

Aug. 27, 1957

M. I. WILLIAMSON  
DISPLAY BOXES

2,804,200

Filed Feb. 21, 1955

4 Sheets-Sheet 1

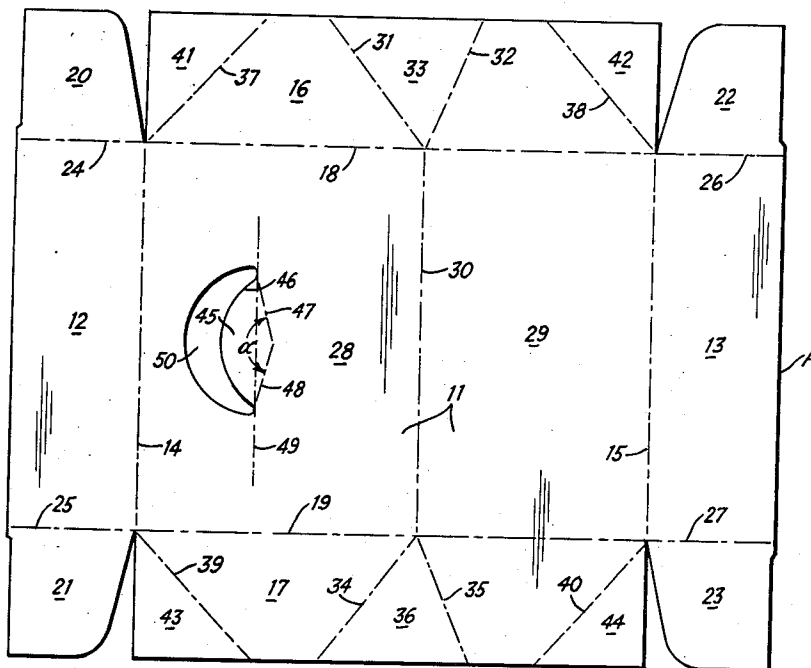


Fig. 1

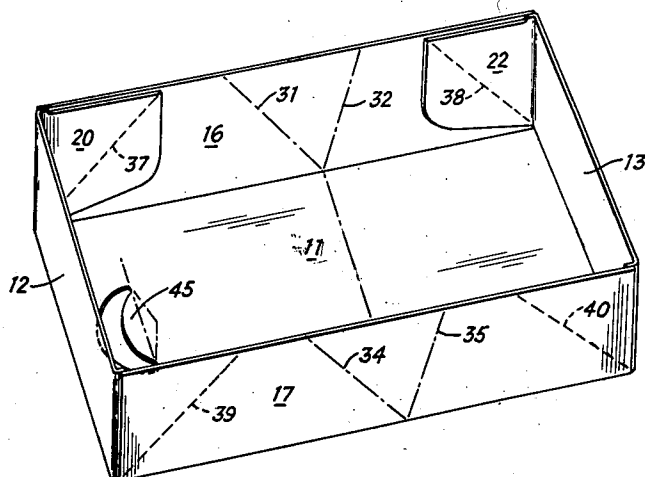


