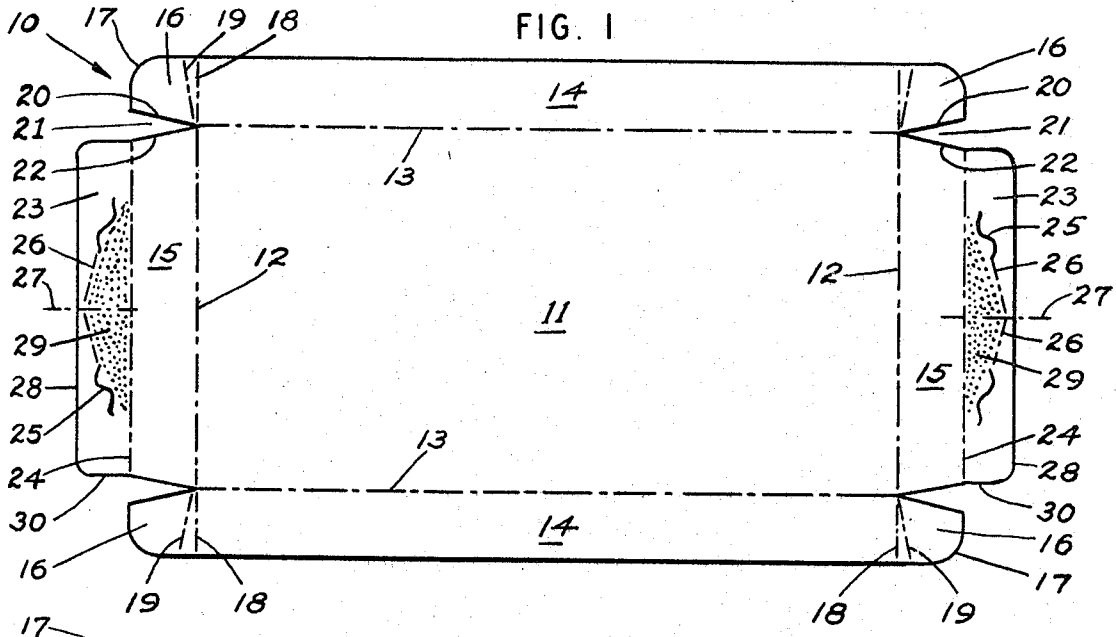
Aug. 18, 1970 S. CONESCU 3,524,579

CARDBOARD FOLDING BOX CONSTRUCTION

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FIG. 1



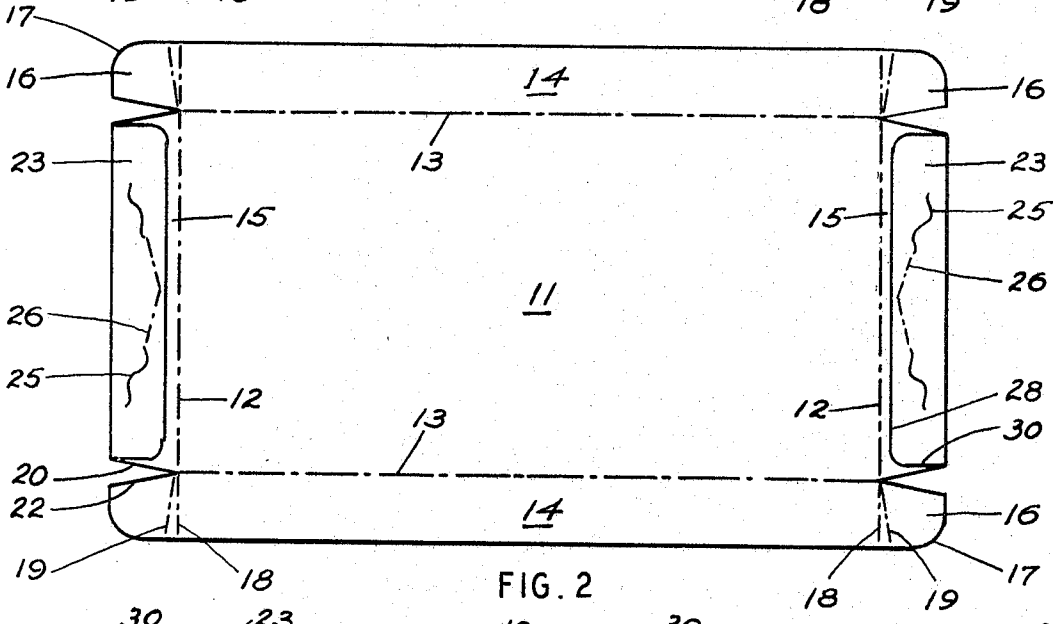


