June 17, 1969 P. W. LEWIS ET AL 3,450,347

CORNER CONSTRUCTION FOR HOLLOW WALL TRAY

Filed Oct. 6, 1967

Fig. 2

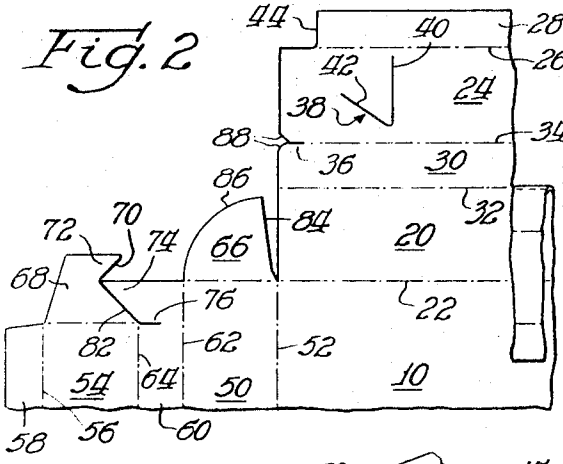


Fig. 3

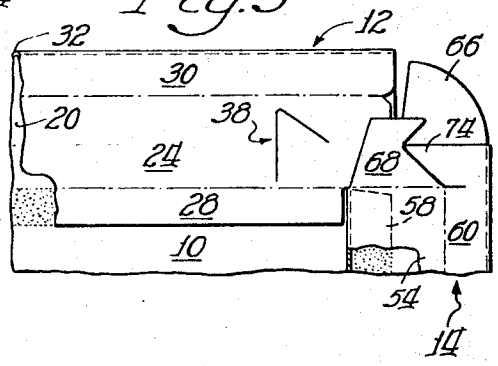


Fig. 1

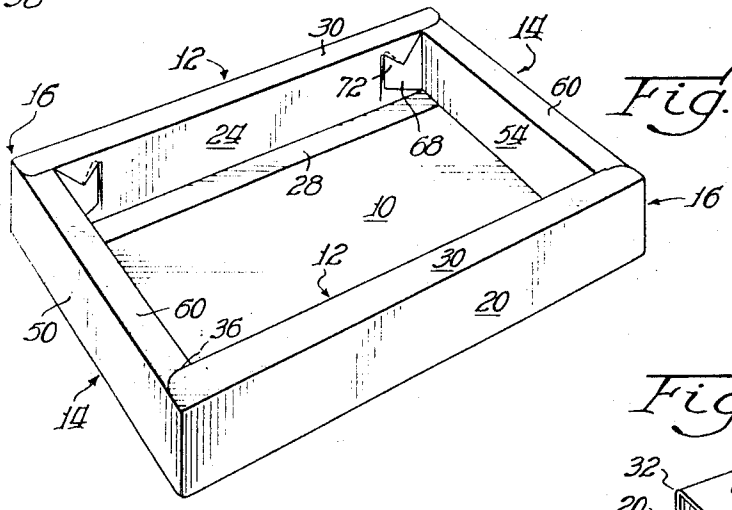


Fig. 4

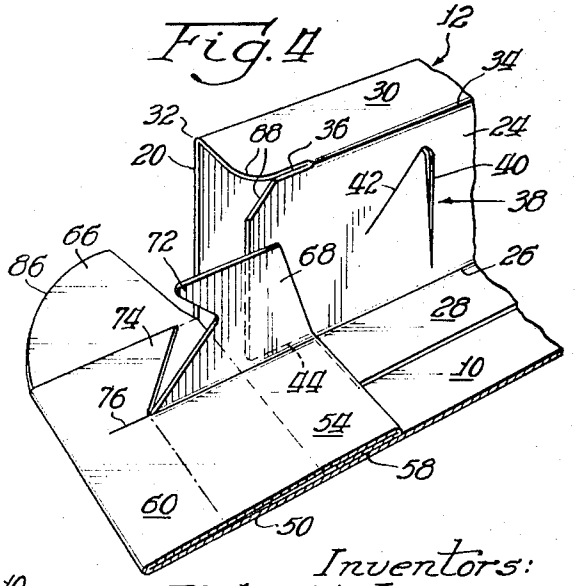
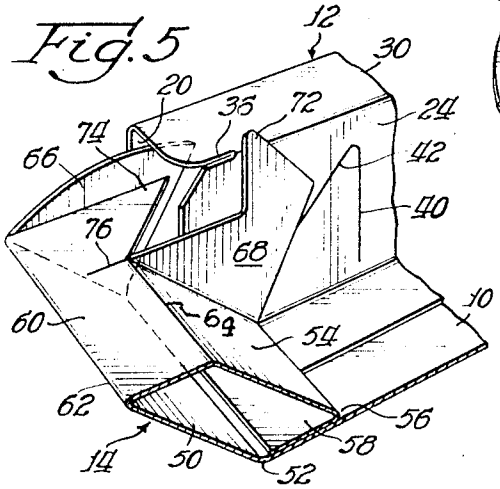


