

[54] **COLLAPSIBLE REUSEABLE CARTON**

3,104,795 9/1963 Adams229/39 R

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[57] **ABSTRACT**

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A one-piece carton differing from the RSC type in that it has a score line medially of each end panel. The bottom-forming panels are defined only by score lines, without slots, and the top closure may be of the RSC type or omitted altogether. The carton is designed particularly for handling the standard lot of 30 dozen eggs.

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[51] Int. Cl.**B65d 5/10**

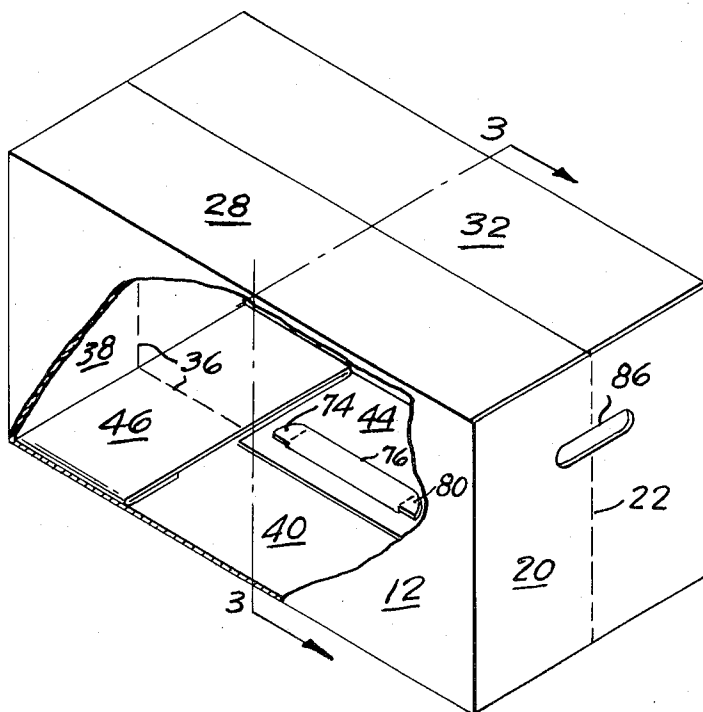
[58] Field of Search229/39 R, 41 R, 41 B