FIG. 2

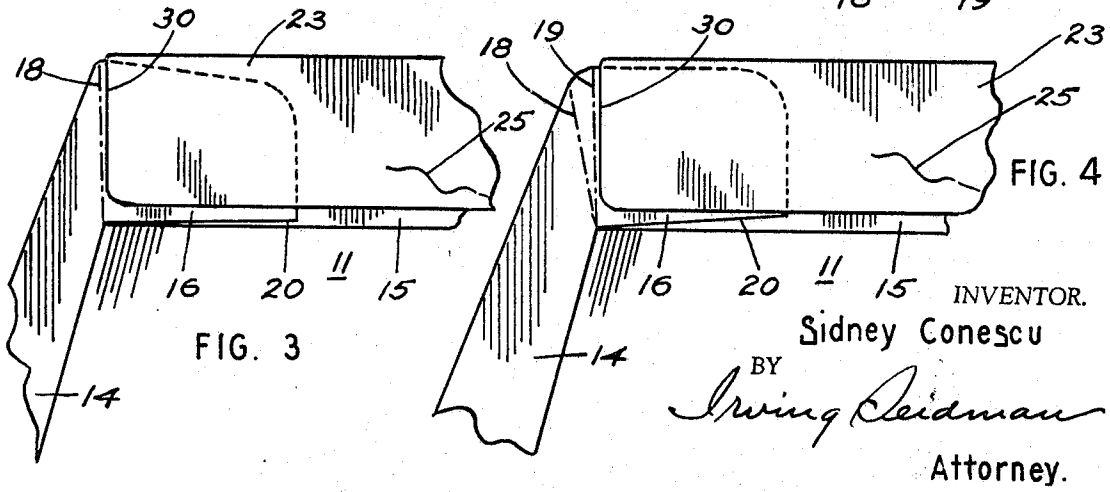


FIG. 3

FIG. 4

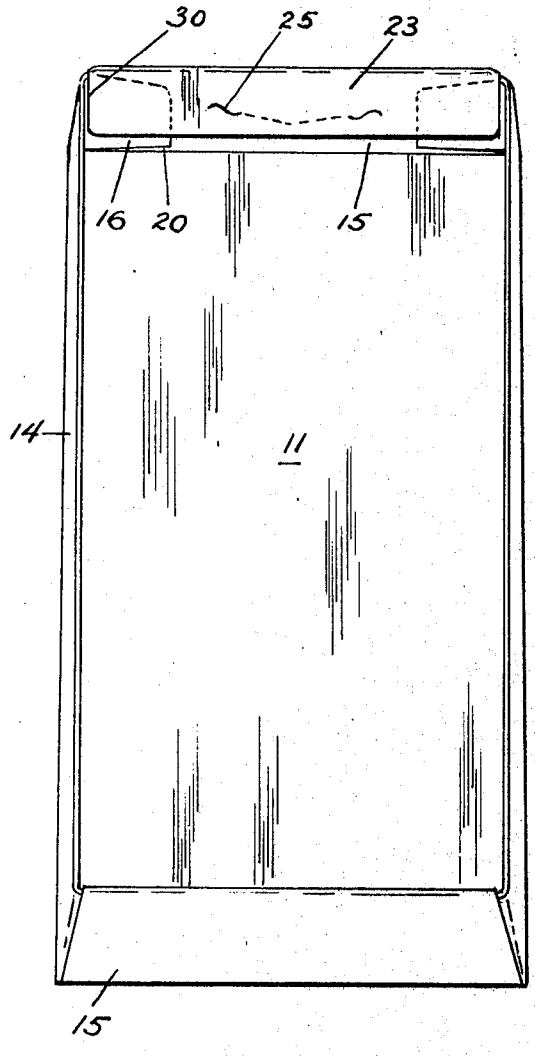
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CARDBOARD FOLDING BOX CONSTRUCTION

