July 30, 1963 R. E. STEASE 3,099,379

REINFORCED SHIPPING CARTON

Filed March 18, 1959 4 Sheets-Sheet 1

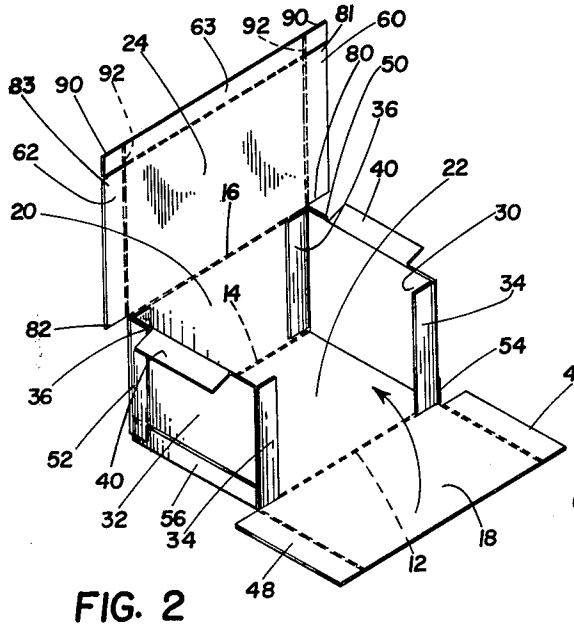



FIG. 2

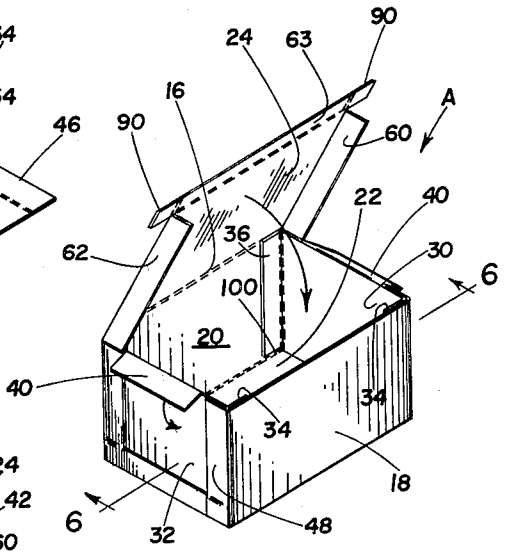



FIG. 3

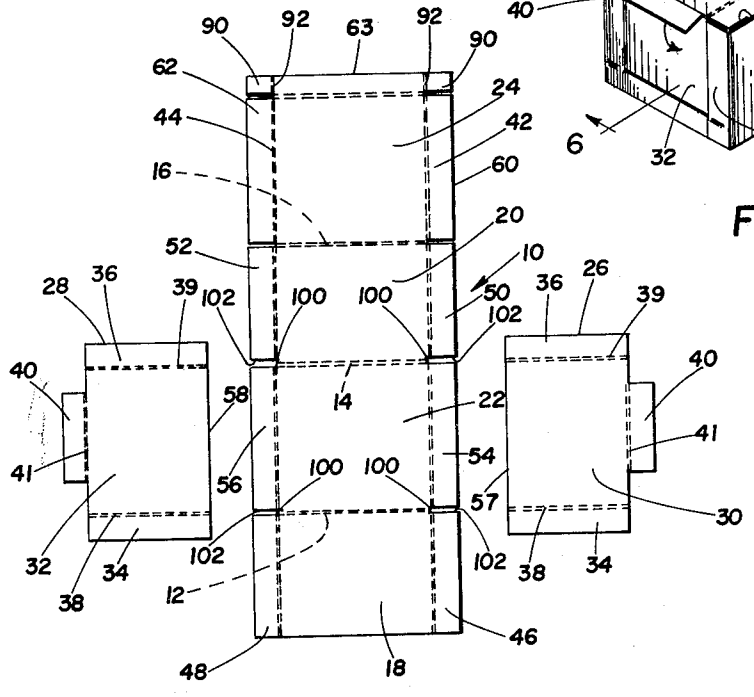



FIG. 1

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REINFORCED SHIPPING CARTON

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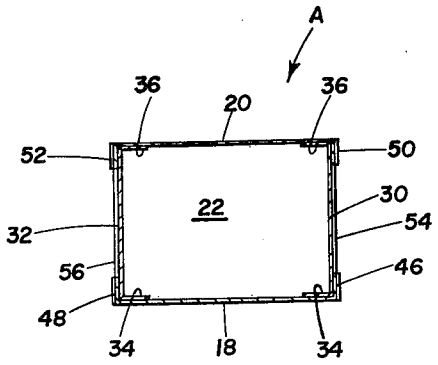



