

[54] CARTON CORNER CONSTRUCTION

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[51] Int. Cl. B65d 5/24; B65d 5/22

[58] Field of Search 229/34 A, 31 FS, 34 R

[56] References Cited

UNITED STATES PATENTS

1,218,353 3/1917 Bachmann 229/34 R
2,572,239 10/1951 Bergstein 229/34 R

FOREIGN PATENTS OR APPLICATIONS

936,705 9/1963 United Kingdom 229/34 R

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[57] ABSTRACT

This disclosure relates to improvements in a carton corner construction which includes upstanding adjacent side and end panels and a locking panel joined by a first fold line to the end panel with the latter including interlocking means cooperative with a corner reinforcing panel to maintain the side and end panels in erected condition, the improvement being the provision of fold line means in the corner reinforcing panel for defining a pair of reinforcing panel portions and a third reinforcing panel portion, the pair of reinforcing panel portions being folded into parallel contiguous relationship to each other adjacent, inboard and in reinforcing relationship to the end panel, and the third reinforcing panel portion being folded adjacent, inboard and in reinforcing relationship to the side panel.

4 Claims, 4 Drawing Figures

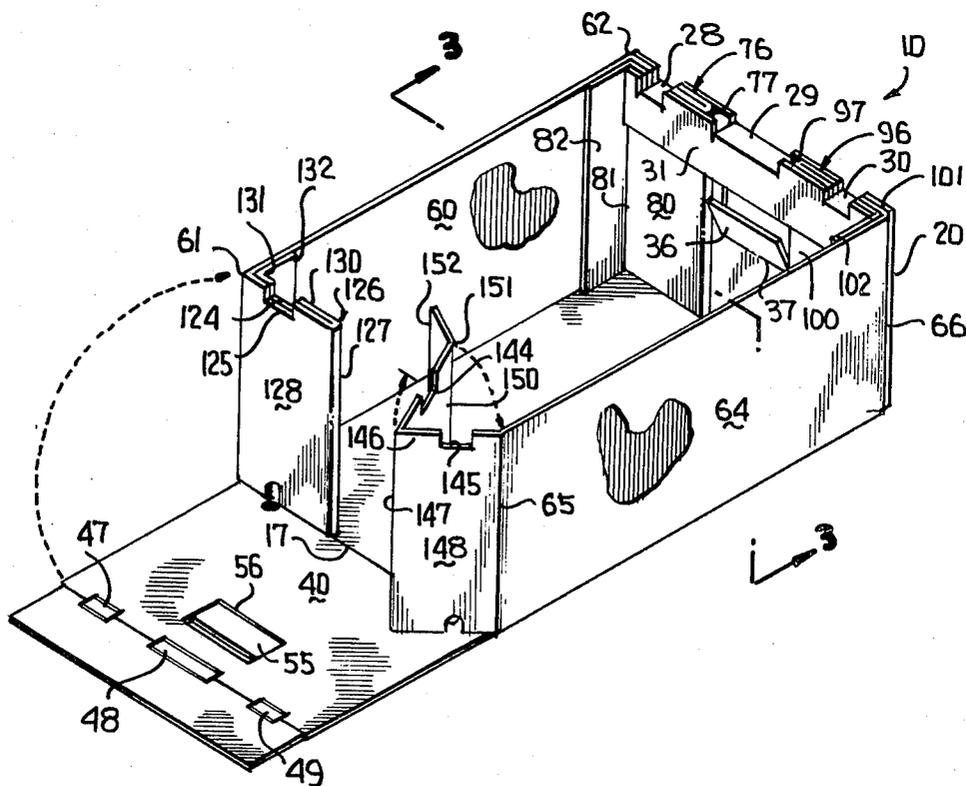


FIG. 2

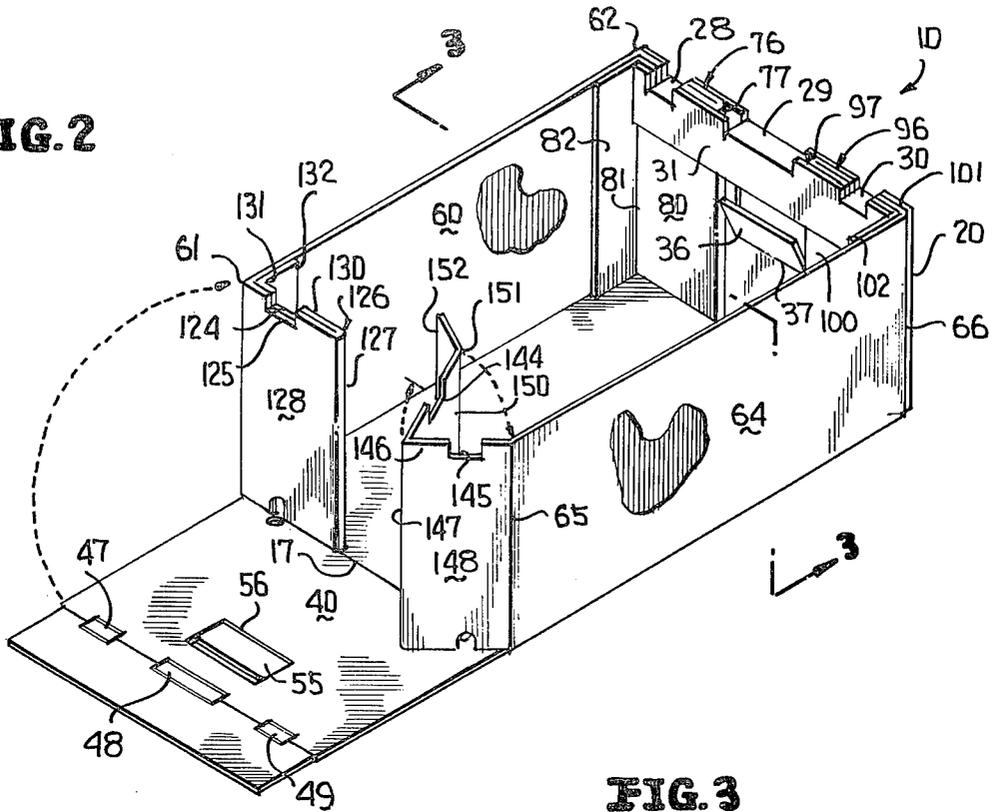


FIG. 3

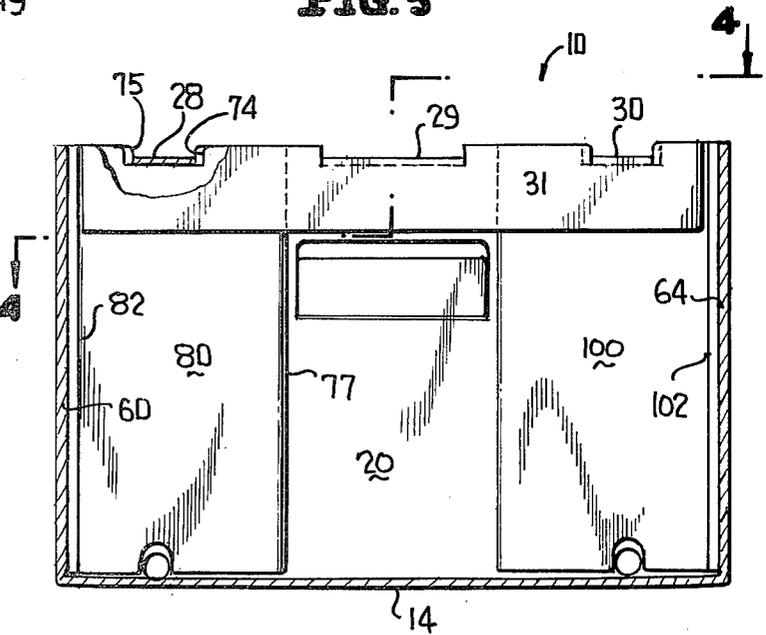
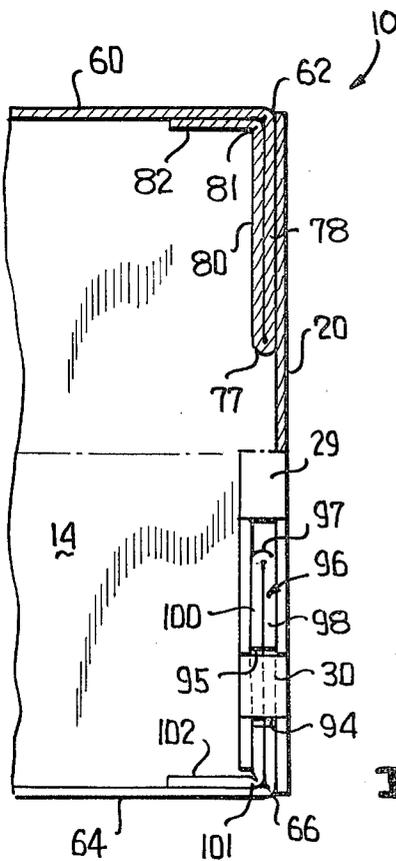


