(No Model.) 2 Sheets—Sheet 1.

S. G. DAMREN.

MACHINE FOR MAKING PAPER BOXES.

No. 423,415. Patented Mar. 18, 1890.

Fig. 1.

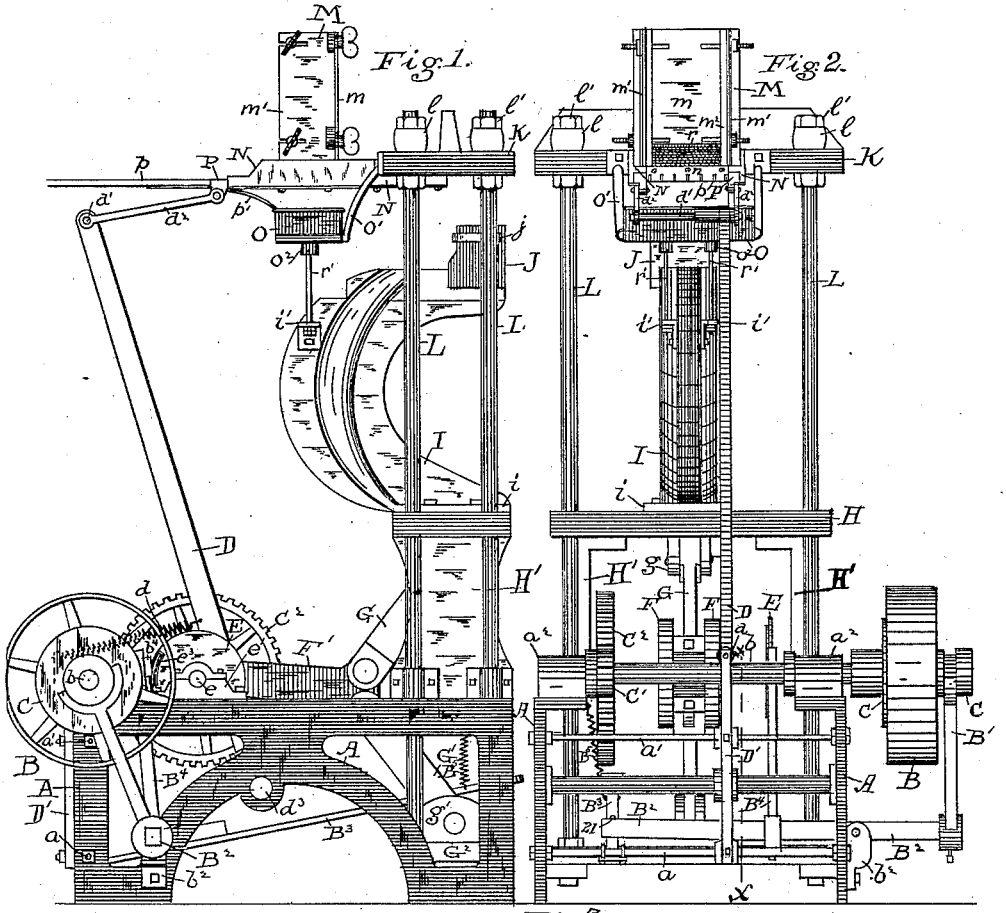


Fig. 2.

Fig. 3.

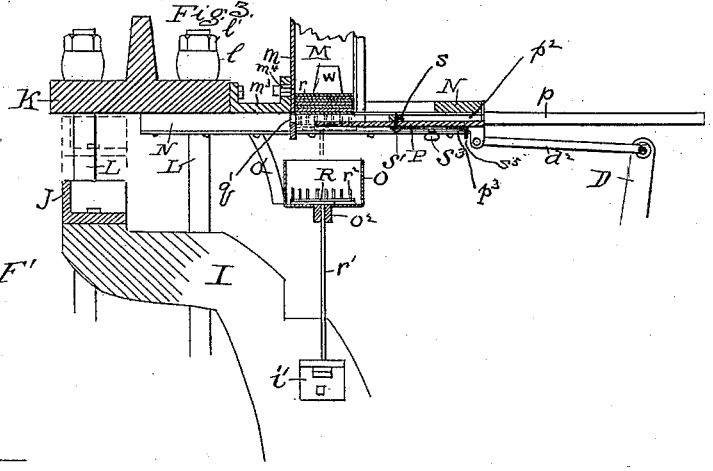
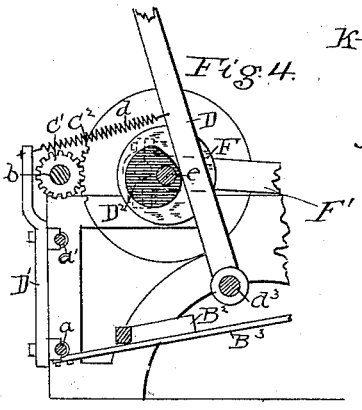


Fig. 4.



