United States Patent [19]

Partain

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[54] **CARTON FOR REFRIGERATED CONSUMABLE PRODUCTS**

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[73] Assignee: **Stone Container Corporation,** Chicago, Ill.

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[21] Appl. No.: **487,625**

[52] **U.S. Cl.** ..... **229/39 R;** 229/45; 229/34 HW

[51] **Int. Cl.²** **B65D 5/02**

[58] **Field of Search** ..... 229/34 HW, 34, 36, 33, 229/45, 39

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Primary Examiner—Davis T. Moorhead

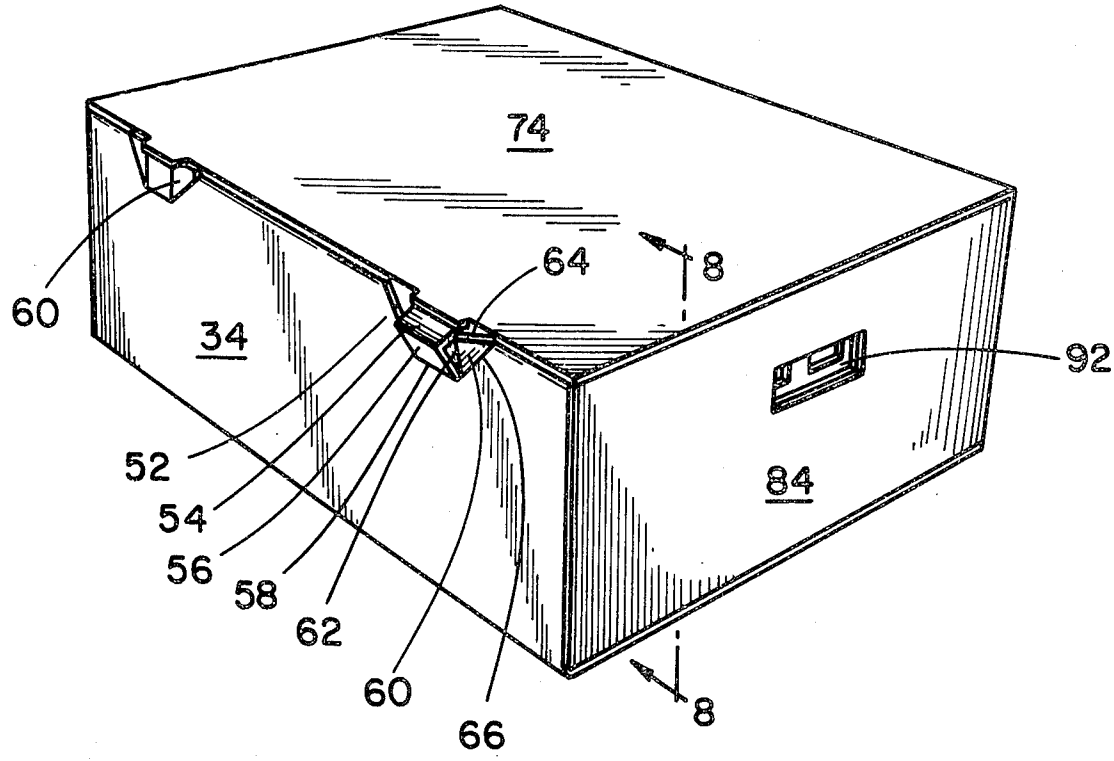
Attorney, Agent, or Firm—Silverman & Cass, Ltd.

[57] **ABSTRACT**

A closeable carton and blank for forming the carton. The carton has cooperating tabs and fingers for releasably locking together a pair of walls for closing the carton. Hinged flaps are provided in one wall adjacent the locking fingers which enable the said flaps to be pivoted to a position allowing access to said fingers for locking and unlocking said walls.

The carton also includes cooperating, spaced apart inner and outer side walls providing an air cell or space therebetween of truncated triangular cross section so as to achieve greater side wall strength.

