L. SMITH.

Paper Tube Machine.

No. 168,193. Patented Sept. 28, 1875.

Fig. 1.

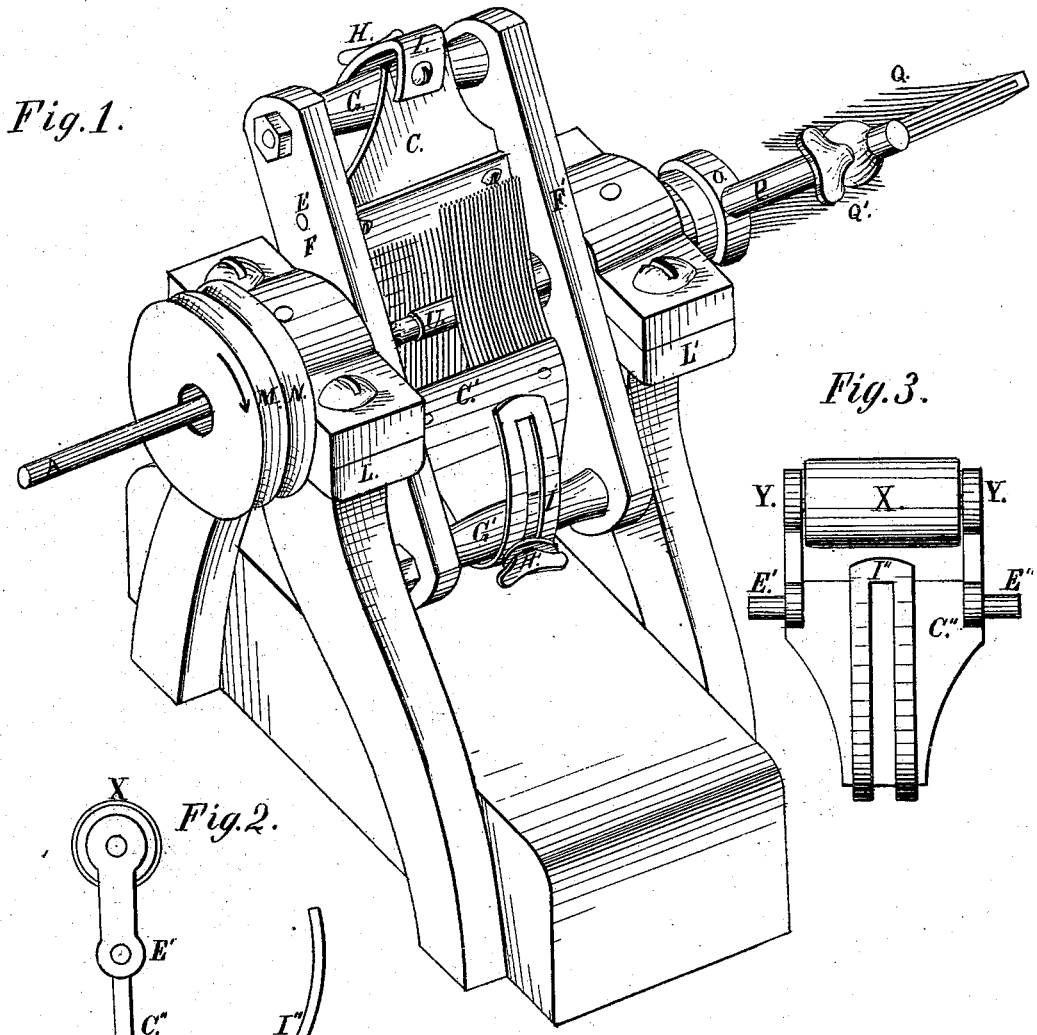

Fig. 3.

Fig. 2.

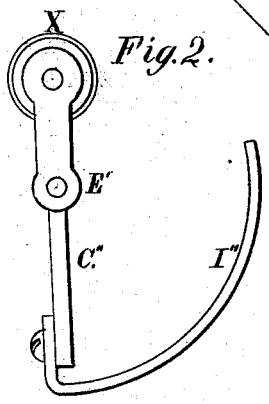

Fig. 4.

Witnesses.

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LUTHER SMITH, OF LOWELL, MASSACHUSETTS.

IMPROVEMENT IN PAPER-TUBE MACHINES.

Specification forming part of Letters Patent No. **168,193**, dated September 28, 1875; application filed September 14, 1874.