FIG. 6

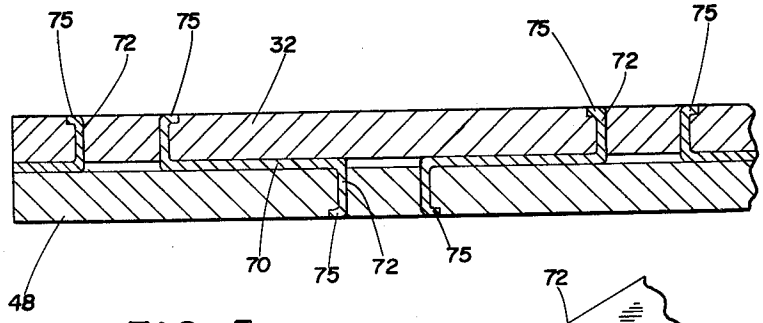



FIG. 5

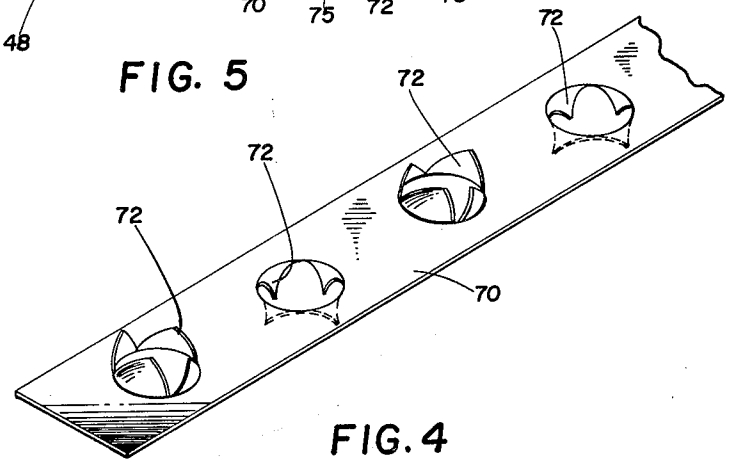



FIG. 4

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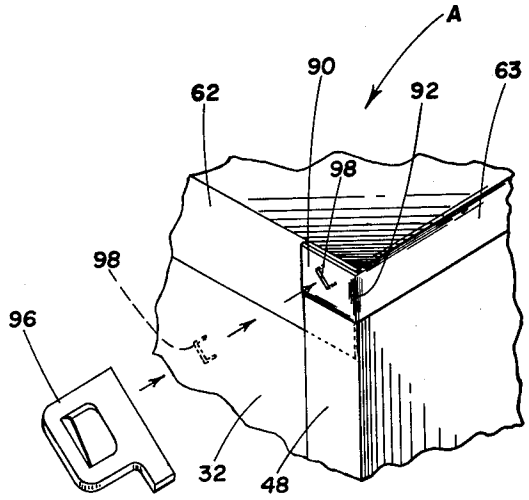



