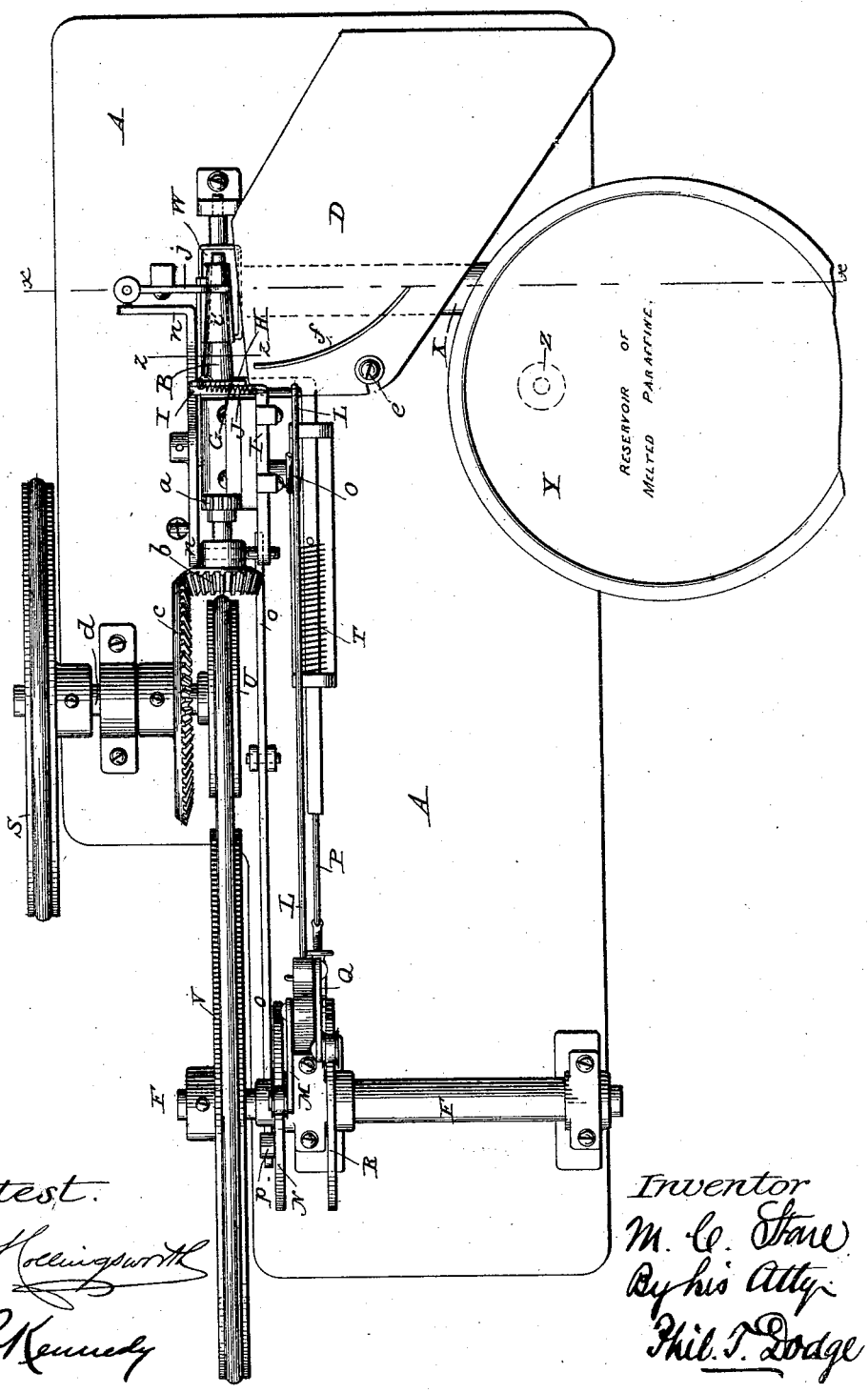
(No Model.) 4 Sheets—Sheet 1.

M. C. STONE.

MACHINE FOR WINDING PAPER TUBES.

No. 454,145. Patented June 16, 1891.

Fig. 1.