Fig. 2

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4 Sheets-Sheet 2

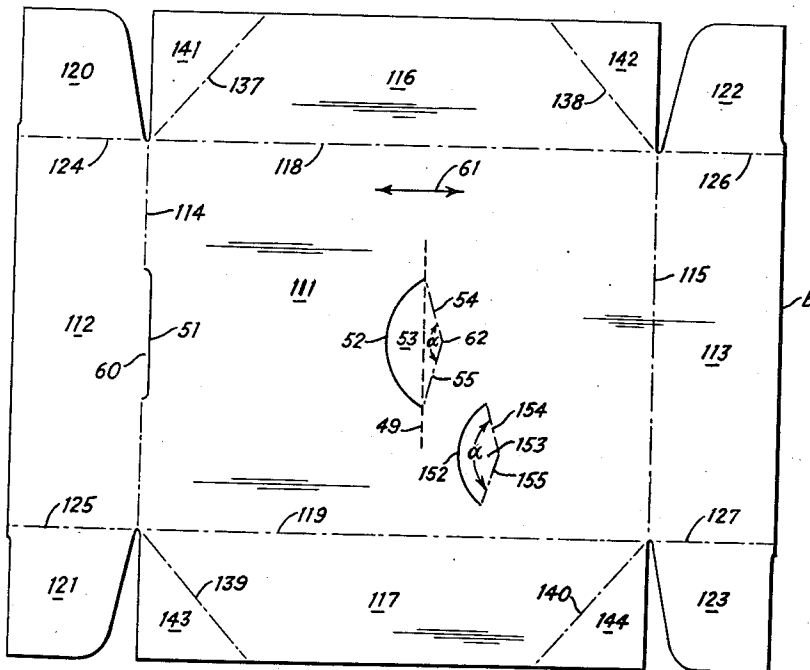
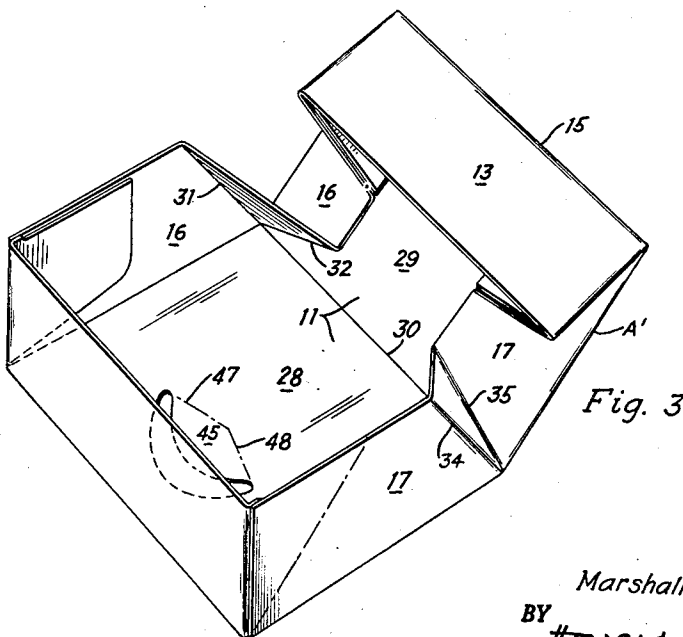


