

Jan. 22, 1963

W. J. CUPO
CARTON CLOSURE

3,074,613

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2 Sheets-Sheet 1

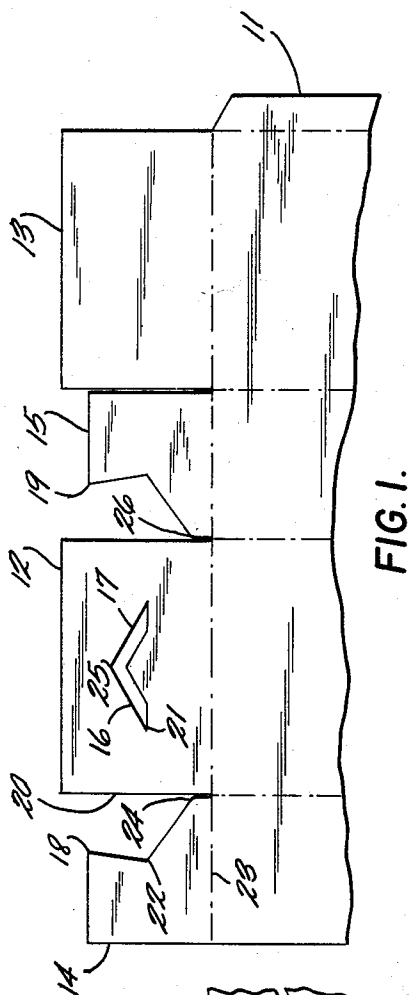


FIG. 1.

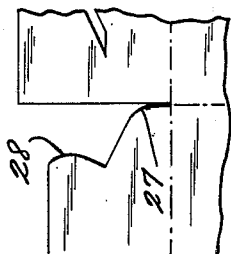


FIG. 2.

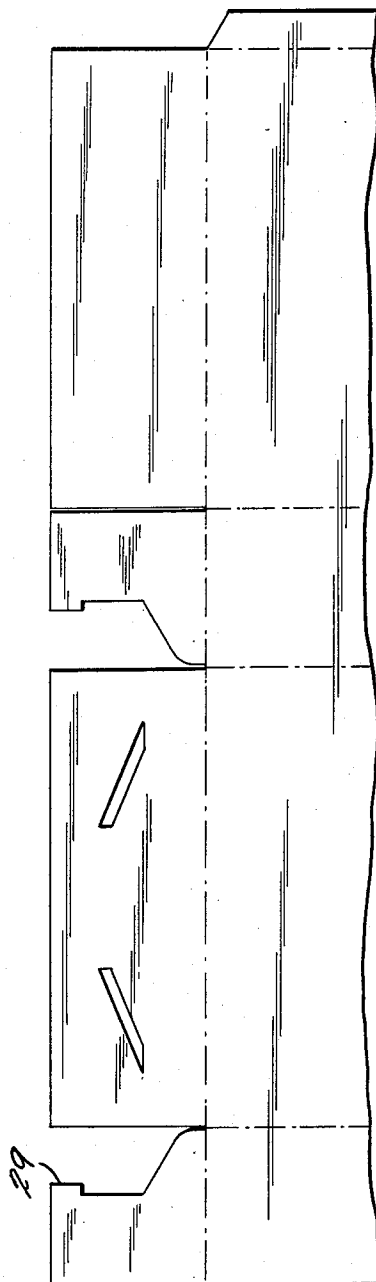


FIG. 3.

