Sept. 10, 1968 C. J. PIERCE, JR 3,400,877

GLUELESS PANEL LOCKS, PARTICULARLY CORNER LOCKS FOR FOLDING BOXES

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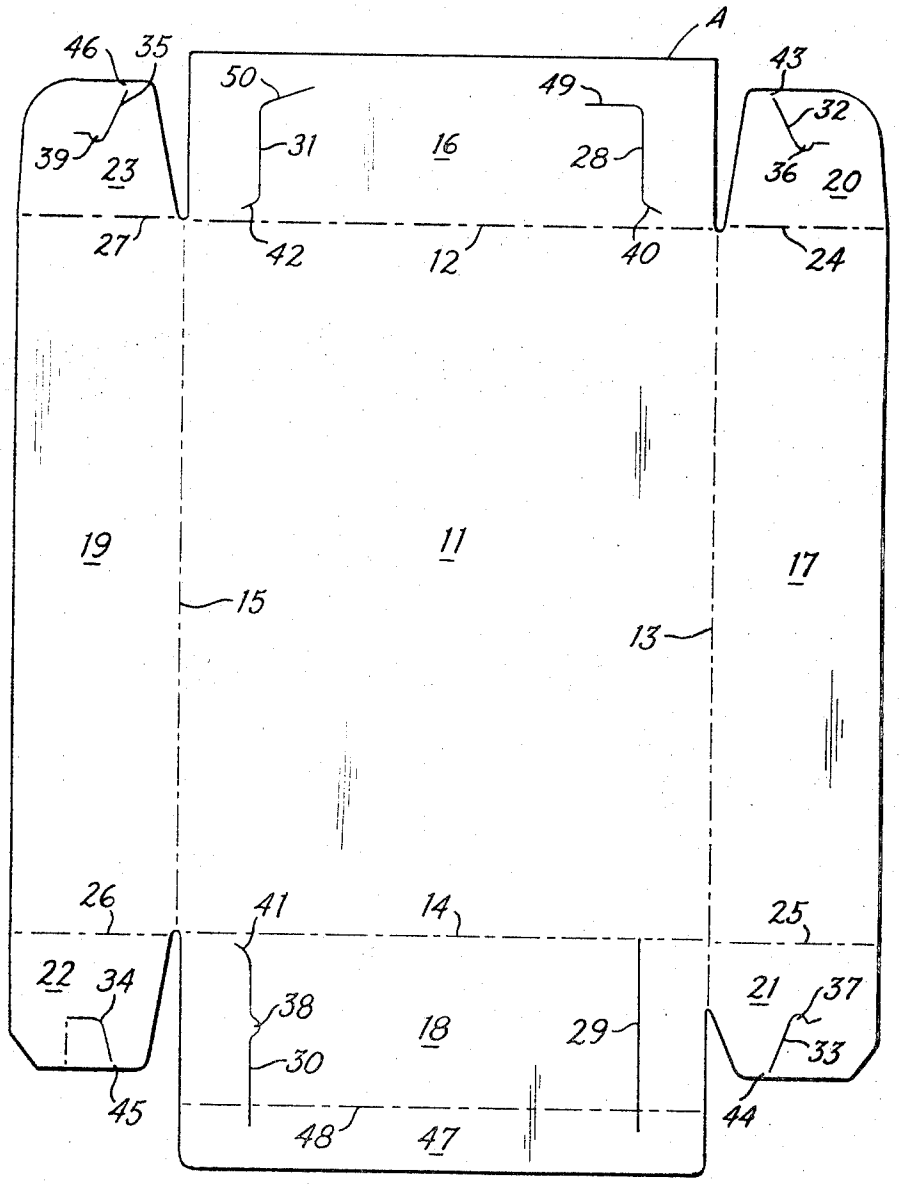


Fig. 1

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Sept. 10, 1968 C. J. PIERCE, JR 3,400,877

GLUELESS PANEL LOCKS, PARTICULARLY CORNER LOCKS FOR FOLDING BOXES

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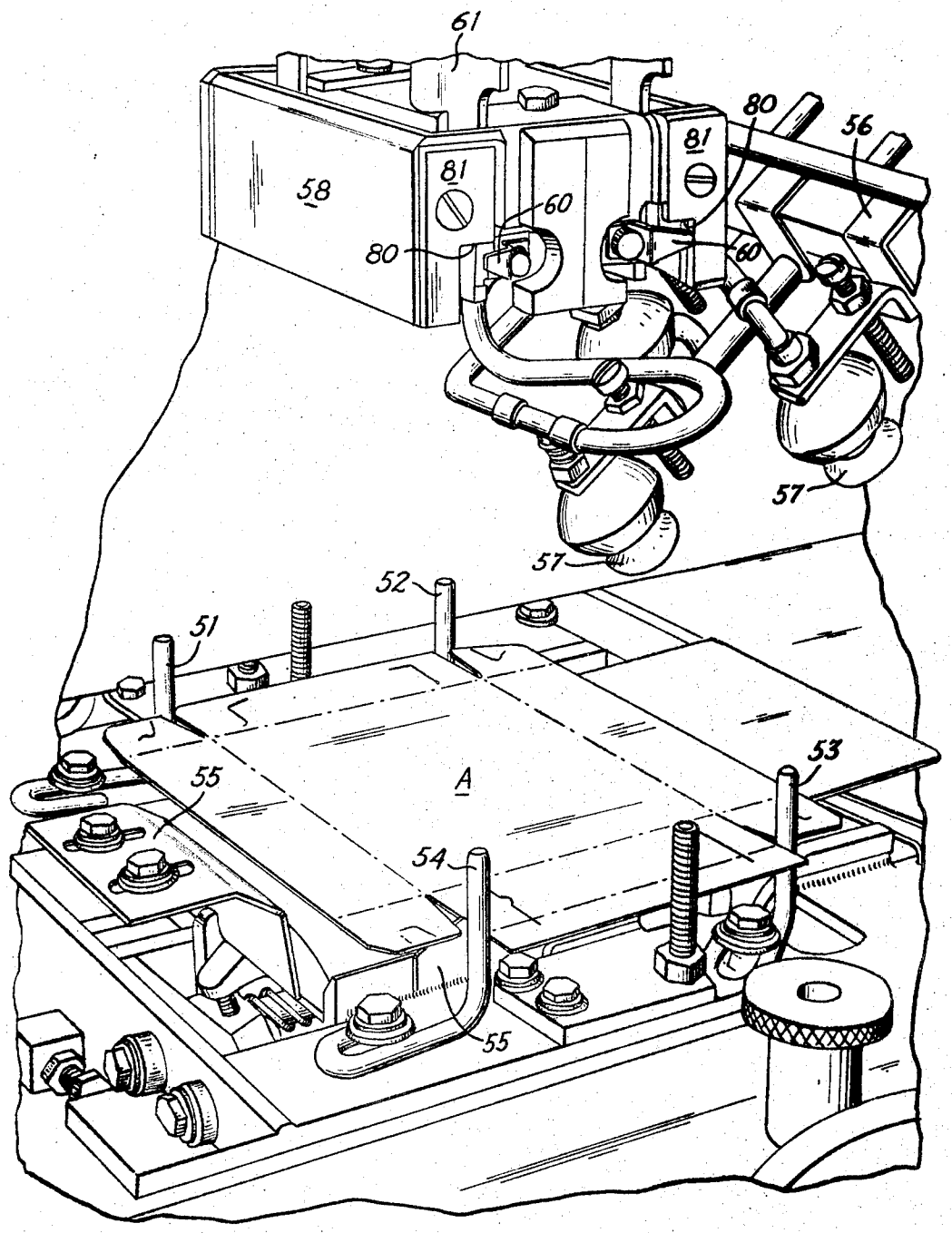


