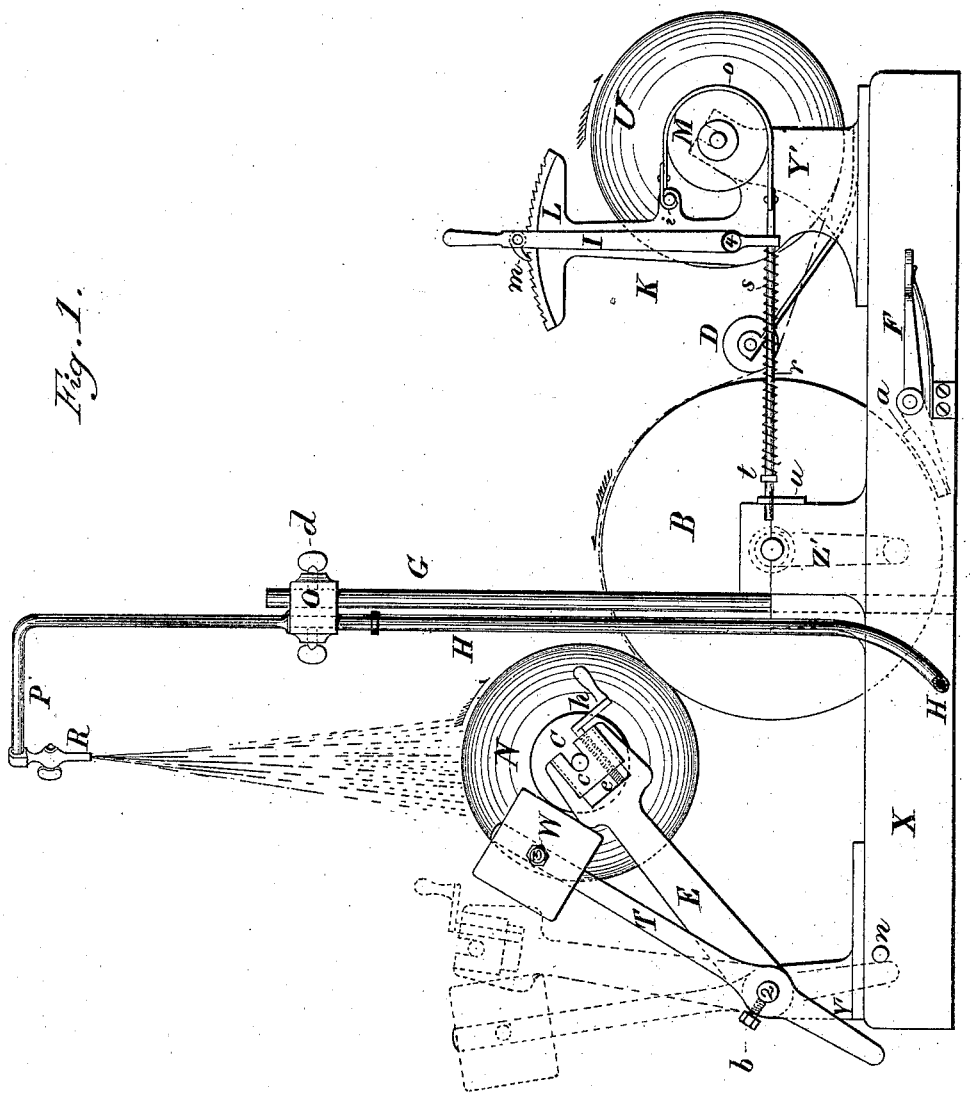
2 Sheets—Sheet 1.

S. D. TUCKER.

Machine for Damping Paper-Webs.

No. 212,767. **Patented Feb. 25, 1879.**

Fig. 1.



