June 20, 1967 M. I. WILLIAMSON 3,326,447

RECLOSABLE CARTON WITH LATCH

Filed Jan. 28, 1966 3 Sheets-Sheet 1

FIG. 1

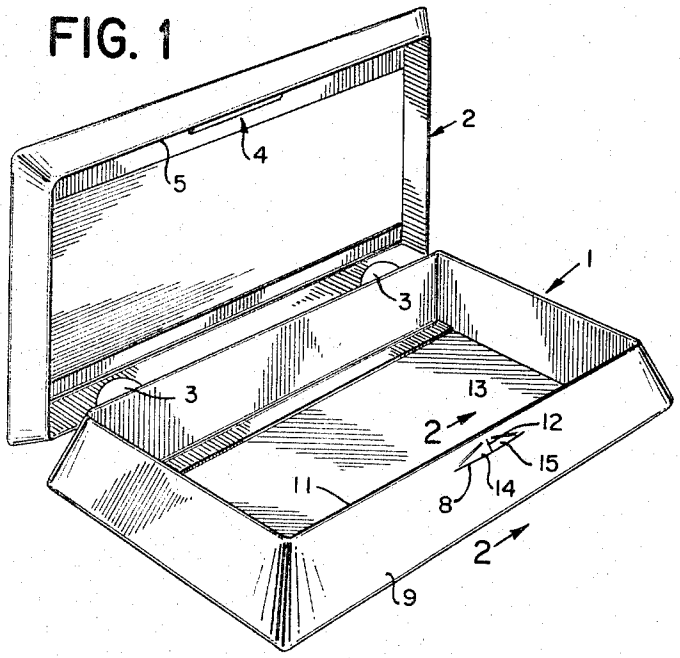


FIG. 2

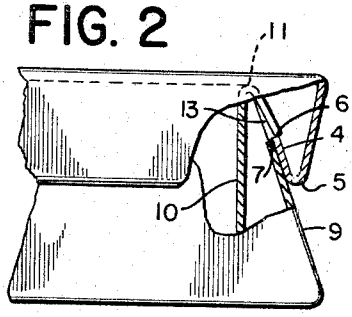
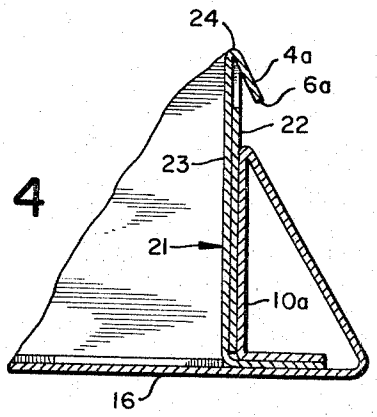


FIG. 4



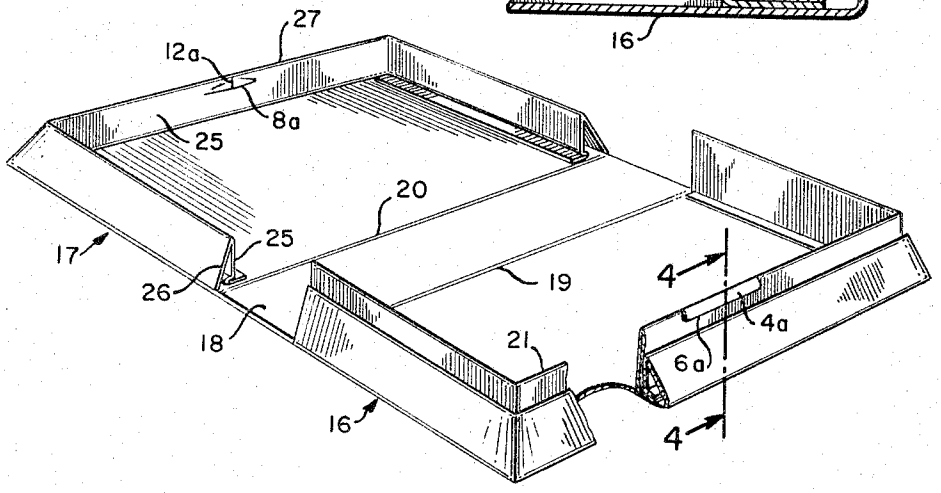


FIG. 3

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June 20, 1967 M. I. WILLIAMSON 3,326,447