Witnesses:
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Jas W Cook

Inventor:
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his atty.

(No Model.) 2 Sheets—Sheet 2.

S. G. DAMREN.

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Fig. 5.

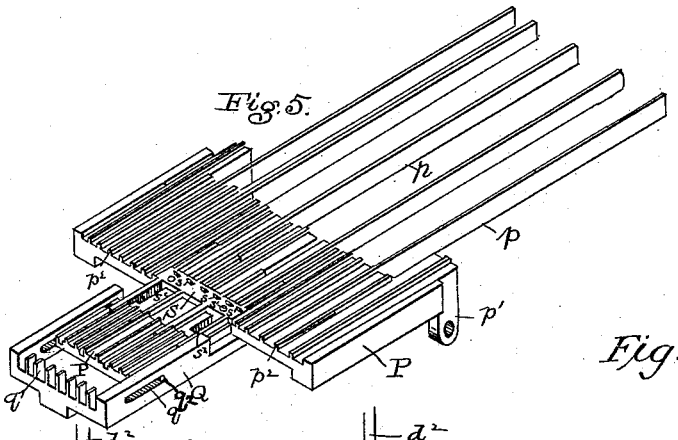


Fig. 6

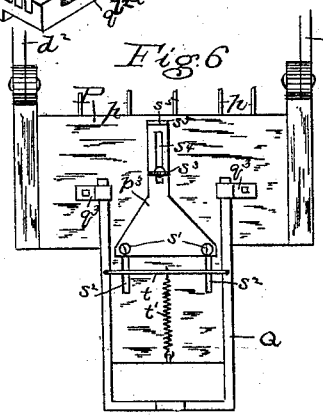


Fig. 9.

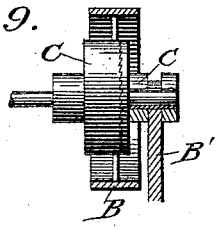


Fig. 7.

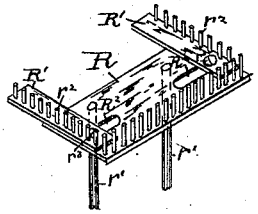
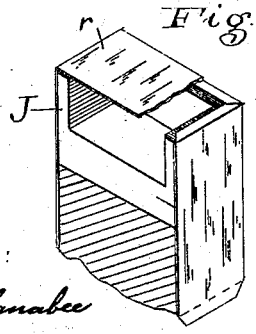


Fig. 8.



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UNITED STATES PATENT OFFICE.

SAMUEL G. DAMREN, OF AUBURN, MAINE.

MACHINE FOR MAKING PAPER BOXES.

SPECIFICATION forming part of Letters Patent No. 423,415, dated March 18, 1890.

Application filed September 21, 1888. Serial No. 286,004. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL G. DAMREN, of Auburn, in the county of Androscoggin and State of Maine, have invented certain new and useful Improvements in Machines for Making Paper Boxes; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to machines for making paper or pasteboard boxes; and it more particularly relates to the operation of securing the two ends to the body of the box, the body having been previously formed by scoring and folding a single sheet of pasteboard, or in any other manner.

The object of my invention is to provide an improved machine for automatically pasting the ends and applying them to the body, which has previously been formed by hand or otherwise.

The principal features of my machine are an open-ended receptacle for containing the box end pieces, a form for containing the box-body having a rearward recess or opening, a slide or carrier having an extensible end reciprocating by the open end of said receptacle and adapted to convey the box end from its receptacle to said form, an anvil-block above said form, cam mechanism for causing said anvil-block and form to press against each other to secure the end to the body, a paste-reservoir, and a row or series of fingers having a reciprocating motion from the paste to the surface of the end piece.

My invention consists in the various combinations of these parts and in certain details of construction, as hereinafter set forth in the claims.

In the accompanying drawings, I illustrate a machine which I have designed to carry out my invention; but I do not wish to confine myself to the exact features here shown, as it is evident that many changes and alterations may be made while still keeping fairly within the spirit of my invention.

In the drawings, Figure 1 is a side elevation. Fig. 2 is a rear elevation. Fig. 3 is a central longitudinal section through the upper part of the machine. Fig. 4 is a section on the line x x of Fig. 2. Fig. 5 is a perspective view of the slide or carrier. Fig. 6 is a plan of the bottom of the same, and Fig. 7 is a perspective view of the paste-applying frame. Fig. 8 is a view of the form, showing a box body and end in place. Fig. 9 shows detail of the clutch which stops and starts the machine.