Fig. 2

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GLUELESS PANEL LOCKS, PARTICULARLY CORNER LOCKS FOR FOLDING BOXES

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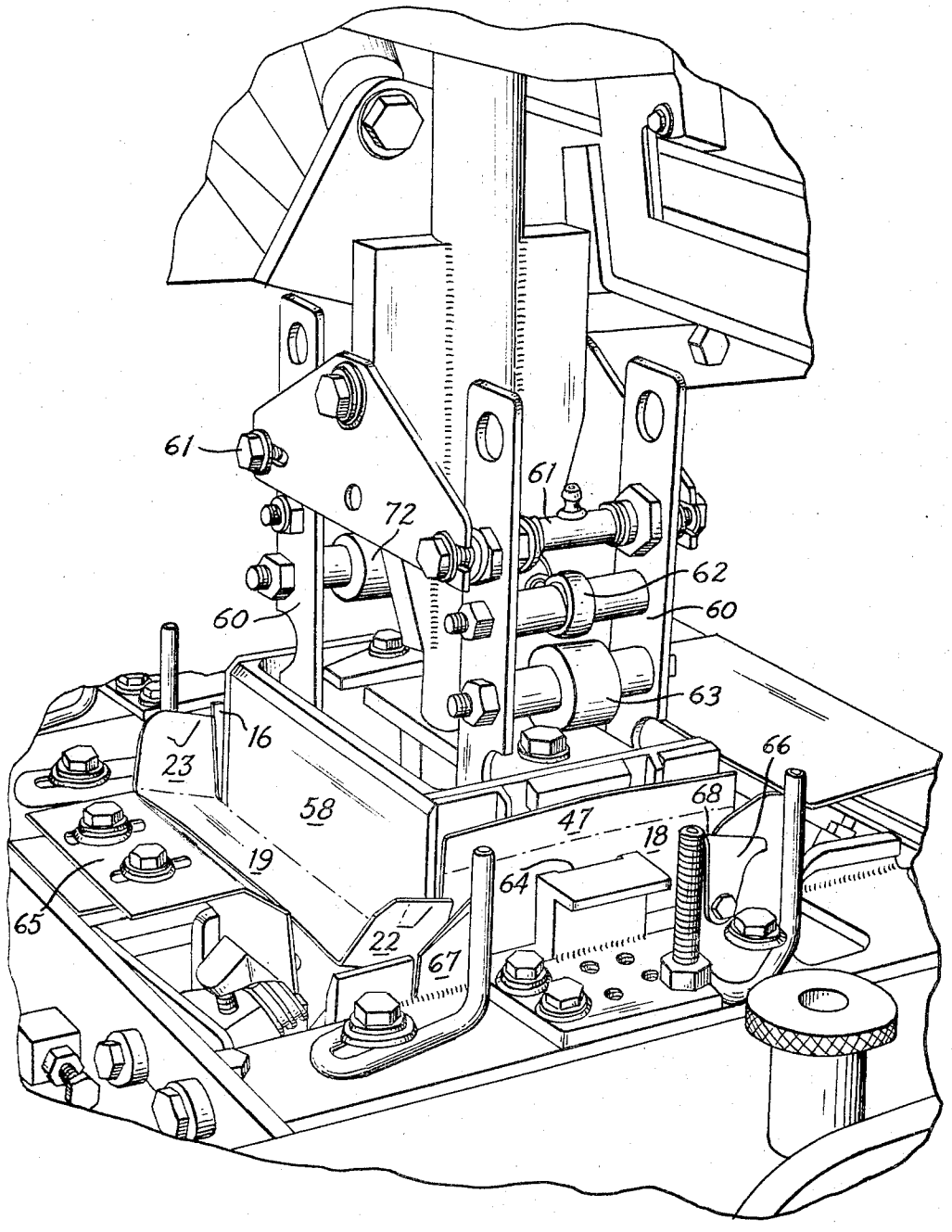


Fig. 3

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GLUELESS PANEL LOCKS, PARTICULARLY CORNER LOCKS FOR FOLDING BOXES

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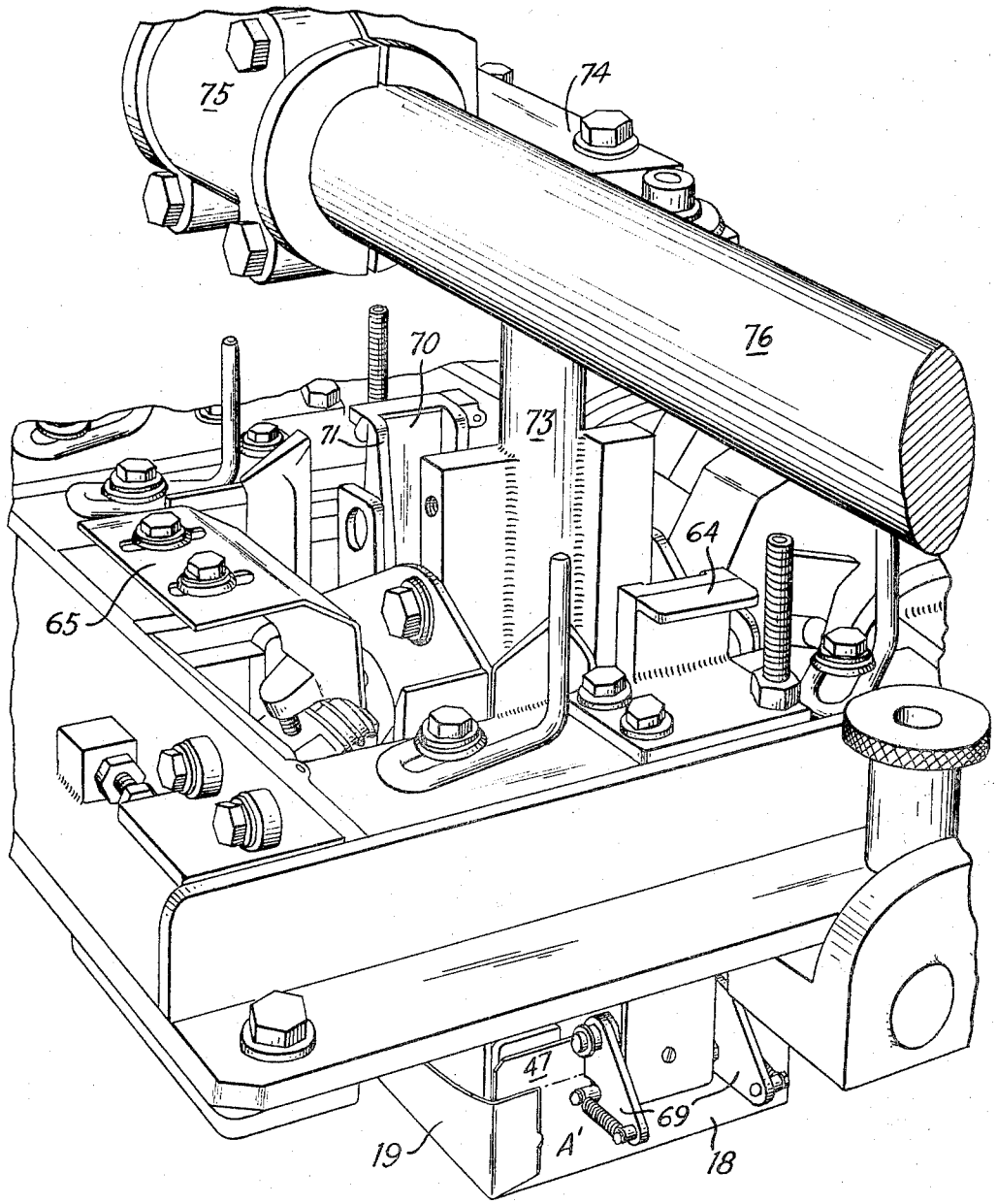


