Aug. 23, 1960 M. M. AUSTIN 2,950,044

RECLOSABLE FOLDING BOX AND METHOD OF MAKING IT

Filed Jan. 19, 1959 2 Sheets-Sheet 1

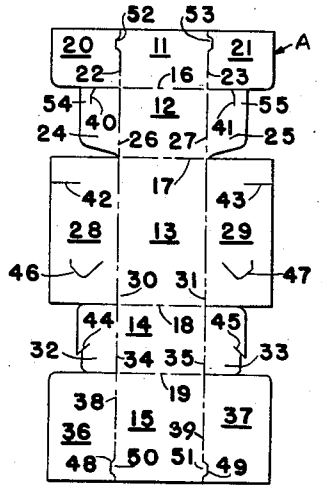


FIG. 1

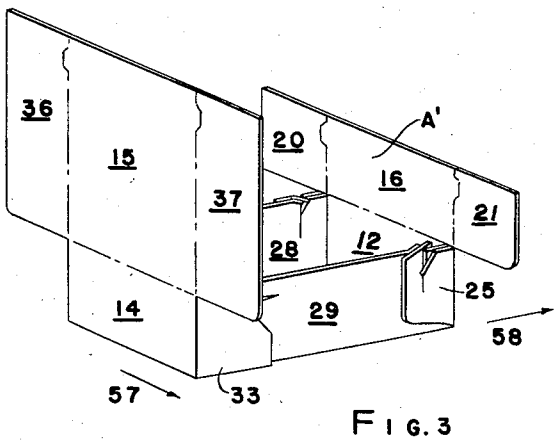


FIG. 3

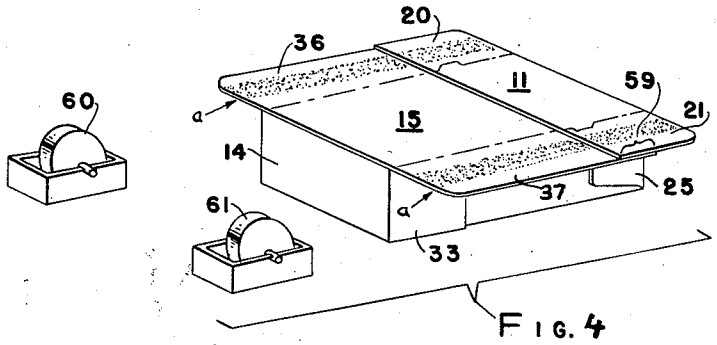


FIG. 4

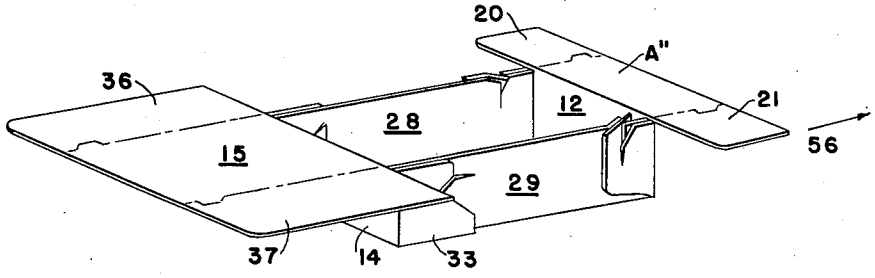


FIG. 2

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RECLOSABLE FOLDING BOX AND METHOD OF MAKING IT

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FIG. 6

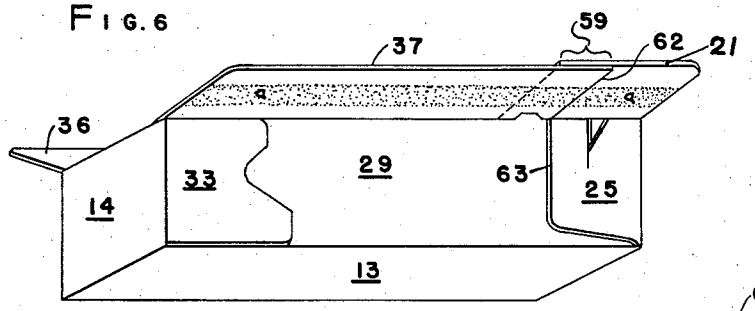


FIG. 7

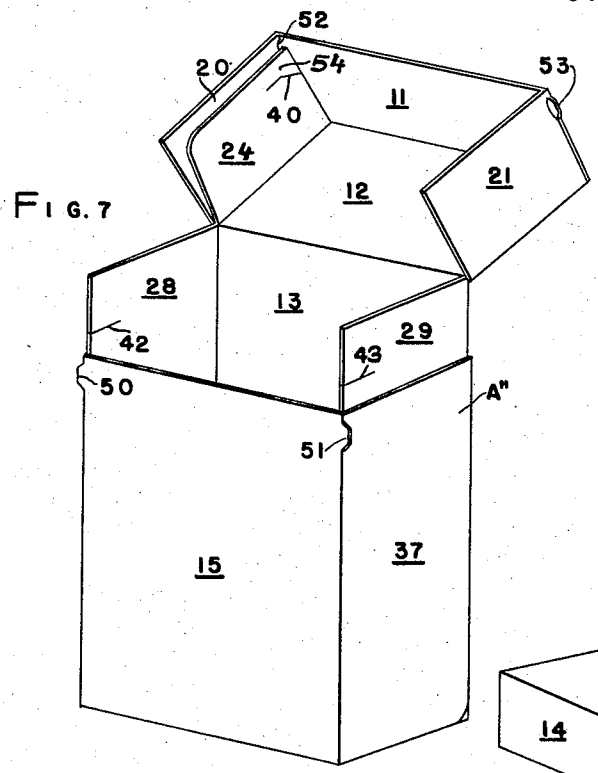


FIG. 8

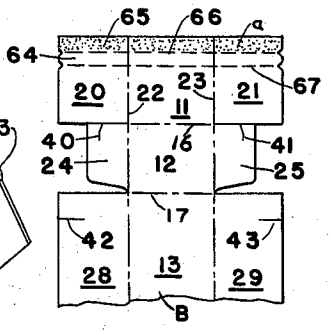


FIG. 9

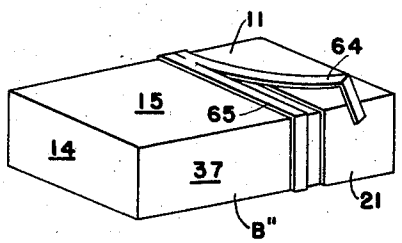
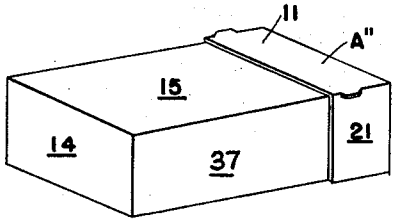


FIG. 5



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United States Patent Office

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2,950,044

RECLOSABLE FOLDING BOX AND METHOD OF MAKING IT

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Filed Jan. 19, 1959, Ser. No. 787,541

10 Claims. (Cl. 229—44)

This invention relates to improvements in reclosable folding boxes of the hinge-cover style and provides a box which may first be partially assembled in the form of a tray. The preliminary tray structure is then filled with merchandise whereafter the box assembly is completed by closing and sealing the box in such a way that it may, after opening, readily be reclosed in a manner of a conventional hinge-cover box.

Hinge-cover boxes generally have an end area which is relatively small and must ordinarily be filled from the top or from the bottom by inserting the merchandise through this small area. Boxes incorporating the invention may be filled, while in the preliminary tray stage, through the much larger front area which at the time of filling is entirely open and unobstructed and equal in size to the back panel of the box, the back panel being, in most instances, the largest panel of the box.

The box may be securely maintained in its preliminary tray stage by a glueless edge-to-edge interlocking procedure at the four tray corners by a high speed blank erecting and corner locking machine as disclosed in the patent to Pagendarm No. 2,580,189, issued December 25, 1951.

After filling of the tray structure, the box is closed and sealed by means of adhesive which is so applied that the box body panels are permanently secured together, whereas the box cover portion, while glued in itself, remains free of the box body so that the cover can be swung open in hinge-cover fashion. The hinge-cover may be reclosed and held closed either entirely by friction between the cover and the box body or by special frictional detents.