FIG. 8

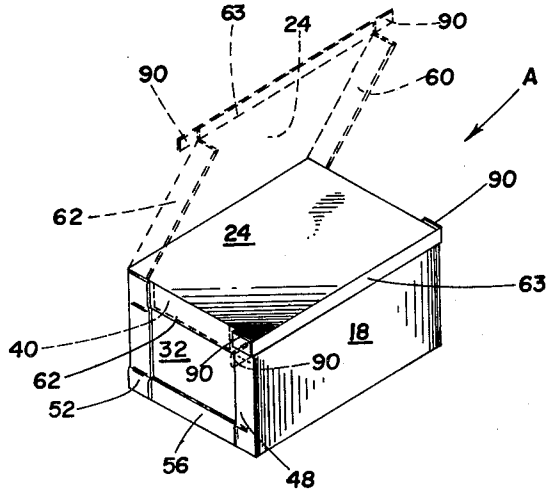



FIG. 7

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REINFORCED SHIPPING CARTON

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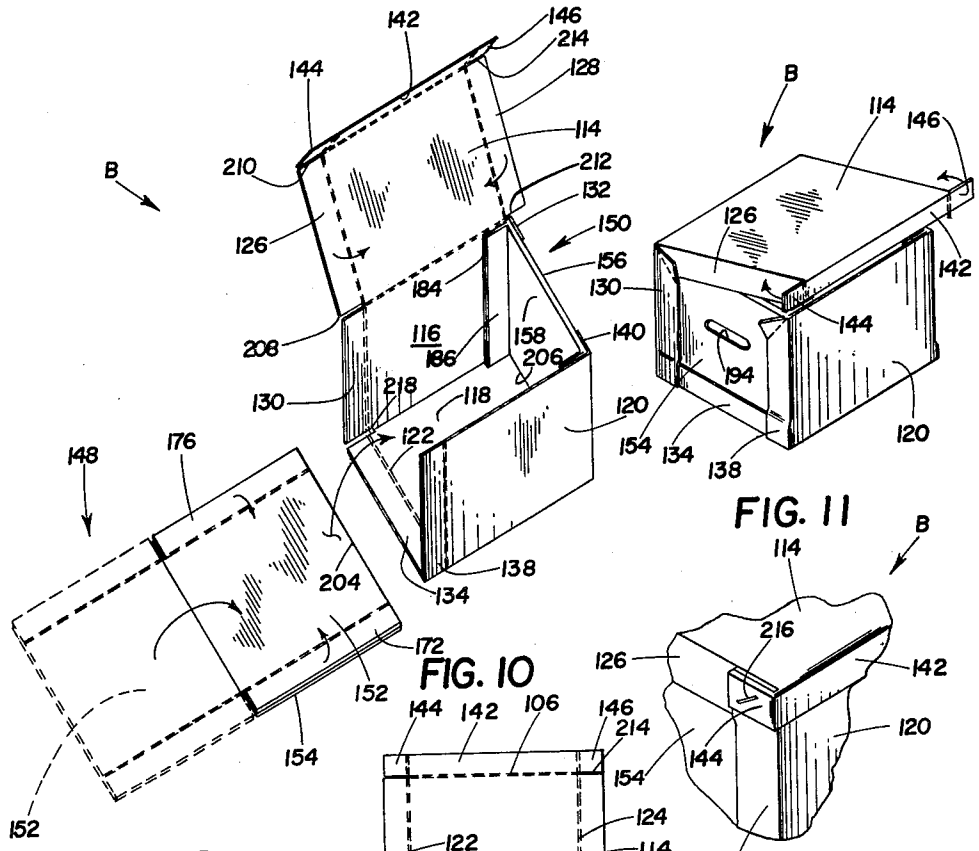



FIG. 10




FIG. 11




FIG. 12




FIG. 9

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3,099,379

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3,099,379

# REINFORCED SHIPPING CARTON

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Filed Mar. 18, 1959, Ser. No. 800,339
8 Claims. (Cl. 229—23)

This invention relates to a shipping carton and, more particularly, to a shipping carton suitable for storing and transporting certain products. For example, hot or cold food products, the cold products comprising frozen food products, fresh ice packed food products, hydrocooled food products, refrigerated food proucts and the like. While the carton embodies features making is especially adapted for use with food products, it is capable of many other applications where a sturdy container is required, and, in particular, where the carton is subjected to the weight of other cartons being stacked thereon during shipping and/or storage.

Many of the shipping cartons in present usage provide inadequate reinforcement at the interior seams where the side panels are joined together. Generally, these side seams tend to split and cause separation of the side panels when the side seams and panels are subjected to excessive forces created by the contents of the carton bearing against the side seams and panels and/or by the weight of other cartons being stacked on top of the same during shipping or storage. While it is possible to provide added strength to the side seams of the carton by utilizing additional thicknesses or multiples of the side panels, such expedients add to the cost and weight of the carton and are for this reason unsuitable.