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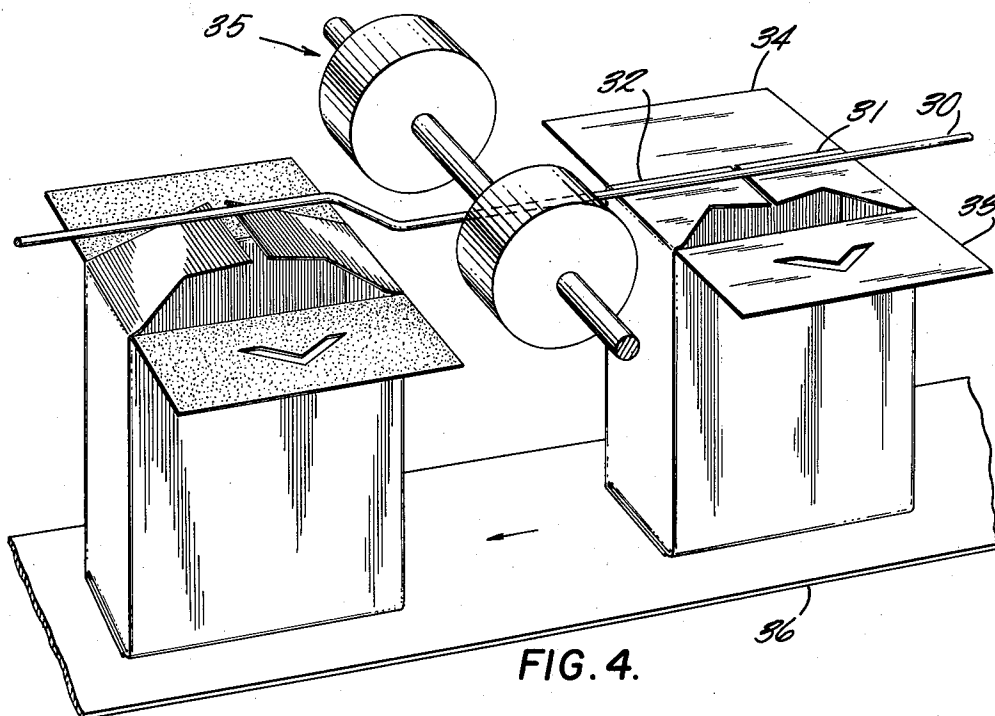
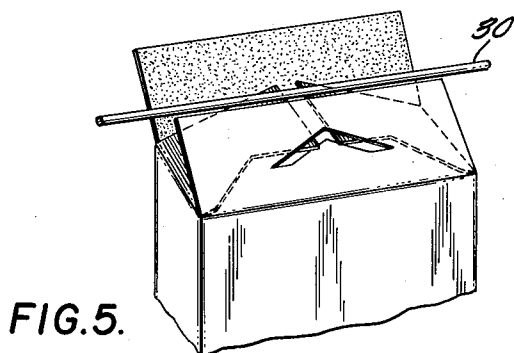
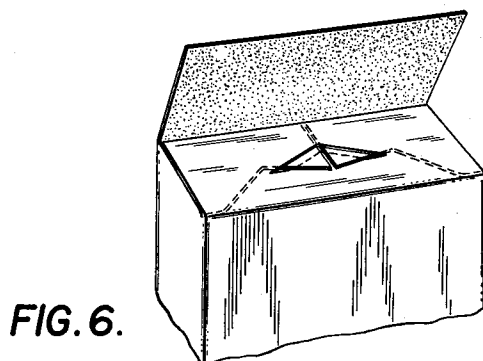
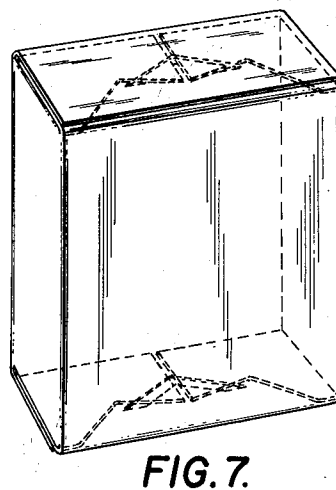
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2 Sheets-Sheet 2



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3,074,613

CARTON CLOSURE

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20 Claims. (Cl. 229—39)

This invention relates to a novel carton and to a novel method of assembling a carton.

Conventional cartons of the type used for packaging soaps, foods, etc. are usually comprised of a carton body having four flaps at each end, two inner flaps, an intermediate flap and an outer flap. When the carton is being assembled, adhesive is applied to the inside of the intermediate and outer flaps, the inner flaps are turned in, the intermediate and outer flaps are turned in over the inner flaps and pressure is applied to the flaps until the adhesive has set. The cartons are usually assembled mechanically at high speeds with the aid of ploughs to turn the flaps in.

A well recognized disadvantage of conventional cartons is the fact that it is difficult to glue the flaps together in such a manner as to provide a tight seal. A tight seal is important of course, because of the possible loss of the contents through leakage and also to prevent the entrance of dust, dirt, and in the case of foods, vermin. The conventional carton is difficult to seal because the pressure applied to the ends of the carton after the adhesive has been applied forces the inner flaps inward away from the outer flaps so that there is poor contact between the flaps and the adhesive does not have a chance to bind them together. The problem also exists in the case of cartons which have an outer wrapper which completely covers the carton. If, as is often the case the seal of the end closures of the carton permits the product to sift out, the material will settle between the outer surfaces of the carton and the inner surfaces of the wrapper. When this happens the resulting package is unsightly to the eye and unpleasant to the touch.

It is, therefore, an object of this invention to provide a carton having interlocking flaps which can be assembled in such a manner as to provide a tight seal on all sides and especially at the corners.

It is another object of this invention to provide a novel method of assembling a carton so as to provide a tight seal.

These and other objects of the invention are accomplished by providing a carton wherein each inner flap has at least one protruding tab and the intermediate flap has a plurality of apertures adapted to receive the protruding tabs so that when the carton is assembled the flaps are interlocking and support each other. A novel method of assembling the carton is also provided which comprises the steps of applying adhesive to the flaps, inserting the tabs into the apertures from below and sealing the carton.

This invention may be better understood from the following detailed description taken in conjunction with the accompanying figures of the drawing in which,

FIGURE 1 is an illustration of a carton constructed according to the invention;

FIGURE 2 is a modification of the carton shown in FIGURE 1;

FIGURE 3 is another modification of the carton shown in FIGURE 1; and

FIGURES 4 through 7 illustrate a method of assembling cartons constructed according to the invention.