A certain style of reclosable hinge-cover box is characterized by a snap cover structure in which edges and flaps or projections of the cover interengage others on the box body proper by snapping past one another when the box cover is being closed. The snap lock elements hold the hinge-cover securely in closed position and may repeatedly be dis- and re-engaged in opening and closing of the box. As far as I am aware all known snap lock boxes require folding and gluing machinery which must be specially built for each box size. The present invention permits boxes of the snap cover style to be glued on standard straight line or right angle folding and gluing machines.

The glueless corner interlocks which maintain the box assembled during its tray stage may be so constructed that the corner locks within the hinge-cover are readily disengaged by the process of opening the hinge-cover without, however, resulting in damage to the box itself. The corner interlocks within the box body portion may be of a different very rugged construction which is not readily disengageable.

These and various other objects, features and advantages of the invention will appear more fully from the detailed description which follows accompanied by drawings showing, for the purpose of illustration, a preferred

embodiment of the invention. The invention also resides in certain new and original features of construction and combination of elements hereinafter set forth and claimed.

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

Fig. 1 is a plan view of a representative blank embodying the invention;

Fig. 2 is a perspective view of the box partially assembled into tray form ready for filling with merchandise;

Fig. 3 is an alternative form which the tray may assume during filling;

Fig. 4 is a perspective view of the partially closed box of Figs. 2 and 3 after application of adhesive *a* to the under-side of the charlottes prior to downfolding of the charlottes;

Fig. 5 is a perspective view of the box after downfolding of the charlottes;

Fig. 6 is a perspective view showing the positional relationship of the charlottes with respect to each other, the flaps and the side wall panels permitting subsequent opening and reclosing of the resulting hinge-cover;

Fig. 7 is a perspective view of the resulting box stood up on end after opening of the hinge cover;

Fig. 8 is a plan view of a modified box blank including a removable tear strip permitting complete sealing of the box prior to its first opening; and

Fig. 9 is a perspective view of the box assembled from the blank of Fig. 8 after partial removal of the tear strip.

In the following description and in the claims various details will be identified by specific names for convenience. The names, however, are intended to be generic in their application. Corresponding reference characters refer to corresponding parts in the several figures of the drawings.

The drawings accompanying, and forming part of, this specification disclose certain specific details of the invention for the purpose of explanation of its broader aspects, but it is understood that the details may be modified in various respects without departure from the broad principles of the invention and that the invention itself may be applied to other structures than the ones shown.

The blank A of Fig. 1 may be cut and scored, in multiple, from rolls or sheets of suitable foldable sheet material, such as paperboard.

The blank is divided by appropriate fold lines and cut lines into a plurality of panels and flaps including an upper front panel **11**, a top panel **12**, a back panel **13**, a bottom panel **14** and a lower front panel **15**, articulated to one another along a front top fold line **16**, a rear top fold line **17**, a rear bottom fold line **18** and a front bottom fold line **19**.

A pair of upper charlottes **20**, **21** are articulated to the upper front panel **11** along upper charlotte fold lines **22** and **23**. A pair of upper flaps **24** and **25** are articulated to the top panel **12** along upper flap fold lines **26** and **27**.

A pair of side wall panels **28** and **29** are articulated to the back panel **13** along side wall fold lines **30** and **31**. A pair of lower flaps **32** and **33** are articulated to the bottom panel **14** along lower flap fold lines **34** and **35**. A pair of lower charlottes **36** and **37** are articulated to the lower front panel **15** along lower charlotte fold lines **38** and **39**.

The upper flaps **24** and **25** may be formed as lock flaps by providing them with external locking cuts **40** and **41** adapted to interlock with correspondingly placed external cuts **42** and **43** in the side wall panels. Particulars regarding the resulting interlock are disclosed in the

United States Patent to Stenger No. 2,785,845, issued March 19, 1957.

The lower flaps **32** and **33** may be made lock flaps also by providing therein external locking cuts **44** and **45** adapted to engage internal cuts **46** and **47** in the side wall panels as disclosed in United States Patent to Meller No. 2,580,181, issued December 25, 1951.