12 Claims, 8 Drawing Figures



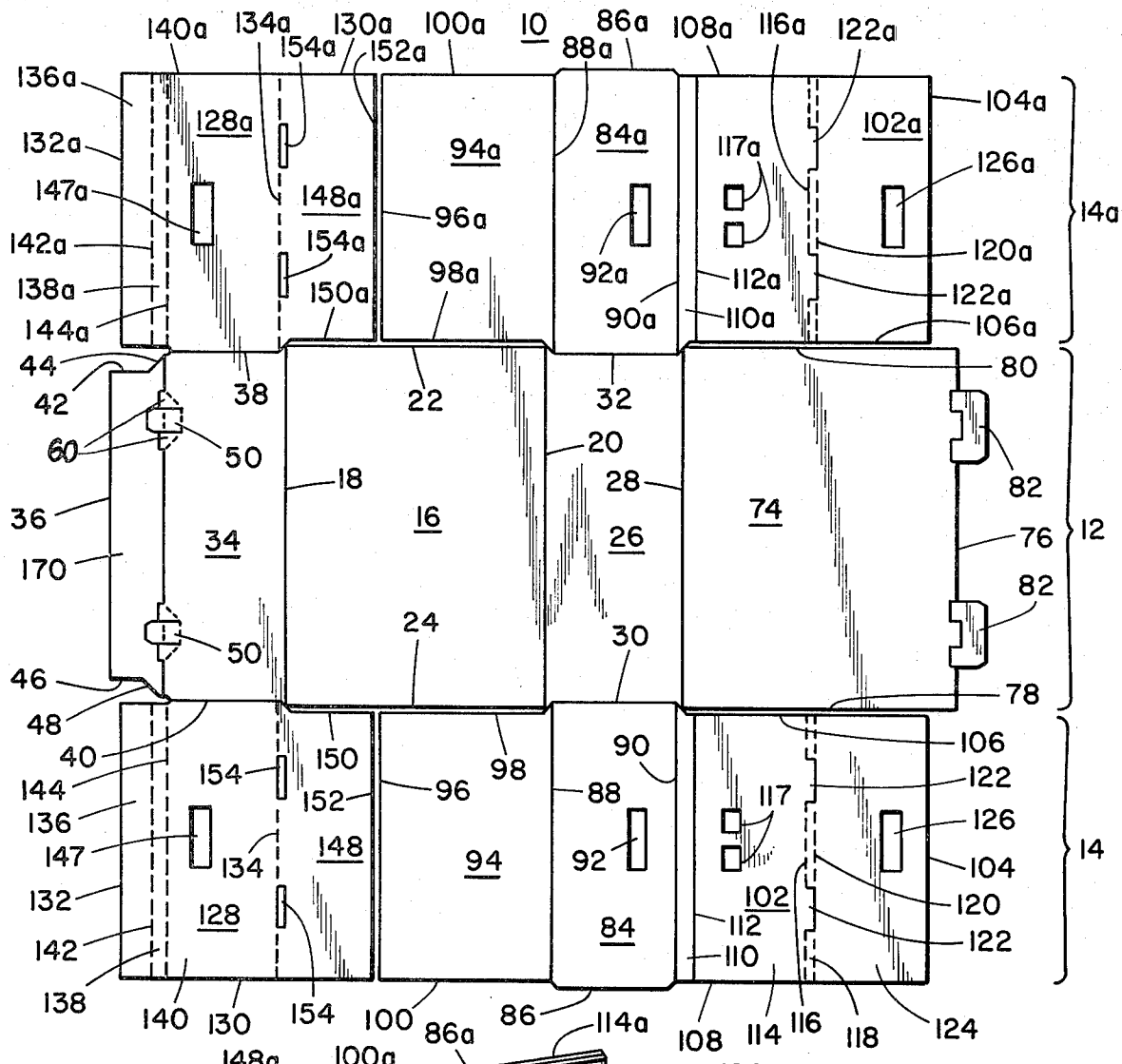

140a
134a
154a
130a
152a
100a
10
86a
88a
108a
116a
122a
136a
128a
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84a
102a
104a
132a
117a
126a
147a
148a
96a
92a
120a
142a
154a
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112a
122a
138a
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154
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86
114a
110
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116
118
124

FIG.1

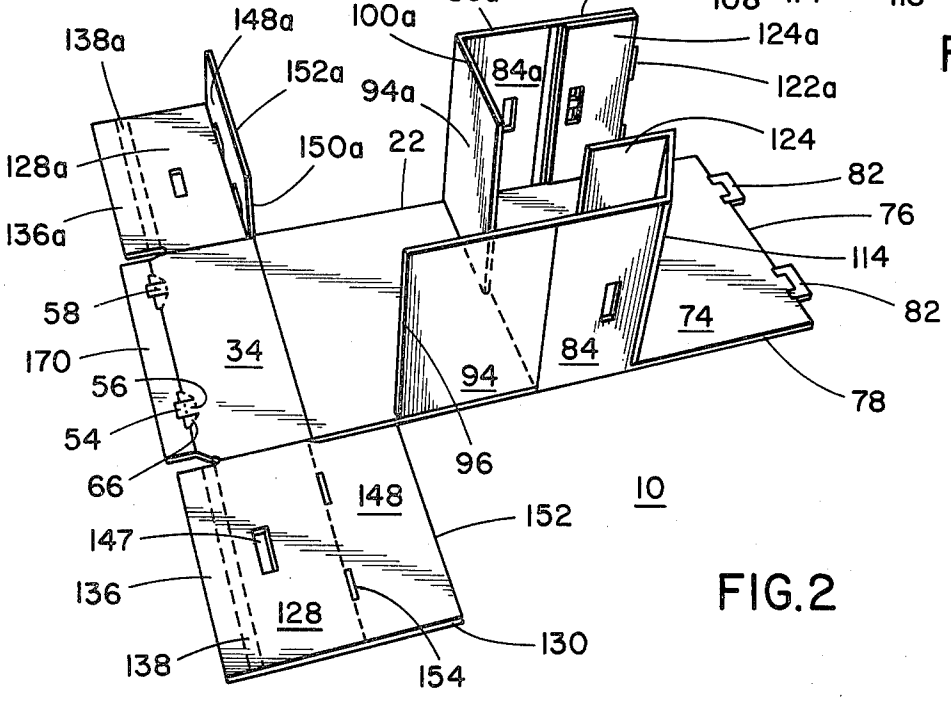

138a
148a
100a
86a
124a
152a
84a
122a
94a
124
150a
22
128a
82
76
136a
114
58
82
74
170
34
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56
78
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96
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148
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152
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130
138
154