With reference to FIGURE 1, a carton constructed according to the invention is comprised of a carton body 11, a front or intermediate flap 12, a back or outer flap 13 and two end or inner flaps 14 and 15. The intermediate flap 12 is formed with two diagonal apertures 16 and 17 and the inner flaps are formed with an angular portion cut away leaving protruding tabs 18 and 19 and knees 24 and 26. The apertures and the tabs are positioned so

2

that, when the carton is being assembled, the inner flaps are turned in first, leaving them inclined upwardly at an angle, the intermediate flap is turned in next with the tabs projecting from below through the apertures and then the outer flap is turned in and the carton sealed. The cartons may be assembled automatically by a machine of the type having two ploughs to turn the intermediate and outer flaps inward and a guide bar to set the position of the inner flaps. The inner flaps are angularly inclined upward, a plough turns the intermediate flap in so that it bears against the inner flaps, the tabs are forced through the apertures as the flaps are forced into a horizontal position and then another plough turns the outer flap inward over the tops of the inner and intermediate flaps. It should be understood that the use of ploughs is intended to be illustrative since other means could be employed to turn the flaps in as will be hereinafter explained.

The diagonal apertures 16 and 17 and the cut away portion of the inner flaps 14 and 15 must be designed to meet a number of requirements: first, the tabs 18 and 19 must extend through the apertures 16 and 17 to provide a bearing surface on top of the intermediate flap and still allow a large area of adhesion between the outer and intermediate flaps, secondly, the knees 24 and 26 should not be so high as to prevent the intermediate flap from being turned inward when the carton is being assembled and may be eliminated entirely although a better seal at the corners would probably be obtained if they extend upward a limited distance; and, thirdly, the end flaps and apertures must be designed so that the carton may be assembled mechanically without danger of the machine binding and jamming when the tabs are being forced through the apertures. Realizing that there are numerous satisfactory designs, the following are the dimensions of the carton illustrated in FIGURE 1. Assuming the flaps 12 and 13 to be 4 inches in length and the flaps 14 and 15 to be $2\frac{3}{16}$ inches in length, the height of flaps 12 and 13 is $2\frac{3}{16}$ inches and the height of flaps 14 and 15 is 2 inches. Flaps 14 and 15 are similarly constructed with the height of the knee 24 being $\frac{1}{4}$ inch from the seam 23. The distance from the apex 22 of the angular cutaway portion to the seam 23 is 1 inch and the distance from the apex 22 to the side 20 is 1 inch. The tab 18 extends approximately $\frac{3}{16}$ of an inch to the right of a vertical line passing through the point 22.

The end 21 of the diagonal aperture 16 is 1 inch from the side 20 and 1 inch from the seam 23. The apex 25 of the two diagonal apertures 16 and 17 is $\frac{3}{4}$ inch from the top of the flap 12 and is located midway between the two sides of the flap. The apertures 16 and 17 are $\frac{1}{4}$ inch in width and are mirror images of each other.

The distance from the side 20 of the flap 12 to the point 21 should be approximately equal to the distance from the seam 23 to the point 22 and the distance from the side 20 to the point 22 should be approximately equal to the distance from the seam 23 to the point 21. The tabs should be long enough and the apertures positioned so that a significant portion of each tab will extend through the apertures and will provide support near the center of the flaps.

In FIGURE 2 is shown another carton constructed according to the invention in which the tab 28 and the knee 27 are rounded off as shown. This modification may be employed when it is desired to give the tab 28 a larger bearing surface on the top of the intermediate flap.

In FIGURE 3 is shown a further modification of the invention wherein the tab 29 presents a square appearance. FIGURE 3 further illustrates the position of the diagonal apertures in the intermediate flap when the length of the carton is more than twice its width. The diagonal apertures no longer meet at the center of the flap and

3

have to be positioned to coincide with size and shape of the tabs. The height of the knees on the inner flaps may also have to be decreased as the width of the carton is decreased to prevent binding when assembling.

FIGURES 4 through 7 illustrate four steps in one method of assembling the carton. First, the two inner flaps are folded inward while adhesive is applied to the intermediate flap and the outer flap; then the inner flaps are allowed to rise part way and the intermediate flap is turned over so that the tabs on the inner flaps are forced through the apertures in the intermediate flap from below; finally, the outer flap is turned inward on top of the inner flaps and the intermediate flap.

In FIGURE 4 the carton is shown being carried by a belt 36 with a guide bar 30 holding the two inner flaps 31 and 32 in a horizontally inward position. The intermediate flap 33 and the outer flap 34 are held in a horizontal outward position by bars or ploughs (not shown) as the carton moves under the glue applicator 35. After glue has been applied to the inner surfaces of the intermediate flap and the outer flap, the guide bar 30 allows the two inner flaps to rise upward to the position shown in FIGURE 5. The inner flaps rise of their own accord by reason of the memory of the paper board, that is, the tendency of the board to return to its original position after being folded. The guide bar allows the inner flaps to rise by the amount shown in FIGURE 5 so that, when the intermediate flap is turned over by a plough (not shown), the intermediate flap will bear against the inner flaps, forcing the tabs through the apertures. As the intermediate flap is turned inward to a horizontal position, as shown in FIGURE 6, it bears against the knees and the upper edges of the inner flaps and forces the inner flaps into a horizontal position beneath it with the tabs extending through the diagonal apertures. After the inner flaps and the intermediate flap have been turned in, another plough (not shown) turns the outer flap over and produces the assembled carton shown in FIGURE 7. The guide bar 30 must be positioned near the back of the carton, of course, so that it will not interfere with the intermediate and outer flaps as they are being turned in.