On a frame-work A, I mount the main shaft b, with bearings a^2, and a main driving-pulley B, having connected with it a friction or other clutch mechanism C of any ordinary construction, indicated but not fully shown in detail. This clutch is operated by means of a forked vertical lever B′, the end of which fits in an annular groove in the clutch C. The lever B′ is secured on the end of a horizontal lever B^2, pivoted to the frame at b^2, its opposite end being secured by means of a loosely-fitting bolt or rivet 21 in turn to the foot-lever B^3, the end of which extends out to the front of the machine and there forms a treadle. Attached to the lever B^2 is an upright arm B^4, having at or near its upper end a flat offset or projection b^4. It will thus be seen that a pressure on the treadle will throw the clutch into gear, and will also move the top of the arm B^4 laterally. A spring B^5 acts to raise the lever B^3, and thus to disengage the clutch C. A pinion C′ is also mounted on the shaft b, and on a second shaft e (here shown as at the same level as the shaft b) is a gear C^2, which engages with the pinion C′. Secured to the shaft e there is also a circular disk E, having in its perimeter an elongated notch or recess e^3, somewhat longer than the length vertically of the projection b^4 on the arm B^4. The disk E is located directly in front of the upper end of the arm B^4 in such a manner that as the arm is moved back and forth by the working of the foot-lever B^3, as before explained, the projection b^4 will pass by its edge and through the notch e^3. There is also located on the shaft e a cam or eccentric D^2, Fig. 4, and a pair of disks F F, between which is pivoted eccentrically the end of the pitman F′. An upright arm or lever D is pivoted at its lower end to the frame of the machine by means of the shaft d^3, to which it is secured. It is drawn backward by means

of a spring d, one end of which is secured to the lever and the other end to the end of an upright D′, which is in turn secured to horizontal rods a and a', which extend across the machine from one side to the other. The lever D rests at all times against the edge of the cam D^2, from which it receives its motion. The pitman F′ is pivoted at its end to two links G and G′, one of which G′ is pivoted to the base G^2 of the machine by means of ears g', while the other G is pivoted by means of ears g to a vertically-movable bed-plate H, angle-irons i, secured thereto, resting when at its lower point on the supports H′.

The links G G′ form a toggle-joint, by which the bed-plate H is raised and lowered with great force. The plate moves up and down on suitable guides (herein shown as rods L) extending from the bottom to the top of the machine. Secured to the upper surface of the plate H is a support I, the upper end of which is formed into a horizontal arm adapted to receive the form J, which is removably secured to it. The body of the support I extends a considerable distance toward the rear of the machine, and to it are secured two upright rods r' r' by means of angle-irons i', which are bolted at each side of the support I.

The top of the form J is made hollow, and is of the exact shape of one end of the box to be made. It has a solid edge or bearing on the two ends and on the front, the rear being open to admit the slide or carrier, as hereinafter shown. Above the support I is the anvil-block K, made fast to the vertical rods L, or otherwise secured solidly in place. Its under surface is flat and true, and is so situated that when the top of the form J reaches its highest point, holding on it the body and end of the box, as in Fig. 8, it will compress the latter against the form. It is evident that since the form and the anvil-block are to be brought together to compress the end in its place this may be effected in a variety of ways. Elastic buffers l are provided on the ends of the rods L, these being held in place by nuts l'. A box or receptacle M is bolted or otherwise secured to the rear side of the anvil-block K. This box is composed of a vertical side piece m and end pieces m', side piece m being secured to end pieces m' in such a manner as to be adjustable to length of the end pieces to be used. The rear side of the receptacle is left open, the end pieces being retained by narrow strips m^2, adjustable for the width of the end pieces r. The end pieces r are represented in position in the receptacle M, and in Fig. 3 a weight W is shown to keep them pressed downward. The bottom of the receptacle is open, so that the end pieces are free to pass down through. Horizontal guides N are secured to the under side of the anvil-block K, and extend backward beyond and at each side of the receptacle M. In these guides runs the slide or carrier P, the upper surface of which is the thickness of one end piece of pasteboard below the lower end of the receptacle. The receptacle M is adjustable vertically by means of the slot m^4, Fig. 3, and is raised and lowered to suit the thickness of the board to be used. The upper face of the slide P is ribbed or corrugated, as shown at p^2, in the direction of its motion to prevent the paste from clogging the slides, as hereinafter shown.

The forward end of the slide is narrower than the body of it, and to this end is secured an extensible frame Q, connected with the slide P by means of pins q^2 and slots q, and forming an extensible end to said frame. A spring t', secured to a cross-piece t on the frame Q and to the slide P, (see Fig. 6,) keeps the frame extended unless it is forcibly retracted. The two rear ends of the frame Q pass through guides q^3. The frame Q has its forward edge grooved in the same manner as the body of the slide by means of ribs q'.