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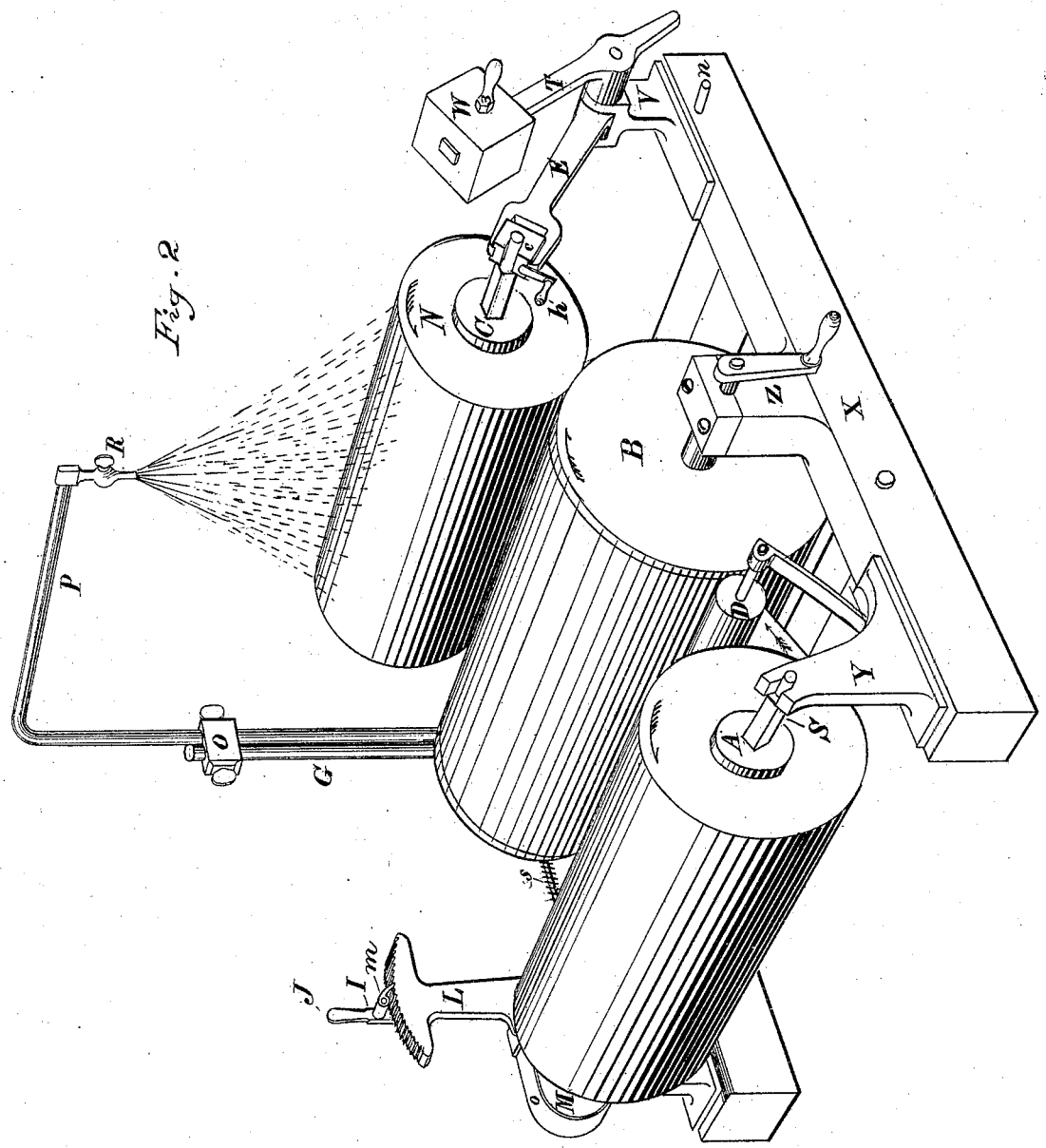
2 Sheets—Sheet 2.

S. D. TUCKER.

Machine for Damping Paper-Webs.

No. 212,767. **Patented Feb. 25, 1879.**

Fig. 2.



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UNITED STATES PATENT OFFICE.

STEPHEN D. TUCKER, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINES FOR DAMPING PAPER WEBS.

Specification forming part of Letters Patent No. **212,767**, dated February 25, 1879; application filed October 21, 1875.

