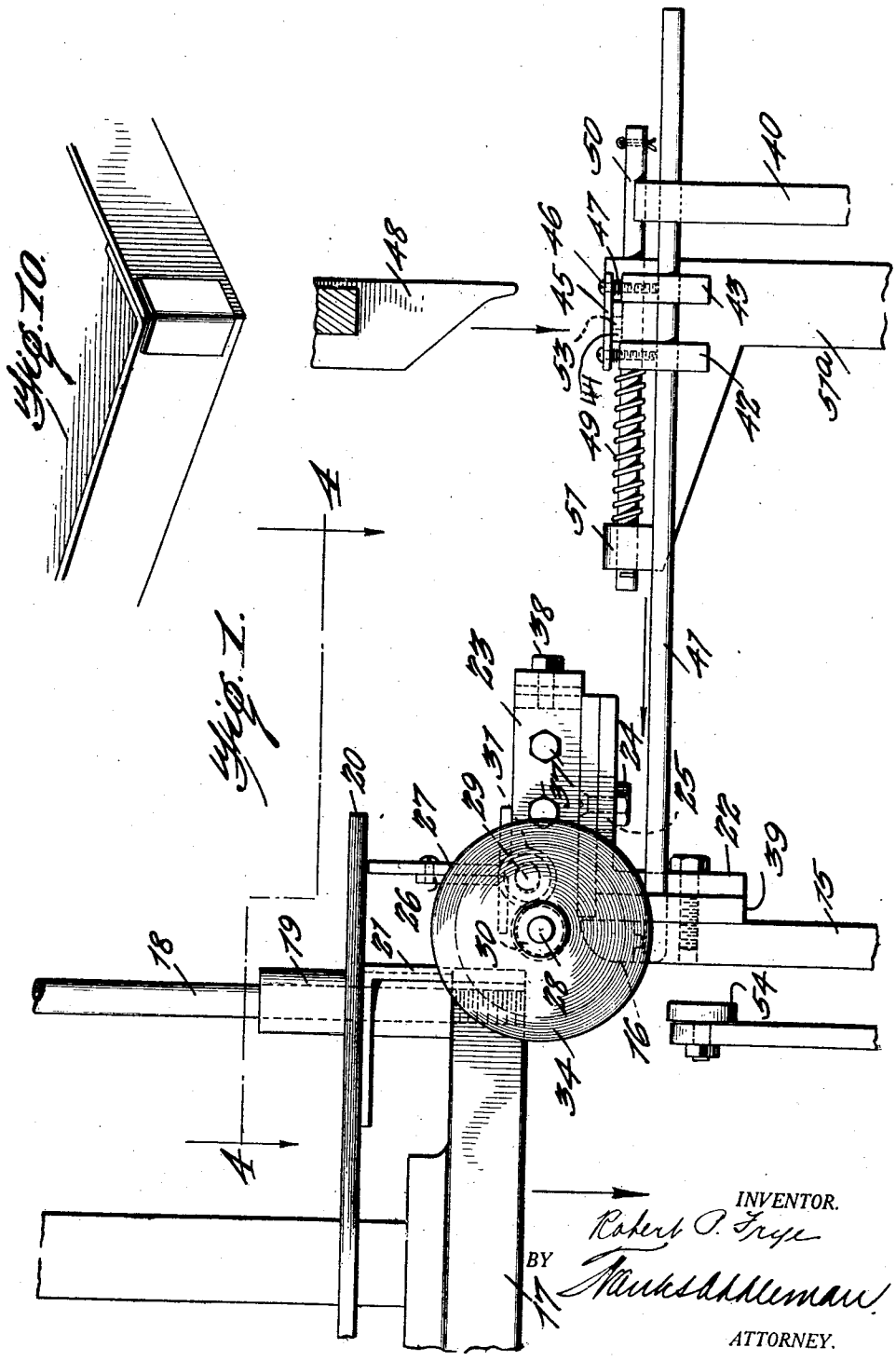
Oct. 29, 1929. R. P. FRYE 1,733,255

PAPER BOX MAKING MACHINE

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PAPER BOX MAKING MACHINE

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Fig. 2.

