a
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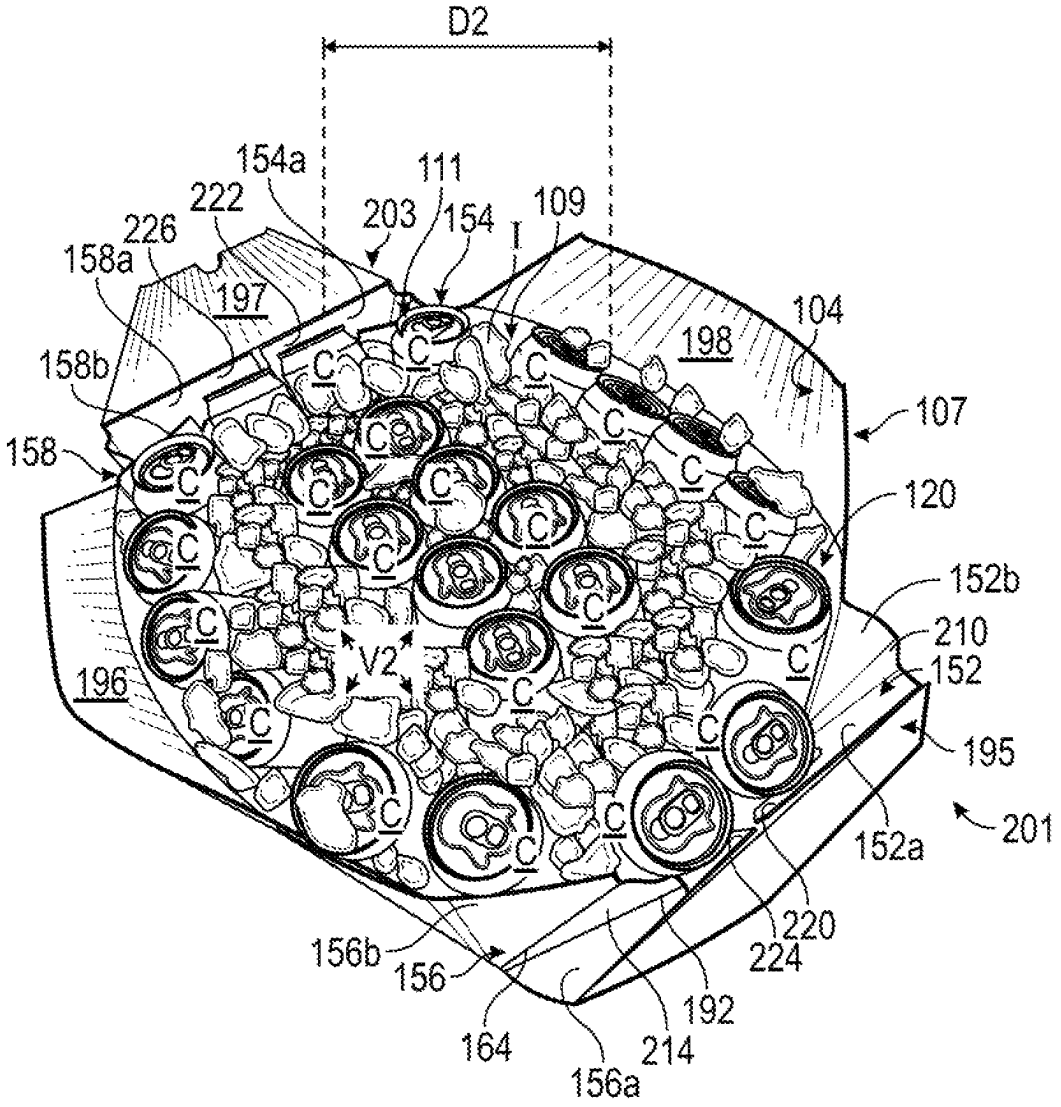
156b
156
192
164
214
156a

FIG. 9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198
158b
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158
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V2
196
195
201
152a
220
224
156b
156
192
164
214
156a

FIG. 10

# CARTON WITH EXPANSION FEATURES

## CROSS-REFERENCE TO RELATED APPLICATION

The present application claims the benefit of U.S. Provisional Patent Application No. 62/303,599, filed on Mar. 4, 2016.

## INCORPORATION BY REFERENCE

The disclosure of U.S. Provisional Patent Application No. 62/303,599, filed on Mar. 4, 2016, is hereby incorporated by reference for all purposes as if presented herein in its entirety.

## BACKGROUND OF THE DISCLOSURE

The present disclosure generally relates to a carton for holding and displaying containers, and particularly cartons having expansion features and liquid-tight or leakage resistant features.

## SUMMARY OF THE DISCLOSURE

According to one aspect of the disclosure, a carton for holding one or more containers comprises a plurality of panels that extend at least partially around an interior of the carton, a plurality of end flaps foldably connected to the respective plurality of panels to form at least one closed end of the carton, and at least one gusset foldably connected between the at least one side panel and the at least one closed end of the carton. The plurality of panels comprises a bottom panel, a top panel, and at least one side panel. The at least one gusset is positionable between a first position and a second position wherein the interior of the carton is expanded.

According to another aspect of the disclosure, a blank for forming a carton for holding one or more containers comprises a plurality of panels for folding at least partially around an interior of the carton when the carton is formed from the blank, a plurality of end flaps foldably connected to the respective plurality of panels for folding to form at least one closed end of the carton when the carton is formed from the blank, and at least one gusset foldably connected between the at least one side panel and the at least one closed end of the carton when the carton is formed from the blank. The plurality of panels comprises a bottom panel, a top panel, and at least one side panel. The at least one gusset is positionable between a first position and a second position wherein the interior of the carton is expanded.

