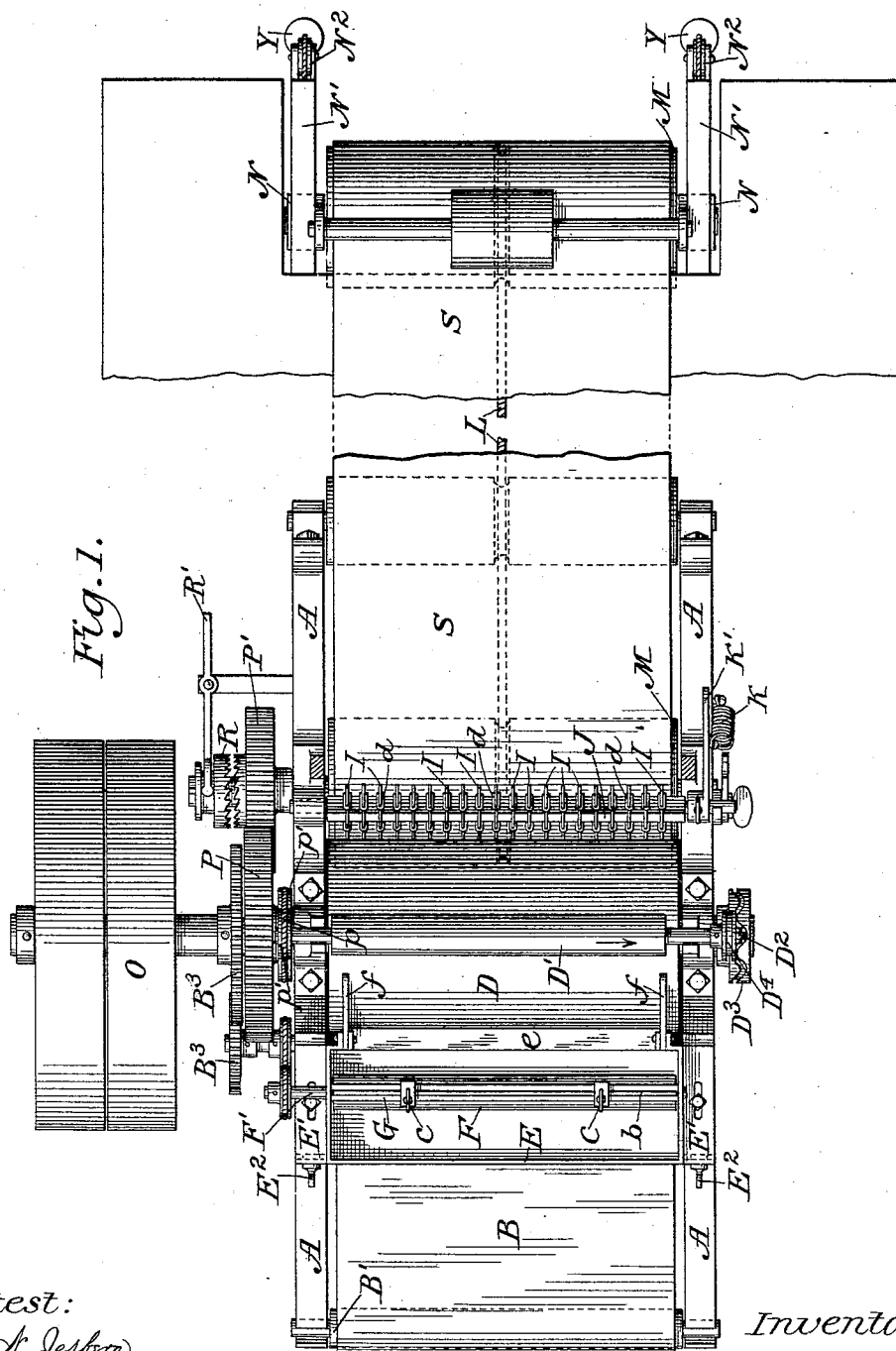


J. M. CAREW
MACHINE FOR APPLYING ADHESIVE MATERIAL TO THE SURFACE
OF PAPER, &c.

No. 475,535.

Patented May 24, 1892.