Instead of using conventional ploughs to turn the flaps as suggested, a set of cams could be used in conjunction with ploughs or similar means. Eccentric cams rotating on axes normal to the plane of the belt 36 may be mounted so that the cams force the flaps from an upstanding position inwardly as the cams are rotated and the carton travels along the belt.

It can therefore be seen that a new and useful carton and a method of assembling the carton have been provided. The flaps on the carton are interlocking and, therefore, support each other when the glue and pressure are applied. The method of assembling is rapid and reliable and produces a carton with a good seal at all points. Both ends of the carton may be constructed and assembled as shown, or one end of the carton may be constructed and assembled in a conventional manner and, after the carton has been filled, the opposite end (constructed in accordance with the invention) may be assembled by the method described herein. In this manner a solid seal is effected between the flaps and for all practical purposes the package is relatively sift-proof for the greater majority of products.

While particular embodiments of the present invention have been shown and described for purposes of illustration, it is apparent that changes and modifications may be made without departing from this invention in its broader aspects. Therefore, the invention described herein is not to be construed as limited to the specific embodiment described is intended to encompass all modifications thereof coming within the scope of the following claims.

I claim:

1. A carton blank having four serially connected rectangular panels and four flaps at one end of the blank with each flap being hinged to a panel along the entire

4

length of the panel end, a first generally rectangular flap joined to a first of said rectangular panels, a second generally rectangular flap joined to a second of said rectangular panels spaced from said first panel by a third of said panels, and a third flap joined to said third rectangular panel through a hinge line, said second flap containing at least one aperture, said third flap having a tab at a cut-away portion adjacent said second flap, said third flap being formed so as to provide a closure at the corners of the assembled carton and said tab being formed so as to extend through said aperture when said third flap is first partly folded inwardly and said second flap is folded down over said third flap forcing said third flap into the completely closed position in the closing operation, said aperture being located in said second flap substantially as determined by the line of intersection between the plane of the second flap and the plane of the third flap (1) when they are bent partly inwardly on said hinge line while maintaining said flaps substantially planar in the closing operation and (2) as said tab first enters said aperture during the closing operation, each of said flaps forming an obtuse angle with its corresponding panel in said partly inwardly bent position, the width of said first flap being greater than the normal distance from a line taken through the hinge line between said third and first panels to the most remote point of said edge of said tab, so that when the carton is assembled the first flap covers completely said aperture and the tab projecting through said aperture; said normal distance being greater than the shortest distance from the outer edge of the second flap to the nearest point on the remote edge of said aperture so that said tab is long enough to extend through said aperture in the assembled carton so that at least a portion of said tab overlies at least a portion of said second flap thereby providing interior support for said third flap during the final closing of the carton, and a fourth flap joined to the fourth panel through a hinge line and being formed with a tab and a corresponding aperture in said second flap in a manner corresponding to said third flap so as to provide support for said fourth flap during the closing operation and a tight closure of the end of the carton.

2. A carton blank according to claim 1 in which the first flap is imperforate and large enough to cover substantially all portions of the second flap in the assembled carton.

3. A carton blank having four serially connected rectangular panels and four flaps at one end of the blank with each flap being hinged to a panel along the entire length of the panel end, a first generally rectangular flap joined to a first of said rectangular panels, a second generally rectangular flap joined to a second of said rectangular panels spaced from said first panel by a third of said panels, and a third flap joined to said third rectangular panel through a hinge line, said second flap containing two slots, said third flap having a tab and knee at a cut-away portion between them adjacent said second flap and a fourth flap joined to the fourth panel through a hinge line and being formed with a knee and a tab in a manner corresponding to said third flap, said knees being formed so as to provide a closure at the corners of the assembled carton and said tabs being formed so as to extend through said slots when said third and fourth flaps are first partly folded inwardly and said second flap is folded down over said third and fourth flaps forcing said third and fourth flaps into the completely closed position in the closing operation, said slots being at an angle to the hinge line joining said second flap to said second panel substantially as determined by the lines of intersection between the plane of the second flap and the planes of the third and fourth flaps (1) when they are bent partly inwardly on said hinge lines while maintaining said flaps substantially planar in the closing operation and (2) as said tabs are first entering said slots during the closing operation, each of said flaps forming an obtuse angle with its correspond-

5

ing panel in said partly inwardly bent position, the width of said first flap being greater than the normal distance from a line taken through the hinge line between said third and first panels to the most remote point of said edge of said tabs, so that when the carton is assembled the first flap covers completely said slots and the tabs projecting through said slots; said normal distance being greater than the shortest distance from the outer edge of the second flap to the nearest point on the remote edge of said slots so that said tabs are long enough to extend through said slots in the assembled carton so that at least a portion of said tabs overlies at least a portion of said second flap thereby providing interior support for said third and fourth flaps during the final closing of the carton.