RECLOSABLE CARTON WITH LATCH

Filed Jan. 28, 1966 3 Sheets-Sheet 2

FIG. 5

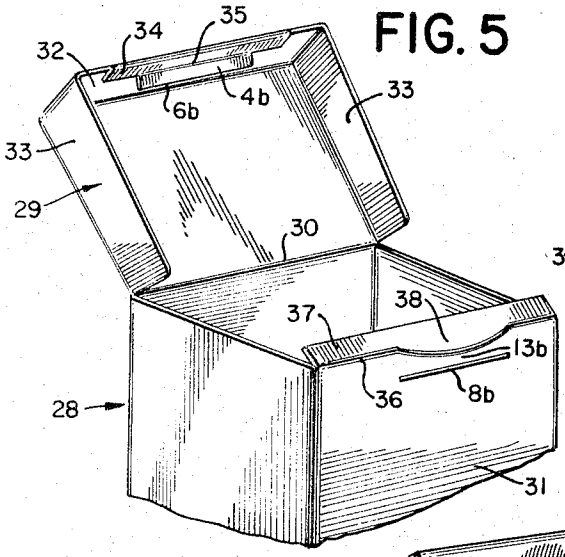


FIG. 6

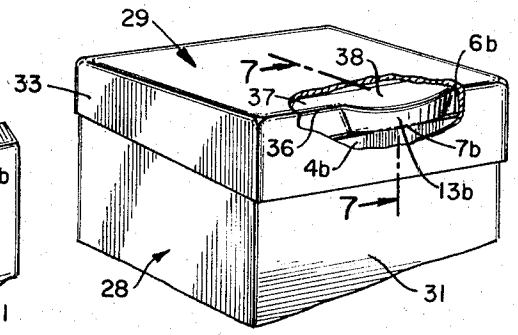


FIG. 7

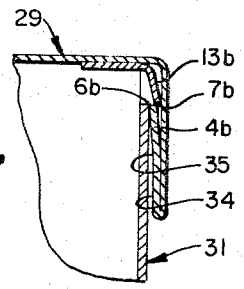


FIG. 8

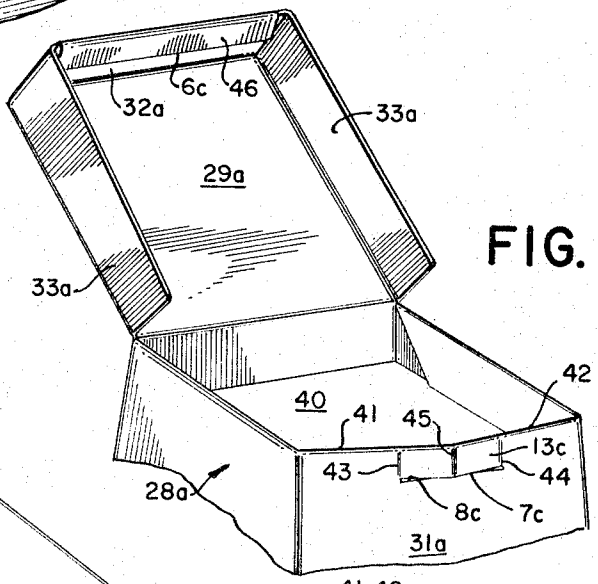


FIG. 9

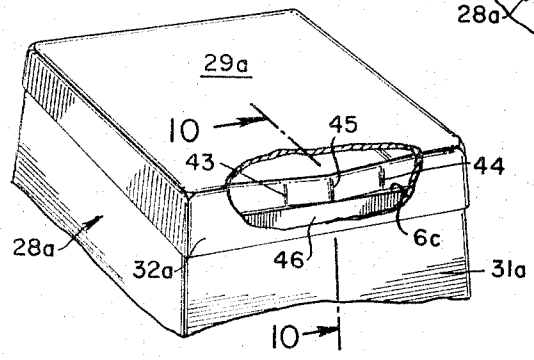
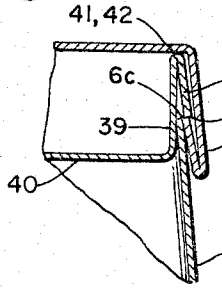


