Dec. 8, 1959 J. KRAMER ET AL 2,916,196

BOX

Filed March 5, 1957 3 Sheets-Sheet 1

FIG-1

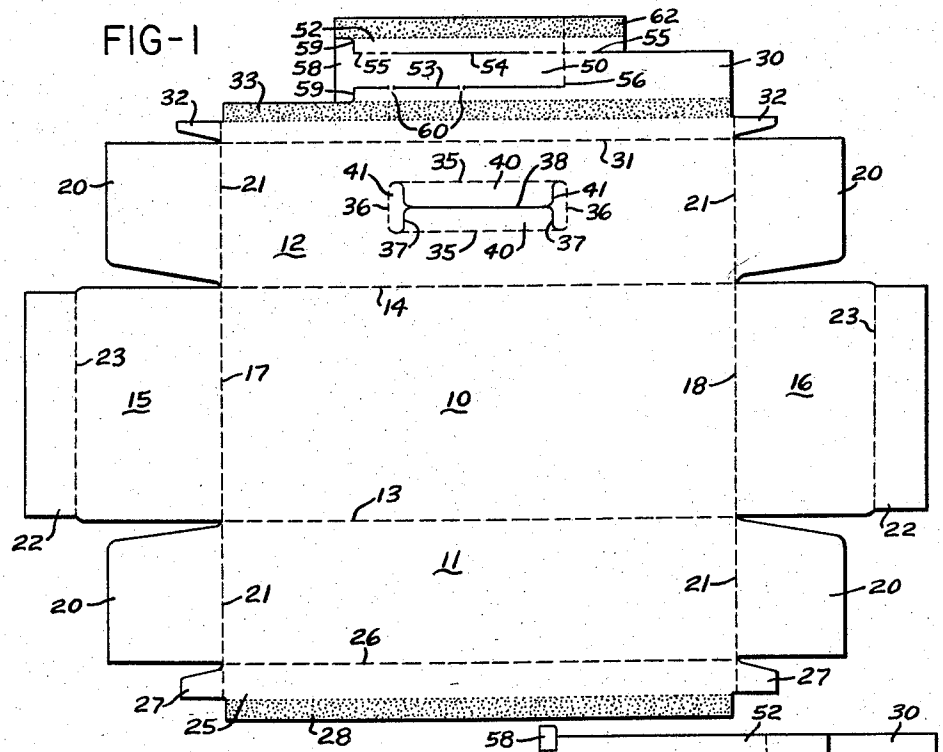


FIG-2

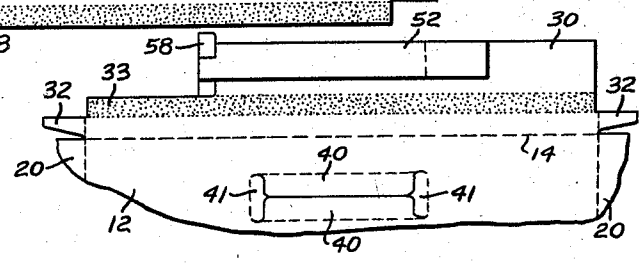


FIG-3

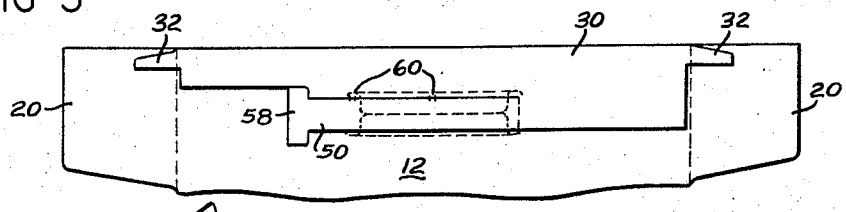


FIG-5

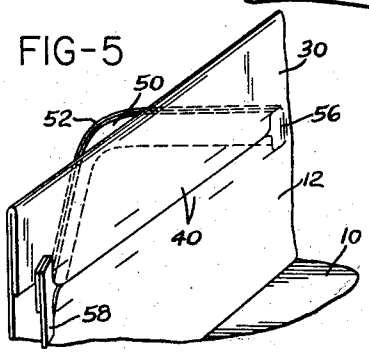
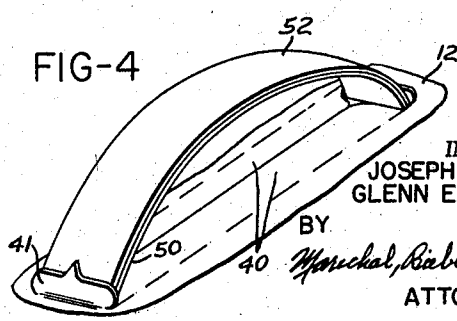