Generally, some suitable provision must be made for lifting and carrying a carton of the above described type. One such means has been to provide carrying handles which are made an integral part of the container. However, it has been found that these prior known carrying handles generally impose objectionable stresses on the fasteners holding the closure lid of the carton to the side panels.

It is, therefore, an object of the present invention to provide a reinforced shipping carton having side panels interconnected adjacent each of their adjoining edges by an intermediate fastening member having spaced deformable detents alternately embedded in the mating surfaces of the side panels.

It is another object of the present invention to provide such intermediate fastening members between the mating surfaces of the side panels and a bottom of the carton where the same are bonded together.

Another object of this invention is to further reinforce such a carton against separation of the side panels by providing at least one reinforcing flap at each of the side seams of the carton, each reinforcing flap extending the full length of the connecting seam.

Another object of this invention is to provide improved carrying handles for the carton whereby substantially none of the lifting force is imposed on the cover of the carton or the fasteners holding the cover in the closed position.

Another object of the invention is to provide a lid or cover for the carton which is hingedly joined to one of the side panels, is adapted to seal at the edges of the remaining wall panels, and is adapted to be fastened in the closed position by a connection reqiuring only two fastening elements in the form of staples or the like. As a result, the carton when assembled can be sealed by the cover which requires fastening at only two points. Conversely, when the carton is opened, only the fastening points need be broken to open the lid which at all times provides an effective seal while in a closed position.

A further object of the invention is to construct a carton which is highly resistant to water, moisture, and vapor transmission.



Another object of the present invention is to provide such a carton having drainage openings at the bottom of the carton which provide outlets for water or other liquid from the interior of the carton.

Other objects and features of the invention in addition to those specifically mentioned will become apparent from a consideration of the following description which proceeds with reference to the accompanying drawings wherein:

FIGURE 1 is a plan view of carton blanks from which a carton is assembled, the carton illustrating a first embodiment of the present invention;

FIGURE 2 is an isometric view of the carton blank of FIGURE 1 and illustrates three of the side panels in their assembled positions, and the manner of folding the fourth side panel into its assembled position;

FIGURE 3 is an isometric view showing the carton blank of FIGURE 1 in the next stage of assembly subsequent to the stage illustrated in FIGURE 2 and illustrating how the cover panel is folded downwardly;

FIGURE 4 is an isometric view showing a connecting strip which is used to hold the side panels together;

FIGURE 5 is an enlarged fragmentary cross-sectional view taken through one of the connecting flaps of the side panels and illustrating how the connecting strip holds the connecting flap and adjacent side panel together;

FIGURE 6 is a sectional view taken along line 6—6 of FIGURE 3 after the carton is completed;

FIGURE 7 is an isometric view showing the cover panel in dotted position when the carton is partially closed, and in full lines when the carton is completely sealed;

FIGURE 8 is an enlarged fragmentary isometric view indicating how the end portions of the forward sealing flap are bent backwardly and thereafter stapled to hold the cover in place;

FIGURE 9 is a plan view of carton blanks from which another carton is assembled, the carton illustrates a second embodiment of the present invention;

FIGURE 10 is an isometric view of the carton blank of FIGURE 9 and illustrates three of the side panels in their assembled positions and the manner of bringing the fourth side panel into its assembled position;

FIGURE 11, in an isometric view similar to FIGURE 7, illustrates the cover panel of the second embodiment being brought into its closed position; and

FIGURE 12 illustrates, in an enlarged fragmentary isometric view, similar to FIGURE 8, how the end portions of the forward sealing flap of the second embodiment are fastened in place.

Reference is now made to FIGURES 1 to 8 illustrating the first embodiment of the present invention, and particular reference is made to FIGURE 1 wherein a carton A is constructed from a blank 10, the blank 10 being divided by score or fold lines 12, 14, and 16 extending across the width of the blank 10 and defining two side panels 18 and 20, a bottom panel 22 and cover panel 24. The other two sides of the carton A are provided by separate blanks 26 and 28 which form the side panels 30 and 32 respectively.

The blanks 10, 26 and 28 may be formed from reclaimed or virgin kraft board and are of any suitable thickness depending primarily upon the intended usage of the carton A. A wax coating or other protective coating may be provided over the surfaces of the kraft board panels to render the carton highly resistant to water, moisture, and vapor transmission.