To all whom it may concern:

Be it known that I, STEPHEN D. TUCKER, of the city, county, and State of New York, have invented an Improvement in Machines for Damping Paper Webs, of which the following is a specification:

In the accompanying drawings, forming a part of this specification, is represented, in Figure 1, a side elevation, and in Fig. 2 a perspective view, of my improved paper-damping machine.

My invention relates to machines in which a web of paper is unwound from one roll and wound up in another, and which web is, during its passage from the dry roll to the wet roll, or as it is partially wound upon the latter, dampened by a spray of water; and the invention consists in improved mechanisms for applying friction to the dry roll, so that its movements in unwinding may be properly governed, and in an improved tension device for controlling the travel of the web, so that the same will be evenly wound up, all of which is fully hereinafter explained.

In the drawings I have illustrated an improved apparatus consisting of a bed-plate or base, X, upon which are mounted, in suitable brackets Y Y′ Z Z′ V V′, the paper cores A and C and the carrying-cylinder B. The web as it comes from the mill is compactly wound upon the core A, and a square shaft, S, is adapted to fit in this core, and has journals suitable to run in the bearings in the brackets Y Y′. A roll of dry paper thus wound and mounted in the brackets Y Y′ has its free end led under a spring-roller, D, which equalizes its tension from edge to edge over the carrying-cylinder B and to the core C, to which latter it is fastened by any approved means.

The journals of the shaft of the core C are in boxes *c*, resting between the bifurcated ends of the arms E, and they are capable of sliding therein, and being fixed in determined positions by means of screw *e*, operated by a winch, *h*, which devices provide for the independent adjustment of each end of the roll N, by which means the tension of the web is equalized at each of its sides or edges, and the paper made to wind straight and even on the core. The arms E, which together form a carriage supporting the roll N, play freely upon short shafts 2, by which they are hung upon the brackets V V′, and thus permit the roll N to rest and press by its own weight upon the carrying-cylinder B, the frictional contact with which causes the web to be wound upon the core C as the carrying-roll is revolved.

When the core C has a small quantity of paper wound upon it, as is the case at the beginning of the operation of damping a roll of paper, its weight is insufficient to afford the pressure requisite to cause the paper to roll up properly. This deficient weight is supplied by the levers T T, which are hung adjustably upon the extended shafts 2 by means of set-screws *b*, and can thus be fixed in any desired position on the shaft. Their free ends are provided with weights, which can slide up and down on them, and may be fixed in any position thereon, more or less near the fulcrum or shaft 2, by a set-screw, 3, which is extended to form a handle by which to raise or lower the levers when taking out a roll of paper or putting in a fresh core.

The weighted lever, or the weight upon the lever, may thus be placed in such a position, more or less distant from the center of motion 2, as to impart such pressure to the roll N as is requisite to cause the paper to reel up properly upon it.

As the paper accumulates upon the roll and is dampened, as hereinafter described, its size is so increased as to raise its supporting-arms E, and hence the weighted levers T; and as the weight W on the levers T is carried back with them toward the center on which the levers move or are fulcrumed, the power they exert upon the roll is proportionately decreased; and as the size of the roll of wet paper is increased, its weight is augmented, so as to afford the proper pressure upon the carrying-cylinder B. Thus the pressure of the roller upon the carrying-cylinder is equalized and kept just sufficient to cause the paper to reel up even and tight. This tension-roller D not only serves to keep the paper smooth and even in its passage to the winding-up roller, but also acts to cause the web to run truly and accurately onto said winding-up roller. Thus, when the paper web, from any cause, as its varying thickness, is drawn through the machine more rapidly at one edge

than the other, said edge, rising to a higher plane of travel, causes the friction-roller to be correspondingly raised, which movement of the roller upwardly bends the spring-arms supporting it, and thus applies a pressure and consequent friction to the web of paper, which makes that edge lap more tightly upon the winding-up roller. This tighter winding soon equalizes the roll of paper and causes it to draw the web evenly again. The retarding power of the friction applied to the paper by this roller is regulated by the extent to which its spring-arms are bent, their resiliency causing their resistance to increase as they are bent upward, whereby a variable pressure of the roller is produced. By this operation of the roller the slightest inequality in the travel of the paper is quickly overcome, and the same is constantly maintained in an even and true movement to the winding-up roller.

In order that the paper shall unwind regularly from the dry roll U, its shaft S is provided with a tension device, by which the requisite friction is imparted to it. This tension device consists of a band, *o*, attached to a stud projecting from the standard K by means of a hook, *i*, and, passing in contact with the face of a pulley, M, on the shaft of the dry roll, is fastened by an eye to the end of a spring-rod, *r*. This spring-rod slides freely in a bearing-plate, *u*, attached to the frame-work, and in an eye in the foot of the lever I, and its encircling spring *s* bears at one end against a collar, *t*, fixed on the rod *r*, and at the other end against the foot of the lever I. This lever is fulcrumed on a stud, 4, and is adjustable to fixed positions by means of a segment-ratchet, L, and a pawl, *m*. By the movements of this lever the spring *s* is more or less compressed upon the rod *r*, to increase or diminish the power it exerts upon the rod, and, consequently, the degree of pressure and friction exerted by the tension strap or band *o* upon the dry-roll pulley M. Ordinarily it is found desirable to put about as much tension on the web in winding as the paper will stand, and to effect this the friction on the dry-roll pulley M must be increased or diminished, according as the roll is large or small.

The water is conducted by a pipe, P, curved or branched to suit the position desired for its eduction-orifice, which may be supplied by one or more spraying devices or nozzles, R, as may be desired, and these spraying devices may be connected therewith by a joint or joints, which will enable their position to be changed to suit the varying position or increasing size of the roll of paper. But to more fully adjust the spray to suit the position and size of the roll, the pipe P is arranged to be adjusted vertically, its base or foot being secured in a stock or holder, O, which slides and is adjustable by means of a set-screw, *d*, upon a supporting rod or standard, G, affixed to the main frame.

A hose, H, extends from the foot of the pipe P to the source of water-supply, and, by its flexibility, provides for the vertical movement of said pipe, though other means of accomplishing this may be employed—as a telescopic joint. The quantity of water required will depend on the quality and condition of the paper and the speed at which it runs, and is regulated by an ordinary cock or valve in the supply-pipe, but not shown in the drawings. The power is applied to the shaft of the carrying-cylinder B, and by means of the frictional contact of the roll N therewith, by means of its own weight and that of the weighted levers T, the web of paper is transferred from the dry roll U to and reeled upon the wet roll N. The spray of water falls upon the paper after it has passed under and arrives at the top of the roll N, and hence after it has been partially wrapped while in a dry state upon said roll.

By this method of damping the web is reeled up under a tension sufficient to enable it to be wound compactly and without danger of its being injured, as is the case when dampened paper is reeled.

When the entire web is dampened and wound upon the wet roll, the arms E are swung backward, the ends of the levers T resting against the stops *n*, and their weights W thus carried back of the center on which the levers swing, as in dotted line, Fig. 1, when they support the arms E in a vertical position to facilitate the removal of the reel of dampened paper.

The motion of the carrying-cylinder B may be readily stopped by a spring-seated foot-brake, F, whose shoe *a* bears against the under face of the cylinder.

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

1. The combination, with the carrying-cylinder B, the shaft of the wet roll, and the shaft of the dry roll, of the pulley M, flexible friction-band O, and a spring whose power is fixedly adjustable, substantially as described.

2. The combination of pulley M, friction-band O, rod *r*, spring *s*, adjustable lever I, and segment-ratchet L, substantially as described.

3. The combination, with the core A, carrying the dry roll, the carrying-cylinder B, and the core C, carrying the wet roll, of the spring-seated roller D, whereby a variable tension of the web is obtained, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

STEPHEN D. TUCKER.

Witnesses:
N. WALTER ANTHONY,
CHARLES VERNON PARR.