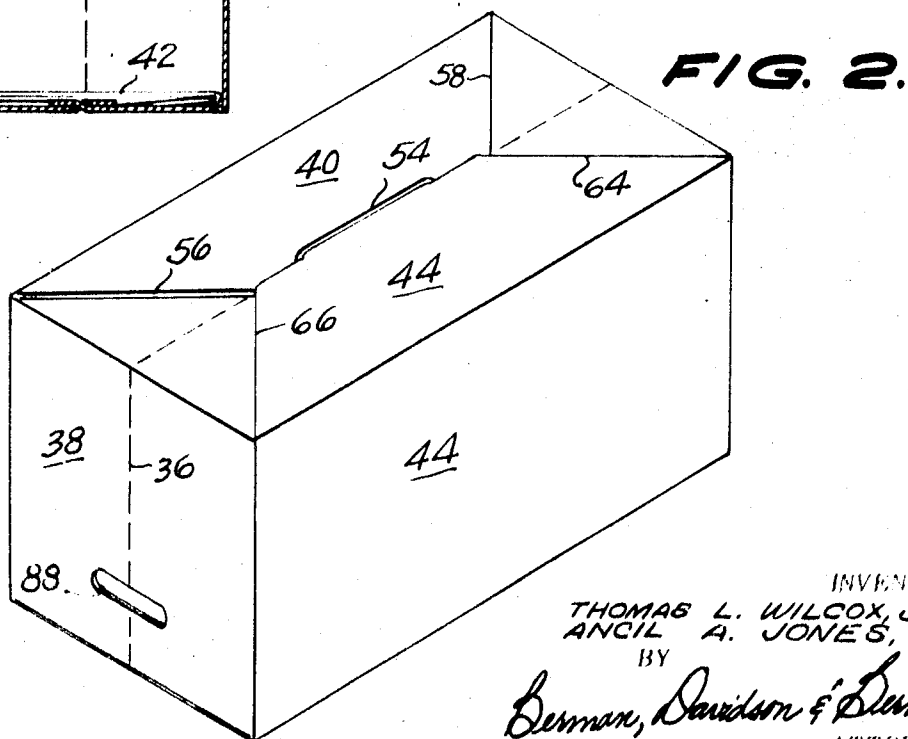
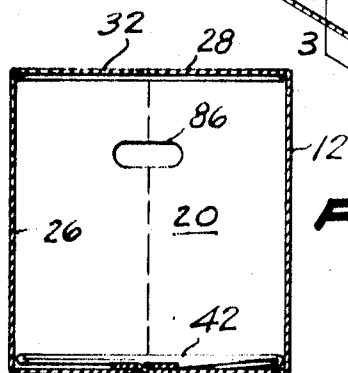
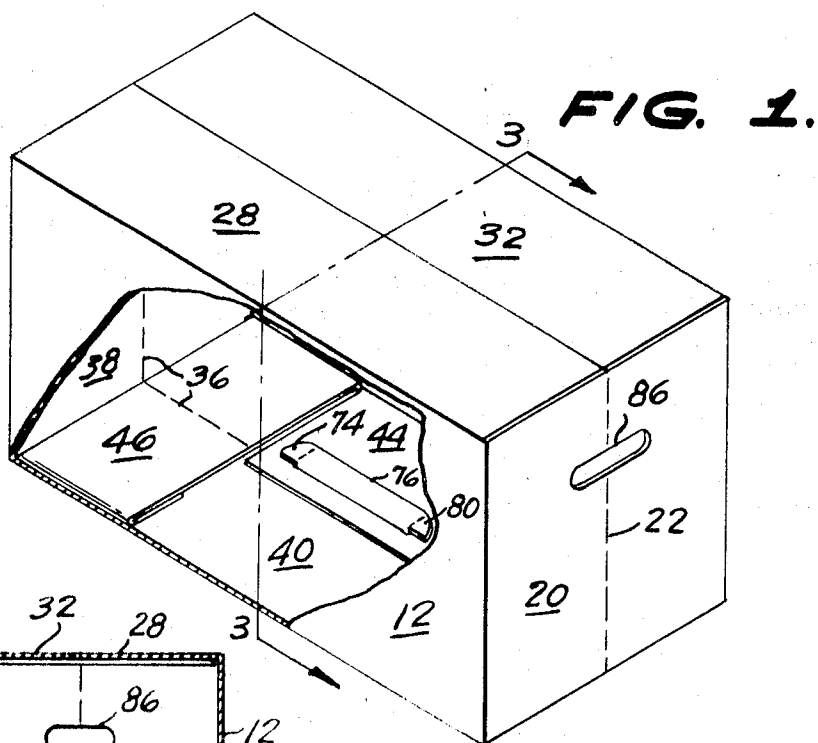
[56] **References Cited**

UNITED STATES PATENTS

1 Claims, 8 Drawing Figures

3,115,291 12/1963 Kotowick229/41 B





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FIG. 4.

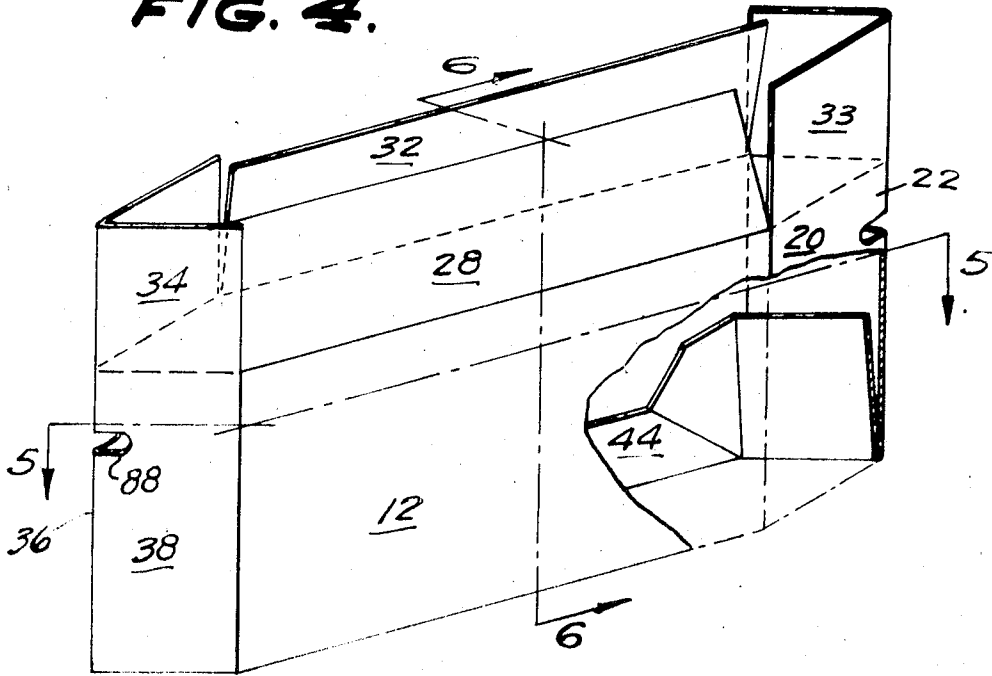


FIG. 5.

