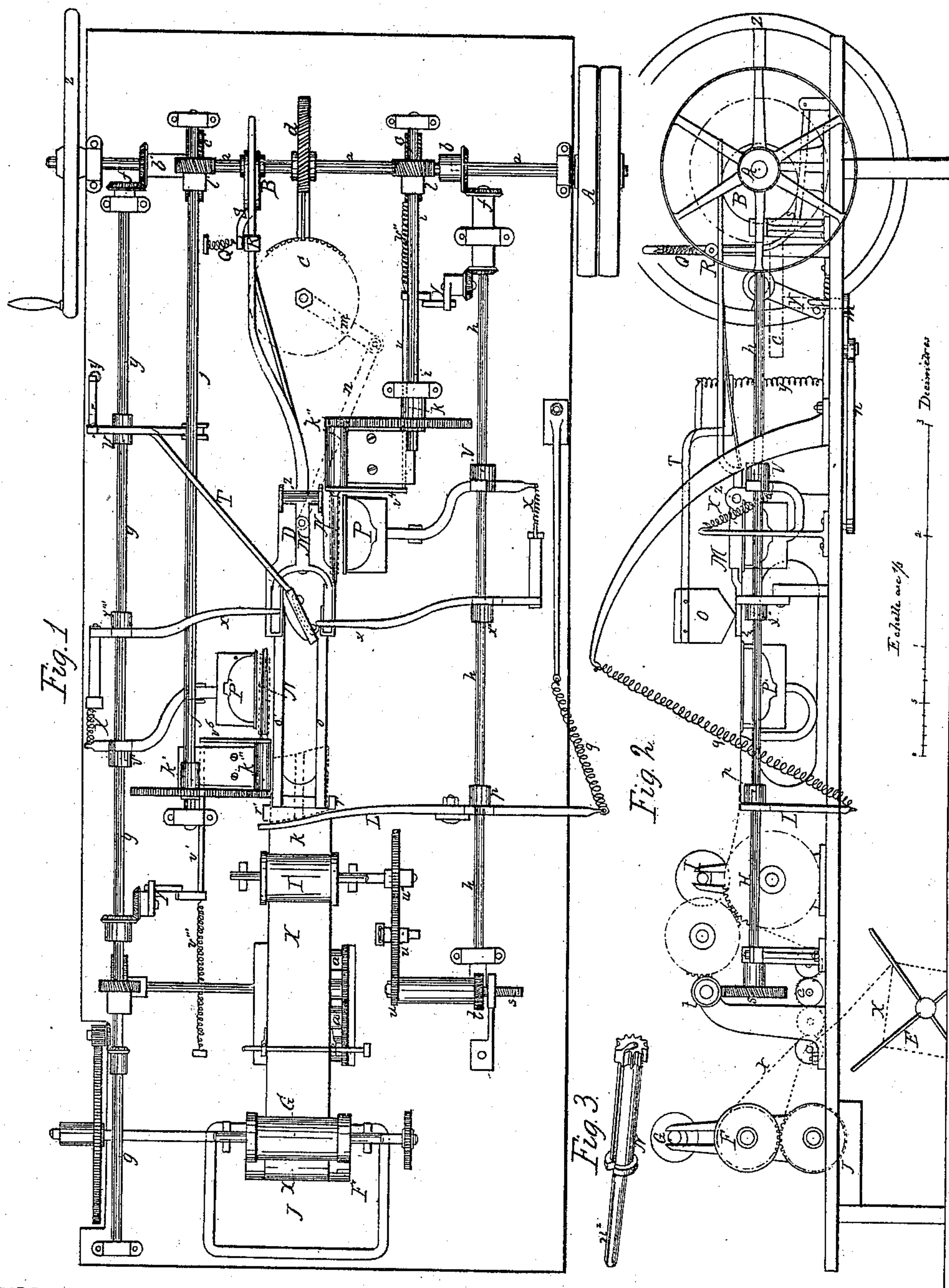


# C. Hotz. Coy Tubes.

N<sup>o</sup> 104,312.

Patented Jun. 14, 1870.



Witnesses  
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# United States Patent Office.

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& LESSIEUX.

Letters Patent No. 104,312, dated June 14, 1870.

## IMPROVEMENT IN MACHINE FOR MAKING PAPER TUBES.

The Schedule referred to in these Letters Patent and making part of the same

### To whom it may concern:

Be it known that I, CONRAD HOTZ, of Zurich, Switzerland, have invented certain new and useful Improvements in Machinery for the Manufacture of Paper Tubes; and I hereby declare the following to be a full, clear, and exact description of the same.

This machine, which embodies my invention, is intended for the manufacture of paper tubes of any desired dimensions, and is especially directed to the ready and economic production of cop-tubes or paper tubes for use in spinning-machinery.

The nature of the invention and the manner in which the same is or may be carried into effect, will be readily understood by reference to the accompanying drawing, in which—

Figure 1 is a plan, and

Figure 2, a longitudinal elevation of a complete machine made in accordance with my invention, having two spindles, upon which the tubes are made, one tube being formed at each revolution of each spindle.

Figure 3 is a perspective view, on an enlarged scale, of one of the spindles detached.

Motion is communicated to all parts of the machine by means of the driving-pulley A, which rotates the arbor *a*, and consequently the wheels *b b'*, *c c'*, *d*, and the cam B mounted on said arbor.

The two bevel gear-wheels *b b'* mesh with like wheels *f f'*, which are mounted on and serve to actuate the two longitudinal arbors *g* and *h*, that carry the mechanism hereinafter described.