The two side panels 30 and 32 each have reinforcement flaps 34 and 36 formed along the edges thereof by means of respective score lines 38 and 39. Carrying handle flaps

40 are located along the outer edge of the side panels 30, 32, the flaps 40 being defined by score lines 41 which permit doubling back of the carrying handle flaps 40.

The panel 10 has score lines 42 and 44 extending parallel with the longitudinal edges providing a margin of material at the opposite sides of each of the panels 18, 20, 22 and 24. The side panels 18 and 20 are thereby respectively provided with opposed pairs of foldable connecting flaps 46, 48 and 50, 52 which are adapted to be fastened to the two side panels 30 and 32. The bottom or base panel 22 includes two foldable connecting flaps 54 and 56 which are adapted to be fastened respectively to side panels 30 and 32 adjacent the respective edges 57 and 58 thereof.

The cover panel 24 also includes foldable flaps 60, 62 and 63 and is folded on the score line 16. The flaps 60, 62 and 63 are adapted to be folded over the edges of the other three side panels 18, 30 and 32 to effectively seal the shipping carton A.

Referring now to FIGURE 2, the side panels 30, 32 are placed vertically on the blank 10 with the bottom edges 57, 58 coincident with the respective score lines 42 and 44 of the bottom panel 22. The reinforcement flaps 34 and 36 are then folded inwardly towards one another as shown in FIGURE 2, and the side panels 18 and 20 are bent transversely at the respective folding lines 12 and 14 to form the remaining upright side panels of the container A.

The connecting flaps 46 and 48 of the side panel 18 and the connecting flaps 50 and 52 of the side panel 20 are bent so as to wrap over the outer surfaces of the respective side panels 30 and 32. Similarly, the connecting flaps 54 and 56 of the bottom panel 22 are bent upwardly to extend over a portion of the outer surfaces of the respective side panels 30 and 32. Each of the connecting flaps 46, 48, 50 and 52 and each of the bottom flaps 54 and 56 is then fastened to the respective outer surface of the side panel 30 or 32, by means of an interposed connecting member 70 (FIGURE 4). Each connecting member 70 has a series of spaced deformable detents 72 which extend alternately from opposite sides of the metal strip 70, the detents being pointed at their outer ends so as to have a piercing effect when pressed against the respective connecting flap and outer surface of the adjoining side panel. Since each connecting member 70 functions in the same manner, only one particular connection will be described. In particular, reference is now made to FIGURE 5 wherein the connecting flap 48 is wrapped over one vertical edge of the side panel 32. The connecting member 70 is then interposed between the flap 48 and panel 32. When normal pressure is applied against the connecting flap 48 and the side panel 32, the detents 72 at the opposite sides of the strip 70 become imbedded respectively therein. The detents 72 are so proportioned that the tips 75 thereof are adapted to be bent backwardly to form an interlocking relation with the connecting flap 48 and the side panel 32. As a result, there is formed a reliable and effective bond. The detents 72 do not protrude beyond the surfaces of the connecting flaps and side panels whereby a smooth joint is formed between each connecting flap and the mating surface of the adjacent side panel. Further details of this connection member can be obtained by reference to the copending application, Serial No. 746,908, filed July 7, 1958.

The flaps 50 and 52 of the side panel 20 and the flaps 46 and 48 of the side panel 18 are connected to the respective side panels 30 and 32 (FIGURE 2) in such a manner that rear corners 80 and 82 and front corners 81 and 83 of the sealing flaps 60, 62 are adapted to be inserted respectively between the connecting flaps 50, 52, 46 and 48 and the respective wall panels 30 and 32 (FIGURE 3). The cover panel 24 is then folded downwardly on the score line or fold line 16 with the sealing flaps 60 and 62 being brought over the upper edges of the wall panels 30 and 32. The carrying handle flaps 40 may be proportioned to be of greater width than the width of the sealing flaps 60, 62 of the cover panel 24 or proportioned to be of the same width as the width of the sealing flaps 60 and 62. Therefore, when the handle flaps 40 are folded downwardly they either project beyond the respective sealing flaps 60 and 62 or are coincident therewith and thus are adapted to carry the entire weight of the shipping carton. In this manner, none of the weight of the carton A is borne by the cover panel 24 when the same is lifted by the handles 40.