FIG. 10



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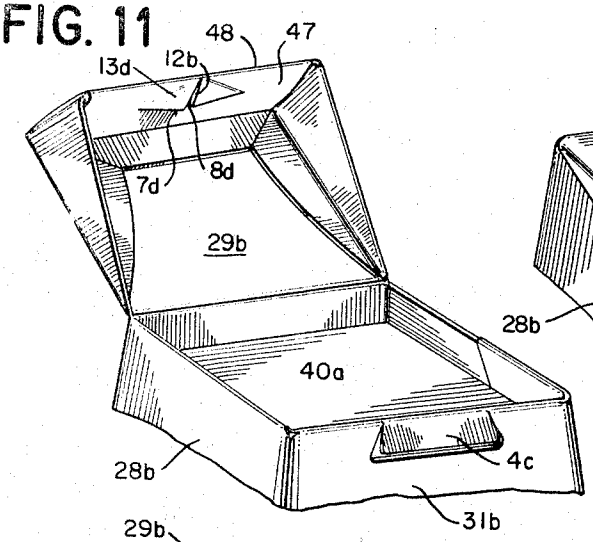
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June 20, 1967 M. I. WILLIAMSON 3,326,447

RECLOSABLE CARTON WITH LATCH

Filed Jan. 28, 1966 3 Sheets-Sheet 3

FIG. 11



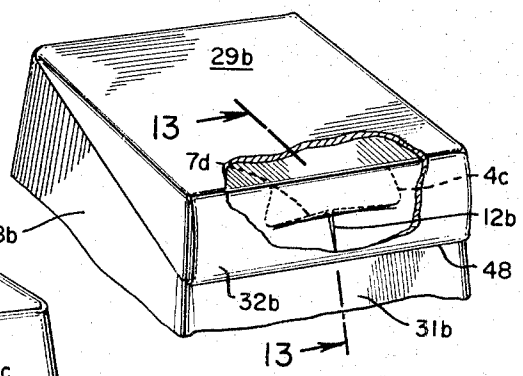


FIG. 12

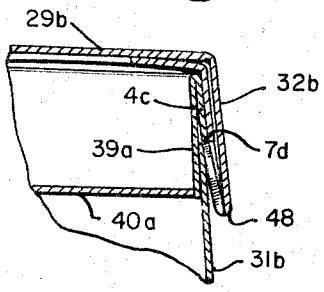


FIG. 13

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United States Patent Office 3,326,447
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3,326,447

RECLOSABLE CARTON WITH LATCH

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Filed Jan. 28, 1966, Ser. No. 523,669
8 Claims. (Cl. 229—44)

This application is a continuation-in-part of applicant's co-pending application Ser. No. 344,983 filed Feb. 14, 1964, as the result of which Patent No. 3,232,518 issued on Feb. 1, 1966.

This invention relates to cartons, made of the usual paperboard and having hinged covers, which are provided with a latching means by which the cover can be held in closed position but which permits the cover to be easily opened and closed. The invention relates more particularly to improvements in latching means such as shown in Patents Nos. 2,369,385 through 2,369,392.

In these prior constructions, and also in the latching means of the present invention, cooperating abutment elements are associated respectively with the cover and receptacle, one of these elements being formed by the edge of a hinged flap projecting from the cover or from the receptacle. However, in the prior art constructions the abutment element which cooperates with the edge of the hinged flap is in each case formed by the edge of a paperboard part which is flat glued to the appropriate surface of the carton, thus forming a shoulder which is fixed in position. In the construction of the present invention the necessity of providing a special part of the desired configuration, and gluing such part in a special position on the carton is eliminated, and the abutment which cooperates with the edge of the hinged flap is formed by the edge of a slit which may be positioned on either the receptacle or the cover.