4. A carton blank having four serially connected rectangular panels and four flaps at one end of the blank with each flap being hinged to a panel along the entire length of the panel end, a first generally rectangular flap joined to a first of said rectangular panels, a second generally rectangular flap joined to a second of said rectangular panels spaced from said first panel by a third of said panels, and a third flap joined to said third rectangular panel through a hinge line, said second flap containing two apertures, said third flap having a tab and a knee at a cutaway portion between them adjacent said second flap and a fourth flap joined to the fourth panel through a hinge line and being formed with a knee and a tab in a manner corresponding to said third flap, said knees being formed so as to provide a closure at the corners of the assembled carton and said tabs being formed so as to extend through said apertures when said third and fourth flaps are first partly folded inwardly and second flap is folded down over said third and fourth flaps forcing said third and fourth flaps into the completely closed position in the closing operation, said apertures being located in said second flap substantially as determined by the lines of intersection between the plane of the second flap and the planes of the third and fourth flaps (1) when they are bent partly inwardly on said hinge lines while maintaining said flaps substantially planar in the closing operation and (2) as said tabs are first entering said apertures during the closing operation, each of said flaps forming an obtuse angle with its corresponding panel in said partly inwardly bent position, the width of said first flap being greater than the normal distance from a line taken through the hinge line between said third and first panels to the most remote point of said edge of said tabs, so that when the carton is assembled the first flap covers completely said aperture and the tabs projecting through said aperture; said normal distance being greater than the shortest distance from the outer edge of the second flap so the nearest point on the remote edge of said apertures so that said tabs are long enough to extend through said apertures in the assembled carton so that at least a portion of said tabs overlies at least a portion of said second flap thereby providing interior support for said third and fourth flaps during the final closing of the carton.

5. A carton blank having four serially connected rectangular panels and four flaps at one end of the blank with each flap being hinged to a panel along the entire length of the panel end, a first generally rectangular flap joined to a first of said rectangular panels, a second generally rectangular flap joined to a second of said rectangular panels spaced from said first panel by a third of said panels, and a third flap joined to said third rectangular panel through a hinge line, said second flap containing apertures, said third flap having a tab at a cutaway portion adjacent said second flap and a fourth flap joined to the fourth panel through a hinge line and being formed with a tab in a manner corresponding to said third flap, said third and fourth flaps being formed so as to provide a closure at the corners of the assembled carton and said tabs being formed so as to extend through said apertures

6

when said third and fourth flaps are first partly folded inwardly and said second flap is folded down over said third and fourth flaps forcing said third and fourth flaps into the completely closed position in the closing operation, said apertures being located in said second flap substantially as determined by the lines of intersection between the plane of the second flap and the planes of the third and fourth flaps (1) when they are bent partly inwardly on said hinge lines while maintaining said flaps substantially planar in the closing operation and (2) as said tabs are first entering said apertures during the closing operation, each of said flaps forming an obtuse angle with its corresponding panel in said partly inwardly bent position, the width of said first flap being greater than the normal distance from a line taken through the hinge line between said third and first panels to the most remote point of said edge of said tabs, so that when the carton is assembled the first flap covers completely said apertures and the tabs projecting through said apertures; said normal distance being greater than the shortest distance from the outer edge of the second flap to the nearest point on the remote edge of said apertures so that said tabs are long enough to extend through said apertures in the assembled carton so that at least a portion of said tabs overlies at least a portion of said second flap thereby providing interior support for said third and fourth flaps during the final closing of the carton.

6. In a carton having six rectangular sides, and having contents therein, comprising a four sided tubular body each of said body sides being a rectangular panel with four edges, an improved closure at one end of said carton comprising: a first flap joined to a first of said rectangular panels, a second flap joined to a second of said rectangular panels opposite and parallel to said first panel, and third and fourth flaps joined respectively to third and fourth rectangular parallel panels on opposite sides of said carton, said third and fourth flaps being bent inwardly so as to lie perpendicular to said body panels, said second flap being bent inwardly perpendicular to said body panels and overlying said third and fourth flaps, said first flap being bent inwardly perpendicular to said body panels overlying and secured to said second flap, said second flap having edge portions approximately midway between adjacent edges of said first panel and second panel and intermediate said third and fourth rectangular panels, said third and fourth flaps each being cut away at the outer corner adjacent said second flap panel and from a point adjacent to the inner corners of said third and fourth flaps leaving sufficient of said flaps to provide a closure at the corners of the carton and to form protruding tabs, each of said tabs being substantially coplanar with its respective flap and long enough so as to extend across said edge portions of said second flap so that at least a portion thereof overlies at least a portion of said second flap thereby providing interior support for said third and fourth flaps during the final closing of the carton, said first flap being large enough to cover completely said edge portions of said second flap and the tabs projecting thereover thereby to improve the imperviousness of the carton; the other end of said carton being tightly closed.

7. A carton according to claim 6 in which the first flap is imperforate and large enough to cover substantially all portions of the second flap in the assembled carton.

8. A carton according to claim 6 in which the inner surface of the first flap is adhesively secured to the outer surface of the second flap and the inner surface of the second flap is adhesively secured to the outer surfaces of the third and fourth flaps thereby to provide a substantially impermeable carton end closure.

