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S. BERGSTEIN

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HINGED LID AUTOMATIC BOX

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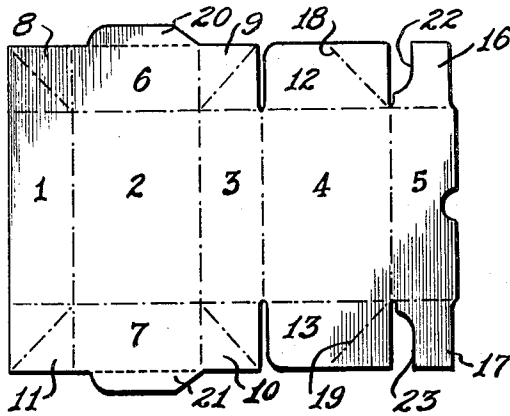


FIG. 1.

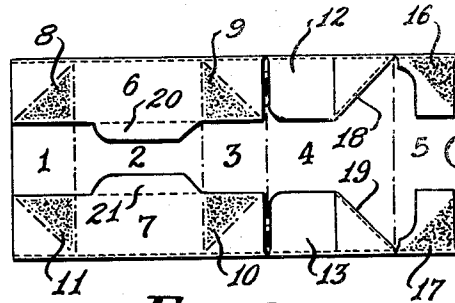
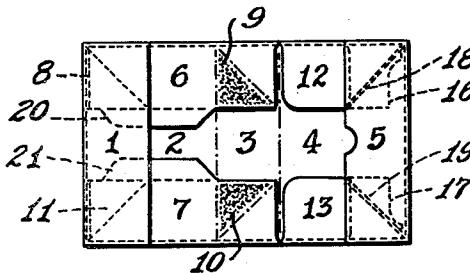


FIG. 2.



UNITED STATES PATENT OFFICE

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HINGED LID AUTOMATIC BOX

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5 Claims. (Cl. 229—31)

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In my pending application entitled "Boxes for Frozen Foods and Like Uses," Serial No. 596,538 filed May 29, 1945, now abandoned, I have disclosed certain types of automatic one-piece boxes, particularly adapted for frozen foods, but useful also for other purposes. My present invention is directed to certain improvements, particularly in the type of box shown in the said co-pending application in Figs. 7 through 12.

It is an object of the present invention to provide a one-piece box in which, when the box is erected, the bottom will stand fully open under varying conveying and handling conditions, so as to provide the most effective and efficient condition for filling. It is a further object of my invention to provide means for the positive retention of the cover of the filled box when it is placed in closed position, automatically, so that it will not spring open under subsequent handling and shipping conditions, but at the same time can be readily opened by a positive raising action when desired. It is a further object of the invention to provide these features in a box construction which has a liquid-tight bottom, making it particularly adaptable for frozen foods and the like. These and other objects of my invention will become apparent as the description proceeds, I attain by that construction and arrangement of parts of which I shall now describe an exemplary embodiment. Reference is made to the drawings forming part of this specification, and in which:

Fig. 1 is a plan view of a blank for my improved box.

Figs. 2, 3 and 4 show in plan successive stages in the folding and gluing of the box.

Fig. 5 is an isometric view indicating the box being opened as by a pair of hands, indicating how the flanges can be folded back and out as part of the simultaneous motion of raising the two side walls.

Fig. 6 is an isometric view of the box after being so opened, the flanges being folded outwardly and serving thereby to retain the bottom portion of the box in opened position.

Fig. 7 is an isometric view showing the lid in partially closed position, indicating how the action of bringing down the lid serves to continue the downward and outward folding of the flanges.

Fig. 8 is an end-elevational view of the closed container showing flanges and the cut-away portions of the corner glued tabs of the lid, to provide a positive automatic interlock when the lid is in fully-closed position.

Fig. 9 is a section along line 9—9 of Figure 8.

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Referring to Figure 1, I have shown a blank, cut and scored to present a front wall 1, a bottom panel 2, a back wall 3, a top panel 4 and a top front wall 5, articulated together by the usual score lines indicated by dot-dash lines in the drawing. At the ends of the bottom panel 2, end walls 6 and 7 are articulated. Webs 8, 9, 10 and 11 join and are articulated to the front, back and end walls; and these webs are provided with diagonal score lines as shown. Top end walls 12 and 13 are articulated to the ends of the top panel and are provided with diagonal score lines 18 and 19 demarking triangular tabs. The top front wall 5 is provided with articulated end tabs 16 and 17. The structure thus far described is similar to a structure shown in my said co-pending application.

