Feb. 15, 1955 R. E. VAN ROSEN 2,702,153

CORNER LOCK BOX

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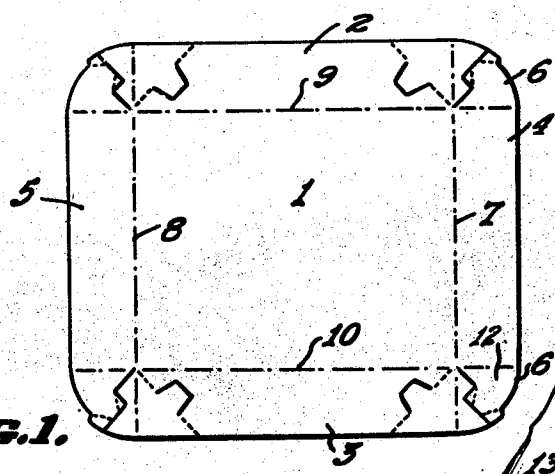


FIG. 1.

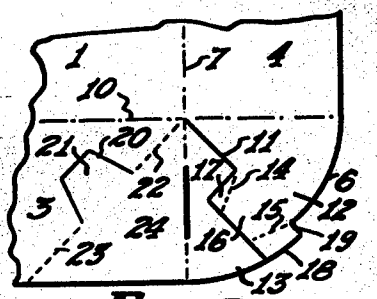


FIG. 2.

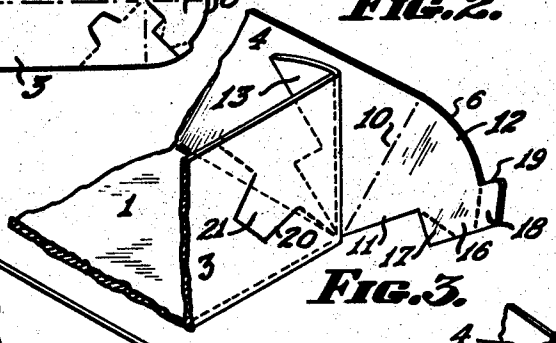


FIG. 3.

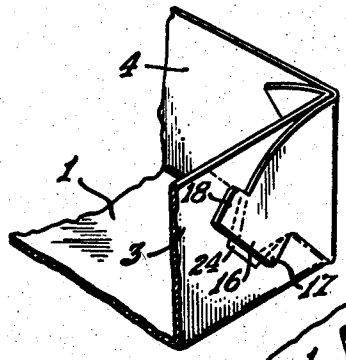


FIG. 4.

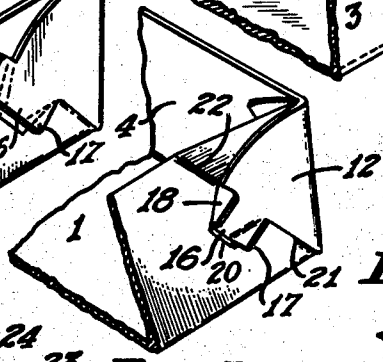


FIG. 5.

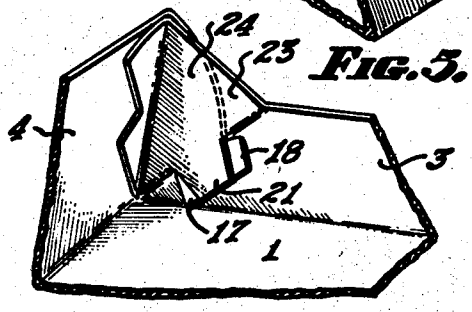


FIG. 6.

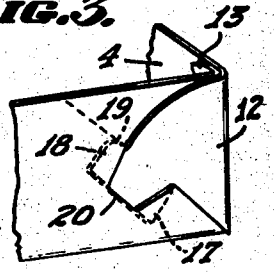


FIG. 7.

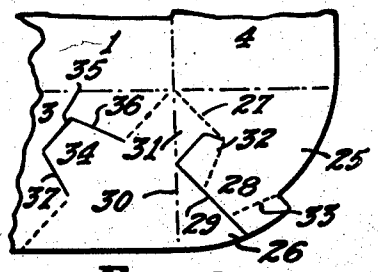


FIG. 8.

INVENTOR.
ROBERT E. VAN ROSEN,
BY Allen & Allen
ATTORNEYS.