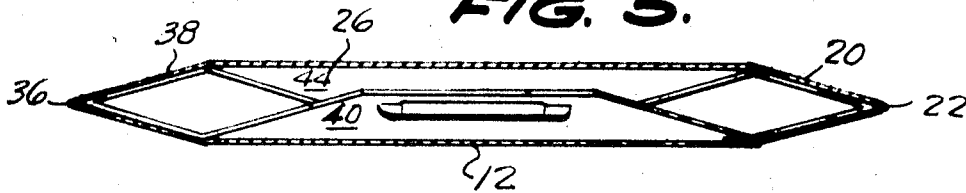


FIG. 6.

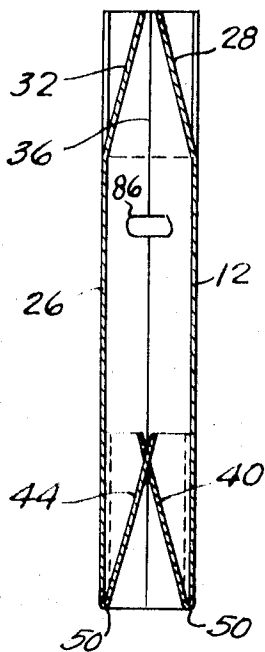
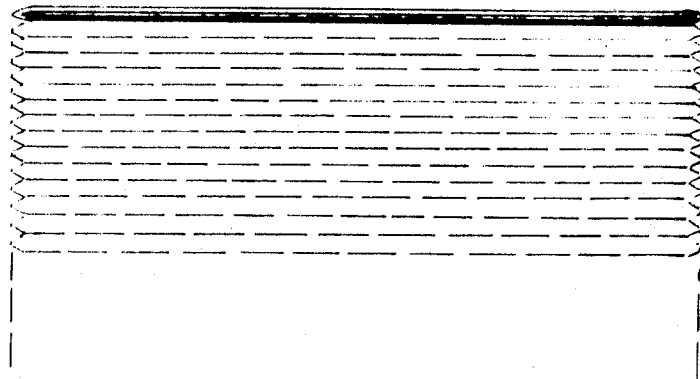


FIG. 7.