According to another aspect of the disclosure, a method of forming a carton for holding one or more containers comprises obtaining a blank comprising a plurality of panels, a plurality of end flaps foldably connected to the respective plurality of panels, and at least one gusset foldably connected to the at least one side panel and at least one end flap of the plurality of end flaps. The plurality of panels comprises a bottom panel, a top panel, and at least one side panel. The method also comprises folding the plurality of panels at least partially around an interior of the carton and forming at least one closed end of the carton so that the at least one gusset is foldably connected to the at least one side panel and the at least one closed end of the carton. The method also comprises expanding the interior of the carton by positioning the at least one gusset from a first position to a second position wherein the carton is expanded.



Other aspects, features, and details of the present disclosure can be more completely understood by reference to the following detailed description, taken in conjunction with the drawings and from the appended claims.

## BRIEF DESCRIPTION OF THE DRAWING FIGURES

According to common practice, the various features of the drawings discussed below are not necessarily drawn to scale. Dimensions of various features and elements in the drawings may be expanded or reduced to more clearly illustrate the embodiments of the disclosure.

FIG. **1** is a plan view of a blank for forming a carton according to one exemplary embodiment of the disclosure.

FIG. **2** is a first sequential perspective view of a folding of the blank of FIG. **1**.

FIG. **3** is a second sequential perspective view of a folding of the blank of FIG. **1**.

FIG. **4** is a third sequential perspective view of a folding of the blank of FIG. **1**.

FIG. **5** is a fourth sequential perspective view of a folding of the blank of FIG. **1**.

FIG. **6** is a perspective view of a carton formed from the blank of FIG. **1**.

FIG. **7** is a perspective view of the carton of FIG. **6** with a top access panel removed.

FIG. **8** is a perspective view of the carton of FIG. **6** with a plurality of access flaps being activated.

FIG. **9** is a perspective view of the carton of FIG. **6** in a first, unexpanded configuration.

FIG. **10** is a perspective view of the carton of FIG. **6** in a second configuration.

Corresponding parts are designated by corresponding reference numbers throughout the drawings.

## DETAILED DESCRIPTION OF THE EXEMPLARY EMBODIMENTS

The embodiments of the present disclosure described below generally relate to a carton suitable for storing and dispensing articles such as, for example, beverage containers. The carton provides a bottom receptacle suitable for accommodating, for example, ice, associated water runoff, liquids, or other cooling materials in the carton bottom. In one exemplary embodiment, ice can be added to the opened top of the carton to cool beverage containers held within the carton. As the ice melts, all or a part of the resultant runoff water may be held within the bottom receptacle.

Articles accommodated within the present carton embodiments can include containers such as, for example, metallic beverage cans, glass or plastic bottles, or other containers such as, for example, those used in packaging beverages, foodstuffs, and other products. For the purposes of illustration and not for the purpose of limiting the scope of the disclosure, the following detailed description describes generally cylindrical metallic beverage containers as disposed within the carton. In this specification, the terms "side," "end," "bottom," and "top" indicate orientations determined in relation to fully erected, upright cartons.

FIG. **1** is a plan view of a blank **105** used to form a carton **107** (FIG. **6**) according to one embodiment of the disclosure. The exterior or printed surface **103** of the blank **105** is shown in FIG. **1**. The blank **105** has a longitudinal axis L**1** extending along a length of the blank **105**, and a lateral axis L**2** extending along a width of the blank **105**. As discussed in detail below, the carton **107** includes a bottom receptacle **111**

(FIG. **8**) that is for containing beverage containers C and which has substantially liquid-tight features for retaining liquid and minimizing, inhibiting, and/or preventing leakage of liquid from the carton **107**. The carton **107** also has top access features **112** for allowing access to the containers C and features for expanding the volume of the carton **107** to allow ice I or other coolant to be placed on top of and surround the containers C retained in the carton **107**. In the illustrated embodiment, the carton **107** is sized to house twenty four containers C in a single layer in a 4×6 arrangement, but it is understood that the carton **107** may be sized and shaped to hold containers of a different or same quantity in more than one layer and/or in different row/column arrangements (e.g., 1×6, 3×4, 2×6×2, 3×4×2, 3×5, 4×5, 3×6, 2×5, 2×6, 4×4, etc.).

As shown, the blank **105** comprises a bottom panel **110**, a first side panel **119** foldably connected to the bottom panel **110** at a lateral fold line **121**, and a second side panel **120** foldably connected to the bottom panel **110** at lateral fold line **122**. A top panel **124** is foldably connected to the first side panel **119** at a lateral fold line **126**, and an attachment flap **128** is foldably connected to the top panel **124** at a lateral fold line **130**. Adhesive **132** may be applied to the attachment flap **128**, as indicated in FIG. **1**.

In one embodiment, as shown, a bottom end panel **136** is foldably connected to the bottom panel **110** at a longitudinal fold line **138** and a bottom end panel **140** is foldably connected to the bottom panel **110** at a longitudinal fold line **142**. A closure flap **144** is foldably connected to a distal end of the bottom end panel **136** at a longitudinal fold line **146** and a closure flap **148** is foldably connected to a distal end of bottom end panel **140** at a longitudinal fold line **150**. In this specification, the terms "end" and "side" are used for ease of reference, and do not imply relative sizes of the end panels **136**, **140** and the side panels **119**, **120**, for example. The end panels **136**, **140**, closure flaps **144**, **148** and fold lines **146**, **150** could be otherwise shaped, arranged, and/or configured without departing from the disclosure. For example, fold lines **146**, **150** could include more than one line of weakening, such as in a double fold line or to define a tear strip or the fold lines could be omitted without departing from the disclosure.