Fig. 4

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GLUELESS PANEL LOCKS, PARTICULARLY CORNER LOCKS FOR FOLDING BOXES

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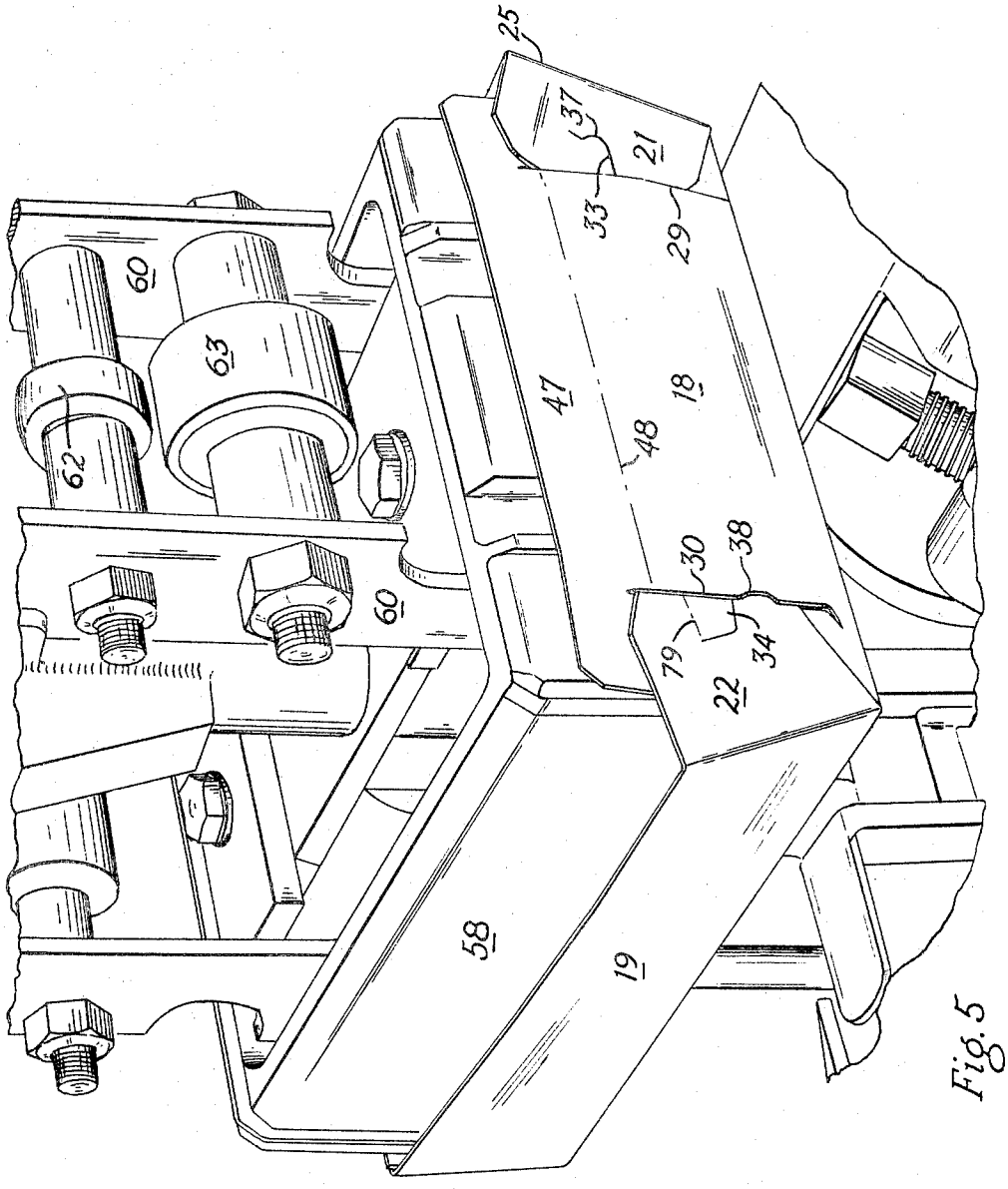


Fig. 5

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Sept. 10, 1968 C. J. PIERCE, JR 3,400,877

GLUELESS PANEL LOCKS, PARTICULARLY CORNER LOCKS FOR FOLDING BOXES

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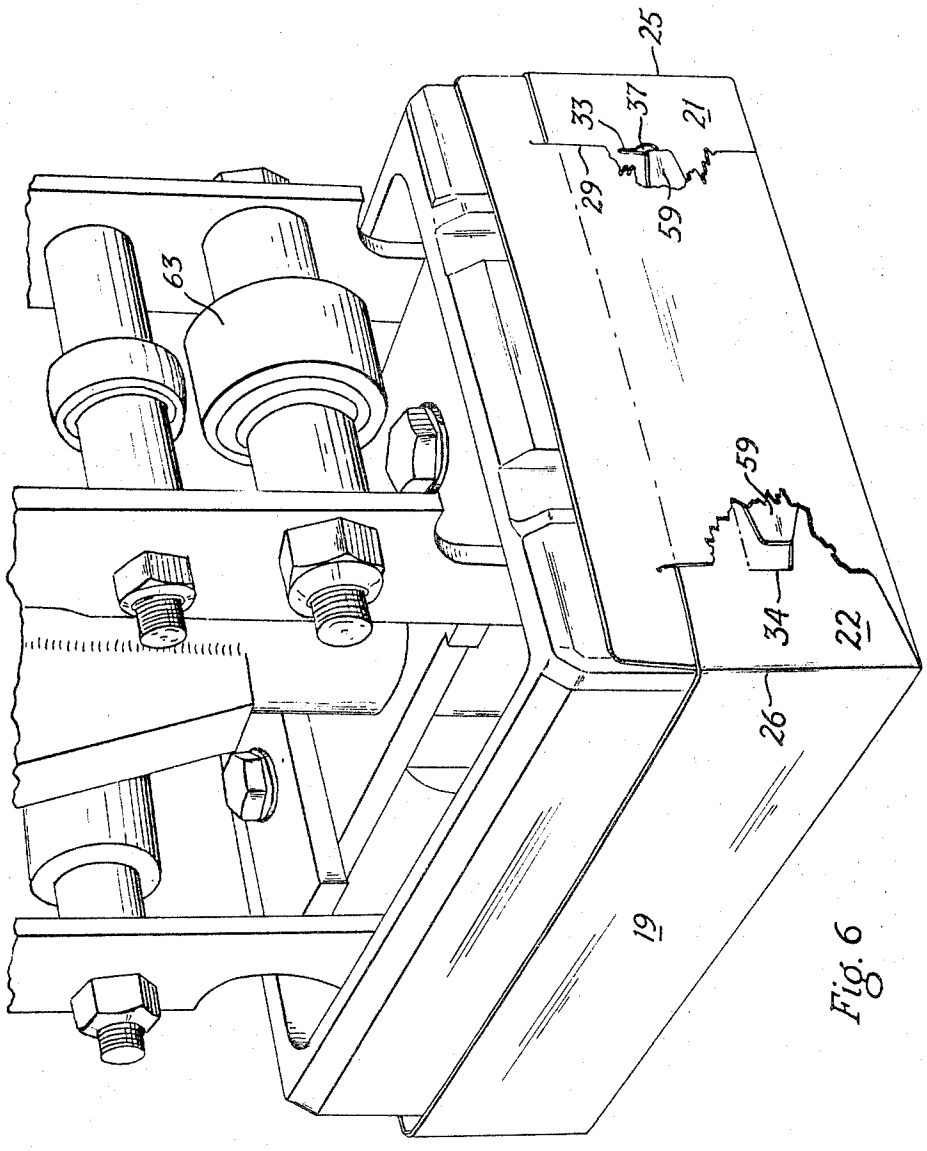


Fig. 6

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Sept. 10, 1968 C. J. PIERCE, JR 3,400,877

