June 9, 1964 W. A. BRASTAD 3,136,471

END CLOSURE COMPRISED OF LINER AND CARTON FLAPS

Filed Oct. 29, 1962 3 Sheets-Sheet 1

FIG. 1

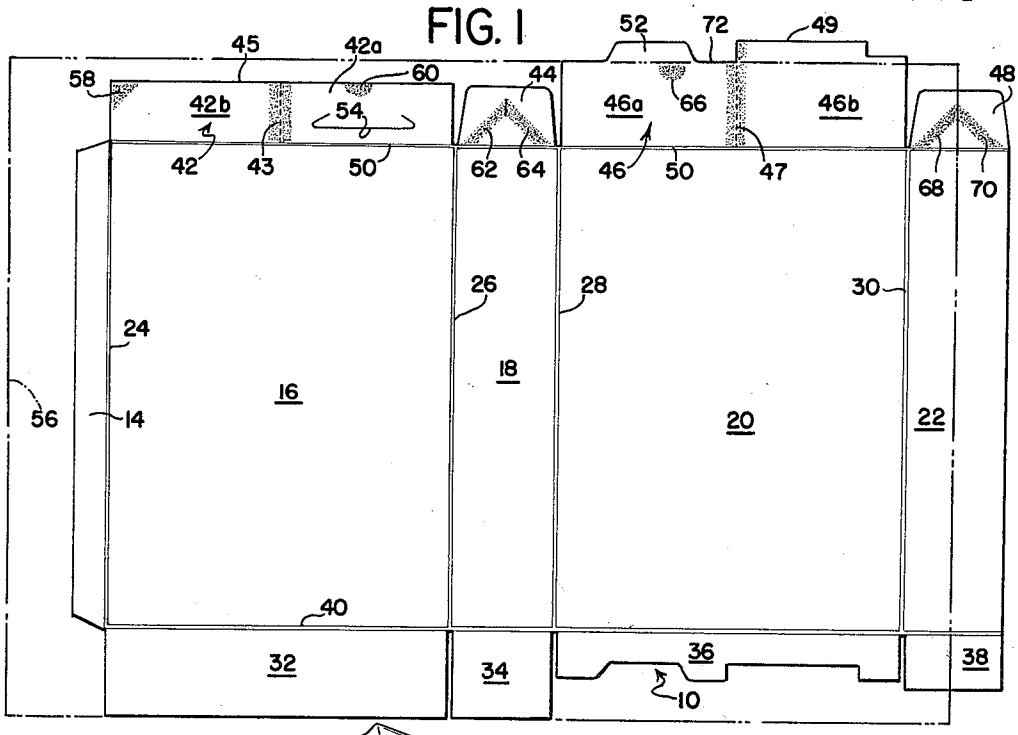



FIG. 2

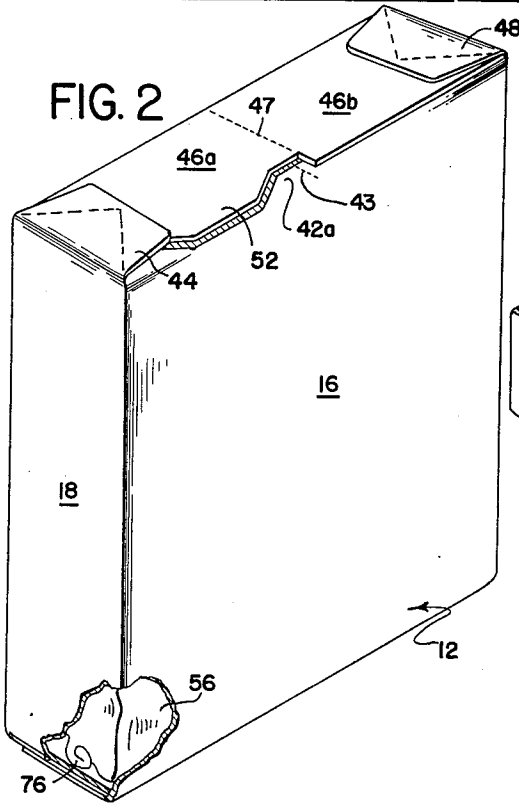
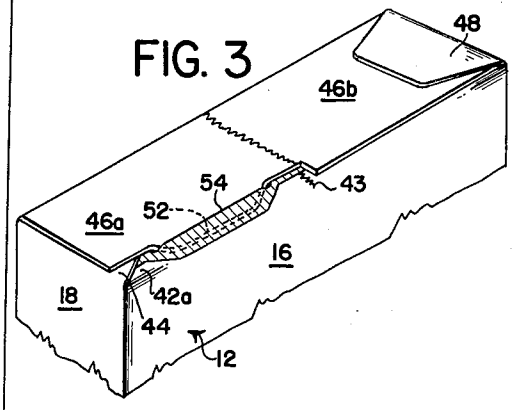