Two essential modifications of structure appear in Figure 1, however, flaps 20 and 21 have been articulated to the outer edges of the end walls 6 and 7. Also, the tabs 16 and 17 have been cut back as indicated at 22 and 23. The effective depth of these cut-backs is made equivalent to the effective depth of the flaps 21 and 22. Moreover, they are so formed as to avoid that portion of the flaps 16 and 17, which in the final form of the box will overlie and be secured to the triangular tabs on the top end walls 12 and 13 (note the shaded areas on flaps 16 and 17 in Figure 2). This will require that the forward ends of the flaps 20 and 21 be spaced slightly inwardly from the ends of the end walls 6 and 7 as shown; and the forward ends of flaps 20 and 21 will preferably be shaped to conform to the shape of the cut-backs 22 and 23.

The order of the steps in forming the finished, knocked-down box, and the mechanism by which these steps are accomplished, are not limitations upon the present invention. It will be sufficient for an understanding of my structure to point out that if the end walls 6 and 7, the webs 8, 9, 10 and 11, the top end walls 12 and 13 and the tabs 16 and 17 are all brought to an infolded position, as shown in Figure 2, with the triangular tabs of the top end walls folded along their diagonal score lines so as to overlie the top end walls, glue may be spotted upon the webs 8, 9, 10 and 11 and upon the tabs 16 and 17 as indicated in stippled areas in that figure. It is now possible to fold the blank along the score lines between front wall 1 and bottom panel 2, and also along the score line between top panel 4 and the top front wall 5, bringing the structure into the condition shown in Figure 3.

It will be noted from this figure that the re-

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sult of this folding will be to bring about the adhesion of the adhesive coated portions of webs 8 and 11 to the end walls 6 and 7 respectively, and also that the adhesive coated portions of tabs 16 and 17 are attached to the triangular tabs on the top end walls 12 and 13.

Next the blank may be folded on the score line between the bottom panel 2 and the back wall 3, bringing the structure to the completed, knocked-down condition shown in Figure 4, and resulting in the attachment of the adhesive coated portions of webs 9 and 10 to the end walls 6 and 7 respectively. Pressure is, of course, applied until the adhesive has set.

Fig. 5 is an isometric view of the box so formed, in its initial stage of being opened for use, by a pair of hands as shown in the drawing. As can be seen, as part of the same motion of raising the two end walls 6 and 7, the flaps 20 and 21 can be folded or brushed outwardly, with no extra time or labor. It will be noted that when the end walls are raised, the webs 8, 9, 10 and 11 fold bellows-wise on their diagonal score lines, with the bellows fold lying outside the end walls.

Fig. 6 shows the box in condition for filling. The flaps 20 and 21 have been folded outwardly, and, overlying the bellows folds, help retain the end walls in erect position, to give the widest possible opening area for ready and convenient filling. This figure also shows the lid portion in partially erected condition.

Fig. 7 shows the lid which has now been fully opened by lifting the top end walls, being brought down into the position over the body of the box. This will normally be done after the contents have been placed therein. The figure indicates how the outward and downward folding of the flaps 20 and 21 is continued by the mere action of bringing the lid down, with no further manipulation or operation required.

Fig. 8 is an end view of the closed box, showing the flap 21 and the tab 17 in dotted lines, and indicating how the flap inter-locks with the recessed or cut back portion of the tab. Figure 9, which is a partial cross section of the end of the box illustrates the abutment of the edges of the flap 21 and the tab 17. It will be understood that the same action occurs between flap 20 and tab 16 at the other end of the box.

This action, which I have called inter-locking retains the box in closed condition which is of distinct advantage not only from the standpoint of appearance but also in handling, stacking, freezing, storing and shipping. It is also of importance when the boxes are to be wrapped as part of the packaging process, facilitating the operation of wrapping devices.

When it is desired to open the box, a positive pull of lifting motion on the lid or top causes the flanges to give upwardly, so that, while the lid is held positively against springing open accidentally through the jolts that may occur in ordinary handling and shipping conditions, it can readily enough be opened by a deliberate lift whenever desired. Furthermore, should it be desired to re-use the box, as, for example, after having used part of the contents, it is possible, by bringing the lid down into closed position again, to cause re-engagement between the flanges and the recessed portions of the corner flaps of the lid, again securing it in closed position.