Fig. 5



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United States Patent Office 3,450,347 Patented June 17, 1969

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CORNER CONSTRUCTION FOR HOLLOW WALL TRAY

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Filed Oct. 6, 1967, Ser. No. 673,361
Int. Cl. B65d 5/22
U.S. Cl. 229—34 5 Claims

ABSTRACT OF THE DISCLOSURE

In a hollow wall tray having a bottom wall and opposed pairs of hollow side walls upstanding therefrom, a corner construction including a pair of flaps hinged to end edges of outer and inner panels of one side wall and disposed to lie against outer and inner panels, respectively, of the outer side wall with the inner flap of one wall having a tongue and slit connection with the inner panel of the other wall, and a projection on a top panel of one side wall being received within the other side wall under the top panel thereof.

It is an object of this invention to provide, in a hollow wall paperboard tray, an improved corner construction that affords a simple yet strong interlocking connection.

Another object of this invention is the provision in a carton of the type described of a corner construction which is adapted to be automatically set up on high speed machinery.

A more specific object of the invention is the provision of a corner construction for a pair of hollow walls, with inner, outer, and top panels, which includes projections from the three panels of one wall disposed to lie against the related three panels of the outer wall.

These and other objects of the invention will be apparent from an examination of the following description and drawings, wherein:

FIGURE 1 is a perspective view of a hollow wall tray carton embodying features of the invention;

FIGURE 2 is a plan view of a corner portion of the blank from which the tray of FIGURE 1 may be formed;

FIGURE 3 is a plan view similar to FIGURE 2, but showing the blank in a glued condition; and

FIGURES 4 and 5 are fragmentary perspective views showing a corner of the tray of FIGURE 1 in various stages of assembly.

It will be understood that, for purposes of clarity, certain elements have been intentionally omitted from certain views where they are believed to be illustrated to better advantage in other views.

Referring now to the drawing for a better understanding of the invention, and particularly to FIGURE 1, it will be seen that the tray carton includes a flat, preferable rectangular bottom wall **10** having opposed pairs of first and second side and end walls **12** and **14**, respectively, upstanding therefrom with adjacent end portions interlocked to form a corner construction indicated generally at **16**.

First or side wall **12**, as best seen in FIGURES 2 and 4, includes an outer panel **20** hinged to and upstanding from the related outer side edge of bottom wall **10** along a hinge line **22**; inner panel **24** spaced inwardly from the outer panel in parallel relation therewith and hinged at its lower edge along a hinge line **26** to a glue flap **28** which is adhesively secured to the upper surface of bottom wall **10**; and a top panel **30** which is hinged along its side edges along hinge lines **32** and **34** to the upper edges of outer and inner panels **20** and **24**, respectively.

As best seen in FIGURE 4, first wall **12** is provided with a relatively short longitudinal slit **36** which extends inwardly from the free edge of first wall **12** along hinge line **34**.

Inner panel **24** of first wall **12** is provided with an inverted, generally V-shaped slit **38** which has a vertical portion **40**, extending upwardly from a point adjacent bottom wall **10** to a point adjacent the upper edge of panel **24**, and an inclined section **42**, extending downwardly and outwardly from the upper end of section **40** at an angle of approximately 45° toward the adjacent corner of bottom wall **10**. Section **42** preferably extends only about halfway from the upper end of vertical section **40** to the corner of the bottom wall.

As best seen in FIGURE 2, glue flap **28** is recessed at its end as at **44**, to provide space for the adjacent end of glue flap **58** of second wall **14**.

As best seen in FIGURE 5, the second or end wall **14** includes an outer panel **50** hinged to an end edge of bottom wall **10** along a hinge line **52**; an inner panel **54** spaced inwardly from the outer panel and in parallel relation therewith which is hinged at its lower edge along a hinge line **56** to a glue flap **58** which is adhesively secured to the upper face of bottom wall **10**; and a top panel **60** which is hingedly connected along its side edges at hinge lines **62** and **64** to upper edges of outer and inner panels **50** and **54**, respectively.

Second wall **14** has a pair of outwardly extending flaps **66** and **68** hingedly attached to the end edges of outer and inner panels **50** and **54**, respectively, which flaps are disposed to extend normal to the second wall, when the carton is in erected condition, and to lie against the inner faces of first wall outer and inner panels **20** and **24**, respectively.

As best seen in FGURE 2, second wall inner flap **68** is cut out at **70** to provide a lock tab or tongue **72** adapted to be received within the V-shaped slit **38** of first wall inner panel **24**.