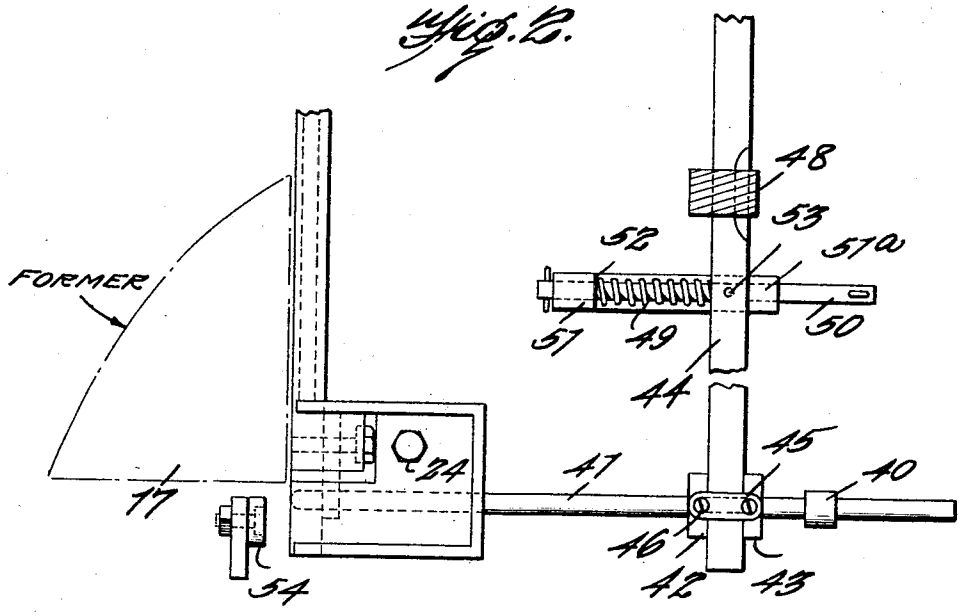
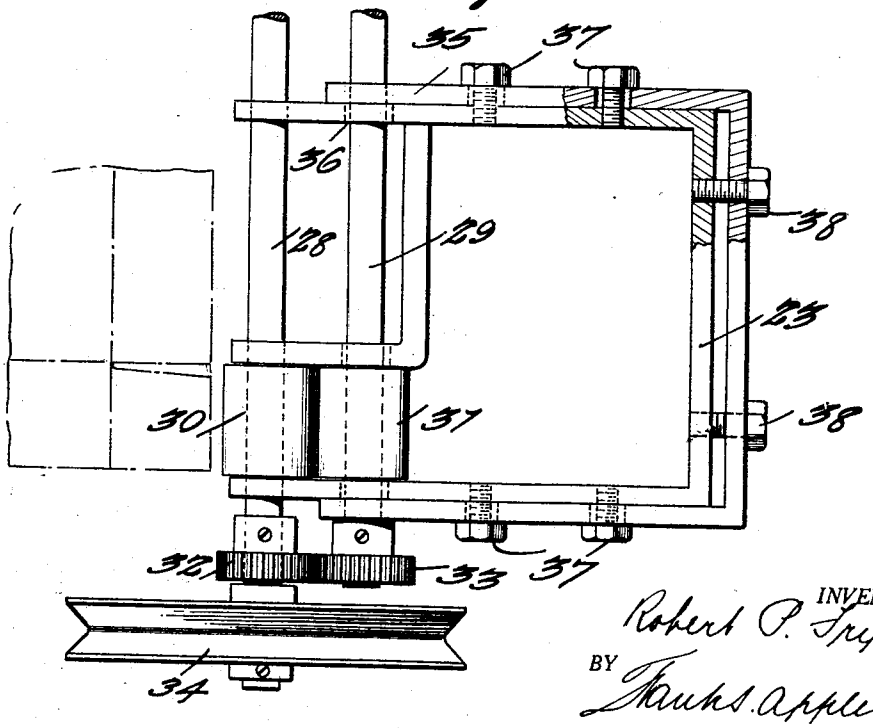


Fig. 3



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PAPER BOX MAKING MACHINE

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Fig. 4.