*Fig. 4*



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4 Sheets-Sheet 3

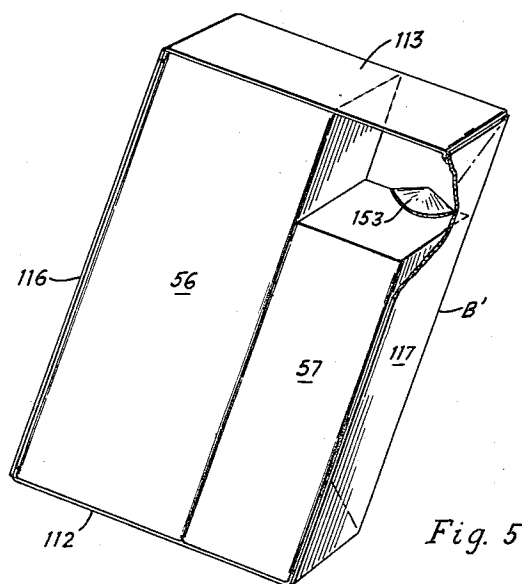


Fig. 5

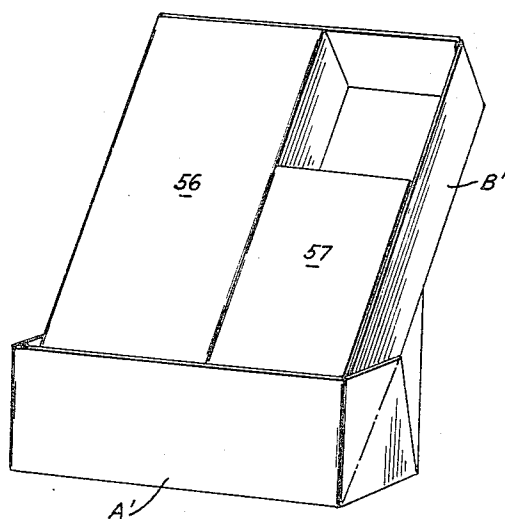


Fig. 6

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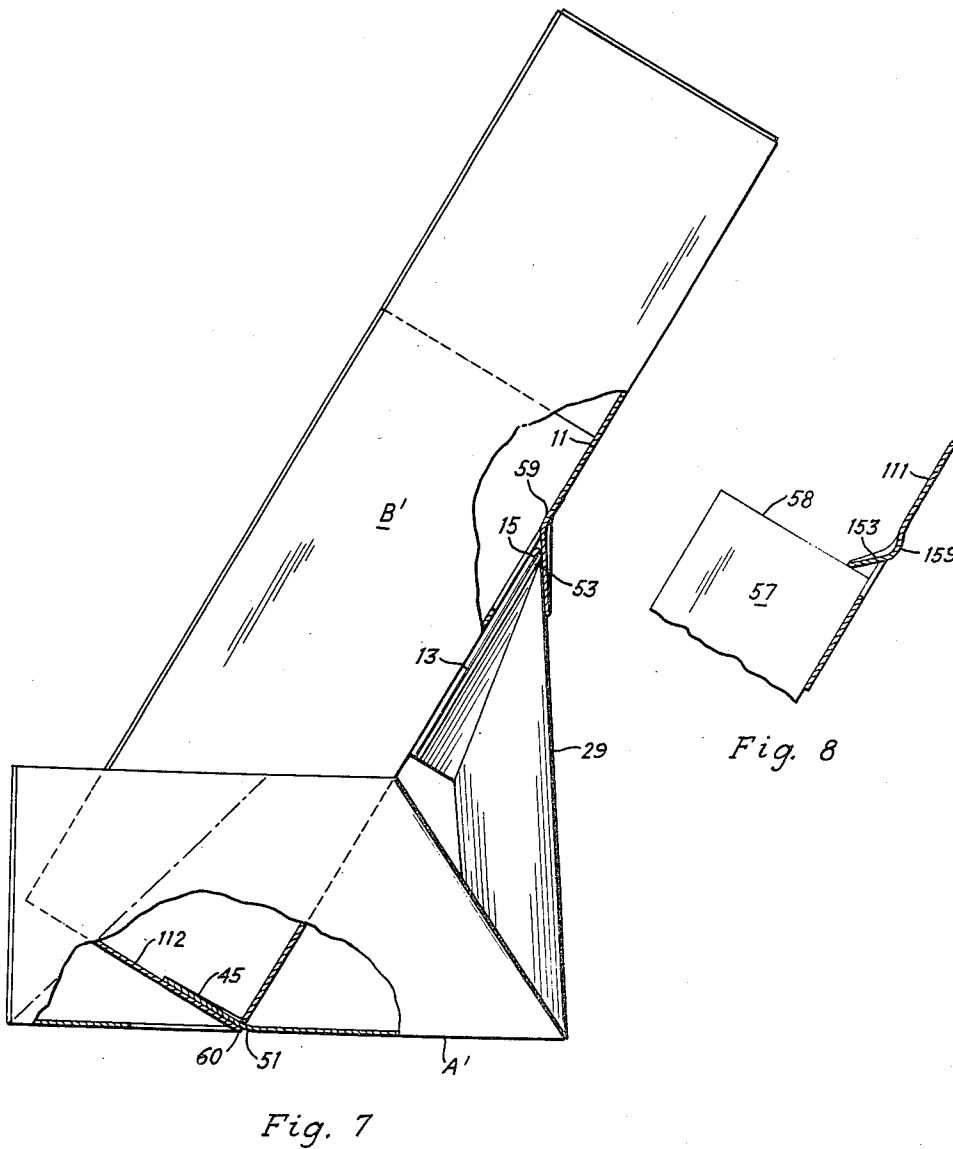
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4 Sheets-Sheet 4



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2,804,200

## DISPLAY BOXES

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Application February 21, 1955, Serial No. 489,519

7 Claims. (Cl. 206—45.22)

This invention relates to improvements in display devices of the folding box type. Such devices may be constructed to hold one or several articles of merchandise inside an enclosing box or on a panel adapted to be tilted for exhibiting the merchandise in an attractive manner.