To all whom it may concern:

Be it known that I, LUTHER SMITH, of Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented certain Improvements in Paper-Tube Machines, of which the following is a specification:

My invention consists, first, in a novel construction of the mandrel on which the tubes are formed, whereby the paper tubes, after being closed up, are drawn out to a uniform size by passing over a cylindrical boss or enlargement of the mandrel; second, in a pair of adjustable floats revolving around a boss on said mandrel, for the purpose of pressing the overlapping edges of the paper firmly together, so that said edges may not be opened by passing over the boss first mentioned; and, third, in a pair of brushes revolving around still another cylindrical boss on said mandrel, to smooth the paper tubes and improve their appearance.

The accompanying drawings represent my invention.

Figure 1 shows the pair of floats and the pair of brushes properly supported and revolving about the mandrel. Figs. 2 and 3 are, respectively, side and front views of one of the adjustable rollers hereinafter described, in its frame, together with the slotted plate by which it is adjusted. Fig. 4 shows a part of the mandrel on which the paper tube is formed, and from which it is drawn from left to right.

A is the hollow mandrel, enlarged at U to sustain the pressure of the revolving floats C C′. These floats consist of bristles clamped in a frame similar to that shown in Figs. 2 and 3. Studs E at the sides of each float enter the flat parallel pieces F F′. On these studs the brush may be turned. These parallel pieces are connected or bolted together by ties G G′. In each of these ties is a set-screw, H H′, which passes through a long slot in a curved plate, I I′, attached to the end of the floats C C′, thereby holding the face of the floats firmly, with any required degree of pressure, against the tube which is being formed on the mandrel, the position of the mandrel being in the center of the hollow shafts, hereinafter described. The pieces F F′ are supported midway on the outer side of each by hollow shafts, which rest in the bearings L L′, respectively, the shaft at the right being marked O. On the outer or left end of the shaft, attached to the parallel piece F, are fast and loose pulleys M N, by which the floats and brushes, hereinafter mentioned, are revolved in the direction of the arrow, and in the direction of the lap of the paper tube. The revolving of the floats presses the lap firmly down. To the hollow shaft O are attached two radial arms at equal distances from each other, one of which is shown at P. Each arm passes through the end of a brush, Q Q′. In the end of each brush is a set-screw, by means of which the brush is kept at such a distance from the mandrel that the ends of the bristles lightly touch the paper tube. These brushes Q Q′ smooth the surface of the tube and improve its appearance. The mandrel A passes through the hollow shafts, and the pulleys M N between the floats and between the brushes—the boss U being between the floats, the boss V between the brushes. As already stated, the paper tube is formed on this mandrel and drawn from its right end. The bosses U and V are to sustain the wet tube from being crushed by the action of the floats and brushes. After passing the boss V, the paper tube is drawn over the boss W, the diameter of which is one-sixty-fourth of an inch greater than that of the bosses U and V. The object of making the bosses U and V smaller is to cause less friction, and to make the tube smaller at first in order that it may be afterward stretched upon the large boss W, thus drawing the lap tighter, and giving the tube its proper size. All the bosses herein described are cylindrical. Although the floats C C′ are made of bristles, as above described, they are not brushes and do not perform the office of brushes. The bristles merely afford a smooth, slightly elastic surface—the best that I know of for the purpose; but the same object could be accomplished nearly as well by the use of thin strips of sheet metal secured in the same manner—that is, clamped at one end. Where the paper is very stiff or of unusual thickness, I propose to use the rollers shown in Figs. 2 and 3, the bristles, in some cases, not being stiff enough to press the edge of the paper firmly down, making the tube oval instead of round in its

cross-section; but for all ordinary paper the bristles are preferable. The rollers X turn on shafts hung between arms Y on a frame similar to that which holds the bristles. They are held against the mandrel in the same way that the floats are held, and are supported between the parallel pieces in the same way. The floats also serve to take the stretch out of the paper. The end boss W is surrounded by a cylindrical socket, in the usual manner.

The mandrel herein described is about six or seven inches longer than usual, owing to the use of the floats and brushes.

Of course the mandrel might be made of uniform size throughout, except at the boss W, where the tube is drawn off; but this would only increase the friction.

I claim as my invention—

1. The mandrel A, provided with the cylindrical bosses U and W, of differing diameters, as and for the purpose described.

2. The combination of one or more floats, C C′, with the mandrel A, having the boss U, as and for the purpose described.

3. The combination of the mandrel A, having the cylindrical boss V, and the brushes Q Q′, revolving about said boss V, as and for the purpose described.

LUTHER SMITH.

Witnesses:
ALBERT M. MOORE,
WM. H. LOUGHLIN.