Comparing the locking properties of the locks **40, 42** and **41, 43** with the properties of locks **44, 46** and **45, 47**, it is preferable to make the locks **44, 46** and **45, 47** strongly resistant to opening. This is accomplished by the illustrated construction comprising internal cuts **46, 47**. In distinction the locks within the upper charlottes are more readily disengaged by forceful opening due to the fact that all cuts of the lock are external cuts and are so placed that the portions **54** and **55** of the upper lock flaps flex readily with regard to the remainder of the lock flaps **24** and **25** upon application of an opening force to the box cover, as will later be described.

Arcuate cuts **48, 49** form projecting lock portions or tips **50** and **51** on the lower front wall panel **15** adapted to engage arcuate cuts **52** and **53** extending into the body of the upper charlottes **20** and **21**. The tips **50** and **51** are preferably smaller than the stock circumscribed by the arcuate cuts **52** and **53** so that the tips **50** and **51** may readily enter the self-opening apertures formed by the cuts **52** and **52** when the upper charlottes **20** and **21** are folded at right angles to the upper front panel **11**.

The blank A may be converted into tray form by automatic box forming meachinism as disclosed in United States Patents to Pagendarm No. 2,580,189, issued December 25, 1951, and to Pierce et al. No. 2,832,270, issued April 29, 1958, comprising basically a plunger and a die through which the blank is forced by the plunger. During passage of the blank through the die the corner locks are engaged by cooperating mechanism on the plunger and the die, respectively.

The resulting tray A′ has the form shown in Fig. 3 as it leaves the box forming mechanism. The lower front panel **15** and the upper front panel **16** are in line with the bottom panel **14** and the top panel **12**, respectively, and are upright with respect to the back panel **13**. The tray may be loaded with merchandise in this form but, if desired, the panels **15** and **16** may be folded flat as shown at A″ in Fig. 2. The tray in the form shown in Fig. 2 lends itself to handling on a so-called straight-line filling and closing machine through which the box travels in the direction of the arrow **56**, whereas the tray in the form of Fig. 3 is preferably handled on a right-angle machine through which the box moves first in the direction of the arrow **57** during filling and closing and then in the direction **56** during gluing. These matters will be apparent to persons skilled in the box art.

Fig. 4 illustrates the tray after downfolding of the upper and lower front panels **11** and **15**, respectively. The lower front panel is folded down first and the upper front panel is folded on top to overlap the lower front panel at a marginal portion **59**. The charottes **20, 21** and **36, 37** extend outwardly like wings and pass over glue wheels diagrammatically indicated at **60** and **61**. The glue wheels apply a strip of adhesive *a* to the underside of the charlottes.

The distribution of adhesive is best seen in Fig. 6 from which it is apparent that the overlapping of the charlottes **37** and **21** leaves the portion **59** between the charlottes uncoated with adhesive. It is further seen that upon downfolding of the charlottes **37, 21**, the top edge **62** of the charlotte **37** will abut, or be slightly spaced from, the bottom edge **63** of the upper flat **25**, so that no overlapping occurs at this point.

The charlottes **36, 20** and **37, 21** are then folded down into adhesive engagement with the side panels **28, 29** and the overlying upper and lower flaps **24, 25** and **32, 33**.

The glue bond effected by the lower charlottes makes the temporary lock between the lower flaps and the side wall panels permanent. For example, the lower charlotte **37** adheres to both the lower flap **33** and to the side panel **29**. The upper charlotte **21**, however, adheres only to the upper flap **25**, but there is no adhesive bond between the upper charlotte **21** and the lower charlotte **37**, nor between the upper flap **25** and the side panel **29**.

This permits reopening of the box A″ by application of a normal opening force to the top portion which comprises the upper charlottes and the upper front panel **11**. When this is done the top edge locks disengage because of the ability of the panel portions **54** and **55** to flex. Fig. 7 shows the portion **54** adjacent the cut **40**. The latter previously engaged the cut **42**.

Once the box is glued the interlock between the external cuts is no longer needed and it remains disengaged after reclosing of the box. The box cover is then held in closed position by a supplementary lock, which in the present example is formed by the tips **50** and **51** engaging cuts **52** and **53** in the cover.

Fig. 8 illustrates a blank B having a modified end portion in which a tear strip **64** and a glue lap **65** are added across the end of the upper front panel **11** and the upper charlottes **20** and **21**. The tear strip is bounded by two lines **66** and **67** of interrupted cuts.