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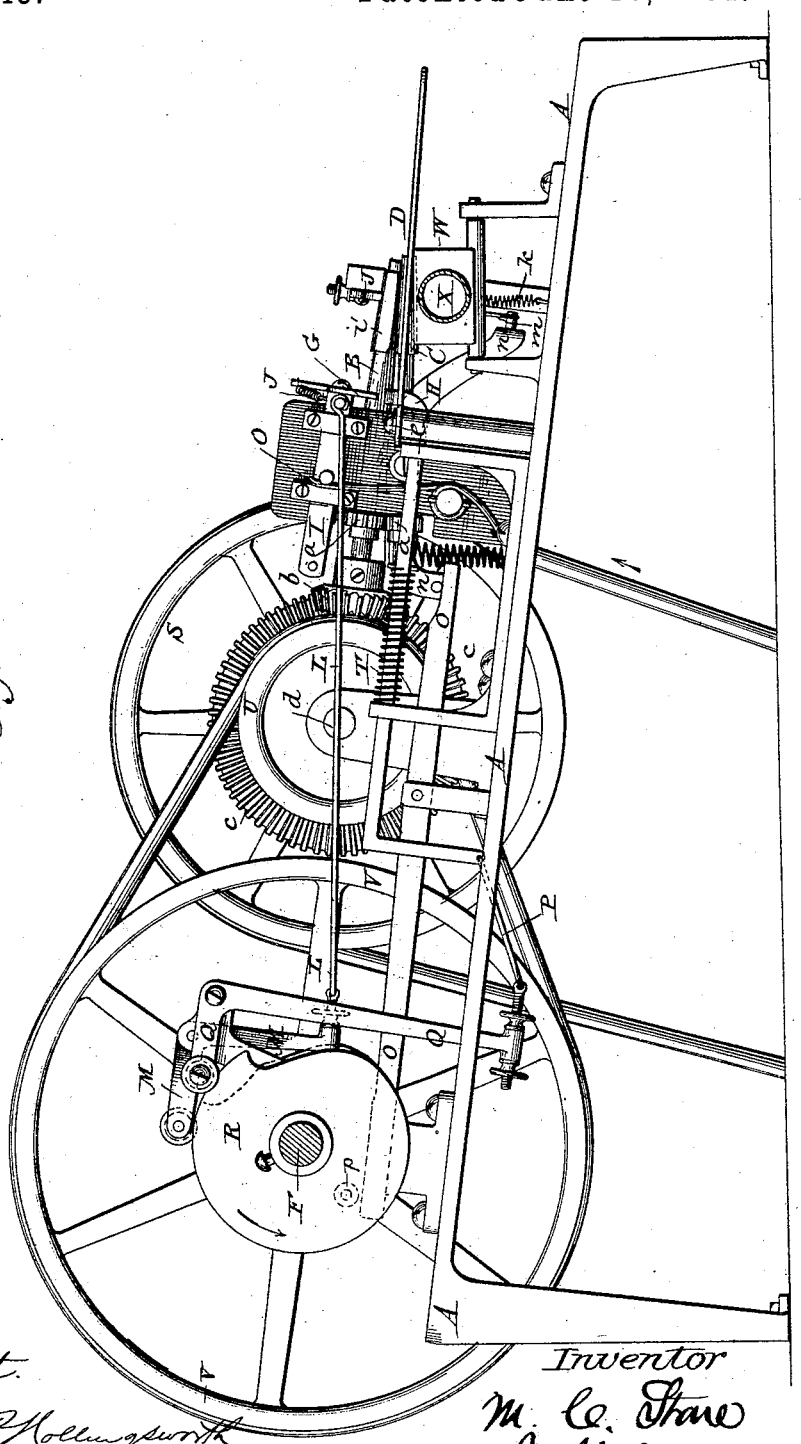

Fig. 2.