FIG. 4



CARTON CORNER CONSTRUCTION

Conventional cartons constructed from corrugated board may be reinforced, particularly at the corners thereof, to assure long life where conditions so dictate and/or sufficient strength for the particular use involved. U.S. Pat. No. 3,696,989 in the name of John W. Kochevar issued on Oct. 10, 1972 and assigned to the present assignee discloses one such typical reinforced corner construction in which an end panel is reinforced by the overfolding of a pair of reinforcing panels, although in the absence of side panel reinforcement. Likewise, U.S. Pat. No. 3,547,337 issued to Thaddeux H. Pisarczuk on Dec. 15, 1970 and assigned to the present assignee discloses another such reinforced construction in which two panels reinforce each end panel, once again in the absence of side panel reinforcement.

In accordance with the present invention the novel carton corner construction not only includes end panel reinforcement adjacent each corner, but by novel means each side panel adjacent each corner is reinforced and a novel interlocking structure maintains the carton in its desired erected condition.

The reinforced carton construction is achieved by hingedly connecting a reinforcing panel to each side wall and providing the reinforcing panel with two fold lines for folding each corner reinforcing panel into a pair of reinforcing panel portions and a third terminal reinforcing panel portion. The pair of reinforcing panel portions are folded about a first of the fold lines into parallel contiguous relationship inboard and in reinforcing relationship to the associated end panel, whereas the third or terminal reinforcing panel portion is folded about the remaining fold line into contiguous inboard and reinforcing relationship to the side panel. In this manner the carton can be not only rapidly and readily erected or set up, but thereafter novel interlocking means maintain the reinforcing panel portions properly disposed to assure that in use abuse, such as may occur during shipment, will not in any way affect the set up condition thereof.

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 carton blank construction in accordance with this invention, and illustrates a reinforcing panel between adjacent side and end panels with the reinforcing panel being provided with a pair of fold lines for folding the reinforcing panel into desired relationship relative to the associated end and side panels.

FIG. 2 is a perspective view of the partially erected carton, and illustrates the manner in which the reinforcing panel portions are folded and subsequently interlocked with the associated end panel.

FIG. 3 is a cross-sectional view taken generally along line 3—3 of FIG. 2, and illustrates the manner in which the side and end panels are reinforced by the associated reinforcing panels.

FIG. 4 is a sectional view taken generally along line 4—4 of FIG. 3, and illustrates with more specificity the reinforcement at one corner of the carton and the man-

ner in which the reinforcing panel portions are held interlocked in their folded or set-up condition.

A novel carton blank constructed in accordance with this invention is fully illustrated in FIG. 1 and is generally designated by the reference character 10. The blank 10 is preferably constructed of corrugated board and as such includes an inner ply 11, an outer ply 12, and a fluted intermediate ply 13. The blank 10 may, of course, be constructed from other materials as might be dictated by eventual intended use and desired life.

The carton blank 10 includes a generally rectangular bottom panel 14 set-off by a pair of longitudinal fold lines 15, 16 and transverse fold lines 17, 18.

