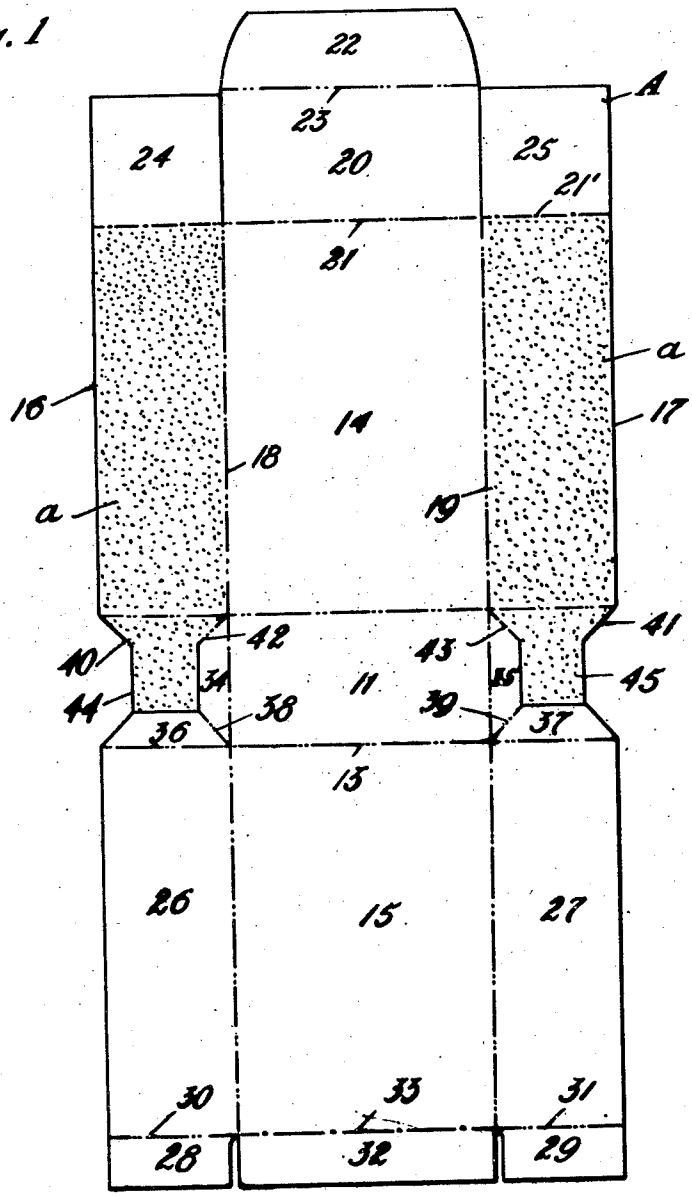
March 29, 1949. M. I. WILLIAMSON 2,465,949

SEALED RECLOSABLE CARTON END STRUCTURE

Filed Feb. 12, 1945 5 Sheets-Sheet 1

Fig. 1



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SEALED RECLOSABLE CARTON END STRUCTURE

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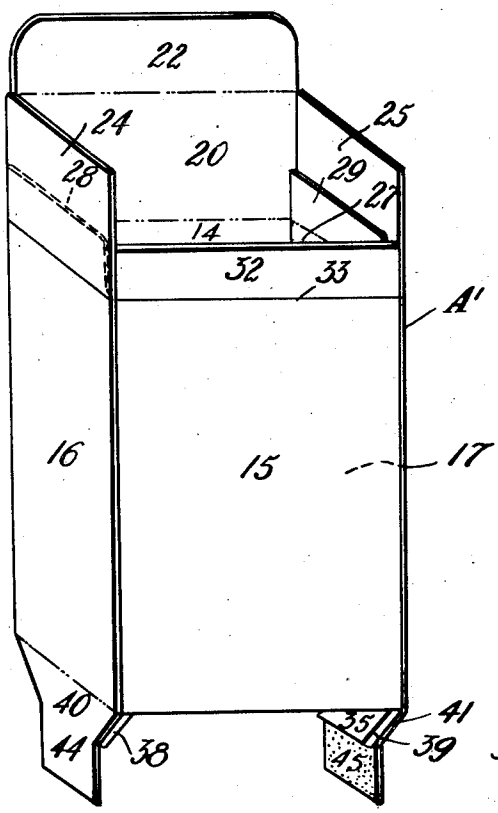