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2,702,153

CORNER LOCK BOX

Robert E. Van Rosen, Middletown, Ohio, assignor to The Gardner Board and Carton Co., Middletown, Ohio, a corporation of Ohio

Application January 20, 1951, Serial No. 206,983

2 Claims. (Cl. 229—35)

My present invention relates to a box construction and more particularly to a box constructed of paperboard, fiberboard and the like which can be shipped and stored in knocked down or collapsed form and then set up when desired to be used. My invention is particularly adapted for use in suit boxes and other merchandise boxes such as are used in department stores and specialty shops to package merchandise delivered to the consumer.

A primary object of my invention is the provision of a box of the character described, having an improved corner lock construction providing for interlocking engagement between adjacent walls of the box in a particularly neat and efficient manner and serving as a reinforcement for the walls of the box.

Another object of my invention is to construct a box of this character, which is simple and inexpensive to produce and which can be quickly and readily assembled with a minimum amount of manipulation and expenditure of time.

Another object of my invention is the provision of a box having a main panel and side and end walls formed from a general rectangular blank having corner areas characterized by little or no waste material.

Yet another object of my invention is the provision of a collapsible box having locking tongues with foldable ears or wings engageable with cut out openings adapted to receive the locking tongues and secure them against accidental detachment in handling or shipping.

Yet another object of my invention is the provision of cut out openings for receiving the locking tongues wherein the openings are formed by U-shaped tabs struck from the walls of the box, the tabs having diagonal score lines extending from their base edges outwardly to the opposite edges of the walls in which they are located but not along the bases of the tabs themselves. In other words, the tabs are bendable along diagonal score lines beyond their ends and not along their bases. The diagonal score lines form triangular portions at the ends of the tab containing walls which are bendable relative to the main portions of the walls. Thus, by flexing the walls along the diagonal score lines, the tabs are moved with the triangular portions without bending with respect to the said triangular portions. This means that the tabs will be coplanar with the walls when erected and will not protrude within the box, as has heretofore been the case with tabs articulated to the wall members along score lines along their bases.

Yet another object of my invention is the provision of a corner lock box which may be collapsed i. e. the side and end walls flattened on the bottom, without disengaging the locking tongues connecting the side and end walls together.

Still another object of my invention is the provision of a corner lock box in which two corners of the box can be locked simultaneously, each corner requiring only one hand of the person assembling the box to set it up in assembled condition.

These and other objects of my invention which will appear hereinafter or which will be apparent to a skilled worker in the art upon reading this specification, I accomplish by that construction and arrangement of parts of which I shall now describe certain exemplary embodiments.

Reference is made to the accompanying drawings wherein:

Figure 1 is a plan view of a boxblank cut and scored in accordance with my invention.

Figure 2 is an enlarged partial plan view of a corner of the blank illustrated in Figure 1.

Figure 3 is a partial perspective view of a step in the erection of my box, showing the manner in which the wall members are erected.

Figure 4 is a view similar to Figure 3 showing the wall members in completely erected condition with the locking tongue overlying the cut out openings but not yet inserted therein.

Figure 5 is a view similar to Figure 4 showing the position of the wall members as the locking tongue is inserted in the cut out opening.

Figure 6 is also a partial perspective view illustrating the box corner in the position shown in Figure 5 but looking from the inside of the box toward the corner, the locking tongue being inserted in the cutout opening.

Figure 7 is a view similar to Figure 5 showing the box corner in completely erected and locked condition, the position of the locking tongue wings being indicated in dotted lines.

Figure 8 is a partial plan view of a corner of a modified form of the boxblank illustrated in Figure 2.

Referring now to Figure 1 of the drawings, I have illustrated a blank for a five-walled box incorporating my novel corner lock. It will be understood, of course, that the blank illustrated forms either the top or the bottom of the ordinary suit box, two sizes of blanks usually being employed in the formation of the box parts so that the top half will telescope over the bottom. The blank comprises a main panel 1, side walls 2 and 3 and end walls 4 and 5. While I have referred to side and end walls, it should be understood that these terms are relative and not intended as limitations affecting the nature of the box being produced, it being obvious that the box could be square or rectangular, or of other shape if so desired.

In the embodiment illustrated, the corner portions are designated generally at 6 and are separated from the side walls 2 and 3 and the end walls 4 and 5 by the score lines 7, 8 and 9, 10 respectively, the score lines also serving to separate the side and end walls from the main panel. The corner portions 6 are divided substantially diagonally by the irregular lines of cut 11 into tongue portions 12 and reinforcement portions 13. As seen more clearly in Figure 2, the tongue portions 12 are each divided by the score lines 14 and 15 into intermediate portion 16 and wing portions 17 and 18. The outer edges of the corner portions 6 are preferably rounded off in the manner illustrated in the drawings, the wing portions 18 projecting beyond the tongue portions 12 so as to provide abutting edges 19 for engagement behind an edge of the cut out openings through which the locking tongues are passed, as will be explained more fully hereinafter.