In one aspect, the invention constitutes an improvement over the convertible folding box structure disclosed in my prior Patent 2,585,361, issued February 12, 1952, and comprising a box body and a telescoping box cover, the box cover being constructed to permit quick conversion into a display easel for supporting the box body with its contents.

The present invention provides improvements which permit heavy articles of merchandise to be securely supported by the easel and also permits the box body and easel combination to be picked up and set down again without danger of disengagement of the box body from the easel and subsequent accidental collapse of the display.

In a further aspect the invention provides structural details and improvements which permit, for example, small boxes or articles of merchandise to be securely locked or clamped inside a larger box by a tab structure of extraordinary strength, rigidity, stiffness, and resistance to flexing. The invention is particularly valuable in its application to combination packages in which articles of unequal size are packaged in a relatively large box and in such a way that they will not rattle or become displaced. It is also valuable and advantageous for locking relatively heavy articles of merchandise inside a larger box in such a way that they will not shift and crush, or damage, other more delicate articles of merchandise in the same box.

These and various other objects, features and advantages of the invention will appear more fully from the detailed description which follows, accompanied by drawings showing, for the purpose of illustration, a preferred embodiment and application of the invention. The invention also resides in certain new and original features of construction, combination and sub-combination of elements hereinafter set forth and claimed.

Although the characteristic features of this invention which are believed to be novel will be particularly pointed out in the claims appended hereto, the invention itself, its objects and advantages, and the manner in which it may be carried out may be better understood by referring to the following description taken in connection with the accompany drawings which form a part of the description and in which:

Fig. 1 is a plan view of a blank for a telescoping box cover, convertible into an easel;

Fig. 2 is perspective view of the box cover in upside down position;

Fig. 3 is a perspective view of the box cover of Fig. 2 in its process of being folded into easel form;

Fig. 4 is a plan view of a blank of a representative form of box body, the blank comprising a locking tab for the easel and a further locking tab for locking merchandise;

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Fig. 5 is a perspective view of the box body of Fig. 4 containing two smaller boxes and an empty space adapted to hold other merchandise.

Fig. 6 is a perspective view of the box of Fig. 5 supported on the fully erected easel of Figs. 1 to 3;

Fig. 7 is an elevational side view, partly in section, showing the manner in which the box body is supported on the easel and locked with regard thereto; and

Fig. 8 is a detailed view showing in side elevation, and partially in section, the manner of locking the smaller of the two boxes of Fig. 5 inside the outer box body.

In the following description and in the claims various details will be identified by specific names for convenience. The names, however, are intended to be generic in their application. Corresponding reference characters refer to corresponding parts in the several figures of the drawings.

The drawings accompanying, and forming part of, this specification disclose certain specific details of the invention for the purpose of explanation of broader aspects of the invention, but it is understood that the details may be modified in various respects without departure from the principles of the invention and that the invention may be applied to other structures than the one shown.

The blank A of Figure 1 may be cut and scored, in multiple, from sheets or rolls of suitable foldable sheet material, for example, paperboard. Only one surface of the board need be imprinted or decoratively finished, since only one side of the blank is exposed to view in the finished box.

The blank comprises a top or main panel 11 to which end panels 12 and 13 are articulated along end fold lines 14 and 15, respectively. Side panels 16 and 17 are articulated to the top panel 11 along side fold lines 18 and 19, respectively.

The end panels 12 and 13 are provided with corner flaps 20, 21, 22 and 23, articulated along corner fold lines 24, 25, 26 and 27, respectively. These corner flaps lie on the inside of the assembled box cover as seen in Figure 2.

The main panel 11 is divided into two portions 28 and 29 by a hinging crease 30.