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FIG. 3A



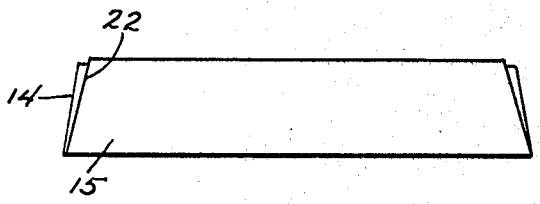
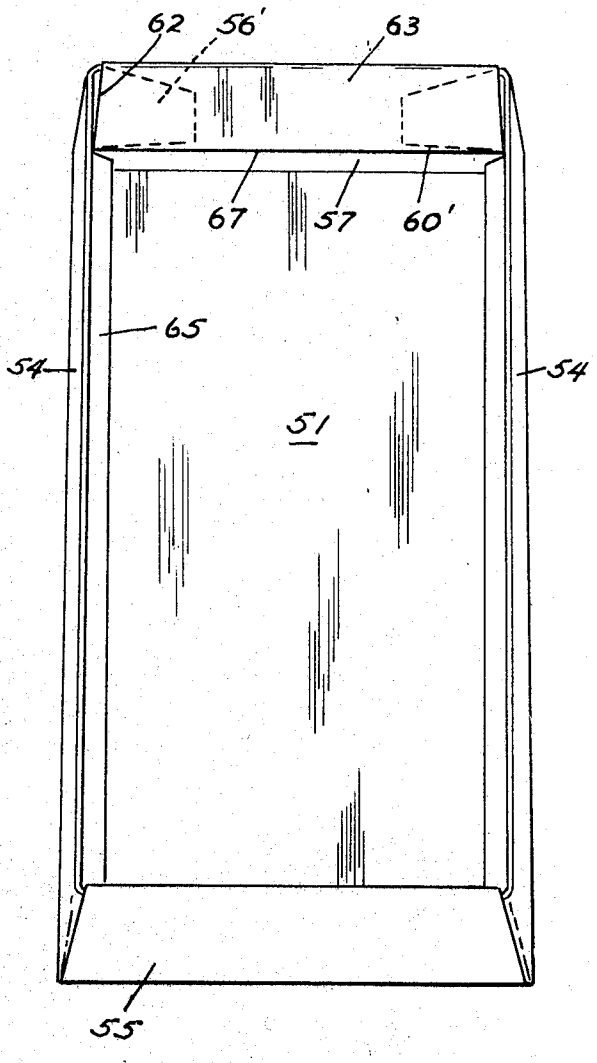


FIG. 3B

FIG. 7A



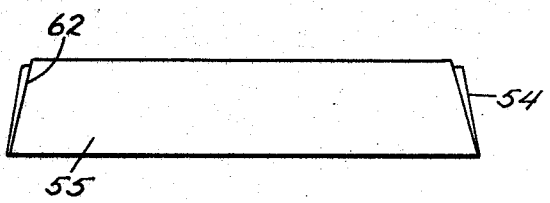


FIG. 7B

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CARDBOARD FOLDING BOX CONSTRUCTION

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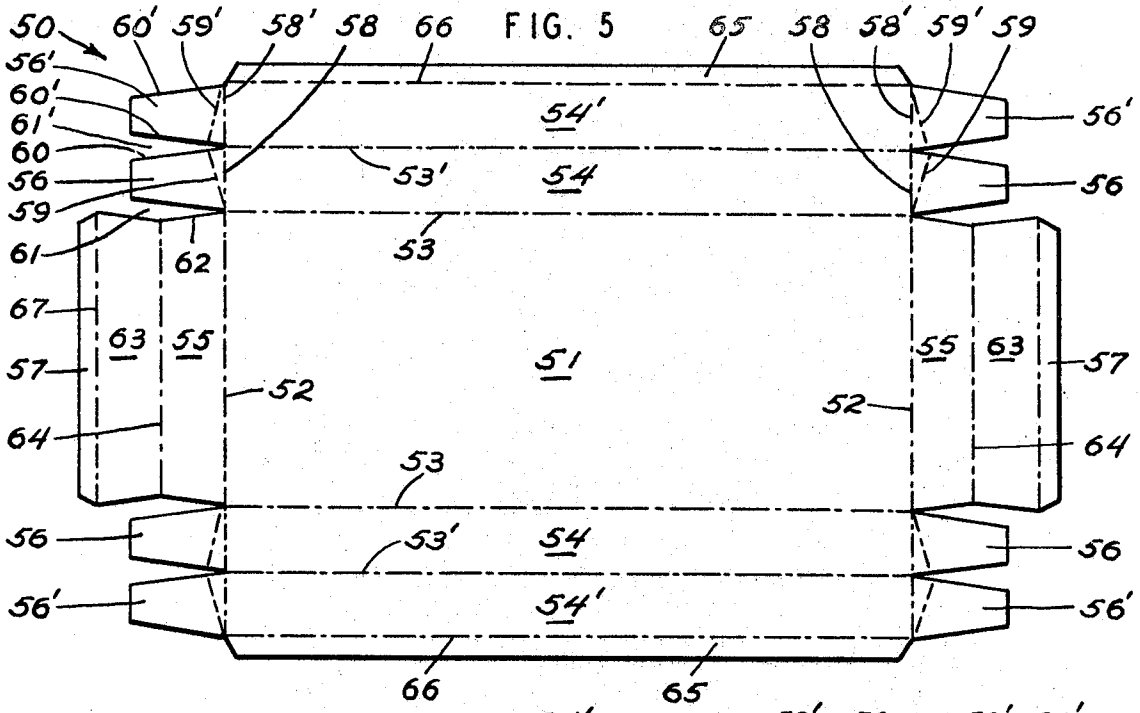