The stock cut from the second wall inner panel **54** projects outwardly from the second wall top panel **60** and is received within the space between the outer and inner panels of the first wall and immediately below the top panel of the first wall. Second wall top panel **60**, as best seen in FIGURES 4 and 5, is provided with a transverse slit **76** immediately inwardly adjacent projection **74** which slit is adapted for interlocking connection with related slit **36** in the top of first wall **12**.

As best seen in FIGURE 2, flap **68** is tapered as at **70**, projection **74** is tapered as at **82**, flap **66** is tapered at **84**, flap **66** is rounded at **86**, and first wall inner and top panels **24** and **30** are tapered as at **88**. These tapers and curves are all designed to facilitate the mating of interlocking portions of the adjacent end portion of the first and second walls as the carton is assembled.

The carton as previously described is designed not only to provide a strong and rigid interlocking connection for the corner construction but also to facilitate assembly of the carton on high speed carton erecting equipment.

To describe the assembly of the carton, it will be understood that the carton is shipped from the manufacturer to the packer as a flat glued blank, as shown in FIGURE 3. Only two operations are required to erect and lock the carton in erected condition. First, the entire first wall and the outer and inner flaps **66** and **68** of the second wall are folded upwardly at right angles to the carton bottom wall and second wall. Thereafter, second wall **14** is folded upwardly at right angles to bottom wall **10** and

first wall, and as second wall **14** moves to vertical position four actions take place simultaneously:

(A) Second wall outer panel flap **66** moves into the first wall to lie against the inner face of first wall outer panel **20**;

(B) Second wall inner panel flap **68** moves along the inner face of first wall inner panel **24** until locking tab **72** of the second wall engage locking slit **38** of the first wall;

(C) Second wall top panel projection **74** moves into the first wall between the inner and outer panels of the first wall and immediately below the top panel of the first wall;

(D) Slit **36** of the first wall engages slit **76** of the second wall.

Thus, it will be seen that by two simple motions the carton can be rapidly assembled and locked in erected condition to form a firm and rigid corner construction.

We claim:

1. In a hollow wall tray formed from a unitary blank of foldable paperboard, an interlocking corner construction, comprising:

(a) a bottom wall;

(b) a pair of first and second side walls disposed normal to each other and having adjacent interlocking end portions;

(c) each of said side walls including:

(i) an outer panel hinged to an outer side edge of the bottom wall and upstanding therefrom;

(ii) an inner panel attached to the bottom wall and upstanding therefrom in spaced parallel relation with said outer panel; and

(iii) a top panel hingedly connected along its side edges to corresponding upper edges of respective inner and outer panels;

(d) all of the panels of said first side wall being of substantially the same length and being coextensive with said bottom wall;

(e) said first side wall including:

(i) a longitudinal slit extending inwardly from the free edge of said first side wall along the hinge line between said top and inner panels;

(ii) an inverted V-shaped slit in said inner panel, having a vertical portion spaced inwardly from the free edge of said inner panel and extending upwardly from a point adjacent the bottom wall to a point adjacent the top panel, and an inclined section extending downwardly and outwardly from the top of said vertical section toward an adjacent corner of said bottom wall;

(f) said second side wall outer and top panels being of substantially the same length and being coextensive with said bottom wall, and said inner panel being shorter than the outer and top panels and extending only to the first side wall inner panel;

(g) said second side wall including:

(i) a pair of outer and inner flaps hingedly attached to end edges of and extending normal to respective outer and inner panels and disposed to lie against the inner faces, respectively, of the first side wall outer and inner panels;

(h) said second side wall inner flap having a notch cut in the upper edge thereof to form therein a locking tab receivable within the slit of said first side wall inner panel;

(i) said second side wall top panel having a portion cut from stock of said inner panel flap and projecting from the side of said top panel adjacent the end thereof for receipt within said first side wall immediately below said first side wall top panel;

(j) said second side wall top panel having a transverse slit therein adjacent said projecting portion thereof for interlocking engagement with the longitudinal slit of said first side wall.

2. In a hollow wall tray formed from a unitary blank of foldable paperboard, an interlocking corner construction, comprising:

(a) a bottom wall;

(b) a pair of first and second side walls disposed normal to each other and having adjacent interlocking end portions;

(c) each of said side walls including:

(i) an outer panel hinged to an outer side edge of the bottom wall and upstanding therefrom;

(ii) an inner panel attached to the bottom wall and upstanding therefrom in spaced parallel relation with said outer panel; and

(iii) a top panel hingedly connected along its side edges to corresponding upper edges of respective inner and outer panels;

(d) all of the panels of said first side wall being of substantially the same length and being coextensive with said bottom wall;

(e) said first side wall including:

(i) a longitudinal slit extending inwardly from the free edge of said first side wall along the hinge line between said top and inner panels;

(ii) a slit in said inner panel;