After the cover 24 is closed over the open end of the carton A, the forward sealing flap 63 is bent downwardly over the upper edge of the side panel 18. The tab sections 90 (FIGURE 7) of the sealing flap 63 are bent backwardly on the transverse fold lines 92 and stapled by a stapler 96 to the respective side panel 30 and 32, each staple 98 connecting a tab 90, connecting flap 46 or 48, adjacent sealing flap 60 or 62 and side panel 30 or 32 together. Thus, by utilizing a single staple 98 at the opposite ends of the sealing flap 63, the cover panel 24 is adapted to be held firmly in place. In this manner, the cover 24 of the carton A can be rapidly fastened in place. Conversely, by merely breaking the connection formed by the staples 98 at only two points, the cover panel 24 can be released and swung backwardly at its hinged connection to open the carton A.

Reference is now made to FIGURE 6, which is a cross-sectional view taken through the middle of carton A. It can be seen that a double thickness of side panel material is provided at each of the side seams of the carton A. This reinforcement at each of the side seams provides added strength to the carton A which is sufficient to resist any tendency of the side seams to split.

If desired, four drainage openings 100 may be provided at the bottom of the carton A, the openings 100 providing outlets for any moisture which accumulates within the carton A or results from limited thawing of the frozen product contained therein. These drainage openings 100 are provided by slots 102 formed between the bottom panel 22 and the side panels 18 and 20, the slots 102 respectively extending along the score lines 12 and 14 and projecting slightly beyond the score lines 42 and 44. Therefore, when the blank 10 is folded on the score lines 12 and 14 and the side panels 30 and 32 are set in place, the slots 102 extend into the interior of the carton 14 as seen in FIGURES 2 and 3.

After the carton A, shown in FIGURE 3 is formed, it is easily packed with produce such as frozen poultry, vegetables or other produce. The cover panel 24 is then swung downwardly at the hinged score line 16 and sealed by means of the flaps 60, 62 and 63. The cover is fastened in the manner previously described by merely folding back the tabs 90 as shown in FIGURES 7 and 8 and then stapling the tabs 90 to hold the cover 24 in place.

It is a simple matter to carry the carton by means of the carrying flaps 40 so that none of the weight of the carton A or its contents is imposed on the cover panel 24. As a consequence, the staple fastenings 98 at each end of the carton A also do not bear any of the weight of the carton. It has been found that by this arrangement, wherein the carrying load is borne solely by side panels 30 and 32 instead of the cover panel 24, there is provided greater assurance that the carton A will not become opened by normal handling.

Also, as a result of the structural features of this invention, the carton can be reused since it is resistant to moisture and minimum damage is done to the carton by the simplified unpacking procedure.

Reference is now made to FIGURES 9–12 illustrating a second embodiment of the present invention, and particular reference is made to FIGURE 9 illustrating a carton blank 104 utilized for forming a carton B (see FIGURE 11). The carton blank 104, similar to the carton blank 10 illustrated in FIGURE 1, is provided with a plurality of parallel score or fold lines 106, 108, 110 and 112 extending across the width thereof and

respectively dividing the carton blank **104** into a cover panel **114**, a side panel **116**, a bottom panel **118**, and another side panel **120**. A pair of transverse score or fold lines **122** and **124** are provided along the outer edges of the carton blank **104** and respectively define side sealing flaps **126** and **128** on the cover panel **114**, connecting flaps **130** and **132** on the side panel **116**, connecting flaps **134** and **136** on the bottom panel **118**, and connecting flaps **138** and **140** on the other side panel **120**. The score line **106** defines a front sealing flap **142** on the cover panel **114** and respectively cooperates with the score lines **122** and **124** to define end sections or tabs **144** and **146** on the front sealing flap **142**.

A pair of side panel blanks **148** and **150** are each respectively divided into two equal side panel sections **152**, **154** and **156**, **158** by respective score or fold lines **160** and **162**. Each side panel blank **148** and **150** is respectively provided with a pair of parallel score or fold lines **164**, **166** and **168**, **170**. The score lines **164** and **166** respectively define two pairs of reinforcing flaps **172**, **174**, and **176**, **178** disposed respectively on opposite sides of the side panel blank **148**, and the score lines **168** and **170** respectively define two pairs of reinforcing flaps **180**, **182** and **184**, **186** disposed on opposite sides of the side panel blank **150**.

