

[54] **CARTON HAVING NOVEL
INTERLOCKED CORNER
CONSTRUCTIONS**

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[51] Int. Cl. **B65d 5/22**

[58] Field of Search.....229/35, 34 R, 32, 31 FS, 30

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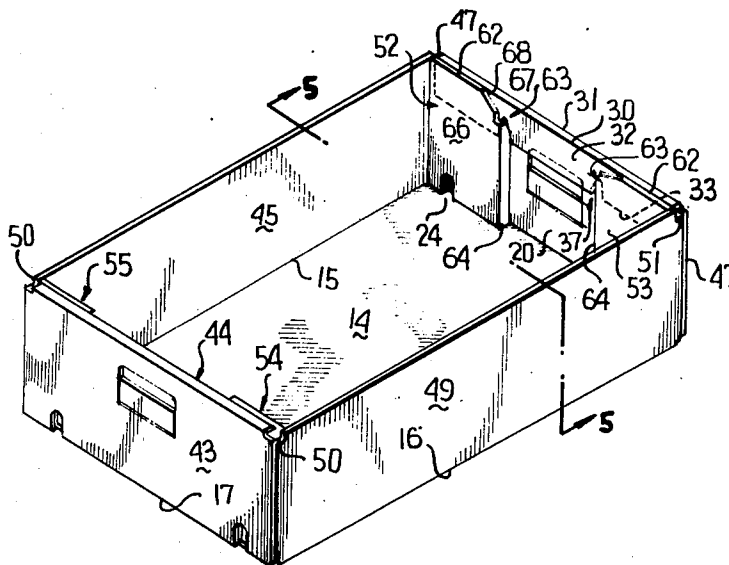
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[57]

ABSTRACT

This disclosure relates to a novel carton which at each of the corners thereof includes a conventional bottom panel and a pair of upright normal end and side panels, the improvement residing in the provision of an intermediate panel joined by a fold line to the side panel, the intermediate panel including first fold line means setting off first and second panel portions, the end panel including second fold line means beyond which is a terminal panel, and the second panel portion and the terminal panel being folded about the respective first and second fold line means in such a manner as to at least partially sandwich the terminal panel between the first and second panel portions thereby interlocking the panels together and reinforcing the same at each corner. More particularly the terminal and intermediate panels are provided with notches which facilitate the folding of the terminal and intermediate panels from planar form to the set-up condition of the carton.