A side panel 20 is joined to the bottom panel 14 along the fold line 18 and is set-off by the fold line 18, edges 21, 22, and an interrupted score line 23 having scores 24, 25, 26 and 27. Three bridging portions 28, 29 and 30 are joined by fold lines (unnumbered) to the end panel 20 as well as to an interlocking panel 31 which is of a generally narrow rectangular configuration and is set-off by the cut lines 24—27, the bridging portions 28—30, edges 32, 33 and a terminal edge 34. A hand-hold opening 35 is partially closed by a flap 36 which may be deflected along a fold line 37.

At the opposite side of the bottom panel 14 another end panel 40 is joined thereto by the fold line 17, and is defined by the fold line 17, an edge 41, an edge 42, cut lines 43—46 and three bridging portions 47, 48 and 49 joined to another interlocking panel 50 in turn defined by the cut lines 43—46, the bridging portions 47—49, edges 51, 52 and a terminal edge 53. Another hand-receiving opening 54 is partially closed by a flap 55 which is deflectable along a fold line 56.

A side panel 60 is joined to the bottom panel 14 along the fold line 15 and is set-off by the fold line 15, spaced parallel fold lines 61, 62 and a terminal edge 63. The fold lines 61, 62 are slightly inboard of the fold lines 17, 18, respectively.

Another side panel 64 is joined to the bottom panel 14 by the fold line 16, and is set-off by the fold line 16, a pair of spaced parallel fold lines 65, 66, and a terminal edge 67. The fold lines 65, 66 are inboard of the respective fold lines 17, 18 and in alignment with the fold lines 61, 62.

A reinforcing panel 70 is joined to the side panel 60 along the fold line 62 and is set-off by the fold line 62, an edge 71, an edge 72 and an edge 73 which is stepped inwardly forming two slots 74, 75 with a projecting portion 76 therebetween. The projecting portion 76 is divided by a fold line 77 which, in turn, sets off a reinforcing panel portion 78 with a portion of the edge 71, the fold line 62, the slot 75, and the portion of the projection 76 to the left of the fold line 77. Another reinforcing panel portion 80 of the reinforcing panel 70 is set-off by the fold line 77, a portion of the edge 71, a fold line 81, the slot 74, and the portion of the projection 76 to the right of the fold line 77. A third reinforcing panel portion 82 of the reinforcing panel 70 is set-off by the fold line 81, a portion of the edge 73, the edge 72, and an edge 83.

Another reinforcing panel 90 is joined to the side panel 64 by the fold line 66 and is defined by the fold line 66, an edge 91, an edge 92, and an edge 93 which includes two slots 94, 95 with a projection or projecting portion 96 therebetween which is divided by a fold line 97. A reinforcing panel portion 98 of the reinforcing panel 90 is set-off by the fold line 66, a portion of the

edge 91, the fold line 97, the edge 93 to the left of the fold line 97, the portion of the projection 96 to the left of the fold line 97 and the slot 94. Another reinforcing panel portion 100 is set-off by a fold line 101, a portion of the edge 91, the fold line 97, the portion of the projection 96 to the right of the fold line 97, the slot 95 and the portion of the edge 93.

A final reinforcing panel portion 102 is set-off by portions of the edges 91, 93 to the right of the fold line 101, the fold line 101 and the edge 92.

Another reinforcing panel 120 is joined by the fold line 61 to the side panel 60 and is set-off by the fold line 61, an edge 121, an edge 122, an edge 123 having two slots 124, 125 between which is a projection 126 divided in half by a fold line 127. A reinforcing panel portion 128 is set-off by the fold line 127, a portion of the edge 121, the fold line 61, a portion of the edge 123, the slot 125, and the portion of the projection 126 to the right of the fold line 127.

Another reinforcing panel portion 130 of the reinforcing panel 120 is set-off by the fold line 127, a portion of the edge 121, a fold line 131, a portion of the edge 123, the slot 124, and the portion of the projection 126 to the left of the fold line 127.

A final reinforcing panel portion 132 is set-off by portions of the edges 121, 123 to the left of the fold line 131, the fold line 131, and the edge 122.