GLUELESS PANEL LOCKS, PARTICULARLY CORNER LOCKS FOR FOLDING BOXES

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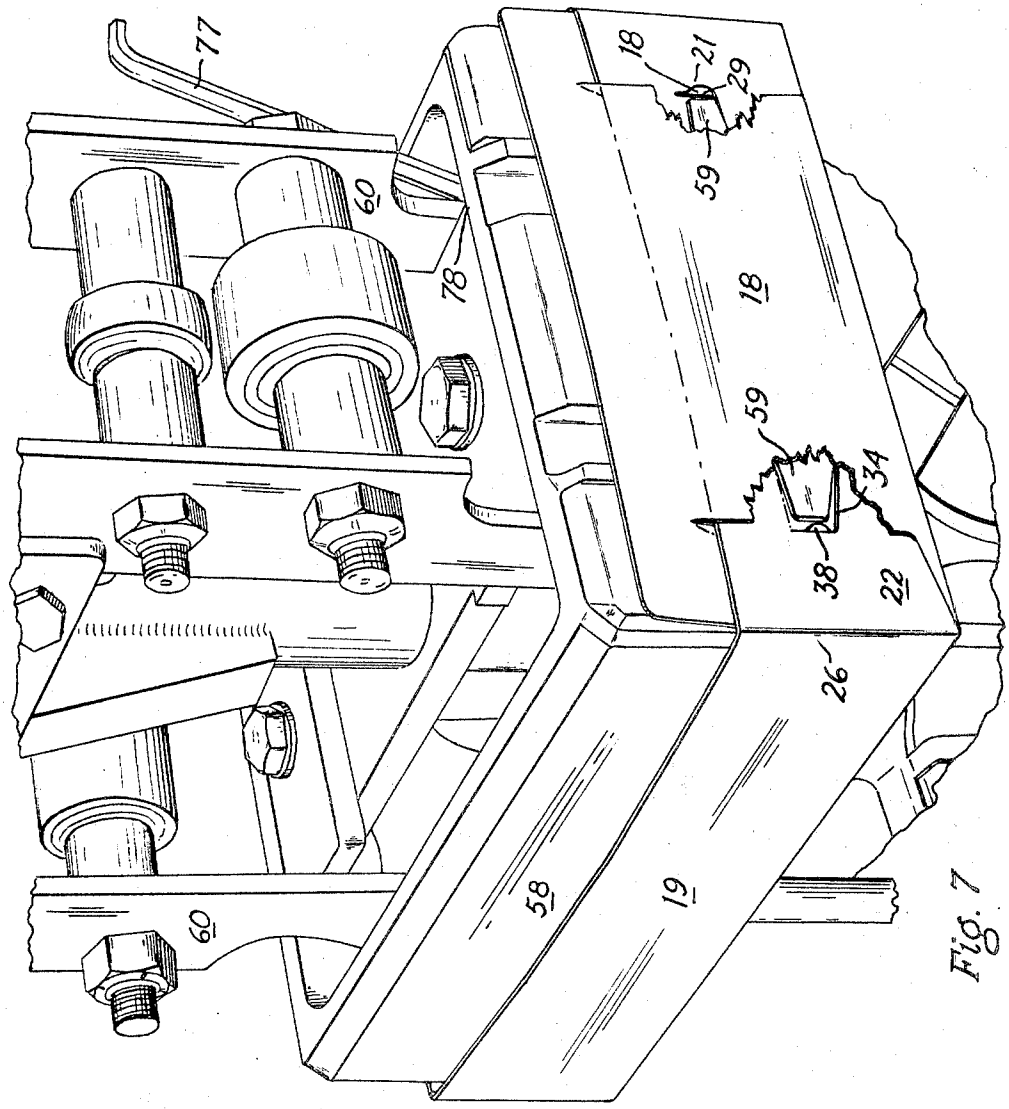


FIG. 7

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Sept. 10, 1968 C. J. PIERCE, JR 3,400,877

GLUELESS PANEL LOCKS, PARTICULARLY CORNER LOCKS FOR FOLDING BOXES

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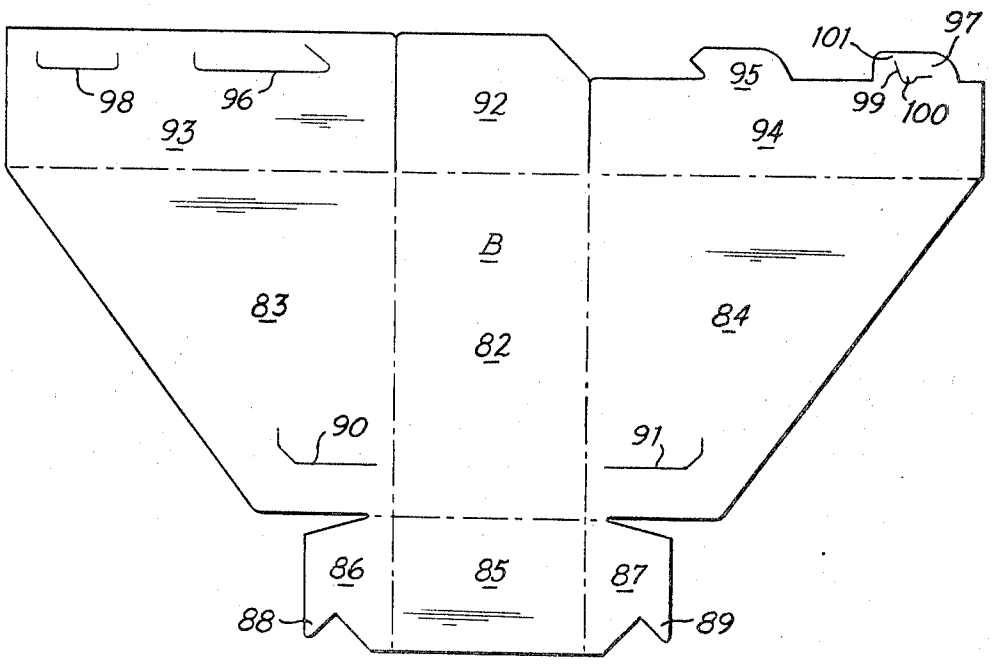