As illustrated in FIG. **1**, gussets **152**, **154**, **156**, **158** are located at respective corners **141**, **143**, **145**, **147** of the bottom panel **110**. Gusset **152** is located at the corner **141** of the bottom panel **110** and extends between and is connected to the side panel **119** and the bottom end panel **136**. Gusset **154** is located at the corner **143** of the bottom panel **110** and extends between and is connected to the side panel **119** and the bottom end panel **140**. Gusset **156** is located at the corner **145** of the bottom panel **110** and extends between and is connected to the side panel **120** and the bottom end panel **136**. Gusset **158** is located at the corner **147** of the bottom panel **110** and extends between and is connected to the side panel **120** and the bottom end panel **140**.

As shown in FIG. **1**, the blank **105** includes top end flaps **116**, **117** respectively foldably connected to the top panel **124** at portions of respective longitudinal fold lines **138**, **142**. In one embodiment, as shown, the handle features **130** can be formed at the top end flaps **116**, **117** for holding and carrying the carton **107** (FIG. **6**). The handle features **130** at the top end flap **116** can include a handle flap **127** defined by a cut or tear line **131** and foldably connected to the top end flap **116** along a longitudinal fold line **129**. The handle features **130** at the top end flap **117** can include a handle flap **133** defined by a cut or tear line **135** and foldably connected to the top end flap **117** along a longitudinal fold line **137**. In one embodiment, the top end flap **116**, the bottom end panel **136**, the closure flap **144**, and the gussets **152**, **156** extend along a first marginal portion of the blank **105** and are for being positioned to close a first end **201** of the carton **107** (FIG. **6**). The top end flap **117**, the bottom end panel **140**, the closure flap **148**, and the gussets **154**, **158** extend along a second marginal portion of the blank **105** and are for being positioned to close a second end **203** of the carton **107**. The blank **105** could have other features for closing the ends **201**, **203** of the carton **107** without departing from the disclosure.

In one embodiment, as shown, the handle features **131** can be formed at the closure flaps **144**, **148** and generally correspond and align with the handle features **130** in the respective top end flaps **116**, **117**. The handle features **131** at the closure flap **144** can include a handle flap **168** defined by a cut **170** and foldably connected to the closure flap **144** along a longitudinal fold line **172**. The handle features **131** at the closure flap **148** can include a handle flap **174** defined by a cut **176** and foldably connected to the closure flap **148** along a longitudinal fold line **178**. The handle features **131** in the closure flaps **144**, **148** could be otherwise shaped, arranged, configured, or omitted without departing from the disclosure.

In one embodiment, as shown, the top access features **112** in the top panel **124** may include a tear line **113** or other breachable line of disruption extending generally around and defining a dispenser panel **114** in the top panel **124**. As illustrated in FIG. **1**, the dispenser panel **114** can include a plurality of score lines **137** and cuts **139** which may provide locations for engagement by a user and/or may provide for relative movement of the dispenser panel **114** during use of the carton **107** (FIG. **6**). The tear line **113** is generally rectangular and includes lateral portions **113***a*, **113***b* connected by longitudinal portions **113***c*, **113***d*, as shown, to form corners **113***e*, **113***f*, **113***g*, **113***h* of the tear line **113**. An arcuate portion **113***i* of the tear line **113** extends from a longitudinal portion **113***d* of the tear line **113** to define an access flap **118**. Oblique tear lines **115***a*, **115***b*, **115***c*, **115***d* extend from the respective corners **113***e*, **113***f*, **113***g*, **113***h* of the tear line **113** to respective corners **124***a*, **124***b*, **124***c*, **124***d* of the top panel **124** and define four top access flaps **195**, **196**, **197**, **198** in the top panel **124**. As shown in FIG. **1**, the top access flap **195** is foldably connected to the top end flap **116** at a portion of the longitudinal fold line **138**. The top access flap **196** is foldably connected to the adhesive flap **128** at the lateral fold line **130**. The top access flap **197** is foldably connected to the top end flap **117** at a portion of the longitudinal fold line **142**. The top access flap **198** is foldably connected to the side panel **119** at lateral fold line **126**. The top access features **112** include at least the dispenser panel **114**, the top panel **124**, and the top access flaps **195**, **196**, **197**, **198**. The top access features **112** could have other features and/or be otherwise shaped, arranged, and/or configured without departing from the disclosure. For example, the dispenser panel **114** could be arcuate and free from score lines and cuts without departing from the disclosure.

As shown, each gusset **152**, **154** comprises a respective first gusset panel **152***a*, **154***a* foldably connected to a respective adjacent bottom end panel **136**, **140** at a portion of the lateral fold line **121** and each gusset **156**, **158** comprises a respective first gusset panel **156***a*, **158***a* foldably connected to a respective adjacent bottom end panel **136**, **140** at the longitudinal fold line **122**. Each gusset **152**, **154**, **156**, **158** includes a respective second gusset panel **152***b*, **156***b* and **154***b*, **158***b* foldably connected to a respective side panel **119**, **120** at a portion of the respective lateral fold lines **138**,

