July 18, 1950 S. BERGSTEIN 2,515,327

METHOD OF MAKING KNOCKDOWN, HINGED LID CARTONS

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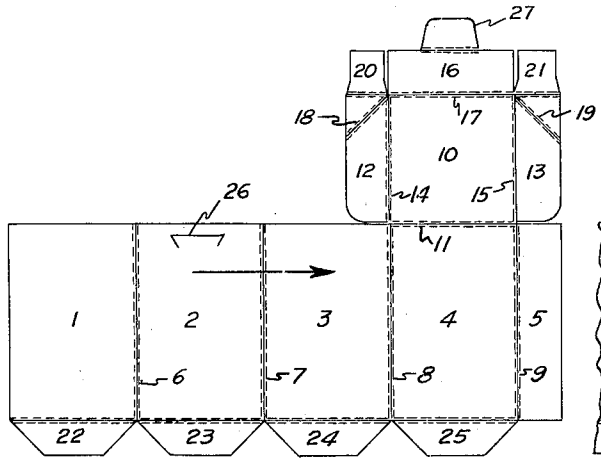


FIG. 1

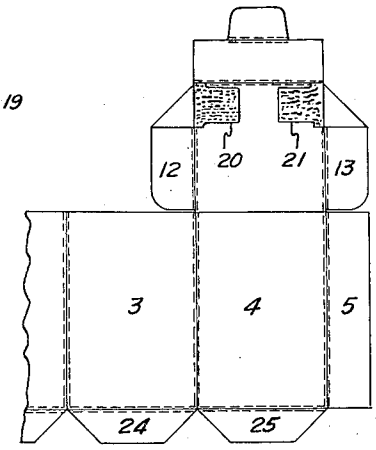


FIG. 2

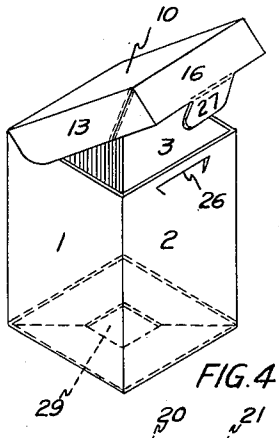


FIG. 4

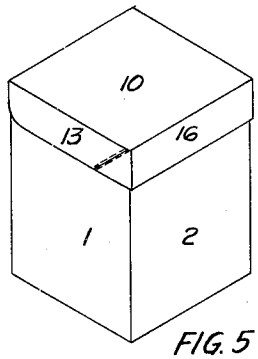


FIG. 5

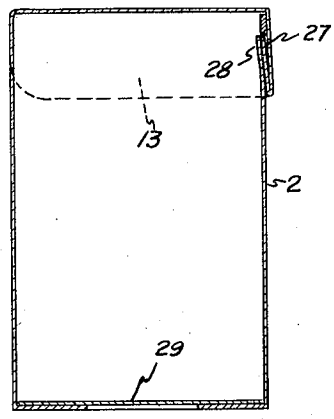


FIG. 6

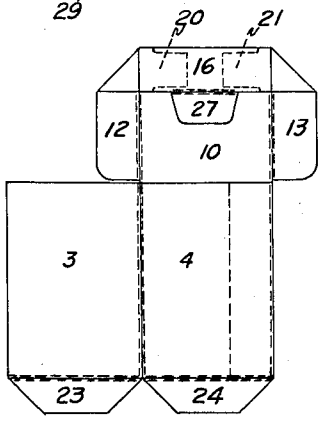


FIG. 3

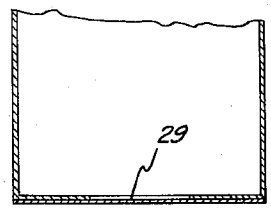


FIG. 7

INVENTOR,
Samuel Bergstein,
BY Allen & Allen,
Attys.

