

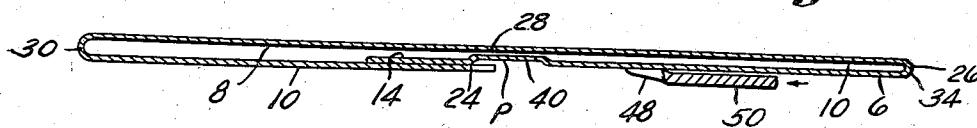
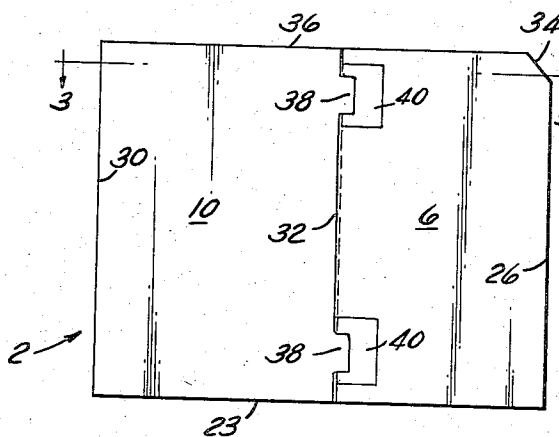
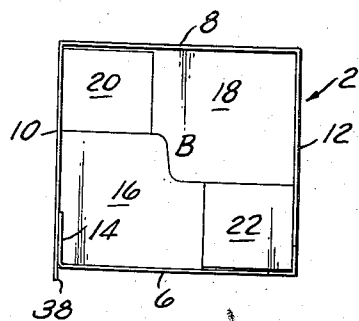
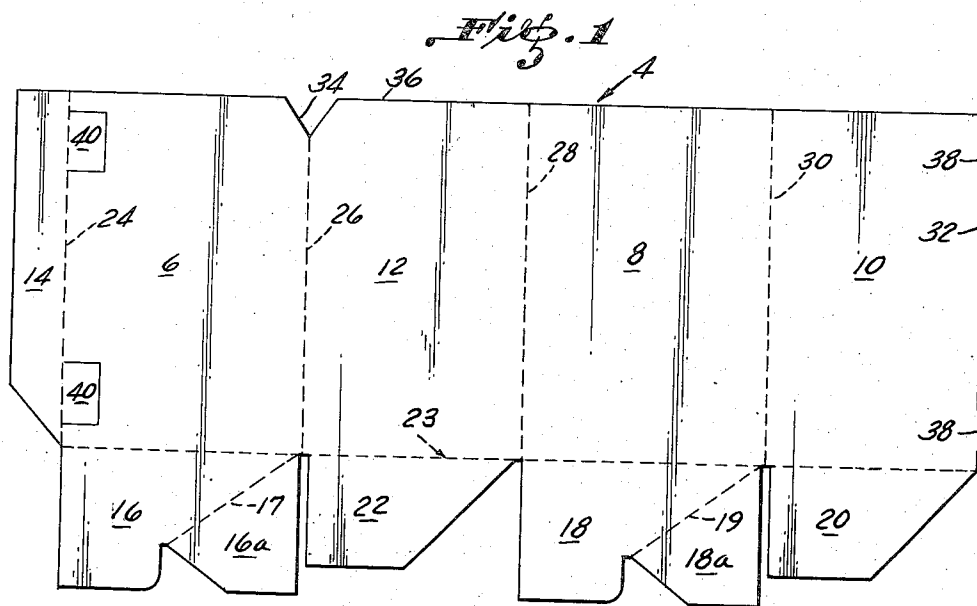
March 17, 1959

