Aug. 14, 1962 O. L. VINES 3,049,281

FLAP SEAL BOX

Filed Sept. 22, 1959

3 Sheets-Sheet 1

Fig. 1.

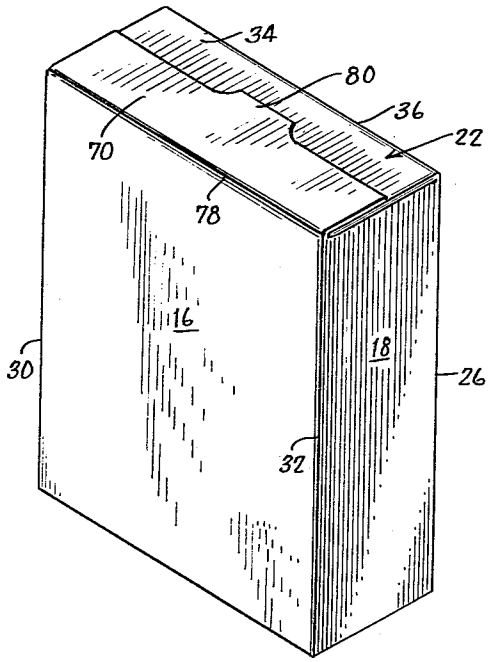


Fig. 2.

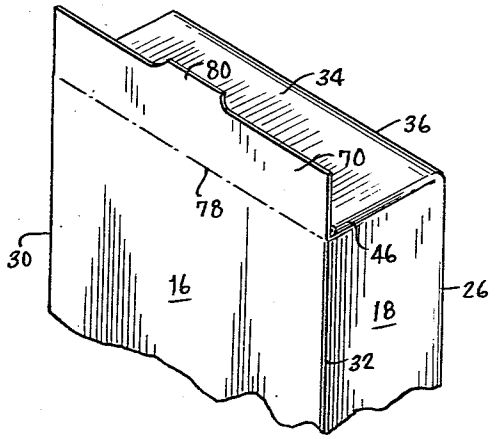


Fig. 3.

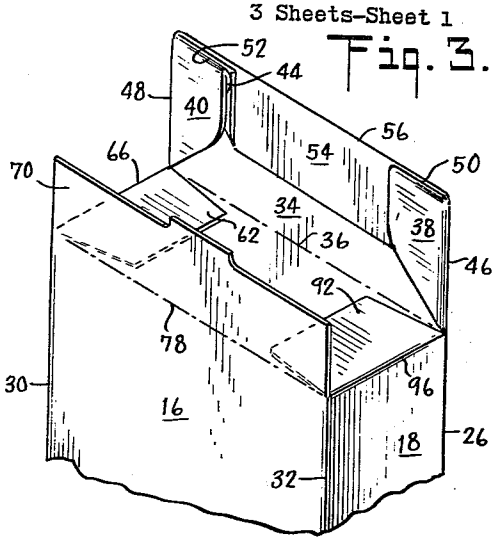


Fig. 4.

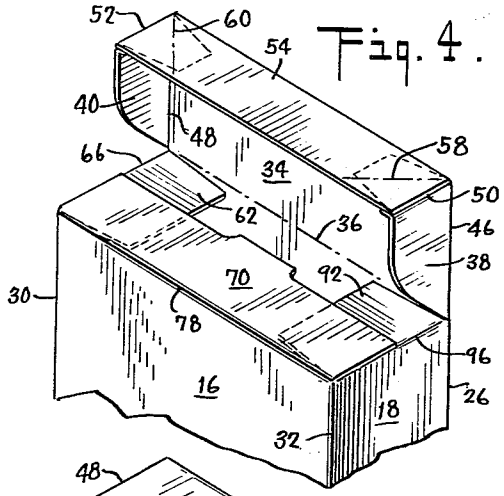
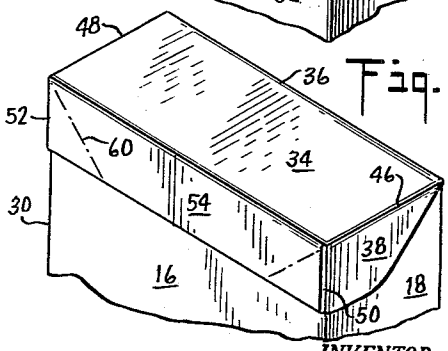


Fig. 5.