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FIG. 8

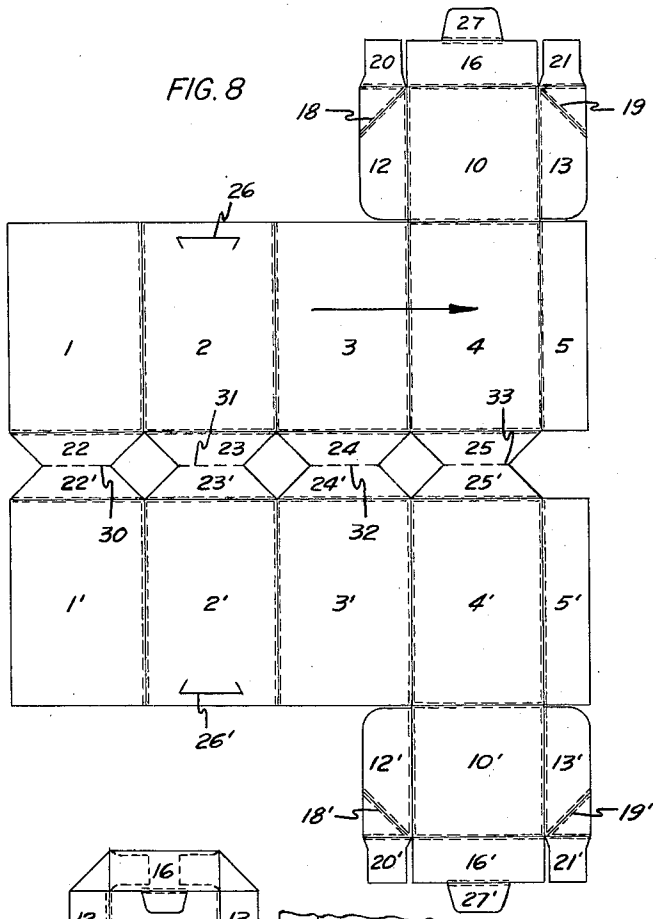


FIG. 11

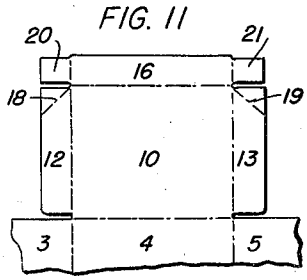


FIG. 12

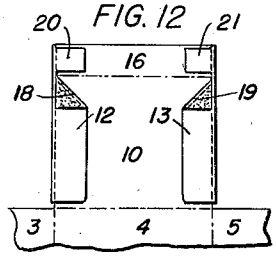
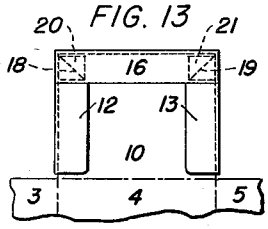
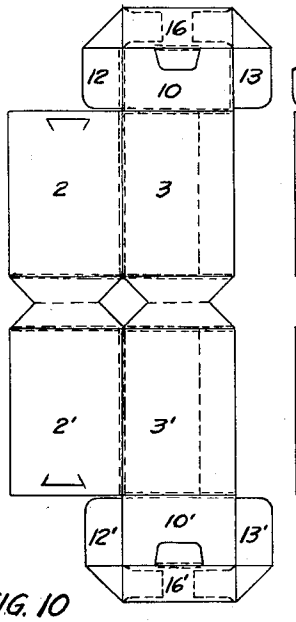


FIG. 13





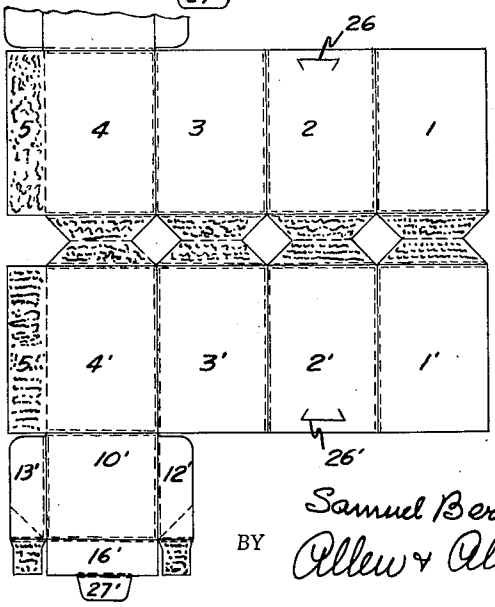


FIG. 9

FIG. 10

INVENTOR,
Samuel Bergstein,
BY Allen & Allen,
Attys.

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UNITED STATES PATENT OFFICE

2,515,327

METHOD OF MAKING KNOCKDOWN, HINGED LID CARTONS

Samuel Bergstein, Cincinnati, Ohio, assignor to Robert Morris Bergstein and Frank David Bergstein, trustees

Application September 9, 1944, Serial No. 553,373

7 Claims. (Cl. 93—49)

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It is an object of my invention to provide a carton having a tubular body and an attached glued corner, knocked down hinged lid, which carton can be made and shipped in the flat or collapsed form and readily erected by the user.

It is an object of my invention to provide a knocked down carton having a preformed hinged lid with provision for ready opening and reclosure.

