2 Sheets—Sheet 1

C. KAHLER & J BICHL.

Paper Damping Apparatus.

No. 196,298. **Patented Oct. 23, 1877.**

Fig. 1.

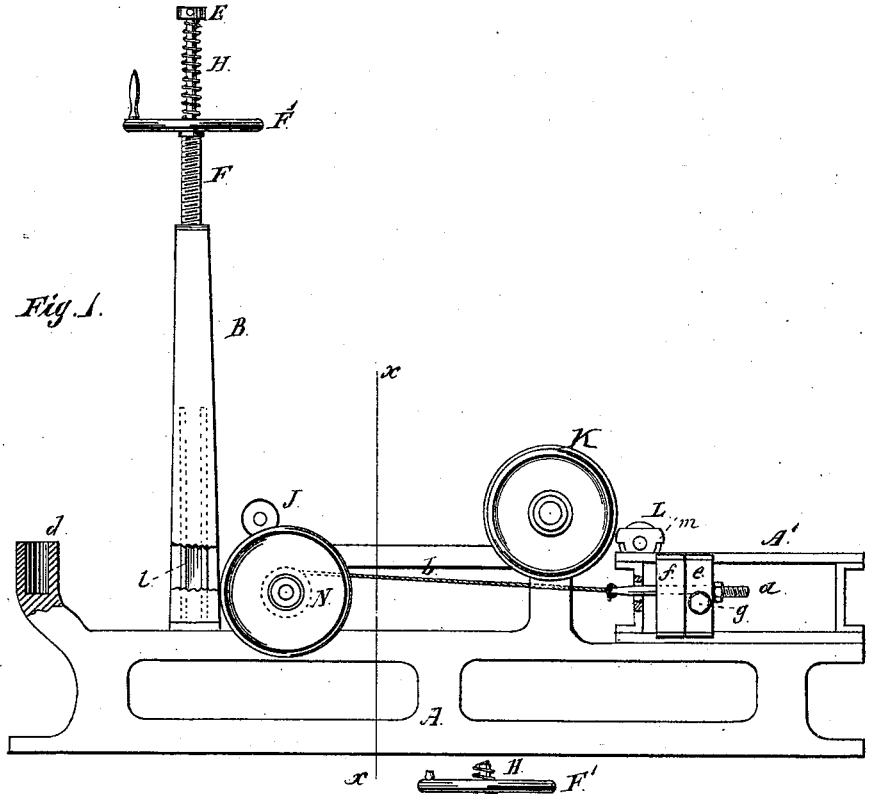
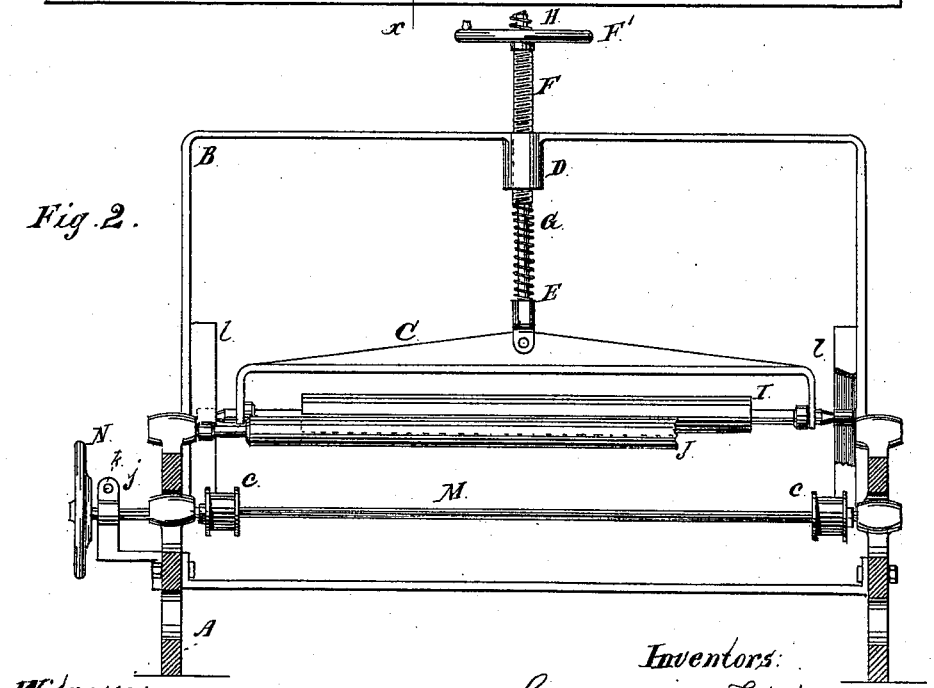


Fig. 2.