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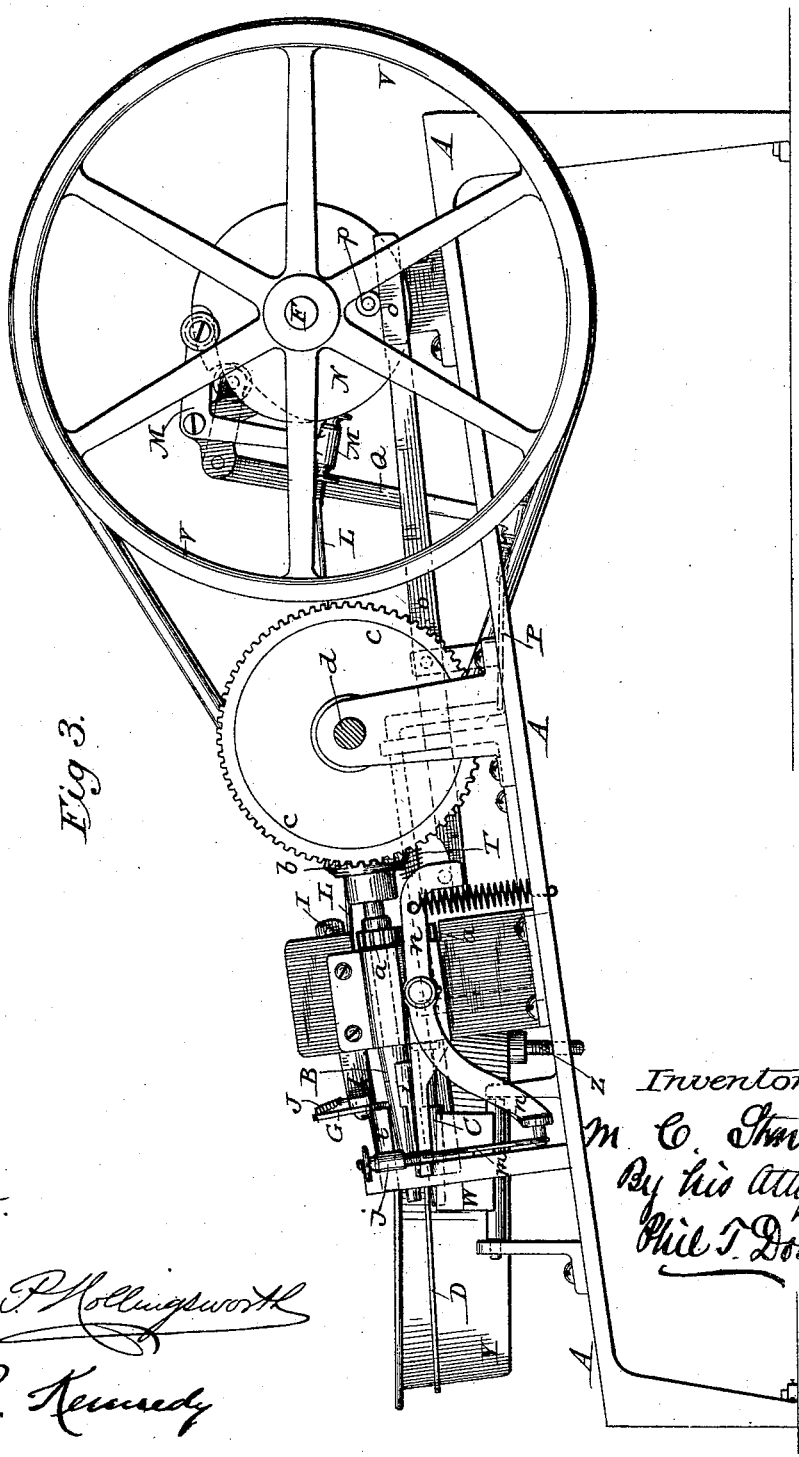

Fig 3.

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(No Model.) 4 Sheets—Sheet 4.

M. C. STONE.

MACHINE FOR WINDING PAPER TUBES.

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Fig. 4.