FIG-4



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BOX

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FIG-6

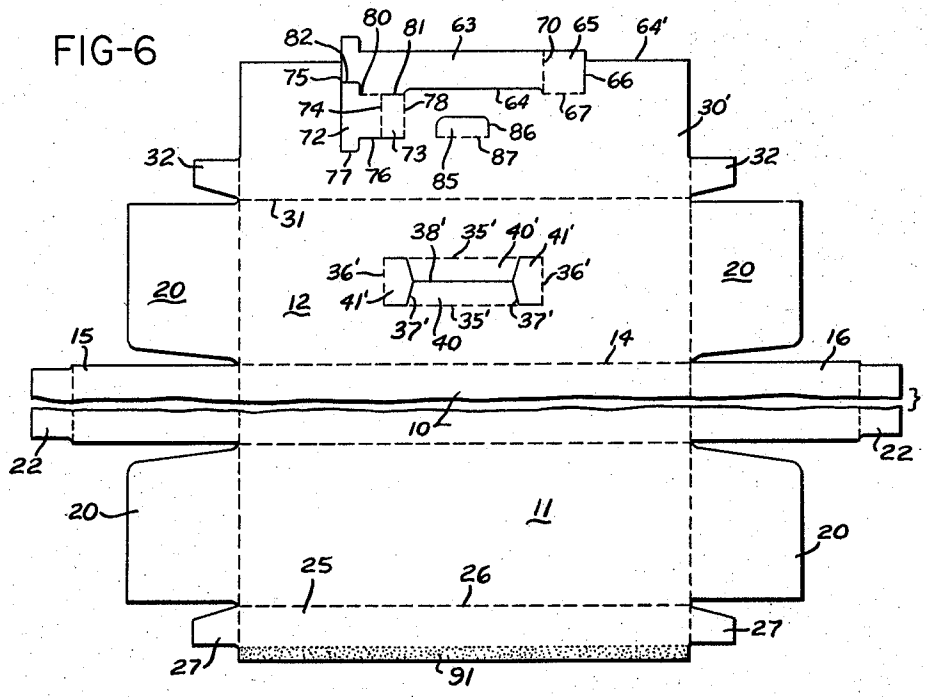


FIG-7

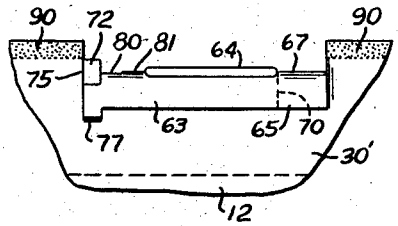


FIG-9

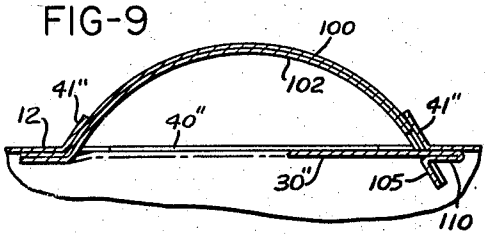
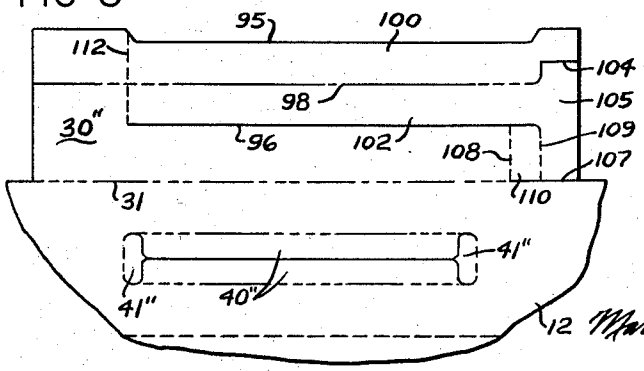