Fig. 2

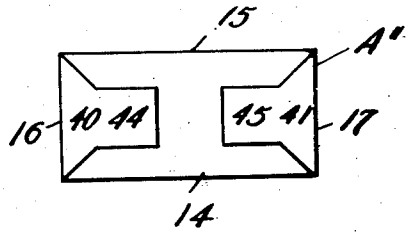


Fig. 3

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SEALED RECLOSABLE CARTON END STRUCTURE

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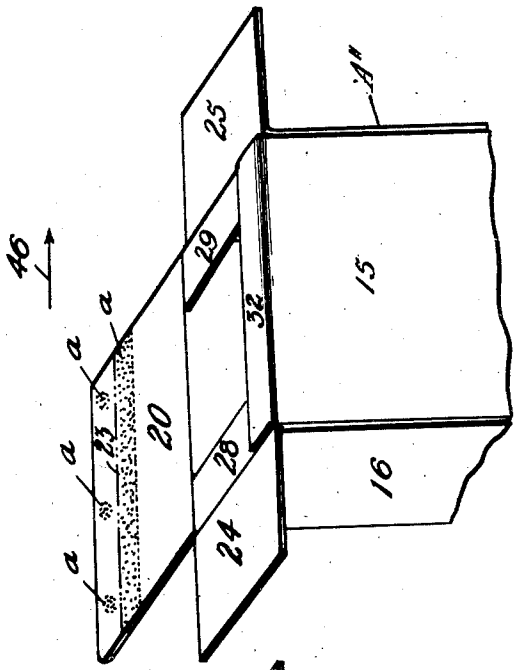


Fig. 5

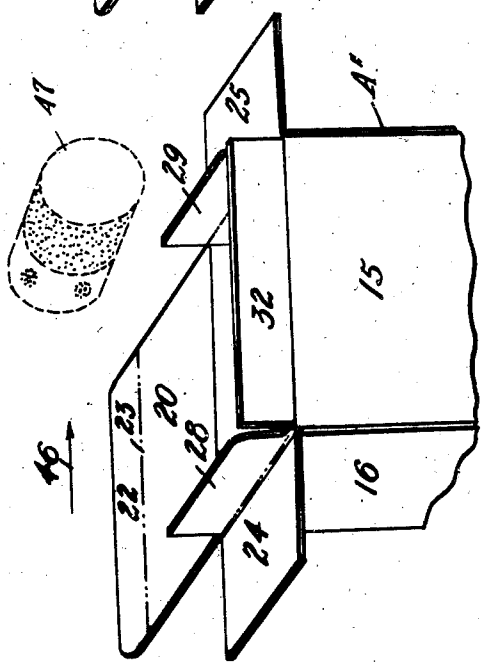


Fig. 4

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SEALED RECLOSABLE CARTON END STRUCTURE

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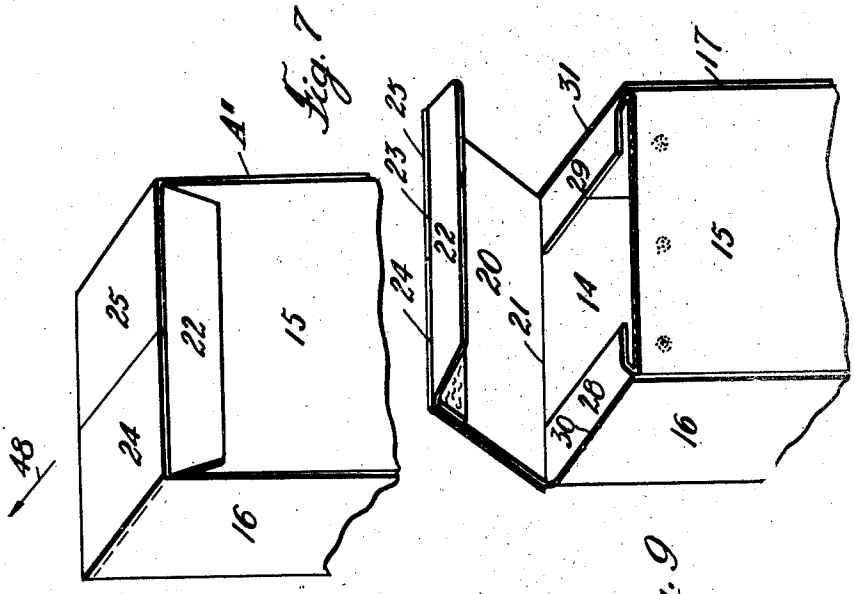


