

M. F. WILSON.  
Machine for Making and Cutting Paper-Tubes.

No. 217,035.

Patented July 1, 1879.

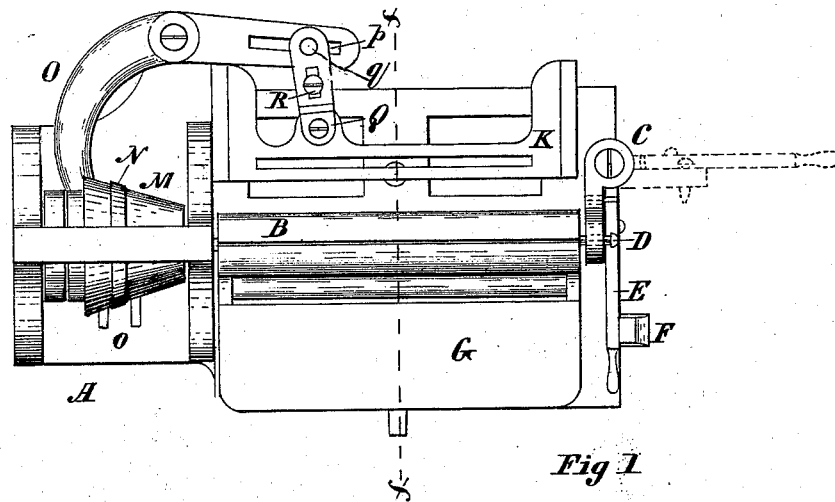


Fig 1

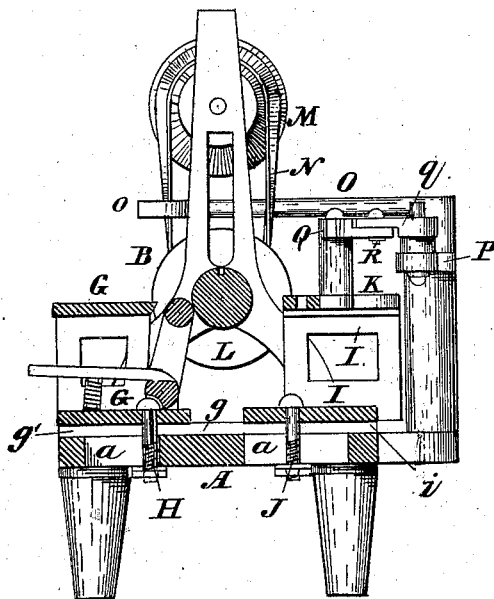


Fig 2

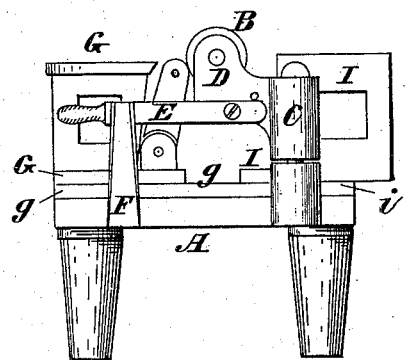


Fig 3

Witnesses

W. C. Corlies  
Jno. C. MacGregor

Inventor

Merrick F. Wilson

By Coburn & Shachin  
Attorneys

# UNITED STATES PATENT OFFICE.

MERRICK F. WILSON, OF CHICAGO, ASSIGNOR TO CHARLES R. STEELE AND V. CLARENCE PRICE, OF WAUKEGAN, ILLINOIS, ONE-FOURTH TO EACH.

## IMPROVEMENT IN MACHINES FOR MAKING AND CUTTING PAPER TUBES.

Specification forming part of Letters Patent No. **217,035**, dated July 1, 1879; application filed April 18, 1879.

*To all whom it may concern:*

Be it known that I, MERRICK F. WILSON, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Forming and Cutting Paper Tubes, which are fully described in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a plan view of a machine embodying my improvements; Fig. 2, a transverse section of the same, taken on the line X X, Fig. 1; and Fig. 3, an end elevation thereof.

My improvement relates to machines for forming paper tubes or mandrels, and then cutting them transversely, being especially adapted to the preparation of short paper cylinders for paper boxes.

The invention consists in a device for changing the speed of the mandrel connected to the sliding frame which bears the cutters, whereby when the latter are moved forward against the tube the revolution of the mandrel is increased.

It also consists in a swinging or removable center bearing for the outer end of the mandrel, whereby the mandrel is supported at both ends, but at the same time the sections of the tube can be removed therefrom after cutting.

It also consists in two separate adjustable frames mounted on the main frame, on opposite sides of the mandrel, and secured thereto by single slots and bolts.

It also consists in special combinations of devices, all of which will be hereinafter more fully described, and pointed out distinctly in the claims.