Attest:
A. N. Jester
C. F. Biddle

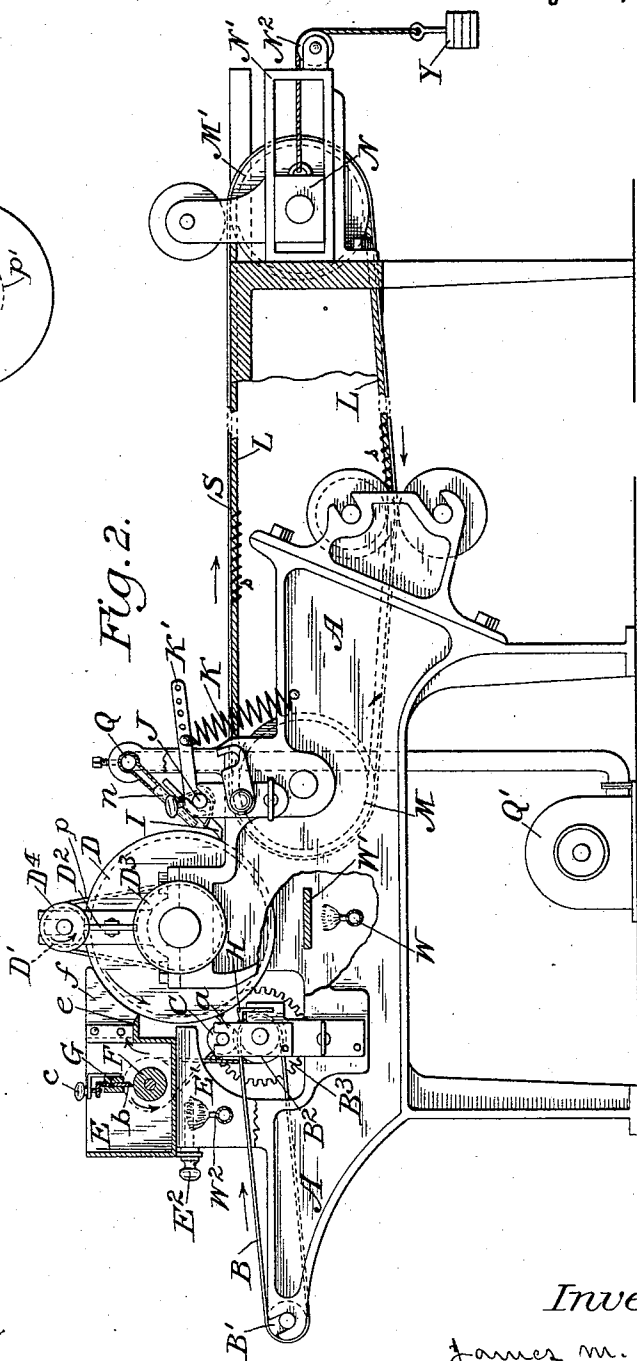
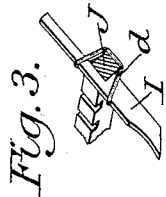
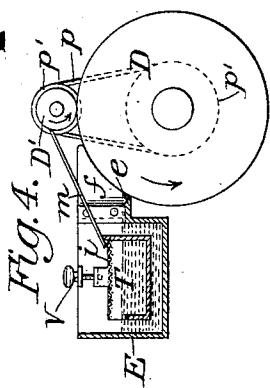
Inventor:
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UNITED STATES PATENT OFFICE.

JAMES M. CAREW, OF NEW YORK, N. Y.

MACHINE FOR APPLYING ADHESIVE MATERIAL TO THE SURFACE OF PAPER, &c.

SPECIFICATION forming part of Letters Patent No. 475,535, dated May 24, 1892.

Application filed April 24, 1891. Serial No. 390,235. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. CAREW, of the city, county, and State of New York, have invented certain new and useful Improvements in Machines for Applying Adhesive Material to the Surface of Paper and other Fabrics; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

My invention relates to machines for coating paper with glue or other adhesive material, and has for its object to simplify the means for feeding the glue to the paper and transferring the gummed sheets from the rolls to the carrier.

It consists in the novel construction, combination, and arrangement of the feeding, transferring, and delivering mechanism, substantially as hereinafter described and claimed, for accomplishing the desired end.

In the accompanying drawings, Figure 1 is a top or plan view of my improved paper-gumming machine. Fig. 2 is a side elevation thereof, partly in section; Fig. 3, a detail in perspective showing manner of securing the stripping-fingers on their supporting-bar, and Fig. 4 a sectional view of a modification in the construction of the paste-receptacle and feeding device.

