(No Model.) 2 Sheets—Sheet 1.

L. GOURDIAT.

APPARATUS FOR DYEING TEXTILE FABRICS.

No. 290,678. Patented Dec. 25, 1883.

Fig. 1.

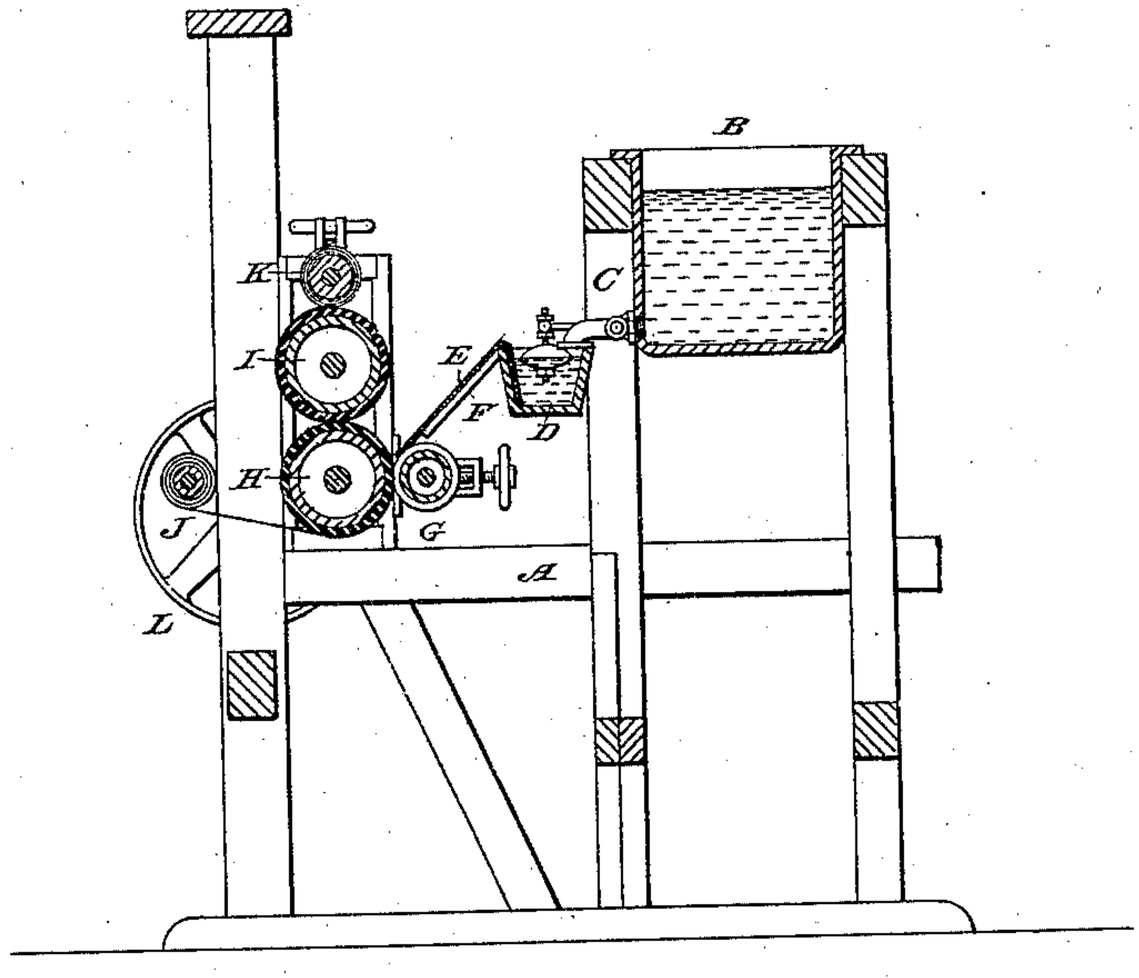
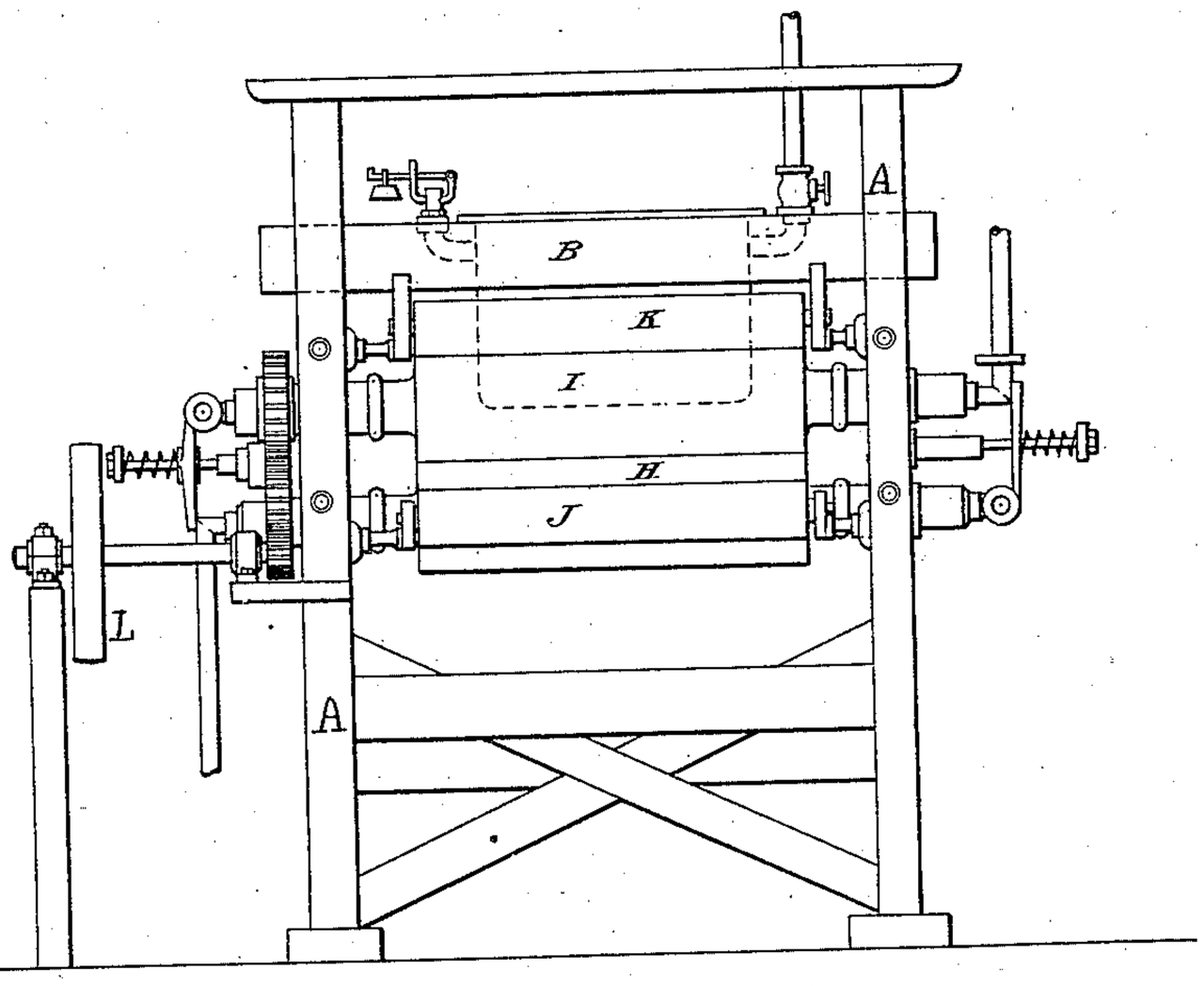