F. A. GASTRIGHT
SELF-ERECTING BOX WITH TABS AND RECESSES FOR ENGAGEMENT
BY FEEDING AND ERECTING MECHANISM

2,877,943

Filed July 16, 1956

2 Sheets-Sheet 1



INVENTOR
FRANK A. GASTRIGHT

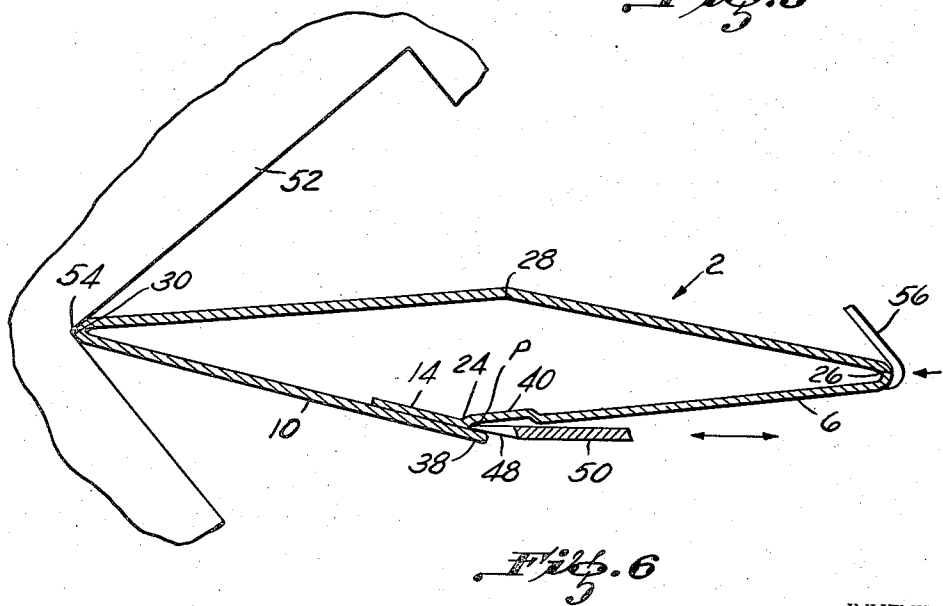
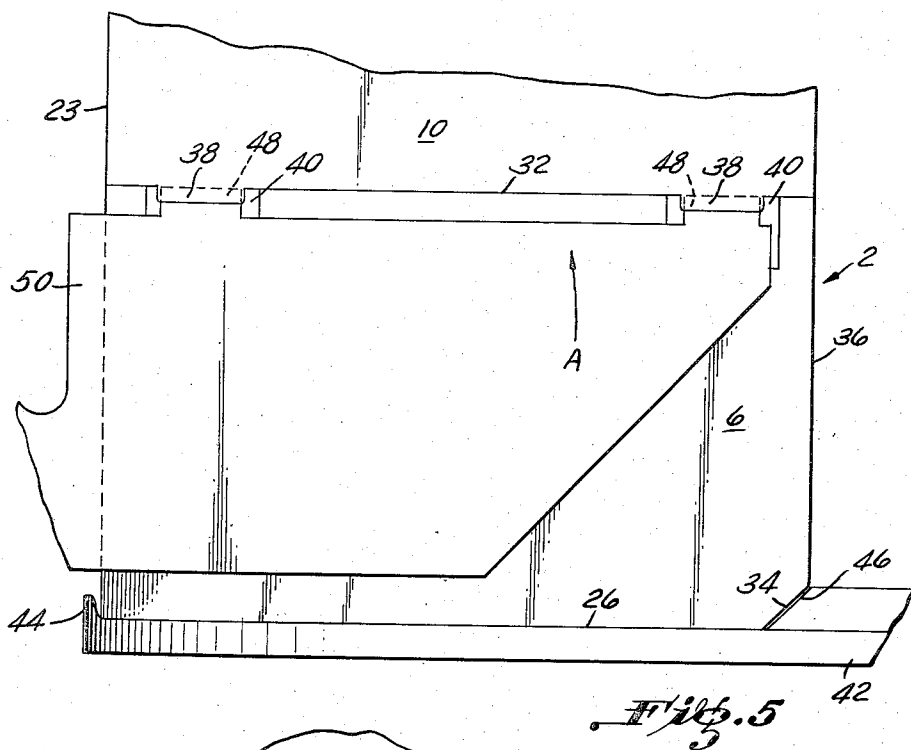
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1

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SELF-ERECTING BOX WITH TABS AND RECESSES FOR ENGAGEMENT BY FEEDING AND ERECT- ING MECHANISM

Frank A. Gastright, Fort Lauderdale, Fla.