A sliding plate S, provided with a row of short spurs s, occupies a shallow recess in the top of the slide P. The lower ends of the screws s' pass through slots s^2 and are secured to a plate or slide p^3, by which the position of the plate s is fixed. In the slide p^3 there is a longitudinal slot s^4, through which passes a screw s^3, by which the plate is secured to slide P. The plate is further provided with a projecting handle s^5.

A paste-reservoir O is secured beneath the receptacle M by means of hangers O′, bolted to the back end of the anvil-block. The two rods r' r', previously spoken of as being secured to the support I, extend up through the glands O^2 in the bottom of the reservoir O, and to their upper ends a plate or frame R is secured. At each end of the plate R is a cross-piece R′, secured to the plate R by means of screws or bolts r^3, passing through longitudinal slots R^2 in the plate R.

In the edges of the plate R and the cross-pieces R′, the whole structure being hereinafter designated as "the frame R," there are three rows of upright fingers r^2, their upper ends being on a level. These three rows of fingers are adjusted to fit three edges of the end piece, which is vertically above them when it is in position in its receptacle. When the reservoir is filled with paste, these fingers are designed to be submerged when at their lower position.

The operation of my machine is as follows: Assuming the lever D to be in the position shown in Fig. 4—that is, drawn back to its greatest extent—the slide P, which is operated by the lever D, is in position under the receptacle M. The form J is at the same time at its lowest point, and the frame R is submerged in the paste-reservoir. The lower end piece rests on the slide P, and is free from the lower edge of its receptacle. As the shaft b rotates, the cam forces the lever D and the slide P forward. The spurs s strike against the edge of the lower box end and carry it forward. The form J, moving a box-body placed

thereon, as shown in Fig. 8, at the same time rises, and as it nears the anvil-block the frame Q at the end of the slide P enters the opening in its rear side, the extension-frame strikes against the front part of the form, closing back against the end of the slide, and permitting the box end to slide forward to the edge of the form, as in Fig. 8. The form now forces the box end against the anvil-block, and the box end, having had its surface supplied with paste, as hereinafter shown, is stuck firmly to the overlapped ends of the side pieces of the box. During the time this is taking place the frame R is lifted out of the paste in which it has been submerged, and as the slide leaves the under side of the box ends the fingers r^2, having their ends covered with paste, are pressed against the lower box end, covering with paste a narrow strip around the two ends and the forward side of the box end. The box ends are supported during the absence of the slide P by means of the rods or bars p, which form a rearward extension of said slide, and which slide along beneath them. The bars p are so spaced that the fingers r^2 as they ascend pass between them. The reverse movement of the lever D draws back the slide to its first position, and the form and the pasting-frame descend to their respective places. As the slide moves back beneath the box end, which has been pasted, it necessarily draws across a portion of the pasted surface, and the grooves in the upper surface of the slide are designed to present as little surface for the adhesion of the paste as possible.

By the use of the foot-lever B^5, I am enabled to throw the machine into operation, so that it will automatically stop at the end of one complete rotation. As the lever B^3 is depressed, the projection b^4 on the lever B^4 is thrown to the other side of the disk E, the clutch being at the same time put in engagement and the machine started. This lever is held on the other side of the disk until the notch e^3 comes around again, when the projection b^4 passes back, impelled by the spring B^5.

The form J is to be varied in size, according to the size of the box to be made, and in operating the machine I provide a number of sizes, changing them as the work changes.

I claim—

1. In a machine for making paper boxes, the combination of a form for receiving the box-bodies and a reciprocating carrier for conveying the box ends thereto, said form having a rearward recess or opening to admit the end of said carrier, substantially as shown.

2. In a machine for making paper boxes, the combination of an open-ended receptacle for containing the box ends, reciprocating pasting-fingers for applying paste in a series of drops to the surface of said box ends, and a slide or carrier reciprocating by the end of said receptacle for conveying the ends therefrom, the surface of said carrier being provided with longitudinal ribs arranged to pass between said drops of paste, substantially as shown.

3. In a machine for making paper boxes, the combination of a reciprocating carrier for conveying the box ends, having an extensible end, and a form for receiving the box-bodies having a rearward recess or opening to admit the extensible end of said carrier, substantially as shown.

4. In a machine for making paper boxes, the combination of an open-ended receptacle for the box end pieces, a reciprocating slide or carrier for conveying the end pieces from said receptacle, bars or rods forming a rearward extension of said slide or carrier, whereby the end pieces are held in place during the forward motion of said slide or carrier, and vertically-reciprocating pasting-fingers adapted to pass between said rods, substantially as shown.

5. In a machine for making paper boxes, the combination of a receptacle for the box ends, a form for receiving the box-bodies, and a reciprocating carrier for conveying the box ends to said form and provided with an extensible end, substantially as shown.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

SAMUEL G. DAMREN.

Witnesses:
S. W. BATES,
L. LINN SMALL.