FIG. 5

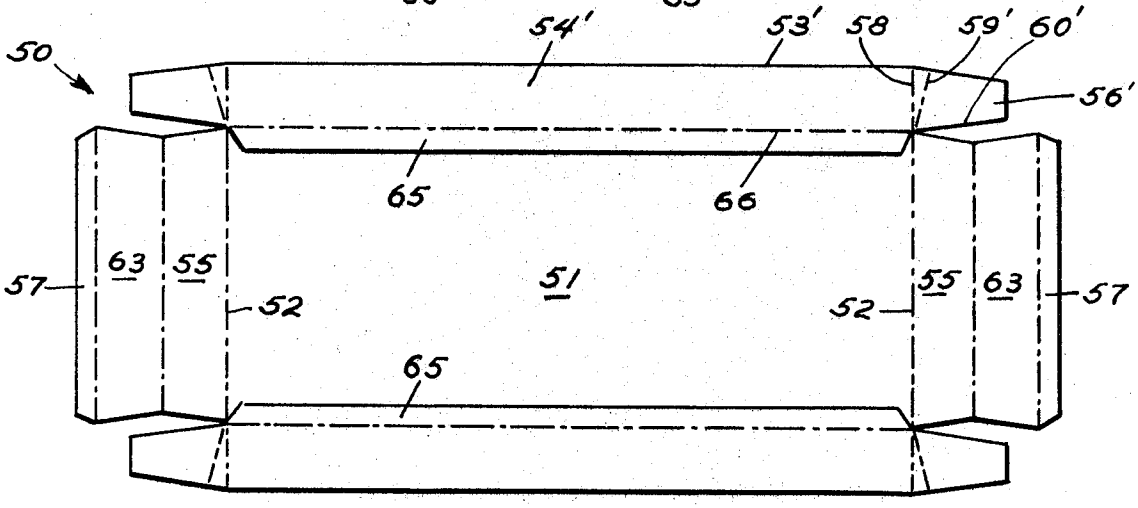


FIG. 6

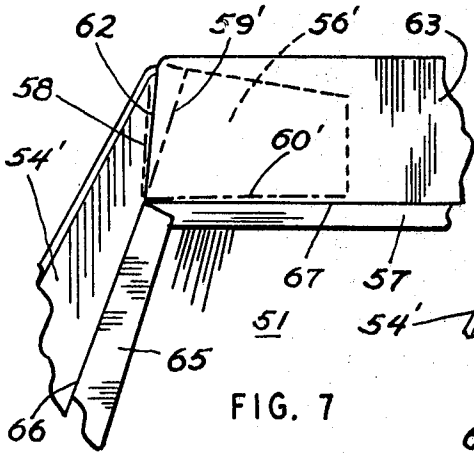


FIG. 7

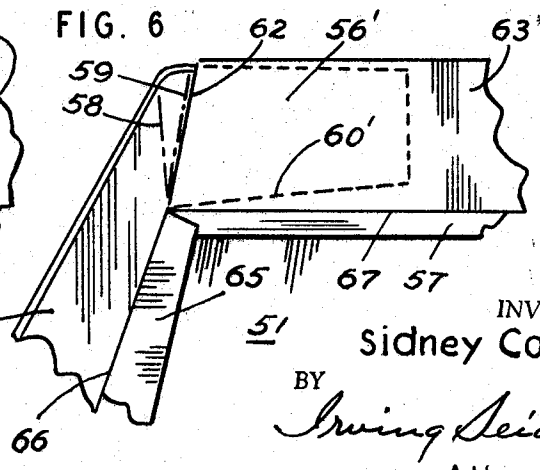


FIG. 8

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3,524,579

CARDBOARD FOLDING BOX CONSTRUCTION

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Filed June 11, 1969, Ser. No. 832,364
Int. Cl. B65d 5/22
U.S. Cl. 229—34 3 Claims