A problem presented is that of displacing the appropriate edge of such a slit out of the plane of the portion of the carton in which it is formed so as to position the edge properly to be engaged by the flap edge abutment element, and maintaining the edge of the slit in such position. This is accomplished according to the present invention by providing a bend line in the material of the carton adjacent the slit, bending or folding the material along such bend line and maintaining the bend or fold in the material thereby causing the material between the bend line and the slit to bulge so as to force the edge of the slit out of the plane of the face in which the slit is cut. This positions the edge of the slit so that it will be engaged by the edge of the hinged flap on the other part of the carton when the carton is closed. The hinged flap is always longer than the slit so as to prevent it from entering the slit.

The invention will be better understood from a consideration of the following detailed description in connection with the accompanying drawings which illustrate the form of the invention disclosed in applicant's application above mentioned, and several variations thereof.

In these drawings:

FIG. 1 is a projectional or perspective view of a carton disclosed in the above mentioned application;

FIG. 2 is a fragmentary view with parts broken away and shown in section on line 2—2 of FIG. 1;

FIG. 3 is a perspective view of a somewhat different form of carton showing a variation of the invention;

FIG. 4 is a sectional view taken on line 4—4 of FIG. 3;

FIG. 5 is a perspective view showing another variation of the invention;

FIG. 6 is a view similar to FIG. 5 but with the cover in closed position;

FIG. 7 is a sectional view taken on line 7—7 of FIG. 6;

FIG. 8 is a view similar to FIG. 5 showing another variation of the invention;

FIG. 9 shows the carton of FIG. 8 with its cover closed;

FIG. 10 is a sectional view on line 10—10 of FIG. 9;

FIG. 11 is a view similar to FIGS. 5 and 8 showing still another variation;

FIG. 12 shows this carton with its cover closed; and

FIG. 13 is a sectional view taken on line 13—13 of FIG. 12.

Referring to FIGS. 1 and 2, a carton consisting of a receptacle 1 and a cover 2 has hollow walls of triangular shape in cross section as best shown in FIG. 2. This is a rectangular carton having front and rear side walls, and end walls. The cover is of similar construction except that its hollow walls are shallower than the walls of receptacle 1 so that when the cover is closed the walls of the cover only partially telescope with respect to the receptacle walls.

Cover 2 is hinged to the rear wall of receptacle 1 in any suitable manner, as by means of flaps 3 which may be cut from the outer side wall at the rear of receptacle 1 and which are adhesively secured to the rear inner side wall of the cover. A flap 4 is cut from the inner side wall of the cover and is hinged at 5 (FIG. 2) along the bottom edge of the cover wall, its upper edge 6 forming one of the abutment elements. The opposite or cooperating abutment element is constituted by the upper edge 7 (FIG. 2) of a slit 8 which is cut in the panel or face 9 of the front wall of receptacle 1. This front wall is formed by the panel 9 which slopes with respect to the bottom of the receptacle and an inner panel 10 which is shown as vertical.

These panels 9 and 10 are formed from a single piece of material which has a sharp bend or fold line 11 along the top thereof. Slit 8 is cut near the upper edge of bend line 11 as shown and is parallel thereto. Extending upwardly from slit 8 there is a short cross slit 12 which is intermediate the ends of the slit and preferably at its center. Such cross slit desirably is also at right angles to slit 8 and divides the upper edge 6 into two sections.

The material indicated by reference numeral 13 in FIG. 2 which is located between the bend line 11 and the slit is forced outwardly by its resilience and the presence of the bend or fold along the bend line 11. Cross slit 12 is not necessary but its presence allows the edge 6 to extend outwardly out of the plane of the face or panel 9 to a greater extent than if the cross slit were omitted. The presence of cross slit 12 also causes the material to bulge in the form of two narrow and similar triangular areas 14 and 15 as indicated in FIG. 1.

It will be understood that when the cover 20 is moved to a closed position, flap 4 on the cover slides along the surface of the material 13, including the triangular areas 14 and 15, forcing the material inwardly until the edge 6 of flap 4 passes beyond the edge 7 of slit 8, when the edge 7 springs outwardly and is engaged by the edge 6 of the flap. Upon raising cover member 2 to open the carton, flap 4 being held at its upper edge 6 by the slit edge 7 swings inwardly (FIG. 2) about its hinge to a sufficient extent to release itself from slit edge 7.