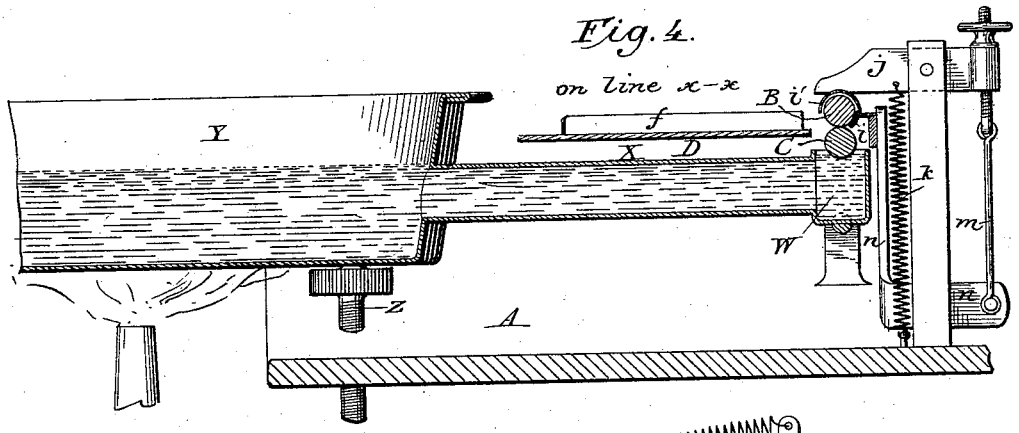


Fig. 5.

on line ε-z

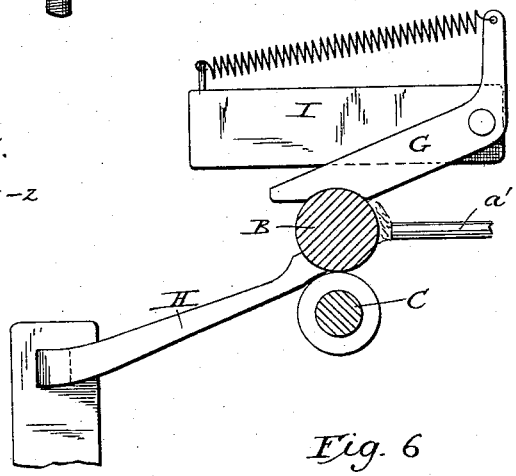
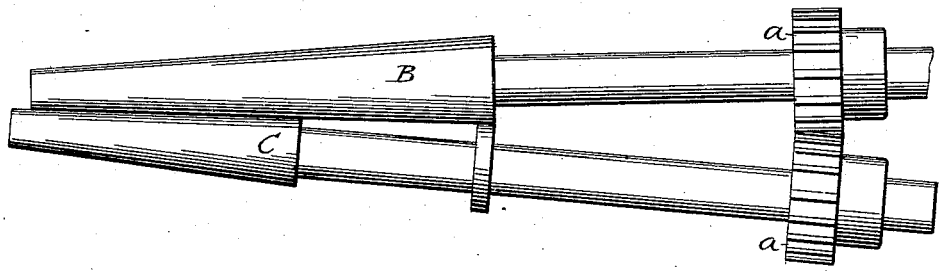


Fig. 6



Attest.

Sidney P. Hollingsworth

W. R. Kennedy

Inventor

M. C. Stone

By his Atty.

Phil. T. Dodge

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

MARVIN C. STONE, OF WASHINGTON, DISTRICT OF COLUMBIA.

MACHINE FOR WINDING PAPER TUBES.

SPECIFICATION forming part of Letters Patent No. 454,145, dated June 16, 1891.

Application filed October 25, 1886. Serial No. 217,153. (No model.)

To all whom it may concern:

Be it known that I, MARVIN C. STONE, of Washington, in the District of Columbia, have invented certain Improvements in Machines for Winding Paper Tubes, of which the following is a specification.

This invention has reference to a machine for winding together articles from paper or equivalent sheet material, being more particularly designed, however, for the formation of cigarette and cigar holders of tubular form, with their ends waxed or otherwise rendered water-proof.

It is the particular aim of the invention to provide a machine by which the blanks may be rapidly wound into form, coated with wax, and discharged, the whole operation, except the feeding of the blanks, being automatic.

The machine is of the same general character as that represented in my application for Letters Patent of the United States filed on the 5th day of August, 1886, No. 210,152, but is modified in various minor details and provided with various additional features not contained in the original machine.

In the accompanying drawings, Figure 1 represents a top plan view of my original machine. Fig. 2 is an elevation of the same viewed from the left. Fig. 3 is an elevation of the same viewed from the right. Fig. 4 is a transverse vertical section on the line *x x*, Fig. 1, showing particularly the waxing device. Fig. 5 is a cross-section on the line *z z*, Fig. 1, showing particularly the strippers by which the finished article is automatically delivered. Fig. 6 is a side elevation showing the form of the spindles and the arrangement of the waxing device thereunder.