Application July 16, 1956, Serial No. 598,095

3 Claims. (Cl. 229—41)

This invention relates to paper boxes with self-locking bottom closure flaps, the boxes being normally stored in collapsed condition in a vending machine magazine, and then automatically erected, filled with a fluent commodity, and dispensed. More particularly, the invention is concerned with structure on the box which requires it to be properly stored in a magazine, and which enables the collapsed blank to be fed and erected.

In order to understand the full significance of the invention, a brief reference is made to the pertinent features of the erecting, filling and dispensing machine in which the box is particularly adapted to be used, and for which a co-pending patent application entitled Popcorn Packaging and Delivering Machine is filed concurrently herewith. In such a machine, a row of the subject boxes are stored in a magazine and urged against a feeder blade which dams up the end of the row. When a collapsed box is to be utilized, the feeder blade sweeps across the row end, wipes off the end box, moves it, while still in flat collapsed condition, to a form. Upon reaching the form, the feeder blade shoves the box so as to press the leading vertical corner fold of the collapsed box into an interior angled corner of the form. The shoving action of the feeder blade is sufficient to partially open the box into the form, and thereafter a pusher takes over and presses the trailing corner fold of the box toward the form so as to complete the opening. Meanwhile, the feeder blade sweeps back across the end of the row of collapsed boxes in the magazine to a position of readiness for wiping off the next succeeding collapsed box from the row end.

The subject invention is concerned with three objectives, the first being to provide a cutout in a portion of the box so that, when collapsed, it can be inserted in a magazine only in one certain position. This expedient assures that when the box magazine is charged with collapsed boxes, the latter will always be arranged for proper handling by the machine even though the charging attendant be unskilled or careless. Conversely, the attendant can't charge the magazine unless the boxes are properly oriented.

The second object of the invention is to provide for a temporary interlock between the collapsed box and a box feeder. To this end, it is intended to provide a collapsible box with short tabs which, when the box is flattened, project beyond a corner fold of the box. When the box is collapsed flat, the tabs project beyond the corner fold, which at that time is as yet not bent, and which then lies intermediate the leading and trailing edges of the collapsed box, so that the tabs overlie parts of an adjacent side wall of the box. The tabs then constitute fingerhold, beneath which flat fingers on a feeder blade can slide when the collapsed box is wiped off the end of its row, thereby also providing projections against which the blade fingers can shove when the collapsed blank is fed to an opening form or abutment. It is intended to provide a further interlock between the feeder blade and collapsed box by providing female

2

indentures, preferably embossed, in and adjacent those portions of the side wall which underlie the tabs. Thus, the feeder blade fingers may more easily slide beneath the tabs, and then the finger ends, which are complementary with the indentures, will lodge in the indentures and be held there by the tabs.

The third objective of the invention is to facilitate the disengagement of the feeder blade fingers from the box, after the feeding and shoving action of the feeder blade has been completed. According to this invention, projecting tabs and underlying indentures are arranged on a collapsible box so that, when the box is fed in flat collapsed condition, the feeder blade, or blade fingers, will be gripped in pockets between the tabs and the adjacent indentured surface. However, as the box opens, the tabs and indentured surfaces swing apart and the pockets open, thereby freeing the feeder blade so that the latter may retract from the open pockets without dragging the box back with it.