Another reinforcing panel 140 is joined to the side panel 64 by the fold line 65 and is set-off by the fold line 65, an edge 141, an edge 142, an edge 143 which includes a pair of slots 144, 145 between which is a projection 146 divided in half by a fold line 147. A reinforcing panel portion 148 of the reinforcing panel 140 is set off by the fold line 65, a portion of the edge 141, the fold line 147, the portion of the projection 146 to the right of the fold line 147, the slot 145, and a portion of the edge 143.

Another reinforcing panel portion 150 is set-off by the fold line 147, a portion of the edge 141, a fold line 151, a portion of the edge 143 to the right of the fold line 151, the slot 144 and the portion of the projection 146 to the left of the fold line 147.

A final reinforcing panel portion 152 of the reinforcing panel 140 is set-off by the fold line 151, portions of the edges 143, 141 to the left of the fold line 151 and the edge 142.

The blank 10 of FIG. 1 is erected to form a carton (FIGS. 2-4) in the manner best illustrated in FIG. 4. Initially the two side walls 60, 64 are folded upwardly about their respective fold lines 15, 16 after which the reinforcing panels 120, 140 are folded about the associated fold lines 61, 127, 131 and 65, 147, 151. In so folding the panel 130 lies inboard and against the panel 128 with the panel 132 lying along the side panel 60. The mirror image portions of the projection 127 overlies one another and the slots 124, 125 are in alignment. Likewise similar folding brings the panels 147, 150 against one another with the panel 150 inboard of the side panel 64. Similarly the mirror images of the portions of the projection 146 become aligned as do the slots 144, 145. Thereafter the end panel 40 is folded upwardly about the fold line 17 after which the locking panel 50 is folded downwardly across the bridging portions 47-49. Upon being so folded the bridging portion 47 is received in the slots 124, 125 whereas the bridging

ing portion 49 is received in the slots 144, 145. The interlocked relationship thereby maintains the reinforcing panels 120, 140 in their erected or set-up condition.

The reinforcing panels 70, 90 are set-up in the same manner and relationship to the end panel 20 and interlocked thereto by the receipt of the bridging portions 28, 30 in the respective slots 74, 75 and 94, 95.

In the set-up condition of the carton 10 each side panel 60, 64 is reinforced at each corner by the reinforcing panel portions 82, 132 and 102, 152, respectively. Thus, a double-ply reinforcement is achieved at these corners whereas a three-ply reinforcement is achieved at each end panel due to the overfolding of the panel portions 78, 80; 98, 100; 128, 130; and 148, 150. Moreover, considering the upper portion of each end panel a four-ply reinforcement is achieved due to the associated inwardly and downwardly directed locking panels 31, 50.

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

What is claimed is:

1. A carton blank comprising a bottom panel defined by spaced first and second parallel fold lines and spaced third and fourth parallel fold lines collectively defining a polygonal area, an end panel connected to said bottom panel at each of said third and fourth fold lines, a side panel connected to said bottom panel at each of said first and second fold lines, a corner reinforcing panel between each adjacent side and end panel, each said corner reinforcing panel having fold line means for folding said corner reinforcing panel portions in parallel contiguous relationship and a third reinforcing panel portion transverse thereto, said fold line means are a pair of spaced parallel fold lines, said pair of panel portions are of substantially equal areas, a locking panel having openings therein joined by a fifth fold line to each end panel, means for directly interlocking securing each locking panel through said openings to a pair of said reinforcing panel portions adjacent each end panel, said interlocking means including projecting edge portions of both reinforcing panel portions foldable upon each other into substantially co-extensive shape, size and area, and a sixth fold line generally linearly aligned with said fifth fold line at each end panel for securing each third reinforcing panel portion to the adjacent pair of reinforcing panel portions associated therewith.

2. The carton blank as defined in claim 1 wherein said securing means include slots in said pair of reinforcing panel portions opening away from the most adjacent of said first and second fold lines and projections therebetween likewise directed.

3. The carton blank as defined in claim 1 wherein said third reinforcing panel portions and said locking panel of are substantially the same width as measured in a direction parallel to said first and second fold lines.

4. The carton blank as defined in claim 2 wherein said third reinforcing panel portions and said locking panel of are substantially the same with as measured in a direction parallel to said first and second fold lines.

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