It is an object of my invention also to provide a method whereby such a carton may be made in machine operations as hereinafter described.

These and other objects of my invention which will be set forth hereinafter or will be apparent to one skilled in the art upon reading these specifications, I accomplish by that certain construction and arrangement of parts and in those procedures of which I shall now describe exemplary embodiments.

Reference is made to the drawings wherein:

Figure 1 is a plan view of a preferred form of my blank.

Figure 2 is a partial plan view showing an initial stage in the formation of the cover or top structure.

Figure 3 is a plan view showing the final stage of cover formation and a tubed condition of the blank.

Figure 4 is a perspective view of an erected carton closed on the bottom and having its cover in open position.

Figure 5 is a perspective view of the closed carton.

Figure 6 is a vertical sectional view through the carton showing one form of bottom closure and also illustrating means for holding the top or cover in closed position.

Figure 7 is a partial sectional view showing another mode of bottom closure formation.

Figure 8 is a plan view of a double blank as hereinafter described.

Figure 9 is a partial plan view of the blank showing the application of adhesive.

Figure 10 is a plan view of a completely formed double structure made from the blank of Figure 8.

Figures 11, 12 and 13 are partial plan views showing successive stages in the formation of an alternative cover or top structure.

In Figure 1 I have shown a carton blank having body walls 1, 2, 3 and 4 and a glue flap 5 in articulation in the order named. These parts are separated by score lines 6, 7, 8 and 9, as shown. At one end at least of the carton I provide a cover structure comprising a top closure wall 10

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articulated to one of the carton body walls by a score line 11. Cover side walls 12 and 13 are articulated to the cover top wall 10 along score lines 14 and 15. A cover front wall 16 is also articulated to the wall 10 along a score line 17. The cover side walls 12 and 13 are provided with diagonal score lines 18 and 19 demarking triangular portions thereof and glue tabs 20 and 21 are articulated to the triangular portions in extensions of the cover side walls 12 and 13.

The particular type of carton which I have illustrated and just described, with the exception of the cover structure does not form a limitation upon the broader aspects of this invention otherwise than as set forth in the appended claims; and it is capable of considerable modification. While I have herein disclosed an unlined carton, lined cartons fall within the purview of this invention. For lined structures and modes of lining them, reference may be made to Patents Nos. 2,099,257; 2,114,621; 2,250,249 and Re. 20,789. As set forth particularly in the two last mentioned patents the carton body may be of the "6-sided" style, in which event it will be tubed about a preformed liner tube or bag by folding it upon a pair of score lines each located medially in one of an opposite pair of carton body walls.

Also containers within the purview of this invention may be closed on the bottom end in a variety of ways. The body walls may be provided with well known seal-end flaps or tuck end flaps, as may be desired. While I have disclosed a hinged cover construction on one end only of the carton, the other end of it may likewise be provided with such a construction, if desired. In the specific embodiment of this case I have shown on the lower ends of the body walls a series of short flaps 22, 23, 24 and 25 beveled at their ends so that they can be bent over in the erected carton to lie substantially in the same plane. This permits the formation of a body closure through the use of a separate die-cut piece of board to extend across the bottom end and to be adhered to these beveled flaps, either inside or outside the flaps, as will be more fully set forth hereinafter.

I have also shown in Figure 1, in the body wall opposite that to which the hinged cover is articulated, a U-shaped line of cut 26. The cover front wall 16 also is provided with a tongue 27 cooperating with this cut in a way hereinafter set forth.

The formation of a knock-down carton from a blank such as shown in Figure 1 may be readily accomplished in the ways now set forth. As to

the steps involved, these are illustrated in Figures 2 and 3. The first step of cover formation is the folding of the triangular portions of the cover side walls 12 and 13 inwardly along their diagonal score lines 18 and 19, as illustrated in Figure 2. Then a suitable adhesive is applied to the glue flaps 20 and 21, as shown by stippling in that figure. The formation of the cover is completed by folding in the cover front wall 16 on its score line 17, as illustrated in Figure 3, so as to cause the glue tabs to adhere to the under side of the cover front wall. The tubing of the carton, as, for example, by folding it along score lines 6 and 8 with application of adhesive to the glue flap 5 so as to adhere this glue flap to the body wall 1, is another main step in the formation of the carton. The carton itself will be in knocked down or collapsed condition and so will the cover structure, upon the completion of these steps. The order of the steps can, however, be varied. The carton body may be tubed before or after the formation of the cover. Incident to the folding and gluing operations generally referred to above, and in the type of carton specifically illustrated, is the application of a coating of adhesive, such as a hot melt composition, to other carton parts, e. g. the flaps 22—25. These operations may readily be carried out by mechanical means.

