Aug. 18, 1953 C. L. GILBERT 2,649,240

BLANK FOR BOX PRODUCTION

Filed Oct. 13, 1947 2 Sheets-Sheet 1

FIG. 1

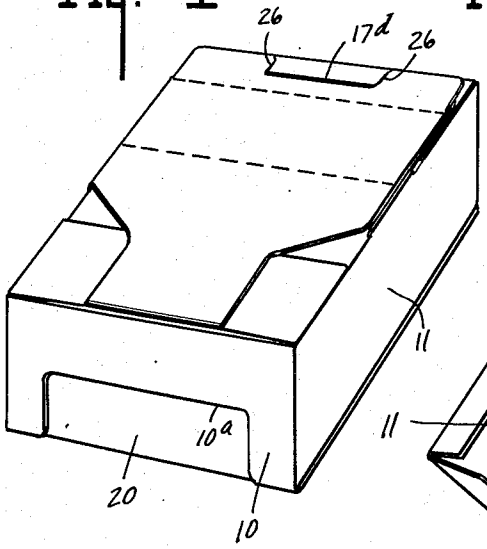


FIG. 2

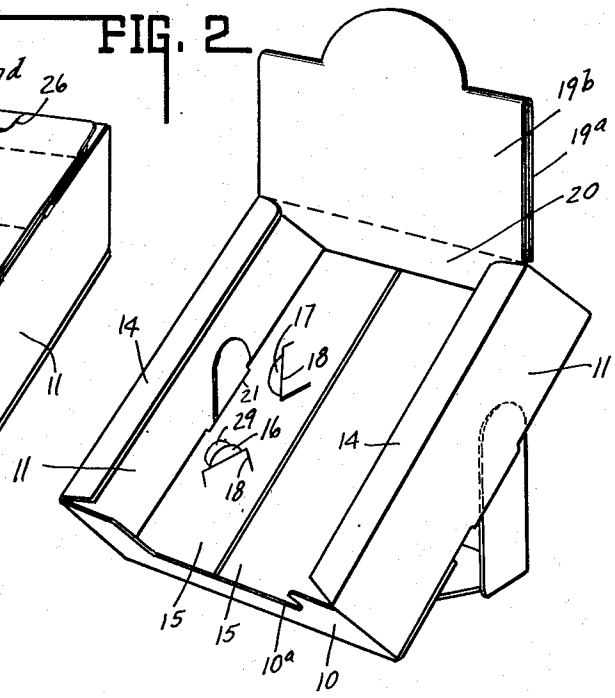
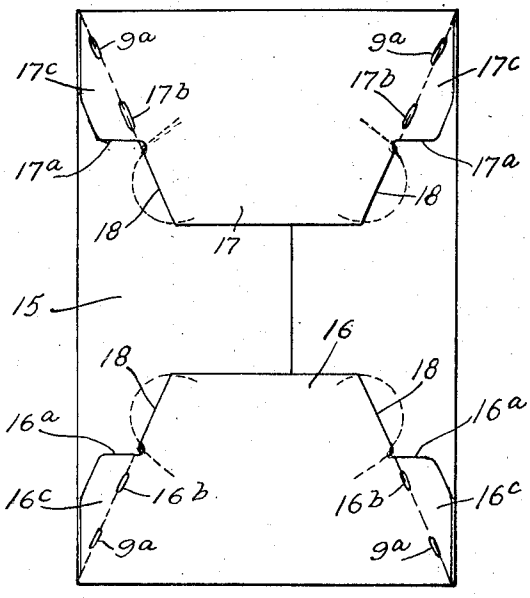