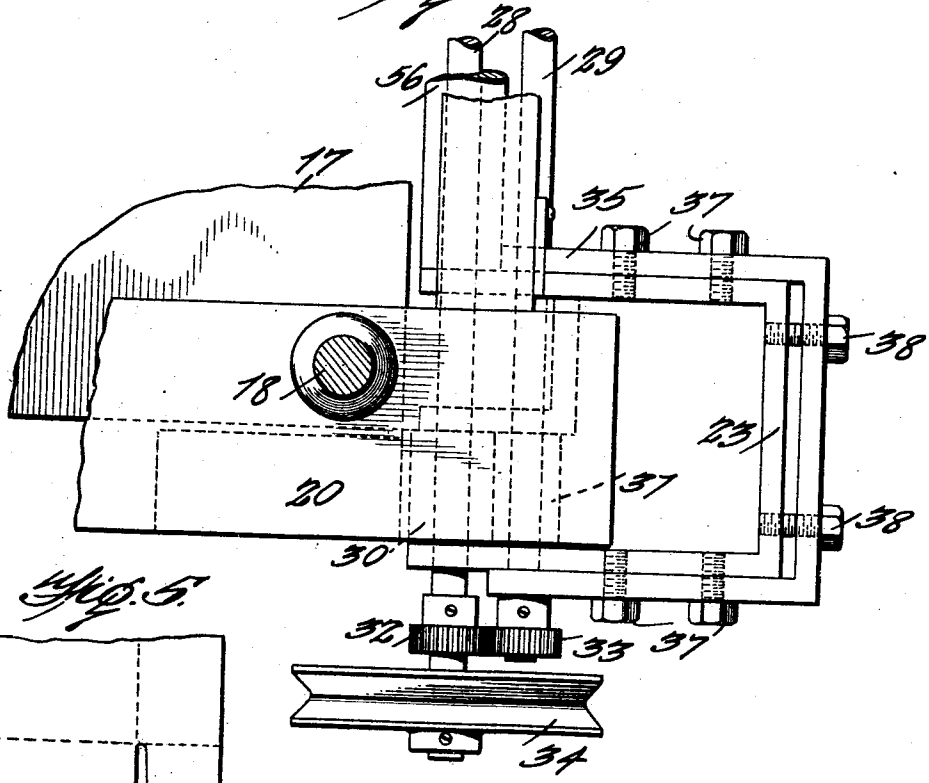


Fig. 5.

Fig. 6.

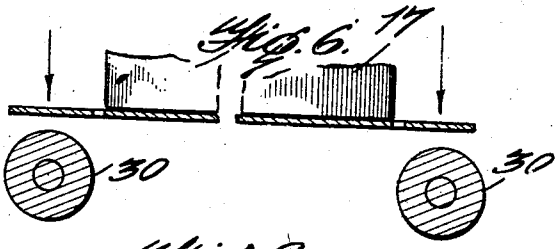


Fig. 7.

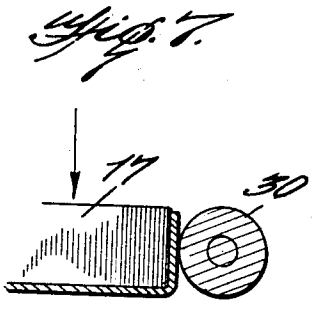


Fig. 8.