9. A collapsed carton having four serially connected rectangular panels and four flaps at one end of the blank with each flap being hinged to a panel along the entire length of the panel end, a first generally rectangular flap

joined to a first of said rectangular panels, a second generally rectangular flap joined to a second of said rectangular panels spaced from said first panel by a third of said panels, and a third flap joined to said third rectangular panel through a hinge line, said second flap containing at least one aperture, said third flap having a tab at a cutaway portion adjacent said second flap said third flap being formed so as to provide a closure at the corners of the assembled carton and said tab being formed so as to extend through said aperture when said third flap is first partly folded inwardly and said second flap is folded down over said third flap forcing said third flap into the completely closed position in the closing operation, said aperture being located in said second flap substantially as determined by the line of intersection between the plane of the second flap and the plane of the third flap (1) when they are bent partly inwardly on said hinge line while maintaining said flaps substantially planar in the closing operation and (2) as said tab first enters said aperture during the closing operation, each of said flaps forming an obtuse angle with its corresponding panel in said partly inwardly bent position, the width of said first flap being greater than the normal distance from a line taken through the hinge line between said third and first panels to the most remote point of said edge of said tab, so that when the carton is assembled the first flap covers completely said aperture and the tab projecting through said aperture; said normal distance being greater than the shortest distance from the outer edge of the second flap to the nearest point on the remote edge of said aperture so that said tab is long enough to extend through said aperture in the assembled carton so that at least a portion of said tab overlies at least a portion of said second flap thereby providing interior support for said third flap during the final closing of the carton, and a fourth flap joined to the fourth panel through a hinge line and being formed with a tab, and a corresponding aperture in said second flap in a manner corresponding to said third flap so as to provide support for said fourth flap during the closing operation and a tight closure of the end of the carton.

10. A collapsed carton according to claim 9 in which the first flap is imperforate and large enough to cover substantially all portions of the second flap in the assembled carton.

11. In a carton having six rectangular sides, and having contents therein comprising a four sided tubular body each of said body sides being a rectangular panel with four edges, an improved closure at one end of said carton comprising: a first flap joined to a first of said rectangular panels, a second flap joined to a second of said rectangular panels opposite and parallel to said first panel, and third and fourth flaps joined respectively to third and fourth rectangular parallel panels on opposite sides of said carton, said third and fourth flaps being bent inwardly so as to lie perpendicular to said body panels, said second flap being bent inwardly perpendicular to said body panels and overlying said third and fourth flaps, said first flap being bent inwardly perpendicular to said body panels overlying and secured to said second flap, said second flap containing two apertures, said third and fourth flaps each being cut away at the outer corner adjacent said second flap panel and from a point adjacent to but removed from the inner corners of said third and fourth flaps to form knees at the inner corners of the third and fourth flaps to provide a closure at the corners of the carton and to form protruding tabs, each of said tabs being substantially coplanar with its respective flap and extending through said apertures, said tabs being long enough so that at least a portion thereof overlies at least a portion of said second flap thereby providing interior support for said third and fourth flaps during the final closing of the carton, said first flap being large enough to cover completely said apertures and the tabs projecting through said apertures thereby to improve the

imperviousness of the carton; the other end of said carton being tightly closed.

12. In a carton having six rectangular sides, and having contents therein comprising a four sided tubular body each of said body sides being a rectangular panel with four edges, an improved closure at one end of said carton comprising: a first flap joined to a first of said rectangular panels, a second flap joined to a second of said rectangular panels opposite and parallel to said first panel, and third and fourth flaps joined respectively to third and fourth rectangular parallel panels on opposite sides of said carton, said third and fourth flaps being bent inwardly so as to lie perpendicular to said body panels, said second flap being bent inwardly perpendicular to said body panels and overlying said third and fourth flaps, said first flap being bent inwardly perpendicular to said body panels overlying and secured to said second flap, said second flap containing two apertures, said third and fourth flaps each being cut away at the outer corner adjacent said second flap panel and from a point adjacent to but removed from the inner corners of said third and fourth flaps, leaving sufficient of said flaps to provide a closure at the corners of the carton and to form protruding tabs, each of said tabs being substantially coplanar with its respective flap and extending through said apertures, said tabs being long enough so that at least a portion thereof overlies at least a portion of said second flap thereby providing interior support for said third and fourth flaps during the final closing of the carton, said first flap being large enough to cover completely said apertures and the tabs projecting through said apertures thereby to improve the imperviousness of the carton; the other end of said carton being tightly closed.