14 Claims, 7 Drawing Figures



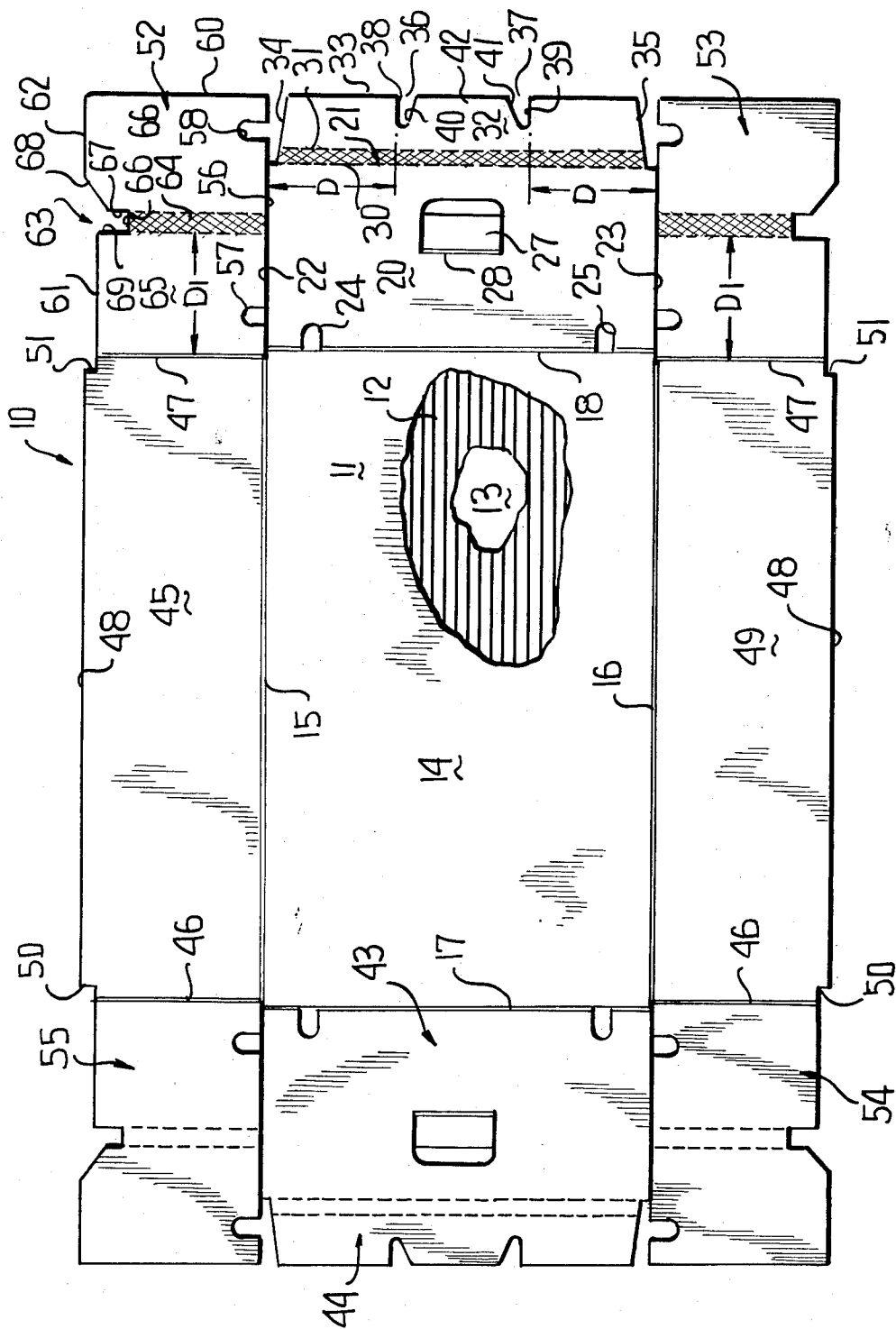


FIG. 1

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FIG. 4

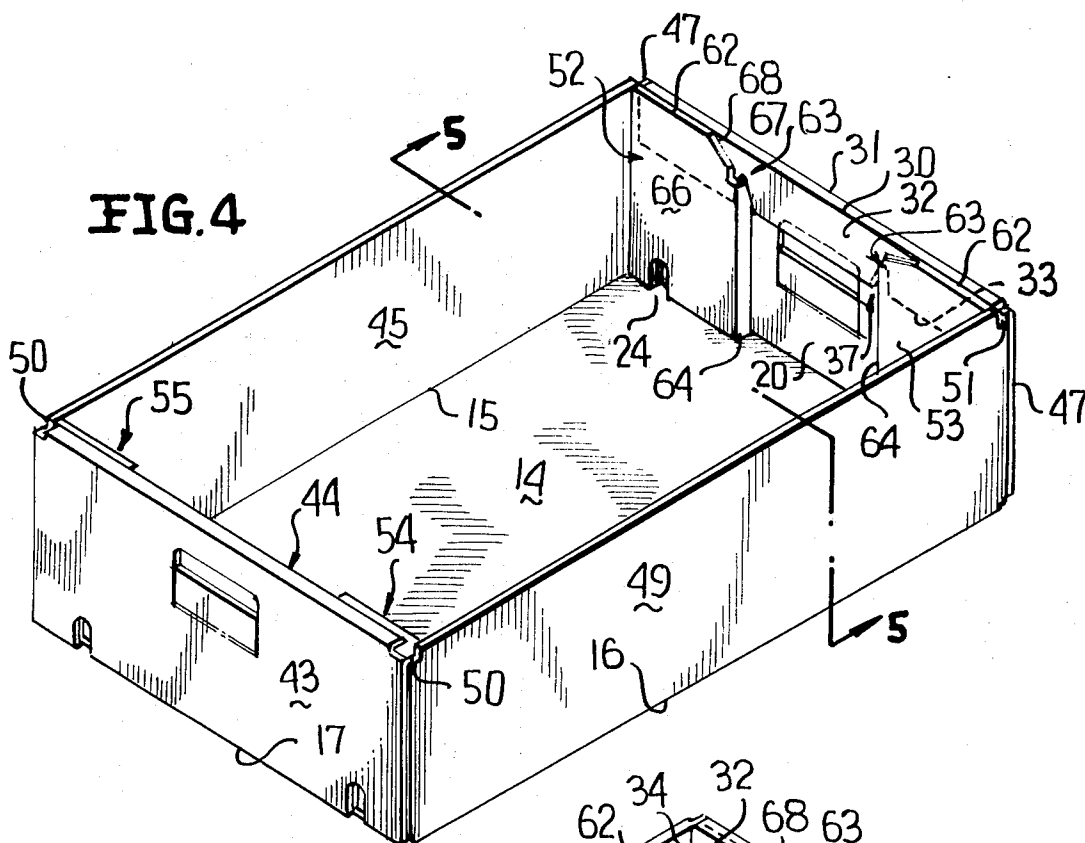


FIG. 2

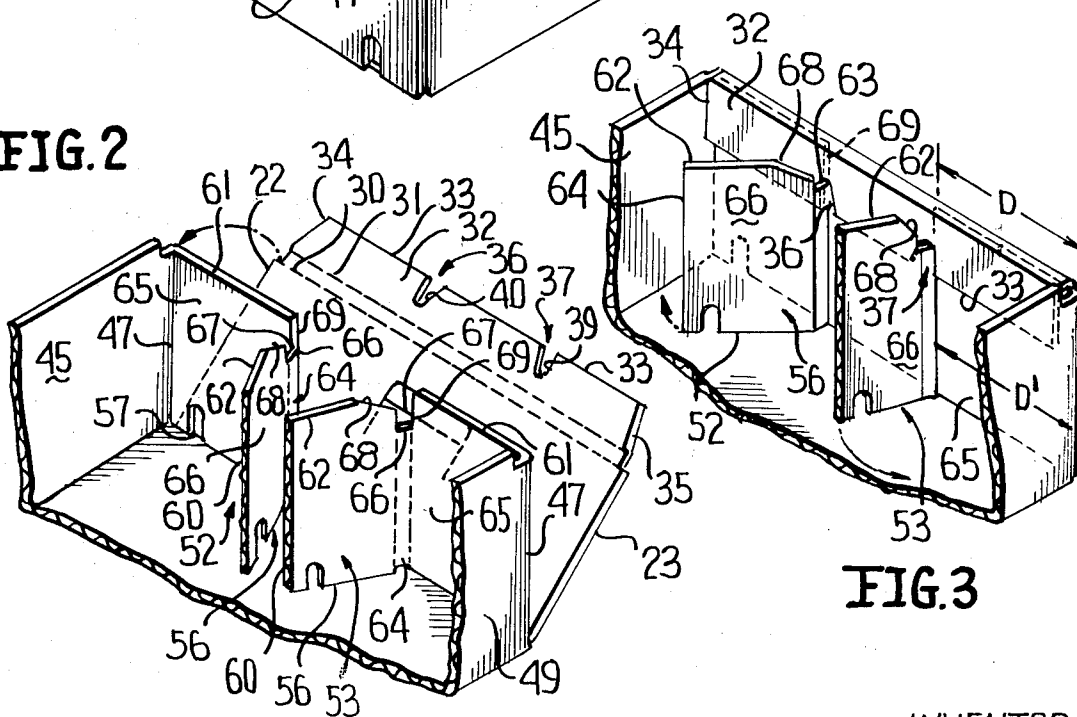


FIG. 3

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FIG. 5

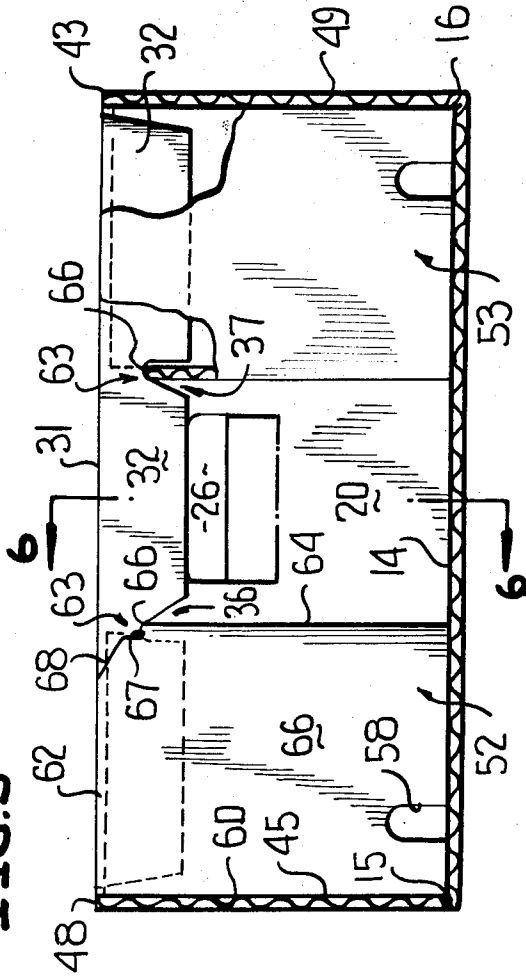


FIG. 6

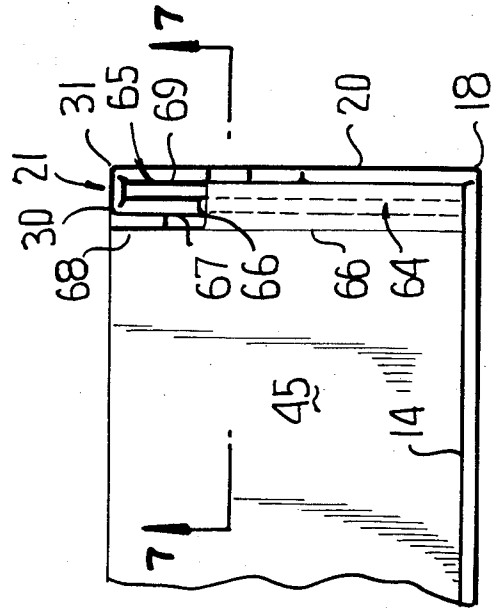
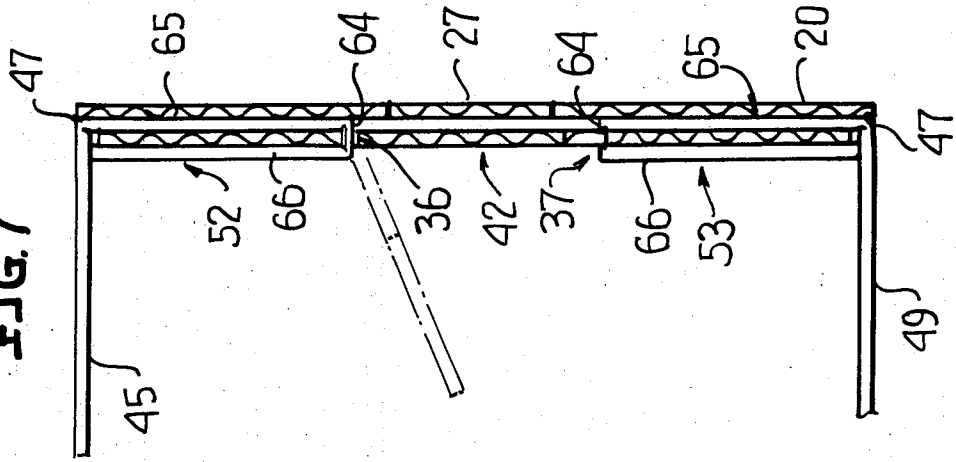


FIG. 7



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CARTON HAVING NOVEL INTERLOCKED CORNER CONSTRUCTIONS

A primary object of this invention is to provide a novel carton blank and a carton formed therefrom, and more particularly a corner structure which includes the usual bottom panel and upstanding normal end and side panels, the improvement residing in the provision of an intermediate panel at each corner joined by a fold line to an associated side panel, and the intermediate panel being folded to bring first and second portions thereof into generally spaced parallel relationship between which is sandwiched at least a portion of a terminal panel joined by fold line means to each of a pair of end panels thus forming a reinforced corner which is interlocked by the frictional purchase of vertical and horizontal edges of the second panel portion with respect to the side and bottom panels of the carton.

Another object of this invention is to provide a novel carton of the type heretofore described wherein in the set-up condition of the carton the terminal panel is received within an upwardly opening notch of the intermediate panel which includes an angular edge cooperative with a second notch of the terminal panel for facilitating the folding of the second panel portion from a position normal to the first panel portion to its position parallel thereto in the set-up condition of the carton.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claimed subject matter, and the several views illustrated in the accompanying drawings.

IN THE DRAWINGS

FIG. 1 is a top plan view of a novel blank constructed in accordance with this invention and illustrates a bottom panel, pairs of end and side panels, and an intermediate panel joined to each side panel which is cooperative with a terminal panel joined to each end panel for forming interlocked and reinforced corner structures of a carton formed from the blank.