The advantages of my invention will be readily apparent. From the description it is obvious that these advantages are provided with no extra manufacturing operations, as compared to the

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folding and gluing of a box that does not provide them. Furthermore, there is no extra labor or time required on the part of the user or packer of the box. As has been previously explained, the flanges are readily folded outwardly, or partially outwardly, along their line of articulation, as a continuation of the same motion required to raise the side walls of the bottom. And to close the box there is no further manipulation required nor any time-consuming hand-locking, and the like. The mere act of bringing the open lid down into closed position serves to continue the folding backwardly or outwardly of the flaps; and when the lid is finally in its fully closed position, the engagement between the edge of the flap and the cut away portions of the front wall tab of the lid occurs automatically. Also as noted previously, the folded out flaps serve the further purpose of helping retain the bottom of the box in its fully opened condition, thereby simplifying the filling operation.

As in the case of my co-pending application previously referred to, the present construction is particularly adapted to the packaging of frozen foods, although its utility, of course, is not confined thereto. The interior of the box may be readily treated with a proofing substance, such as a wax or a wax-like mixture, and still the knock-down box may be securely glued because the adhesive unions between parts of the bottom is between outer surfaces of the blank. The scored, bellows-folded arrangement of the bottom part of the box is such that when the interior of the blank is properly treated with a proofing substance, it is liquid-tight. Accordingly when the box is in its normal position, as during a freezing operation, the juices or fluids are retained without leakage in the contents, which is an important advantage.

It will be understood that my boxes may be varied as to both size and shape. The terms used herein and in the claims which follow, such as "end walls," "front and back walls" and the like, have been adopted as a matter of convenient terminology to distinguish walls from each other, but do not imply matters of relative dimension.

It will be apparent to those skilled in the art that modifications in my invention may be made without departing from the spirit of the invention as disclosed. Hence, having described my invention in an exemplary embodiment, what I claim as new and desire to secure by Letters Patent is:

1. A knock-down, one piece box having a bottom portion with front, bottom, back and end walls, said front, back and end walls being connected by bellows folding corner webs, portions of said webs being connected to outer sides of said end walls, and an articulated lid portion having top, front and end walls, the bottom portion end walls having flaps articulated to their upper edges and foldable outwardly and downwardly over said folded webs, the top portion having tabs articulated to its front wall whereby said front wall is secured to adjacent side walls of said top portion, said tabs having their upper edges recessed so as to come into inter-locking relationship with said flaps.

2. A knock-down, hinged lid box having front, back and end walls folded inwardly over a bottom panel, said walls being connected by bellows-folding corner webs, portions of said webs being connected to outer sides of said end walls, said end walls having flaps articulated to their edges and adapted, when folded outwardly and down-

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wardly, to overlies said folded webs, said box having front and end walls folded inwardly over a top panel, corner tabs of the infolded front wall of the lid being secured to reversely folded triangular portions of said lid end walls, said corner tabs being recessed to interlock with said flaps when said box is in erected and closed condition.

3. A one-piece knock-down box having four bellows corners adhesively secured to two opposite side walls, said opposite side walls having flanges adapted to be folded out and over said bellows corners, a glued-corner lid having recessed corner flaps secured within the two opposite lid walls, said flanges being adapted to be folded down by the closing of said lid and to be engaged within the recesses in said lid corner flaps to hold said box securely in erect form and to prevent accidental release of said lid.

4. In a knock-down, hinged lid box, a box body having a bottom panel with front, back and end walls articulated thereto, with the ends of said front, back and end walls connected by bellows-folding corner webs, said bellows-folding webs folded outside of said end walls at each end of said body with the innermost folded portions of said webs secured to the outer sides of said end walls, flap portions articulated to the top edges of said end walls and extending substantially the whole length of said walls and foldable outwardly and downwardly over said folded webs, and a box lid having a top panel articulated to the rear wall of said box body, a front wall and end wall articulated to said top panel, tabs on the ends of said lid front wall, with portions of said tabs secured to reversely folded triangular portions of said lid end walls, cut outs in the unsecured portions of said tabs corresponding to the forward ends of the folded over flap portions on the body end walls whereby said tabs and said flaps may

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be interlocked when the box is in erected and closed condition.

5. A hinged lid box for frozen foods and the like comprising a front wall, a bottom wall, a back wall, a top wall and a cover front wall in articulation in the order named, end walls articulated to the ends of the bottom wall, cover end walls articulated to the ends of the top wall, corner connecting webs, diagonally scored, and articulated to the ends of the front, back and end walls and foldable outside said end walls, means for connecting the cover front wall and the cover end walls in knock-down but erectable condition, said means comprising glue tabs articulated to said front cover wall and secured to triangular portions of said cover end walls demarked by diagonal score lines, and flaps articulated to the edges of said end walls and foldable outwardly and downwardly over said corner connecting webs, so as to be confined in such folded position by the lid of said box when in closed position, said glue tabs being recessed to come into interlocking engagement with said flaps upon closing the lid of said box.

SAMUEL BERGSTEIN.

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