FIG. 3




INVENTOR.
WILLIAM A. BRASTAD
BY Kenneth D. Ohm
ATTORNEY

June 9, 1964 W. A. BRASTAD 3,136,471

END CLOSURE COMPRISED OF LINER AND CARTON FLAPS

Filed Oct. 29, 1962

3 Sheets-Sheet 2

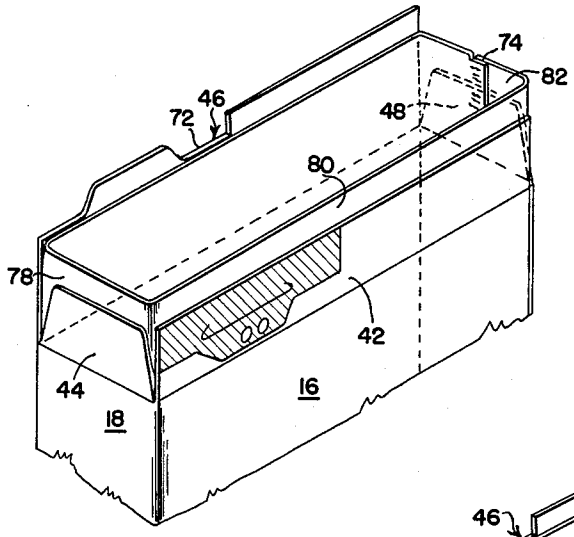



FIG. 4

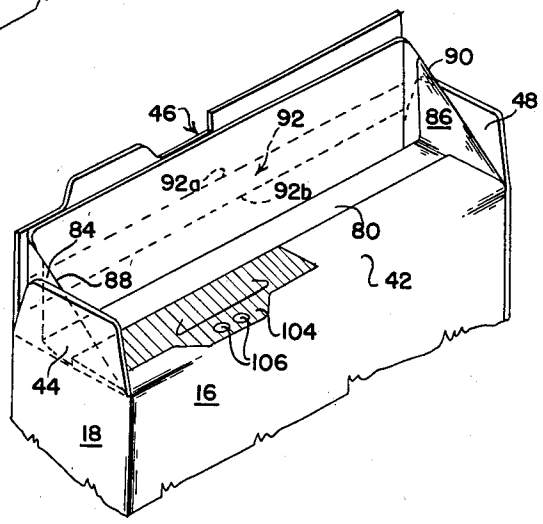



FIG. 5

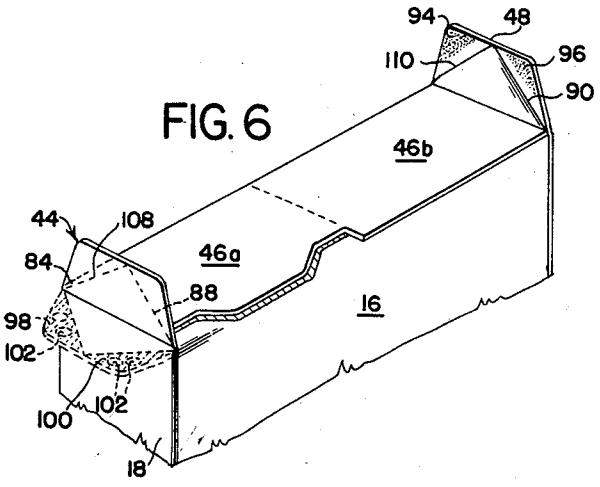



FIG. 6

INVENTOR.
WILLIAM A. BRASTAD
BY Kenneth D. Ohm.
ATTORNEY

June 9, 1964 W. A. BRASTAD 3,136,471

END CLOSURE COMPRISED OF LINER AND CARTON FLAPS

Filed Oct. 29, 1962 3 Sheets-Sheet 3

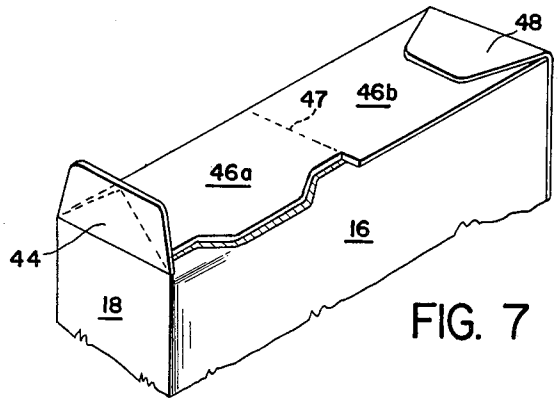



FIG. 7

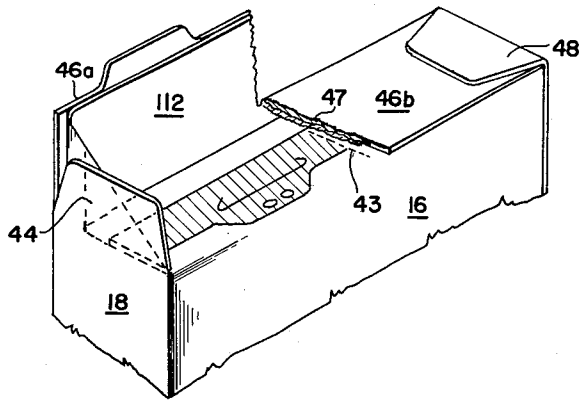



FIG. 8

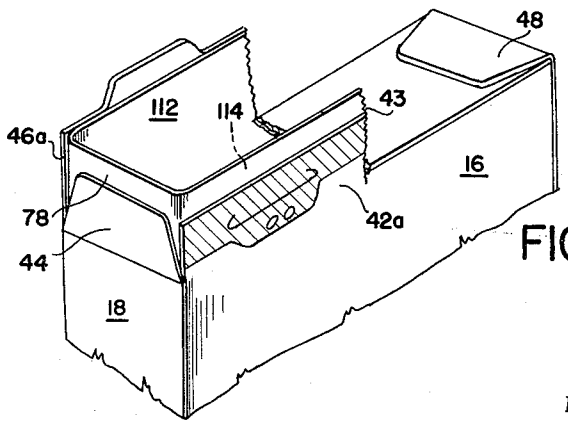



FIG. 9

INVENTOR.
WILLIAM A. BRASTAD
BY Kenneth D. Ohm
ATTORNEY

United States Patent Office 3,136,471 Patented June 9, 1964



3,136,471

# END CLOSURE COMPRISED OF LINER AND CARTON FLAPS

William A. Brastad, Minneapolis, Minn., assignor to General Mills, Inc., a corporation of Delaware

Filed Oct. 29, 1962, Ser. No. 233,711
3 Claims. (Cl. 229—14)

The present invention relates to improvements in carton end closures. More particularly, it pertains to a closure including a carton with a liner inserted therein in which certain end flaps of the carton and certain portions of the liner are folded over the carton end during the same operation.

An object of the present invention is to provide a moisture impervious end closure comprised of carton end flaps and a liner wherein at least two portions of the liner are folded down simultaneously with the flaps which are adjacent thereto.

Another object of the present invention is to provide an end closure comprised of carton end flaps and a liner in which at least a portion of the liner opens simultaneously with the flaps.

Other objects and advantages of the invention will be apparent from the following description in which certain preferred embodiments of the invention are disclosed.