FIG.2

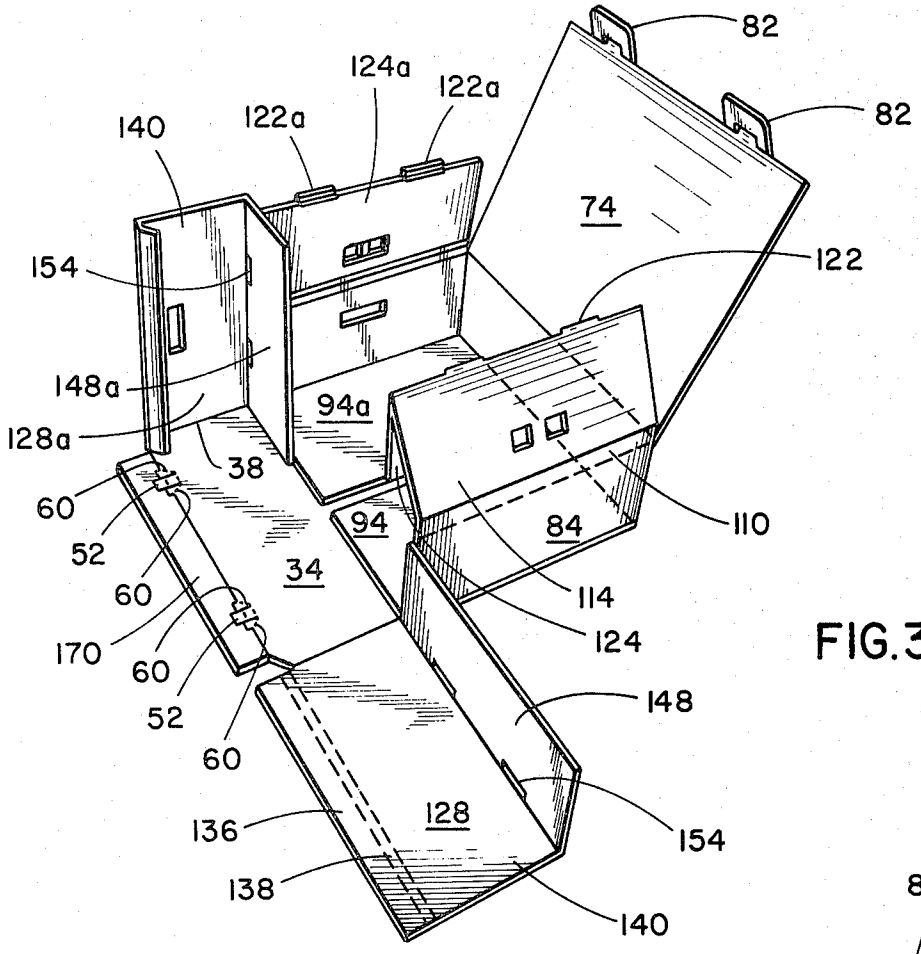

82
82
124a
122a
122a
140
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148a
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128a
38
60
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124
170
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52
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154
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140

FIG.3

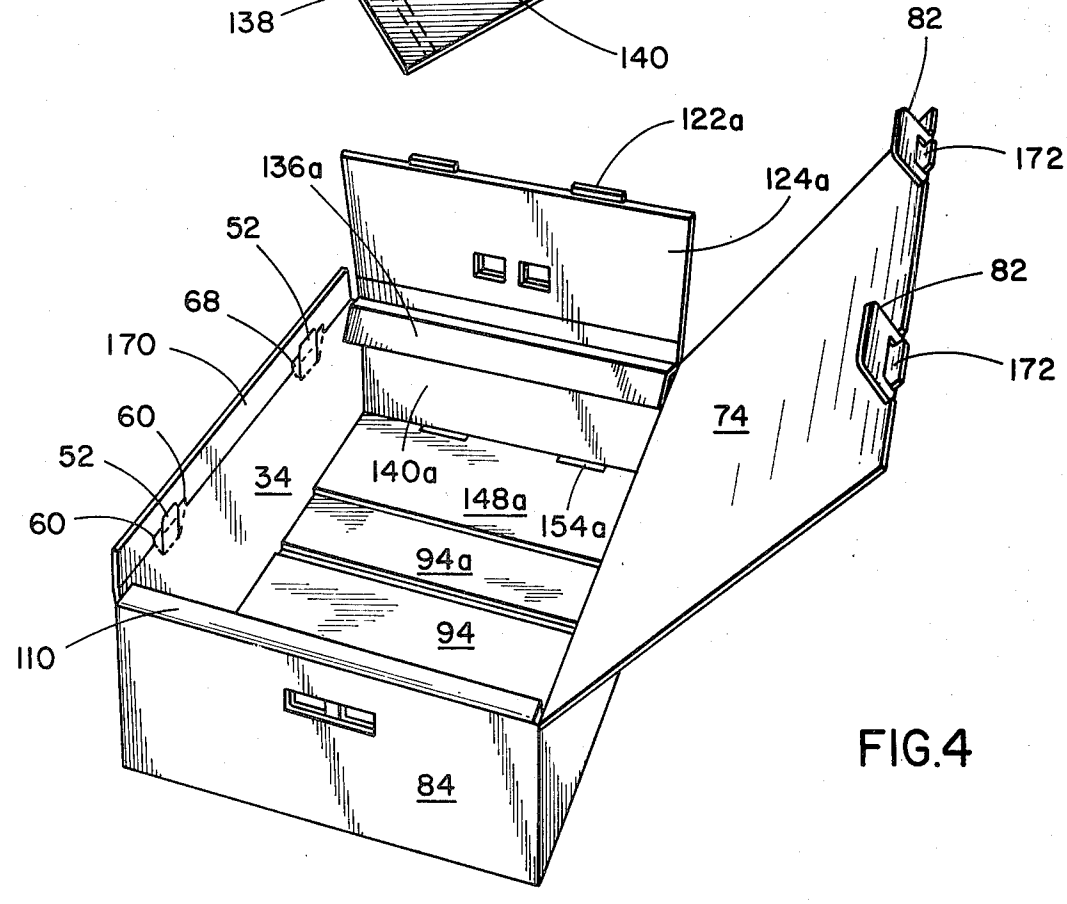
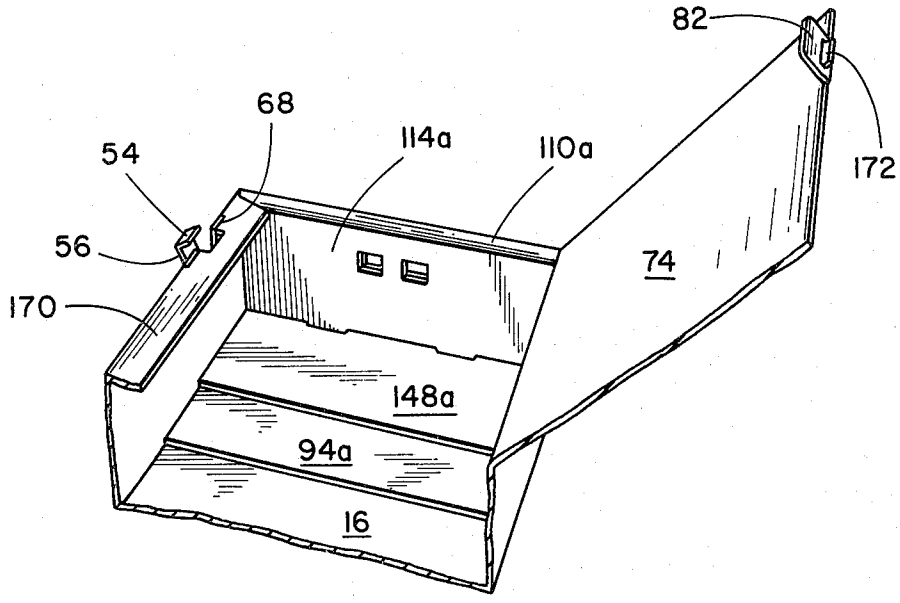