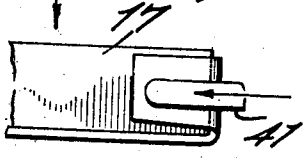
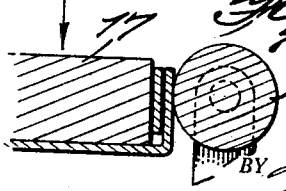


Fig. 9.



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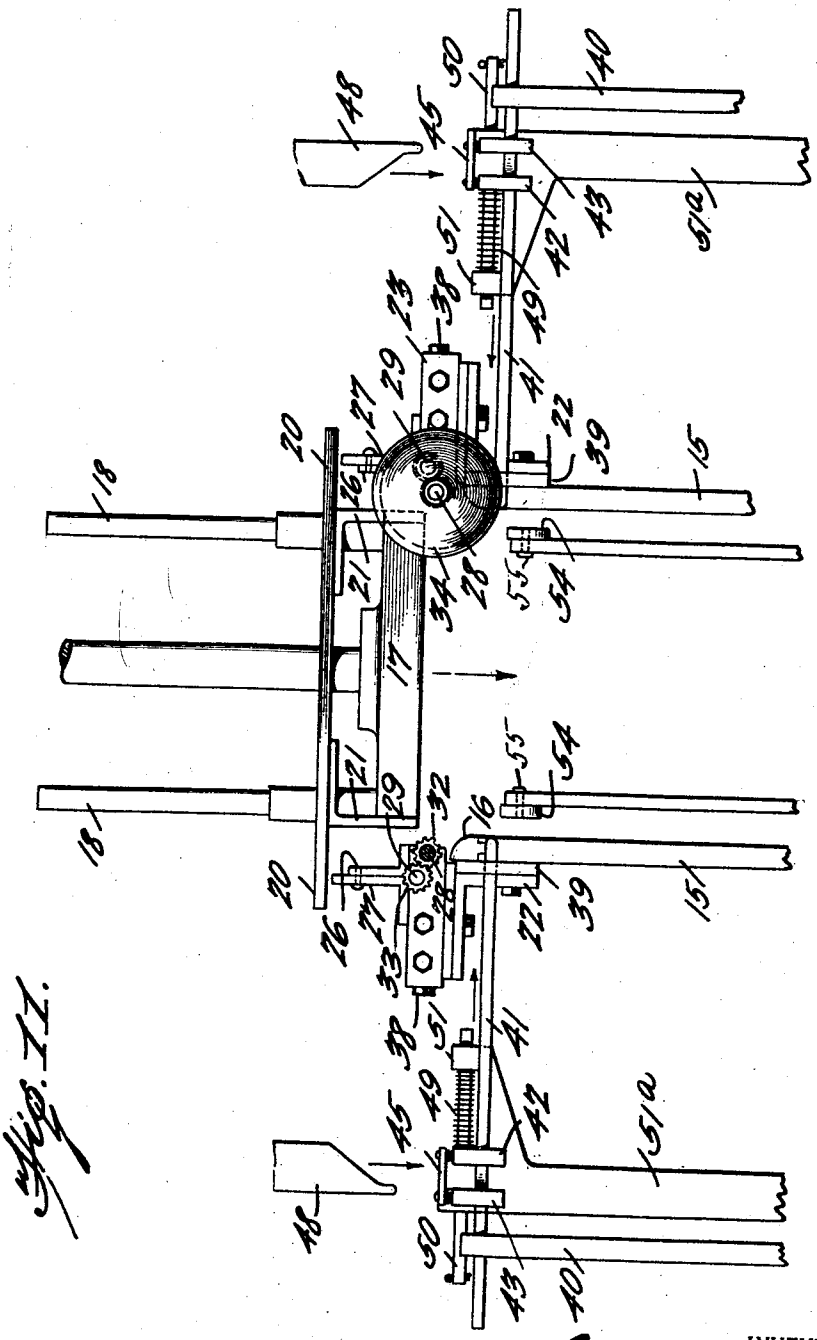


Fig. 11.