In the drawings which form a part of this application,

FIGURE 1 is a plan view of a blank forming one embodiment of the present invention;

FIG. 2 is a perspective view of a carton partly in section formed from the blank of FIG. 1 in closed state;

FIG. 3 is a perspective view of the upper end of the carton of FIG. 2 in a reclosed state;

FIG. 4 is a perspective view of the upper end of the carton of FIG. 2 in open state;

FIGURES 5 and 6 are perspective views of the upper end of the carton shown in FIG. 4 in partially closed states;

FIGURES 7 and 8 are perspective views of the upper end of the carton of FIG. 2 in partially opened states;

FIG. 9 is a perspective view of the upper end of the carton of FIG. 2 in open state.

With reference to FIG. 1, the full lines represent a blank 10 forming one embodiment of a carton illustrating the present invention whereas the dash-dot lines indicate a liner for said carton. The blank 10 is shown with the surface which later becomes the inside of the carton 12 uppermost. The blank 10 comprises a glue panel 14, a front side panel 16, a first end side panel 18, a rear side panel 20, and a second side panel 22. The side panels are hingedly connected at score lines 24, 26, 28, and 30 as shown in FIG. 1. Hingedly attached to the lower portion of the side panel 16, 18, 20, and 22 are bottom end flaps 32, 34, 36, and 38, respectively. The attachment of said side panels and said end flaps is along a score line 40. Hingedly attached to the upper portion of the side panels 16, 18, 20, and 22 are top end flaps 42, 44, 46, and 48, respectively. The end flaps 44 and 48 are sometimes hereinafter referred to as tabs. The attachment of the end flaps and said side panels is along a score line 50.

The top end flap 46 has a weakened perforated tear line 47 therein which extends transversely across from the upper edge 72 of said flap towards the hinge line 50 of said flap. The transverse line 47 divides the flap 46 into an opening portion 46*a* and a normally unopened portion 46*b*. The opening portion 46*a* has a tab 52 extending therefrom.

The top end flap 42 has a weakened perforated line 43 therein which extends transversely across from the upper edge 45 of the flap 42 toward the hinge line 50



of said flap. The transverse line 43 divides the flap 42 into an opening portion 42*a* and a normally unopened portion 42*b*. The opening portion 42*a* has an inverted C type slit 54 therein. The tab 52 and the slit 54 are designed and positioned so that when the carton 12 (see FIG. 2) has been once opened as illustrated in FIG. 9 and it is desired to reclose the carton, the tab 52 can be inserted in the slit 54 as shown in FIG. 3.

In the preferred embodiment of the carton formed from the blank 10, a waxed liner 56 is adhesively bonded to the end flap 42 in the darkened areas 58 and 60 and along both sides of weakened line 43, to the end flap 44 along darkened diagonal lines 62 and 64, to the end flap 46 in the darkened area 66 and along both sides of the weakened line 47, and to the end flap 48 along the darkened diagonal lines 68 and 70. The waxed paper liner 56 has its upper edge parallel to or coincident with the upper edge 72 of the opening portion 46*a* of the end flap 46. At least the surface of the liner 56 directly adjacent the blank 10 has a waxed layer thereon.

To secure the carton body in its rectangular tubular shape as illustrated in FIG. 2, the glue-panel 14 is adhesively bonded to the inner surface of a second side end panel 22, i.e., the surface of said panel 22 which can be seen in FIG. 1. FIG. 4 is the top end of the carton of FIG. 2 before the top flaps are folded down. When the body of carton 12 is in its rectangular tubular shape as shown in FIG. 4 the upper edge of the liner 56 is parallel to the upper edge 72 of the opening portion 46*a* of the end flap 46 and the liner assumes the rectangular tubular shape of the carton 12. This structure provides the carton comprised of a tubular body with a tubular liner snugly inserted therein. The liner 56 has its vertical edges bonded together from the top to the bottom along a seam 74. The bottom edge of the liner 56 can also be bonded together and rolled as shown at 76 in FIG. 2.

It will be noted in FIG. 4 that a first selected portion 78 of the liner 56 projects above the upper edge of the tab 44, that a second selected portion 80 of the liner 56 projects above the upper edge of the side flap 42, and that a third selected portion 82 of the liner 56 projects above the upper edge of the tab 48.