FIG. 2 is a fragmentary perspective view of the blank of FIG. 1, and illustrates a pair of the intermediate panels being folded toward their final position along with one of the end panels and a terminal panel projecting therefrom.

FIG. 3 is a view of the blank similar to FIG. 2 but illustrating one of the intermediate panels received in a notch of the terminal panel prior to being folded toward its final position during which time the notches pass, intersect each other, and permit the final folding to take place as illustrated by the remaining intermediate panel.

FIG. 4 is a perspective view of a novel carton constructed in accordance with this invention, and illustrates the entire carton in its fully set-up condition with each of the four corners being in interlocked reinforced relationship.

FIG. 5 is a slightly enlarged sectional view taken generally along line 5—5 of FIG. 4, and illustrates in-board or second portions of the two intermediate panels with edges thereof in frictional purchase with the side and bottom panels.

FIG. 6 is a fragmentary sectional view taken generally along line 6—6 of FIG. 5, and illustrates the manner in which the terminal panel is sandwiched between the inner and outer portions of the intermediate panel.

FIG. 7 is a fragmentary sectional view taken generally along line 7—7 of FIG. 6, and illustrates the manner in which the intermediate panels are folded such that a portion thereof is sandwiched between the end and terminal panels.

A novel blank constructed in accordance with this invention for forming a carton is illustrated in FIG. 1 and is generally designated by the reference numeral 10. The blank 10 is constructed from suitable paper stock or other material capable of being folded, and in the illustrated embodiment of the invention the paper stock material is three-ply corrugated board consisting of an inner ply 11, an intermediate undulating ply 12, and an outer ply 13.

The carton blank 10 is of an over-all generally rectangular configuration and centrally thereof is a generally rectangular bottom panel 14 defined by a pair of parallel longitudinal fold lines 15, 16 and a pair of transverse fold lines 17, 18.

An end panel 20 is joined to the bottom 14 along the fold line 18 and is defined by the fold line 18, transverse fold line means generally designated by the reference numeral 21, and a pair of longitudinal generally parallel edges 22, 23 which are coincident with respect to fold lines 15, 16. Openings 24, 25 are formed in the end panel 20 adjacent the fold line 18. Inasmuch as the carton blank 10 is adapted to form a carton in which poultry or similar products are packaged using ice (or CO₂), the openings 24, 25 permit the escape of water as the ice melts in order that the structural rigidity of the blank 10 is not unduly reduced. A conventional hand-receiving opening 26 is provided in the end panel 20 and is partially closed by a flap 27, the latter being foldable along the fold line 28 to an out-of-the-way position if desired.

The fold line means 21 may be constructed in any one of a plurality of different ways, but is preferably merely achieved by crushing the material of the plies 11, 12, 13 with the crushed area being indicated by crossed lines. It has been found that crushing by an 8 point rule is effective to attain the desired end. If desired, crushing of the material may not be necessary and suitable weakening lines 30, 31 may be provided as, for example, a plurality of interrupted cut lines or fold lines. As a final alternative a combination of both may be provided to form the fold line means 21. However, irrespective of the manner in which the fold line means 21 is formed, the width thereof as measured between the lines 30, 31 should be equal or substantially greater than the thickness of the blank 10 since, as will be noted hereinafter, a single thickness of the blank will be sandwiched between the end panel 20 and a terminal panel 32 joined thereto along the fold line means 21.

The terminal panel 32 is defined by the fold line means 21, a transverse edge 33, and a pair of edges 34, 35 which converge toward the edge 33. Likewise, opening outwardly through the edge 33 are a pair of notches 36, 37 having respective normal edges 38, 39 and inclined edges 40, 41 between which is defined a

tab 42. The distance D between the edge 39 and the transverse edge 23 is significant, as will be described more fully hereinafter. Also, the edge 38 is similarly spaced an identical distance D from the transverse edge 22.

At the opposite side of the bottom panel 14 is another end panel 43 and a terminal panel 44 which are identical in construction to the respective panels 20, 32 and thus identical reference numerals have been added thereto and a further description thereof is considered to be unnecessary for a complete understanding of this invention.

A side panel 45 is joined to the bottom panel 14 along the fold line 15 and is defined by the fold line 15, a pair of parallel transverse fold lines 46, 47 and a longitudinal edge 48 which is notched at 50, 51.