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UNITED STATES PATENT OFFICE

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PAPER-BOX-MAKING MACHINE

Application filed April 11, 1927. Serial No. 182,904.

This invention relates to paper box making machines, and has for an object the provision of novel means for producing a box or cover therefor, which product, in the interest of simplicity of description will be hereinafter termed a "box," in which the intersecting sides have tabs adapted to reinforce the corners of the box and be pasted with their outer surfaces against the inner adjacent sides of the box, the same to be preferably associated with the usual mechanism for applying reinforcing strips at the corners of the structures.

The attachment or improvement may be used in association with frames and mechanisms of machines such as disclosed in Patents No. 728,086 of May 12, 1903, and No. 1,383,697 of July 5, 1921. In this improvement, the blank to be shaped by the machine is moved to a location where it will be operated on by mechanism for coating the tabs with adhesive while the said blank is shifted to locate the tabs with relative breakers which will force them to postions at angles to the sides of which they are a part, and into engagement with the adjacent sides of the box to which they are to adhere in the formation of the box.

It is a further object of this invention to provide novel bending mechanism and novel adhesive applying instrumentalities coacting with the other operating parts of the machine wherein by progressive steps the blank having the tabs thereon is bent and the parts thereof are secured to produce a box.

With the foregoing and other objects in view, the invention consists in the details of construction, and in the arrangement and combination of parts to be hereinafter more fully set forth and claimed.

In describing the invention in detail, reference will be had to the accompanying drawings forming part of this application, wherein like characters denote corresponding parts in the several views, and in which—

Figure 1 illustrates a view in elevation of a fragment of a box making machine with a device embodying the invention applied thereto;

Figure 2 illustrates a plan view of the tab breaking instrumentalities, associated with other parts of a box machine;

Figure 3 illustrates a detail view in plan, partly in section of an adhesive applying device;

Figure 4 illustrates a sectional view on the line 4—4 of Fig. 1;

Figure 5 illustrates a plan view of a fragment of a blank;

Figure 6 illustrates an end view of the former with the blank and paste applying rollers in section;

Figure 7 illustrates an end view of the side former with the adhesive applying roller and tab in section;

Figure 8 illustrates an end view illustrating the step of breaking or turning the tab against the end of the form;

Figure 9 illustrates a side sectional view with the end of the blank being folded against the adhesive surface of the tab;

Figure 10 illustrates a perspective view of one corner of the completed article; and Figure 11 illustrates a view in elevation showing the mechanisms on each side of a former with which the mechanism is associated, parts of the device on one side of the former being omitted.

In these drawings, 15 denotes one of the corner posts of a box making machine which may be regarded as of conventional type, and it has thereon a forming rail 16, and it will be understood that these parts of the mechanism are duplicated at the four corners of the box former. 17 denotes a plunger or former and it is operated with respect to the forming rails and the mechanisms to be hereinafter described, and posts such as 18 extend upwardly from the former. Sleeves such as 19 are slidable on the posts 18 and they are associated with and carry a plate 20, and the relation of the plate 20 to the former is determined by the depth of the sleeves or the position which the plate occupies with relation to the sleeves. The plate 20 is also associated with and carries an angle plate 21 on either side and spaced to the width of the form, and the depending

portion of the angle plate extends to the bottom of the former.

Brackets such as 22 are attached to the corner posts 15 and they are intended to support paste boxes such as 23, and the paste boxes are attached to the brackets by fastenings 24 such as bolts or the like, which may slide in enlongated holes 25 in the brackets. Guide rails such as 26 are held in positions above the paste boxes by brackets such as 27, and it is to be understood that the card or blank rests upon the guide rail when it is delivered to the machine.