The sealing of the end closure of carton 12 is accomplished as follows. The end flap 42 shown in FIG. 4 is folded down across the carton end as illustrated in FIG. 5. A portion of the liner 56 is folded down with the flap 42. That is, with the flap 42 folded as shown in FIG. 5 the selected portion 80 of the liner 56 extends in its folded down state further across the carton end than its adjacent flap 42. Also, the liner 56 is caused to double fold in selected first and second areas 84 and 86. The fold lines 88 and 90 of these areas 84 and 86, respectively form substantially an angle of 45° with the hinge line 50 of the tabs 44 and 48. These diagonal fold lines 88 and 90 are directly adjacent to the adhesive areas which bound the previously mentioned glue lines 62 and 70 respectively, of the end tabs 44 and 48.

Folding the flap 46 down to at least partially overlie the flap 42 as illustrated in FIG. 6 brings parts of the double fold areas 84 and 86 into direct overlying contact with other parts of said double fold areas. The folding down of flap 46 also brings an area 92 (shown between dotted lines 92*a* and 92*b*) of the liner which is close to the hinge line of the flap 46 into direct overlying contact with the portion 80 of the liner.

Folding the tabs 44 and 48 down to at least partially overlie the flap 46 brings the parts of the double fold areas 84 and 86 which overlie the other parts of said double fold areas into direct overlying contact with the

outside surface of the flap 46. Areas 94 and 96 of the tab 48 are provided with adhesive to hold the flap 48 in its closed position as shown in FIG. 2. Selected areas 98 and 100 of the tab 44 (shown in dotted lines on FIG. 6) are provided with means to provide a limited readily releasable adhesive bond, for example by use of glue resistant material such as varnish. The areas 98 and 100 are provided with circular spots 102 which are free from adhesive resistant material (these areas are illustrated in FIG. 6 where the flap 44 is shown by dotted lines in an outwardly folded down position). Thus, when adhesive is applied to the tab 44, and the tab 44 is placed to overlie the flap 46, the spots 102 will provide readily releasable adhesive between the tab 44 and the opening portion 46*a* of the flap 46.

A selected area 104 of the opening portion 42*a* of the flap 42 is provided with glue resistant material such as varnish. The area 104 is provided with circular spots 106 which are free from adhesive resistant material. Thus, when adhesive is supplied to the spots 106 and the flap 46 is placed to overlie the flap 42, readily releasable adhesive bond will be formed between the opening portion 42*a* of the flap 42 and the opening portion 46*a* of the flap 46 in the areas of the spots 106.

With the end flaps 42, 44, 46, and 48, and the liner portions adjacent thereto folded down as shown in FIGURES 5 and 6 to their closed positions as shown in FIG. 2 a continuous liner to liner end closure across the end of the carton is obtained. The double fold areas of the liner, the parts of said double fold areas which overlie the other parts of the double fold areas, and the selected area 92 which overlies the projecting portion 80 of the liner are sealed by applying heat and pressure thereto. This is accomplished preferably by inserting a mandrel (not shown) in known manner inside the folded structure shown in FIG. 2, while the bottom end of this structure is open. The heat and pressure applied by the mandrel and its associated equipment to the top end closure seals the carton end by flattening the folds of the liner along lines like 88, 90, 108, and 110, by bonding the overlapping liner portions and areas together, and by setting the adhesive placed between the carton flaps. The bond of the liner to liner (e.g. wax seal) is more easily separated than a bond of the liner to the flap (e.g. glue). Because the folds along lines 88, 90, 108, and 110 slant inwardly from the carton side panels, the portions of the liner 56 therealong will not overhang the side edges of the mandrel and can be flattened by the mandrel. After the carton end is thus sealed, the merchandise is placed in the liner of the carton 12 from the bottom end thereof and the bottom end of the liner and the carton are sealed individually in manners well known in the art.