The flap 4 and the slit 8 may have any lengthwise dimensions desired, with the provision that the length of the hinged flap 4 is always somewhat greater than the length of slit 8. This provision applies not only to the construction of FIGS. 1 and 2, but also to all of the variations shown in FIGS. 3–13.

In FIGS. 3 and 4 there are shown what may be referred to as a book-type box inasmuch as its hollow walls on receptacle 16 and cover 17 are of the same height and meet edge to edge and are connected by a backbone member 18. This member has suitable score lines 19 and 20 which joint it respectively with receptacle 16 and cover 17. A neck member 21 is provided, a portion of which extends above the top of the hollow walls of receptacle 16 and over which the hollow walls of cover 17 tele-

scope and form a total closure when the cover is swung to closed position.

In this box construction, the hinged flap 4*a* which corresponds to flap 4 of FIGS. 1 and 2 is arranged on the receptacle and the cooperating slit 8*a* on the cover, flap 4*a* being somewhat longer than the slit.

In order that flap 4*a* may be hinged at or near the top edge of neck 21 and have a normally outwardly extending position as shown in FIG. 4, neck member 21 is made of two thicknesses of material, an outer thickness 22 and an inner layer 23. These are folded flat against one another along the top of the neck. Neck member 21 may be secured in place in any suitable manner. As shown in FIG. 4 the foot of the neck member is secured to the bottom of receptacle 16, and if desired, to the vertical wall panel 10*a* of the receptacle hollow wall.

It will be understood that the hollow walls of FIGS. 1–4 may be made with the inner panels thereof vertical as shown, or both the inner and outer panels may be at any desired angle to the bottom panel or cover panel.

The construction of slit 8*a* is identical with that described in FIGS. 1 and 2 except that it is formed on the inner vertical face 25 of the cover hollow wall. Since the inner and outer members 25 and 26 of the cover wall have a bend line 27 extending along the edge thereof, the material between slit 8*a* and bend line 27 is caused to bulge towards the interior of the box and form an abutment edge along the top edge of slit 8*a* which will engage the edge of abutment flap 4*a* when the cover is closed on the receptacle. Slit 8*a* desirably also has a cross slit 12*a* for the same purpose as cross slit 12 previously described.

Referring now to the construction shown in FIGS. 5–7, the box or carton has a receptacle 28 to which a cover member 29 is secured along a hinge line 30 at the rear of the top of the receptacle. The receptacle has a front wall panel 31 and the cover has a front flange or wall and side flanges or walls 33 which partially telescope the front panel 31 and the side panels of receptacle 28 when cover 29 is swung to closed position.

The hinged flap 4*b* of the latch means is formed by a narrowed extension of a wider flap 34 which is folded around the edge of flange 32 and glued to its inner surface. Flap 4*b* is attached along a hinge line 35 and in its normal position extends outwardly with respect to cover wall 32 at an angle of about 30°.

There are some box constructions, as in the present instance, where it is impossible to place the slit edge abutment adjacent or near a bend line where the carton material is folded through an angle of the order of 270° as in FIGS. 1–4. Where the fold angle is as low as 90° as in the construction of FIGS. 5–7, an additional provision is necessary in order to obtain the desired bulge so as to place the slit edge abutment element well out of the plane of the material in which it is formed and in a position to be easily engaged by the flap edge abutment element.

In FIGS. 5–7 slit 8*b* is cut in the front wall panel 31 of the receptacle at a distance adjacent to, i.e. slightly below, the top edge of this panel. This edge forms a bend line for a narrow flap 37 which may extend the full width of the box front panel 31. The normal position of flap 37 is at an angle of about 45° to the horizontal, or 135° to the inner surface of panel 31, and the flap is bent downwardly to approximately right angles to the panel 31 by contact with cover 29 when the cover is closed.