82
122a
172
136a
124a
52
82
68
170
172
60
74
52
34
140a
148a
154a
94a
60
94
110
84

FIG.4

FIG.5



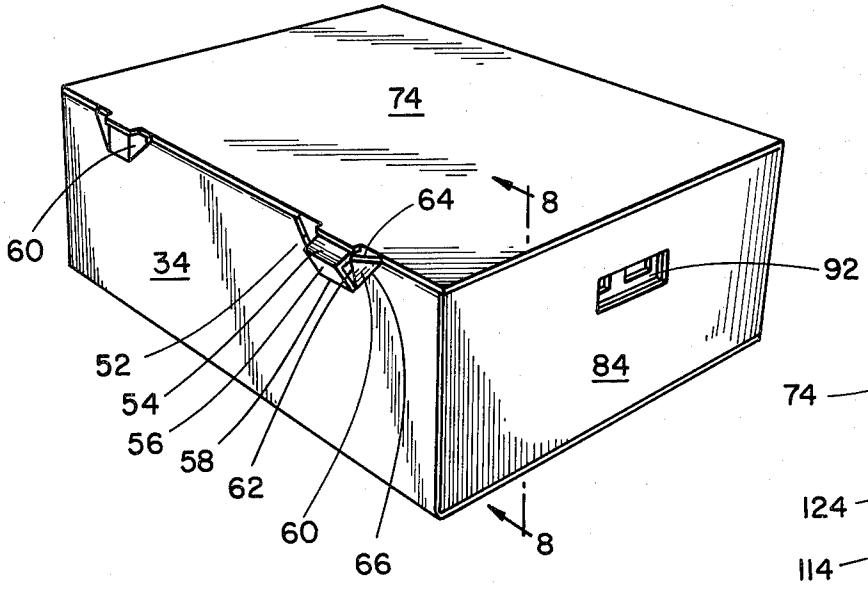
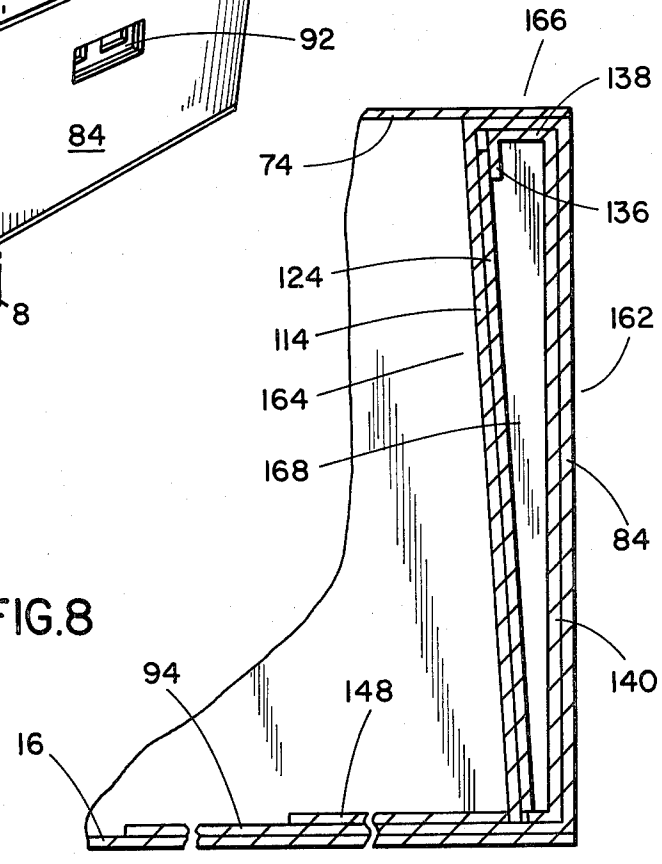