Referring to the drawings, A represents a rigid bed-plate arranged, preferably, in an inclined position. In a stationary bearing on this frame I mount the journal of a tapered winding-spindle B, such as shown in Fig. 6, and immediately beneath this spindle I mount a second tapered spindle C, having its journal mounted, as shown in Figs. 3 and 6, on a horizontal pivot, so that it may be thrown downward away from the spindle B, for purposes hereinafter explained. The two spindles have their journals connected by pinions *a*, and may receive motion through a beveled pinion *b* from a gear-wheel *c*, mounted on a horizontal shaft *d* in fixed bearings on the frame, this arrangement serving to drive the two spindles at equal speeds and toward each other. Adjacent to the spindles and on a level with the space between them is mounted a feed-table D, on which the paper blanks are placed, and from which they are fed, one at a time, cornerwise between the winding-spindles. The table is secured by an adjusting-screw *e*, passing through a slot therein, so that the table may be adjusted horizontally as the form of the blanks may demand. On its upper surface the table is provided with a flange *f*, against which the edges of the blanks are pressed and by which they are directed in the proper direction as they enter between the spindles. The flange *f* is curved longitudinally, as shown, so that as the blanks pressed edgewise against it are moved toward the tapered spindle their path or course of movement is changed—that is to say, they are advanced in a curved line as is required in the formation of cigarette-tips and similar conical articles. The upper spindle is nearly encircled, as shown particularly in Fig. 4, by a shield or guide passing downward on the rear side close to the surface of the lower spindle and serving to turn the edge of the advancing blanks upward in order that they may be certain to wind around the upper instead of the lower spindle. This guard is divided, as in my previous machine, longitudinally into two parts separable from each other and from the spindle in order to permit the removal of the finished tube. The lower portion *i* is attached to the bearing of the lower spindle and moves downward therewith. The upper portion *i'* is attached to a lever *j*, pivoted midway of its length and urged downward by a spring *k*, as in Fig. 4. The opposite end of this lever is connected by a link *m* to a second lever *n*, acted upon at its opposite end by a lever *o*, which is in turn pivoted near its middle to the frame and acted upon at its rear end by a crank pin or wrist *p*. This crank-pin is carried by a disk on a shaft F, mounted in bearings on the main frame. The lever *n* is fixed to the pivoted bearing of the lower spindle. When the crank-pin *p* depresses the lever *o* and operates the lever *n*, the latter serves to throw the lower spindle

and the lower section *i* of the guide away from the upper spindle, and also serves, through the connection *m* of lever *j*, to lift the upper section *i* of the guide away from the upper spindle, the result of this action being, as in the previous machine, to uncover and expose the upper spindle, so that the finished article may be stripped endwise therefrom.

For the purpose of discharging the finished article I provide two strippers G and H, which act successively, the first to start the tube forcibly from its place, and the second to expel the loosened tube quickly from the machine. The first stripper consists of an angular finger pivoted near its middle to a supporting-arm I and connected to a spring J, by which its opposite end is caused to bear snugly on top of the upper spindle and to follow down closely on the upper surface of this spindle in the act of removing the tube therefrom. The bar I is arranged to slide in suitable bearings in a direction parallel with the axis of the spindle. It is drawn rearward to maintain the stripper G at the larger end of the spindle and out of the way of the incoming paper by a rod L, connected to an elbow-lever M, which latter is pivoted to the frame and provided at its opposite extremity with a roller bearing on a cam-disk N on the shaft F, before referred to. This disk has its circumference of circular form and concentric to the axis, except at one point, where it is cut inward to release the lever M momentarily. A spring O, fixed to the frame, acts upon the ejector-slide I and tends constantly to urge the same forward, so that when the depression in the disk arrives at the end of the lever N and releases the parts the spring acts to drive the ejector constantly forward. The second ejector H is simply a slide mounted in bearings in the frame, its forward end arranged to slide between the two winding-spindles and its rear end connected by a rod P to an angular lever Q, which is pivoted on the main frame and arranged to be operated by a cam-disk R. A spring T, connected with the ejector I, serves to throw it quickly forward, when its controlling-lever is released by the cam. As before mentioned, the second ejector acts immediately after the first, and advancing beyond the point at which the first stops follows up the blank, insuring its delivery from the spindle. Motion is communicated to the machine by a driving-wheel S, applied to the shaft *d*, from which motion is communicated by a pulley U, fixed thereon through a belt to a pulley V on the shaft F.