Fig. 9

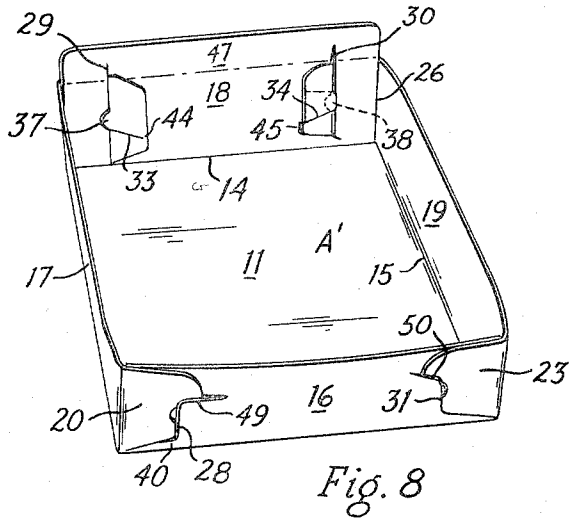


Fig. 8

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GLUELESS PANEL LOCKS, PARTICULARLY CORNER LOCKS FOR FOLDING BOXES

Filed Oct. 10, 1966 10 Sheets-Sheet 9

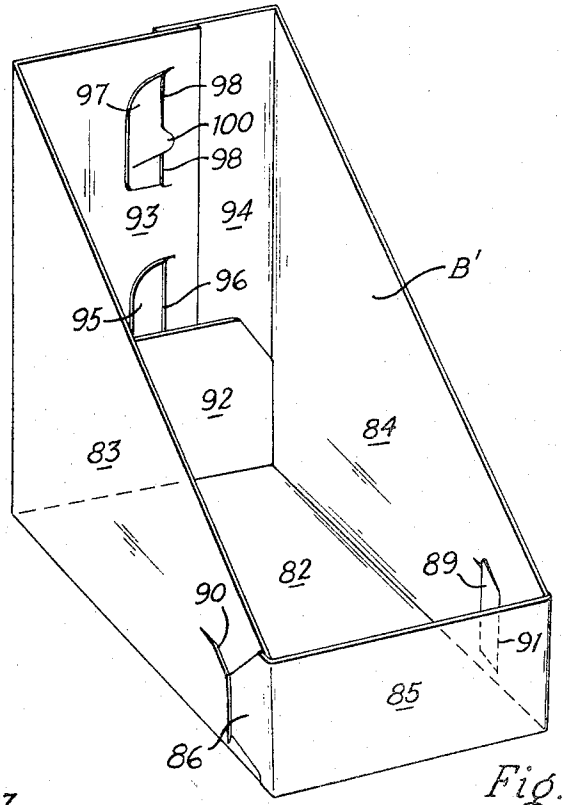


Fig. 10

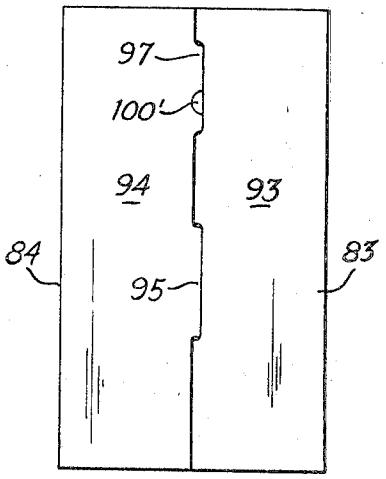


Fig. 11

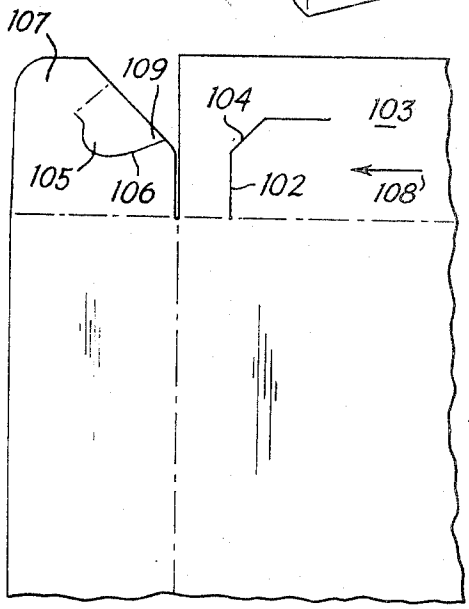


Fig. 12

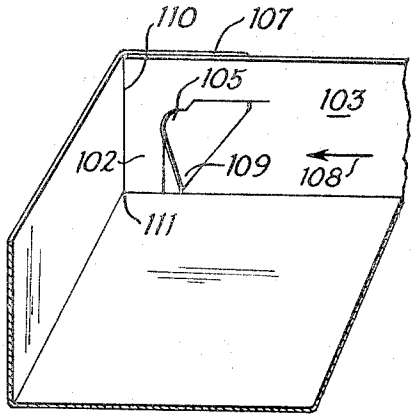


Fig. 13

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GLUELESS PANEL LOCKS, PARTICULARLY CORNER LOCKS FOR FOLDING BOXES

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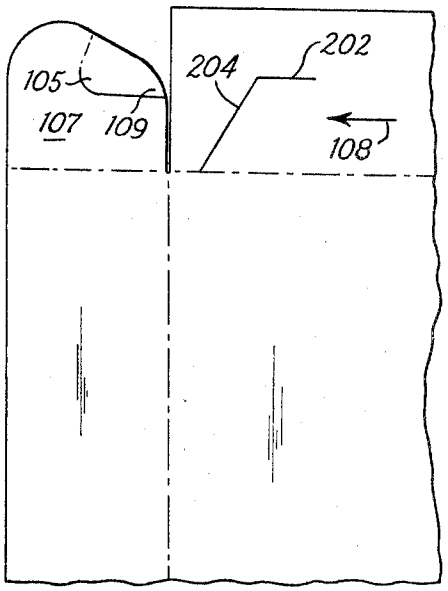


Fig. 14

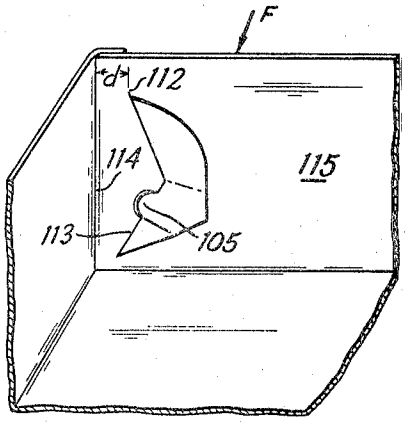


Fig. 16

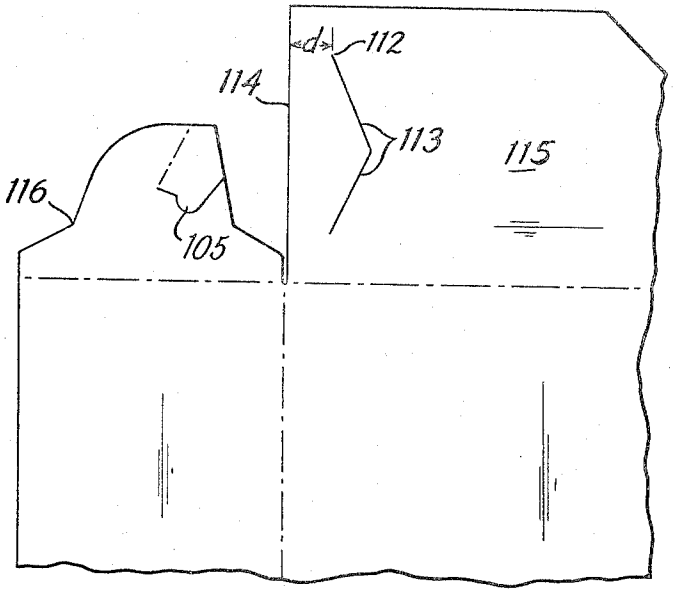


Fig. 15

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United States Patent Office 3,400,877
Patented Sept. 10, 1968

3,400,877

GLUELESS PANEL LOCKS, PARTICULARLY CORNER LOCKS FOR FOLDING BOXES

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Filed Oct. 10, 1966, Ser. No. 585,435
23 Claims. (Cl. 229—32)

ABSTRACT OF THE DISCLOSURE

The present improvements provide a folding box panel interlock of the general type in which a tab is inserted into an insertion slot and in which an interlock results between the insertion slot and a coinciding portion of a slot in the tab. A pointed tip at the outer end portion of the tab slot is directed towards the box bottom panel. This precludes interference with the insertion of the tight fitting box contents or interference with the top edge of the box body in case the structure serves as a telescoping cover. A lug on the insertion slot or on the tab slot is snapped past an edge of the interlock and serves as a safety catch in this position. A bridge is optionally provided at the tab tip to prevent the tip from catching on an edge of the insertion slot. This bridge is severed after insertion of the tip.

The invention relates to improvements in glueless panel locks for folding boxes, blanks incorporating such improved corner locks, and in the method of interlocking the box or blank panels either within a wall area or at a box corner or corners.

The development of the practice of gluelessly interlocking box panels, rather than gluing them, accompanied by the origination of a great number of lock designs has led to increasingly stricter demands including the following:

The lock must be capable of being formed by automatic machinery.

The lock must be capable of being formed at high rates of speed of the order of at least one hundred boxes per minute.

The lock when formed should be tight, i.e., free from play or lost motion.

The lock must incorporate a safety-catch feature guarding against accidental disengagement.

The lock must be so shaped as not to catch on, or otherwise interfere with the insertion of, contents to be packaged.

The lock must be so shaped as to engage positively with a very low incidence of failure when handled on automatic machinery.

The requirement that the lock must not catch on box contents or interfere with their insertion has become acute in recent years as a result of the development of automatic high speed loading devices taking the place of hand loading in which it was possible to compensate by the operator's skill for physical characteristics of the lock.

Closely related to the requirement of non-interference with the box contents is the desirability that the lock should be usable for a box body as well as for a box cover telescopically fitting thereover without interference by edges, points, projections, etc. of the lock.

Fulfilling the above requirements, the improved lock provided by this invention is free from tips or points extending opposite to the direction of insertion of box contents.

This, however, involves another problem:

Tips or points extending in the direction of insertion, in which direction they do not interfere with the contents, are likely to interfere with, or render difficult, the insertion of the lock flap through the slot in the side wall. The improved lock design overcomes this difficulty by an appropriate guard for the tip or point which precedes the latter during the insertion movement and may serve an additional function, as will become apparent from the following detailed description.