ABSTRACT OF THE DISCLOSURE

A folding box comprising two duplicate members which provide expansion and contraction of the sides permitting one member to fit within the other member forming the cover and bottom of the box.

This invention relates to cardboard folding boxes and is an improvement on my United States Letters Patent Nos. 2,414,854 and 2,777,628.

In the folding box constructions of my previous patents above-mentioned it was necessary to have both a top or cover member and a bottom member, the former being slightly larger than the latter so that the bottom member could fit within the cover member thus forming a complete box. This type of construction necessitates the use, storage and manufacture of two sizes of cardboard members, namely a cover member and a bottom member of the folding type which may be stored in collapsed condition in partially assembled relationship, but may be quickly set up.

In certain other types of folding boxes on the market today the sides of the box have a tendency to deflect inwardly so that the sides are not too rigid and the goods placed within such folding boxes are often subjected to creasing; thus when the goods are taken out of such boxes they do not have the fresh pressed look of new goods.

It is an object of my invention to provide a folding box in which both the top or cover member and the bottom member is of the same size and construction but which permits sufficient expansion of the sides to permit one member to expand so that it will fit upon or within the other member as the cover or bottom when the box members or units are set up and still have the sides of both the cover and bottom members of the box remain in vertical position providing strength and rigidity to the box. Either of the two members of my new construction that comprise the box may be used as the top or bottom member or unit.

To accomplish the necessary stretch of the sides of the members in both the lengthwise and sidewise directions, I provide a V-cut or notch at each of the corners when the box member is in its flat condition and a wedge shaped crease in the opposed sides and end webs which comprise the corners of the box units. When the box member is set up the wedge shape crease and V-cut permit the corners to expand and contract in both directions, namely lengthwise and sidewise, so that one member can easily fit within the other member to provide a top and bottom for a complete box as will hereinafter be described.

This improved expanding and contracting box construction may be applied to folding cardboard boxes of the glued down type and the friction type.

By omitting the wedge shaped crease and having only a lateral crease line, the expansion will be sidewise only but not substantially lengthwise.

For a fuller understanding of the nature and objects of the invention, reference is had to the following detailed description, in connection with the accompanying drawings, in which:

FIG. 1 is a plan view of a blank for my improved glued down folding paper box tray member;

FIG. 2 is a plan view showing the blank with the extending flaps in glued down or folded condition lying flat;

FIG. 3 is a fragmentary perspective view of one inside corner of the set up box member showing the position of the side panel and end web when the member is compressed to narrow the dimensions of the member so that it may act as the bottom of the box;

FIG. 3A is a top perspective view of the set-up box member shown in FIGS. 1, 2 and 3, the sides being in contracted position;

FIG. 3B is an end elevational view of the box shown in FIG. 3A;

FIG. 4 is a fragmentary perspective view of one inside corner of the set-up box member showing the position of the side panel and end web when the member is expanded to enlarge the dimensions of such member so that it may act as the cover of the box;

FIG. 5 is a plan view of a blank for my improved friction type folding paper box tray member;

FIG. 6 is a plan view of the blank shown in FIG. 5 showing the blank with the extending side panels either folded down or glued down depending upon the size of the tray member;

FIG. 7 is a fragmentary perspective view of one inside corner of the set-up box member showing the position of the side panel and end web when the tray member is compressed to narrow the dimensions of the member so that it may act as the bottom of the box;

FIG. 7A is a top perspective view of the set-up box member shown in FIGS. 5, 6 and 7, the sides being in contracted position;

FIG. 7B is an end elevational view of the box shown in FIG. 7A;

FIG. 8 is a fragmentary perspective view of one inside corner of the set-up box member showing the position of the side panel and end web when the member is expanded to enlarge the dimensions of such member so that it may act as the cover of the box.