For the purpose of automatically treating the blanks with paraffine, wax, or other material previous to their delivery, I arrange the lower spindle directly over a box or receptacle W, which receives the liquid material through a tube X from a melting-pot or reservoir Y, subject to the action of a gas-flame or other appropriate means of heating the same. This reservoir is supported on an adjusting-screw Z, by which its height may be regulated, and thus the level of the fluid in the chamber W controlled, as required.

In order that the wax may be applied to the smaller end only of the tube or smoker, the rear end of the lower spindle C is reduced in diameter, as shown in Fig. 6. This prevents the wax or paraffine from finding its way onto the rear end of the spindle, whence it would pass to the paper.

It will be observed that the reduction in the diameter of spindle C ceases near its rear or larger end; or, in other words, that it is left of full diameter at its rear end beyond the box W, so as to bear against the end of the paper tube and confine the same against the winding-spindle.

I do not claim, broadly, herein a spindle C co-operating with the winding-spindle and the wax-receptacle and mounted to advance alternately to the said winding-spindle and receptacle, the same forming part of my prior application, above referred to. The present invention in this regard is limited to the spindle C in the peculiar form herein shown, its two ends adapted to bear upon the tube on the winding-spindle and one end reduced to prevent the transfer of the wax or other material thereby, combined with the winding-spindle and reservoir.

When necessary, in order to prevent the chilling of the wax by contact with the spindles, I provide a special flame, as shown at *a'*, to heat the parts adjacent to the spindles; or a rigid arm may be extended from the frame which supports the spindles to the flame which melts the wax, transmission of heat through this arm serving to keep the frame and spindles at a sufficiently high temperature to prevent the wax from chilling.

While I have represented a machine particularly adapted for the formation of tapered smokers or mouth-pieces, it is to be understood that spindles of any suitable length and of any suitable form may be used in order to adapt the machine for the formation of other tubular articles from paper.

In using the machine as represented in the drawings, the blanks are pasted at one edge previous to their passage between the rolls; but it is to be understood that, although I lay no claim thereto in the present application, I may use automatic devices for pasting the blanks and feeding them into the machine represented herein.

Having thus described my invention, what I claim is—

1. In a machine for winding tubular paper articles, the winding-spindle, in combination with two strippers or ejectors acting successively.

2. In combination with the winding-spindle, the stripper G, arranged to traverse its rear end, and a second stripper arranged to advance beyond the stripper G.

3. In combination with the winding-spindle, the two strippers, springs urging said strippers forward, and two retracting-cams connected by levers and suitable intermediate devices with the respective strippers.

4. In combination with the winding-spindle B and a sliding bar I, the stripper G, movably attached to said bar, and a spring acting to hold the stripper in contact with the surface of the spindle.

5. In combination with the spindles B and C, the reservoir beneath the latter, and the melting-pot connected with the reservoir, substantially as described.

6. In combination with the waxing-spindle C, the reservoir thereunder, the melting-pot connected with the reservoir, and means, substantially as described, for adjusting the melting-pot vertically.

7. A tapered winding-spindle, in combination with a feed-table provided with a ledge or flange *f*, curved, substantially as described, to direct the blanks at a changing angle to the spindle.

8. In combination with the tapered winding-spindle, the horizontally-adjustable feed-table D, provided with a curved guard or flange *f*.

9. In a machine for forming and coating paper tubes, the combination of the rotary winding-spindle, the reservoir W for the coating material, and the intermediate movable spindle C, having the reduced portion extended from a point near the middle nearly to the rear end, but terminating short of said end, whereby it is adapted to apply the coating material to one end of the paper tube and to apply pressure to both ends of the same.

In testimony whereof I hereunto set my hand this 20th day of October, 1886, in the presence of two attesting witnesses.

MARVIN C. STONE.

Witnesses:
W. R. KENNEDY,
ANDREW PARKER.