142. The second gusset panels 152*b*, 154*b*, 156*b*, 158*b* are foldably connected to a respective first gusset panel 152*a*, 154*a*, 156*a*, 158*a* at a respective oblique fold line 188, 190, 192, 194. In the illustrated exemplary embodiment, each of the gussets 152, 154, 156, 158 may comprise a notch 180, 182, 184, 186 generally shaped to correspond to, e.g., align with, the handle features 131 in the respective closure flaps 144, 148 so that, upon alignment with the handle features 131, the notches 180, 182, 184, 186 at least partially surround the handle features 131, as described further herein. In embodiments, the notches 180, 182, 184, 186 may be cutouts or other indentations. As shown, the gusset panels 152*b*, 154*b*, 156*b*, 158*b* include the respective oblique fold lines 188, 190, 192, 194 extending from the respective corners 141, 143, 145, 147 of the bottom panel 110 to generally the upper portion of the notches 180, 182, 184, 186. In one embodiment, the oblique score lines 188, 190, 192, 194 are offset an angle "θ" from the oblique fold lines 160, 162, 164, 166 in the respective second gusset panels 152*b*, 154*b*, 156*b*, 158*b*. The angle "θ" may range from about 1 to about 30 degrees. In one embodiment, as shown, each of the second gusset panels 152*b*, 154*b*, 156*b*, 158*b* includes a respective expansion panel 210, 212, 214, 216 foldably connected therealong that may be generally triangular-shaped, as shown. In this regard, the second gusset panels 152*b*, 154*b*, 156*b*, 158*b* are larger than the respective first gusset panels, 152*a*, 154*a*, 156*a*, 158*a*, as shown. The expansion panel 210 is in the gusset 152 and is defined between the two oblique fold lines 160, 188. The expansion panel 212 is in the gusset 154 and is defined between the two oblique fold lines 162, 190. The expansion panel 214 is in the gusset 156 and is defined between the two oblique fold lines 164, 192. The expansion panel 216 is in the gusset 158 and is defined between the two oblique fold lines 166, 194. In the illustrated embodiment, the oblique fold lines 188, 190, 192, 194 include respective curved end portions 187, 189, 191, 193 that are spaced inward from an edge of a respective notch 180, 182, 184, 186 of the blank 105. In one embodiment, each of the first gusset panels 152*a*, 154*a*, 156*a*, 158*a* includes an attachment tab 220, 222, 224, 226 at least partially extending adjacent a respective notch 180, 182, 184, 186. The gussets 152, 154, 156, 158 and the various features of the gussets may be otherwise shaped, arranged, and/or configured, or one or more of the various features could be omitted, without departing from the disclosure.

An exemplary method of erecting the carton 107 from the blank 105 is discussed below with additional reference to FIGS. 2-6. The carton 107 can be erected with other methods or folding steps without departing from the disclosure.

In one embodiment, the blank 105 is positioned with the exterior side 103 facing down, and the blank 105 is then folded along fold lines 122, 126 and the attachment flap 128 is positioned in face-to-face contact with the second side panel 120. The exterior surface of the attachment flap 128 is adhered to the interior surface of the second side panel 120 with the adhesive 132. The partially erected blank 105 may then be opened up into a sleeve 108 having open ends or another generally tubular form such that an interior 109 is formed. The interior 109 will form the interior of the carton 107 upon closing the ends 201, 203 of the carton 107, as described herein. The carton 107 may be filled with articles such as, for example, generally cylindrical beverage containers C, as shown in FIG. 2, before closing one or both ends 201, 203 of the carton 107, as described further herein. As illustrated in FIG. 3, from the open-ended sleeve 108 form, the first and second gusset panels 152*a*, 154*a*, 156*a*, 158*a* and 152*b*, 154*b*, 156*b*, 158*b* are folded inwardly with respect to each other about the oblique fold lines 160, 162, 164, 166. As shown in FIG. 4, the closure flaps 144, 148 are folded about respective fold lines 146, 150 and adhesive A can be added to the interior of the gusset panels 152*a*, 154*a*, 156*a*, 158*a*. The expansion panels 210, 212, 214, 216 remain free from adhesive A as they are overlapped by the respective first gusset panels 152*a*, 154*a*, 156*a*, 158*a*. The closure flaps 144, 148 can then be adhesively secured to the gusset panels 152*a*, 154*a*, 156*a*, 158*a* by raising the closure flaps 144, 148 into face-to face contact with portions of the gusset panels 152*a*, 154*a*, 156*a*, 158*a*, as shown in FIG. 5. As shown in FIGS. 5 and 6, adhesive A can be added to the exterior of the closure flaps 144, 148 and the top end flaps 116, 117 can be downwardly folded and positioned in face-to-face contact with the closure flaps 144, 148 to form the carton 107 having closed ends 201, 203. The ends 201, 203 of the carton 107 can be closed by other features or forming steps without departing from the disclosure.

In the illustrated embodiment, the carton 107 is loaded with twenty-four generally cylindrical twelve-ounce beverage containers C (FIG. 2) disposed in a 4×6×1 configuration. Embodiments with alternative configurations are considered within the scope of the present disclosure. The carton 107 has a generally parallelepipedal shape. At a respective ends 201, 203 of the carton 107, the end flaps 116, 117 overlap the closure flaps 144, 148. Each of the bottom end panels 136, 140, the side panels 119, 120, and the gussets 152, 154, 156, 158 cooperate to form a substantially liquid-tight bottom receptacle 111, as described further herein.

Referring to FIGS. 1, 7, and 8, the access or dispensing features 112 of the carton 107 are activated by tearing the tear line 113 to remove the dispenser panel 114 to create a dispenser opening 230 through which one or more containers C in the interior 109 of the carton 107 can be accessed, as illustrated in FIG. 7. Removal of the dispenser panel 114 may include breaching the tear line 113*i* about the access flap 118 such that the access flap 118 can be pushed toward the interior 109 of the carton 107 to allow for engagement of the remainder of the dispenser panel 114 by a user. The top access flaps 195, 196, 197, 198 can be separated by tearing the top panel 124 along tear lines 115*a*, 115*b*, 115*c*, and 115*d*. The separated top access flaps 195, 196, 197, 198 are folded upwardly about respective fold lines 138, 130, 142, 126 to expand the dispensing opening 230 and provide access to the interior 109 of the carton 107. In the illustrated configuration, the bottom receptacle 111 of the carton 107 has a first volume V1 that is reconfigurable to a different volume through manipulation of portions of the carton 107, as described further herein.