A mechanism capable of folding the triangular portions and glue tabs on the cover side walls 12 and 13, of applying glue thereto and of folding over the cover front wall is illustrated in the Butterfield Patent No. 1,461,966. The carton of Figure 1 can be sent through such a machine in the direction of the arrow in that figure. At the end of the machine the cartons which are now untubed but which have their cover portions in completely folded and glued condition may be stacked as is usual and then transferred to the usual carton tubing machines, being sent through those machines in a direction transverse to the direction of the arrow, to effect the tubing, all as will be understood in the light of these teachings.

Again, instead of stacking the cartons at the end of the machine, I may tube the bodies of the cartons as a previous operation, or I may couple to the end of the Butterfield machine in right angle relationship a standard tubing machine employing known means for transferring the carton blanks to the new path of travel and thus complete the formation of the carton to the condition shown in Figure 3 in a single machine. Yet again, the instrumentalities shown in the said Butterfield patent are capable of folding the glue tabs and triangular portions of the cover side walls when the carton is moving in an orientation transverse to the arrow in Figure 1. To these instrumentalities or their equivalents I may add in the machine underneath means such as a toothed disk for striking up the cover front wall 16 together with an overhead stationary folder to fold it backwardly over the glue tab; and in this event I may couple a standard tubing machine to the end of the Butterfield machine and complete the formation of the carton while it is moving in a single direction and orientation.

In the practice of my invention with a blank such as that shown in Figure 1, I preferably apply a pre-coating of adhesive to the flaps 22 to 25 inclusive. This is readily done in the first mode of operation described by a glue pot and glue disk applying a longitudinal stripe of adhesive to the blank and requiring no spot gluing operation. In the last mentioned mode of operation spot gluing mechanisms may be employed to accomplish the same end. The gluing means will be located above or below the path of travel of the blanks in the machine, depending upon whether in the formation of the bottom closure of the specific embodiments the flaps 22 to 25 inclusive are to be folded over outside or inside the separate bottom closure piece as hereinafter described.

Since the formation of the bottom closure, as in the exemplary embodiment, is to be accomplished in the plant of the carton user, the adhesive applied to the flaps 22 to 25 inclusive must in this aspect of my process be an adhesive capable of being rendered non-tacky within the limits of machine operation and then reactivated or rendered tacky again by suitable means. The most readily available adhesives with these properties are adhesives of thermoplastic character applied hot and molten or viscous, having the property of setting upon rapid cooling and capable of being readily re-activated by the application of heat.

Figure 4 shows my carton in the exemplary embodiment erected and closed on the bottom but with the cover partially open. Figure 5 shows a closed carton. Figure 6 indicates the manner in which the small flap 27, turned inwardly when the carton lid is closed, depresses a flap 28 in the wall 2 formed by the cut line 26, and abuts at its edge against a portion of the wall 2 at the top of the cut. This forms a releasable lock which holds the cover closed but which when an opening force is applied to the cover, releases when the flap 27 pivots on its score line. Such a carton may readily be opened and reclosed indefinitely, yet is capable of maintaining its closed condition.

The specific types of bottom closure illustrated in the drawings of this case, and the procedure for forming such closures do not form a limitation on this invention. It may be pointed out that the bottom of the exemplary carton herein is closed through the use of a separate die cut piece of board 29 in Figures 4, 6 and 7 which is put in position after the carton body is erected. The bottom flaps 22 to 25 inclusive are folded over either outside of and after the application of the die cut piece, as in Figure 6, or are folded over first, after which the die cut piece is applied to them, as in Figure 7. The choice of either of these structures determines upon which side of the flaps 22 to 25 the adhesive will be imposed. In forming these types of bottom closure, where the adhesive has already been imposed as described, it will be reactivated in any appropriate fashion. If it is thermoplastic, the adhesive will be reactivated by heat during the application of pressure to the flaps and the die cut piece in forming the closure. It is, of course, possible to omit the application of adhesive to the flaps 22 to 25 during the formation of the blank and to apply it either to these flaps or to the die cut piece during the formation of the closure. Again, the die cut pieces may have an adhesive applied to them before the closure is made.