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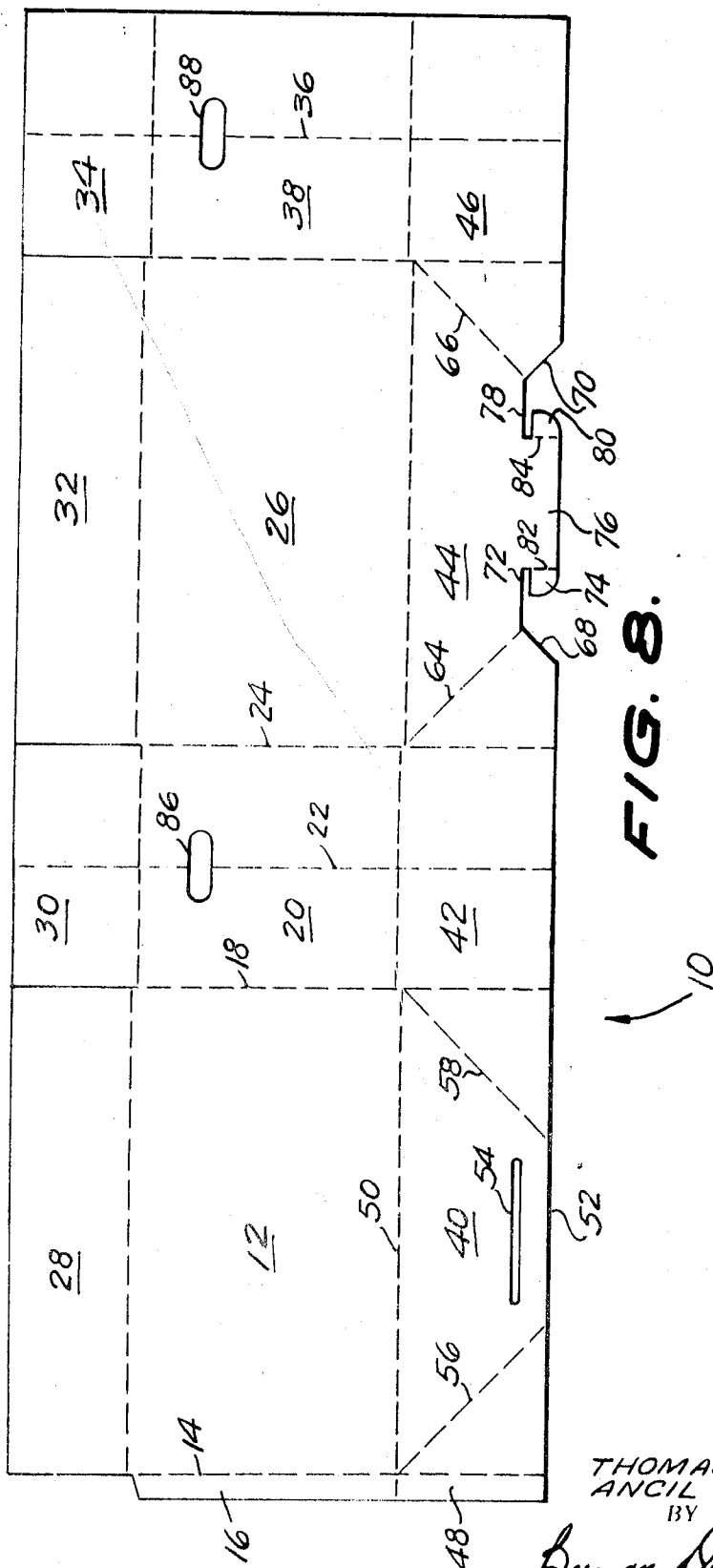


FIG. 8.

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COLLAPSIBLE REUSEABLE CARTON

While the present invention will be described with reference to a 30-dozen egg carton, it has, as a matter of fact, a vastly greater significance. To the end that its true significance may be comprehended, it is necessary at least to outline some of the economic and business background which gave rise to its conception.

Disposal of waste, i.e., garbage, trash, etc., is a problem facing every city and town throughout the more or less civilized world. On analysis, the problem largely resolves itself into one of cubic capacity of the trash gathering medium, i.e., trucks and the men who handle them. In this field, the RSC type of carton presents a most particular difficulty. The problem is not entirely that of the volumetric capacity of the trash-collecting agency, but it also extends to the retail store which acquires most of its merchandise in corrugated cartons of the RSC type. Such cartons are difficult to flatten, and if not flattened, occupy valuable "cargo space" not only in the trash collecting truck, but in the store which must retain the cartons between trash collections.

The carton of this invention is designed to afford the buyer of goods contained therein to collapse the same, and thereby effect an enormous saving in cubic footage in the requisite storage space for emptied cartons. The present invention accomplishes this by providing a blank which uses very little more board than the RSC type, which can be made on standard equipment, and which may be collapsed to a small fraction of its erected volume either for storage or reuse.

In addition to the feature of collapsibility which, by the way, is accomplished without mutilation of the carton, there is the feature of reuseability where the nature of the product permits. This is particularly true and customary in shipping standard lots of 30-dozen eggs. Manifestly, reuseability would not enter into liquor cartons through the feature of collapsibility unquestionably is advantageous in the liquor carton market as well as in such fields as canned goods, detergents, etc.

The above and other objects of this invention will be made clear from the following detailed description, taken in connection with the annexed drawings, in which:

FIG. 1 is a perspective view of the erected carton of this invention, with some parts broken away;

FIG. 2 is a similar perspective view of the carton of this invention, showing the bottom side of the erected carton;

FIG. 3 is a cross section on the line 3—3 of FIG. 1;

FIG. 4 is a perspective view of the carton of this invention in a halfway condition between either collapse or erection;

FIG. 5 is a cross section on the line 5—5 of FIG. 4;

FIG. 6 is a cross section on the line 6—6 of FIG. 4;

FIG. 7 is purely illustrative of a stack of collapsed cartons which would exceed the length of the page many times were the cartons not collapsed according to the present invention; and

FIG. 8 is a plan view of the blank from which the carton of this invention is formed.