The various objects, features and advantages of this invention will appear more fully from the detailed description which follows accompanied by drawings showing, for the purpose of illustration, preferred embodiments 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 iself, 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 form of box blank incorporating different forms of corner locks;

FIGS. 2, 3 and 4 illustrate, in perspective views, three sequential phases of the box forming operation performed on the blank by a plunger and die mechanism;

FIGS. 5, 6 and 7 illustrate, in perspective views, and on an enlarged scale, three further phases of the box forming operation lying between the phases shown in FIGS. 3 and 4;

FIG. 8 is a perspective view of the formed box;

FIG. 9 is a plan view of a blank incorporating a typical panel lock;

FIG. 10 is a perspective view of the box set up from the blank of FIG. 9;

FIG. 11 is an elevational view of the back of the box of FIG. 10;

FIGS. 12 and 14 are plan views of modified corner portions of blanks;

FIG. 13 is a perspective view of the box corner portion resulting from the blank of FIG. 12;

FIG. 15 is a plan view of a modified corner portion of a blank; and

FIG. 16 is a perspective view of a corner portion of a box resulting from blank 15.

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 construction for the purpose of explanation of broader aspects of the invention, but it should be understood that structural details may be modified in various respects without departure from the principles of the invention and that the invention may be incorporated in other structural forms than shown.

The blank A shown in FIG. 1 may be cut and creased from sheets or rolls of paperboard, box board or other foldable sheet material on conventional cutting and creasing machines.

The blank A comprises a central main panel 11 which could become a box bottom panel, in the event the blank is made into a box body, or a box top panel in the event the blank is made into a box cover. In this specification the blank will be described as being formed into a box body, and for reasons of convenience the panel 11 will

sometimes be referred to as a bottom panel. It is to be understood that the term bottom panel is not intended to be used in a limiting sense as the box body, if inverted, can serve as a telescoping box cover.

The blank A was specifically designed for experimental purposes. One of its ends comprises a dust flap, which is absent from the other, and the specific lock configurations differ. This design made it possible to erect and lock four differently designed corners at once. In the actual production of boxes incorporating the invention only one form of lock will generally be used.

The main panel **11** is bordered by fold lines **12, 13, 14** and **15** along which side wall panels **16, 17, 18** and **19** are articulated.

Pairs of adjacent side walls are interconnectible by means of flaps articulated to the end of one wall along a corner fold line and insertable into a slot in the other side wall.

Thus, flaps **20, 21, 22** and **23** are articulated to panels **17** and **19**, respectively, along corner fold lines **24, 25, 26** and **27**.

The corresponding insertion slots are in the panels **16** and **18** and are numbered **28, 29, 30** and **31**.

There is a further slot **32, 33, 34** and **35** in each of the flaps, the flap slot being so laid out that the insertion slot and the flap slot have at least a point of coincidence within the body of the flap when the flap is fully inserted into the insertion slot to an end position in which the lock is completed after forming of the corner.

The course of one slot otherwise differs from the course of the other slot so as to form a locking lug seen at **36, 37, 38** and **39**. It is readily seen that the locking lug proper may be formed on the flap, such as at **36, 37** and **39**, but that it may also be formed in the side wall by appropriate configuration of the insertion slot, as seen at **38**.

The locking lug is so disposed that the insertion slot in the wall continues, beyond the lug, towards the main or bottom panel.

In the illustrated example the insertion slots **28, 29, 30** and **31** are directed substantially perpendicular to the main panel, when the box is erected, except for the terminal portions of the slots which may optionally be angled off, as shown at **40, 41** and **42**. As will later be seen from FIG. 14, the last described slot portion may also be slanted with respect to the main panel.

Considering now the course of the flap slot beyond the location of the respective locking lug, the flap slot continues towards an outer edge of the flap in a general direction towards the main panel, considering the aforementioned end position in which the lock is complete, but the flap slot diverges increasingly from the course of the insertion slot for increasing distances from the lug.

This can be visualized from an inspection of FIG. 1 alone, but is more conveniently seen from a comparison of FIG. 1 with FIG. 8 showing the respective end positions.

Advantages are obtainable by termination of the flap slots short of the respective outer edge, thus leaving a narrow weak bridge in the blank between the two flap portions adjacent the flap edge towards which the flap slot is directed. Such bridges are seen at **43, 44, 45** and **46**.

As will be seen later, the unbroken bridges facilitate insertion of the flaps into the insertion slots and are ruptured after insertion by an operation by which the locking lug is snapped from a position overlying one surface, past the edge of the other slot, into a position overlying the opposite surface of the wall panel or flap, as the case may be.

The wall panel **18** of the blank A is fitted with a dust flap **47** articulated to the wall panel **18** along a dust flap fold line **48**. The insertion slots **29** and **30** are extended to terminate with their upper ends in the dust flap. This permits the corner flaps **21, 22** to be of such large size that portions of the flaps swing beyond the top boundary of the panel **18** when being inserted into the slots **29** and **30** (see FIG. 5).

In a wall not fitted with a dust flap, such as wall **16**, additional clearance for the top portion of the corner flap is obtainable by angularly disposed portions **49, 50** of the insertion slots, which portions **49** and **50** are directed away from the respective corner.

Turning next to automatically operable devices and steps in the method of setting up and interlocking the blank, the blank A is shown deposited between four locating pins **51, 52, 53** and **54** of a forming die **55** by a blank feeder **56** comprising vacuum cups **57**. At the illustrated instant the feeder is retreating to the upper right of the figure and a plunger **58** is descending to seat on the main panel of the blank.

The plunger comprises projectible and retractable hook elements **59** at the lower ends of blades **60** which are pivotally mounted at **61** on the plunger assembly (see also FIG. 3).

The hook elements **59** are normally in a projected position due to outwardly directed spring force applied at points **62** and may be retracted by rollers **63** entering between central cam elements **64** as the plunger descends further.

In the position shown in FIG. 3 the plunger has depressed the main panel of the blank below the top surface of the cam elements on which the blank rested originally (FIG. 2). This causes the end portions **18** and **16** to be folded into nearly upright position.

The blank further encountered lateral folding elements, one of which is seen at **65**, which fold the walls **19** and **17** towards an upright position. During this operation the corner flaps strike flap folding cams visible at **66** and **67** which cause the flaps to fold at their respective corner fold lines and move towards a position substantially parallel to the panels **16** and **18**.

Shortly after the position shown in FIG. 3, the central cam elements press the panels **16** and **18** firmly against the ends of the plungers. Likewise, the vertical edges of the flap folding cams **66** and **67** press the panels **16** and **18** against the plunger ends, one of these edges being visible at **68**. At the same time the hook elements **59** of the plunger, which at this moment are still fully extended, bulge the panels **16** and **18** outwardly and cause the insertion slots to open, into which the corner flaps then enter, as the panels **17** and **19** are being erected.

The fully erected box with its corners locked is seen underneath the die in FIG. 4 at a moment shortly before the plunger reaches its lowest position at which spring-urged strip off latches **69** engage upper box edges and hold the finished box while the plunger is being withdrawn upwardly.

FIG. 4 shows also the face **70** of the track on the far central cam element **71** which is engaged by the far roller **72** (FIG. 3) which retracts hook elements of the plunger. There is further shown in FIG. 4 the upper end of the plunger stem **73** attached at **74** to an angle fitting **75** on a vertically reciprocating plunger drive bar **76**.

Between the operations of FIGS. 3 and 4 there lie a series of further operations which could not conveniently be recorded in photographs on which the drawings are based, because these further operations take place inside the die.

FIGS. 5, 6 and 7 illustrate these operations and show the partially folded blank on the plunger, but without the die, and on an enlarged scale to show the engagement of the locking elements more clearly.

In the position shown in FIG. 5 the flaps **21** and **22** entered the insertion slots **29** and **30**. The panel **18** is fully upright, but the panel **19** has not yet reached its vertical position. The hook elements **59** of the plunger bulge out the panel **18** about midway of the ends of the insertion slots, and the entering edges of flaps slip under the blade-shaped hooks **59** which are not visible in FIG. 5, but

which can be seen in FIG. 6 in which portions of the blank overlying the hooks were torn out in order to show this detail.