Fig. 7

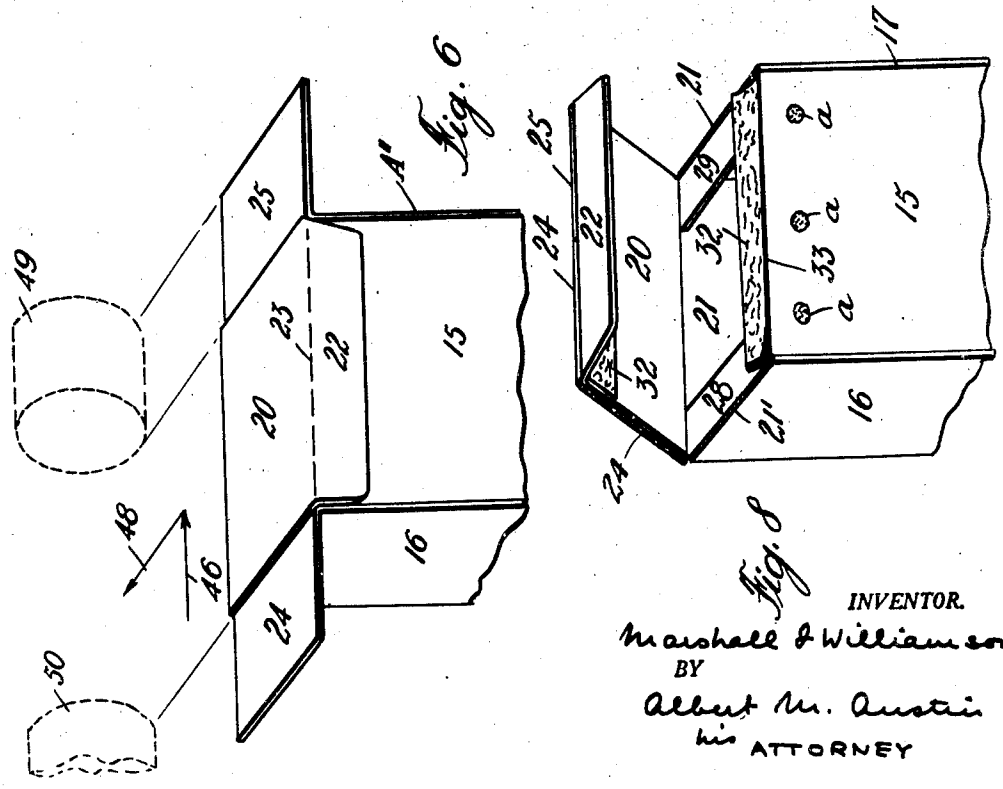


Fig. 6

Fig. 9

Fig. 8

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SEALED RECLOSABLE CARTON END STRUCTURE