13. A collapsed carton having four serially connected rectangular panels and four flaps at one end of the carton with each flap being hinged to a panel along the entire length of the panel end, a first generally rectangular flap joined to a first of said rectangular panels, a second generally rectangular flap joined to a second of said rectangular panels spaced from said first panel by a third of said panels, and a third flap joined to said third rectangular panel through a hinge line, said second flap containing two slots, said third flap having a tab and knee at a cutaway portion between them adjacent said second flap and a fourth flap joined to the fourth panel through a hinge line and being formed with a knee and a tab in a manner corresponding to said third flap, said knees being formed so as to provide a closure at the corners of the assembled carton and said tabs being formed so as to extend through said slots when said third and fourth flaps are first partly folded inwardly and said second flap is folded down over said third and fourth flaps forcing said third and fourth flaps into the completely closed position in the closing operation, said slots being at an angle to the hinge line joining said second flap to said second panel substantially as determined by the lines of intersection between the plane of the second flap and the planes of the third and fourth flaps (1) when they are bent partly inwardly on said hinge lines while maintaining said flaps substantially planar in the closing operation and (2) as said tabs are first entering said slots during the closing operation, each of said flaps forming an obtuse angle with its corresponding panel in said partly inwardly bent position, the width of said first flap being greater than the normal distance from a line taken through the hinge line between said third and first panels to the most remote point of said edge of said tabs, so that when the carton is assembled the first flap covers completely said slots and the tabs projecting through said slots; said normal distance being greater than the shortest distance from the outer edge of the second flap to the nearest point on the remote edge of said slots so that said tabs are long enough to extend through said slots in the assembled carton so that at least a portion of said tabs overlies at least a portion of said second flap thereby providing in-

terior support for said third and fourth flaps during the final closing of the carton.

14. A collapsed carton having four serially connected rectangular panels and four flaps at one end of the blank with each flap being hinged to a panel along the entire length of the panel end, a first generally rectangular flap joined to a first of said rectangular panels, a second generally rectangular flap joined to a second of said rectangular panels spaced from said first panel by a third of said panels, and a third flap joined to said third rectangular panel through a hinge line, said second flap containing two apertures, said third flap having a tab and knee at a cutaway portion between them adjacent said second flap and a fourth flap joined to the fourth panel through a hinge line and being formed with a knee and a tab in a manner corresponding to said third flap, said knees being formed so as to provide a closure at the corners of the assembled carton and said tabs being formed so as to extend through said apertures when said third and fourth flaps are first partly folded inwardly and said second flap is folded down over said third and fourth flaps forcing said third and fourth flaps into the completely closed position in the closing operation, said apertures being located in said second flap substantially as determined by the lines of intersection between the plane of the second flap and the planes of the third and fourth flaps (1) when they are bent partly inwardly on said hinge lines while maintaining said flaps substantially planar in the closing operation and (2) as said tabs are first entering said apertures during the closing operation, each of said flaps forming an obtuse angle with its corresponding panel in said partly inwardly bent position, the width of said first flap being greater than the normal distance from a line taken through the hinge line between said third and first panels to the most remote point of said edge of said tabs, so that when the carton is assembled the first flap covers completely said aperture and the tabs projecting through said aperture; said normal distance being greater than the shortest distance from the outer edge of the second flap to the nearest point on the remote edge of said apertures so that said tabs are long enough to extend through said apertures in the assembled carton so that at least a portion of said tabs overlies at least a portion of said second flap thereby providing interior support for said third and fourth flaps during the final closing of the carton.

15. A collapsed carton having four serially connected rectangular panels and four flaps at one end of the blank with each flap being hinged to a panel along the entire length of the panel end, a first generally rectangular flap joined to a first of said rectangular panels, a second generally rectangular flap joined to a second of said rectangular panels spaced from said first panel by a third of said panels, and a third flap joined to said third rectangular panel through a hinge line, said second flap containing two apertures, said third flap having a tab at a cutaway portion adjacent said second flap and a fourth flap joined to the fourth panel through a hinge line and being formed with a tab in a manner corresponding to said third flap, said third and fourth flaps being formed so as to provide a closure at the corners of the assembled carton and said tabs being formed so as to extend through said apertures when said third and fourth flaps are first partly folded inwardly and said second flap is folded down over said third and fourth flaps forcing said third and fourth flaps into the completely closed position in the closing operation, said apertures being located in said second flap substantially as determined by the lines of intersection between the plane of the second flap and the planes of the third and fourth flaps (1) when they are bent partly inwardly on said hinge lines while maintaining said flaps substantially planar in the closing operation and (2) as said tabs are first entering said apertures during the closing operation, each of said flaps forming an obtuse angle with its corresponding panel in said partly inwardly bent position, the width of said first flap being greater

than the normal distance from a line taken through the hinge line between said third and first panels to the most remote point of said edge of said tabs, so that when the carton is assembled the first flap covers completely said apertures and the tabs projecting through said apertures; said normal distance being greater than the shortest distance from the outer edge of the second flap to the nearest point on the remote edge of said apertures so that said tabs are long enough to extend through said apertures in the assembled carton so that at least a portion of said tabs overlies at least a portion of said second flap thereby providing interior support for said third and fourth flaps during the final closing of the carton.