The side walls 2 and 3 are provided adjacent their ends with cut out openings 20 to receive the locking tongues described above. As will be evident from the drawings, the cut out openings are formed by cutting substantially U-shaped tabs 21 in the wall members 2 and 3, the tabs being diagonally disposed with respect to the end edges of the side walls and having diagonal score lines 22 and 23 extending from their base ends to opposite edges of the side wall members. The score lines 22 extend diagonally outward from the corners of the main panel 1 and terminate at the inner ends of the tabs 21, whereas the score lines 23 which are in effect extensions of the score lines 22 start at the opposite ends of the U-shaped tabs 21 and extend outwardly to the free edges of the side wall members. It will be noted that the score lines 22 and 23 together with the U-shaped tabs 21 define generally triangular panel portions 24 which are foldable relative to the side walls along the aforementioned diagonal score lines. When the panel portions 24 are folded along the score lines 22 and 23 they carry with them the tab portions 21, thereby exposing the cut out openings 20. Thus the tab portions 21 are bent relative to the side wall members along score lines extending beyond their end edges rather than along score lines along their bases, as would be the usual procedure. This is one of the important features of my invention since it provides tabs adapted to hold the locking tongues in assembled condition which do not protrude within the box and also enables the user

to collapse or knock down the body walls of the box without the necessity of disassembling the locking tongues.

The mode of erecting a corner of my box is illustrated in various stages in Figures 3 through 7. The first step, as seen in Figure 3, is the erection of the side wall 3 to a position substantially perpendicular to the main panel 1, accompanied by the infolding of the reinforcement portion 13. The end wall 4 is then folded upwardly until it is also substantially perpendicular to the main panel with the locking tongue 12 extending freely beyond the corner formed by the juncture of the wall members 3 and 4. The locking tongue 12 is then folded on the score line 10 until it lies along the side wall 3 in substantially the manner illustrated in Figure 4 of the drawings. In this position it will be noted that the intermediate portion 16 of the locking tongue overlies the tab portion 21 with the wing portions 17 and 18 extending therebeyond.

Pressure is next applied to the intermediate portion 16 of the locking tongue so as to cause it to pass through the cut out opening 20. As seen in Figure 5, the intermediate portion of the tongue has been passed through the opening 20 thereby causing the wing portions 17 and 18 to be bent outwardly so that they will also pass through the opening. It will be noted that this movement of the tongue is accompanied by an inward flexing of wall member 3 and triangular panel portion 24 along the score lines 22 and 23. This action can be best seen in Figure 6 which shows the flexing of the wall member 3 and the triangular portion 24 as seen from the interior of the box. It will be noted that the triangular portion 24 in flexing, carries with it the tab portion 21, the tab portion moving only with respect to the wall member 3 and remaining coplanar with respect to the portion 24. When the wing portions 17 and 18 have been passed inwardly beyond the edges of the U-shaped cut 20, they will spring outwardly and assume the position illustrated in Figure 6. There then remains only to return the wall member 3 and the triangular portion 24 to their original coplanar position to complete the erection of the box corner. It will be understood that each corner of the box will be treated in like manner and preferably the corner locks at each end of the box will be assembled simultaneously.

The completely erected corner assembly is seen in Figure 7 of the drawings, wherein the wing portions 17 and 18 of the locking tongue lie flush against the inside of the wall member 3 adjacent the cut out opening 20. It will be noted that the tab 21, which is coplanar with the triangular portion 24, serves to press the free end of the locking tab against the inner surface of wall member 3 and thus prevents the tongue from extending within the box where it will interfere with contents placed therein and possibly be torn off. It will also be evident from Figure 7 that the abutting edge 19 of wing portion 18 is firmly anchored beyond the cut out opening 20 and will not become disengaged in ordinary handling. Furthermore, it will be noted that the infolded reinforcement portion 13, which has been infolded, presses outwardly against the end wall 4 and thus compensates for any looseness in the engagement between the locking tongue and the cut out opening by urging the locking tongue away from the slot and hence tightening the engagement between the tongue and the edges of the opening. The locking tongue may, however, be readily disengaged simply by flexing the wall member 3 inwardly while at the same time grasping the free edge of intermediate tongue portion 16 and pulling it outwardly. thus causing the wing portions 17 and 18 to bend in the opposite direction along their score lines and be extracted from the cut out opening.