Gusset fold lines 31 and 32 define a gusset panel 33 within the side panel 16 and corresponding gusset fold lines 34 and 35 define a gusset panel 36 within the side panel 17. The gusset fold lines extend from the ends of the hinging crease 30, this structure constituting one of the features of my aforementioned Patent 2,585,361 of February 12, 1952.

Further collapsing creases 37, 38, 39 and 40 define securing panels 41, 42, 43 and 44 within the side panels 16 and 17 for attachment to the respective corners flaps 20, 21, 22 and 23.

A fold resistant tab 45 is formed by the stock of the main panel 11 by an arcuate cut 46. Scores 47 and 48 form the base of the tab 45. These scores lie on the far side of a theoretical crease line 49 along which the board would tend to crease or break, if the scores 47 and 48 were not present and were not to provide an area of reduced resistance to folding or creasing than the unweakened area through which the theoretical crease line 49 extends.

The scores 47 and 48 form an obtuse angle, the angle being identified as  $\alpha$  and being of a magnitude of the order of approximately 140 to 160 degrees. It is evident that the theoretical or imaginary fold line 49 subtends both the arc 46 and the angle formed by the scores 47 and 48 extending substantially to the ends of the arcuate or U-shaped cut 46.

In order to facilitate engagement of the tab 45 in setting

up the display box, a crescent-shaped piece of stock 50 may be removed at the tip of the tab.

The blank A may be assembled into hollow box form as follows: The side panels 16 and 17 are first folded over the main panel 11 along the side fold lines 18 and 19. Next, the securing panels 41, 42, 43 and 44 are folded back upon the remainder of the side panels 16 and 17.

The corner flaps 20, 21, 22 and 23 are folded back upon the end panels 12 and 13 from which they extend. Adhesive may then be applied to the securing panels 41, 42, 43 and 44, and the end panels 12 and 13 may be folded over the main panel 11 and the folded side panels 16 and 17. This folding operation brings the corner flaps 20, 21, 22 and 23 into adhesive engagement with the securing panels 41, 43, 42 and 44, respectively.

The result is a collapsed flat structure of single-ply thickness in certain portions and multiple-ply thickness in other portions. It may be stored and shipped in collapsed flat condition and can be erected into hollow box form simply by pulling the end wall panels 12 and 13 into upright position with regard to the main panel. This causes the side panels 16 and 17 to flatten out along the collapsing creases 37, 38, 39 and 40. In fully erected position the substantially rectangular securing panels 20, 21, 22 and 23 act as a stop and prevent outward collapsing of the side walls as is readily seen in Figure 2.

The box cover of Figure 2 is readily convertible into easel form by collapsing the side walls along the gusset fold lines 31, 32, 34 and 35 as shown in Figure 3. This causes the main panel 11 to fold along the hinging crease 30 so that the panel portion 28 becomes a base portion whereas the panel portion 29 becomes an easel portion.

The end panel 13 is also recollapsible along the collapsing creases 38 and 40, along which it was first creased during the gluing operation previously described. Recollapsing of the end wall 13 causes the easel portion of the box structure to assume a substantially flat form as is readily seen from Figure 3. The box cover converted into easel shape may now be combined with the body portion of the box to form a display. Before turning to this assembly operation, a representative form of box body will be briefly described.

The box body may be of any conventional construction. Figure 4 shows a typical form of blank which may be used and which, for convenience of explanation, corresponds closely to the blank A for the box cover except for the absence of the hinging crease for its main panel 111 and the absence of gusset panels in its side panels 116 and 117.

Briefly, end panels 112 and 113 are articulated to the main panel 111 along end fold lines 114 and 115. Side panels 116 and 117 are articulated to the main panel 111 along side fold lines 118 and 119. Corner flaps 120, 121, 122 and 123 extend from the end panels 112 and 113 along corner fold lines 124, 125, 126 and 127. Collapsing creases 137, 138, 139 and 140 define securing panels 141, 142, 143 and 144 in the side walls 116 and 117.

A flat substantially U-shaped cut 51 forms a self-opening aperture along the center portion of the end fold line 114, the cut opening automatically when the end panel 112 is folded into upright position with respect to the main panel 111.