FIG-8



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BOX

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FIG-10

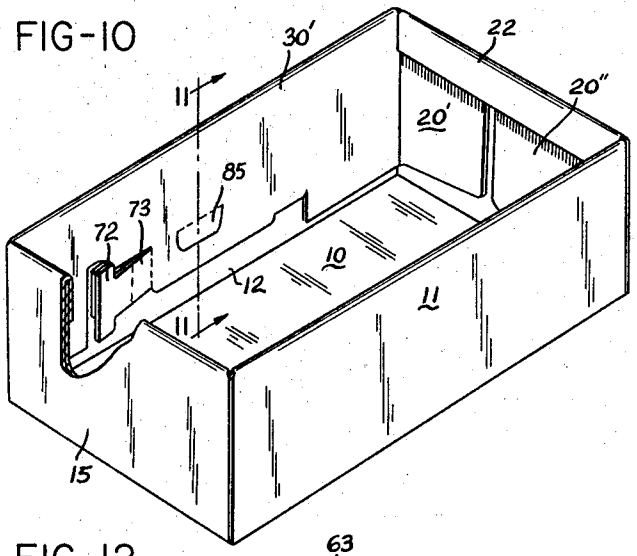


FIG-11

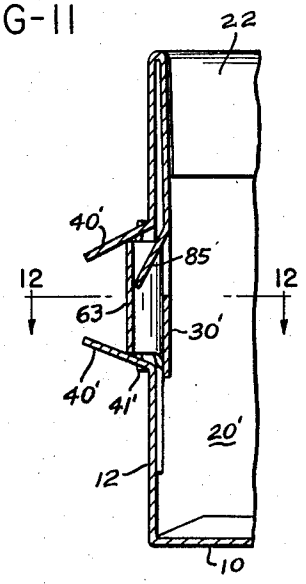


FIG-12

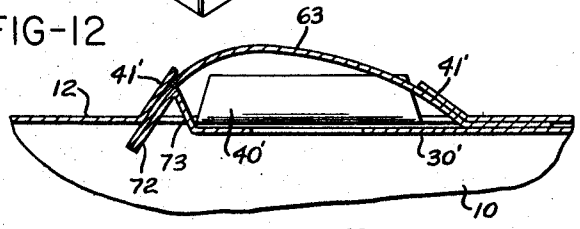


FIG-13

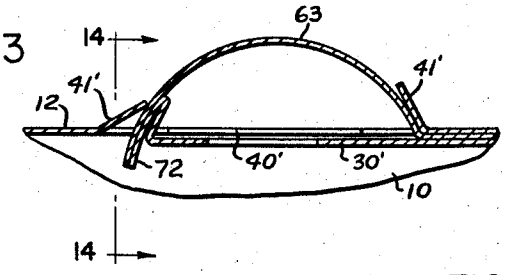


FIG-14

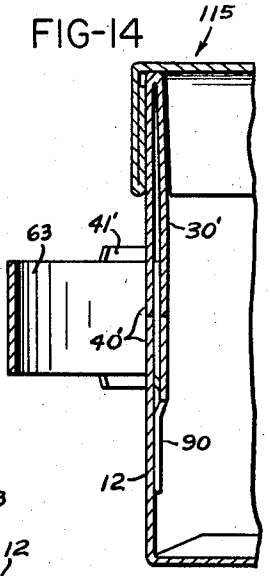


FIG-15

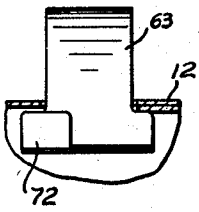
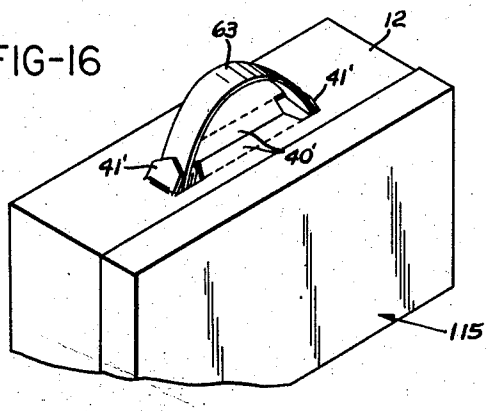


FIG-16



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United States Patent Office 2,916,196 Patented Dec. 8, 1959

2,916,196

BOX

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Application March 5, 1957, Serial No. 644,154

3 Claims. (Cl. 229—52)

This application relates to boxes and cartons, particularly to handle constructions for boxes and cartons made of paperboard and like sheet material.

