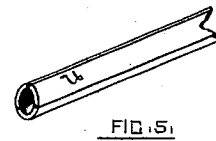
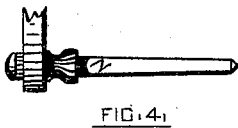
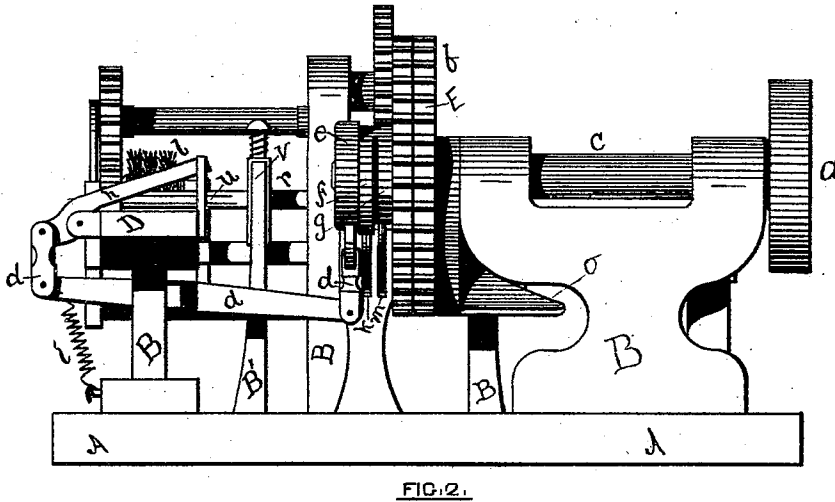
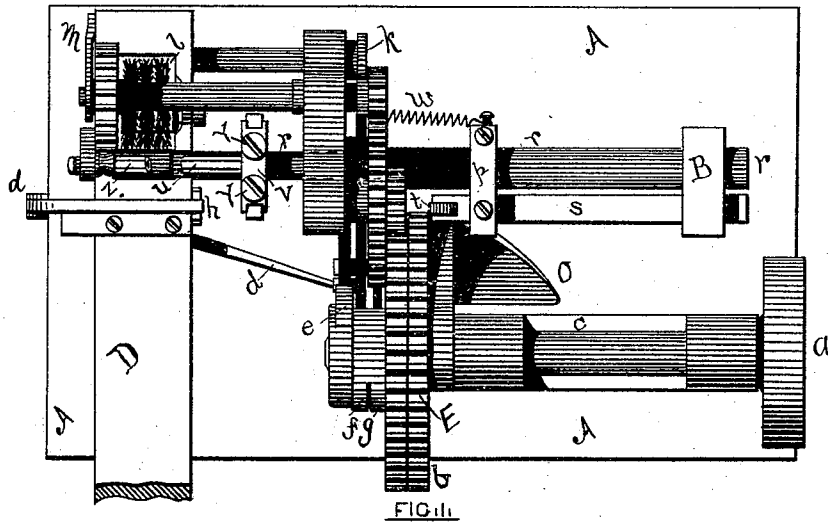


W. M. MARCHANT.
PAPER COP-TUBE MACHINE.

No. 174,831.

Patented March 14, 1876.

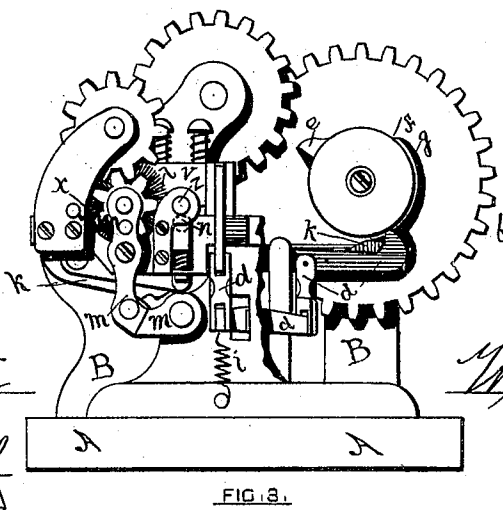


WITNESSES,

George H. Smith
Thos. P. Barusfield

INVENTOR,

W. M. Marchant



UNITED STATES PATENT OFFICE

WILLIAM M. MARCHANT, OF PAWTUCKET, RHODE ISLAND.

IMPROVEMENT IN PAPER COP-TUBE MACHINES.

Specification forming part of Letters Patent No. **174,831**, dated March 14, 1876; application filed July 26, 1875.

To all whom it may concern:

Be it known that I, WILLIAM M. MARCHANT, of Pawtucket, in the county of Providence and State of Rhode Island, have invented certain Improvements in Machines for Making Paper Cop-Tubes, of which the following is a specification:

My said invention consists of improved devices for more rapidly and perfectly forming the tube and delivering it from the machine when completed.

The accompanying drawing is hereby made a part of this specification, similar letters of reference indicating corresponding parts.