In the closing of a box B″ made from the blank B of Fig. 8, adhesive *a* is applied to the glue lap **65** so that the cover portion of the box is adhesively attached to the body portion. The box is opened initially by removing the tear strip **64**, whereafter the box can be reclosed and reopened in the same manner as the box shown in Figs. 5 and 7.

What is claimed is:

1. The method of forming, filling and sealing a folding box from a blank comprising, a back panel, side wall panels articulated to the back panel along side wall fold lines, a top panel and a bottom panel articulated to the back panel along a rear top fold line and a rear bottom fold line, respectively, extending transverse to said side wall fold line, a pair of upper flaps articulated to said top panel along upper flap fold lines, a pair of lower flaps articulated to said bottom panel along lower flap fold lines, an upper front panel articulated to said top panel along a front top fold line, a pair of upper charlottes articulated to said upper front panel along upper charlotte fold lines, a lower front panel articulated to said bottom panel along a front bottom fold line, and a pair of lower charlottes articulated to said lower front panel along lower charlotte fold lines, the method comprising the steps of first forming a tray in which said back panel forms the tray bottom, said side wall panels form the tray sides and said top and said bottom panel form the tray ends, and in which said flaps overlie said side walls; then filling said tray; and then closing the box by folding the lower front panel over the top of the tray and adhesively securing said lower charlottes to both said lower flaps and said side walls, and folding said upper front panel over said tray and adhesively securing said upper charlottes to said upper flaps, whereby a reclosable box is formed having a top structure composed of said top panel, said upper front panel, said upper flaps and said upper charlottes, said rear top fold line constituting the hinge of the cover.

2. The method of forming, filling and sealing a folding box from a blank comprising, a back panel, side wall panels articulated to the back panel along side wall fold lines, a top panel and a bottom panel articulated to the back panel along a rear top fold line and a rear bottom fold line, respectively, extending transverse to said side wall fold lines, a pair of upper flaps articulated to said top panel along upper flap fold lines, a pair of lower flaps articulated to said bottom panel along lower flap fold lines, an upper front panel articulated to said top panel along a front top fold line, a pair of upper charlottes articulated to said upper front panel along upper charlotte fold lines, a lower front panel articulated to

said bottom panel along a front bottom fold line, and a pair of lower charlottes articulated to said lower front panel along lower charlotte fold lines, the method comprising the steps of first forming a tray in which said back panel forms the tray bottom, said side wall panels form the tray sides and said top and said bottom panel form the tray ends, and in which said flaps overlie said side walls; then filling said tray; and then closing the box by folding the lower front panel over the top of the tray and adhesively securing said lower charlottes to both said lower flaps and said side walls, and folding said upper front panel over said tray to overlap a marginal upper portion of said lower front panel, and then adhesively securing said upper charlottes to said upper flaps and said upper front panel to said marginal portion, whereby a reclosable box is formed having a top structure composed of said top panel, said upper front panel, said upper flaps and said upper charlottes, said rear top fold line constituting the hinge of the cover.

3. A reclosable hinge-cover folding box comprising, in combination, a box body portion and a box cover portion, said box body portion comprising, a back panel; side wall panels articulated to said back panel along side wall fold lines, said side wall panels being provided with two sets of locking edges; a bottom panel articulated to said back panel along a rear bottom fold line; a pair of lower lock flaps articulated to said bottom panel along lower lock flap fold lines, said lower lock flaps overlying said side wall panels at least partially and being provided with cut edges adapted to interlock with one set of the cut locking edges of the side wall panels; a lower front panel articulated to said bottom panel along a front bottom fold line; a pair of lower charlottes articulated to the sides of said lower front panel along lower charlotte fold lines, said lower charlottes being larger in area than said lower lock flaps, overlying said lower lock flaps, and being adhesively secured to said lower lock flaps and to said side wall panels; said box cover portion comprising a top panel articulated to said back panel along a rear top fold line constituting the cover hinge fold line; a pair of upper lock flaps articulated to the sides of said top panel and overlying the upper portion of said side wall panels, said upper lock flaps being provided with cut edges adapted to engage the other set of locking edges of the side wall panels; an upper front panel articulated to said top panel along a front top fold line; and upper charlottes articulated to the sides of said upper front panel, said upper charlottes overlying, and being adhesively secured to, said upper lock flaps.