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2 Sheets—Sheet 2.

C. KAHLER & J. BICHL.

Paper Damping Apparatus.

No. 196,298. Patented Oct. 23, 1877.

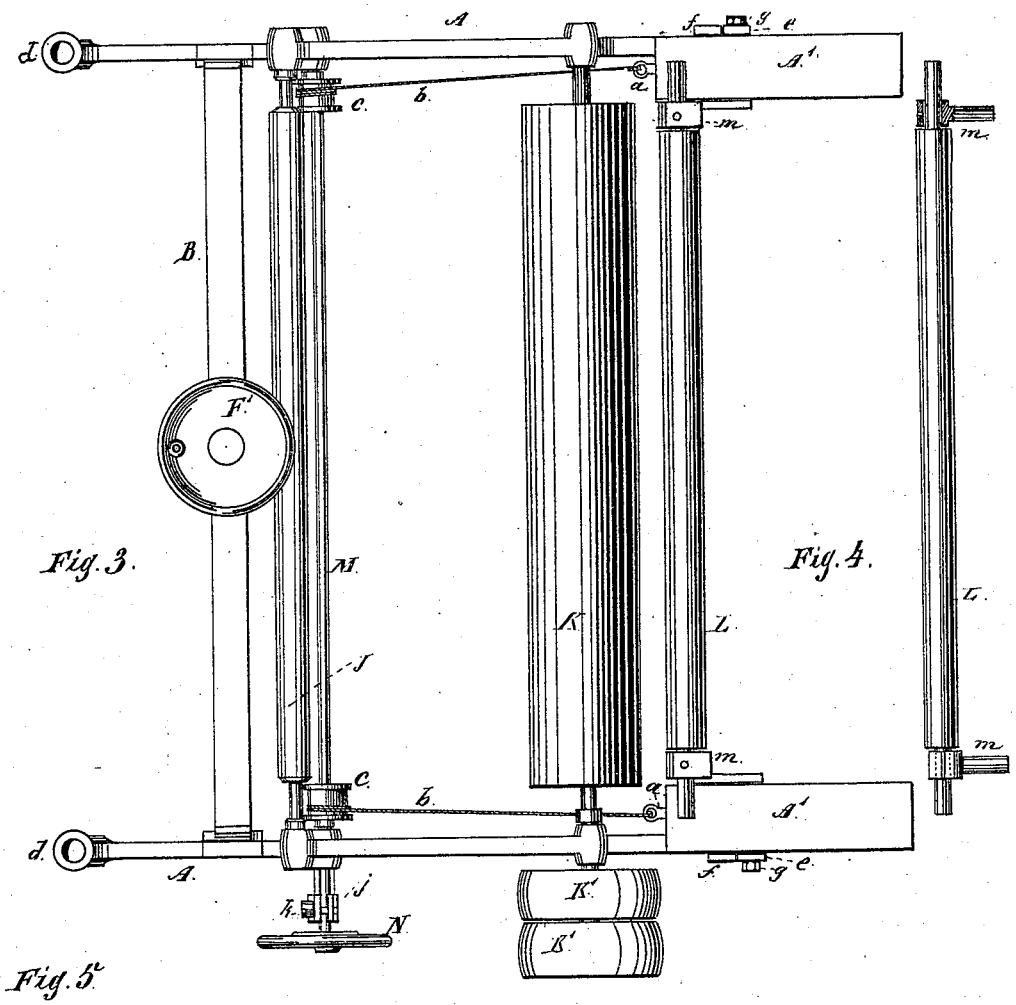
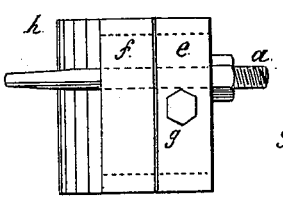


Fig. 3.

Fig. 4.

Fig. 5.