Filed Feb. 12, 1945

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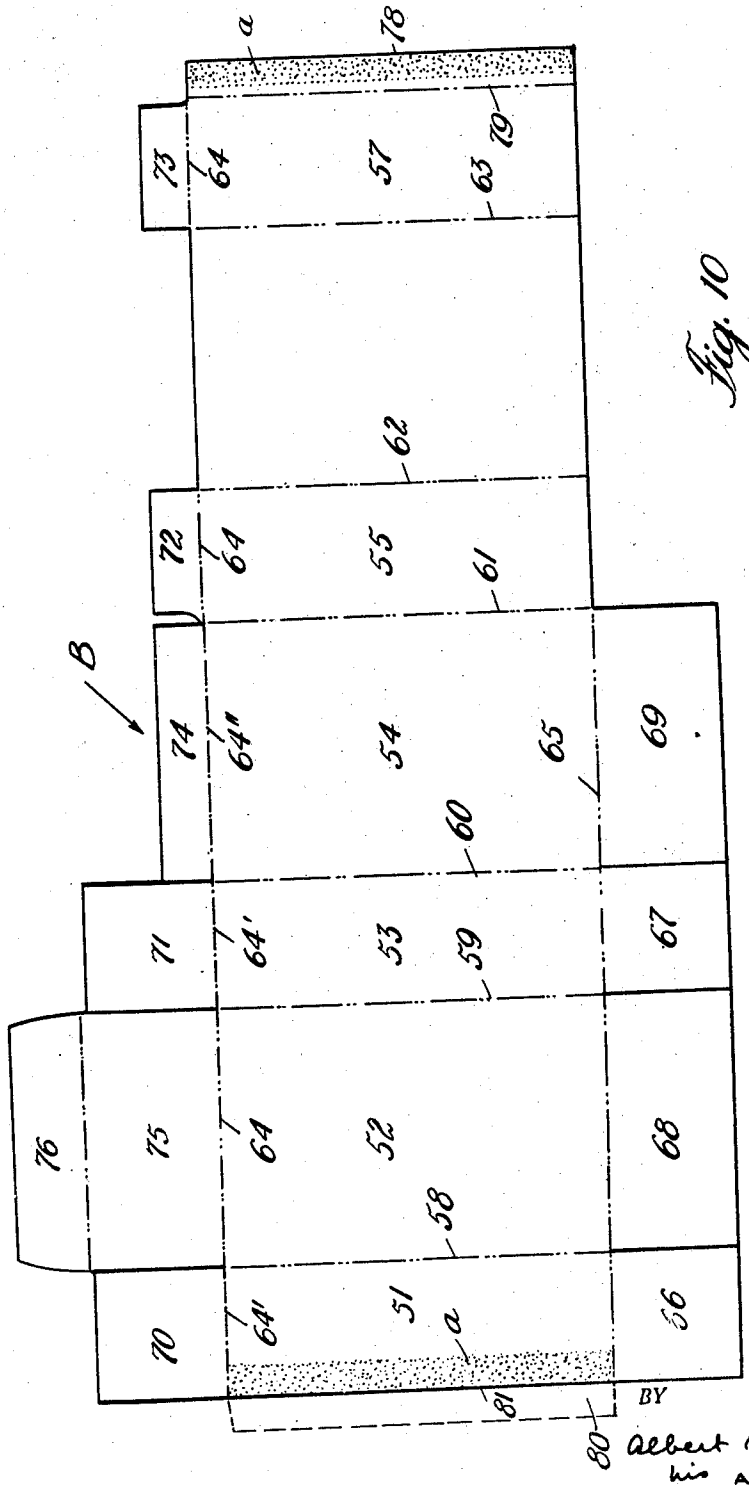


Fig. 10

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Patented Mar. 29, 1949 2,465,949

UNITED STATES PATENT OFFICE

2,465,949

SEALED RECLOSABLE CARTON END STRUCTURE

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Application February 12, 1945, Serial No. 577,372

2 Claims. (Cl. 229—38)

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This invention relates to improvements in containers, and has particular reference to containers for the packaging of powdered, granular, or flaked material.

The invention provides a carton which is sealable on standard automatic machinery, which may easily be opened by a consumer for removal of a part of its contents, which may then be reclosed and reopened repeatedly until the contents are completely removed.

In accordance with the invention, an improved end structure for a carton is provided comprising an inner end, an outer side flap extending from opposite side walls, a top panel extending from the back wall, the top panel having a tuck flap connected to it, and a front flap extending from the front wall. The carton is originally sealable by adhesively securing the top panel to the front flap and securing the outer side flaps to the outside of the top panel. The outer side flaps are connected to the side walls preferably along a weakening score line so as to be easily severable therefrom when the top panel is first opened. The front flap is preferably cut halfway through the material at its hinge line, so as to cause peeling of the material when the carton is first opened. The tuck flap is preferably spotglued to the outside of the front wall when the carton is originally sealed so that it may easily be removed from the front wall when the carton is first opened and may then, for subsequent reclosure, be tucked in between the inner surface of the front wall and the front edges of the inner side flaps which underlie the top panel.