The operative parts of the machine are supported in the customary manner upon a suitable frame A, and consists mainly, as is usual in machines of this class, of an endless paper-feeding apron B, mounted upon suitable parallel carrying-rollers B' B², a pressure-roller C, journaled immediately over the inner carrying-roller B² in open housings *a* to bear upon the interposed apron and hold the paper down thereon as it passes forward, a large cylindrical drum D, supported in front of the inner roller B² parallel therewith in suitable bearings in the frame-work A of the machine to receive and transfer the adhesive material to the paper fed under it from the apron B, a paste or glue receptacle E, mounted upon adjustable supports, from which the transferring drum D is supplied with the adhesive material, and an endless delivery-apron S, upon which

the gummed paper is deposited in readiness to be taken off by the attendants.

The general construction and arrangement of these several parts is not essentially different from those of machines heretofore constructed.

In my improved machine the paste-receptacle E is mounted loosely upon brackets or a stand E', so as to be free to move to and from the transferring-drum D, and is actuated for adjustment by means of set-screws E² E² at each end. The upper part of the inner face of the receptacle next to the drum is cut away and provided with a horizontally-projecting lip *e*, formed along its upper edge to extend nearly into contact with the periphery of the drum, the closeness of the approach of the lip to the drum or the width of the interval between the two being adjusted and determined by the bodily movement of the receptacle through the operation of the set-screws E² E².

The spaces between the drum and the sides of the receptacle at each end of the lip *e* are closed by strips of leather *ff* or other equivalent elastically-yielding material fitted to form by pressure against the periphery of the drum a sufficiently close joint to prevent the escape of the adhesive material thereat. The lip *e* is so inclined slightly toward the roller as to insure a slow gradual even flow of the material thereon toward the drum.

Within the adjustable receptacle E a roller F is mounted parallel with the axis of the drum D to rotate in close proximity to the bottom of the receptacle and more or less below the lower edge of the discharging-lip *e*. This roller F is fitted upon a shaft F', extending out through one end of the receptacle, and which is geared by a cord or belt to the inner carrying-roller B² of the feed-apron B, so as to be made to revolve in unison with said roller, its upper surface being made to turn from the lip *e*, so that its under surface, submerged more or less in the liquid glue or other adhesive material in the lower part of the receptacle, shall turn toward the lip and operate to raise the liquid in front of it to a height sufficient to cause it to flow over the lip for deposit upon the surface of the drum. A metallic blade *b* is mounted over the roller F in

contact therewith in a guide-bar G, which is supported in the upper part of the receptacle and is made to rest upon the roller to serve as a partition above it and prevent a return flow of the adhesive material back over the roller. This blade or partition-plate *b* is adjusted and secured by means of set-screws *c* c. (See Fig. 2.)

The passage of the paper from the feeding-apron B to the under side of the drum D is facilitated by means of a metallic strip or an angle-iron H, (see Fig. 2,) fitted in front of the inner carrying-roller B² of the apron so that one edge thereof, made thin and sharp, shall project against the apron as it turns downward over the roller and by intervention lift the paper from the apron and guide it forward to the periphery of the drum, while its opposite edge, approaching very closely to the drum, will operate to hold the paper up until it strikes the drum and is engaged by its adhesive coating.

The removal of the paper from the gummed surface of the drum D is effected by means of a series of stripping-fingers I I, fitted tangentially in grooves cut transversely in a bar J, (see Fig. 1,) mounted parallel with the axis of the drum diametrically opposite the lip *e* of the paste-receptacle E, or nearly so, said bar being so journaled at its ends in bearings in the frame of the machine as to admit of oscillation upon its axis. Each stripping-finger I is preferably secured in its seat by an elastic band *d*, looped around the two ends of the finger close to the bar and passed under the side thereof opposite the finger, as shown in the detail, Fig. 3. The lower ends of the stripping-fingers are held lightly in contact with the surface of the drum D by the tension of a spring K upon an arm K', projecting radially from the rock-bar J, the tension of the spring operating to rotate the bar in manner to swing the fingers at an angle against the periphery of the drum, as shown in Fig. 2. By changing the spring from one hole to another of those shown in the arm K' the pressure of all of the fingers can be adjusted at the same time, while the loose connection of each finger to the bar permits the necessary freedom of individual movement. The lower end of each finger is beveled, so as to form an acute angle, constituting a wedge which will enter between the paper and drum and cause the former to peel off from the latter and drop, with its gummed face upward, upon the endless delivery-apron S, whose inner end passes immediately under the stripping-fingers. The removal of the paper from the drum D is furthermore facilitated by means of a blast or jet of air delivered tangentially against the periphery of the drum immediately above the fingers I I from a suitable naggle *n*, extending parallel with the roller from a hollow head Q, which is charged with air from a blower Q'. (See Fig. 2.)