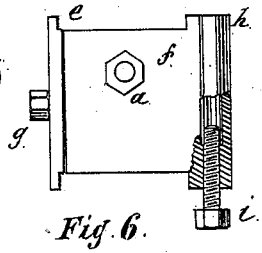


Fig. 6.

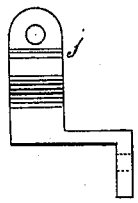


Fig. 8.

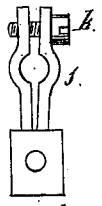


Fig. 9.

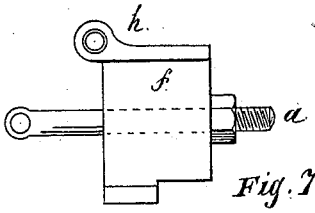


Fig. 7.

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UNITED STATES PATENT OFFICE.

CONRAD KAHLER AND JOSEPH BICHL, OF CHICAGO, ILLINOIS, ASSIGNORS TO FRANK B. WILLIAMS.

IMPROVEMENT IN PAPER-DAMPING APPARATUS.

Specification forming part of Letters Patent No. **196,298**, dated October 23, 1877; application filed April 10, 1877.

To all whom it may concern:

Be it known that we, CONRAD KAHLER and JOSEPH BICHL, of the city of Chicago, Cook county, State of Illinois, have invented new and useful Improvements in Paper-Damping Apparatus, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation; Fig. 2, a cross-section on line *x x* of Fig. 1; Fig. 3, a top or plan view; Fig. 4, a side view of the paper-roller detached; Figs. 5, 6, 7, enlarged side, rear, and top views, respectively, of the sliding bearing-blocks of the paper-roller; Figs. 8 and 9, side and end views of the tension-bearing enlarged.

The nature of our invention consists in providing a paper-wetting machine with a self-adjusting roller between the dry-paper roll and the wetting-board; in moving the wet-roll horizontally, and the devices therefor; in the tension devices for the wet-roll; and in the improved adjustments, all of which are more fully set forth.

In the drawings, A represents the main frame; A′, guide-frames for the wet-roll supports; B, supporting-frame for the self-adjusting roller; C, yoke; D, screw-socket; E, shaft supporting the yoke C; F, screw-threaded collar, through which the shaft E passes; F′, crank-wheel or crank for operating the collar F; G H, springs on the shaft E for keeping the shaft in position and adjusting the pressure of the roller I; I, pressure and guide roller; J, roller for receiving the paper at the front edge of the wetting-board; K, the main roller; K′, fast and loose pulleys; L, roller or shaft upon which the wet-roll is wound; M, shaft upon which the cords *b* are wound; N, hand-wheel for returning the roller or shaft L to the roller K; *a*, adjustable bolts, to which the cords *b* are fastened; *b*, cords or wire cables for holding the roller L in position; *c*, spools on shaft M; *d*, sockets for inserting the bearings of the roller or shaft of the dry-roll; *e*, friction-plate clamp or guide; *f*, blocks supporting the roller L, and fitting in the frames A′; *g*, screws or bolts for adjusting the pressure of the plates *e*; *h*, sockets for holding the bearings *m* of the shaft L; *i*, set-screws for adjusting the bearings *m*; *j*, clamp-bearing for the shaft M; *k*, set-screw for adjusting the clamping of the shaft M and the tension of the cords *b*; *l*, guides for the ends of the roller I; and *m*, removable bearings for the shaft L.

The frame A, A′, and B is made of cast-iron most conveniently, and all of the parts shown are usually made of metal, to avoid swelling and shrinking. The frame A′ is planed or fitted on the inside, and the blocks *f* are fitted therein so as to slide back and forth when required. The sliding blocks *f* are cut away or grooved at the top and bottom, as shown at Figs. 6 and 7.

For convenience of inserting, the outer projecting parts may be made of a separate plate or piece, and be bolted or otherwise secured to the blocks after they are in position, or the plate *e* may be made wide enough to cover the face. The eye or hook bolts *a* are passed through these blocks, and at their outer ends are provided with a screw and nut for evening or adjusting the cables *b*, so as to give the shaft L the exact line required in reference to the roller K. The blocks are also provided with plates *e*, which are applied and held in place by the screws or bolts *g*, so that the projecting ends of the plates press against the sides of the frames A′, and by regulating them by means of the screws *g*, they regulate the pressure necessary to crowd them back, and act as a part of the tension, and may be made or used to regulate and perform the entire tension work.