A primary object of the invention is to provide improved handle constructions combining ease and rapidity of assembly with adequate strength and rigidity.

Another important object is to provide handle constructions readily adaptable to assembly on high speed folding and gluing machines while requiring a minimum of sheet material for the handle parts.

A further object of the invention is to provide a handle construction for paperboard boxes or cartons wherein the handle parts are formed integral with the blank of sheet material from which the box is constructed.

Another object of this invention is to provide two-ply carrying handles for paperboard and similar type boxes which are formed from a blank of material.

An additional object of the invention is to provide such handle constructions, particularly in connection with cartons or boxes formed from sheet material having one finished surface, wherein the handle, in its erected or carrying position, presents a finished surface at its upper side visible from the exterior of the box.

Other objects and advantages of the invention will be apparent from the following description, the accompanying drawings and the appended claims.

In the drawings—

Fig. 1 is a plan view of a blank of sheet material for forming a box, incorporating an improved handle construction in accordance with the invention;

Fig. 2 is a detail view of the handle parts shown in Fig. 1, illustrating an intermediate step in the assembly thereof;

Fig. 3 is a view similar to Fig. 2 illustrating the handle parts in assembled flat-folded form;

Fig. 4 is a perspective view of the handle in its erected or carrying position;

Fig. 5 is a perspective view of the handle parts taken from within the box, and illustrating the parts which retain the handle in bowed carrying position;

Fig. 6 is a broken plan view of a box blank similar to the one in Fig. 1, and showing a further handle construction in accordance with the invention;

Fig. 7 is a detail view of the handle parts shown in Fig. 6, illustrating an initial step in the assembly thereof;

Fig. 8 is a partial plan view of a further modified handle construction;

Fig. 9 is a partially broken sectional view showing the handle of Fig. 8 in carrying position;

Fig. 10 is a perspective view of a box assembled from the blank of Fig. 6, with parts broken away to illustrate the initial step in erecting the handle;

Fig. 11 is an enlarged section taken on line 11—11 of Fig. 10;

Fig. 12 is a partial section taken on line 12—12 of Fig. 11;

Fig. 13 is a partial section similar to Fig. 12 and illustrating the handle in its fully extended bowed carrying position;

Fig. 14 is a section taken on line 14—14 of Fig. 13, and showing in addition parts of a lid on the assembled box;

Fig. 15 is a detail view showing the engagement of one end of the handle strip within the box; and

Fig. 16 is a perspective view of the complete box, with a lid thereon, showing the handle in fully extended carrying position.

Referring to the drawings, which illustrate preferred embodiments of the present invention, Fig. 1 shows a blank for forming a box including one preferred handle construction in accordance with the present invention. In the blank fold lines are indicated by dotted lines and slits or cuts in the sheet material are indicated by solid lines, as is the outline of the blank. Stippled portions designate areas of the blank to which adhesive is applied during folding and gluing operations.

The blank shown in Fig. 1 includes a bottom 10 having side wall panels 11 and 12 connected thereto along fold lines 13 and 14, respectively. End wall panels 15 and 16 extend from the other sides of bottom 10, and are connected to the bottom along fold lines 17 and 18. At opposite sides of panels 11 and 12 there are end closure flaps 20, hinged to the respective panels along fold lines 21. These end flaps are adapted to be folded across the ends of the assembled box within the end wall panels 15 and 16, and suitable locking flaps 22 are foldably connected along lines 23 for engagement with the flaps 20 to retain the box in an assembled condition, as will be more fully described below.

The side wall panel 11 is provided with an extension panel 25 connected thereto along fold line 26, and including small end tabs 27 arranged to be engaged beneath the flaps 22 in the assembled carton. A suitable adhesive may be applied to an area along the free edge of extension panel 25, as indicated by the stippled surface 28, and this adhesive may be applied by a glue roller in a high speed gluing machine since there is no other structure of the blank longitudinally aligned with such portion 28.

A further extension panel 30 is connected to side wall panel 12 along a fold line 31, and includes tabs 32. Panel 30 is adapted to receive adhesive from a glue wheel along an extended path transversely thereof, as indicated at 33. A generally rectangular opening is formed in panel 12, defined by a pair of spaced elongated fold lines 35 which extend substantially parallel to fold line 31, and shorter fold lines 36 connecting the ends of lines 35. The area between fold lines 35 and 36 is divided into a plurality of flaps by a pair of slits 37, the opposite ends of which extend approximately to the corners of the rectangular opening, and by a longitudinal slit 38 joining slits 37. This arrangement provides two long folding flaps 40 and two shorter flaps 41 which cover the rectangular opening but are adapted to hinge away along their respective connections to panel 12 for passage of a handle strip through the opening.

The extension panel 30 has a pair of handle strips 50 and 52 formed along its free edge by a pair of longitudinally extending slits 53 and 54, the latter of which terminates in fold lines 55 at its opposite ends. A further fold line 56 extends across fold line 55 and is generally aligned with one of the fold lines 36 which define the rectangular opening in panel 12. An enlarged head 58 is formed on handle strip 50, separated from strip 52 and from the remainder of panel 30 by slits 59. Also, slit 53 is interrupted, as at 60, to provide a severable connection between handle strip 50 and the remainder of handle 30, tending to hold the handle strip in place until it is forcibly bent out of the plane of panel 30.

As will be apparent from Fig. 1, adhesive can be ap-

plied to handle strip 52 in a continuous path, as indicated by the stippled parts 62, and the handle strip 52 can then be folded over along line 55 to adhere to strip 50, as shown in Fig. 2. Further application of adhesive along the path 33 will provide for adherence of extension panel 30 to side wall panel 12 when the former is folded over along fold line 14 to the position shown in Fig. 3. As will be apparent from the drawings, the dimensioning of the parts is such that the doubled handle strip extends across the rectangular opening in panel 12 and is retained in this flat-folded position until ready for use. Extension panel 30, together with extension panel 25 and flaps 22, provides a reinforcing rim around the upper end of the assembled box.

In addition to the double thickness handle feature provided by the construction shown in Figs. 1–5, it will be noted that the top surface of the handle, or that surface immediately inside the rectangular opening, is the same as the exterior of the box. In the construction of boxes such as illustrated herein the paperboard material frequently has a finished surface on one side only, and it is important from a commercial viewpoint to have the finished surface presented on the top of the handle when the handle is extended for use. Referring to Fig. 1, and assuming that the finished surface is down or underneath in that view, the first folding step in Fig. 2 brings the finished surface of handle strip 52 to the top, and the second folding step of Fig. 3 places the finished surface of strip 52 in contact with the unfinished surface of panel 12, extending across the rectangular opening closed by flaps 40 and 41.

When it is desired to extend the handle to its bowed carrying position the parts 60 are severed and the combined handle strips 50 and 52 are pushed through the rectangular opening, with flaps 40 and 41 bending out of the way to provide for passage of the handle. The long flaps 40 are then folded across the opening to cover substantially all of the opening. The head 58 engages the edges of flaps 40 defined by cut 37 to retain the ends of the handle in spaced relation, since the other end is hinged to panel 30 along fold line 56. Therefore, flaps 40 act in conjunction with head 58 to define the carrying position of the handle strip and in addition substantially close the rectangular opening in panel 12 through which the handle is extended. The upper surface of the extended handle, as viewed in Fig. 4, is the same finished surface as the remainder of the exterior of the box.

Another handle construction in accordance with the invention is shown in Figs. 6, 7 and 12–16. This particular handle is integrally connected at both ends to the blank, and at one end a hinged or folding connection is included which provides for outward bowing of the handle strip into its erected carrying position. The overall construction of the box is generally the same as described previously, and accordingly the bottom, sides, extension panels and end flaps and tabs are all designated by the same reference numerals as in Fig. 1. Similar parts are identified by primed reference numerals and thus the rectangular opening in side wall 12 is defined by longitudinally extending fold lines 35′ and the shorter fold lines 36′ extending transversely. Two generally U-shaped slits 37′, having their sides coincident with the fold lines 35′ and terminating at opposite ends of the fold lines 36′, are connected by a longitudinal slit 38′. These slits and fold lines provide the longer flaps 40′ and shorter flaps 41′ in the same manner as described above in connection with Fig. 1.

The extension panel 30′ includes a handle strip 63 defined by a slit 64 extending generally parallel to the outer edge 64 of panel 30′. One end of the handle strip is hinged to panel 30′ through a flap 65 which is separated on one side by a slit 66 from panel 30′, and foldably connected to that panel along a fold line 67 extending parallel to and spaced from the edge of the panel. Another side of flap 65 is defined by a fold line 70 which extends between handle strip 63 and flap 65 and terminates at the intersection of slit 64 and fold line 67. This arrangement provides a fixed folding connection at one end of handle strip 63, and it will be noted that the fold line 70 at the end of the handle strip is generally aligned with one of the fold lines 36′ defining one end of the rectangular opening in the box side wall panel 12.

The other folding connection between handle strip 63 and panel 30′ includes double folding flaps 72 and 73 separated from each other by fold line 74, and separated from the panel 30′ by a transversely extending slit 75 and a generally longitudinally extending slit 76 including an L-shaped portion 77 intersecting slit 75. Flap 73 is foldably connected to panel 30′ along a fold line 78, and flap 72 is foldably connected to handle strip 63 along a short fold line 80, while flap 73 is separated from the handle strip by a short slit 81 extending between fold line 80 and slit 64. Another L-shaped slit 82, complementary to slit 77, separates a portion of flap 72 from handle strip 63. Also, the end of the handle strip adjacent flaps 72 and 73 is separated from the remainder of panel 30′ by slit 75. A small flap 85 is provided centrally of the handle construction by a U-shaped slit 86, the opposite ends of which are connected by a fold line 87.

The modified handle construction is assembled by folding the handle over along lines 67 and 80 to cover the flap 85 and panels 72 and 73, with flap 65 folding over together with the handle strip. Such folding of the handle strip may be accomplished in any straight line high speed folding and gluing machine, since the folding may be accomplished by a folding bar as the blank is moved along in the direction of its length, or from one side to the other as viewed in Fig. 6. With the handle strip folded over, as shown in Fig. 7, a suitable adhesive may be applied along the edge of panel 30′, as shown by the stippled portions 90, and again this adhesive may be applied in a continuous stream, as by a glue roller, since the handle construction is folded away from the edge and will not be contacted by the glue wheel. In a similar manner adhesive may be applied at 91 to the edge of panel 25, and the two panels 25 and 30′ may be folded over along lines 26 and 31 thus assembling the blank in flat folded form for storage or shipment. It will be noted that the handle strip 63 is then located between the outer side wall panel 12 and extension panel 30′ (Fig. 10), and if the finished surface of the sheet material is the under surface of the blank shown in Fig. 6, then the finished surface of the handle strip will face the back or inner surface of panel 12 and will extend across the rectangular opening therein, covered by the flaps 40′ and 41′. The sequence of steps followed in erecting this handle is shown in Figs. 10–14.

Another type of handle provided by the invention is shown in Figs. 8 and 9, and includes a double ply handle generally similar to that shown in Fig. 1, but having integral connections at both ends to the blank, of the same general type as shown in the handle of Fig. 6. A portion of a box blank is shown in Fig. 8, including a box wall panel 12 having a second wall panel 30″ connected thereto along fold line 31. A rectangular opening is formed in panel 12, in the same manner as described above in connection with Figs. 1 and 6, leaving two larger flaps 40″ and two smaller end flaps 41″. Through this opening the handle is extended to a carrying position bowed outwardly of the box wall panel 12 as shown in Fig. 9.

Panel 30″ is formed at the edge of the blank and thus includes a free edge 95 which is generally parallel to the length of the rectangular opening. A slit 96 extends across panel 30″, spaced from fold line 31 by a distance substantially equal to the spacing between that fold line and the adjacent side of the rectangular opening in panel 12. Intermediate slit 96 and edge 95 there

is a fold line **98**, which may include through slit portions, defining first and second handle strips **100** and **102** which are adapted to be folded one upon the other, forming a two-ply handle.

At one end of fold line **98** is a generally L-shaped slit **104** which defines part of an enlarged head **105** on strip **102**, and the other side of head **105** is separated from panel **30''** by a slit **107** coextensive with fold line **31**. From the end of this slit a fold line **108** extends inwardly to intersect with slit **96**, and a second fold line **109** extends parallel to fold line **108**, connecting the end of slit **96** with the slit **107**, thus defining a folding flap **110** which provides an integral folding connection between the head end of the handle and the remainder of the blank. The dimensioning of the parts is such that the width of flap **110** and the distance between fold line **108** and a line extending through the adjacent edge of the rectangular opening in panel **12** is approximately equal, and when the handle is bowed outwardly through the opening the head **105** will be retained beneath the end of the rectangular opening, defining the proper spaced relation between opposite ends of the erected handle.

The other end of handle strips **100** and **102** is connected to panel **30** along a common fold line **112** which is generally aligned with the other end of the rectangular opening so that this folding connection is located beneath the other end of the opening when the handle parts are folded ready for use. Erection of the handle shown in Figs. 8 and 9 is generally as described above in connection with the other handles of Figs. 1 and 6, with the flap **110** folding inwardly to the position shown in Fig. 10 as the handle is erected, and with the flaps **40** being closed over the opening as the handle is erected.

A finished box made from the blank of Fig. 6, with the handle in its extended carrying position, is shown in Fig. 16, with a suitable lid **115** closing the open top of the box. It will be understood, however, that the present invention is not limited to boxes of the type shown in the drawings, which are commonly used for packaging shoes and the like. Rather, the present invention provides handle constructions which can be incorporated as integral parts of many different types of box blanks, and provides for assembly of the handle parts into a flat-folded form, ready for extension to carrying position, with the use of straight line folding and gluing apparatus. This results in economy in the manufacture and assembly of the boxes, since such straight line machines can be operated at a substantially greater rate than those machines requiring indexing of the blanks for spot gluing or registry of supplementary parts on the box blank. Furthermore, all of the handles provided by this invention present a finished surface visible at the exterior of the box which contributes substantially to the favorable appearance of the box when the handle is erected to its carrying position. In the case of the double-ply handles, such a finished surface is presented at both the top and bottom of the handle.

While the forms of apparatus herein described constitute preferred embodiments of the invention, it is to be understood that the invention is not limited to these precise forms of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. A carrying handle construction formed as an integral part of a box erected from a blank form, comprising first and second box wall panels connected along a common fold line for folding said second panel into underlying relation with said first panel, means defining a generally rectangular opening of substantially greater length than width in said first panel, said second panel having a free edge extending generally parallel to the length of said opening, said second panel also having a slit therein spaced from and approximately parallel to said free edge, a fold line intermediate and generally parallel to said slit defining first and second handle strips forming a two-ply handle, an integral hinged connection between one end of said handle and said second panel, said connection being located beneath one end of said opening, and folding flap means for retaining the other end of said handle adjacent the other end of said opening when said strip is bowed outwardly through said opening into its carrying position.

2. A carrying handle construction formed as an integral part of a box erected from a blank form comprising first and second box wall panels connected for folding said second panel into underlying relation with said first panel, means defining a generally rectangular opening of substantially greater length than width in said first panel, said second panel having a free edge extending generally parallel to the length of said opening and having a slit spaced from and substantially parallel to said edge defining a handle strip, said handle strip being of less width than said opening and of greater length than said opening, said handle strip and said second wall panel being dimensioned to provide for positioning of said handle beneath said opening, and means defining integral folding connections between both ends of said handle and said second wall panel, one of said folding connections including folding flap means providing for movement of said handle to a carrying position bowed outwardly through said opening.

3. A carrying handle construction formed as an integral part of a box erected from a blank form comprising first and second box wall panels connected for folding said second panel into underlying relation with said first panel, means defining a generally rectangular opening of substantially greater length than width in said first panel, said second panel having a free edge extending generally parallel to the length of said opening and having a slit spaced from and substantially parallel to said edge, a fold line intermediate said edge and said slit defining first and second handle strips for folding one upon the other to form a two-ply handle, said handle strips being of less width than said opening and of greater length than said opening, said handle strips and said second wall panel being dimensioned to provide for positioning of said handle beneath said opening, and means defining integral folding connections between both ends of said handle and said second wall panel, one of said folding connections including folding flap means providing for movement of said handle to a carrying position bowed outwardly through said opening.

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