Each paste box and its mechanism comprises, in the present embodiment of the invention, the box 23 with shafts 28 and 29 extending therethrough. The shaft 28 has stationary bearings and the shaft 29 adjustable bearings, as will presently appear. The shaft 28 carries a roll 30 which applies paste to a tab and the shaft 29 carries a wiping roll 31. The shafts 28 and 29 have pinions 32 and 33 secured to them, respectively, on their ends externally of the paste box, and these pinions are in mesh so that the shafts 28 and 29 will operate in unison. A pulley 34 is secured on the shaft 28 and it may be driven by any suitable source of power that need not, it is thought, be shown for an understanding of the invention by one skilled in the art. It is the purpose of the inventor that the pulley 34 should, in the present showing of the invention, be rotated anticlockwise or in a direction of the downward travel of the tab. A bearing 35 externally of the paste box is supplied for the shaft 29 and the shaft is movable in slots 36 formed in the walls of the paste box to permit the bearing of the said shaft 29 to be adjusted with relation to the shaft 28 in order that the rolls 30 and 31 of the shafts may be adjusted with relation to each other. The bearing 35 is adjusted with relation to the paste box by means of screws 37 at the sides of the box and the screws 38 at the ends of the box. The screws 37 are in the nature of clamp screws and are loosened during the adjustment of the screws 38 for positioning the parts.

The tab breaking or turning mechanism is applied to the frame by means of brackets 39 and 40, a pair of which is associated with each corner post of the machine. Plungers 41 are slidably mounted in the brackets 39 and 40 and it is seen that the bracket 39 is associated with a corner post 15, whereas the bracket 40 is spaced therefrom. Collars 42 and 43 are secured to each plunger, and the said collars are in spaced relation to each other. A cross bar or plate 44 will extend from the collars of one plunger to like collars on another plunger at the opposite corner of the machine. A plate or link 45 connects each of the pair of collars on each plunger, and preferably the plate is mounted on fastenings 46 such as screws, by which the collars are held on the plunger. Springs 47 are interposed between the plate and the collars, and the said springs are relied upon to absorb shock incident to the operation of the plungers through means of the cam 48 which is mounted for reciprocation with the cross head of a box machine such as has been referred to. The plungers are retracted against the action of the cam 48 by a spring 49 on a rod 50 which slides through guides 51 of a bracket 51^a. The spring bears against a shoulder 52 of the guide and against an abutment located in proximity to the fastenings 53, by which the cross bar is connected to the rod 50. Preferably, the parts just described are duplicated on each side of the cam 48 in order that the plungers operated by the cam will act in unison.

The forming posts and standard of a machine of this character are supplied with rollers 54 that are rotatably mounted on shouldered trunnions 55, and these rollers serve as supplying additional pressure at the ends of the former.

A sleeve or length of tubing 56 is applied to the shaft 28 between the paste boxes which will assist in bending the sides of the box as it is drawn from the side rails of the machine by the former.

The functions of the several parts of the machine have been stated in connection with a description of the elements, but it might be further stated that when the card or blank is fed between guide rails 26 to proper location which may be determined by any conventional type of stop that may be mounted on the guard rails, the former of the machine starts downwardly to fold the sides of the box. In passing the roll 30, paste is applied to the outer surface of a tab, which tab is held closely against the roll by means of the depending flange of the angle plate 21. When the lower side of the former reaches the center line of the roll 30, the extension of the plate 20 is arrested by the extension of the bracket 27, the angle plate 21, the plate 20 and the sleeve 19 will remain stationary, whereas the former carrying the posts 18 continues downwardly.

After the card or blank is carried below the forming rails of the machine, the plungers 41 are thrust inwardly by means of the cam 48 and its cross bar, turning the tabs against the end of the former. Immediately after these tabs are turned, the ends of the card or blank are turned upward against the outer pasted surfaces of the tabs by means of the end forming posts and their rollers 54. The subsequent steps of the operation of the machine such as are produced by the staying attachment may remain as in the patented machines mentioned.