Refer now to FIG. 8 which shows a blank, generally designated 10. The blank 10 has a front wall 12 defined at its left side by a score line 14 which also defines a tab 16 which will form part of the "manufacturer's joint." Referring again to FIG. 8, a score line 18 defines the right-hand end of the front panel 12, as well as defining the right-hand end panel 20. The end panel 20 has a medial score line 22 and its definition is completed by a score line 24 which also defines the right-hand end of the rear panel 26. Let it also be understood that the terms "front" and "rear," "top" and "bottom" are used purely for the purpose of clarification of the disclosure, and are not at all terms of limitation.

The top closure panels 28, 30, 32 and 34, if used at all, are of the RSC type. With due regard to 35 U.S.C. 112, perhaps it would be well to define the term "RSC" which the trade defines as "regular slotted carton." The "top" closure, in this case, is completely immaterial. In the egg business, the top flaps usually are simply folded over into closure position and loaded into a car with the flaps distributing over one carton, the weight of another superimposed carton.

It will be noticed, however, that top panels 30 and 34 share a prolongation of the medial score lines 22, in the case of the end panel 20, and a score line 36 which bisects the other end panel 38 at the right hand end of FIG. 8.

What has been described up to this point is RSC plus, of course, the end panel score lines 22 and 36. The "bottom" structure, in conjunction with the above-noted medial score lines 22 and 36 in the end panels, goes to the heart of the invention.

The bottom closure flaps are designated 40 adjacent the front panel 12, end panel 42, adjacent end panel 20, rear panel 44, adjacent rear wall 26, and end panel 46 adjacent vertical end wall 38.

It is to be noted that a tab 48 forms a continuation of the tab 16 defined by a prolongation of the score line 14, the tabs 16 and 48, which really are but a single tab, enter into the manufacturer's joint previously referred to.

The bottom-forming panel 40 is defined from its adjacent front, vertical panel 12 by a score line 50 which extends across the entire width of the blank, as seen in FIG. 8, and serves to define the bottom closure flaps 40, 42, 44, and 46 from their adjacent vertical panels.

The bottom-forming flap 40 has, adjacent its extremity 52, a die cut slot 54 located medially of the length of the panel 40. At the intersection of the score lines 14 and 50, the panel 40 has a diagonal score line 56 angling inwardly from the intersection toward, but not including, the slot 54. Between the intersection of score lines 18 and 50 a score line 58 runs similarly but in opposition to the score line 56.

The bottom-forming end panels 42 and 46 are of the utmost simplicity, being defined in the case of panel 42, by score lines 18, 24 and 50, with a bisection by a prolongation of the score line 22. The panel 46 is identical with panel 42, being defined by a free edge 60, a score line 62, which also defines end panel 38, and by the score line 50. A prolongation of the medial score line 36 bisects the panel 46.

The bottom panel 44 has a diagonal score line 64 rendering inwardly from the intersection of score lines 24 and 50, and a similar score line 66 is provided running inwardly from the intersection of score lines 50 and 62. The score line 64 terminates in a cutout portion 68 while the score line 66 terminates in a similar cutout portion 70. A slot 72 extends horizontally from the cutout portion 68 and defines an end tab 74 of a flap 76. A similar slot 78 extends horizontally from the cutout 70 and defines a similar end tab 80 of the flap 76. The tab 74 is defined from the flap 76 by a score line 82 while the tab 70 is defined from the flap 76 by a score line 84. End panel 20 is provided with a conventional handhold 86 while end panel 38 is applied with a similar handhold 88.

At the manufacturer's plant the simplest assembly step is to fold blank 10 along score line 24 and to fold the flaps 16 and 48 on the score line 14 so that optionally they contact either the exterior or interior surface with the free edge of end panel 38. The flaps 16 and 48, which after all are a single entity, receive a line of staples securing the flaps throughout their length to the free edge 60 of end panels 38 and 46. Conceivably, flaps 16 and 48 might be omitted and the then free edge of panels 12 and 40 could be taped to the free edge of the panel 38. Such a joint, however, would be recommended only for very light work.