The delivery-apron S is mounted upon a longitudinal cord L, fitting in peripheral

grooves in the carrying-rollers M M', whereby the apron is prevented from slipping laterally upon either roll, but is constantly held in a true even position with reference thereto. The cord is not secured fixedly to the apron, but has freedom of longitudinal movement with respect thereto in order to prevent possibility of wrinkling the apron. To this end these the cord is passed. The bearings of the outer carrying-roller M' of the delivery-apron S are formed in boxes N N, which have free horizontal movement in suitable brackets N' N', and after the apron is adjusted upon its rollers a constant yielding tension is exerted thereon to keep it taut and true by means of weights Y, attached by cords to the boxes N N, said cords being led over guide-rollers N² N² at the outer ends of the brackets, as shown in Fig. 2.

The transferring or gumming drum D may be driven in any suitable manner, and is represented in the drawings as having a band-pulley O on its shaft, (see Fig. 1,) by means of which it is geared to the motor.

The carrying-roller B² for the paper-feeding apron is geared to the shaft of the drum D, so as to revolve constantly in unison therewith, by means of a toothed gear B³ B³, and the carrying-roller M for the delivery-apron is likewise geared to the same shaft by the intervention of a toothed wheel P on the latter meshing with a loose pinion P' on the shaft of the carrying-roller, which admits of being coupled with or uncoupled from the shaft by means of a clutch R of any approved form, actuated by a clutch-lever R', so that the delivery-apron may be at any time disconnected from the driving mechanism and allowed to stand still without reference to the movement of the transferring-drum.

Although a distributing-roller F is preferred as a means for supplying a proper proportion of the adhesive material in the receptacle E to the horizontal distributing-lip *e* on the front edge of the receptacle, other devices may be employed for this purpose, the important features of my improved device being the lip itself, in combination with a receptacle from which it is fed and the revolving drum, to which it delivers the adhesive material.

A longitudinally-reciprocating roller D' is mounted immediately over the drum D to rest upon the periphery of the latter, its reciprocation being produced by means of a vertical lever D², (see Fig. 2,) pivoted centrally between the drum and roller at one end thereof and whose lower end engages a zigzag or undulating groove cut in the periphery of a cam-wheel D³, secured upon the shaft of the drum, and whose upper end engages a peripheral groove in a disk D⁴, fixed upon the end of the roller D'. As the drum revolves, this longitudinally-reciprocating roller, bearing upon its upper surface, smooths the coat-

ing of glue therein, which has become ridged by the action of the fingers I I, and removes the surplus glue remaining upon it. The roller is geared to the drum D by means of a cord *p* and pulleys *p' p'* at one end thereof, as shown in Fig. 1, in manner to cause the roller to revolve in the same direction as the drum, (see the arrows in Fig. 4,) and thereby carry up the excess of glue, which in its action it removes from the drum, and this surplus is then taken off of the roller by the contact therewith of a blade *m*, forming an inclined apron, (see Fig. 4,) by which it is conducted back into the receptacle E.

A modification in the device for feeding the glue or paste to the lip *e* from the receptacle E is illustrated in Fig. 4. In this case an inner box T of smaller dimensions is fitted to play vertically in the receptacle E, said inner box being made with its rear edge lower than its front edge. This inner box T is suspended for vertical adjustment within the receptacle upon set-screws V, and it operates as a plunger to displace the liquid in the receptacle, so that by lowering the box the level of the column of liquid may be raised until it shall overflow upon the lip *e*. Hence by simply lowering the box T by means of the screws V as often as required this level may be maintained as the liquid is used up. The top of the box T may be covered with a screen to receive the glue returned to it from the inclined apron *m*.

A gas-burner or other simple heating device W may be placed under the drum D to prevent solidification of the glue thereon, the heat being distributed to operate uniformly by means of a deflecting-plate W', interposed between the burner and the drum. A similar heating device W is placed under the paste-receptacle E.