Referring to FIGS. 1, 9, and 10, once the top access feature 112 is opened, the bottom receptacle 111 is capable of receiving ice I or other cooling material that can be placed on top of and/or around the containers C. In embodiments, the top access flaps 195, 196, 197, 198 may be used to guide ice I or other cooling material into the interior 109 of the carton 107. However, additional space within the bottom receptacle 111 of the carton 107 may be desired for accommodating ice I or other cooling material. In this regard, the carton 107 is configured for expansion to allow additional room for ice I or other cooling material to be placed on top of and around the containers C. To facilitate such expansion, the side panels 119, 120 and end panels 136, 140 flex outwardly from the interior 109 of the carton 107, as shown. Such relative movement of the panels 119, 120, 136, 140 is facilitated by unfolding of the gussets 152, 154, 156, 158. In particular, and as shown, when the end panels 136, 140 at

each end **201**, **203** of the carton **107** are expanded, each expansion panel **210**, **212**, **214**, **216** is pulled away from a respective end panel **136**, **140** to expand each end **201**, **203** of the carton **107** such that a distance D**2** between selected points on one of the first side panel **119** and the second side panel **120** and an adjacent end **201**, **203** of the carton **107** is greater than a distance D**1** (FIG. **8**) between the same points when the carton **107** is in the unexpanded configuration. Accordingly, the second gusset panels **152***b*, **154***b*, **156***b*, **158***b*, which include respective expansion panels **210**, **212**, **214**, **216**, can be transitioned from a first, folded configuration against respective first gusset panels, **152***a*, **154***a*, **156***a*, **158***a* (shown best in FIG. **8**) to a second, unfolded configuration in which the second gusset panels **152***b*, **154***b*, **156***b*, **158***b* are folded away from the respective first gusset panels **152***a*, **154***a*, **156***a*, **158***a* (shown best in FIGS. **9** and **10**).

Such unfolding of the gussets **152**, **154**, **156**, **158** occurs as the first gusset panels **152***a*, **156***a* and **154***a*, **158***a* are adhered to respective end panels **136**, **140**, and the second gusset panels **152***b*, **156***b*, **154***b*, **158***b* are free to unfold relative to the respective first gusset panels **152***a*, **156***a*, **154***a*, **158***a*. Accordingly, the expansion panels **210**, **214** and **212**, **216** are free from adhesive connection to a respective end panel **136**, **140** while the portion of the gusset panels **152***a*, **156***a* and **154***a*, **158***a* adjacent a respective expansion panel **210**, **214** and **212**, **216** is adhesively attached to a respective end panel **136**, **140**. As such, the expansion panels **210**, **212**, **214**, **216** allow each gusset **152**, **154**, **156**, **158** to expand and to increase separation between the second gusset panels **152***b*, **156***b* and **154***b*, **158***b* and the respective end panels **136**, **140** while maintaining the substantially liquid-tight configuration of the bottom receptacle **111**. The tabs **220**, **222**, **224**, **226** of the gussets **152**, **154**, **156**, **158** allow secure attachment of the first gusset panels **152***a*, **156***a* and **154***a*, **158***a* to the respective end panels **136**, **140**.

In this regard, the volume V**1** of the bottom receptacle **111** can be increased by the expansion of the gussets **152**, **154**, **156**, **158** and the flexing of the side panels **119**, **120** to a greater volume V**2** (shown best in FIGS. **9** and **10**) that can accommodate a greater amount of ice I or other cooling material. The carton **107** may be assembled such that the bottom receptacle **111** is substantially liquid-tight to keep the ice I or other cooling material and associated runoff such as water from escaping from the carton **107** to maintain a desired temperature of the containers C. In the expanded configuration shown in FIGS. **9** and **10**, containers C disposed in the bottom receptacle **111** can be accessed and withdrawn from the carton **107** as in the unexpanded configuration.

According to one aspect of the present disclosure, if desired, additional articles may be placed in the carton **107** after opening. As the ice I melts, the carton **107** serves to retain all or a portion of the water runoff from the melting ice due to the substantially liquid-tight configuration of the bottom receptacle **111**.

The lower gusset panels **152***b*, **154***b*, **156***b*, **158***b* and expansion panels **210**, **212**, **214**, **216** may define in part the at least partially liquid-tight bottom receptacle **111** in the erected carton **107**. The height of the top edge or upper border of the gusset panels **152***b*, **154***b*, **156***b*, **158***b* may represent a portion of the carton **107** below which no glued seals or seams are formed through which water or other liquid might leak. That is, no adhesive seal or other joinder of material where fluid might escape the carton **107** is located in the carton **107** at a position below the top edge of the bottom receptacle **111**. The bottom receptacle **111** may therefore be formed from a continuous portion of folded material of the blank **105**. The dimensions of the bottom receptacle **111** may be increased or decreased, for example, to accommodate larger or smaller anticipated liquid volumes in the carton **107**.

The blank **105** can, for example, be constructed of fluid-resistant material to any degree desired so that liquid in the carton **107** remains in the carton **107** for a selected amount of time.

Cartons according to the principles of the present disclosure may be formed from materials such as, for example, paperboard. Therefore, if exposed to water or other liquids for extended periods of time, the carton may allow for the passage of liquid through the wetted carton surfaces due to partial permeability of the carton material. In this specification, the term "liquid-tight" is generally used to define a portion of a carton that is formed from a continuous portion of material or of a portion without any glued seams through which liquid or fine particulate matter might leak, and the term "liquid-tight" therefore encompasses cartons that may become partially water permeable over time due to prolonged exposure to water or other liquids.