The inner extension of the blocks *f* is provided with an opening or socket, *h*, the depth of which is regulated by the screw *i*, which comes in contact with the lower end of the bearing *m*, and by raising or lowering these bearings *m* by means of the screws *i*, an accurate adjustment of the roller or shaft L vertically can be made. The bearings *m* may be made as shown, or the boxes may be split and hinged, so as to avoid lifting them out of place when the shaft L is shifted or taken out. Similar bearings to these are placed in the sockets *d* for the dry-roll, or friction-bearings may be used at that place.

The shaft M is provided with an ordinary

bearing at one end, and at the opposite end with the clamp-bearing *j*. This clamp-bearing is made in two parts, as shown at Fig. 9, which do not quite encircle the shaft, so that by turning the screw *k* any desired degree of pressure can be applied, and the tension of the cables *b* regulated so as to give the required pressure of the wet-roll against the roller K, and permit it to move away on a horizontal line as the size of this wet-roll increases.

As shown, the clamping-bearing *j* is carried away from the main frame somewhat, for convenience of access; but this feature is not essential.

The roller I is journaled in the yoke C, and its ends are provided with anti-friction rollers, which play in the guides *l*. The yoke C is suspended from the frame B by the rod or shaft E. This rod passes through the screw-collar F freely, and is held in place by the springs G and H, located below and above the collar F, and each pressing at one end against the collar F, and at the opposite ends against shoulders or collars on the rod E. As the screw-collar F is turned down in its screw-socket D, the yoke and roller are moved downwardly, and when the roller meets with resistance the spring G is compressed, and the device can be lowered, so as to cause the spring to give any required degree of pressure. The spring H prevents the yoke from falling down in the way when there is no paper in the machine or when changing rolls, and at the same time permits of a sufficient length of rod to accommodate the roller I in its varied positions to a large roll of paper. In use, an ordinary wetting-board is placed between the rollers J and K.

The advantages of our improvements are, that paper is frequently thicker at one edge than the other, so that in winding a large roll of paper a considerable variation in the size of the ends is found. The roller I adjusts itself freely to this and other variations, and it also takes out any wrinkles or inequalities in the paper, which occur frequently near the middle of the roll, caused by imperfections in the shaft or roller upon which the paper is originally wound. This roller is run down by the hand-wheel F′ as the size of the dry-roll diminishes. By the lateral and vertical adjustment of the shaft or roller L, upon which the wet-roll is wound, an exact compensation for varying thicknesses is had, so that the wetted paper is evenly and smoothly laid on; and by the use of the various adjustments shown, much larger rolls of paper can be unwound, wetted, and rewound than has been practical in the machines heretofore in use for this purpose.

The center of the shaft L is a little below that of the roller K, and side set-screws may be applied to the bearings *m* to lock them in position when adjusted. The wet-roll will then run perfectly true, and will not bob or jump, so that the machine can be run at a much higher speed than heretofore, and at the same time make a more perfect roll; and by moving the wet-roll out in a horizontal plane as it is being formed, its point of contact with the main roller is always below the center of the main roller, and the wet-roll is therefore held down in place as it increases in size, and the general result is a saving of time and paper, with more perfect work.

What we claim as new, and desire to secure by Letters Patent, is—

1. The roller I, journaled in the vertically vibrating and pivoted yoke C, and operating in front of the roller J, substantially as specified.

2. The combination of the yoke C and roller I with the rod E, screw-collar F, and springs G and H, substantially as specified.

3. The adjusting-bolts *a*, in combination with the tension-cables *b*, shaft L, and shaft M, for adjusting the ends of the shaft L, substantially as described.

4. The combination of the shaft M and friction-bearing *j* with the cables or cords *b*, roller L, and blocks *f*, for regulating the rearward movement of the wet-roll, substantially as set forth.

5. The combination of the shaft M, tension-bearing *j*, and cables *b* with the blocks *f*, plates *e*, set-screws *g*, roller L, and frames A′, substantially as set forth.

6. The combination of the horizontal frames A′, blocks *f*, and shaft L with the main shaft K, for receding the wet-roll in a horizontal plane below the center of the shaft K, substantially as described.

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