These and other objects will be apparent from the following specification and drawings, in which:

Fig. 1 is a plan view of the blank from which the subject box is formed;

Fig. 2 is a front elevation of the box in collapsed condition;

Fig. 3 is an enlarged cross section along the 3—3 of Fig. 2 showing the collapsed box, and further illustrating the starting action of a fingered feeder blade;

Fig. 4 is a plan view of the erected box;

Fig. 5 is a front elevation of the endmost one of a row of collapsed boxes supported in a magazine, and further illustrating the engaging action of the fingers on a feeding blade; and,

Fig. 6 is a diagrammatic cross-section showing the pocket opening action of the box when the latter has been shoved by the feeder blade into a form.

Referring now to the drawings, in which like reference numerals denote similar elements, the box 2, shown collapsed in Fig. 2 and erected in Fig. 4, is formed from a blank 4 shown in Fig. 1. Box 2 has a vertical front and rear wall panels 6 and 8, side wall panels 10 and 12, and a bottom B. A glue flap 14 is contiguous with wall panel 6, and interlocking bottom flaps 16, 18, 20 and 22 are provided. The bottom flaps are bent upwardly along bottom fold line 23, the blank is then bent along corner fold lines 24, 26, 28, 30 and 32, and the glue flap 14 is secured under the region adjacent edge 32 to form a rectangular box. At the bottom, flaps 16 and 18 are creased along fold lines 17 and 19, and flap portions 16a, 18a are secured beneath adjacent flaps 22, 20 respectively. The disclosed arrangement of the bottom flaps is but one of many well known to those skilled in the art, and various others may be used in conjunction with the novel features detailed below, the significant feature of the box being that it collapses flat, as shown in Figs. 2 and 3, and when corners 26 and 30 are moved towards one another, the box sides assume a tubular configuration, and the bottom flaps interlock to hold the assembly thusly erected, as shown in Fig. 4.

The invention is concerned with the features which adapt a box of the described class for handling by automatic feeding and erecting machinery, i. e., the cut out 34, tabs 38, and indentures 40.

The boxes are adapted to be stored in collapsed condition in a magazine, a portion of which is diagrammatically illustrated in Fig. 5, wherein it should be understood that box 2 is the endmost one of a row of collapsed boxes supported on a tray 42 and confined on one side by a lip 44. All the boxes are oriented so that sides 6 and 10 face towards the row end, with tabs 38 pointing downwardly, this orientation, which is necessary

for utilization of tabs 38 and indentures 40, being assured by the provision of the cut-outs 34 which fit against a correspondingly shaped shoulder 46 on tray 42. If attempt were made to insert a stock of the collapsed boxes on tray 42 with any orientation other than that shown in Fig. 5, they could not seat.

Suitable mechanism, not shown, is provided for forcing the stock of collapsed boxes towards the near end of tray 42 so that the endmost one is pressed against a feeder blade 50, which has a portion normally disposed across the end of the collapsed box row somewhat below the position shown in Fig. 5. Feeder blade 50 is supported by a pivot at a point off to the left of Fig. 5, and swings about an arc A in the direction of the curved arrow to an erecting station (Fig. 6) disposed upwardly and to the left of the Fig. 5 structure. In so swinging, feeder blade 50 wipes the endmost collapsed box from the row in the magazine, transports it to the erecting station form 52, lodges the leading corner 30 of the collapsed box in an interior corner 54 of form 52, and gives the box a sufficient further shove into the form so as to partially open it, as shown in Fig. 6. A pusher 56 then moves behind the trailing box corner 26 and pushes that corner towards form 52 until the box is completely erected in the form. As pusher 56 comes into operation blade 50 returns to its dwell position somewhat below that of Fig. 5 until another cycle starts.