The carton 12 of FIG. 2 is opened easily by grasping and lifting the tab 44 upwardly and away from the flap 46. This causes the flap 46 and the portion of liner 56 adjacent to flap 46 to raise simultaneously since the liner 56 is adhered to the tab 44 along lines 62 and 64. This is illustrated in FIG. 7. Next the tab 52 is grasped and lifted upwardly and away from the flap 42. This causes the flap 46 and the liner 56 to tear simultaneously along the weakened perforated tear line 47 since the liner 56 is adhered to the opening portion 46*a* along line 47 and in area 66, and a region 112 of the liner 56 to move simultaneously with said opening portion 46*a* to the position shown in FIG. 8. The opening portion 42*a* of the flap 42 is then lifted and moved to the position shown in FIG. 9. This causes the flap 42 and the liner 56 to tear simultaneously along the weakened perforated tear line 43. Because the liner 56 is adhesively attached to the opening portion 42*a* along line 43 and in area 60, a selected region 114 of said liner is lifted simultaneously with said opening portion 42*a* to the position shown in FIG. 9. In the open position shown in FIG. 9, the opening portions 42*a* and 46*a* and the tab 44 along with the selected regions 112, 114, and 78 of the liner 56 provide a pour-spout through which the merchandise placed in the liner 56 of the carton 12 can be poured out of said carton.

The fact that the liner 56 is adhered to the flaps 42 and 46 along weakened tear lines 43 and 47, respectively, facilitates the tearing of said liner when the opening portion 46*a* and 42*a* are moved into their positions shown in FIG. 9. FIG. 8 shows that the tear line 43 of flap 42 is positioned closer to the side panel 18 than the tear line 47 of the flap 46 when the carton 12 is in its assembled condition. Such an orientation of the weakened tear lines 43 and 47 provides an arrangement whereby the line 43 can be torn after the opening portion 46*a* of the flap 46 has been separated from the opening portion 42*a* of the flap 42. This arrangement also prevents a crack entering directly into the package.

The closure of the carton 12 shown in FIG. 9 is effected by moving the flap 42 back to the position shown in FIG. 8, then moving the flap 44 so that it overlies flap 42, then folding flap 46*a* down upon flap 44, and then tucking the tab 52 into the slit 54. This closed condition is shown in FIG. 3. Alternately, the carton 12 can be closed by folding the tab 44 down to overlie the carton end, then moving the flap 42*a* so that it overlies tab 44, then folding the flap 46*a* down upon flap 42*a*, and then tucking the tab 52 into the slit 54. Thus, the operation of reclosing the flaps also recloses the liner and provides liner to liner contact for better preservation of the contents in the reclosed carton.

In view of the principles set forth herein, I have shown some of the ways of carrying out the present invention and some of the equivalents which are suggested by these disclosures.

What is claimed is:

1. A carton comprising a tubular body formed of side panels and a liner inserted therein, said carton having end flaps for closing in end of said cartons, said end flaps including first and second flaps hinged at first and second hinge lines respectively to first and second panels located at opposite sides of said body, said end flaps including a tab hinged at a third hinge line to a third panel connecting said first and second hinged panels, said liner being long enough so a first selected portion thereof projects beyond the upper edge of said third panel, said liner also being long enough so a second selected portion thereof projects beyond the upper edge of said first flap, said second selected portion being folded down to extend across the carton end and to double fold the liner in at least one selected area to form a first double fold area, said liner being adhesively attached to said first tab so the fold line of said first double fold area extends diagonally from substantially one end of the hinge line of said first flap along said tab to form substantially a 45° angle with said tab hinge line, a second double fold area in the liner comprised of a first part of said first double fold area being folded over a second part of said first double fold area, said liner being adhesively attached to said first tab so the fold line of said second double fold area extends diagonally from substantially one end of the hinge line of said second flap along said tab to form substantially a 45° angle with said tab hinge line, said liner being attached to said tab to permit said liner to form said diagonal lines and to cause said liner to be raised when said tab is raised, said first flap being folded down to at least partially overlie the carton opening, said second flap being folded down to at least partially overlie said first flap and to bring said first part of said first double fold area into direct contact with said second part of said first double fold area, said folding down of said second flap to also bring the inner surface of at least a part of the area of said liner which is close to and projects above the hinge line of said second flap into direct contact with the outer surface of the portion of the liner which projects beyond the upper edge of said first flap, said tab being folded down to at least partially overlie said second flap and to bring said first and second double fold areas into superposed position between said tab and said second

flap, and means providing a limited readily releasable adhesive attachment between said first flap and said tab for ready separation thereof, while at the same time bonding said flap and tab against premature accidental separation.