Referring to the drawings, FIGS. 1 to 4, inclusive, numeral **10** is a blank from which the body member **11** is formed. I will designate this type as the "glued down" type. Crease lines **12**, **12** and **13**, **13** outline side panels **14**, **14** and the end panels **15**, **15**, leaving an end web **16** at each of the four corners. Between side panel **14** and end web **16** there are wedge shaped crease lines **18**, **19**. In certain types of boxes, the angular crease line **19** may be omitted so that the expansion of the box may be lengthwise. End web **16** has its upper outer corner **17** arcuately shaped and its lower or bottom edge **20** outwardly and angularly cut making a V-shaped cutout **21** with the outwardly and angularly cut ends **22** of side panel **15** for purposes which wil appear more clearly as

this description proceeds. From the end panes **15, 15** there are extended flaps **23, 23** defined by crease line **24**. line **26** extending from the outer end of the S-shaped incisions **25** whose axial line is angularly directed to diverge toward the crease line **24**, are made on each side of a lateral medial line indicated as **27** with a wide V crease line **26** extending from the outer end of the S-shaped incisions **26** to almost the outer edge **28** of flap **23**, as shown on FIG. 1.

At this stage, the blank **10** is fed through a folding machine and as an incident thereof, an applicator applies an adhesive film **29** to the central portion of the flap **23** between the incisions **25**, the crease line **26** and the crease line **24**. Thereupon, the extended flaps **23** are folded about the crease lines **24** to bring the flaps **23** over the panels **15** and connect the flaps **23** at the medial portion and between the S-shaped incisions **25**, the crease line **26** and the crease line **24** by engagement of the adhesive film **29** with the body of the panel **15**. While glue is preferred, other known fastening means may be employed. By pasting the central portion of flap **23** to end panel **15** there is a definite "break" at the crease line **26** and incisions **25** to definitely control the bending of the unglued portions of flap **23** and increasing the strength of the glued parts of the box at this portion. The incisions **25** serve to ease the lifting of the end portions of flap **23** when setting up the box.

In order to set up the box, the side panels **14** are folded upwardly at right angles to the body member **11**, the opposed end webs **16** are turned inwardly so that the bottom edges **20** of the web **16** fall upon the crease line **12**; the opposite outer end portions of the flaps **23** are then pryed up by their unglued outer edges with the index fingers of the hand and by pressing the thumbs upon edge **24** (which was designated as crease line **24** but becomes edge **24** when flap **23** becomes glued to panel **15**) and while placing the middle fingers in the opposed corners, the end panel **15** is lifted upward placing its pryed up outer edges over the upper edges of end webs **16** until end panel **15** is at right angles to the body member **11**. The rounded corner **17** of end web **16** facilitates the sliding over of the outer end portitons of flap **23** over the end web **16**. Thus, the end webs **16** are locked between the end panel **15** and the outer ends of the flaps **23**. This is done at each end of the member.

By setting up two blanks as above described, one acts as the cover and the other as the bottom of the box. Since both members are of identical size and one must fit within the other, it is necessary to provide some expansion and contraction of the side panels **14**. This is accomplished by the wedge shaped crease lines **18, 19** and the V-shaped cutout **21**, as will be hereinafter described.

To provide the bottom of the box, the opposite corners of the set-up member are pressed inwardly. Such pressure causes the bottom edge **20** of end web **16** to move downward toward the body member **11** and since the ends **22** of side panels **15** are cut angularly, the inward pressure exerted by the fingers upon the corners of the side panels **14** permit the side panels **14** to move inwardly to the point where the outer side edges **30** of flaps **23** may stop against crease line **18**. Thus, the opposite sides **14, 14** may be moved towards one another to contract the width and also the length of the box especially at the outer edges of same.

Conversely, to provide the cover of the box, the opposite side panels **14** are moved apart which causes the bottom edge **20** of end web **16** to move upwardly and away from the body member **11** and the side panel may be moved to a point where the outer side edges **30** of flaps **23** reach the crease line **19** thus expanding the cover of the box.

As a rule it is not necessary to expand both the cover and contract the bottom since expanding one, namely the cover, or contracting the other, namely the bottom, provides sufficient "play" to place one member within the other.

Because there are no crease lines in the side panels **14** such side panels cannot collapse inwardly to crease or mar goods placed within the box and provides a firm box with strong and rigid walls.

I have found that in a nine inch wide box I can expand the side walls at their edges easily one-half inch. However, I have also found that a fraction of an inch in expansion or contractiton is sufficient to place the cover over the bottom or vice versa.