Fig. 2.



WITNESSES:

Geo. H. Fraser.

E. R. Bolton

INVENTOR:

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(No Model.) 2 Sheets—Sheet 2.

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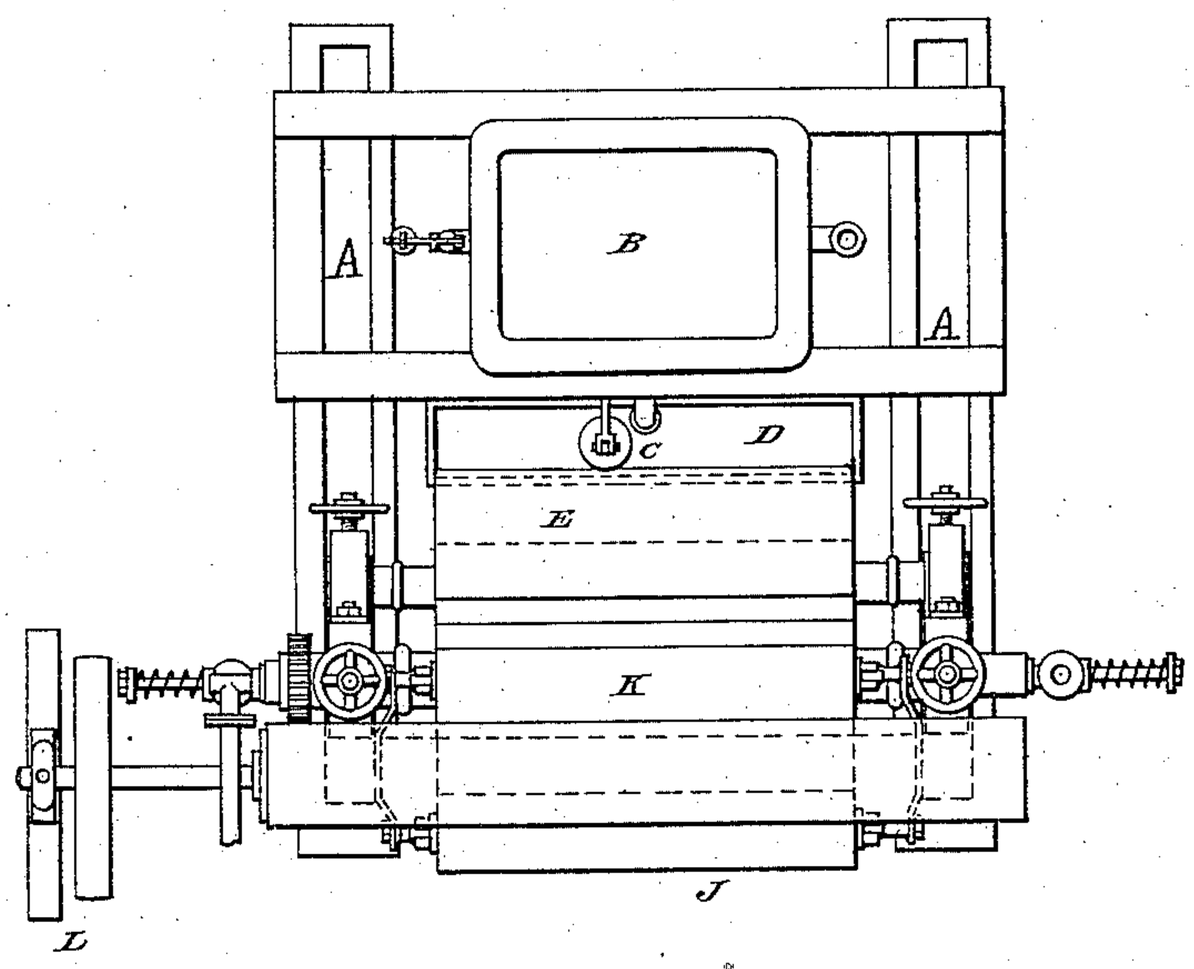
Fig. 3.



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UNITED STATES PATENT OFFICE.

LAURENT GOURDIAT, OF TARARE, FRANCE.

APPARATUS FOR DYEING TEXTILE FABRICS.

SPECIFICATION forming part of Letters Patent No. 290,678, dated December 25, 1883.

Application filed August 9, 1883. (No model.) Patented in France May 21, 1883, No. 143,287; in England June 11, 1883, No. 2,906; in Belgium June 11, 1883, and in Italy June 18, 1883, No. 15,608.

To all whom it may concern:

Be it known that I, LAURENT GOURDIAT, a citizen of the French Republic, and a resident of Tarare, Rhone, France, have invented certain Improvements in Apparatus Employed in Dyeing Textile Fabrics and Materials, of which the following is a specification.