In the drawings, A represents the main supporting-frame of the machine; and B the mandrel, which is of ordinary construction, and is mounted at its inner end in the usual way. In machines of this kind this mandrel has heretofore been supported at its inner end alone, and there has consequently been an unsteadiness and unevenness in its revolution, which made it more or less difficult to construct perfect cylinders. I provide a center bearing for the outer end as well as the inner, thereby giving steadiness to the motion of the mandrel. This I obtain by means of a swinging frame

or arm, C, which is pivoted to the main frame at one side of the outer end of the mandrel. In the outer end of this piece is secured in any suitable manner a center-pin, D, so arranged that when the piece is swung up against the end of the mandrel it will be directly in line with the bearing at the other end of the mandrel. The outer end of this mandrel is, of course, provided with a suitable bearing for the pin, so that it will be held in position and revolve thereon. The swinging arm is also provided with a hand-lever, E, pivoted thereto so as to vibrate vertically, and an upright stop-post, F, is attached to the main frame opposite to the pivot of the piece C. When the center-pin is swung up against the end of the mandrel the lever E is thrown down and passes behind this post, as shown in Fig. 3 of the drawings, and by this means the pin is held firmly to the mandrel as long as required.

The devices and means for rolling the paper upon the mandrel to form the tube are such as are in ordinary use, and require no description.

The frames on opposite sides of the mandrel, however, are constructed and secured to the main frame in a somewhat novel manner. The table-frame G is an independent frame, and arranged to be moved back and forth thereon to and from the mandrel. It is supported on suitable ways to permit this movement, and is secured to the main frame by a single bolt, H, which passes down through a single slot, *a*, in the bed of the main frame, being secured by a nut on this lower end. The slot and bolt are arranged about midway of the length of the table-frame G, and it is evident that the adjustment of this table may be made with great ease by simply loosening a single bolt. The end ways *g*, on which the ends of the frame move back and forth, support the bottom of the frame a little above the bed of the main frame, and just inside of them are guides *g'*, attached to the table-frame, by which device the movement of the frame is always guided in right lines.

On the opposite side of the mandrel is a somewhat similar frame, I, which is secured to the bed of the main frame by a single bolt, J, and passing through a similar slot, *a*, in

the bed-plate. The end ways *i* and the guides *i'* are also arranged in the same way as described above. On this frame is mounted the horizontal sliding frame K, which carries the cutters for dividing the tube transversely when formed on the mandrel.

This device may be of any ordinary construction and will be readily understood without description.

Now, while the paper is being wound upon the mandrel the movement should be somewhat slower and steadier than when the cutting is done, for the more quickly the latter operation can be performed the cleaner will be the cut, and at the same time there will be a saving of time. I have therefore devised means for increasing the speed of the mandrel at the moment the cutting is performed.

On the driving end of the mandrel a conical pulley, L, is mounted on the shaft of the mandrel, and above it is arranged a similar pulley, M, which is fastened to the driving-pulley. A band, N, passes from one of these conical pulleys to the other.

A shifting-lever, O, is pivoted to a suitable support on the main frame at the inner end of the cutting-table, being provided with a fork, *o*, at its outer end, which embraces the pulley-band, so as to shift it back and forth on the pulleys in a way well known.

An arm, P, is secured to the lever O, and mounted on the pivot of the latter. This arm extends back of and over the cutter-frame, and is provided with a slot, *p*, in its outer end.

A link, Q, is pivoted at one end to a post on the cutter-frame, and at the other end to a pivot-pin, *q*, which is secured in the slot of the lever-arm P, so as to be adjusted back and forth therein.

The link may also be made in two sections, fastened together by a bolt, R, passing through slots in one or more of the sections, so that the length of the link may be adjusted as occasion may require. These parts are all constructed and arranged so that when the cutter-frame is moved up toward the mandrel in the usual way the band on the conical pulleys will be shifted toward the large end of the upper one and the small end of the lower one, thereby increasing the speed of the mandrel, and vice versa, and thus the revolution of the paper tube is increased by automatic means just at the time of the cutting.

The tube having been formed on the man-

drel and divided by cutters in the usual way, the lever on the swinging piece C is raised, and the piece swung outward, as shown in Fig. 1 of the drawings, when it is evident that there is no obstacle to the removal of the tube-sections by slipping them from the outer end of the mandrel as usual.

The provisions for the several adjustments of different devices in the machine, as described above, adapts the machine to the formation of tubes of different sizes.

Some parts of mechanism herein shown and described may be changed somewhat in construction, and I do not limit myself to the precise devices herein described for moving the bearing at the outer end of the mandrel, or for changing the speed of the mandrel. The latter can evidently be performed by suitable change speed-gearing, as well as with the pulleys mentioned, and some other devices may be used to effect the change either with pulleys or gearing.

Now, then, having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The mandrel B, provided with a center socket-bearing at its outer end, in combination with the pivoted swinging support C and the center-pin D, mounted on the support, substantially as and for the purpose set forth.

2. The mandrel B, in combination with the swinging support C, center-pin D, lever E, and stop F, substantially as described.

3. In a machine for forming and cutting paper tubes, the sliding cutter-frame K, in combination with changeable speed devices for driving the mandrel and mechanism for connecting the speed-changing devices with the cutter-frame, whereby the speed at which the mandrel is driven is controlled by the attendant by simply moving the said cutter-frame, and the mandrel is driven temporarily more rapidly at the time of cutting, substantially as described.

4. Mandrel B, in combination with the conical pulleys L and M, band N, sliding cutter-frame K, and shifting-lever O P, connected to the cutter-frame by a pivot-link, substantially as and for the purpose set forth.

MERRICK F. WILSON.

Witnesses:

L. A. BUNTING,  
JNO. C. MACGREGOR.