In the above embodiments, the cartons are described as accommodating twenty four 12-ounce cans containers in 4×6×1 configuration. Other arrangements of containers, packages, articles, and other items, however, can be accommodated within a carton constructed according to the principles of the present disclosure. For example, a carton constructed according to the principles of the present disclosure would also work satisfactorily if the carton were sized and shaped to hold articles in other configurations, such as 3×4×1, 3×6×1, 2×4×1, 2×5×1, 2×6×1, etc., and multi-tier variations of the aforementioned configurations.

The dimensions of the blanks may also be altered, for example, to accommodate various container forms. For example, bottles having any shape, may be accommodated within a carton constructed according to the principles of the present disclosure.

The blanks according to the present disclosure can be, for example, formed from coated paperboard and similar materials. For example, the interior and/or exterior sides of the blanks can be coated with a clay coating. The clay coating may then be printed over with product, advertising, price coding, and other information or images. The blanks may then be coated with a varnish to protect any information printed on the blank. The blanks may also be coated with, for example, a moisture barrier layer, on either or both sides of the blank. In accordance with the above-described embodiments, the blanks may be constructed of paperboard of a caliper such that it is heavier and more rigid than ordinary paper (e.g., a caliper of at least about 14). The blanks can also be constructed of other materials, such as cardboard, hard paper, or any other material having properties suitable for enabling the carton to function at least generally as described herein. The blanks can also be laminated or coated with one or more sheet-like materials at selected panels or panel sections.

The above embodiments may be described as having one or more panels adhered together by glue. The terms "glue" and "adhesive" are intended to encompass all manner of adhesives commonly used to secure carton panels in place.

In accordance with the above-described embodiments of the present disclosure, a fold line can be any substantially linear, although not necessarily straight, form of weakening that facilitates folding therealong. More specifically, but not for the purpose of narrowing the scope of the present disclosure, fold lines include: a score line, such as lines

formed with a blunt scoring knife, or the like, which creates a crushed portion in the material along the desired line of weakness; a cut that extends partially into a material along the desired line of weakness, and/or a series of cuts that extend partially into and/or completely through the material along the desired line of weakness; and various combinations of these features. In the present specification, a "panel" or "flap" need not be flat or otherwise planar. A "panel" or "flap" can, for example, comprise a plurality of interconnected generally flat or planar portions.

For purposes of the description presented herein, the term "line of disruption" can be used to generally refer to, for example, a cut line, a score line, a crease line, a tear line, or a fold line (or various sequential and/or overlapping combinations thereof) formed in a blank. A "breachable" line of disruption is a line of disruption that is intended to be breached during ordinary use of the carton. An example of a breachable line of disruption is a tear line.

As an example, a tear line can include: a slit that extends partially into the material along the desired line of weakness, and/or a series of spaced apart slits that extend partially into and/or completely through the material along the desired line of weakness, or various combinations of these features. As a more specific example, one type tear line is in the form of a series of spaced apart slits that extend completely through the material, with adjacent slits being spaced apart slightly so that a nick (e.g., a small somewhat bridging-like piece of the material) is defined between the adjacent slits for typically temporarily connecting the material across the tear line. The nicks are broken during tearing along the tear line. The nicks typically are a relatively small percentage of the tear line, and alternatively the nicks can be omitted from or torn in a tear line such that the tear line is a continuous cut line. That is, it is within the scope of the present disclosure for each of the tear lines to be replaced with a continuous or substantially continuous slit, or the like. For example, a cut line can be a continuous slit or could be wider than a slit without departing from the present disclosure.

In the illustrated embodiments, selected fold lines are shown as including spaced cuts to facilitate folding along the lines. If the cuts are below or adjacent to a bottom receptacle portion of a carton, less than 100% cuts may be used to prevent leakage along the fold lines. Alternatively, cuts or scores may be omitted within or near the receptacle portion.

The foregoing description of the disclosure illustrates and describes various exemplary embodiments. Various additions, modifications, changes, etc. could be made to the exemplary embodiments without departing from the spirit and scope of the claims. It is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense. Additionally, the disclosure shows and describes only selected embodiments of the disclosure, but the disclosure is capable of use in various other combinations, modifications, and environments and is capable of changes or modifications within the scope of the inventive concept as expressed herein, commensurate with the above teachings, and/or within the skill or knowledge of the relevant art. Furthermore, certain features and characteristics of each embodiment may be selectively interchanged and applied to other illustrated and non-illustrated embodiments of the disclosure.

What is claimed is:

**1**. A carton for holding one or more containers, comprising:

a plurality of panels that extend at least partially around an interior of the carton, the plurality of panels comprising a bottom panel, a top panel, and at least one side panel;

a plurality of end flaps foldably connected to the respective plurality of panels to form at least one closed end of the carton;

at least one gusset foldably connected between the at least one side panel and the at least one closed end of the carton, the at least one gusset comprising a first gusset panel foldably connected to a second gusset panel, the at least one gusset further comprising a tab extending from the first gusset panel to at least partially define a notch in the at least one gusset, the at least one gusset is positionable between a first position and a second position wherein the interior of the carton is expanded; and

a handle feature in at least one end flap of the plurality of end flaps, wherein the notch aligns with the handle feature in the at least one closed end of the carton.

**2**. The carton of claim **1**, wherein the first gusset panel is attached to at least one end flap of the plurality of end flaps at the at least one closed end of the carton, and the second gusset panel is movable relative to the first gusset panel.

**3**. The carton of claim **1**, wherein the second gusset panel is larger than the first gusset panel.

**4**. The carton of claim **1**, wherein, in the first position, the at least one side panel and the at least one closed end are spaced apart a first distance, and in the second position, the at least one side panel and the at least one closed end are spaced apart a second distance that is larger than the first distance.

**5**. The carton of claim **1**, wherein in the first position, the interior of the carton has a first volume, and in the second position, the interior of the carton has a second volume that is larger than the first volume.