Referring again to Figure 6, it will be evident that even with the locking tongue in the assembled condition, the side walls 3 and 4 may be collapsed to lie on the main panel 1, the wall member 3 being first folded so that the triangular portion 24 may be reversely folded along the score lines 22 and 23 with the wall member 4 folded over on top.

A modified version of the blank illustrated in Figures 1 and 2 is shown in Figure 8. This embodiment differs from the former in that the irregular diagonal line separating the locking tongue 25 from the reinforcement portion 26 is in part a score line and in part a line of severance. Thus, the irregular diagonal line comprises a scored portion 27 extending from the corner of the main panel 1 outwardly to the base of the intermediate tongue portion 28, the remainder of the diagonal line being a line of severance 29 defining the wing portions of the locking tongue. It will be noted that the line of severance 29 contacts the score line 30 intermediate its ends to provide a bellows folding portion 31. When the box is erected, the portion 31 will fold outwardly with the tongue 25 as the latter is folded to overlie the wall member 3. The reinforcement portion 26 will be infolded to lie against the inner surface of the wall member 4 as before.

It has also been found that a superior and more readily obtainable locking engagement can be obtained between the locking tongues and the cut out openings if the score lines defining the wing portions of the locking tongues are made to converge more rapidly than the lines of cut defining the side edges of the openings for receiving the locking tongues. Thus, with reference to Figure 8 of the drawings, it will be noted that the intermediate portion 28 of the locking tongue, as defined by the score lines 32 and 33, resembles closely the tab 34 defined by the line of cut 35 having converging sides 36 and 37. It will be noted, however, that while the distance between the score lines 32 and 33 at their base is substantially equal to the distance between the lines of cut 36 and 37 at their base, the score lines 32 and 33 converge more rapidly and hence the intermediate portion 28 is narrower at its free edge than is the tab portion 34. It has been found much easier and more convenient to interlock the parts when this arrangement exists than it would be if the parts were of substantially equal dimensions throughout. It will be understood that this arrangement of parts is equally applicable to the blank illustrated in Figures 1 and 2 as it is to the blank illustrated in Figure 8. Also, it will be understood that the intermediate portions of the locking tongues, and the tab portions of the cut out openings, need not be of general U-shaped configuration, but may, if desired, take other shapes such as that of a triangle; the score lines 32 and 33 in Figure 8, for example, converging to form a point adjacent the line of cut 29.

It will be understood that modifications may be made in my invention without departing from the spirit of it. Having, however, described my invention in certain exemplary embodiments, what I desire to secure by Letters Patent is:

1. In a corner lock box capable of being flat-folded from the erected condition without disengaging the corner locks, a main panel having a corner, a first sidewall articulated to a first side edge of the main panel contiguous said corner, a second sidewall articulated to a second side edge of said main panel contiguous said corner, a locking tongue articulated to the end edge of said first sidewall and foldable about the end edge of said second sidewall, a generally U-shaped tab formed in said second sidewall defining a cutout opening for receiving said locking tongue, the base of said tab lying along a line extending diagonally outwardly through said second sidewall from the corner of said main panel to the outer edge of said wall and defining a triangular portion in said wall, said tab lying intermediate the ends of said line and to the outside of said triangular portion, said line being scored from the corner of said main panel to the base of said tab, and from the base of said tab to the outer edge of said second sidewall, the base of said tab itself being free of scoring, whereby to constitute said triangular portion and said tab an integral coplanar surface foldable relative to the remainder of said second sidewall to expose said cutout opening, so that upon folding of said locking tongue to overlie said second sidewall, said tongue and said tab will be juxtaposed and, upon joint inward movement of said tab and said locking tongue, said locking tongue will be passed through the cutout opening created by the displacement of said tab, said tab serving in the erected box to prevent said locking tongue from projecting inwardly within said box.

2. The box structure claimed in claim 1 wherein said locking tongue comprises a central portion and articulated wing portions, said central portion corresponding substantially to the generally U-shaped configuration of said tab and adapted to contact said tab in face-to-face relation, said tab and the central portion of said tongue being jointly depressable to pass said tongue through

said cutout opening, the wing portions of said tongue being foldable relative to the central portion thereof as the latter is passed through said cutout opening.

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