By having crease line **18** as the corner of the box, the side panels **14** may be moved inwardly or outwardly because of the V-shaped cutout **21** which permits lateral expansion of the member. If the crease line **19** is added providing a wedge shaped crease line with crease line **18** at the corner, both lateral and longitudinal expansion and contraction is provided.

In the friction type shown in FIGS. 5 to 8, numeral **50** is a blank of a single piece of cardboard from which the body member **51** of this type of box is formed. Crease lines **52, 52** and **53, 53, 53', 53'** outline side panels **54, 54, 54', 54'** and end panels **55, 55**, leaving an end web **56, 56'** at each of the four corners outlined by substantially wedge shaped crease lines **58, 59** and **58'** and **59'** between side panel **54, 54'** and end panels **55**. Side panels **54** and **54'** are of the same width. Extending from and along the full length of side panels **54'** are narrow holding strips **65, 65** which have their outer ends tapered inwardly and are defined by crease lines **66, 66'**. End web **56, 56'** has opposed outwardly tapered sides **60** and **60'** making a V-shaped cutout **61, 61'** with the angularly cut end **62** of the side panel **55** for purposes which will appear more clearly as will follow hereinafter. From end panels **55, 55** there are extending flaps **63, 63** defined by crease line **64**. Flaps **63, 63** are of the same width as end panel **55** and have the outer ends outwardly tapered. From extending flaps **63, 63** there are narrow extending holding strips **57, 57** divided by crease line **67** and have their outer sides inwardly tapered.

At this stage, the blank **50** is fed through a folding machine and as an incident thereof an applicator applies an adhesive film to either the inside of side panel **54** or **54'**. Thereupon the side panel **54'** is folded inwardly about the crease lines **53'** to bring side panel **54'** over side panel **54** connecting such two panels firmly together as one and placing the unglued holding strip **65** upon the body member **51** along its outer edge as shown in FIG. 6 for the purpose as will be further described.

In order to set up the box member, the opposed end webs **56, 56'** are turned inwardly so that the bottom edges **60, 60'** fall upon the crease line **52**. The end panel **55** and extending flap **63** are then lifted with the thumbs so that they are at a right angle to the body member **51**. By placing the middle finger in the corners, the flap **63** is folded inwardly about crease line **64** with the index fingers so that crease line **67** falls upon crease line **52** and holding strip **57** lays upon the body member **51**. The tapered ends of holding strip **65, 65** are then lifted over the tapered ends of holding strip **57**. Since the side panels **54, 54'** are glued together, the holding strip **65**, which is not glued to member **51**, is firmly positioned but can be lifted over the ends of holding strip **57** thus locking the holding strip **57** and the end panel **55, 63** in its upright position and creating a sleeve within which webs **56, 56'** slide.

In certain small box sizes it is not necessary to glue the side panels **54, 54'** together since the interlocking of the holding strips **57, 65** will hold the side and end panels together.

By setting up the side and end panels heretofore described, a box tray is formed. Two such trays form the complete box, one acting as the cover and the other as the bottom. Since both members or units are exactly of the same size and construction and one must fit within

the other, it is necessary to provide expansion and contraction of the side and end panels **54** and **63**. This is accomplished by the wedge shaped crease lines **58, 59** and **58', 59'** and the V-shaped cutouts **61, 61'**, as will be hereinafter described.

By pressing the opposite side panels **54, 54'** of the set up member inwardly the bottom edges **60, 60'** of end web **56, 56'** are caused to move downward toward the body member **51** and since the ends **62** of end panel **55** are cut angularly, the inward pressure exerted by the fingers upon the corners of the side panels **54, 54'** permit the side panels to move inwardly to the joint where the outer side edges **62** of end panels **55** may stop against the corner crease line **58**. Thus the opposite sides **54', 54'** may be moved towards one another to contract the width of the tray unit as shown in FIG. 7.

Conversely, to provide the cover of the box, the opposite side panels **54, 54'** are moved apart which cause the bottom edge **60, 60'** of end web **56, 56'** to move upwardly and away from the body member **51** and the side panels may be moved to a point where the outer side edges **62** of flaps **63** reach crease line **59, 59'** thus expanding the cover of the box as shown in FIG. 8.

As a rule it is not necessary to expand both the cover and contract the bottom since expanding one member as the cover provides sufficient expansion to place it over the other or bottom member.