**6**. The carton of claim **1**, wherein the at least one side panel comprises a first side panel and a second side panel, the at least one closed end of the carton comprises a first closed end and second closed end, the at least one gusset comprises a first gusset foldably connected to the first side panel and the first closed end, a second gusset foldably connected to the second side panel and the first closed end, a third gusset foldably connected to the first side panel and the second closed end, and a fourth gusset panel foldably connected to the second side panel and the second closed end.

**7**. The carton of claim **1**, wherein at least one end flap of the plurality of end flaps, the at least one gusset, and the at least one side panel cooperate to form a bottom receptacle of the carton.

**8**. The carton of claim **7**, wherein the bottom receptacle has a substantially liquid-tight configuration.

**9**. The carton of claim **1**, wherein the second gusset panel comprises an expansion panel foldably connected to the first gusset panel.

**10**. The carton of claim **9**, wherein the expansion panel further comprises a first oblique fold line foldably connecting the first gusset panel and the second gusset panel, the second gusset panel comprises a second oblique fold line, and the expansion panel is at least partially defined by the first oblique fold line and the second oblique fold line.

**11**. The carton of claim **10**, wherein the angular distance between the first oblique fold line and the second oblique fold line is between about 1 degree and about 30 degrees.

**12**. The carton of claim **1**, wherein the top panel comprises at least one access feature.

13. The carton of claim 12, wherein the at least one access feature comprises a plurality of access flaps foldably connected to the top panel, each access flap separable from an adjacent access flap along a respective tear line.

14. The carton of claim 13, wherein the at least one access feature comprises a dispenser panel separable from the top panel.

15. A blank for forming a carton for holding one or more containers, comprising:

a plurality of panels for folding at least partially around an interior of the carton when the carton is formed from the blank, the plurality of panels comprising a bottom panel, a top panel, and at least one side panel;

a plurality of end flaps foldably connected to the respective plurality of panels for folding to form at least one closed end of the carton when the carton is formed from the blank; and

at least one gusset foldably connected between the at least one side panel and the at least one closed end of the carton when the carton is formed from the blank, the at least one gusset comprises a first gusset panel foldably connected to a second gusset panel, the at least one gusset further comprises a tab extending from the first gusset panel to at least partially define a notch in the at least one gusset, the at least one gusset is positionable between a first position and a second position wherein the interior of the carton is expanded; and

a handle feature in at least one end flap of the plurality of end flaps, and wherein the notch aligns with the handle feature in the at least one closed end of the carton when the carton is formed from the blank.

16. The blank of claim 15, wherein the first gusset panel is for attachment to at least one end flap of the plurality of end flaps at the at least one closed end of the carton when the carton is formed from the blank, and the second gusset panel is movable relative to the first gusset panel.

17. The blank of claim 15, wherein the second gusset panel is larger than the first gusset panel.

18. The blank of claim 15, wherein, when the carton is formed from the blank, in the first position, the at least one side panel and the at least one closed end are spaced apart a first distance, and in the second position, the at least one side panel and the at least one closed end are spaced apart a second distance that is larger than the first distance.

19. The blank of claim 15, wherein, when the carton is formed from the blank, in the first position, the interior of the carton has a first volume, and in the second position, the interior of the carton has a second volume that is larger than the first volume.

20. The blank of claim 15, wherein the at least one side panel comprises a first side panel and a second side panel, the at least one closed end of the carton comprises a first closed end and second closed end when the carton is formed from the blank, the at least one gusset comprises a first gusset foldably connected to the first side panel and the first closed end when the carton is formed from the blank, a second gusset foldably connected to the second side panel and the first closed end when the carton is formed from the blank, a third gusset foldably connected to the first side panel and the second closed end when the carton is formed from the blank, and a fourth gusset panel foldably connected to the second side panel and the second closed end when the carton is formed from the blank.

21. The blank of claim 15, wherein at least one end flap of the plurality of end flaps, the at least one gusset, and the at least one side panel are for cooperating to form a bottom receptacle of the carton when the carton is formed from the blank.

22. The blank of claim 21, wherein the bottom receptacle has a substantially liquid-tight configuration.

23. The blank of claim 15, wherein the second gusset panel comprises an expansion panel foldably connected to the first gusset panel.

24. The blank of claim 23, wherein the expansion panel further comprises a first oblique fold line foldably connecting the first gusset panel and the second gusset panel, the second gusset panel comprises a second oblique fold line, and the expansion panel is at least partially defined by the first oblique fold line and the second oblique fold line.

25. The blank of claim 24, wherein the angular distance between the first oblique fold line and the second oblique fold line is between about 1 degree and about 30 degrees.

26. The blank of claim 15, wherein the top panel comprises at least one access feature.

27. The blank of claim 26, wherein the at least one access feature comprises a plurality of access flaps foldably connected to the top panel, each access flap separable from an adjacent access flap along a respective tear line.

28. The blank of claim 27, wherein the at least one access feature comprises a dispenser panel separable from the top panel.

29. A method of forming a carton for holding one or more containers, comprising:

obtaining a blank comprising a plurality of panels comprising a bottom panel, a top panel, and at least one side panel, a plurality of end flaps foldably connected to the respective plurality of panels, and at least one gusset foldably connected to the at least one side panel and at least one end flap of the plurality of end flaps, and a handle feature in at least one end flap of the plurality of end flaps, the at least one gusset comprises a first gusset panel foldably connected to a second gusset panel, the at least one gusset further comprises a tab extending from the first gusset panel to at least partially define a notch in the at least one gusset;

folding the plurality of panels at least partially around an interior of the carton and forming at least one closed end of the carton so that the at least one gusset is foldably connected to the at least one side panel and the at least one closed end of the carton and so that the notch aligns with the handle feature in the at least one closed end of the carton; and

expanding the interior of the carton by positioning the at least one gusset from a first position to a second position wherein the carton is expanded.