4. A reclosable hinge-cover folding box comprising, in combination, a box body portion and a box cover portion, said box body portion comprising, a back panel; side wall panels articulated to said back panel along side wall fold lines; a bottom panel articulated to said back panel along a rear bottom fold line; a pair of lower flaps articulated to said bottom panel along lower flap fold lines, said lower flaps overlying the outside of said side wall panels at least partially; a lower front panel articulated to said bottom panel along a front bottom fold line; a pair of lower charlottes articulated to the sides of said lower front panel along lower charlotte fold lines, said lower charlottes being larger in area than said lower flaps, overlying said lower flaps, and being adhesively secured to said lower flaps and to said side wall panels; said box cover portion comprising a top panel articulated to said back panel along a rear top fold line constituting the cover hinge fold line; a pair of upper flaps articulated to the sides of said top panel and lying face to face with the outside of the upper portion of said side wall panels; an upper front panel articulated to said top panel along a front top fold line; and upper charlottes articulated to the sides of said upper front panel, said upper charlottes overlying, and being adhesively secured to, said upper flaps.

5. A reclosable hinge-cover folding box comprising, in combination, a box body portion and a box cover portion, said box body portion comprising, a back panel; side wall panels articulated to said back panel along side wall fold lines; a bottom panel articulated to said back panel along a rear bottom fold line; a pair of lower flaps articulated to said bottom panel along lower flap fold lines, said lower flaps overlying the outside of said side wall panels at least partially; a lower front panel articulated to said bottom panel along a front bottom fold line; a pair of lower charlottes articulated to the sides of said lower front panel along lower charlotte fold lines, said lower charlottes being larger in area than said lower flaps, overlying said lower flaps, and being adhesively secured to said lower flaps and to said side wall panels; said box cover portion comprising a top panel articulated to said back panel along a rear top fold line constituting the cover hinge fold line; a pair of upper flaps articulated to the sides of said top panel and lying face to face with the outside of the upper portion of said side wall panels; an upper front panel articulated to said top panel along a front top fold line; upper charlottes articulated to the sides of said upper front panel, said upper charlottes overlying, and being adhesively secured to, said upper flaps; and a securing tab on said upper front panel, set off from the remainder of the upper front panel by spaced lines of weakness extending across the upper front panel for severance, said securing tab overlying, and being adhesively secured to the upper marginal portion of said lower front wall panel.

6. A reclosable hinge-cover folding box comprising, in combination, a box body portion and a box cover portion, said box body portion comprising, a back panel; side wall panels articulated to said back panel along side wall fold lines, said side wall panels being provided with two sets of locking edges; a bottom panel articulated to said back panel along a rear bottom fold line; a pair of lower lock flaps articulated to said bottom panel along lower lock flap fold lines, said lower lock flaps overlying said side wall panels at least partially and being provided with cut edges adapted to engage one set of said locking edges of the side wall panels; a lower front panel articulated to said bottom panel along a front bottom fold line; a pair of lower charlottes articulated to the sides of said lower front panel along lower charlotte fold lines, said lower charlottes being larger in area than said lower lock flaps, overlying said lower lock flaps, and being adhesively secured to said lower lock flaps and to said side wall panels; said box cover portion comprising a top panel articulated to said back panel along a rear top fold line constituting the cover hinge fold line; a pair of upper lock flaps articulated to the sides of said top panel and overlying the upper portion of said side wall panels, said upper lock flaps being provided with cut edges adapted to engage the other set of locking edges of the side wall panels; an upper front panel articulated to said top panel along a front top fold line; upper charlottes articulated to the sides of said upper front panel, said upper charlottes overlying, and being adhesively secured to, said upper lock flaps, and a securing tab on said upper front panel, set off from the remainder of the upper front panel by two spaced lines of weakness extending across the upper front panel for severance, said securing tab overlying, and being adhesively secured to the upper marginal portion of said lower front wall panel.