An internal arcuate cut 52 defines a tab 53 whose base is formed by two scores 54 and 55 forming an obtuse angle  $\alpha$  of the order of 140 to 160 degrees.

The tab 53 when deflected out of the plane of the panel 111 causes the board to crease along the scores 54 and 55 thereby distorting or flexing the board in a peculiar way in which the tab 53 and the area about the apex 62 assume three-dimensional, rather than a flat, shape. As will later be described with particular reference to Figure 7, the tab 53 engages the top edge of the easel when the box body is assembled with the easel to form a display.

A further article engaging fold-resistant tab 153 is formed by a substantially U-shaped cut 152 and base

scores 154 and 155 enclosing the aforementioned angle  $\alpha$  between them.

The blank B may be converted into box form in the same manner as previously described in connection with the assembly of the box cover. The side wall panels 116 and 117 are folded back upon the main panel 111 along the side fold lines 118 and 119. The securing panels 141, 142, 143 and 144 are folded back upon the respective collapsing creases 137, 138, 139 and 140. Adhesive is applied to the folded back securing panels, and the corner flaps 120, 121, 122 and 123 are brought into adhesive engagement with the securing panels by first folding the corner flaps back upon the end panels 112 and 113 and then folding the end panels back upon the main panel 111 and the side wall panels 116, 117, which overlie the main panel 111.

After erection of the glued and collapsed structure, the box body may be filled with merchandise. Figure 7 illustrates the box body B' containing a smaller box 56 and a still smaller box 57. The box 56 fills the space between the end panels 112 and 113 and both boxes 56 and 57 fill the space between the side walls 116 and 117. However, the box 57 is shorter than the box 56 and would not remain in its proper position unless restrained by the fold resisting tab 153 which is deflected to the inside of the box body B' to bear against the top 58 of the smaller box or carton 57. The deflection of the tab causes the panel 111 to bulge out at the area above the vertex of the angle  $\alpha$  formed by the scores 154 and 155. The bulging area is indicated at 159 in Figure 8.

The filled box body may be inserted into the cover structure of Figure 3 by first inserting the tab 45 into the self-opening cut 51 at the fold line 114. This operation is facilitated by the formation of a shallow tab extension 60 on the end panel 112 by reason of the shallow U-shaped cut 151 (see Figure 4). The tab extension 60 catches under the fold resisting tab 45 and guides it into its proper position, overlying the end panel 112.

The fold resisting tab 53 is then deflected to receive the easel portion 13, 29 of the converted box cover A' of Figure 3. Deflection of the tab 53 causes the main panel 11 to bulge out at 59. This bulge is the result of stress caused by the folding of the stock along the angular scores 47, 48 along which the stock is forced to crease instead of along the aforementioned theoretical straight fold line which would have left the stock flat. The angular arrangement of the scores 54 and 55 at the base of the tab 53 prevents the board from creasing along its theoretical straight crease line extending from one end of the U-shaped cut 52 to the other. This line is also indicated in Figure 4 at 49. Best results are obtained by laying the blank out in such a way that the grain extends in the direction of the arrow 61.

The easel structure of Figure 7 is very strong and secure and is capable of sustaining considerable weight, for example, heavy merchandise in the box B'. It may safely be moved about, as by sliding it from one position to another on a counter or table top, without dislodging, deforming or collapsing the easel. If the display is lifted up by the box B', the box portion B' and the easel portion A' will not disengage due to the relatively large overlap of the tab 53 over the top edge 15 of the easel portion.

Obviously, the fold-resistant tab structure may advantageously be employed wherever a stiff and fold-resistant tab is required, as exemplified for example by the tab 153 which holds merchandise securely locked within a larger space.