In the operation of the machine the paper to be coated with glue or mucilage is laid upon the endless feeding-apron, and it is carried forward by it into contact with the under side of the periphery of the transferring or gumming drum D, which is made to revolve toward said apron. The face of this drum is coated with a thin film of the adhesive material which is supplied thereto automatically by being made to simply flow thereon in an even tenuous sheet from the lip *e* of the paste-receptacle E, this lip *e* being made to extend along the whole length of the roller in very close proximity thereto. The proper supply of the adhesive material to the lip is obtained by means of the roller F within the receptacle, the lower side of whose periphery is made to dip in the material and whose revolution operates by centrifugal force to throw a modicum of the material up upon the feeding-lip, or the lip may be readily supplied by other means, substantially as described. The fresh paper brought into contact with the surface of the drum, coated as described with a thin film of adhesive material, will adhere thereto, and the adherent surface will become

coated with the interposed adhesive substance before reaching the stripping-fingers I I. These stripping-fingers I I, operating as wedges between the sheets of paper and the surface of the drum, will detach the paper from the drum and cause it to drop, with its dry face downward, upon the underlying endless delivery-apron S, which will carry the gummed sheet out within reach of the attendant. The grooves formed in the adhesive coating on the drum by the contact of the stripping-fingers therewith are removed and the surface rendered uniform by the action of the longitudinally-reciprocating roller D' bearing upon the upper surface of the drum, and, as shown in the modification of the apparatus illustrated in Fig. 4, any excess of the adhesive material on the drum may be scraped off by the straight contacting edge of an apron *m*.

I claim as my invention—

1. The combination, with a revolving drum for receiving and transferring a coating of adhesive material to the surface of paper or other fabric, of a receptacle to contain the adhesive material, having a discharging lip or ledge projecting horizontally from the upper edge of one side thereof at a lower level than its remaining sides and into close proximity to the periphery of the drum, means for adjusting the receptacle and its lip with reference to the drum, and means, substantially as described, within the receptacle and below the level of said lip for producing a delivery of the material from within the receptacle outward upon said discharging-lip, substantially in the manner and for the purpose herein set forth.

2. The combination, with the receptacle for adhesive material in a paper-gumming machine, of a lip or ledge projecting outwardly horizontally from the upper edge of one of its walls at a lower level than the remaining top edges thereof, and a roller revolving in the receptacle at a level below said lip parallel therewith, whereby a discharge of the material within the receptacle is produced from said lip, substantially in the manner and for the purpose herein set forth.

3. The combination, with the receptacle for adhesive material in a paper-gumming machine, of a lip or ledge projecting outwardly from the upper edge of one of its walls at a lower level than the remaining top edges thereof, a roller revolving in the receptacle at a level below said lip parallel therewith, and a metallic blade mounted over the roller in contact therewith, whereby a return flow of the adhesive material over the roller as it revolves is prevented and the material is made to rise and overflow the lip, substantially in the manner and for the purpose herein set forth.

4. The combination, with the revolving drum for receiving and transferring a coating of adhesive material, and means for delivering the paper to and against the under side of the drum, of a rocking bar mounted parallel with

the axis of said drum, stripping-fingers loosely secured to said bar to bear with their lower ends against the periphery of the drum, an arm secured to said bar, and a spring adapted to engage the arm at different points to actuate the bar to swing the fingers toward the drum with adjustable pressure, substantially in the manner and for the purpose herein set forth.

5. The combination, in a paper-gumming machine, with its stripping-fingers and a rocking bar supporting the same, having transverse grooves or notches therein to receive the fingers, of the elastic bands looped over the fingers on each side of the bar and carried under it, substantially in the manner and for the purpose herein set forth.

6. The combination, with an endless belt, of a longitudinal series of rings secured to the inner side of said belt, a cord passed loosely through said rings, and carrying-rollers having peripheral grooves adapted to receive said cord and prevent thereby a lateral displacement of the belt in its movement over the rollers, substantially in the manner and for the purpose herein set forth.

7. The combination, with the revolving drum

for receiving and transferring a coating of adhesive material to the surface of paper or other fabric, means for carrying and delivering the paper to and against the drum on one side, and a series of fingers for detaching the paper from the drum on the opposite side, of an air-jet pipe mounted above said fingers to deliver a blast of air against the paper as it leaves the drum, and thereby facilitate its separation and delivery therefrom, substantially in the manner and for the purpose herein set forth.

8. The combination, with a revolving drum in a paper-gumming machine, of a longitudinally-reciprocating gum-smoothing roller revolving in contact therewith, and a blade for scraping the gum from said roller, substantially in the manner and for the purpose herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES M. CAREW.

Witnesses:

A. N. JESBERA,
A. WIDDER.