With the wedge shape crease lines **58, 58'** and **59, 59'** the tray member can be readily expanded both lengthwise and sidewise. If the crease line **59, 59'** is omitted the side panels may be expanded laterally. However, in boxes of certain sizes, especially the larger boxes, there is sufficient flexibility of the outer ends of the end panels to permit one unit to be placed over the other unit to act as the cover.

In the type of box shown in FIGS. 5 to 8, the double walls **54, 54'** of the side panels provide a particularly strong box with rigid side walls which cannot collapse inwardly.

In the claims, where I refer to "member" or "unit" I mean to include thereby that portion of a folding box in the form of a tray which may constitute the bottom or cover, whether separable or set-up.

It should be observed that my folding box units are each made of a single piece of cardboard which is economical in construction and which can be easily and quickly set up with great ease minimizing the cost of handling. It is also a quick, easy and simple process of expanding or contracting the unit to fit one within the other.

I claim:

1. In a folding box comprising two duplicate units one of which may be the cover and the other the bottom of said box,

(a) each of said units having a body member and hinged side and end panels,

(b) said side and end panels being edgewise connected to each other by substantially right angle folding end webs arranged to lie in the set-up condition of said box against one of said panels,

(c) each of said last mentioned end panels carry a locking flap defined by a fold,

(d) each of said locking flaps being foldable over said end webs,

(e) said end panels and said end webs having angular edges forming a V-shaped cutout therebetween when said folding unit is in its flat condition prior to being set-up,

(f) said locking flaps are narrower than said end panels,

(g) each of said locking flaps having a substantially medial portion thereof connected to said last mentioned end panel leaving the ends of each of said locking flaps free for spreading over said webs,

(h) the combination wherein each of said locking flaps is provided on each side of said connected portion with diagonally inwardly directed S-shaped hinging cuts and diagonal crease lines extending from a point located adjacent the center of the outer edge of said locking flap to the inner end of said S-shaped hinging cuts to control the bending of the unconnected portions of said locking flap,

(i) wedge-shaped crease lines with the point of said wedge-shape at each corner of said unit to permit the side and end panels to expand or contract so that one of said units may be placed within the other of said units,

(j) whereby when said box is in its set-up condition and said end webs are between said end panel and said end flap, said webs are slidable within the pocket formed by said end panel and said end flap permitting the distance between said side panels to expand or contract relative to one another.

2. A blank for a folding box, said blank comprising

(a) a body member,

(b) opposite side panels and end panels divided by folding crease lines,

(c) a flap extending from each end panel divided by a folding crease line, each of said flaps having a lateral medial line,

(d) an end web extending from each end of said side panels divided by V-shaped crease lines,

(e) each of said end webs having its outer corner rounded and its lower or inner edge cut angularly,

(f) each of said end panels having its side edges cut inwardly forming a V-shaped cutout between said end panels and said end webs,

(g) S-shaped incisions on each side of the lateral medial line of each of said flaps, said incisions having their axial lines angularly directed to diverge toward the folding edges of said end panels,

(h) an angular crease line on each side of said lateral medial line of each of said flaps extending from the outer end of said S-shaped incisions to almost the outer longitudinal edge of said flap on each side of said lateral medial line forming a wide V-shaped crease line,

(i) adhesive means at the central portion of said flap between said incisions, said wide V-shaped crease lines and said crease line between said flap and said end panel for attaching said flap to said end panel when said flap is folded at the dividing crease line between said flap and said end panel.

3. A blank for a folding box, said blank comprising

(a) a body member,

(b) opposite side panels, each of said side panels comprising an outside panel and an inside panel,

(c) a holding strip inwardly tapered at each end extending from each of said inside panels of said side panels,

(d) opposite end panels, each of said end panels comprising an outside panel and an inside panel, said inside and outside panels having mirror-like tapered ends,

(e) a holding strip inwardly tapered at each end extending from each of said inside panels of said end panels,

(f) inwardly tapered end webs extending from each end of said inside and outside panels of said side panels,

(g) said end webs forming V-shaped cut-outs between said inside and outside side panels and between said outside panels and said end panels,

(h) crease lines between said body member and said outside side panels, crease lines between said outside and inside side panels, crease lines between said inside side panels and said holding strips, crease lines between said body member and said outer end

panels, crease lines between said outer end panels and said inner end panels, and crease lines between said inner end panels and said holding strips.

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JOSEPH R. LECLAIR, Primary Examiner

S. E. LIPMAN, Assistant Examiner

U.S. Cl. X.R.

229—31