(f) said second side wall outer and top panels being of substantially the same length and being coextensive with said bottom wall, and said inner panel being shorter than the outer and top panels and extending only to the first side wall inner panel;

(g) said second side wall including:

(i) a pair of outer and inner flaps hingedly attached to end edges of and extending normal to respective outer and inner panels and disposed to lie against the inner faces, respectively, of the first side wall outer and inner panels;

(h) said second side wall inner flap having a locking tab receivable within the slit of said first side wall inner panel;

(i) said second side wall top panel having a portion cut from stock of said inner panel flap and projecting from the side of said top panel adjacent the end thereof for receipt within said first side wall immediately below said first side wall top panel;

(j) said second wall top panel having a transverse slit therein adjacent said projecting portion thereof for interlocking engagement with the longitudinal slit of said first side wall.

3. In a hollow wall tray formed from a unitary blank of foldable paperboard, an interlocking corner construction, comprising:

(a) a bottom wall;

(b) a pair of first and second side walls disposed normal to each other and having adjacent interlocking end portions;

(c) each of said side walls including:

(i) an outer panel hinged to an outer side edge of the bottom wall and upstanding therefrom;

(ii) an inner panel attached to the bottom wall and upstanding therefrom in spaced parallel relation with said outer panel; and

(iii) a top panel hingedly connected along its side edges to corresponding upper edges of respective inner and outer panels;

(d) all of the panels of said first side wall being of substantially the same length and being coextensive with said bottom wall;

(e) said first side wall including:

(i) a longitudinal slit extending inwardly from the free edge of said first side wall along the hinge line between said top and inner panels;

(ii) a slit in said inner panel;

(f) said second side wall outer and top panels being of substantially the same length and being coextensive with said bottom wall, and said inner panel being shorter than the outer and top panels and extending only to the first side wall inner panel;

(g) said second side wall including:

(i) a pair of outer and inner flaps hingedly attached to end edges of and extending normal to respective outer and inner panels and disposed to lie against the first side wall outer and inner panels, respectively;

(h) said second side wall inner flap having a locking tab receivable within the slit of said first side wall inner panel;

(i) said second side wall top panel having a portion projecting from the side of said top panel adjacent the end thereof for receipt within said first side wall immediately below said first side wall top panel;

(j) said second side wall top panel having a transverse slit therein adjacent said projecting portion thereof for interlocking engagement with the longitudinal slit of said first side wall.

4. In a hollow wall tray formed from a unitary blank of foldable paperboard, an interlocking corner construction, comprising:

(a) a bottom wall;

(b) a pair of first and second side walls disposed normal to each other and having adjacent interlocking end portions;

(c) each of said side walls including:

(i) an outer panel hinged to an outer side edge of the bottom wall and upstanding therefrom;

(ii) an inner panel attached to the bottom wall and upstanding therefrom in spaced parallel relation with said outer panel; and

(iii) a top panel hingedly connected along its side edges to corresponding upper edges of respective inner and outer panels;

(d) said first side wall including:

(i) a longitudinal slit extending inwardly from the free edge of said first side wall along the hinge line between said top and inner panels;

(ii) a slit in said inner panel;

(e) said second side wall including:

(i) a pair of outer and inner flaps hingedly attached to end edges of and extending normal to respective outer and inner panels and disposed to lie against the first side wall outer and inner panels, respectively;

(f) said second side wall inner flap having a locking tab receivable within the slit of said first side wall inner panel;

(g) said second side wall top panel having a portion projecting from the side of said top panel adjacent the end thereof for receipt within said first side wall immediately below said first side wall top panel;

(h) said second side wall top panel having a transverse slit therein adjacent said projecting portion thereof for interlocking engagement with the longitudinal slit of said first side wall.

5. In a hollow wall tray formed from a unitary blank of foldable paperboard, an interlocking corner construction, comprising:

(a) a bottom wall;

(b) a pair of first and second side walls disposed normal to each other and having adjacent interlocking end portions;

(c) each of said side walls including:

(i) an outer panel hinged to an outer side edge of the bottom wall and upstanding therefrom;

(ii) an inner panel attached to the bottom wall and upstanding therefrom in spaced parallel relation with said outer panel; and

(iii) a top panel hingedly connected along its side edges to corresponding upper edges of respective inner and outer panels;

(d) said first side wall having a slit in said inner panel;

(e) said second side wall including:

(i) a pair of outer and inner flaps hingedly attached to end edges of and extending normal to respective outer and inner panels and disposed to lie against the first side wall outer and inner panels, respectively;

(f) said second side wall inner flap having a locking tab receivable within the slit of said first side wall inner panel;

(g) said second side wall top panel having a portion projecting from the side of said top panel adjacent the end thereof for receipt within said first side wall immediately below said first side wall top panel.

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U.S. Cl. X.R.

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