The various objects, features, and advantages of the invention will appear more fully from the detailed description which follows, accompanied by drawings showing, for the purpose of illustration, a preferred embodiment of the invention. The invention also consists in certain new and original features of construction and combination of parts hereinafter set forth and claimed.

Although the characteristic features of the invention which are believed to be novel will be particularly pointed out in the claims appended hereto, the invention itself, its objects and advantages and the manner in which it may be carried out may be better understood by referring to the following detailed description and the accompanying drawings, forming a part thereof, in which—

Fig. 1 is a plan view of a flat carton blank from which a carton embodying the features of this invention may be made; the inside surface of the blank facing the observer;

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Fig. 2 shows the blank of Fig. 1 after initial gluing and folding operations, the folded blanks forming a hollow carton structure;

Fig. 3 is a plan view of the completed bottom structure of the carton shown in Fig. 2;

Fig. 4 is a perspective view illustrating a first folding operation performed on the carton top end structure in preparation of its sealing;

Fig. 5 is a perspective view of the carton top end structure after a further folding operation and application of adhesive to the top panel and tuck flap;

Fig. 6 is a perspective illustration of the carton end structure of Fig. 5 after a further folding operation performed on the top panel and the tuck flap, preparatory to the application of adhesive to the outer side flaps;

Fig. 7 is a perspective view of the sealed carton end structure after folding of the outer side flaps into adhesive engagement with the outer surface of the top panel;

Fig. 8 is a perspective illustration of the carton end structure after its initial opening by the consumer;

Fig. 9 is a perspective view of the carton end structure after removal of the remainder of the front flaps after peeling, the carton being ready for reclosure; and;

Fig. 10 is a plan view of a different type of blank from which a carton embodying this invention may be formed.

In the following description and in the claims various details will be identified by specific names for convenience. These names, however, are intended to be as generic in their application as the art will permit. Like reference characters refer to like parts in the several figures of the drawings.

In the drawings accompanying, and forming part of, this specification certain specific disclosure of the invention is made for the purpose of explanation, but it is understood that details may be modified in various respects without departure from the broad aspect of the invention.

The blank A shown in Fig. 1 is substantially rectangular in outline, resulting in a minimum of waste of material. The blank may be cut and scored from a large sheet or roll of paperboard or other suitable foldable material on an automatic cutting and scoring machine. Only one side of the blank need be decoratively finished or imprinted, since only one surface of the blank is presented as the outside surface of the assembled carton. Preferably laminated stock is used for the blank, consisting of an outer ply

of high-grade tear-resistant paper laminated to a ply of lower grade material.

Fig. 1 shows the blank in a position in which the inside surface faces the observer. The blank comprises a bottom panel 11 having a back wall panel 14 and a front wall panel 15 hingedly secured thereto along parallel score lines 12 and 13. The back wall panel 14 has two outer side wall panels 16 and 17 connected thereto along score lines 18 and 19 intersecting the score lines 12 and 13 substantially at right angles. A top panel 20 extends from the back wall panel 14 and is hingedly secured thereto along a score line 21. A tuck or end flap 22 is hingedly connected to the end of the top panel along a score line 23.

Outer side flaps 24 and 25 are hingedly connected to the ends of the outer side wall panels 16 and 17 along fold lines 21', forming extension of the score line 21. Preferably the fold lines 21' are cut scored, perforated, or otherwise weakened so as to permit easy severance of the outer side flaps 24 and 25 from the outer side walls 16 and 17 when the carton is first opened by the consumer as will later be explained.

Inner side wall panels 26 and 27 are hingedly connected to the sides of the front wall panel 16 along the score lines 18 and 19. Inner side flaps 28 and 29 are hingedly connected to the ends of the inner side wall panels 26 and 27 respectively, along score lines 30 and 31. A front flap 32 extends from the front wall panel 15 and is hingedly secured thereto along a fold line 33. The fold line 33 is preferably cut part way through the stock so as to sever the tear-resistant outer lamination of the board along the line 33. This will enable the stock to peel when the carton is first opened in such manner that the outer lamination of the board adheres to the top panel to which it is glued, thereby reducing the thickness of the front flap of the opened carton to approximately one half.

The bottom structure of the blank is optional and includes in the illustrated embodiment gusset panels 34 and 35 hingedly connected to the bottom panel 11 along the score lines 18 and 19 and further gusset panels 36 and 37 hingedly connected to the inner side wall panels 26 and 27 along the score line 13. The gusset panels 34 and 36 meet at an oblique score line 38, and the gusset panels 35 and 37 meet at an oblique score line 39. Further gusset panels 40 and 41 are hingedly connected to the outer side wall panels along the score line 12 and meet the gusset panels 34 and 35 at oblique score lines 42 and 43, respectively. The gusset panels 40 and 41 are preferably provided with securing tabs 44 and 45 to hold the gusset structure in folded position, as will later appear.

The blank A shown in Fig. 1 is of a so-called Brightwood type and is adapted to be folded into hollow carton form on a machine comprising a plunger which engages the bottom panel 11 and moves the blank into a folding chamber or well, thereby bringing the bottom, front and side wall panels into the position which the panels occupy in the finished carton.

Preparatory to the folding operation adhesive *a* is applied to the inside surface of the outer side wall panels 16 and 17, to the inside surface of the gusset panels 34, 35, 36, 37, 40, and 41, and to the securing tabs 44 and 45 as indicated in the drawing.

Fig. 2 shows the carton blank of Fig. 1 after an initial folding operation performed by an automatic box machine of the Brightwood type and prior to the completion of the bottom structure.

In the folded blank A' the outer side wall panels 16 and 17 overlie and are adhesively secured to the inner side wall panels 26 and 27. The gusset panels 34 and 36 are folded about the score line 38 and the gusset panels 35 and 37 are folded about the score line 39. The outer gusset panels 40 and 41 are adhesively secured to the outside of the gusset panels 36 and 37, respectively.

In the top structure the inner side flaps 28 and 29 lie inside the outer side flaps 24 and 25. It is apparent that in the folded blank A'' the front wall 15 and the back wall 16 are of single thickness, while the side walls of the carton are formed by two superimposed panels and are double-ply, with pairs of side flaps 24, and 28, and 25, and 29, respectively, extending from the side walls.

After forming of the flat blank A into a hollow structure A' the bottom structure may be completed by folding the gusset panels to bring the securing tabs 44 and 45 into adhesive engagement with the outside surface of the bottom panel 11 as shown in Fig. 3. The hollow carton is designated A'' and is ready for filling with merchandise.

The closing and sealing of the filled carton may be performed on an automatic box machine of standard construction. The series of closing operations is shown in Figs. 4 to 7 and will not be described.

The box folding and sealing machine is preferably of the so-called right-angle-track type, advancing the filled carton first in one direction and then in a second direction at right angles to the first direction. Alternatively a straight-track machine may be equipped with a device for turning the carton 90° at a predetermined point along the track so that the direction of advance is changed relatively to the carton.

The filled carton A'' is first advanced through the machine in the direction of the arrow 46. During the advance the outer side flaps 24 and 25 as well as the top panel 20 with its attached tuck flap 22 are first outfolded to assume a position at right angles with respect to the side walls of the carton. This leaves the inner side flaps 28 and 29 and the front flap 32 in a position in which they may be engaged by folding devices of the machine.

During its further advance through the machine the extended top panel 20 and the tuck flap 22 pass underneath an applicator 47 which applies a strip of adhesive *a* to a marginal portion of the top panel along the score line 23 and spots of adhesive to the tuck flap 22. Substantially simultaneously the inner side flaps 28 and 29 are infolded and the front flap 32 is folded thereover as shown in Fig. 5.

The carton A'' then continues its advance through the machine in the direction of the arrow 46 and is engaged by appropriate folding mechanism which folds the top panel 20 over the open end of the carton so as to bring the glued portion adjacent the score line 23 into adhesive engagement with the front flap 32 and to bring the tuck flap 22 into adhesive engagement with the front surface of the front wall 15.

Thereafter the direction of travel of the carton A'' may be changed and the carton advanced in the direction of the arrow 48 towards adhesive applicators 49 and 50 applying adhesive to the inside surface of the outwardly extended outer side flaps 24 and 25. After the glue application the carton continues its advance in the direction

48 and is engaged by suitable folding devices which fold the outer side flaps 24 and 25 into adhesive engagement with the outer surface of the top panel 20. The completely closed and sealed carton is shown in Fig. 7 and is ready for shipment.

The seal between the top panel 20 and the front flap 32, and the seal between the side flaps 24, 25, and the top panel 20 provide an effective closure which is sift-proof. Sifting at the corners of the carton is effectively prevented by the multiply corner structure. At the rear corners the structure is three ply, formed by the inner side flaps 28 and 29, top panel 20 overlying the inner side flaps 28 and 29, and the outer side flaps 24 and 25 overlying the top panel 20.

At the front corners the structure is four ply and is formed by the inner side flaps 28 and 29, the front flap 32 overlying the inner side flaps, the top panel 20 overlying the front flap 32 and finally the outer side flaps 24 and 25 overlying the top panel 20. By reason of the improved corner structure the carton will stand up under rough handling without danger of its contents sifting through the corners.

The consumer may easily open the sealed carton without tools. The opening and reclosing of the carton is performed by the consumer as illlustrated in Figs. 8 and 9.

The carton is opened by grasping the tuck flap 22 to sever the glue spots *a* connecting the tuck flap to the front panel 15. The carton top is then torn open by the tuck flap, causing the front flap 32 to peel along the cut-scored line 33 and causing the outer side flaps 24 and 25 to become severed from the respective side wall panels 16 and 17 along the weakened score lines 21'. The opened carton is shown in Fig. 8. Preferably the remainder of the front flap 32 is then torn off from the front panel by the consumer to prepare the carton for reclosing.

Fig. 9 shows the carton ready for reclosing. In the reclosing the tuck flap 22 is inserted between the front edges of the inner side flaps 28 and 29 and the front wall 15. The tuck flap 22 is retained between the front wall 15 and the inner side flaps 28 and 29 by friction and maintains the carton cover in closed position.

It will be noted that in the reclosed carton an effective closure is provided along the four top edges of the carton top. At the rear edge the carton top is closed along the hinge line 21 connecting the top panel with the back wall 14. At the side edges the carton top is closed along the hinge lines 30 and 31 connecting the inner side flaps 28 and 29 with the side walls. At the front edge the carton top is closed along the score line 23 connecting the tuck flap 22 with the top panel 20.

It is evident that the reclosable carton end structure according to this invention may be combined with any convenient form of side wall and bottom structure. It is therefore not limited to a carton or carton blanks of the so-called Brightwood type. It may, in fact, be formed on any carton having at least four side walls by providing a pair of side flaps on each side wall, a front flap on the front wall and a tuck flap on the top panel.

A modified form of blank incorporating the top structure of my invention is shown in Fig. 10. The carton blank B may be cut and scored from any suitable sheet material, laminated material being preferable to obtain on easy peeling of the front flap as it was explained in describing the blank A.

The carton blank B is shown in a position in which its inside surface faces the observer.

The blank B comprises seven wall panels 51, 52, 53, 54, 55, 56, and 57, hingedly connected along side score lines 58, 59, 60, 61, 62, and 63. The ends of the wall panels are defined by end score lines 64 and 65 intersecting the side score lines substantially at right angles. Bottom side flaps 66 and 67 are hingedly connected to the side walls 51 and 53 along the end score line 65 and inner and outer bottom panels 68 and 69 are hingedly connected to the wall panels 52 and 53 along the end score line 65. The top structure according to this invention comprises a pair of outer side flaps 70 and 71 hingedly connected to the side walls 51 and 53 along cut scored extensions 64' of the end score line 64. A pair of inner side flaps 72 and 73 is hingedly connected to the side walls 55 and 57 along the end score line 64. A front flap 74 is hingedly connected to the wall panel 54 along a fold line 64'' along which the material is cut part way through its thickness so as to enable the front flap 74 to peel during the opening of the carton. A top panel 75 is hingedly connected to the wall panel 52 along the end score line 64 and has a tuck flap 76 connected to it along a score line 77. A glue flap 78 may be hingedly connected to the side wall panel 57 along a further side score line 79, but may also be omitted as will be easily apparent to persons skilled in the art after considering the assembly operations of the blank B. A corresponding end flap 80 indicated in dotted lines may be provided at the opposite end of the blank, the end flap 80 being connected to the side panel 51 along a side score line 81.

The assembly of the blank B into hollow carton form may proceed as follows:

Adhesive *a* is first applied to the inside surface of the end flap 78, or to the marginal portion of the outside surface of the side wall panel 57 along the edge 79 in the event the blank is not provided with a glue flap. The blank is then folded about the score line 62 so as to bring the inside surface of the panels 56 and 57 into face to face position with the inside surface of the panels 54 and 55. The glue flap 78 is thus brought into adhesive engagement with the wall panel 54.

Thereafter the blank is further folded about the side score line 60 so as to bring the outside surface of the panels 56 and 57 into face to face position with the inside surface of the wall panels 52 and 53. This folding operation also causes the glued portion of the side wall panel 57 to adhere to the side wall panel 53 along the score line 60 in the event the glue flap 78 is omitted.

Thereafter adhesive *a* is applied to the inside surface of the glue flap 80, or to the inside surface of the side wall panel 61 along the edge 81, if no such side flap 80 is present. The blank is then folded about the score line 58 to bring the end panel 51 into face to face position with the outside surface of the side wall panel 55. The side wall panels 51 and 55 are connected in this position either by adhering the glued portion of the panel 51 to the panel 55, or by adhering the glue flap 80 to the outside surface of the front wall panel 54 in a blank where such a glue flap is present.

The result is a collapsed tubular structure which may be expanded into hollow form in a manner well-known in the art per se. The tubular carton blank has a single-ply front wall,

double-ply side walls and a double-ply rear wall.

The bottom structure of the carton from the blank B is closed in conventional manner by first infolding the bottom side flaps 66 and 67, then folding the bottom panels 68 and 69 thereover, and securing the bottom panels in position.

After completion of the bottom structure the carton may be filled with merchandise and then be sealed, opened, and reclosed in the same manner as hereinbefore described in connection with the blank A.

Obviously the shape of the carton blank may be modified in various ways without change of the improved end structure. For example, other known forms of bottom structures, either of the Brightwood or other types may be used. Instead of applying glue in spots to the tuck flap of the carton top in the manner disclosed, the tuck flap may receive an application of glue over its entire inner surface and be secured to a front panel bearing an imprint of glue repellant ink except at certain spots where a solid glue seal is desired. The glue will adhere firmly to such spots, but will only lightly adhere to the printed surface and be easily severable therefrom. Such and other changes and modifications are manifestly within the scope of this invention.

It is, therefore, obvious that the present invention is not limited to the specific examples herein shown and described. Numerous modifications, changes, omissions, additions, and substitutions may be made in constructing cartons embodying the invention without departure from the spirit and teaching of the invention herein disclosed.

I claim:

1. An end closure for a carton having a front and a back wall, and double thickness side walls, each side wall consisting of an inner and an outer side wall panel, the closure comprising, in combination, a pair of first side flaps hingedly connected along fold lines to the inner side wall panels; a front flap severably connected to the front wall along a cut score line and folded over the infolded first side flaps; a top panel hingedly connected along a fold line to the back wall, folded over and secured to said front flap; an end flap hingedly connected to the end of the top panel and folded over, and severably adhered to said front wall; and a pair of second side flaps severably connected along cut score lines to the outer side wall panels, said second side flaps being folded over, and adhesively secured to, said top panel.

2. An end structure for a carton having side walls, a front wall, and a back wall, the end structure comprising, an inner and an outer side flap extending from each of the side walls along fold lines, the fold lines of the outer side flaps being severable cut scores; a top panel extending from said back wall; an end flap hingedly connected to the end of the top panel; and a front flap extending from said front wall along a severable cut scored fold line, the carton being sealable by adhesively securing the top panel to the front flap, securing the outer side flaps to the top surface of the top panel, and severably adhering the end flap to the outside of the front wall the inner side flaps remaining unattached, the carton being adapted to be opened by removing the end flap from the front wall, severing the outer side flaps from the side walls along the cut scores, and severing the front flap from the front wall along its cut scored fold line, the carton being reclosable by tucking in the end flap between the front edges of the inner side flaps and the front wall.

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