The two obliquely toothed gear-wheels *c c'* actuate the two similarly toothed wheels *l l'*, the arbors *i j*, and consequently the gears *k k'*.

The large wheel *d* has a peculiar construction; the step of its oblique or helicoidal teeth is variable, and there are upon it three dead-points, so that, at these points, it may revolve without communicating motion to the horizontal obliquely-toothed wheel C, thus imparting an intermittent movement to the latter.

The wheel C actuates the crank *m*, the connecting-rod *n* and the carriage D, which, in this manner, is caused to have a reciprocating rectilinear motion on the ways *o o'*, fixed to the frame of the machine.

The paper X is first cut into bands of about eleven centimeters in width, and is then wound on the reel E, whence it passes between the rollers F G and H I, after having received from the bath J a stripe of paste or glue, which follows a sinuous path about three or four centimeters in width between the edges of the paper.

Between the rollers F G and H I are arranged several padded rolls, *a' a''*, charged with ink, and provided with letters and commercial marks, in order to produce upon the paper the name or trade-mark of the manufacturer.

After coming out from between the rollers H I, the

paper X rests upon a table, K, and is cut by the blade L, the movement of which is effected by the cam *p* on the arbor *h*, the spiral spring *q* serving to hold the shank or stem of the blade L up against the cam during the revolutions of the latter. I, however, make no claim to the parts of this machine shown in the drawing that feed and operate upon the paper up to the blade L.

Before following the movement of this piece of paper, I will explain the construction and operation of the mechanism, which has served to cause the quantity of paper necessary to form two tubes to advance beyond the rollers H I.

The intermittent movement, which has brought about this result, arises from the obliquely toothed wheel *s* on one end of the arbor *h*, which is also cut away so as to have at intervals a dead motion, thus causing the intermittent motion of the gears *t* and *u*, which movement is transmitted to the rolls H I through the intermediary of the toothed wheels *u u' u''*.

It will be, therefore, understood, that the paper taken between the rollers H I is advanced upon the tablet K to the desired extent, this being determined by the speed and size of the wheels *s*.

At the moment the severed part of the paper is laid upon the guide-rests *o o'*, and between the uprights *r r'*, the reciprocating carriage D has moved up and the presser M comes down upon the paper, and draws it, as the carriage moves back, between the twin spindles N N', and causes the edges to enter longitudinal slits formed in the spindles. In fig. 3 I have represented one of the spindles detached, in order to show more clearly its construction and the slit *n²* formed therein.

The paper is introduced into the two slits simultaneously, and to this end the spindles are arranged about opposite each other, and not so far apart as represented in the drawing, the object of so showing them in the drawing being to avoid confusion and enable the parts to be better distinguished. When the paper is brought to this position, the knife O falls and separates the paper into two parts, the line of division following a line slightly oblique to the length of the paper, and coinciding with the line of paste. The spindles are then actuated so as to rotate rapidly, thus rolling up on the spindles the paper which is held to them by the action of the pressers P and P', and a tube is thus formed on each spindle.

The rods *v v'* are provided with angular arms *v⁴ v⁵*, whose extremities encircle and are fitted to slide upon the spindles, and serve to disengage or push off from them the tubes, which are then pressed downward by the levers *x x'*, so as to fall into a receptacle prepared for their reception.

The movement of all these parts is effected as follows:



The presser M is a lever capable of vibrating upon its axis *z*, which is mounted on the carriage D. Of the two arms of the lever, the one which constitutes the presser consists of two branches or pressing-feet, and the other extends back and rests upon the cam B, and has combined with it a spiral spring and roller, actuated by means of the curved lever S, which extends under the cam B as shown in the drawing. By this means the cam, in its revolution, causes the alternate rising and falling of the presser, this motion being timed with that of the carriage, as hereinbefore set forth. The reciprocating movement of the carriage D is effected, as before stated, by means of the crank *m* and connecting-rod *n*.

The cutter O is a steel blade, fixed on a lever, T, which is actuated by the cam U fixed on the arbor *g*. A spiral spring returns it to its normal position.

The rotary movement of the two spindles N and N' is effected by means of the wheels *k k'*, which are actuated respectively by the shafts *j* and *i*, as before stated. These two wheels *k k'* gear with pinions *k'' k'''*, which are fixed on the same axis and serve to drive the spindles N N'. The intermittent movement of the spindles is produced by the construction of the helicoidal wheels *c c'*, which, like the wheel *d*, have dead-points on their peripheries.

The pressers P P', which press the paper on the spindles in order to cause the paste to take hold

strongly, are actuated by the cams V and V', which are fixed on the arbors *h* and *g*, and they oscillate upon a suitable axis, and are brought back to their normal positions by means of the springs X X'.

The rods *v v'* slide in bearings formed in the standards which support the spindles. They are held at rest by the spiral springs *v'' v'''*, and the crank-studs Y Y' push their ends *v<sup>4</sup> v<sup>5</sup>* toward the spindles, in order to bring the tubes under the levers *x x'*, which throw them into the lower receptacle above named. These levers turn upon pivots fixed to the frame of the machine, and by their own weight are caused to press upon cams *x'' x'''*, which actuate them.

A fly-wheel, Z, regulates the speed of the machine, and can be used to drive the mechanism by hand.

What I claim, and desire to secure by Letters Patent, is—

The mechanism herein described for cutting the paper, presenting it to the spindles, severing it and rolling it into tubes, and discharging it from the spindles, when arranged and operating as set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

C. HOTZ.

Witnesses:

-JACOB BAUMANN,  
ANNA MEYN.