The carton is received by the original buyer in the folded condition just described and with a stapled joint between flaps 16 and 48 and flap 38. The first step performed by the recipient is to set the carton up into ordinary rectangular condition, with wall 12 parallel to wall 26 and panel 20 parallel to panel 38. At this point, both top and bottom closure flaps all project outwardly in the plane of the respective panels. The next step is to thrust bottom closure panels 42 and 46 toward each other which produces flexure of the corner portions of panel 40 on diagonal score lines 56, 58 and a similar effect in panel 44 on diagonal score line 64 and 66. Then by proper manipulation folding outwardly along score lines 22 and 36, the tongues 76 of panel 44 may be brought into juxtaposition with the slot 54 of panel 40. The tabs 74 and 76, respectively,

are folded about score lines 82 and 84 to lie in the plane of the flap 76 which permits the flap to enter the slot 54 in panel 40. After this, tabs 74 and 80 are flattened out to the condition shown in FIG. 8 and form a lock preventing disengagement of the flap 76 from the slot 54. The flaps 42 and 46 are then pressed firmly down to the position of FIG. 1 and the box becomes a rigid rectangular structure.

It is to be noted in FIG. 2, as well as in FIG. 1, that the flap 76 with tabs 74 and 80 lies on the interior of the box and presents no exterior disturbance of the bottom surface. It also should be noted that when the flap 76 is engaged in the slot 54, as shown in FIG. 2, it is quite impossible to open the bottom while the carton is in erect and filled condition without mutilation of the locking flaps 74 and 80.

After the box has been filled and shipped and it is desired to collapse the box, it is not necessary to disengage the flap 76 from the slot 54. With the box open and the top flaps in the planes of their respective panels, it is only necessary to bulge, for example, panel 38 on its score line 36 and panel 20 along its score line 22. In this case, tab 76, as engaged with slot 54, in effect forms a median hinge, median insofar as the center line of the box is concerned. An intermediate stage is shown in FIGS. 4, 5 and 6 so that panels 40 and 44 fold inwardly and upwardly while panels 20 and 38 fold outwardly. As the collapse progresses the box ultimately assumes a completely flattened condition and may be stacked, as shown in FIG. 7.

The steps previously described to collapse the box from fully erected condition, of course, could be performed by the manufacturer at nominal extra cost and the box could be shipped in the condition indicated in FIGS. 4-7, thus minimizing the cost of erecting the box at the plant of the user. If this were done, however, the collapsed box would have uneven thickness due to multiple plies in the collapsed bottom and thereby would reduce the number of boxes shippable in a given cubic footage. To determine the desirability of erecting and collapsing the box at the plant of the manufacturer, it will usually be desirable to conduct a preliminary cost analysis both at the plant of the manufacturer and the plant of the user in order to secure actual minimum costs.

In a regular slotted carton, all the bottom flaps would terminate on the line coincident with the inner edge of slot 54 which line would extend entirely across the blank of FIG. 8. The distance between slot 54 and free edge 52 presents the additional material required for the present carton as against the material required for a regular slotted carton. The present car-

ton is designed as previously noted to receive the standard 30-dozen pack of eggs. The carton including the closure flaps increases board consumption by only about 6 percent over the equivalent regular slotted carton. Depending upon the particular plant in which they are manufactured, in corrugated boxes of this type, material cost of boards runs between 60 and 65 percent of total cost of the finished container. The regular slotted container would have to be destroyed in order to collapse it so that if the present container makes even two, let alone 10 or more trips, the extra initial cost is trivial and, as previously mentioned, even when the container is not reused, the ease of collapsibility minimizes a very considerable problem of empty carton storage.

While certain details of construction have been disclosed herein, no doubt various changes in the structure would suggest themselves to one skilled in the art who peruses this specification. Accordingly, the invention is not to be limited to the precise details disclosed herein.

What is claimed is:

1. A one-piece blank for forming a collapsible carton, said blank comprising a sheet of board divided by parallel transverse score lines into a front wall, an end wall, a rear wall and a second end wall, said sheet having a pair of parallel longitudinal score lines perpendicularly intersecting all of the aforesaid score lines to define bottom closure panels corresponding to said front, rear and end panels and integral therewith and with each other, and top closure panels corresponding to said front, rear and end panels and integral therewith; said end panels having medial score lines extending throughout said end panels and throughout the top and bottom panels integral therewith; the bottom-forming panels which form extensions of said front and rear wall panels having at their ends diagonal score lines extending inwardly and downwardly from the intersections of said transverse score lines with one of said longitudinal score lines; and combined interlocking and hinge means formed in each of said last-named bottom-forming panels to coact one with the other to secure said panels together when said carton is erected and to provide a hinge connection between said bottom-forming panels when erecting or folding the carton; said interlocking and hinge means including a slot formed inwardly of said bottom-forming panel connected to said front wall centrally of the carton and a locking tab formed by cutout portions in the bottom-forming panel connected to said rear wall.

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