2. A carton comprising a tubular body formed of side panels and a liner inserted therein, said carton having end flaps for closing the end of said carton, said end flaps including a first tab hinged to a first panel of the carton, first and second flaps hinged at first and second hinge lines respectively to second and third panels at opposite sides of said first panel, said liner being long enough so selected portions thereof project beyond the upper edges of at least said first tab hinge line and said first flap, said first flap being folded down to extend across said carton end and to double fold the liner in at least one selected area, said liner being adhesively attached to said first tab along a first line extending diagonally from substantially one end of the hinge line of said first flap to form substantially a 45° angle with said first tab hinge line, said second flap being folded down to extend across the carton end and to double fold the liner in at least one other selected area, said liner being adhesively attached to said first tab along a second line extending diagonally from substantially one end of the hinge line of said second flap to form substantially a 45° angle with said first tab hinge line, said first tab being folded down to at least partially overlie said second flap and to bring at least a portion of one of said double fold areas into direct contact with the outer surface of said second flap, the folding down of said second flap bringing the inner surface of at least a part of the area of the liner which is close to and projects above the hinge line of said second flap into direct contact with the outer surface of the portion of the liner which projects beyond the upper edge of said first flap, and means providing limited readily releasable adhesive attachment between said tab and said second flap and said second and first flaps for ready separation thereof, while at the same time bonding the said flaps against premature accidental separation.

3. A carton comprising a rectangular tubular body formed of side panels and a tubular liner inserted therein, said carton at least at one end having flap hingedly connected with respective side panels for closing the end of said carton, said end flaps including first and second tabs hinged to opposite panels of said carton and first and second outer flaps hinged to the other opposite panels of said carton, said first flap having a weakened tear line therein which extends transversely thereacross from the upper edge of said first flap towards the hinge line of said first flap, said transverse line dividing said first flap into an opening portion and a normally unopened portion, said second flap having a weakened tear line therein which extends transversely thereacross from the upper edge of the second flap towards the hinge line of said second flap, said transverse line dividing said second flap into an opening portion and a normally unopened portion, said liner being long enough so selected portions thereof project beyond the upper edges of the tab hinge lines and the upper edge of said first flap, said liner being adhesively attached to said first tab along a first line extending diagonally from substantially the free end of the hinge line of the opening portion of one of said first and second flaps, said diagonal line forming substantially a 45° angle with said first tab hinged line, said liner also being adhesively attached to said second flap on both sides of said second flap transverse line, said liner also being adhesively attached to said first flap on both sides of said first flap transverse line, said first flap being folded down across said end, a first selected outer portion of the liner which projects beyond the upper edge of said first flap extending in its folded down state further across said carton end than said first flap, said second flap being folded down across said first flap with the opening portion of said second flap overlying the opening portion of said first flap so that the weakened tear line of said first flap can be torn after the opening portion of the second flap has been separated from the opening portion of the first flap, said liner being short of extending up to the upper edge of said unopened portion of said second flap thereby providing an area between the upper edge of the liner and the upper edge of said normally unopened portion of said second flap which is free from having any liner portion directly adjacent thereto, the free area being adhesively bonded to an area of the normally unopened portion of the first flap, a selected inner surface area of the liner adjacent to said second flap directly overlying said first selected outer surface portion of the liner which projects beyond the upper edge of the first flap, said first and second tabs being folded down to at least partially overlie said second flap, said liner being releasably sealed together where said selected inner surface liner area overlies said first selected outer surface liner portion and where said liner forms said double fold areas, and means providing limited readily releasable adhesive attachment between one of said tabs and said opening portion of said second flap and between said overlying opening portions of said flaps for ready separation of said tab and said opening portions, while bonding said tab and said opening portions against premature accidental separation.

**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 2,583,856 | Klein | Jan. 29, 1952 |
| 2,950,036 | Vergobbi | Aug. 23, 1960 |
| 2,979,247 | Pellaton et al. | Apr. 11, 1961 |
| 3,071,304 | Brastad | Jan. 1, 1963 |