16. In a carton having six rectangular sides, and having contents therein comprising a four sided tubular body each of said body sides being a rectangular panel with four edges, an improved closure at one end of said carton comprising: a first flap joined to a first of said rectangular panels, a second flap joined to a second of said rectangular panels opposite and parallel to said first panel, and third and fourth flaps joined respectively to third and fourth rectangular parallel panels on opposite sides of said carton, said third and fourth flaps being bent inwardly so as to lie perpendicular to said body panels, said second flap being bent inwardly perpendicular to said body panels and overlying said third and fourth flaps, said first flap being bent inwardly perpendicular to said body panels overlying and secured to said second flap, said second flap containing two apertures, said apertures being slots inclined at an angle to the line joining the second flap to the second panel, substantially as determined by the lines of intersection between the plane of the second flap and the planes of the third and fourth flaps (1) when they are bent partly inwardly on the lines joining them to their respective panels while maintaining said flaps substantially planar in the closing operation and (2) as said tabs are first entering said apertures during the closing operation, each of said flaps forming an obtuse angle with its corresponding panel in said partly inwardly bent position, said third and fourth flaps each being cut away at the outer corner adjacent said second flap panel and from a point adjacent to but removed from the inner corners of said third and fourth flaps to form knees at the inner corners of the third and fourth flaps to provide a closure at the corners of the carton and to form protruding tabs, each of said tabs being substantially coplanar with its respective flap and extending through said apertures, said tabs being long enough so that at least a portion thereof overlies at least a portion of said second flap thereby providing interior support for said third and fourth flaps during the final closing of the carton, said first flap being large enough to cover completely said apertures and the tabs projecting through said apertures thereby to improve the imperviousness of the carton; the other end of said carton being tightly closed.

17. The process of closing one end of a carton having six rectangular sides, a four sided tubular body each of said body sides being a rectangular panel with four edges, a first flap joined to a first of said rectangular panels, a second flap joined to a second of said rectangular panels opposite and parallel to said first panel, and third and fourth flaps joined respectively to third, and fourth rectangular parallel panels on opposite sides of said carton, said third and fourth flaps being bent inwardly so as to lie perpendicular to said body panels, said second flap being bent inwardly perpendicular to said body panels and overlying said third and fourth flaps, said first flap being bent inwardly perpendicular to said body panels overlying and secured to said second flap, said second flap containing two apertures, said third and fourth flaps each being cut away at the outer corner adjacent said second flap panel and from a point adjacent to but removed from the inner corner of said third and fourth flaps to form knees at the inner corners of the third and fourth flaps to provide a closure at the corners of the carton and to form protrud-

ing tabs, said process comprising bending inwardly said third and fourth flaps so as to form an obtuse angle with said respective body panels, bending inwardly said second flap to form an obtuse angle with said second panel and to overlie said third and fourth flaps with said tabs substantially planar and extending into said apertures, pressing said second flap inwardly thereby to force said third and fourth flaps inwardly also and to force said tabs through said apertures, said tabs being long enough so that at least a portion thereof overlies at least a portion of said second flap in the closed position thereby providing interior support for said third and fourth flaps during the closing of the carton, and bending said first flap inwardly perpendicular to said body panels overlying and secured to said second flap, said first flap being large enough to cover completely said apertures and the tabs projecting through said apertures thereby to improve the imperviousness of the carton.

18. The process of closing one end of a carton having six rectangular sides, a four sided tubular body each of said body sides being a rectangular panel with four edges, a first flap joined to a first of said rectangular panels, a second flap joined to a second of said rectangular panels opposite and parallel to said first panel, and third and fourth flaps joined respectively to third and fourth rectangular parallel panels on opposite sides of said carton, said third and fourth flaps being bent inwardly so as to lie perpendicular to said body panels, said second flap being bent inwardly perpendicular to said body panels and overlying said third and fourth flaps, said first flap being bent inwardly perpendicular to said body panels overlying and secured to said second flap, said second flap having edge portions approximately midway between adjacent edges of said first panel and second panel and intermediate said third and fourth rectangular panels, said third and fourth flaps each being cut away at the outer corner adjacent said second flap panel and from a point adjacent to the inner corners of said third and fourth flaps leaving sufficient of the third and fourth flaps to provide a closure at the corners of the carton and to form protruding tabs, said process comprising bending inwardly said third and fourth flaps so as to form an obtuse angle with said respective body panels, bending inwardly said second flap to form an obtuse angle with said second panel and to overlie said third and fourth flaps with said tabs substantially planar and overlying said edge portions of said second flap, press-

ing said second flap inwardly thereby to force said third and fourth flaps inwardly also and to force said tabs further across said edge portions, said tabs being long enough so that at least a portion thereof overlies at least a portion of said second flap in the closed position thereby providing interior support for said third and fourth flaps during the closing of the carton, and bending said first flap inwardly perpendicular to said body panels overlying and secured to said second flap, said first flap being large enough to cover completely said edge portions and the tabs projecting thereover thereby to improve the imperviousness of the carton.

19. The process described in claim 18 in which said third and fourth flaps are first turned horizontally inwardly so as to lie perpendicular to said body panels, said first and second flaps are turned horizontally outwardly so as to be perpendicular to said body panels and adhesive is applied to the inner surfaces of each of said first and second flaps, and said third and fourth flaps are then allowed to rise to form said obtuse angle with said respective body panels and said second flap is turned inward to form said obtuse angle with said second panel, so that said first flap becomes secured to said second flap by a glued joint and said second flap becomes secured to said third and fourth flaps by glued joints.

20. The process described in claim 18 wherein adhesive is applied between said first and second flaps and between said second flap and said third and fourth flaps thereby to provide a tight closure.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,074,613

January 22, 1963

William J. Cupo

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 5, line 69, for "to" read -- two --.

Signed and sealed this 3rd day of September 1963.

(SEAL)

Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents