A. Overend.

Paper Damping Mach.

No. 10627. Patented Mar. 14. 1854.

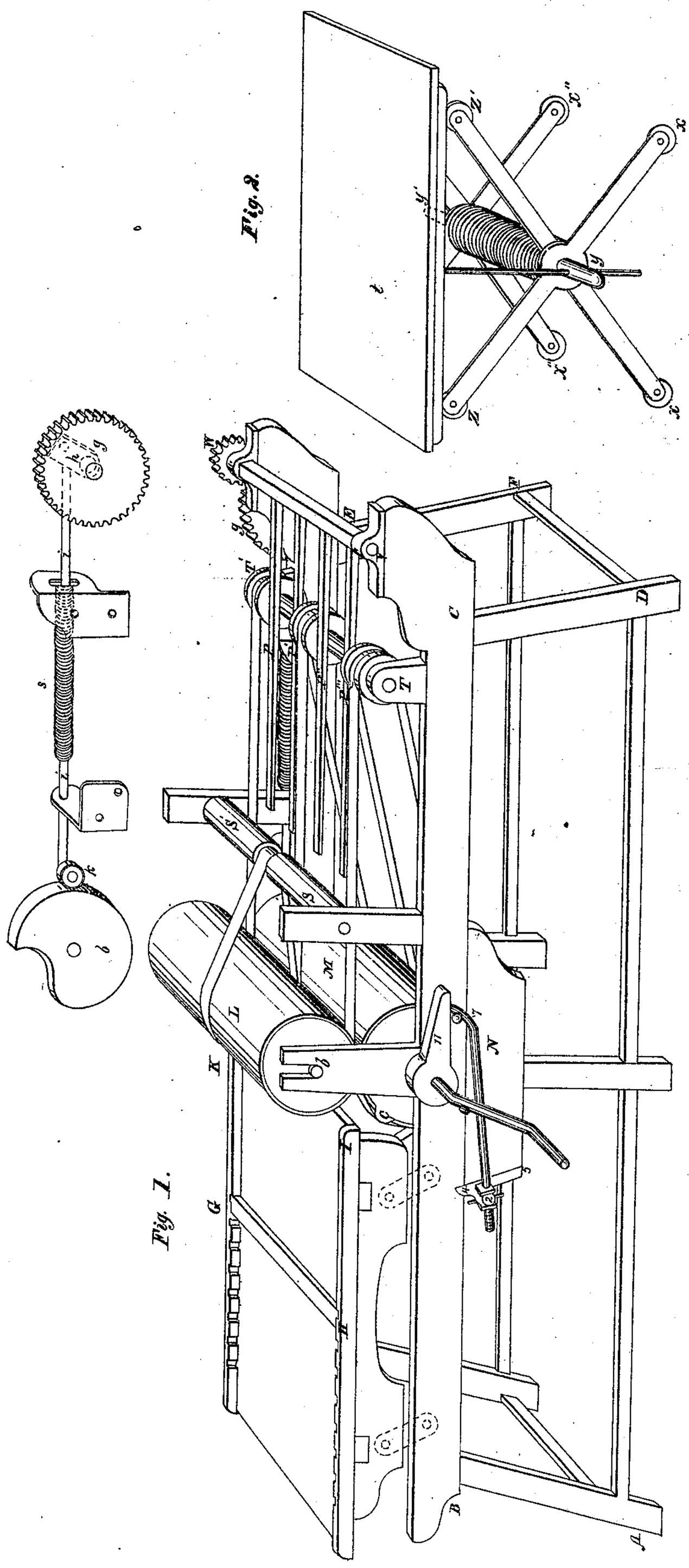

Fig. 2.

Fig. 3.

Fig. 1.

Fig. 4.

UNITED STATES PATENT OFFICE.

ANDREW OVEREND, OF PHILADELPHIA, PENNSYLVANIA.

MACHINE FOR DAMPING PRINTING-PAPER.

Specification of Letters Patent No. 10,627, dated March 14, 1854.

To all whom it may concern:

Be it known that I, ANDREW OVEREND, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Machine for Damping Printing-Paper; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 represents a perspective view of my improved damper with the upper board on which the paper rests removed. Fig. 2 is the table on which the paper is placed after it has been wetted. Fig. 3 is a detached view of the mechanism for operating the fly. Fig. 4 is a detached view of the mechanism for moving forward the feed board of Fig. 1.

In order that the impression may be properly made by the printing press it is necessary that each sheet of paper should be damped to a certain extent. To wet the sheets of paper in a uniform manner and to a proper extent great care is required. It has been heretofore generally performed by the hand—a few sheets only being wetted at a time. This is a tedious and where large editions are printed, an expensive process.

The nature of my improved machine is such that by the aid of a belt connected with the ordinary gearing of a printing office a single person can wet as much paper in a day as 6 or 8 persons could wet by hand labor alone.

To enable others skilled in the art to make and use my improved machine I proceed to describe its construction and mode of operation.

A, B, C, D, Fig. 1, represents a wooden frame work on which the parts of the apparatus are supported.

G, H, I, K represents the feed board on which the sheets of extended paper about to be wetted are placed. The strip G H fits into slots in each side of the board and is adjustable to the size of the sheets of paper to be wetted.

M is a large main roller having its surface covered with blanket or felt. It is placed upon the main or driving shaft of the apparatus and is turned by a crank or pulley placed at O. This roller M turns with one half of its surface immersed in a trough of water N. Above this roller M a second felted roller L is placed with its journals turning in a slotted bearing at *b*. The roller L is of just $\frac{1}{2}$ the diameter of the roller M and as the former is turned by its contact with the latter the roller L makes two revolutions to one of the roller M. By this arrangement of the two felted rollers, the lower roller M is kept constantly saturated with water and the upper roller L becomes saturated by revolving in contact with M. When the paper is introduced between these rollers as hereinafter described the upper roller L rises in its slotted bearings so as to permit the paper to pass through. The roller L imparts its moisture to the upper surface and the roller M to the lower surface of the paper. By this simple arrangement, the upper roller L alternately derives moisture from the lower roller M, and imparts it again to the upper surface of the paper passing through. Thus the necessity for a sprinkling apparatus on the upper side of the paper, or within the upper roller which have been hitherto suggested are obviated. I deem it best to make the lower roller M of twice the diameter of the upper roller L so that one revolution of M will insure the wetting of L and also the passage of the paper. The two rollers may, however, be of the same diameter and then the same result will be obtained by causing both L and M to make a complete revolution between successive feedings of paper. The paper to be wetted enters from the feed board H K and passes between the rollers. About a quire is fed in at a time. A small projection C is placed at one portion of the circumference of roller M, and a similar projection at the opposite end of the roller M. The paper is fed in at such intervals that the moment the edge of the quire of paper enters between the rollers, the projection C and its corresponding projection shall just pass under the roller L and thus force the surface of roller L to rise for an instant from contact with the surface of roller M. The slotted bearings *b* permit this rising of the roller L. A bead or strip of water always collects at the line of contact of the two rollers and unless L rose up this bead would be forced in at the edges of the quire of paper and wet it at the edge too much. A quire of paper is fed through for each revolution of M.

The first half of the revolution of M is employed in saturating the felt on roller L with water. At the second half of the revo-

lution of M the paper enters and is wetted on the lower side by M and on the upper by L. The weight of the roller L pressing upon M forces the water into the body of the quire. A guide tape similar in its action to those used on printing presses passes around the roller L and the small roller S. Another set of three guide tapes also surrounds roller M and roller T T′. The paper passes out from between the rollers L and M and between the upper and lower sets of guide tapes. The lower set of guide tapes carry it on to the strips of the fly P P′ P″ P‴.

P P′ P″ P‴ is a fly constructed as the ordinary fly attached to printing presses is constructed. It turns on an axis at V W, and is operated by a cog wheel at W geared into a cog wheel *g*. *g* is rotated by a crank *h* (see Fig. 3) and a sliding rod *i* terminating in a small friction roller K which presses on a cam or eccentric *l*. *l* is placed on the end of the shaft of the cylinder M. A spring is placed at *s* to press the little roller K against the cam. As the eccentric or cam *c* rotates the roller K is alternately pushed backward and forward and thus the rod *i* forces the wheel *g* to make a partial revolution backward and forward. The wheel *g* is so geared into W that every time the rod *i* slides back and forth the fly P P′ makes a partial rotation about V W from the position shown in the drawing to the table *t*. Thus the quires of wetted paper are successively carried by the sets of tapes into the fly and are placed by the fly in a smooth pile on the table *t*. The table *t* is so constructed that as the pile of paper increases in height the table is depressed in the same proportion and thus the level of the surface of the paper is kept constant. This facilitates the action of the fly and is effected by supporting the top of the table *t* by two pair of X shaped pieces Z X Z′ X′ and Z″ X″ Z‴ X‴ which are free to extend on the points *y* and *y′*. A spiral spring 1 is placed around the rod *y y′* and connected with the pieces Z X Z′ X′ and Z″ X″ Z‴ X‴ in such a manner that as Z and Z′ and Z″ Z‴ diverge the spiral spring 1 will become more tense. As the weight upon the table *t* increases it depresses the table and extends Z X and Z′ X′ and Z″ X″ Z‴ X‴ overcoming the tension of the spring 1. When the weight of paper is removed the spring 1 reacts and elevates the table *t*.

The feed board G H I K is made to advance toward the wetting rollers L M at the proper intervals of time to introduce the paper, between these rollers. The advancing of this feed board is effected by an arrangement placed under the feed board and partially hidden by it in Fig. 1 but shown detached in Fig. 4. A small rock shaft 2, 3 (Fig. 4 and Fig. 1) is supported by a bearing at 4, 5 and on the opposite side of the frame work. From one extremity 2 of the rock shaft an arm 2, 7 extends. This arm is bent at the end 7 which rests against a radial arm 11 placed upon the shaft of roller M—the driving shaft of the machine. A vertical arm 8, 9 projects from the rock shaft 2, 3. The upper end of this arm 9 fits into a small socket 10 attached to the under side of the feed board G H I K. As the shaft of M revolves, the arm 11 pushes the arm 2, 7 down, and thus acts on the rock shaft 2 3, and advances the feed board toward the wetting rollers. When the arm 11 has reached its lowest point the arm 2, 7 slips over it and a spring under the feed board restores it to its ordinary position.

Having thus described the construction and operation of the several parts I will briefly describe the operation of the entire machine.

The paper to be wetted is placed in a pile on a board extended across the top of the standards supporting roller L and those supporting roller *s s′* (this board has been removed in the drawing to show the parts below it). The trough is filled with water and the main shaft of cylinder M is rotated by any convenient application of power. A quire of paper extended is laid upon the feed board G H I K with the edge of the paper projecting about two inches toward the rollers. As the main shaft revolves the feed board advances and inserts the edge of the sheet of paper between the wetting rollers L and M. At the moment of the entrance of the paper the roller L rises by the action of the projection *c* and immediately afterwards falls again. The paper is then forced through by the rollers L and M and at the same time the pressure of the rollers saturates the paper with water. The paper as it emerges is carried between the tapes on to the fly P P′ and as soon as it is entirely on the fly, the fly makes a partial rotation deposites the paper smoothly and in a pile on the table *t* and then returns again to its former position. The self adjusting character of the table and its advantage has been explained above.

Experience has shown that the apparatus above described operated by a boy or girl only will operate about 400 reams of paper in a day with more uniformity and exactness than 6 or 8 persons could possibly do by hand labor.

Having thus described my improved paper wetting machine what I desire to claim and secure by Letters Patent is—

1. The self acting feed board arranged and operating as herein described.

2. The arrangement and combination of the upper and lower felted rollers for the purpose of saturating the upper roller in

the intervals between the passage of the paper, in the manner substantially as hereinbefore described.

3. The projections *c*, *c*, for the purpose of breaking the bead as the paper enters arranged and operating substantially as herein described.

4. The combination of the wetting cylinders and fly substantially as hereinbefore described.

ANDW. OVEREND.

Witnesses:
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