FIG.6

FIG.8



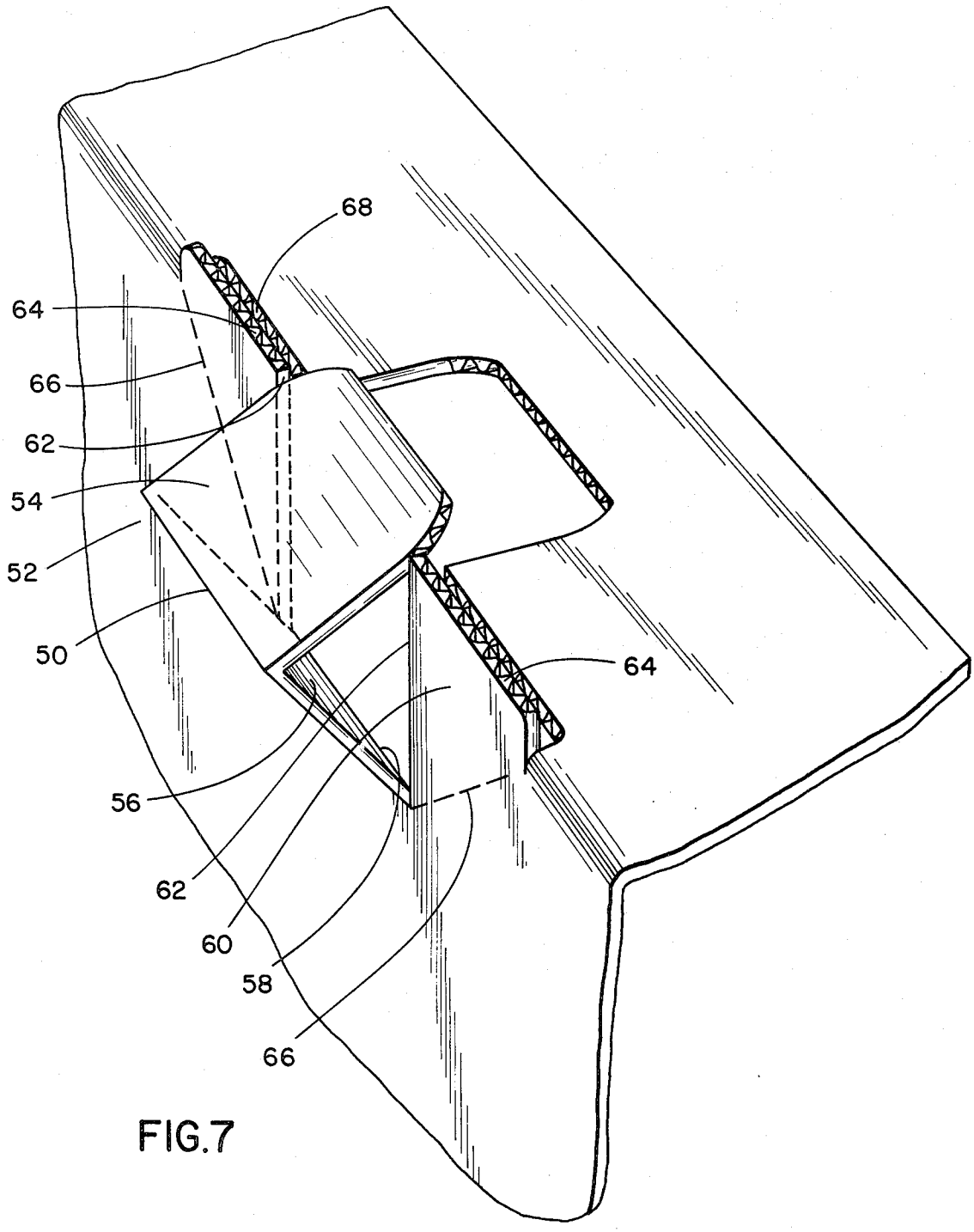


FIG.7

CARTON FOR REFRIGERATED CONSUMABLE PRODUCTS

BACKGROUND OF THE INVENTION

This invention relates primarily to closeable paperboard cartons formed from a single blank having novel cooperating locking means operable between a pair of carton walls for gaining access to and from the carton. The invention also provides for novel side wall formations providing unexpected strength thereat.