In order to provide the necessary bulge in the material 13*b* between slit 8*b* and bend line 36, this bend line, instead of being straight from side to side of panel 31, is provided with a convex portion 38 opposite slit 8*b* and having approximately the same length as the slit. When sheet material has a bend line which is curved throughout either a portion of its length or its entire length, and the material on one side of the bend line is folded through a given angle, the material on the opposite side of the bend line bulges to a greater extent than if the bend line were straight. With the curved bend line 38 it is unnecessary to provide a cross slit corresponding to cross slits 12 and 12*a* in the previous figures.

It will be understood that when the cover 29 is swung to closed position, flap 37 is bent downwardly by contact with the cover, this causes a bulge in the material 13*b* which forces the upper edge 7*b* of slit 8*b* forwardly out of the plane of the front wall panel or face 31, and when the abutment edge 6*b* of flap 4*b* reaches a point below the edge 7*b* the two abutment elements interlock with one another as shown in FIGS. 6 and 7.

The embodiment of the invention shown in FIGS. 8–10 utilizes the same principle as just described in connection with FIGS. 6–7, the difference being that instead of providing a bend line which is curved towards the slit, the bend line has two straight sections diverging from one another opposite the center of the slit at an obtuse angle to one another, these two sections being displaced only slightly out of a straight line. The fold angle at the bend line however is substantially 360° instead of being only 90°.

Thus the front wall panel 31*a* has an extension 39 which is folded to form the top edge of the box or carton 28*a*, the extension being folded so as to lie flat against the interior surface of panel 31*a*, as shown in FIG. 10. Extension 39, at a short distance below the top of the box is continued to the left (FIG. 10) to form a shelf member 40 so as to produce a shallow compartment at the top of the box for a special purpose. Shelf 40 maintains the extension 39 in contact with the interior surface of panel 31*a*.

The bend line at the top of the box is made up of two sections 41 and 42 which are straight lines meeting at the center of panel 31*a* which is also slightly above the center of the slit edge abutment 7*c* formed by the slit 8*c*. The material 13*c* between slit 8*c* and the fold line 41–42 is caused to bulge outwardly for the reason referred to above, and to facilitate this bulging action the area 13*c* is provided with vertical cross score lines 43 and 44 opposite the ends of slit 8*c* and also with vertical score line 45 opposite the center of the slit. These score lines extend from the slit to the bend line 41–42. In this way the abutment edge 7*c* is forced out of the plane of the front panel 31*a* as shown in FIG. 10.

The cover member 29*a* is provided with a front flange or wall 32*a* and side walls or flanges 33*a* similar to the carton shown in FIGS. 5 and 6, and the flap edge abutment element 6*c* is formed by the edge of a flap 46 which extends from the edge of wall 32*a* and whose normal position is at an angle of about 30° to the surface of this wall. When the cover 29*a* is swung to closed position flap 46 is swung inwardly until its lower edge 6*c* passes below the upper edge 7*c* of slit 8*c*, when these two parts engage one another to hold the cover in closed position.

It will be understood that in either of the forms of invention shown in FIGS. 5–10 the bend line may be referred to as making a dip towards the slit. This includes the curved bend line shown in FIGS. 5–7 and the bend line shown in FIGS. 8–10 which has two straight sections diverging from one another at an obtuse angle opposite the center of the slit.

The form of the invention shown in FIGS. 11–13 is a reverse arrangement of the carton of FIGS. 8–10, that is, the hinged flap 4*c* is on the receptacle 28*b*, and the slit 8*d* is on cover member 29*b*. Otherwise these two cartons are substantially alike. Abutment flap 4*c* is cut from the front wall panel 31*b* of receptacle and hinges along the top edge of this panel, there being an extension 39*a* on the inside of the panel wall which extends downwardly to a shelf 40*a*.

Slit 8*d* is cut in an extension 47 of the front wall or flange 32*b* of cover member 29*b*. This extension is folded

along a bend line **48** which forms the edge of wall or flange **32***b* so as to lie against the inner surface of the flange, the extreme inner portion of flap **47** being bent at right angles and being held in position in any appropriate manner. The lower margin of flap **47** is maintained in contact with the inner surface of flange **32***b*, and the resilience of the material caused by its being folded along bend line **48** causes the material **13***d* between slit **8***d* and the fold line to bulge inwardly with respect to the cover as shown in FIG. 11. A cross slit **12***b* may extend from slit **8***d* to fold line **48** so as to increase the extent to which the abutment edge **7***d* is forced out of the plane of the surface of extension **47**.