In the position shown in FIG. 6 the panel **19** is fully erected and the flaps **21** and **22** have reached their end position except for the snapping into place of the lugs which then become safety catches of the lock.

In FIG. 6 the portions of the flaps defined by the flap slots **33** and **34** still lie in the plane of the remainder of the flaps and the hook elements **59** are fully extended. This condition exists at the point where the plunger has entered the die, but its hook-element-retracting rollers **63** have not yet made contact with the cam elements **64** (FIGS. 3 and 4).

In FIG. 7 the hook elements are shown retracted. In order to show this condition without the die an Allen wrench **77** was wedged between the blade **60** and the wall of the hollow plunger **58** at **78**.

Retraction of the hooks **59** caused the lug **37**, which in FIG. 6 overlies the panel **18**, to be snapped past the edge of the insertion slot **29** into a position underlying the panel **18**, thus completing the lock. The result is shown in the upper left corner of FIG. 8 in which the box A' is shown in a position in which its ends are reversed.

Considering next the left box corner of FIG. 7, the flap portion defined by the flap slot **34** is drawn to the inside of the box and past the locking lug **38** on the panel **18** which can be seen just to the left of the left hook blade **59**.

The engaged lock is seen in FIG. 8 in the upper right corner of the box. The locking lug **38** is not visible, as it is formed by the insertion slot **30**, and a straight edged portion of the flap **22** is snapped past it and lies innermost of the box.

Referring to the left front corner of the box shown in FIG. 8, the arcuate configuration is the portion of the flap **20** from which the lug was cut, the lug proper lying on the inside of the box. Similarly the lug of the flap **23** is out of view. However, the corresponding lug **37** of the lock of the upper left box corner is plainly visible on the inside of the box. Its disposition corresponds to the location of lugs on the inside of the wall **16** nearest the observer.

When a locking lug is being snapped past the edge of the respective other slot, the weak bridge **43**, **44**, **45** and **46**, respectively, at the end of the flap slot is ruptured due to the greater degree of flexing of the portion of the flap which directly underlies the hook **59** in relation to the lesser degree of flexing of the remainder of the flap.

It is seen from FIG. 8 that the flap slot increasingly diverges from the insertion slot for increasing distances from the locking lug in a direction towards the flap edge or bridge portion.

Further, it is apparent that if two points are selected of equal height above the main panel, one point on the insertion slot and the other on the flap slot, the points of the flap slot have a greater distance from the corner fold line than the points of the insertion slot in the wall.

Returning briefly to FIGS. 3 and 5 illustrating the insertion of the corner flaps, it is readily seen that the lower corner portion of each flap enters the insertion slot first. The existence of a bridge portion, which is later ruptured, insures that the remainder of the flap follows its lower corner portion without danger of the flap portion, which is later grasped and flexed by the hooks **59** of the plunger, catching on the edge of the insertion slot, in which case the upper edge portion of the flap might pass to the outside of the wall panel **18** rather than enter the slot.

While the strength and reliability of the lock is not affected by the presence or absence of a rupturable bridge, the incidence of failures of assembly is reduced, particularly in machines operating at high speeds of the order of over 100 boxes per minute.

The slots may be shaped to provide for a substantial lineal coincidence of the two interlocking cut edges formed by the wall slot and the flap slot. In FIG. 1 the straight portion of the flap slot **33** above the lug **37** is designed to engage the wall slot **29** along a line, rather than a point, of coincidence, thus distributing any load exerted on the lock over a substantial length of edges.

The length of the flap slots **34** may similarly be chosen great enough to engage the wall slot **30** in a line-to-line form of engagement.

The flap **22** is provided with a crease **79** in order to predetermine the creasing of the board under the pull of the plunger hook elements **59**. This crease line lines up with edge **80** of a back-up plate **81** on the plunger (FIG. 2).

FIG. 9 illustrates the application of the invention to a panel lock, as distinguished from a corner lock.

The blank B comprises a bottom panel **82** to which side panels **83** and **84** are articulated. A front panel **85** is articulated to the bottom panel and has two corner flaps **86**, **87** hinged to it which comprise hook portions **88** and **89** for interengagement with appropriately shaped side wall slots **90** and **91**.

An inner end panel **92** is articulated to the bottom panel **82** and outer end panels **93** and **94** are articulated to the side panels **83** and **84**. The panel **94** comprises a hook **95** adapted to engage a slot **96** in the panel **93**. As this hook engagement is not sufficiently reliable to prevent accidental withdrawal of the hook from its slot, a further lock is provided comprising a tab **97** and an insertion slot **98**.

The panel **94** and tab **97** are comparable to any of the above discussed flaps provided with a flap slot **99** contoured to define a lug **100** and, optionally, a bridge portion at **101**.

FIGS. 10 and 11 show the box B' set up from the blank B of FIG. 9. The outer end panels **93** and **94** lie in substantially the same plane and form the rear wall of the box. The lug **100** lies on the inside and the arcuate cut **100'** visible from the back of the box (FIG. 11) indicates its location.

FIG. 12 shows the corner portion of a blank in which the insertion slot **102** in the wall **103** comprises a slanted portion **104** with which the lug **105** defined by the flap slot **106** in flap **107** interlocks. The merit of this arrangement is apparent from FIG. 13 showing the set up box corner.

The box is designed to be loaded in the direction of the arrow **108** with contents likely to catch on any projecting portion of the corner lock. It is seen that the lock construction does not interfere with the loading as the tip **109** of the locking element of the flap points toward the corner fold line **110** or corner point **111**.

FIG. 14 shows a modification of the blank of FIG. 12 in which the slanted portion **204** of the insertion slot **202** extends to the bottom panel in order to eliminate any tendency of the vertical portion of the insertion slot **102** of FIG. 13 to catch on contents. Non-modified elements of FIG. 14 are identified by the same reference numerals as were applied to FIG. 12.

In the blank portion shown in FIG. 15 the upper end **112** of the angled wall slot **113** is removed from the edge **114** of the wall **115** by only a short distance "*d*." This arrangement provides increased resistance to pressure exerted from the outside on the wall **115** towards the inside of the box. The locking lug **105** engages the lower portion of the insertion slot, whereas the point **116** wedges into the upper end **112** of the slot and stabilizes the wall panel **115**. The resulting box corner is shown in FIG. 16 in which the force is indicated by the arrow F.

It is evident that still further modifications of the lock may be made to meet other specific requirements.

What is claimed is:

1. A carton of foldable board having side walls hingedly connected to a main panel, at least one pair of adjacent

corner forming side walls being interconnected by means of a flap articulated to the end of one side wall along a corner fold line and inserted into an insertion slot in the other side wall to an inserted end position, there being a further slot in the said flap extending from the interior of the body of the flap towards an edge of the flap, the insertion slot and the flap slot having at least a point of coincidence within the interior of the body of the flap from which point of coincidence the flap slot runs towards the edge of the flap in a direction toward said main panel, continuing from said point in the direction toward said main panel, one slot following a course deviating from the course of the other slot to form a locking lug which is to be snapped from a position overlying one surface past the edge of the other slot to a position overlying the opposite surface, the insertion slot continuing beyond the lug towards the main panel, and the flap slot continuing beyond the lug towards an outer edge of the flap in a general direction towards the main panel, considering wall and flap in the end position, and diverging increasingly from the insertion slot for increasing distances from said lug.

2. A carton according to claim 1 in which both slots within the range of increasing divergence are substantially straight.

3. A carton according to claim 1 in which the points of the flap slot within the range of divergence of the slots are at a greater distance from the corner fold line than comparable points of the wall slot, comparing points having the same height above the main panel, considering the main panel in the position of a carton bottom panel.