Closeable cartons formed from single blanks of paperboard material having a cover or closure wall hingedly attached along only one edge thereof to a wall of the carton are well known. Various locking means for connecting the cover or closure wall to a second or mating wall of the carton for releasably locking the carton are well known also. One such locking means consisted of locking fingers or tabs attached to or formed in the closure wall and mating walls and which could be inserted in or attached to an adjoining or mating wall for releasably locking the closed carton. When the carton was thus closed these locking fingers or tabs generally were either not accessible because they were positioned in the interior of the carton or exposed, manipulable portions thereof were flush with the carton walls. In either case, it was inconvenient and difficult to handle the locking fingers or tabs and repeated manipulation thereof frequently distorted and/or damaged them sufficiently to render the locking means inoperative or inadequately effective.

SUMMARY OF THE INVENTION

There is provided a closeable carton formed from a single paperboard blank. The carton has a cover or closure wall hingedly joined thereto. Said closure wall has a free edge and locking tabs are formed therein adjacent the free edge. The carton has a second wall arranged to be mated with the closure wall when the carton is closed. Locking fingers are formed in the second wall which are located to mate with the locking tabs on the closure wall for releasably closing the carton. Also, hinged flaps are formed in the second wall adjacent the locking fingers. These hinged flaps are integral with the second wall and may be pivoted outwardly of said second wall for allowing access to the locking fingers so that they can be attached to and detached from the locking tabs.

The carton also includes side walls having inner and outer panels cooperating to form an air cell or space therebetween. The inner panel is arranged angularly relative to the outer panel in the setup of said side walls so as to achieve an air cell of relatively triangular cross section with the apex at the bottom of the carton for achieving desirable added strength.

The carton embodying the invention is especially suitable for packaging and transporting heavy, consumable products. Consequently, the products may require refrigeration and this carton is suitable for such exposures as well.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of the blank from which the carton embodying the invention is formed;

FIG. 2 is a perspective view showing initial partial folding of the blank for forming the carton;

FIG. 3 is a perspective view of said blank shown in a folded condition progressive from that of FIG. 2 for forming the carton;

FIG. 4 is a perspective view of said blank shown in a folded condition progressive from that of FIG. 3 for forming the carton;

FIG. 5 is a fragmentary perspective view of the folded blank as seen in FIG. 4 with additional folding for erecting the carton shown;

FIG. 6 is a perspective view of the fully erected carton;

FIG. 7 is a perspective view of the locking tabs of the carton shown in FIG. 6; and

FIG. 8 is a fragmentary sectional view taken along the line 8—8 of FIG. 6 and in the direction indicated generally.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The single or unitary blank for forming the carton is identified generally by the reference number 10 in FIG. 1. Blank 10 has a plurality of hingedly connected together panels which form the various walls of the carton. Blank 10 is divided into a first portion 12 and second and third portions 14 and 14*a* which are mirror images of one another. Since portions 14 and 14*a* are the same, only the blank portion 14 will be described in detail. Corresponding elements in the second blank portion 14*a* are identified with the same reference number and the appended subscript (*a*).

First portion 12 includes a rectangular-shaped panel 16 which in the embodiment shown is the bottom wall panel. The bottom wall panel 16 is defined in first portion 12 by fold lines 18 and 20 which extend parallel to one another and the parallel edges 22 and 24 which intersect fold lines 18 and 20.

A rectangular-shaped panel 26 is hingedly connected at the fold line 20 and is defined by parallel fold lines 20 and 28 and parallel fold lines 30 and 32 which intersect fold lines 20 and 28. In the embodiment shown, panel 26 is a side panel. Fold lines 30 and 32 in side panel 26 are spaced slightly closer together than free edges 22 and 24 in bottom wall panel 16 in order to facilitate folding and overlapping of the various panels.

A second side panel 34 is hingedly connected at the fold line 18 to bottom panel 16. Second side panel 34 is defined by fold line 18 and free edge 36 which extend parallel to one another and crease lines 38 and 40 which are parallel. Crease line 38 is connected with free edge 36 via free edges 42 and 44, and free edge 36 is connected to crease line 40 via free edges 46 and 48. Crease lines 38 and 40 are spaced slightly closer to one another than are free edges 22 and 24 of bottom wall panel 16 in order to facilitate folding the second side panel 34.

A fold line 50 extends across second side panel 34 parallel to fold line 18 and free edge 36, dividing second side panel 34 into two sections. Locking fingers 52, as seen in FIG. 7, are cut from second side panel 34 forming a cutout in side panel 34 divided into two portions 54 and 56 by fold line 50. The fingers 52 are hingedly connected to second side panel 34 at crease line 58.

Integral hinged flaps 60 are formed from the second side panel 34 adjacent fingers 52. Each integral hinged flap 60 is defined by two free edges 62 and 64 which intersect at one end and by a perforated line 66 which intercepts free edges 62 and 64 at their other ends and

hingedly connects flap **60** to the remainder of side portion **34.** Free edge **62** is located adjacent a free edge of first portion **56** on finger **52,** and free edge **64** is one edge of a slot **68** cut in second side panel **34** adjacent fold line **50** and extending on each side of fingers **52** adjacent the cutout in second side panel **34.**

A rectangular closure wall or panel **74** is hingedly connected by the fold line **28** to the first side panel **26.** Panel **74** is defined by fold line **28** and free edge **76** which are parallel and parallel free edges **78** and **80.**

Locking tabs **82** are formed on top panel **74** adjacent free edge **76.**

Second portion **14** of blank **10** includes a rectangular panel **84** which forms a third side wall of the carton. Wall **84** is defined by fold line **30** and free edge **86** which are parallel and parallel score lines **88** and **90.** A finger grip opening **92** is cut in side wall panel **84.**

A rectangular panel **94,** which in the embodiment shown is a first internal bottom panel, is hingedly connected at the fold line **88** to the side wall panel **84.** Panel **94** is defined by score line **88** and free edge **96** which are parallel with score line **88** and parallel free edges **98** and **100** which intercept free edge **96** and score line **88** to form a rectangular panel.

Another panel **102,** which in the embodiment shown includes the interior side panels, is hingedly connected at the fold line **90** to third side wall panel **84.** Interior side panel **102** is defined by score line **90** and free edge **104** extending parallel to score line **90** and free edges **106** and **108** extending parallel to one another and intersecting free edge **104** and score line **90** to form a rectangular wall. Interior side panel **102** includes a portion **110** which is the interior side wall top portion and is defined by score lines **90** and **112.** A second portion **114** of side panel **102,** which is the first interior side portion, is defined by free edges **106** and **108,** score line **112** and a perforated line **116.** Finger holes **117** also are cut in this second portion. A third portion **118** of the interior side panels **102,** which in the embodiment shown is the bottom interior side portion, is defined by perforated lines **116** and **120.** Tabs **122** are cut from this portion **118.** A fourth portion **124** of interior side panel **102,** which is the second interior side portion, is defined by perforated line **120** and free edges **104, 106** and **108.** A hand slot **126** also is cut in portion **124.**

Second portion **14** of blank **10** further includes a panel **128** which in the embodiment shown is a third interior side panel. Panel **128** is defined by a crease line **40,** and free edge **130** extending parallel to one another, and free edge **132** and perforated line **134** extending parallel to one another. Perforated line **134** intersects crease line **40** and free edge **130** and free edge **132** intersects free edge **130** and a free edge extension of crease line **40.** Panel **128** is divided into three portions **136, 138,** and **140,** which, respectively, are the first, second and third portions of third interior side panel **128.** First portion **136** is defined by free edge **132** and perforated line **142,** free edge **130,** and the free edge extension of crease line **40.** Second portion **138** is defined by the space between perforated lines **142** and **144** and third portion **140** is defined by the space between perforation lines **144** and **146.** A hand slot **147** also is cut in third portion **140.**

A panel **148,** which in the embodiment shown is the second internal bottom panel, is hingedly connected at perforation line **134** to the panel **128.** Panel **148** is defined by free edges **150, 152,** and **130** and perforation line **134.**

To assemble the carton **160** seen in FIG. **6,** third side walls **84** and **84***a* are folded upwardly along fold lines **30** and **32** respectively as shown in FIG. **2.** First internal bottom panels **94** and **94***a* are folded inwardly at score lines **88** and **88***a* and second internal side portions **124** and **124***a* are folded against first internal side portions **114** and **114***a* along perforation lines **116** and **120** exposing tabs **122.** Progressive folding of blank **10** will be described in connection with FIGS. **2, 3, 4,** and **5.**

With the carton thus partially folded, first side panel **26** is folded upwardly along fold line **20** so that first internal bottom panels **94** and **94***a* seat on bottom wall panel **16.** Third interior side panels **128** and **128***a* are now folded upwardly along crease lines **40** and **38** respectively, and portions **136, 136***a*, **138, 138***a* and **148** and **148***a* are folded inwardly towards one another. Second side panel **34** is now folded upwardly along fold line **18** so that second interior bottom panels **148** and **148***a* seat on first interior bottom panels **94** and **94***a* respectively. Interior side panel portions **102** and **102***a* can now be folded along fold lines **112** and **112***a*, and interior side top portions **110** and **110***a* may be folded along score lines **90** and **90***a* until tabs **122** and **122***a* are inserted into slots **154** and **154***a* respectively. The side and bottom walls of the structure have now been formed together and locked in place.

Referring to FIG. **8,** bottom panels **16, 94** and **148** overlap one another. Third side wall **84** and third portion **140** of third interior side panel **128** are engaged together to form a strong exterior layer **162** of the carton **160.** First interior side portion **114** and second interior side portion **124** of interior side panel **102,** and their mirror images **114***a* and **124***a* are folded over together to form a strong interior wall **164.** Interior side top portion **110** and second portion **138** of third interior side panel **128** are seated against one another to form a strong interior wall **166** at the upper end of the side wall structure. Bottom interior side portion **118** seated on bottom panels **16, 94** and **148** forms a strong, bottom layer which separates the exterior and interior layers **162** and **164** at the bottom of the side walls. The air space or cell **168** formed between interior and exterior layers **164** and **162** provides for additional strength and can act as an insulation and vapor barrier in a well-known manner.