It will be a normal procedure in the use of cartons formed in accordance with my invention to erect them, close them upon the bottom and fill them, after which, when the cover side walls 12 and 13 are erected with respect to the cover top wall 10 and the flap 27 turned in, it is a simple matter to position the lid or cover, as shown in Figure 5. If the cartons are lined cartons, then concurrently with these last mentioned opera-

tions the liners will be closed and sealed at one or both ends, as may be necessary.

In Figures 8 to 10 inclusive, I have illustrated a double blank and operations in forming it. The top half of this blank is the same as the blank shown in Figure 1 and the same index numerals have been applied to it. The lower half is a reverse counterpart or mirror image of the upper half to which the same numerals, primed, have been applied. The two blanks are joined at their respective bottom flaps 22 to 25 and 22' to 25' along lines for severance 30, 31, 32 and 33. The same instrumentalities and modes of operation which have been discussed in connection with the formation of the knocked down carton from the single blank of Figure 1 apply here also; and the change in these operations is merely that the triangular portions and glue flaps of the lower cover conformation must also be folded as well as the cover front wall 16' of the lower blank, as is illustrated in Figure 10 and as will be readily understood. The Butterfield mechanism is capable of performing these operations with the double blank traveling in the direction of the arrow in Figure 8. It is also capable of folding the triangular portions and glue flaps with the blank traveling in a direction normal to the arrow; but in this event, folding means moving more rapidly than the blank are provided to fold forwardly the cover front wall 16'. The tubing operation remains unchanged.

Figure 9 shows the application of adhesive to the glue flaps 5 and 5' and also the striping of adhesive on the flaps 22 to 25 and 22' to 25'. The result of the forming operations described is two complete cartons articulated together along lines for ready severance. The two cartons may be shipped in this condition or they may be separated before shipment. In accordance with this aspect of my invention a single machine operation provides two complete boxes, thereby substantially reducing manufacturing cost and doubling the speed of production.

Various modifications may be made in my invention without departing from the spirit of it. Some of these modifications have been set forth above. By way of another example, in the formation of a hinged, 4-wall cover in knocked down form, I may articulate the glue flaps 20 and 21 to the ends of the cover front wall 16 instead of to the cover side walls 12 and 13, as illustrated in Figure 11. In this event, the cover may be formed as illustrated in Figures 12 and 13 by infolding the cover side walls 12 and 13, folding reversely the triangular portions thereof along score lines 18 and 19, folding inwardly the glue tabs 20 and 21 on the cover front wall 16, and then folding over the cover front wall 16 with the application of adhesive between the meeting edges of the glue tabs and the triangular portions. For such an operation the mechanism of my Patent No. 1,926,364 dated September 12, 1933, may be used. These and other variations which will be apparent to the skilled worker in the art in the light of the teachings herein are intended to be included within the scope of the appended claims excepting where otherwise specifically excluded.

Having thus described my invention in certain exemplary embodiments, what I claim as new and desire to secure by Letters Patent is:

1. A method of making knocked down hinged cover cartons which comprises providing a carton blank having enclosing body walls and a glue flap, a cover top panel articulated to one of the body walls and cover side walls, and a cover front wall articulated to the cover top wall, which includes moving said blank, folding portions of said cover side walls on diagonal lines, folding the cover front wall and connecting said side walls with said front wall so as to produce a formed cover in knocked down condition, and tubing said blank by folding it upon a pair of parallel score lines and adhering said glue flap to one of the enclosing body walls.

2. The method claimed in claim 1 wherein glue tabs are provided on the ends of said cover side walls and wherein said glue tabs are folded with portions of said cover side walls with the adhesion of said glue tabs to said cover front wall.

3. The method claimed in claim 1 wherein glue tabs are articulated to the ends of said cover front wall, wherein said glue tabs are folded with respect to said cover front wall and said cover side walls are folded inwardly with reverse turning of end portions thereof, said end portions being adhered to said glue tabs whereby to provide a cover structure in knocked down form and in folded condition.

4. The method of claim 1 wherein the blank is moved in a path transverse the said enclosing body walls while said cover structure is being folded and is moved in a direction normal thereto while said body is being tubed.

5. The method of claim 1 wherein the carton is being moved in a direction longitudinal of the enclosing body walls during the folding of said cover side walls and said cover front walls.

6. The method of claim 1 wherein the carton blank has closure flaps at the ends of said enclosing body walls opposite said cover structure and which includes the step of applying adhesive to said flaps during the movement of the carton and prior to the tubing thereof.

7. The method of claim 1 wherein the blank includes two carton constructions articulated together along a line of severance, and oppositely directed, and in which the folding of two cover structures occurs simultaneously in opposite directions.

SAMUEL BERGSTEIN.

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