As will be apparent from Fig. 3, tabs 38 are substantially coplanar with side wall 10, from which they extend so as to overlie an adjacent part of side wall 6 when the box is collapsed. In the region of tabs 38, side wall 6 is embossed to provide indentures 40. Blade 50 is formed with fingers 48, preferably slightly offset as indicated in Figs. 3 and 6. Thus, when blade 50 moves from its dwell position of Fig. 3 towards tabs 38, indentures 40 make it easier for fingers to slide under the tabs, as shown in Fig. 5. The effect of tabs 38 and indentures 40, when the box is collapsed flat, is to provide pockets P into which feeder blade fingers 48 slide. The engagement of the blade fingers in the pockets beneath tabs 38 is sufficiently tight that the box will not dislodge during the feeding stroke of blade 50, even though the feeder blade swings rapidly in an arc from the point at which it wipes the endmost box from the end of the stack in the magazine to the erecting station.

As will be apparent from Fig. 6, the extension of tabs 38 beyond the line of corner fold 24 results in the provision of pockets which open up when feeder blade 50 shoves leading edge 30 of the theretofore collapsed box against an abutment, i. e., the interior corner 54 of form 52. Thus, fingers 48 are free to disengage from the pockets when the feeder blade reverses its direction of swing to start its return stroke, as indicated by the double-ended arrow of Fig. 6. Thus, there is no tendency of the feeder blade to drag the fed box back on the return stroke of the blade.

The invention is not limited to the precise form and details of the structure illustrated and described, but is intended to cover all substitutions, equivalents and modifications within the scope of the following claims.

I claim:

1. In a collapsible box for use in a machine having erecting means therefor, said box including a tubular body having four enclosing wall panels articulated by four

corner folds and being normally delivered by a feeder blade from a magazine to an erecting station in flattened condition, wherein one opposed pair of corner folds respectively constitute leading and trailing edges of the flattened box with respect to the feeding motion, and the other opposed pair of corner folds are substantially unfolded and lie between adjacent pairs of substantially co-planar wall panels, the improvement which comprises extension means on one of the last-named wall panels along the edge thereof which is connected by one of said unfolded corner folds to an adjacent substantially co-planar panel when the box is collapsed as aforesaid, said extension means extending beyond the last-named corner fold and freely overlapping the next adjacent substantially co-planar panel, said next adjacent panel being indented in the region underlying the extension means whereby to provide a pocket for receiving a feeder blade.

2. In a collapsible box for use in a machine having erecting means therefor, said box including a tubular body having four enclosing wall panels articulated by four corner folds and being normally delivered by a feeder blade from a magazine to an erecting station in flattened condition, wherein one opposed pair of corner folds respectively constitute leading and trailing edges of the flattened box with respect to the feeding motion, and the other opposed pair of corner folds are substantially unfolded and lie between adjacent pairs of substantially co-planar wall panels, the improvement which comprises tabs on one of the last-named wall panels along the edge thereof which is connected by one of said unfolded corner folds to an adjacent substantially co-planar panel when the box is collapsed as aforesaid, said tabs extending beyond the last-named corner fold and freely overlapping the next adjacent substantially co-planar panel, said next adjacent panel having indentures providing depressed surfaces in the region underlying the tabs whereby to provide pockets for receiving a feeder blade.

3. In a collapsible box for use in a machine having erecting means therefor, said box including a tubular body having four enclosing wall panels articulated by four corner folds and being normally delivered by a feeder blade from a magazine to an erecting station in flattened condition, wherein one opposed pair of corner folds respectively constitute leading and trailing edges of the flattened box with respect to the feeding motion, and the other opposed pair of corner folds are substantially unfolded and lie between adjacent pairs of substantially co-planar wall panels, the improvement which comprises extension means on one of the last-named wall panels along the edge thereof which is connected by one of said unfolded corner folds to an adjacent substantially co-planar panel when the box is collapsed as aforesaid, said extension means extending beyond the last-named corner fold and freely overlapping the next adjacent substantially co-planar panel, the extension means being spaced from and out of contact with the overlapped material of said next adjacent panel and providing a pocket for receiving a feeder blade.

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