The side panel section **154** of the side panel blank **148** is partially cut away at **188** to form two symmetrical tabs **190** and **192** which, in turn, define a recess means or grasping means **194** in the side panel **148** (see FIGURE 11). Similarly, the panel section **156** of the side panel **150** is partially cut away at **196** to define a pair of symmetrical tabs **198** and **200** which, in turn, define a recess means or grasping means **202** in side panel **150**.

As shown in FIGURE 10, the carton blank **104** is folded in substantially the same manner as the carton blank **10** illustrated in FIGURE 2. However, the side panels **148** and **150** are each folded on the respective score or fold lines **160** and **162** in such a manner that the panel sections **152** and **158** form part of the interior of the carton B and the panel sections **154** and **156** form part of the exterior of the carton B. When the side panels **148** and **150** have been folded on the respective score lines **160** and **162** in the manner illustrated in FIGURE 10, the bottom edges **204** and **206** thereof are placed perpendicularly on the respective score lines **122** and **124** extending across the bottom panel **118**. The connecting flaps **134** and **136** of the bottom panel **118** are then respectively wrapped around a portion of the outer side panel sections **154** and **156** and interconnected therewith by connecting members **70** (see FIGURE 4) in the manner previously described. Similarly, the connecting flaps **138** and **140** of the side panel **120** and the connecting flaps **130** and **132** of the side panel **136** are secured respectively to the outer side panel sections **154** and **156** by connecting members **70**. When the side panels **148** and **150** have been secured to the carton blank **104**, each side panel **148** and **150** provides a double wall at the respective side of the carton B. As shown in FIGURE 10, each side seam of the carton B is reinforced by a pair of reinforcing flaps disposed within the carton B and extending along the respective side seam. For example, the reinforcing flaps **184** and **186** of the side panel blank **150** extend completely along the side seam defined by the side panels **116** and **150** and thus provide added strength to the carton B at the particular point where reinforcement is desired.

As shown in FIGURE 11, when the side panels **148** and **150** have been assembled to the carton blank **104** in the manner previously described, the cover panel **114** is adapted to close the carton B and be secured thereto by folding the same downwardly on the score or fold line **108**. The connecting flaps **130** and **138** and the connecting flaps **132** and **140** are secured to the respective side panels **148** and **150** in such a manner that the respective side sealing flap **126**, **128** of the cover panel **114** is adapted to have the respective corner portions **208**, **210** and **212**, **214** inserted between the connecting flaps and the respective side panel **148** and **150** when the cover panel **114** is closed. In order to completely close and seal the carton B, the front sealing flap **142** of the cover panel **114** is folded downwardly over the adjacent side panel **120** and the end sections **144** and **146** thereof are folded backwardly, as shown in FIGURE 12, and secured to the respective side panels **148** and **150** by staples **216** in substantially the same manner as the carton A illustrated in FIGURES 1 to 8.



When the carton B has been assembled in the manner set forth above, it can be seen that not only does the double thickness of the side panels **148** and **150** add rigidity to the carton B but the pairs of reinforcing flaps **172**, **174**; **176**, **178**; **180**, **182**; and **184**, **186** also provide a double thickness along the respective side seams of the carton B to further reinforce the same and thereby prevent separation of the side panels. The manual grasping means **194** and **202** of the respective side panels **148** and **150** provide suitable means for lifting the carton B without subjecting the cover panel **114** or the fastening means **216** to any of the lifting force normally encountered in prior known cartons.

If desired, the carton B may be provided with drainage openings **218** (FIGURES 9 and 10) in substantially the same manner as the carton A.

Also, if desired, one or more of the reinforcement flaps **34** and **36** of carton A and flaps **172**, **174**; **176**, **178**; **180**, **182**; and **184**, **186** of carton B can be extended whereby the interior of the respective cartons is provided with at least a double thickness at each of the sides thereof. By such a construction, there would be a substantial increase in top to bottom strength and additional protection prohibiting the transmission of heat and cold would be provided for products contained in the carton. For example, the resulting double thickness could be so constructed and arranged to provide a dead air space therebetween for insulation, or to provide cavities for receiving a cold medium such as Dry Ice and the like, or a heat generating or radiating medium, whichever medium is necessary to maintain the products contained in the carton at a desired predetermined temperature.