Like reference numerals have been applied to an identical side panel 49 joined to the bottom panel 14 along a fold line 16.

At each of the corners of the bottom panel 14 is disposed an intermediate panel, there being a total of four in number and being identified by the reference numerals 52 through 55. Since the intermediate panels 52 through 55 are identical, the following description of the panel 52 will be sufficient for a complete understanding of the invention.

The intermediate panel 52 is joined to the side panel 45 along the fold line 47, and is defined by the fold line 47, a transverse edge 56 having slots 57, 58, a transverse edge 60 parallel to the edge 47, a pair of offset upper edges 61, 62, and an irregularly shaped notch 63 therebetween. Fold line means 64 identical to the fold line means 21 divide the intermediate panel 52 into first and second panel portions 65, 66, respectively. It is to be noted that the irregularly shaped notch 63 includes an edge 69 normal to the edges 61, 62, an edge 66 parallel to the edges 61, 62, another edge 67 parallel to edge 65, and an angular edge 68 defining an obtuse angle with the edge 62. The edge 68 forms an important part of this invention which will be described hereinafter. It is also to be noted that the distance D1 between the fold line 47 and the fold line means 64 is generally equal to the distance D heretofore described, the importance of which will be apparent from the following description of the manner of setting up the blank 10 to form a carton therefrom.

Reference is now made particularly to FIGS. 2 and 3 which illustrate the manner in which one end of the carton 10 is set up, it being understood that the opposite end is set up in identical manner. First, the side walls 45, 49 are folded about the respective fold lines 15, 16 to a position normal to the bottom panel 14. The intermediate panels 52, 53 are then folded about the respective fold lines 47, 47 toward each other to the position generally illustrated in FIG. 2 of the drawings. Thereafter the panel 20 is folded upwardly about the fold line 18, in the manner indicated by the unnumbered headed arrow in FIG. 2 toward a position at which the end panel 20 is generally parallel to the first panel portions 65, 65 of the intermediate panels 52, 53. The panels 65, 65 are then folded inwardly along the fold lines 64, 64, as shown in FIG. 2, and at this time the end panel 20 lies against the panels 65, 65 with the notches 36, 37 being in alignment with the notches 63 of the respective panels 52, 53. This alignment between

the notches 36, 37, 63 and 63 takes place because of the general identity in the dimensions D, D1 providing a straddling and interlocking between the notches, in the manner best illustrated in FIG. 3. This interlocking occurs, of course, upon the downward folding of the panel 32 along the fold line 21, as is readily apparent from FIG. 3.

Thereafter the second panel portions 66 of both of the intermediate panels 52, 53 are urged to the positions illustrated in FIG. 4 completely sandwiching portions of the terminal panel 32 between the portions 65, 66 of the intermediate panels 52, 53. This condition of the panels is maintained by the frictional purchase between the vertical edges 60 of the intermediate panels 52, 53 and the horizontal edges 56, 56 which engage the respective side and bottom panels 45, 52 and 14, in the manner clearly evident from FIG. 4 through 6 of the drawings. Furthermore, as is best shown in FIG. 4, the notches 36, 63 and 37, 63 are in registry and it is impossible to remove the terminal panel 32 from its sandwiched condition except by purposely unfolding the carton in an opposite manner to that heretofore described.

Of particular importance in regard to the latter-described construction is the rapidity of setting up the blank 10 to form the carton due to the construction of the notches 36, 37, 63, 63 and the dimensions D, D1. Furthermore, because of this construction it should be noted that the edge of each of the notches 36, 37 is supported upon the edges 66 of the intermediate panels inboard of the fold lines 46, 47. Thus, when stacking one carton upon another compression loads are not only supported at the three-ply reinforced corners, but also inboard thereof by virtue of the support of the terminal panels 32 by the material beneath the edges 66.

Though mentioned briefly heretofore, it is also pointed out that upon the formation of the corners the openings 57, 58 and 24 align as do the openings 57, 58 and 25 to permit water to flow outwardly of the carton.

While preferred forms and arrangements of parts have been shown in illustrating the invention, it is to be clearly understood that various changes in details and arrangement of parts may be made without departing from the spirit and scope of this disclosure.