4. A carton of foldable material having side walls hingedly connected to a bottom panel, at least one pair of adjacent side walls being interconnected by means of a flap articulated to the end of one side wall and inserted into an insertion slot in the other side wall to an inserted end position, there being a slot in said flap comprising a first portion registering with said insertion slot, a second portion extending from said first portion, said second portion deviating from the insertion slot to form on said flap a locking lug which is to be snapped from an overlying position through said insertion slot into an underlying, positive locking, position, said lug extending in opposite direction relative to the insertion direction of said flap, and a third portion extending from said second portion through the body of said flap to an outer edge thereof in a direction towards said bottom panel in inserted position and diverging increasingly from said insertion slot as the distance from said lug increases in the direction towards the bottom panel.

5. A carton according to claim 4 in which the third slot portion is formed by an incomplete cut such as to leave adjacent said outer edge a narrow rupturable bridge between flap areas on either side of the said third slot portion.

6. A carton of foldable material having side walls hingedly connected to a bottom panel, at least one pair of adjacent side walls being interconnected by means of a flap articulated to the end of one side wall and inserted into an insertion slot in the other side wall to an inserted end position, there being a slot in said flap comprising a locking portion coinciding with a portion of the insertion slot, between said locking portion and the outer edge of the flap towards which the flap slot runs in a direction towards said bottom panel, there being a locking lug formed on said flap by said flap slot which lug is to be snapped from an overlying position through said insertion slot into an underlying, positive locking, position, said lug extending in opposite direction relative to the insertion direction of said flap, said flap slot comprising an outer slot portion extending between said lug forming portion (through the body of said flap to) and an outer edge of said flap in a direction towards the bottom panel, considering the flap in inserted position in said wall, said outer slot portion diverging increasingly from said insertion slot for increasing distances from said lug.

7. A carton according to claim 6 in which the outer slot portion is formed by an incomplete cut such as to leave adjacent said outer edge a narrow rupturable bridge between the flap areas on either side of the outer slot portion.

8. A carton according to claim 6 in which the points of the flap slot within the range of increasing divergence of the slots are at a greater distance from the corner fold line than comparable points of the insertion slot, comparing points having the same height above the bottom panel.

9. A carton of foldable material having side walls hingedly connected to a bottom panel, at least one pair of adjacent side walls being interconnected by means of a flap articulated to the end of one side wall along a corner fold line and inserted into an insertion slot in the other side wall to an inserted end position, there being a slot in said flap, said insertion slot comprising a point of coincidence with said flap slot and comprising between said point and said bottom panel a locking lug past which an edge of the flap slot is to be snapped from an overlying position into an underlying, positive locking, position, said lug extending in the direction of insertion of the flap, the portion of the flap slot which extends from the portion which is to be snapped past said lug towards an outer edge of the flap being directed towards the bottom panel considering the lug in inserted position, the flap slot diverging increasingly from the insertion slot for increasing distances from said lug and decreasing distances from the bottom panel.

10. A carton according to claim 9 in which the terminal slot portion is formed by an incomplete cut such as to leave adjacent the outer flap edge a narrow rupturable bridge of weakness between the flap areas on either side of the terminal slot portion.

11. A carton according to claim 9 in which the points of the flap slot with the range of increasing divergence of the slots are at a greater distance from the corner fold line than comparable points of the insertion slot, comparing points having the same height above the bottom panel.

12. A carton of foldable board having side walls hingedly connected to a bottom panel, at least one pair of adjacent corner forming side walls being interconnected by means of a flap articulated to the end of one side wall along a corner fold line and inserted into an insertion slot in the other side wall to an inserted end position, there being a further slot in said flap, the insertion slot and the flap slot having at least a point of coincidence within the body of the flap, considering said end position, continuing from said point, one slot following a course deviating from the course of the other slot to form a locking lug which is to be snapped from a position overlying one surface past the edge of the other slot to a position overlying the opposite surface, the insertion slot continuing beyond the lug toward the bottom panel and the flap slot continuing beyond the lug, within the body of the flap, towards an outer edge of the flap in a general direction toward the bottom panel, considering said end position, said flap slot incompletely severing at the outer edge of the flap the two flap portions to either side of the flap slot to leave a severable bridge between the two portions which maintains the two portions connected during insertion into the insertion slot.

13. A carton according to claim 12 in which both slots within the range of increasing divergence are substantially straight.

14. A carton according to claim 12 in which the points of the flap slot within the range of divergence of the slots are at a greater distance from the corner fold line than comparable points of the wall slot, comparing points having the same height above the bottom panel.

15. In a carton blank of paperboard comprising a main panel, wall panels articulated to the main panel along

main fold lines, a corner lock flap articulated to one of a pair of adjacent corner forming wall panels along a corner fold line, the other of the pair of wall panels having an insertion slot in it for insertion of at least a portion of the corner flap in corner forming position, the corner flap having a flap slot in it for interengagement with said insertion slot in corner forming position, the improvement which is characterized by the flap slot being formed as an internal slot, one end of which lies within the body of the flap at a greater distance from the flap edge than the other end of the slot, which other end lies at a distance from the flap edge sufficiently short to form a severable bridge of weakness between the two flap portions on either side of said other end of the flap slot.

16. A carton blank according to claim **15** in which the flap bridge is formed by an unslotted portion of the paperboard, the thickness of the bridge being substantially equal to the thickness of the board.

17. A carton blank according to claim **15** in which the flap bridge is formed by a cut extending partially, but not entirely, through the board.

18. A carton blank according to claim **15** in which the bridged flap slot is substantially tangentially disposed with respect to an imaginary circle about the corner point and in which the bridge is within that portion of the flap slot which first passes through the insertion slot, the corner point being the point at which said main fold lines and said corner fold line meet.

19. A carton blank of paperboard comprising a main panel, a pair of adjacent wall panels articulated to the main panel along main fold lines meeting at a corner point; a corner lock flap articulated to the end of one of said wall panels along a corner fold line aimed at said corner point, the other of the pair of wall panels having an insertion slot in it for insertion of at least a portion of the corner flap in corner forming position, there being a flap slot in said flap, the insertion slot being so disposed in relation to the flap slot that in corner forming position in which the flap is inserted to an end position the two slots have at least a point of coincidence which point lies within the body of the flap, one slot following, continuing from said point of coincidence, a cource deviating from the other slot to form a locking lug which is to be snapped from a position overlying one surface past the edge of the other slot to a position overlying the opposite surface, the insertion slot continuing beyond the lug towards the main panel ,and the flap slot continuing beyond the lug towards an outer edge of the flap substantially in a tangential direction with respect to an imaginary circle about the corner point, the flap slot terminating short of the outer edge of the flap, there remaining a connecting bridge of weakness between the two flap portions on either side of the flap slot.

20. A carton of foldable board, the carton comprising a bottom panel and sides which are upright with respect to the bottom panel, at least one of the sides comprising two panel portions which overlap and are interlocked by a tab on one of the panel portions, said tab extending into an insertion slot in the other panel portion, there being a further slot in said tab extending from the interior of the body of the tab towards an edge of the tab, the insertion slot and the tab slot having at least a point of coincidence within the interior of the body of the tab from which point of coincidence the tab slot runs towards the edge of the tab in a direction towards the bottom panel, continuing from said point in the direction toward the main panel, one slot following a course deviating from the course of the other slot to form a locking lug which is to be snapped from a position overlying one surface past the edge of the other slot into a position overlying the opposite surface, the insertion slot continuing beyond the lug towards the bottom panel, and the tab slot continuing beyond the lug towards an outer edge of the tab in a general direction towards the bottom panel, considering said tab and said other panel portion in the end position in which said panel portions are interlocked, said tab slot diverging increasingly from the insertion slot for increasing distances from said lug.

21. A carton according to claim **20** in which the locking lug is formed on said tab and points in a direction opposite to the direction of insertion of the tab into the insertion slot.

22. A carton according to claim **20** in which the locking lug is formed on said other panel portion by said insertion slot and points in the direction of insertion of said tab into the insertion slot.

23. A carton according to claim **20** in which the tab slot terminates short of the outer edge of the tab toward which it extends, leaving a severable bridge between the board portions on either side of the tab slot.

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