What is claimed is:

1. A folding box comprising a box body and a telescoping outside-fitting box cover, the box cover being convertible into an easel, the box body having a tab cut from the stock of the bottom panel, the tab pointing toward one end panel of the box body and being defined by a substantially U-shaped cut and a score extending substantially between the ends of said cut and being of

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angular outline, the angle being obtuse and its vertex being on the far side, with respect to said tab, of an imaginary chord extending between substantially the ends of the cut and subtending both said U-shaped cut and said angular score, the box cover comprising a main panel, opposite side walls and opposite end walls, said walls being articulated to said main panel and to one another at the corners, a transverse fold line extending across the main panel intermediate of, and substantially parallel to, said end walls, said fold line dividing the main panel into a box receiving base portion and a box elevating easel portion, each of the side walls including a pair of gusset fold lines extending at an angle to each other and at an angle with respect to said transverse fold line, across said side walls and defining inwardly foldable gusset panels, one of the gusset fold lines of each pair lying within the base portion of the cover, the other gusset fold line lying within the easel portion of the cover, diagonal collapsing creases extending from the corners of the easel portion across said side walls to form corner gussets along which the side walls collapse when the end panel of the easel portion is folded inwardly back upon the main panel to form a flattened top edge on the easel portion insertable under said tab, the base portion comprising a further tab cut from the stock of the main panel and pointing toward the end wall of the base portion, the body portion having a slit along the fold line between the end panel and the bottom panel of the box body, said last named tab extending into said slit in display position.

2. The folding box construction set forth in the preceding claim 1 in which the obtuse angle is of the order of 140 to 160 degrees.

3. A panel of foldable sheet material comprising a fold-resistant internal tab constituting an integral part of the panel of foldable sheet material, the tab being outlined by an internal cut and a score, the cut being substantially U-shaped, the score extending substantially from the ends of the cut, the score being of bent outline deviating from the imaginary natural crease extending as a chord substantially between the ends of said cut, along which natural crease the material tends to crease in the absence of said score, the score being bent oppositely to said cut, so that the theoretical natural crease lies between said cut and said score, the material being weakened at said score to offer less resistance to creasing than at the area through which said imaginary natural crease extends.

4. A panel of foldable sheet material comprising a fold-resistant internal tab in the panel, the tab being integral with said panel and defined by a substantially U-shaped cut and characterized by a score along which the material is forced to crease automatically when the tab is deflected with respect to the remainder of said panel, said score extending substantially between the ends of said cut and being of bent outline, the two end portions of the score, adjacent said cut, forming an angle with respect to each other and extending away from said tab into the body of said panel, the score weakening the

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board to a greater extent with regard to creasing than the imaginary straight line, extending in the manner of a chord between the ends of said cut.

5. A panel of foldable sheet material comprising a fold-resistant internal tab in the panel, the tab being integral with said panel and defined by a substantially U-shaped cut and characterized by a score along which the material is forced to crease automatically when the tab is deflected with respect to the remainder of said panel, said score being substantially an obtuse angle whose vertex is on the far side, with respect to said tab, of an imaginary chord extending between substantially the ends of the cut and subtending both said U-shaped cut and said angular score.

6. A panel of foldable sheet material comprising a fold-resistant internal tab in the panel, the tab being integral with said panel and defined by a substantially U-shaped cut and characterized by a score along which the board is forced to crease automatically when the tab is deflected with respect to the remainder of said panel, said score being substantially an obtuse angle of the order of 140 to 160 degrees whose vertex is opposite said tab on the far side, with respect to said tab, of an imaginary chord extending between substantially the ends of the cut and subtending both said U-shaped cut and said angular score.

7. A folding box structure comprising, a main panel, normally upright side panels articulated to said main panel along side fold lines, and a normally upright end panel articulated to the main panel along an end fold line and connected to said side panels at the box corners, the main panel including a fold resistant internal tab, the tab being integral with the stock of the main panel and being defined by a substantially U-shaped cut extending towards said end panel and characterized by a score along which the board is forced to crease automatically when the tab is deflected with respect to the remainder of said main panel, said score extending substantially between the ends of said cut and being of bent outline, the two end portions of the score, adjacent said cut, forming an angle with respect to each other and extending away from the tab into the body of said panel, the score weakening the board to a greater extent with regard to creasing than the imaginary straight line extending in the manner of a chord between the ends of said cut, whereby an article clamped between said end panel and the inwardly deflected tab is urged towards said end panel by resilient force.

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