It should be noted that composite walls **162** and **164** are canted one relative to the other or convergent toward the bottom of the carton. Thus, air cell **168** is triangular in cross-section from top to bottom of the side wall formation of the carton so as to provide additional strength at the top **166.**

To close the carton, the panel **170** is folded inwardly initially. Locking tabs **82** are folded at right angles to top or closure wall **74** exposing slots **172.** Panel **74** is folded downwardly along fold line **28** to a position overlying panel **170.** Flaps **60** are pivoted outwardly along perforation lines **66** allowing access to portions **56** of locking fingers **52.** Second portions **56** are then pivoted outwardly along crease line **58,** allowing second portion **54** to be drawn out of the interior of carton **160.** When the portion **54** has been fully withdrawn, tabs **82** can be inserted into slots **68** so that closure wall **74** mates with side wall **34** and seats on panel **170.** Second portions **54** of fingers **52** can now be passed through slots **172** in tabs **82** into the carton **160** until second portion **56** is flush with side wall **34** and second

portion **54** is bearing against the interior surface of top wall **74** and is coplanar with interior top edge **170.** This interlocking type of structural arrangement adds great structural rigidity to the closed carton **160.** Integral hinged flaps **60** can now be pivoted back to their original positions flush with the remaining portions of side wall **34** in order to complete the closure of side wall **34** and provide a smooth or flush side wall which facilitates stacking of cartons **160.**

In order to unlock and open carton **160,** hinged flaps **60** can be pivoted outwardly along perforated line **66** exposing the side edges of first portion **56** of sealing fingers **52.** Sealing fingers **52** may be grasped and pivoted about crease line **58** in order to fully withdraw second portion **54** from the carton and slot **172** in tab **82.** With first portions **54** of sealing fingers **52** fully withdrawn, sealing tabs **82** may be withdrawn from slots **68** and wall **74** withdrawn to open the carton.

Physical measurements for the carton have not been specified. However, the carton herein concerned is suitable for storage of food products requiring refrigeration, such as poultry and meat. The handholes provided allow for desired circulation of air through the carton. The double side wall thickness provides desired strength for stacking and handling. Also are to be noted, the great strength achieved at the side walls of the carton for the reasons stated. The unique locking means provided eliminates the need for gluing or stapling or other mechanical means for assuring proper closure of the carton yet providing for re-opening and closing thereof and without damaging the locking means.

What it is desired to secure by Letters Patent of the United States is:

1. A paperboard carton formed from a unitary blank including:

a. an upwardly opening tray having a closure wall hingedly connected along the edge of a first wall of the tray,

b. said closure wall having at least one locking tab depending from a free edge thereof,

c. said tray having a second wall transverse to said closure wall and arranged to be releasably locked therewith for closing the carton,

said second wall having at least one locking finger integral therewith having a first portion pivotally attached thereto which is movable to a position flush with said second wall and a second portion extending transverse to said first portion into the interior of carton and adapted to cooperably engage said locking tab for releasably locking the carton in a closed condition,

said second wall having integral hinged flaps adjacent said first portion arranged to be pivoted to a position exposing said locking finger sufficiently to permit same to be manually gripped when flush with the second wall, thereby enabling said finger to be moved relative to the tab for locking and unlocking the closure and second walls one relative to the other.

2. The carton of claim **1** wherein said locking tab is hingedly connected to said closure wall along a fold line and extends transverse to said closure wall, said locking tab having a slot therethrough arranged to receive said second part of the locking finger.

3. The carton of claim **1** wherein said second wall includes a third wall part and a fourth part one adjacent the other and separated by a first fold line, said fourth part being transverse to said third part, said locking finger being struck from said second wall so as to form a cutout therein with said first portion hingedly attached to said third part at one end of said finger, said first portion extending to a second fold line substantially co-linear with said first fold line, said second portion extending from said second fold line to a free edge thereof in the interior of said carton.

4. The carton of claim **3** wherein said first fold line is cut through a predetermined distance adjacent said finger forming a slot.

5. The carton of claim **4** wherein said flaps have a first free edge of said third part adjacent said finger first portion, said first free edge being an edge of said cutout, a second free edge of said third part forming one side of said slot a predetermined distance adjacent said finger and intersecting said first free edge at one end, and a line or reduced strength extending between the other ends of said first and second free edges.

6. The carton of claim **3** wherein said closure wall overlies said third wall part in the closed condition of the carton.

7. The carton of claim **4** wherein said locking tab is engaged in said slot and said cutout and said finger is engaged through said tab.

8. The carton of claim **1** wherein said tray has a pair of opposite side walls of substantially identical construction, each side wall extending between said closure wall and wall opposite said closure wall and formed of a pair of side wall layers spaced one from the other and divergent toward said closure wall to provide a cell space of generally triangular cross section.

9. A closeable carton of rectangular configuration formed of paperboard and including, a first wall having a first edge hingedly connected to a second wall and at least one second edge having locking tabs secured thereto, a third wall positioned in a plane transverse to the plane of said first wall and adapted to be mated with said first wall for closing said carton, said third wall having locking fingers formed therein each having a first portion hingedly secured to said third wall and adapted to be seated flush with the plane thereof, and a second portion secured to said first portion and extending transverse to said first portion in the interior of said carton, said second portion adapted to be mated with said tabs when said carton is closed, and flaps formed in said third wall adjacent said first portion and hingedly attached to said third wall at a first fold line for allowing access to said finger first portion whereby said fingers first portion can be pivoted for releasably interlocking said fingers and tabs.

10. The carton of claim **9** wherein said fingers are struck from said third wall so as to form a cutout in said third wall defined by edges of said third wall, said flaps having a first free edge adjacent said finger first portion, said first free edge being a cutout edge, said flaps further having a second free edge extending transverse to said first free edge and intercepting said first free edge at one end, said first fold line extending between the other ends of said first and second free edges.

11. The carton of claim **10** wherein said first and second free edges and said first fold line define a triangular-shaped flap.

12. The carton of claim **10** wherein said locking tabs extend transverse to said first wall and have slots formed therein, said finger second portions extending into said slots when said carton is closed.

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