Figure 1 is a top view of the machine. Fig. 2 is a front elevation thereof. Fig. 3 is an end view, showing the operating parts which form the tube. Fig. 4 is a detached view of the tapering spindle on which rests the improved core, of which Fig. 5 is a detached view, and on which core the tube is formed, as hereinafter described.

a is the driving-pulley, connecting with the double intermittent gear *b* by means of the shaft *c*, which shaft extends beyond said intermittent gear and carries the cams *e f g*. The cam *e* operates the levers *d d* and knife or shears *h*, the spring *i* promptly raising said knife after it has severed the inwardly-moving paper, as hereinafter described. The cam *f* operates the levers *k k*, which depress the calendering-roll *n*, as and for the purposes hereinafter stated. In like manner the cam *g* operates the levers *m m* and spring *x*, by which the circular brush *l* is adjusted to the forming-tube, as hereinafter set forth. Attached to the intermittent gear *b* is a cam, *o*, which, in the revolution of said gear, operates the sliding carriage, composed of the parts *p r s*. The forward end of the part *s* is provided with the pulley *t*, as seen in Fig. 1, and this forms a bearing against which the cam *o* impinges to produce the outward motion incident to said sliding carriage in the operation of the device. When said carriage has completed its outward movement, as hereinafter described, the spring *W* causes said carriage quickly to return to its former position. Attached to the forward end of the part *r* of said carriage is the cylindrical core *u*, which passes through and has a bearing in the upright *B'*, passes under the clamp

V, and fits onto the tapering spindle *Z*. *A A* show the base, and *B B* the uprights, which support the operating parts. On the shelf *D* are to be placed the gum-box, the distributing-rolls, and the gearing which operates them, substantially as described in Patent No. 157,953, issued to John F. Wilkinson, December 22, 1874, and subsequently assigned to me. This part of the device is operated from the part *E* of the double intermittent gear *b* by connecting mechanism similar to that described in the patent above mentioned.

The operation of said machine is substantially as follows: The roll of paper from which the tubes are to be made is to be conveniently placed to bring the end up through the gum-box and to pass the same under the distributing-rolls, for the purpose of evenly and thoroughly gumming one surface of said paper. The end of said paper then passes under said knife or shears *h*, and forward between the hollow core *u* and calendering-roll *n*. At the moment when there has passed under the knife sufficient paper to form an individual tube the paper is severed by the descending knife *h*, operated, as aforesaid, by said levers *d d* and cam *e*. The forward end of the paper, having passed to the core *u*, as aforesaid, is quickly wound around said core, the successive folds or layers thereof being solidly pressed together by the calendering-roll *n* immediately underneath said core, and by the operation of the revolving brush *l*, which not only assists in pressing the folds and layers together, but also removes any superfluous gum from the forming or completed tube.

At the time when the second strip of paper has been wound into tubular form the cam *o* strikes against the pulley *t* and slides the carriage *p r s* outward. This movement also slides the core *u* off the tapering spindle *Z*, and carries along said core and completed tube until the end of the tube strikes against the side of the clamp *V*. By this means said completed tube is pushed off the core and drops into the receptacle previously set to receive the finished tubes.

It will be observed that said core, though hollow, is so constructed as to be divided into three or more longitudinal parts or strips, each of which has the action of a spring. Thus,

when it passes onto the tapering spindle Z the diameter of the core is enlarged by pressing outward these individual parts or strips, and when said core is drawn off said spindle, and is brought under the clamp V, its diameter is reduced by pressing together these said individual parts or strips. The object of this construction is to have the core larger while the tube is being wound upon it, and smaller when the completed tube is to be removed from it, to the end that the delivery of the tube from the machine shall be perfectly easy and without injury to it in its then wet or green condition. The pressure of the clamp V upon the receding core may be regulated, as desired, by means of the set-screws *y y*. About the time the tube is formed, and just before the core is drawn off the spindle, the calendering-roll *n* is depressed by means of the cam *f* and connecting-levers *k k*, so that there shall be no friction or other interference between said roll and the newly-formed tube pending the delivery of the latter from the machine. The cam *g*, connecting-levers *m m*, and spring *x* regulate the pressure of the revolving brush *l* upon the forming-tube; and this pressure is automatically adjusted during the operation of the machine, and in such manner that said

brush is very close to the cylindrical core when the tube is first started; and, in proportion as the successive layers of paper increase the size of the tube, the brush is made to recede therefrom by means of the graduated leverage and cam attachment last aforesaid.

I claim as my invention and desire to secure by Letters Patent—

1. In paper-tube machines, the cylindrical core *u*, having its forward end cut into longitudinal and elastic strips, in the manner and for the purposes substantially as shown and described.

2. The combination, with said core *u*, of the tapering spindle Z and compressing-clamp V, for the purpose of alternately enlarging and diminishing the diameter of said core, substantially as set forth.

3. The combination of the adjustable calendering-roll *n* and of the adjustable revolving brush *l* with the hollow core *u* and tapering spindle Z, in the manner and for the purposes substantially as described and shown.

WILLIAM M. MARCHANT.

Witnesses:

GEORGE H. SMITH,
THOS. P. BARNEFIELD.