I claim:

1. A carton blank comprising a generally rectangular sheet material member having a plurality of fold lines setting off opposite pairs of end and side panels and a bottom panel, means between at least one of said side and end panels for locking the same in an upright position normal to each other, said locking means being an intermediate panel joined by a first fold line to said one side panel, first fold line means generally parallel to said first fold line dividing said intermediate panel into first and second panel portions, said second panel portion being remote from said first fold line, said one end panel including second fold line means setting off therefrom a terminal panel, said second fold line means being disposed parallel to said first fold line means whereby a portion of said terminal panel can be sandwiched between said first and second panel portions when the latter are in the upright position thereof, said terminal panel includes a free edge parallel to said second fold line means, said intermediate panel includes a free edge normal to said first fold line means, a

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first notch opening outwardly of the free edge of said intermediate panel, a second notch opening outwardly of the free edge of said terminal panel, said first and second notches defining cooperative means for facilitating the folding of said second panel portion from a position normal to said first panel portion to a position parallel thereto and the folding of said terminal panel portion parallel and between said first and second panel portions in the upright position of said intermediate panel.

2. The carton blank as defined in claim 1 wherein each of said first and second fold line means is a pair of spaced parallel fold lines.

3. The carton blank as defined in claim 1 wherein said second notch is in alignment with said first fold line means.

4. The carton blank as defined in claim 1 wherein said intermediate panel and said one end panel have adjacent parallel edges disposed generally normal to said first and second fold line means, and the distance between said adjacent edge of said one end panel and the notch thereof is generally equal to distance between said first fold line and said first notch.

5. The carton blank as defined in claim 4 wherein said first notch and said first fold line means are in alignment.

6. The carton blank as defined in claim 5 wherein said first fold line means is a pair of generally parallel fold lines, and said pair of parallel fold lines terminate at said first notch.

7. A carton blank comprising a generally rectangular sheet material member having a plurality of fold lines setting off opposite pairs of end and side panels and a bottom panel, means between at least one of said side and end panels for locking the same in an upright position normal to each other, said locking means being an intermediate panel joined by a first fold line to said one side panel, first fold line means generally parallel to said first fold line dividing said intermediate panel into first and second panel portions, said second panel portion being remote from said first fold line, said one end panel including second fold line means setting off therefrom a terminal panel, said second fold line means being disposed parallel to said first fold line means whereby a portion of said terminal panel can be sandwiched between said first and second panel portions when the latter are in the upright position thereof, said terminal panel includes a free edge parallel to said second fold line means, said intermediate panel includes a free edge normal to said first fold line means, a first notch opening outwardly of the free edge of said intermediate panel, a second notch opening outwardly of the free edge of said terminal panel, said first and second notches defining cooperative means for

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facilitating the folding of said second panel portion from a position normal to said first panel portion to a position parallel thereto in the upright position of said intermediate panel, said intermediate panel and said one end panel having adjacent parallel edges disposed generally normal to said first and second fold lines, the distance between said adjacent edge of said one end panel and the notch thereof is generally equal to the distance between said first fold line and said first notch, and said first notch includes an edge disposed at an obtuse angle relative to said first fold line means.

8. The corner construction as defined in claim 7 wherein said first fold line means terminates at said first notch.

9. The carton blank as defined in claim 7 wherein said first fold line means is a pair of generally parallel fold lines, and said angled edge of said first notch merges with one of said pair of parallel fold lines by another edge coincident therewith.

10. In a corner construction of the type having a bottom panel and upright side and end panels normal thereto, the improvement comprising an intermediate panel joined to said side panel by a first fold line, first fold line means dividing said intermediate panel into first and second panel portions, said intermediate panel being folded along said first fold line and said first fold line means to bring said first and second panel portions into spaced parallel relationship, second fold line means joining a terminal panel to said end panel, said terminal panel being folded about said second fold line means into at least partially sandwiched relationship to said first and second panel portions, said intermediate and terminal panels include respective first and second notches opening respectively upwardly and downwardly relative to said bottom panel, and said terminal panel is secured within said first notch.

11. The corner construction as defined in claim 10 wherein said first notch is disposed within said second notch.

12. The corner construction as defined in claim 10 wherein said second panel portion includes horizontal and vertical edges in frictional purchase with said bottom and side panels, respectively.

13. The corner construction as defined in claim 10 wherein said intermediate panel includes an upper edge, and said first notch includes a downwardly inclined edge intersecting said upper edge and defining an obtuse angle therewith.

14. The corner construction as defined in claim 11 wherein said intermediate panel includes an upper edge, and said first notch includes a downwardly inclined edge intersecting said upper edge and defining an obtuse angle therewith.

* * * * *

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