30. The method of claim 29, wherein the first gusset panel is attached to at least one end flap of the plurality of end flaps when the plurality of panels are folded, and the second gusset panel is movable relative to the first gusset panel.

31. The method of claim 29, wherein the second gusset panel is larger than the first gusset panel.

32. The method of claim 29, wherein, in the first position, the at least one side panel and the at least one closed end are spaced apart a first distance, and in the second position, the at least one side panel and the at least one closed end are spaced apart a second distance that is larger than the first distance.

33. The method of claim 29, wherein, in the first position, the interior of the carton has a first volume, and in the second position, the interior of the carton has a second volume that is larger than the first volume.

34. The method of claim 29, wherein the at least one side panel comprises a first side panel and a second side panel, the at least one closed end of the carton comprises a first closed end and second closed end when the plurality of panels are folded, the at least one gusset comprises a first gusset foldably connected to the first side panel and the first closed end when the plurality of panels are folded, a second gusset foldably connected to the second side panel and the first closed end when the plurality of panels are folded, a third gusset foldably connected to the first side panel and the second closed end when the plurality of panels are folded, and a fourth gusset panel foldably connected to the second side panel and the second closed end when the plurality of panels are folded.

35. The method of claim 29, wherein at least one end flap of the plurality of end flaps, the at least one gusset, and the at least one side panel form a bottom receptacle of the carton when the plurality of panels are folded.

36. The method of claim 35, wherein the bottom receptacle has a substantially liquid-tight configuration.

37. The method of claim 29, wherein the second gusset panel comprises an expansion panel foldably connected to the first gusset panel.

38. The method of claim 37, wherein the expansion panel further comprises a first oblique fold line foldably connecting the first gusset panel and the second gusset panel, the second gusset panel comprises a second oblique fold line, and the expansion panel is at least partially defined by the first oblique fold line and the second oblique fold line.

39. The method of claim 38, wherein the angular distance between the first oblique fold line and the second oblique fold line is between about 1 degree and about 30 degrees.

40. The method of claim 29, wherein the top panel comprises at least one access feature.

41. The method of claim 40, wherein the at least one access feature comprises a plurality of access flaps foldably connected to the top panel, each access flap separable from an adjacent access flap along a respective tear line.

42. The method of claim 41, wherein the at least one access feature comprises a dispenser panel separable from the top panel.

43. A carton for holding one or more containers, the carton comprising:

a plurality of panels that extends at least partially around an interior of the carton, the plurality of panels comprising a bottom panel, a top panel, and at least one side panel;

a plurality of end flaps foldably connected to the respective plurality of panels to form at least one closed end of the carton; and

at least one gusset foldably connected between the at least one side panel and the at least one closed end of the carton, the at least one gusset comprising a first gusset panel foldably connected to a second gusset panel at a first oblique fold line and an expansion panel foldably connected to the second gusset panel at a second oblique fold line, the at least one gusset further comprising a notch at least partially defined by a free edge of the expansion panel, the free edge extends between the first oblique fold line and the second oblique fold line, the at least one gusset is positionable between a first position and a second position wherein the interior of the carton is expanded.

44. The carton of claim 43, further comprising a handle feature in at least one end flap of the plurality of end flaps, the notch aligns with the handle feature in the at least one closed end of the carton.

45. A blank for forming a carton for holding one or more containers, the blank comprising:

a plurality of panels for folding at least partially around an interior of the carton when the carton is formed from the blank, the plurality of panels comprising a bottom panel, a top panel, and at least one side panel;

a plurality of end flaps foldably connected to the respective plurality of panels for folding to form at least one closed end of the carton when the carton is formed from the blank; and

at least one gusset foldably connected between the at least one side panel and the at least one closed end of the carton when the carton is formed from the blank, the at least one gusset comprises a first gusset panel foldably connected to a second gusset panel at a first oblique fold line and an expansion panel foldably connected to the second gusset panel at a second oblique fold line, the at least one gusset further comprising a notch at least partially defined by a free edge of the expansion panel, the free edge extends between the first oblique fold line and the second oblique fold line, the at least one gusset is positionable between a first position and a second position wherein the interior of the carton is expanded; and

a handle feature in at least one end flap of the plurality of end flaps, and wherein the notch aligns with the handle feature in the at least one closed end of the carton when the carton is formed from the blank.

46. The blank of claim 45, further comprising a handle feature in at least one end flap of the plurality of end flaps, and wherein the notch aligns with the handle feature in the at least one closed end of the carton when the carton is formed from the blank.

47. A method of forming a carton for holding one or more containers, the method comprising:

obtaining a blank comprising a plurality of panels comprising a bottom panel, a top panel, and at least one side panel, a plurality of end flaps foldably connected to the respective plurality of panels, and at least one gusset foldably connected to the at least one side panel and at least one end flap of the plurality of end flaps, the at least one gusset comprises a first gusset panel foldably connected to a second gusset panel at a first oblique fold line and an expansion panel foldably connected to the second gusset panel at a second oblique fold line, the at least one gusset further comprising a notch at least partially defined by a free edge of the expansion panel, the free edge extends between the first oblique fold line and the second oblique fold line;

folding the plurality of panels at least partially around an interior of the carton and forming at least one closed end of the carton so that the at least one gusset is foldably connected to the at least one side panel and the at least one closed end of the carton and so that the notch aligns with the handle feature in the at least one closed end of the carton; and

expanding the interior of the carton by positioning the at least one gusset from a first position to a second position wherein the carton is expanded.

48. The method of claim 47, wherein the blank further comprises a handle feature in at least one end flap of the plurality of end flaps, and the plurality of panels are folded so that the notch aligns with the handle feature in the at least one closed end of the carton.

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