I claim:

1. In a paper box making machine, a form-

ing rail, a support for a box blank having a tab above the forming rail, a former for carrying the blank downwardly from the support for coaction with the forming rail, means for applying adhesive to the tab during the travel of the blank, means below the forming rail for bending the tab of that portion of the box shaped by the forming rail and former, and means on a lower plane for pressing the side of a box into contact with the bent tab.

2. In a paper box making machine, a frame having a blank support thereon, said blank having tabs, a forming rail below the said support for bending a portion of the blank to form a side of the box, an adhesive distributor in a plane below the blank support, means for holding the tab of the blank against the adhesive distributor as the former descends, means for bending the tabs thereafter and means for pressing the side of the box at right angles to the ones containing the tabs into engagement with the tabs.

3. In a paper box making machine, a former having guides, sleeves slidable on the guides, an element traveling with the sleeve and projecting beyond the edges of the former, a plate carried with the element having a depending portion extending downwardly at the edge of the former, supports for arresting the member and holding it when the former has descended a predetermined extent, a support for a blank in the path of travel of the former, an adhesive distributor adapted to coact with the surface of the depending portion of the plate for distributing adhesive on a portion of the blank in its descent, a forming rail with which the former coacts to shape a side of the box, a reciprocating element in a plane below the forming rail adapted to engage a tab at the end of a side of the box for bending the said tab against the side of the former, means for imparting motion in one direction to said reciprocating element, means for retracting the said element, and means for pressing the side of the box at an angle to that having the tabs into engagement with the side of the former and the said tab.

4. In a paper box making machine, an adhesive distributor including a receptacle for the adhesive, shafts extending through the receptacle and journaled in operative relation to each other, an adhesive distributing element on one of the shafts, a wiping element on the other shaft coacting with the distributor, a sleeve on the distributor shaft adapted to coact with a former for shaping a blank, and means for operating the distributor shaft.

5. In a paper box making machine, an adhesive distributor including a receptacle for the adhesive, shafts extending through the receptacle and journaled in operative relation to each other, an adhesive distributing element on one of the shafts, a wiping element on the other shaft coacting with the distributor, a sleeve on the distributor shaft adapted to coact with a former for shaping a blank, and means for operating the distributor shaft and the wiping shaft in unison.

6. In a paper box making machine, an adhesive distributor including a receptacle for the adhesive, shafts extending through the receptacle and journaled in operative relation to each other, an adhesive distributing element on one of the shafts, a wiping element on the other shaft coacting with the distributor, a sleeve on the distributor shaft adapted to coact with a former for shaping a blank, and means for mounting the shafts for movement in unison and for adjustment of one relative to the other.

7. In a box making machine, a tab bending instrumentality comprising a plunger mounted for reciprocation on a plane at right angles to a former and operative to bend a tab against the former, means for moving the said plunger inwardly, and means for retracting the said plunger.

8. In a box making machine, a tab bending instrumentality comprising a plunger mounted for reciprocation on a plane at right angles to a former and operative to bend a tab against the former, collars secured in spaced relation to each other on the plunger, elements projecting upwardly from said collars, springs on said elements, a bar secured on said elements and supported by the springs, a vertically movable cam adapted to engage the edge of the bar for forcing the plunger inwardly, and means for retracting the said plunger.

9. In a box making machine, a tab bending instrumentality comprising a plunger mounted for reciprocation on a plane at right angles to a former and operative to bend a tab against the former, collars secured in spaced relation to each other on the plunger, elements projecting upwardly from said collars, springs on said elements, a bar secured on said elements and supported by the springs, a vertically movable cam adapted to engage the edge of the bar for forcing the plunger inwardly, means for retracting said plunger consisting of a rod secured to the bar, a guide for said rod, a spring encircling the bar and having an abutment on a portion on said guide.

10. In a box making machine, a forming rail, a support for a box blank having a tab above the forming rail, a former for carrying the blank downwardly from the support and coacting with the forming rail to shape the box, means for applying adhesive to the tab during the travel of the blank, means for bending the tab after the side is bent, and means for bending the angularly disposed side against the tab.

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