Therefore, it can be seen that various shipping structures have been disclosed, each having improved means for reinforcing the same at the critical points thereof without unduly adding to the cost of the production of same. It can be further seen that the carton structures described are relatively simple to assemble and can be sealed and unsealed in a relatively short period of time.

While this invention has been described in conjunction with certain specific embodiments thereof, it should be understood that this is merely illustrative of the invention and is in no sense restrictive thereof. It is intended that such revisions and modifications of the invention as are reasonable to be expected on the part of those skilled in the art and which incorporate the herein disclosed principles will be included within the scope of the following claims.

What is claimed is:

1. A carton comprising: a plurality of side panels each having a pair of opposed vertically disposed edges; a connecting flap extending from each of said edges of all of said side panels; and a plurality of vertically extending metal strip connecting members respectively disposed between all of said connecting flaps and the adjacent side panels to secure said side panels together at adjacent edges thereof, said connecting members each including outwardly extending penetrating tongue portions lockingly embedded in the respective connecting flap and side panel to overlappingly secure said connecting member, connecting flap, and adjacent side panel together, to increase the strength of said corners of said carton against rupture and against deformation by stacking like cartons thereon.

2. A carton comprising: four rectangular side panels each having a pair of opposed vertically disposed edges; a connecting flap extending from each of said edges of each opposed pair of said side panels; and a plurality of vertically extending metal strip connecting members respectively disposed between said connecting flaps and the other opposed pair of said side panels to secure said side panels together at adjacent edges thereof, said connecting members each including outwardly extending penetrating tongue portions lockingly embedded in the respective connecting flap and side panel to overlappingly secure said connecting member, connecting flap, and adjacent side panel together, and to increase the strength of said corners of said carton against rupture and against deformation by stacking of like cartons thereon.

3. A carton formed in accordance with claim 2 wherein a handle flap extends from the upper edge of a pair of opposed side panels, and a cover is hingedly secured to another side panel and includes a pair of opposed side sealing flaps and a front sealing flap, said side sealing flaps respectively extending over portions of said handle flaps and said front flap being turned over and fixed to an adjacent side panel to close said carton whereby said handle flaps bear the weight of said carton when said handle flaps are utilized for lifting said carton.

4. A carton formed in accordance with claim 2 wherein a bottom panel is integrally connected with a pair of opposed side panels and has a pair of opposed connecting flaps secured to the other pair of opposed side panels by connecting members respectively interposed between said connecting flaps and said other pair of opposed side panels.

5. A carton formed in accordance with claim 4 wherein said bottom panel has at least one drainage opening formed by an inward extension of a flap defining slit therein to provide means for draining moisture from said carton.

6. A carton formed in accordance with claim 2 wherein a cover panel is hingedly secured to one of said side panels and includes a pair of opposed side sealing flaps and a front sealing flap, said front flap being turned over an adjacent side panel and having end sections which are respectively folded back for connection with a pair of opposed side panels.

7. A carton formed in accordance with claim 6 wherein each of said pair of opposed side sealing flaps of said cover panel has corner portions disposed respectively adjacent said one side panel and said adjacent side panel, each said corner portion being adapted to be received between an adjacent connecting flap and its associated side panel when said cover panel is moved to the closed position.



8. A carton comprising: a plurality of side panels each having a pair of opposed vertically disposed edges; a connecting flap extending from each of said edges of all of said side panels; a plurality of vertically extending metal strip connecting members respectively disposed between said connecting flaps and the adjacent side panels to secure said side panels together at adjacent edges thereof to provide a plurality of parallel side seams of said carton, said connecting members each including outwardly extending penetrating tongue portions lockingly embedded in the respective connecting flap and side panel to secure said connecting member, connecting flap, and adjacent side panel together; a bottom panel secured to said side panels; a cover panel having a hinged connection with one of said side panels and having a pair of opposed side edges and a front edge; a sealing flap extending from each of said side edges of said cover; and a front flap extending from said front edge of said cover, said front flap being turned over an adjacent side panel and including end sections which are respectively folded back for connection with a pair of said side panels, and to increase the strength of said corners of said carton against rupture and against deformation by stacking of like cartons thereon.


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