7. A reclosable hinge-cover folding box comprising, in combination, a box body portion and a box cover portion, said box body portion comprising, a back panel; side wall panels articulated to said back panel along side wall fold lines; a bottom panel articulated to said back panel along a rear bottom fold line; a pair of lower flaps articulated to said bottom panel along lower flap fold lines, said lower flaps overlying said side wall panels at least partially; a lower front panel articulated to said bottom panel along a front bottom fold line; a pair of

lower charlottes articulated to the sides of said lower front panel along lower charlotte fold lines, said lower charlottes being larger in area than said lower flaps, overlying said lower flaps, and being adhesively secured to said lower flaps and to said side wall panels; said box cover portion comprising a top panel articulated to said back panel along a rear top fold line constituting the cover hinge fold line; a pair of upper flaps articulated to the sides of said top panel and overlying the upper portion of said side wall panels; an upper front panel articulated to said top panel along a front top fold line; upper charlottes articulated to the sides of said upper front panel, said upper charlottes overlying, and being adhesively secured to, said upper flaps; and a securing tab on said upper charlottes, set off from the remainder of the upper charlottes by a line of weakness for severance, said securing tab overlying, and being adhesively secured to the upper marginal portion of said lower charlottes.

8. A folding box blank for forming a reclosable hinge-cover box fillable with merchandise from the front in the form of a tray, said blank comprising, in this order, an upper front panel, a top panel, a back panel, a bottom panel, and a lower front panel, articulated to one another along substantially parallel fold lines constituting a front top fold line, a rear top fold line, a rear bottom fold line, and a front bottom fold line, respectively; a pair of upper charlottes articulated to opposite sides of said upper front panel, a pair of upper lock flaps articulated to opposite sides of said top panels, a pair of side wall panels articulated to opposite sides of said back panel along side wall fold lines extending substantially at right angles to the said rear top fold line and said rear bottom fold line; a pair of lower lock flaps articulated to opposite sides of said bottom panel; and a pair of lower charlottes articulated to opposite sides of said lower front panel, the lines of articulation of said charlottes and lock flaps being substantially in line with said side wall fold lines, said upper lock flaps and said back panel having locking cuts in them for interengagement of cut edges of the cuts in a position in which the upper lock flaps overlie the upper portion of the back panel, said lower lock flaps and said side wall panels having further cuts in them providing interlocking edges in a position in which said lower lock flaps overlie the lower portion of said side wall panels.

9. A blank as set forth in claim 8 in which the upper lock flaps have external cut locking edges and in which the side wall panels have external locking cuts for engaging the external cut locking edges of the lock flaps, whereas the lower lock flaps have external cut locking edges and said side wall panels have internal locking cuts for engaging said external cut locking edges of the lower lock flaps.

10. A reclosable hinge-cover folding box comprising, in combination, a box body portion and a box cover portion, said box body portion comprising, a back panel; side wall panels articulated to said back panel along side wall fold lines and having cut locking edges therein; a bottom panel articulated to said back panel along a rear bottom fold line; a pair of lower lock flaps articulated to said bottom panel along lower flap fold lines, said lower lock flaps overlying said side wall panels at least partially and being provided with cut edges in interlocking engagement with the locking edges of the side wall panels; a lower front panel articulated to said bottom panel along a front bottom fold line; a pair of lower charlottes articulated to the sides of said lower front panel along lower charlotte fold lines, said lower charlottes being larger in area than said lower flaps, overlying said lower flaps, and being adhesively secured to said side wall panels; said box cover portion comprising a top panel articulated to said back panel along a rear top fold line constituting the cover hinge fold line; a pair of upper flaps articulated to the sides of said top panel and overlying the upper portion of said side wall panels; an upper front panel articulated to said top panel along a front top fold line; and upper charlottes articulated to the sides of said upper front panel, said upper charlottes overlying, and being adhesively secured to, said upper flaps.

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UNITED STATES PATENTS

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2,870,952	Ringler	Jan. 27, 1959

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 2,950,044

August 23, 1960

Marshall M. Austin

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 3, line 27, for "52", second occurrence, read -- 53 --; line 30, for "meachinism" read -- mechanism --; same column 3, line 69, for "flat" read -- flap --; column 7, line 30, for "panels" read -- panel --; same column 7, lines 39 and 42, for "back panel", each occurrence, read -- side wall panels --.

Signed and sealed this 17th day of October 1961.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents

USCOMM-DC