FIG. 4



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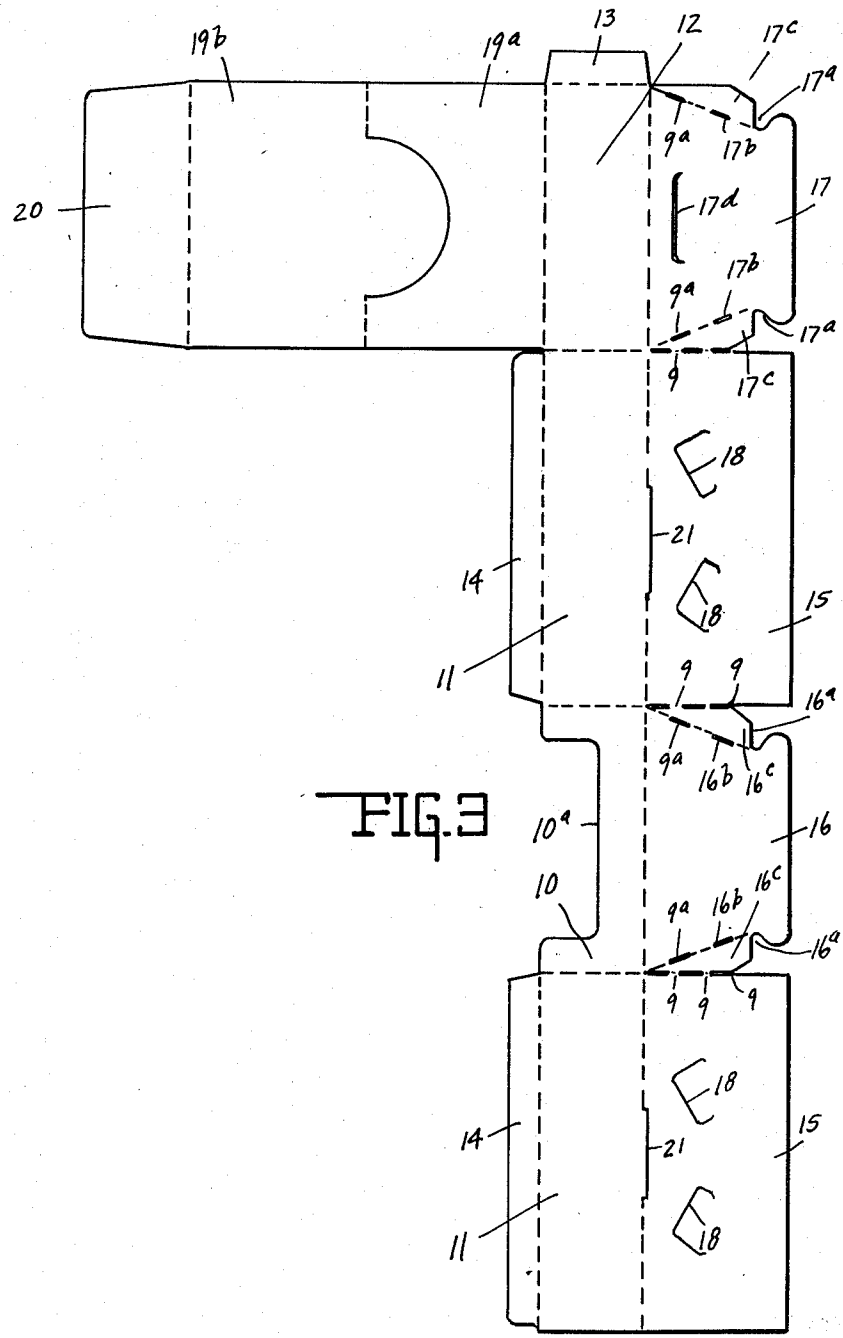

FIG. 3

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BLANK FOR BOX PRODUCTION

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2 Claims. (Cl. 229—39)

1

This invention relates to paper board box structures which may be of the display type and tiltable for content display.

One of the objects of the present invention is to provide in a knock down glued box certain readily severable connecting portions whereby high speed gluing can be effected without box "cocking".

Another feature resides in the non-separation of box bottom forming portions prior to gluing for effecting square folding of the blank preliminary to the gluing thereof, whereby the folded parts do not distort from their desired relative positions, heretofore a universal accompaniment of same due to inertia of parts, speed of blank advance, etc., as well understood in the box making art.

Such non-separation feature is peculiarly effective when the height or depth of the box is appreciably less than half the length or width of the box whichever is less.

A further feature of the invention resides in the semi-automatic interlocking of bottom forming parts when disposed beyond closure formation and subsequent release to closure forming position.

Other objects and features of the invention will be set forth more fully hereinafter.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims:

In the drawings Fig. 1 is a perspective view of the bottom and front of the box in closed position.

Fig. 2 is a perspective view of such box in opened and display position.

Fig. 3 is a plan view of the box blank.

Fig. 4 is a view looking at the bottom of the box in locked condition.

Reference will first be had to Fig. 3. Herein 10 indicates a box front cut away at 10*a*. Sides 11 are hinge connected to the sides of the box and/or front and to one of said sides there is hingedly connected a back 12 which is provided with a glue flap 13.

Each of the sides 11 at its top edge includes an inwardly directed, hingedly connected, article retaining flap 14. Bottom forming side flaps 15 are provided on the bottom edges of the sides 11. Bottom forming end flaps 16 and 17 are provided on the bottom edges of front 10 and back 12, respectively, each of said portions being notched at the remote corners as at 16*a* and 17*a*, respectively, to form locking tongues receivable by the angle like slits 18 in each of portions 15.

2

The foregoing, together with partially divided and foldable top 19*a*—19*b*, hingedly connected to back 12 and provided with hingedly connected front closing flap 20, comprises the box selected for exemplary purposes, which box as so far described is old in the art.

Herein each bottom side flap 15, however, is provided with an elongated slit or slot 21 substantially coincident with the side hinge, the said slots being intermediately disposed. Likewise, each bottom end flap 16—17 at the notched ends includes inwardly directed scored creases 16*b* and 17*b* having spaced "knife" slits, respectively, defining triangular portions 16*c* and 17*c*, respectively. End 17 is also slit as at 17*d*.

As will be observed in Figs. 3 and 4, each of the angular slits 18 terminates in inwardly directed slits at right angles thereto, the outer such inwardly directed slit being longer than the opposed inwardly directed slit, whereby the stock embraced by the slits will flex about a line between the free ends of the inwardly directed slits will extend at an angle to the slits 18. This arrangement facilitates the projection therethrough of the tongue formations adjacent the notches indicated at 16*a* and 17*a* respectively in the manner hereinafter described. Thus, when the box is erected the bottom forming side flaps 15 are depressed in angular relation when the bottom forming end flaps 16, 17 are forced downwardly until their tongue formations snap over the slits 18. The angularly directed flexing portion of the stock embraced by the slits bends at the proper angle to accommodate the depressed angular relation of said side flaps. This arrangement causes the tongue formations to slide through the slots as the bottom forming end flaps are released and the side flaps return to their normal positions. This results in a very rapid and positive interlocking of bottom flaps in setting up the box.

The box shown in Figs. 1 and 2 is formed from the blank illustrated in Fig. 3 by initially applying glue to the flap 13 and then lapping the other end of the blank thereover. The blank is thus doubled upon itself and the user

opens it into its generally rectangular form and interconnects the bottom forming portions.

Since this blank provides for relatively shallow boxes and since the ends and sides are quite narrow, see Fig. 3, in the automatic gluing, folding, and securing operations "cocking" is usual, resulting in a union not exactly "square." This results in bottom buckling, etc., and requires more care and time in erection.

To avoid this most prevalent difficulty with its attendant objections, etc., the sequentially arranged bottom forming flaps 15—16, 15 and 17, normally initially independent of each other, herein are formed and initially joined with readily severable ties 9 as indicated in Fig. 3.

Such ties, accordingly, hold the bottom forming flaps together in sequential relation so that following glue application to glue flap 13, the automatic folding, for securing, is a "square" fold. This permits "perfect" high speed automatic gluing of shallow box blanks. These ties remain unbroken until the box is erected, thus also facilitating the initial erection step, arranging the blank in tubular form, etc., by the purchaser.

When so arranged, the ties are readily pressure severable as the side flaps 15 are turned inwardly towards each other and the end flaps 16 and 17 are similarly turned to exteriorly lap the side flaps 15 and be pushed down or inwardly to interlock therewith.

To reinforce and maintain the blank in proper shape during the gluing operation, and facilitate erection of the box structure, the bottom forming side and end flaps 15, 16, 17 are firmly joined together by the triangular portions or flaps 16c and 17c through both the severable ties 9 and "knifed" score creases as indicated at 9a and 16b. This structure firmly maintains the box "square" not only during the gluing operation but in the tubular forming of the blank into the knockdown flat box structure, as well as during its erection. During erection the ties 9 are broken away so as to free the bottom side and end flaps from each other. The triangular flap portions 16c, 17c are caused to flex about the "knifed" score line while serving as a side bearing and guiding portion as said end flaps are forced against the side flaps until the tongues register with and slide into slits 18. The knifing of the scored lines 16b, 17b forming the spaced slits increases the flexibility of these triangular web portions so that they will not too greatly resist the depressing and interlocking action during erection.

From the foregoing it will be observed that a box of this structure, and particularly one formed of light flexible stock and of small size, will not become distorted or cocked during the gluing operation such as to throw the blank out of square. The ties 9, through the triangular web portions 16c, the highly flexible "knifed" score lines 16b, 17b, and highly flexible stock of which the box is formed will be held square. This is an essential feature in the production of boxes of this character which are generally run through the gluing machines at a high rate of speed such as 10,000 to 20,000 per hour.

The invention claimed is:

1. A blank for forming a collapsible box of paper stock, including an elongated series of alternate side and end wall sections joined at score lines, a glue flap extending outwardly from one of said sections as a continuation of the elongated series of alternate side and end wall sections to receive an application of glue for adhering it to the free end of the far section when said blank is formed into a collapsible tube for box erection, a second and adjoining elongated series of alternate bottom forming side and end flaps hingedly connected at a score line with said sections respectively, said bottom forming side flaps each having spaced tongue receiving slits, said tongue receiving slits being angularly related transversely of the direction of movement of said tongues in entering said slits, and terminating at each end thereof in inwardly directed slits extending at right angles thereto, the near end slits being of less length than the far end slits whereby the stock embraced by said slits will flex along a line extending at an angle to the tongue receiving slits, and opposed locking tongues notched from the free edges of said bottom forming end flaps respectively for registry and interlocking engagement with said slits when erected, said side and end flaps being severed throughout the greater portion of their adjoining edges, and wherein a creased score line extends at an angle to the partially severed line between said side and end flaps and within said end flaps from each inner corner thereof outwardly to the inner portion of each notched out locking tongue, forming a triangular web portion between adjacent side and end flaps, adapted to be bent on said angularly disposed score line upon said flaps being forced into interlocking position.

2. A blank for forming a collapsible box of paper stock, including an elongated series of alternate side and end wall sections joined at score lines, a glue flap extending outwardly from one of said sections as a continuation of the elongated series of alternate side and end wall sections to receive an application of glue for adhering it to the free end of the far section when said blank is formed into a collapsible tube for box erection, a second and adjoining elongated series of alternate bottom forming side and end flaps hingedly connected at a score line with said sections respectively, said bottom forming side flaps each having spaced tongue receiving slits, said tongue receiving slits being angularly related transversely of the direction of movement of said tongues in entering said slits, and terminating at each end thereof in inwardly directed slits extending at right angles thereto, the near end slits being of less length than the far end slits whereby the stock embraced by said slits will flex along a line extending at an angle to the tongue receiving slits, and opposed locking tongues notched from the free edges of said bottom forming end flaps respectively for registry and interlocking engagement with said slits when erected, said side and end flaps being severed throughout the greater portion of their adjoining edges, and wherein a creased score line extends at angle to the partially severed line between said side and end flaps and within said end flaps from each inner corner thereof outwardly to the inner portion of each notched out locking tongue, forming a triangular web portion between adjacent side and end flaps, adapted to be bent on said angularly disposed score line upon said flaps being forced into interlocking position, said angularly disposed score line being formed with alternate knife-cut slits to increase the flexing of the said triangular web portion.

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