My invention relates to an apparatus for dyeing fabrics wherein the dye is applied to the fabric in precisely the quantity necessary to produce the tint or shade desired. My object is to avoid inequalities in the color or tint by applying to the fabric, as it is borne or drawn along in a smooth and stretched condition, just the amount of dye it will take up, said dye being fed to the fabric from a reservoir by means of a capillary apparatus, which will be hereinafter described. By this method the undyed portions of the fabric are brought in succession into contact with new portions of the dye from the vat or reservoir and the shade or color produced will be uniform throughout from one end to the other of the piece.

The apparatus I employ in carrying out my method of dyeing is well illustrated in the accompanying drawings, wherein—

Figure 1 is a vertical mid-section. Fig. 2 is a front elevation, and Fig. 3 is a plan.

A is a frame, of wood or metal.

B is the reservoir or vat containing the dyeing-bath.

C is a cock which leads the dye into a trough, D, wherein it is maintained at a constant level by a float in D, which controls the flow of liquid through C. In other words, C is a ball-cock.

E is a capillary conduit, made from some textile or fibrous material and supported by an inclined platform, F. One end of this capillary conduit rests in the dye in D, and the other end is in contact with the dyeing-roll G. The conduit feeds the dye to the roll G, and also serves to filter the dye in so far as it prevents any impurities therein from reaching the fabric.

H and I are hollow rolls heated by steam. The steam enters the rolls through their hollow journals in the usual way, and the water of condensation flows out at the opposite ends. These rolls are capable of being highly heated in order to dry the fabric as it passes over them.

J is the roller or reel on which the undyed fabric is wound, and K is the roller or reel which receives it after it is dyed.

The dyeing-roll G and the steam-rolls H and I are covered with rubber, and the several rolls which impart the movement to the fabric are driven through a belt and pulley, L, and suitable gears. The particular arrangement of the several rolls will vary somewhat according to the circumstances, but that shown is the usual one. The strip of fabric passes from J under H, between H and G, between H and I, and then to K, where it is rolled up. As the fabric passes up between the rollers H and G, it receives just the quantity of dye it will take up, which is supplied, as before stated, by the conduit E.

The amount of the dyeing liquid to be supplied may be regulated either by making the trough D adjustable up and down, and in consequence varying the inclination of the conduit E, or by making the stem of the float adjustable as to the length, and thus varying the level of the fluid in D; but whatever the supply is, this will remain constant until the adjustments above described are changed. The fabric should of course be moved along with a uniform speed. I obtain, in other words, by my apparatus a union of two naps or surfaces—namely, one of the fabric and one of color. The movement of these two naps is so regulated that the dye is presented always of the same color, strength, or body to a fabric capable of taking it up entirely.

In some cases it may be desirable to heat the fabric before it receives the dye. This may be done by passing it over a steam drum or roll.

By a slight modification of my apparatus it may be employed for dyeing fabrics in graduated shades in the nature of stripes extending lengthwise of the piece. This may be done by employing several reservoirs or dyes, each of the proper color or shade, arranged in proper order, and each having its trough D. From these the dyes are fed by wicks to the roller G, the wicks serving the same purpose as the single capillary siphon E.

Having thus described by invention, I claim—

1. In an apparatus for dyeing fabrics, the combination, with mechanism, substantially as described, for carrying the fabric, of a reservoir or vessel to hold the liquid dye, and a capillary conduit to deliver the dye to the moving fabric, substantially as set forth.

2. An apparatus for dyeing fabrics comprising rolls for conveying the fabric, substantially as set forth, a dyeing-roll, a capillary conduit to feed the liquid dye to the fabric in regulated quantities, a trough with a capillary delivery, as described, and a vat or reservoir to supply dye to said trough, said vat having a ball-cock to control the flow of dye to said trough, all arranged to operate substantially as set forth.

3. As a means of supplying dye in regulated quantities to a moving fabric, the combination, with the vat B, provided with a ball-cock, C, and the trough D, of the capillary conduit E, and its support, and the roll G, all constructed and arranged to operate substantially as set forth.

4. The combination, in a dyeing apparatus, of the rollers or reels J and K, the steam-heated rolls H and I, the dyeing-roll G, the capillary conduit E and its support, the trough D, and the vat B, provided with a ball-cock, C, to maintain a constant level in the trough, all constructed and arranged to operate substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

L. GOURDIAT.

Witnesses:
HENRI BABOIRE,
I. P. A. MARTIN.