Accordingly when cover **29***b* is swung to closed position on the carton the material **13***d* contacts flap **4***c* and these two parts swing with respect to one another until the two sections of the abutment **7***d* pass beneath the lower edge of flap **4***c*, when the abutment edges engage one another and the cover is latched.

I claim:

1. A reclosable carton comprising a receptacle and a cover hinged to the receptacle, the cover and receptacle each having walls, at least one cover wall partially telescoping the corresponding wall of the receptacle, and latch means interconnecting the partially telescoped walls comprising cooperating abutment elements associated respectively with the cover and receptacle, one of said abutment elements comprising the edge of a hinged flap and being longer than the cooperating abutment element, the cooperating element being formed by the edge of a slit, the slit being in the telescoping face of one of said walls, the wall adjacent the slit having a bend line therein causing the material of the wall between the bend line and slit to bulge thus forcing the edge of the slit out of the plane of the wall face and to a position to be engaged by the flap edge abutment element, and a cross slit extending from the first mentioned slit intermediate the ends thereof towards the bend line so as to enhance the bulging of the edge of the slit.

2. A carton as set forth in claim **1** in which the slit is disposed centrally of a wall of the receptacle and the bend line forms the top edge of said wall, said bend line having two straight sections extending from the center of said wall towards the sides of the carton at an obtuse angle to each other which is only slightly less than 180°.

3. A carton as set forth in claim **2** in which cross score lines extend from the ends and center of the slit to the bend line.

4. A carton as set forth in claim **1** in which the bend line has a portion opposite the slit which is convex towards the slit.

5. A carton as set forth in claim **1** in which the slit is in a wall of the receptacle and a flap extends inwardly of the receptacle from the bend line, the bend line having a portion opposite the slit which is curved towards the slit, the cover having a flap hinged thereto having an edge

for cooperating with an edge of the slit when the cover is closed, the movement of the cover to closed position contacting the flap on the receptacle and forcing it downwardly as the cover is closed thus causing the material between the bend line and the slit to bulge outwardly and move the slit edge into position to engage the edge of the hinged flap.

6. A carton as set forth in claim **1** in which the slit whose edge forms said cooperating element is in the inner telescoping face of the cover member front wall.

7. A reclosable carton comprising a receptacle and a cover hinged to the receptacle, the cover and receptacle each having walls, at least one cover wall partially telescoping the corresponding wall of the receptacle, and latch means interconnecting the partially telescoped walls comprising cooperating abutment elements associated respectively with the cover and receptacle, one of said abutment elements comprising the edge of a hinged flap on the cover and being longer than the cooperating abutment element and the cooperating abutment element being formed by the edge of a slit in a wall of the receptacle, the slit being shorter than the length of said wall and disposed intermediate the ends thereof, the wall adjacent the slit having a bend line therein at least a portion of which makes a dip toward the slit, said portion being spaced from and generally parallel with the slit, such bend line causing the material of the wall between the bend line and the slit to bulge and force the edge of the slit out of the plane of the wall face and to a position to be engaged by the flap edge abutment element.

8. A reclosable carton comprising a receptacle and a cover each having at least one hollow wall of triangular cross section telescoping that of the other, each hollow wall being folded at its apex, their folded apexes being in inverted relation, and latch means interconnecting said telescoped hollow walls comprising cooperating abutment elements associated respectively with the facing telescoping panels of said hollow walls.

References Cited

UNITED STATES PATENTS

2,116,336	5/1938	Boeye	229—44
2,369,388	2/1945	Carruth et al.	229—44 X
2,373,977	4/1945	Scherer	229—45 X
2,456,841	12/1948	Rushing	229—45
2,515,327	7/1950	Bergstein	229—44 X
2,579,346	12/1951	Theander	229—45
2,777,629	1/1957	Osteen	229—45 X
3,100,074	8/1963	Beck	229—44
3,232,518	2/1966	Williamson	229—44
3,283,991	11/1966	Hughes	229—45

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