INVENTOR.
OSCAR L. VINES
BY
ATTORNEY

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Fig. 6.

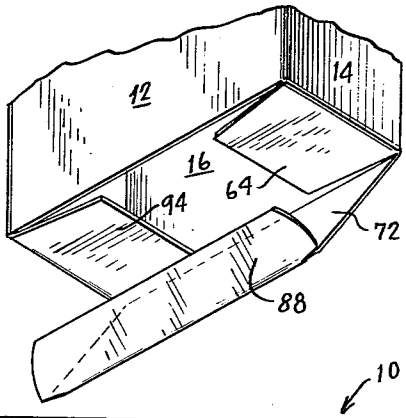
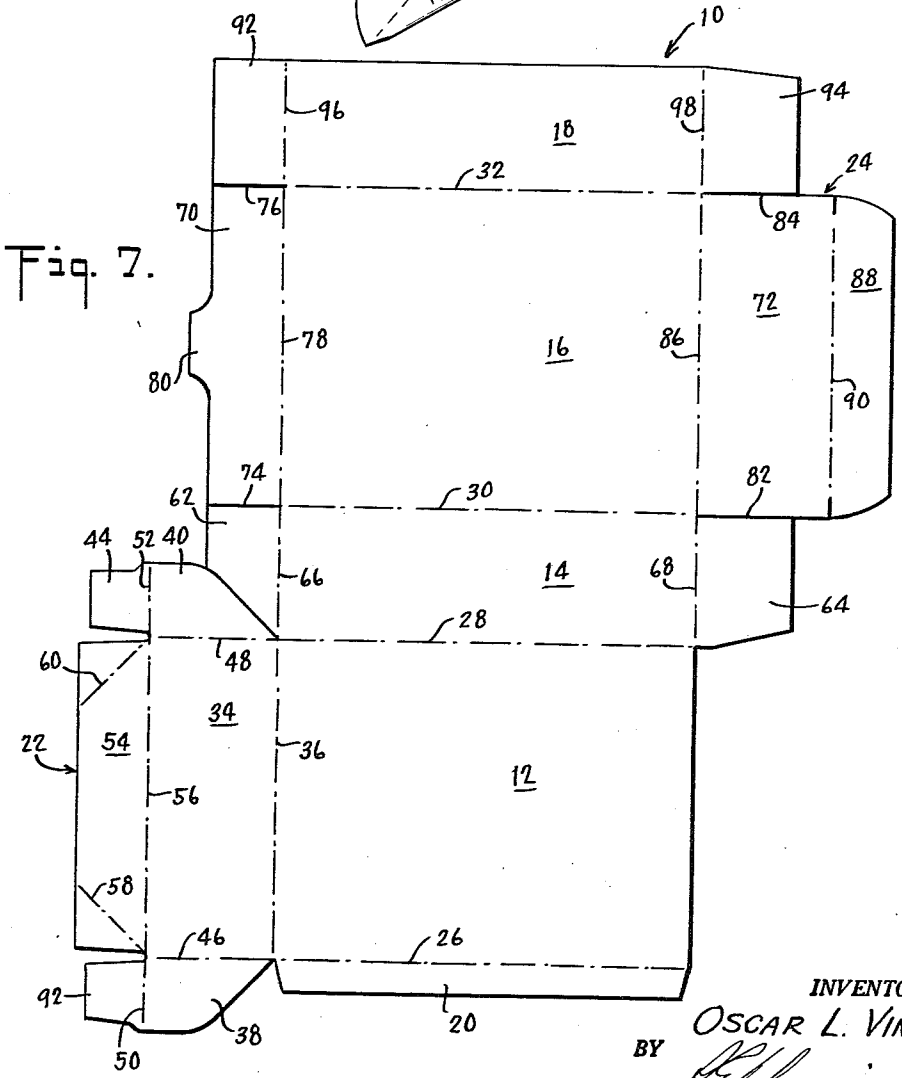


Fig. 7.



INVENTOR.
OSCAR L. VINES
BY
ATTORNEY

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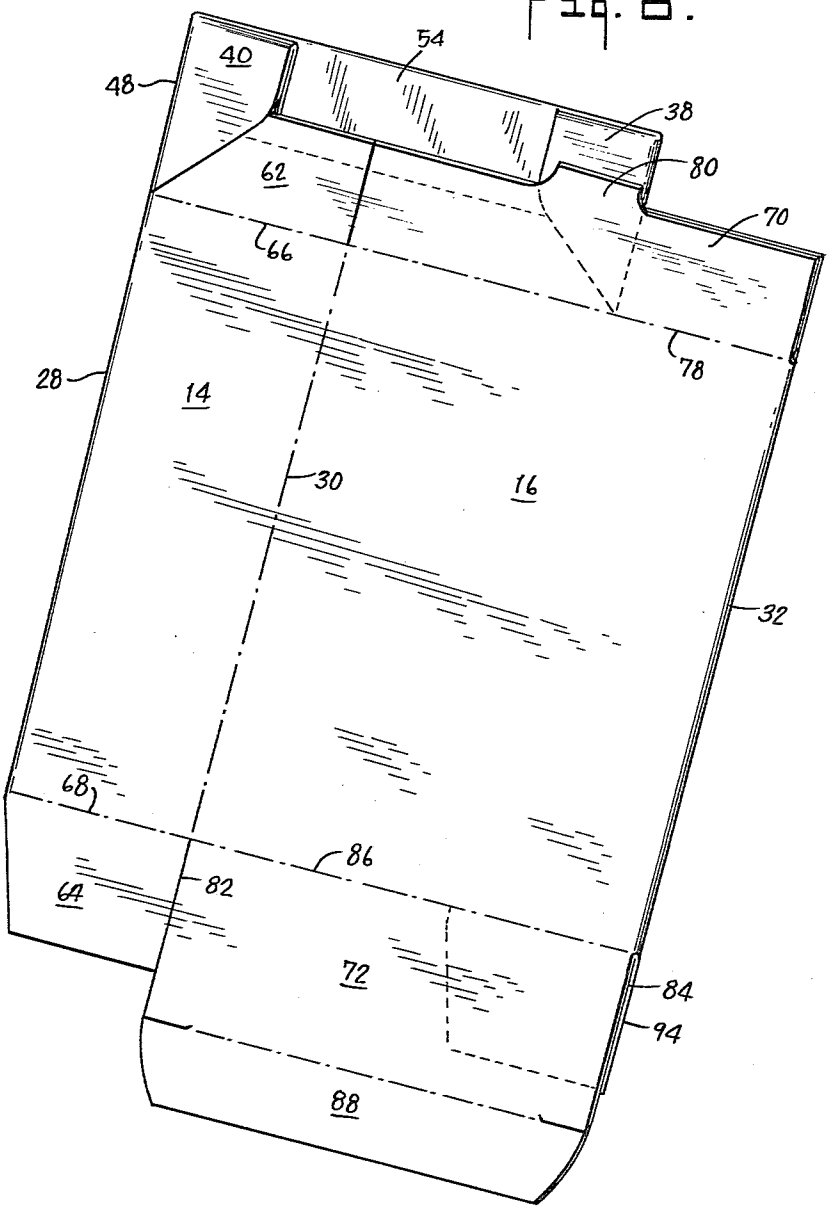
Fig. 8.



INVENTOR.
OSCAR L. VINES
BY
ATTORNEY

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3,049,281

FLAP SEAL BOX

Oscar L. Vines, Providence, R.I., assignor to Continental Paper Company, Ridgefield Park, N.J., a corporation of New Jersey

Filed Sept. 22, 1959, Ser. No. 841,505
3 Claims. (Cl. 229—37)

This invention relates to a closure structure for boxes. In particular, the invention relates to an integral reuse closure for foldable, tubular boxes.

Conventional folded cardboard boxes employ integral closure flaps which are adapted to be infolded into overlapping relation over the open end of the box. These boxes have the great virtue that they can be made at a convenient fabricating point and can be shipped economically to a remote point of use in their flat-folded state, and because they are adapted to relatively simple erecting and sealing equipment available to the packer. To gain access to the contents of a package formed of the conventional folded box, the consumer usually tears off the closure flaps or cuts them free along three sides of the box such that they are useless as reclosures for the box. Closure structures of the specified construction are entirely satisfactory for boxes whose entire contents are to be used as soon as they are opened. However, many products subject to intermittent use are also merchandised in boxes of the kind described. In the latter case, the closures referred to, which are mutilated in opening and which provide no reclosing means, are not satisfactory because they leave the remaining contents of the box exposed once the box is opened and a portion of its contents removed. Furthermore, a box mutilated in the opening thereof presents an unsightly appearance.

Boxes having flanged, hinged closures do not encounter the difficulties enumerated above, and they are, therefore, well suited to use for contents which are expected to be consumed over a period of time. Boxes having such closures have not been universally available heretofore because the flanged top has not been adapted to folded box structures; therefore, space limitation have prevented their manufacture at one point for shipment to a remote point of use. The result has been that the packer has been required to manufacture this type of box on his premises, or in the alternative, employ elaborate or expensive equipment for erecting and fabricating such boxes from blanks acquired from other sources.

It is, therefore, the primary object of this invention to provide a folded box having a folded reuse cover hinged thereto in conjunction with a sealing flap design for the initial closure of the box.

In its specific aspect, the invention contemplates a reuse closure for a folded tubular box having a face panel, a back panel and a pair of side panels connected to the face panel and the back panel. It is intended to provide a folded flanged reuse closure top formed in the upper end of the back panel for rotation into closing position over the end of the box. The closure comprises a top panel adapted to overlie the entire opened end of the box. The top panel has joined thereto by a fold line at the outer extremity thereof a front wall, and also a pair of side walls jointed thereto by a fold line at the lateral extremities of the panel. The lateral edges of the front wall and the adjacent forward edges of the respective side walls are connected whereby these walls form a depending flange structure adapted to engage the outer faces of the corresponding box panels. The flange structure has a pair of diagonal fold lines adjacent the connections of the side walls and front wall whereon the walls may be folded flat against the face of the top panel. A sealing flap is formed in the upper end of the face panel for rotation into contact with the outer face of the top

closure when the same is rotated into box closing position.

The foregoing objects, advantages and features of the invention as well as others inherent therein will be made clear in the following description when read in light of the drawings wherein like reference numerals indicate like parts and in which:

FIG. 1 is a perspective view of the sealed box as it would pass from the packer to the consumer;

FIG. 2 is a perspective view of the top portion of the box, the sealing flap thereof being opened;

FIG. 3 is a perspective view of the top portion of the box with both the sealing flap and the reclosure top thereof opened;

FIG. 4 is a perspective view of the top portion of the box with the sealing flap turned in and the reclosure top thereof opened into operative position;

FIG. 5 is a perspective view of the top portion of the box showing the reclosure top thereof rotated into closing position;

FIG. 6 is a perspective view of the bottom portion of the box showing a suitable bottom closure structure;

FIG. 7 is a plan view of the blank from which the box is constructed; and

FIG. 8 is a plan view of the folded box as it would pass from the box fabricator to the packer.

The specific aspects of the invention can best be ascertained by reference to the blank of FIG. 7 in which it is shown that the blank is formed of a generally rectangular piece of cardboard stock 10 which is so cut and creased as to permit the folding and fabrication thereof into a folded box such as shown in FIG. 8.

The blank of FIG. 7 includes as principal elements thereof a back panel 12, a right side panel 14, a face panel 16, a left side panel 18, a glue flap 20, an infolded top closure 22, and a suitable bottom closure 24. The blank is suitably creased to permit the folding thereof into the form of a tubular box body; thus a plurality of crease lines 26, 28, 30 and 32 are formed in parallel across the width of the blank. The crease line 26 separates the glue flap 20 from the back panel 12 and permits relative rotation therebetween; the crease line 28 separates the back panel 12 from the right side panel 14 and permits relative rotation therebetween; the crease line 30 separates the right side panel 14 from the face panel 16 and permits relative rotation therebetween; and the crease panel 32 separates the face panel 16 from the left side panel 18 and permits relative rotation therebetween.

The top closure structure 22 is formed as an extension of the back panel 12 and the same consists of a top panel 34 which is hinged to the back panel 12 along a hinge line 36. The hinge line 36 is preferably scored or even cut through the cardboard stock by series of interrupted slots therethrough to substantially destroy the native resilience of the cardboard stock along the line at which the top panel 34 is adapted to rotate in respect to the back panel 12.

Attached to the top panel 34 are the remaining elements which form the top closure 22. Thus, at one lateral edge of the top panel 34 is a left side wall 38 and at the opposite lateral edge of the top panel 34 is a similar right side wall 40. The left side wall has an outwardly projecting glue tongue 42, and the right side wall 40 has a similar outwardly projecting glue tongue 44. The left side wall 38 is adapted to be folded inwardly in respect to the top panel 34 along a crease line 46, while the right side wall 40 is similarly adapted for inward folding in respect to the top panel 34 along a crease line 48. The glue tongue 42 is adapted to be folded inwardly in respect to the left side wall 38 along a crease line 50, and in like manner, the glue tongue 44 is adapted to be folded inwardly in respect to the right side wall 40

along a crease line 52. Formed at the outer end of the top panel 34 is a front wall 54 which is adapted to be folded inwardly in respect to the top panel 34 along a crease line 56. The front wall 54 is creased along diagonal lines 58 and 60 at the respective opposite ends thereof such that the front wall can be folded inwardly along these lines. It is obvious that the diagonal fold lines 58 and 60 may be formed in the side walls 38 and 40, respectively, and provide an equally foldable wall structure.

The right side panel 14 has a right upper side flap 62 and a right bottom side flap 64. The right upper side flap 62 is adapted for inward folding in respect to the right side panel 14 along a crease line 66 while the right bottom side flap 64 is also adapted for inward folding in respect to the right side panel 14 along a crease line 68.

The face panel 16 has at the upper end thereof a sealing flap 70 and at the bottom end thereof a bottom panel 72. The sealing flap 70 is defined by incisions 74 and 76 which are continuations respectively of the crease lines 30 and 32 and by a fold line 78 along which the sealing flap 70 can be rotated inwardly in respect to the face panel 16. The sealing flap 70 includes a tab 80 which extends outwardly from its free edge.

The bottom panel 72 is defined by a pair of incisions 82 and 84 which are continuations respectively of the fold lines 30 and 32 and by a crease line 86 which separates the same from the face panel 16 and permits rotation of the bottom panel in respect to the face panel. The free outer end of the bottom panel 72 has a tuck-in flap 88 adapted to rotate about a crease line 90.

The left side panel 18 has a respective left upper side flap 92 and a left bottom side flap 94 which are attached, respectively, to the left side panel 18 by crease lines 96 and 98 permitting them to be turned inwardly in respect to the left side panel 18.

The blank of FIG. 7 is fabricated into the folded product of FIG. 8 by folding and gluing various component parts thereof. The glue tongues 42 and 44 of the top closure 22 are folded inwardly on their respective fold lines 50 and 52, and the left side wall 38 and the right side wall 40 are folded inwardly on their respective fold lines 46 and 48. Glue is applied to the triangular areas defined by the fold lines 58 and 60 formed in the front wall 54, and the front wall 54 is folded inwardly on the fold line 56 such that the glue tongue 42 is attached to the triangular area at one end of the front wall 54 and the glue tongue 44 is attached to the triangular area at the other end of the front wall 54. This results in the formation of a flanged top closure such as shown in FIG. 4. The front wall 54 is further folded along the fold lines 58 and 60 such that the front wall, the left side wall 38 and the right side wall 40 are folded flat as shown in FIG. 3.

The body of the box is formed by gluing the glue flap 20 against the underside of the left side panel 18 and the box is folded into the position illustrated in FIG. 8. This involves the folding of the blank on the fold line 28, such that the back panel is rotated rearwardly to bring the inner face thereof into contact with the inner face of the right side panel 14 and in overlapping relationship with a portion of the inner face of the face panel 16. The left side panel 18 is rotated rearwardly so that its inner face is in contact with the inner face of the face panel 16.

The box so fabricated and folded is shipped to the packer who is able to utilize the folded box in filling and closing equipment already at his disposal. At most, minor adjustments may be required to adapt pre-existing equipment to the erection, filling and closing of the box herein.

The box may be erected for filling from either end depending on the equipment and practice of the packer and depending further on the nature of the bottom closure which is employed. Tuck bottom boxes are frequently filled from the bottom and assuming, therefore, that the box herein is to be filled from the bottom, the erecting, filling and closing procedure may proceed as follows:

The blank of FIG. 8 is erected such that the back and face panel are respectively in right angular relationship with the side panels. The right upper side flap 62 and the left upper side flap 92 are then turned inwardly and the infolded top closure 22 is turned down upon the inturned side flaps. Thereafter, the sealing flap 70 is turned inwardly against the top panel 34 of the infolded top closure 22, and the sealing flap 70 is glued to the top panel 34 preferably by spot gluing so that the sealing flap 70 can be opened without unnecessarily mutilating it. It will be observed that the left upper side flap 92 is rectangular in shape such that the lateral free edges thereof, respectively, engage the inner faces of the back panel 12 and the face panel 16, thereby tending to hold the erected box in squared-up position.

The box may now be filled through its open bottom whereafter the side flaps 64 and 94 are turned inwardly about their respective fold lines 68 and 98. Thereafter the bottom panel 74 is folded inwardly about its fold line 86 and the tuck-in flap 88, being rotated about its fold line 90, is tucked into the bottom of the box such that it is engaged between edges of the side flaps 64 and 94 and the back panel 12.

If the filling and closing machinery is best adapted to fill the box from the top or if the packer so prefers, the bottom closure will be first sealed, the box will be filled from the top and the top closure will be sealed thereafter. If the box is to be employed as a receptacle for finely divided or powdered materials, a suitable sift-proof liner may be employed. Furthermore, the bottom closure structure may be adapted to best suit the intended contents of the box or the type best suited for the filling and closing equipment in which it is to be employed. In any event, the filled and closed box will appear as shown in FIG. 1, wherein the infolded top closure 22 appears as a simple closure panel and is held down by the overlying sealing flap 70.

In order to gain access to the contents of the box, it is merely necessary to grasp the tab 80 which has no glued connection with the top panel 34 of the infolded top closure 22 and pull outwardly thereon to disengage the sealing flap 70 from the top panel 34 of the infolded top closure. The sealing flap 70 can then be rotated about its fold line 78 such that it is free of the infolded top closure 22 as shown in FIG. 2. Outward rotation of the infolded top closure 22 about its fold line 36 then renders accessible the contents of the box, as shown in FIG. 3.

The box, as stated, is particularly designed for contents which are not completely exhausted at the first use thereof, but which are expected to be consumed a bit at a time over a period of time. Therefore, the infolded top closure 22 serves the valuable function of a reuse closure as shown in FIGS. 4 and 5. When the first portion of the contents of the box has been removed, the infolded top closure 22 may be erected into the position shown in FIG. 4 in which it provides a flanged cover member having depending walls at three sides thereof which are adapted to overlap corresponding three side walls of the tubular box body. The top closure 22 is easily erected into the position shown in FIG. 4 by pulling out the free edge of the front wall 54 such that the front wall 54 is rotated about its fold line 56 until it is disposed at a right angle to the top panel 34. This movement will project the entire front wall 54 into a single plane by rotating the triangular corner sections on their respective fold lines 58 and 60. This projection also serves to erect the side walls 38 and 40 by rotating them on fold lines 46 and 50 as to the side wall 38 and on fold lines 48 and 52 as to the side wall 40. After the top closure has been erected it provides a means whereby the top of

the box can be closed again to secure the remaining contents. First the upper side flaps 62 and 92 are turned in and the sealing flap 70 is turned inwardly to overlie the inturned upper side flaps. This position is shown in FIG. 4. The top closure is now rotated downwardly on its hinge line 36 such that its side wall 40 overlaps and engages the right side panel 14, the side wall 38 overlaps and engages the left side panel 18 and the front wall 54 overlaps and engages the face panel 16. This forms an exceptionally desirable package for potables which should be maintained in a closed receptacle for sanitary reasons.

It can be seen, therefore, that the top closure 22 can now be employed as a box cover and can be moved from open to closed and from closed to open positions repeatedly without destroying its function or in any way mutilating the package. The precise manner in which the top closure and particularly the walls thereof are folded to form a flat structure is not of the essence of the invention so long as the folding that is employed results in a flat panel-like structure which will lie flat on the top of the box. Furthermore, while it may be desirable to utilize the sealing flap 70 as part of the reuse closure, the top closure will ordinarily sufficiently protect the contents of the box in the absence of the sealing flap 20. Accordingly, the utility of the box is not substantially affected if the sealing flap 70 is cut from the face panel along its fold line 78 during the process of opening the package. Indeed, it may be desirable to provide for such severance by perforating the blank along the fold line 78.

It has been mentioned hereinbefore that the bottom closure adopted for illustration herein is a conventional closure and the insofar as the utility of the invention is concerned, any desirable bottom closure may be employed. For example, if a so-called automatic bottom is to be utilized in the box, the procedure described above will be varied by filling the box through the open top, and the final operation, under those circumstances, will be the infolding and sealing of the top. Without regard to the type of bottom employed, it may be expedient to fill the box through the open top and reserve as the final operation the infolding and sealing of the top. A possible advantage of first infolding and sealing the top thereby requiring the box to be filled through the open bottom is that a slightly longer set period can thereby be provided for the glue applied during the top sealing operation. These, however, are considerations which will be dependent largely on the erecting, filling and sealing equipment available to the packer or to his preference for one or the other procedure.

It can be seen from the foregoing that a very simple folded box structure has been provided herein which at once makes available to the packer a box which is of conventional appearance, which can be processed in erecting, filling and sealing equipment at his disposal, and which provides a relatively rigid reuse top closure once the box has been initially opened.

Such terms as "face," "back," "side," "upper" and "front" are relative, and are used in the foregoing description and in the following claims for purposes of identification only.

While the fundamentally novel features of the invention have been illustrated and described in connection with a specific embodiment of the invention, it is believed that this embodiment will enable others skilled in the art to apply the principles of the invention in forms departing from the exemplary embodiment herein, and such departures are contemplated by the claims.

What is claimed is:

1. A tubular box having a face panel, a back panel and a pair of side panels connected to said face panel and said back panel, a reuse closure top formed in an extension at the upper end of said back panel rotated inwardly into closing position over the end of said box, said closure top comprising a top panel overlying the entire open end of said box and having joined thereto by a fold line at the outer extremity thereof a front wall and a pair of side walls joined thereto by a fold line at the lateral extremities of said top panel, a connection between the lateral edges of said front wall and the adjacent forward edges of said respective side walls whereby said walls comprise a flange structure adapted to engage the outer faces of said face panel and said side panels, a pair of diagonal fold lines in said flange structure adjacent said connections defining triangular areas at the free edge of said flange structure, said connections being limited to said triangular areas and said walls comprising said flange structure being infolded on said fold lines whereby said walls lie flat against the inner face of said top panel, and a glue flap formed in the upper end of said face panel adhesively attached to the outer face of said inwardly rotated closure top.

2. A tubular box having a face panel, a back panel and a pair of side panels connected to said face panel and said back panel, a reuse closure top formed in an extension at the upper end of said back panel rotated inwardly into closing position over the end of said box, said closure top comprising a top panel overlying the entire open end of said box and having joined thereto by a fold line at the outer extremity thereof a front wall and a pair of side walls joined thereto by a fold line at the lateral extremities of said top panel, a connection between the lateral edges of said front wall and the adjacent forward edges of said respective side walls whereby said walls comprise a flange structure adapted to engage the outer faces of said face panel and said side panels, a pair of diagonal fold lines in said front wall adjacent said connections defining triangular areas at the free edge of said front wall, said connections being limited to said triangular areas and said walls comprising said flange structure being infolded on said fold lines whereby said walls lie flat against the inner face of said top panel, and a glue flap formed in the upper end of said face panel adhesively attached to the outer face of said inwardly rotated closure top.

3. A tubular box having a face panel, a back panel and a pair of side panels connected to said face panel and said back panel, an infolded closure flap formed in the upper end of each of said side panels, a reuse closure top formed in an extension at the upper end of said back panel rotated inwardly into closing position over said infolded closure flaps, said closure top comprising a top panel overlying the entire open end of said box and having joined thereto by a fold line at the outer extremity thereof a front wall and a pair of side walls joined thereto by a fold line at the lateral extremities of said top panel, a connection between the lateral edges of said front wall and the adjacent forward edges of said respective side walls whereby said walls comprise a flange structure adapted to engage the outer faces of said face panel and said side panels, a pair of diagonal fold lines in said flange structure adjacent said connections defining triangular areas at the free edge of said flange structure, said connections being limited to said triangular areas and said walls comprising said flange structure being infolded flat against the inner face of said top panel, and a glue flap formed in the upper end of said face panel adhesively attached to the outer face of said inwardly rotated closure top.

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