(No Model.)

3 Sheets—Sheet 1.

J. H. LORIMER.

DYE VAT.

No. 306,695. Patented Oct. 14, 1884.

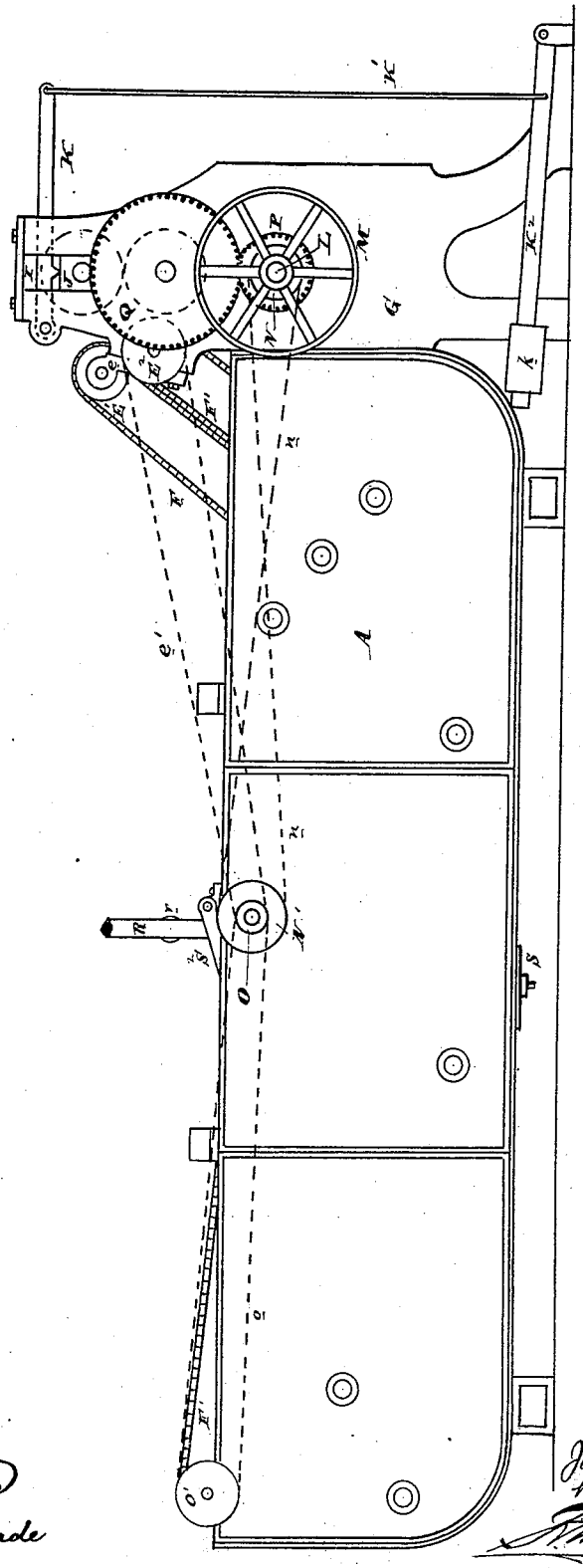

Fig. 1.

Attest
L. F. Mahs.
W. S. McMade

Inventor
John H. Lorimer
By his Atty.
Thos. G. Orwig

(No Model.)

3 Sheets—Sheet 2.

J. H. LORIMER.

DYE VAT.

No. 306,695. Patented Oct. 14, 1884.

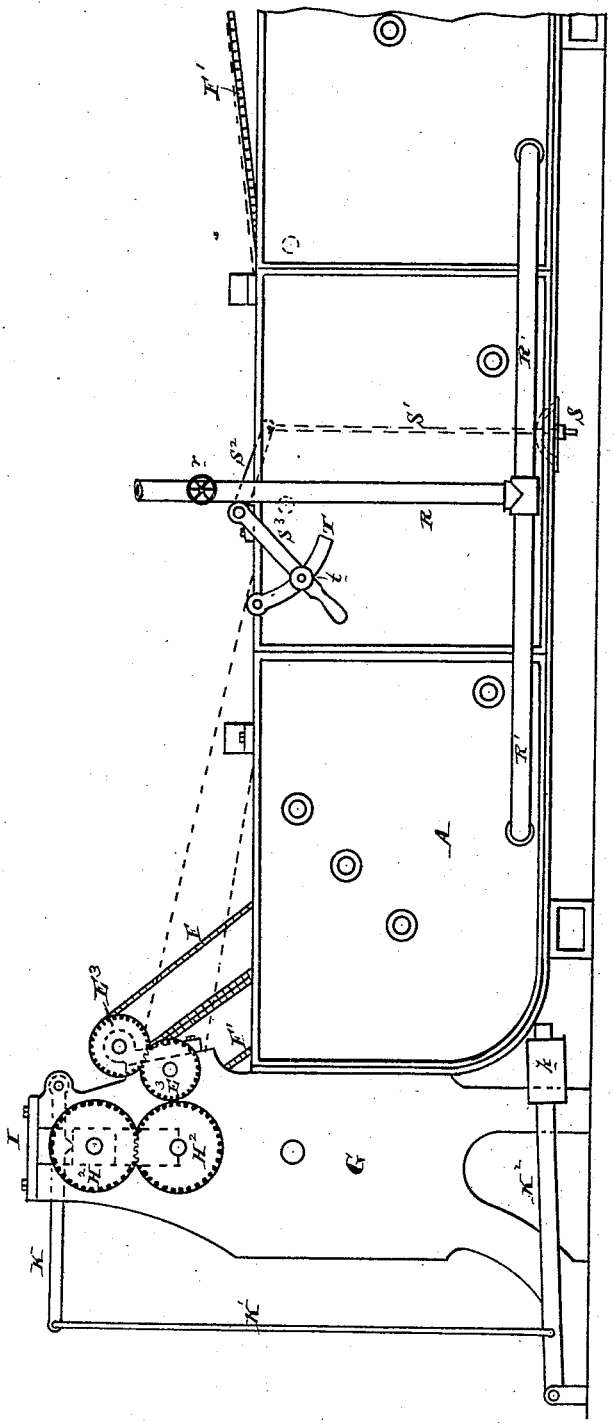

Fig. 2.

Attest
L. J. Mills.
W. S. McWade

Inventor
John H. Lorimer
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Wm. Thurston

(No Model.)

3 Sheets—Sheet 3.

J. H. LORIMER.

DYE VAT.

No. 306,695. Patented Oct. 14, 1884.

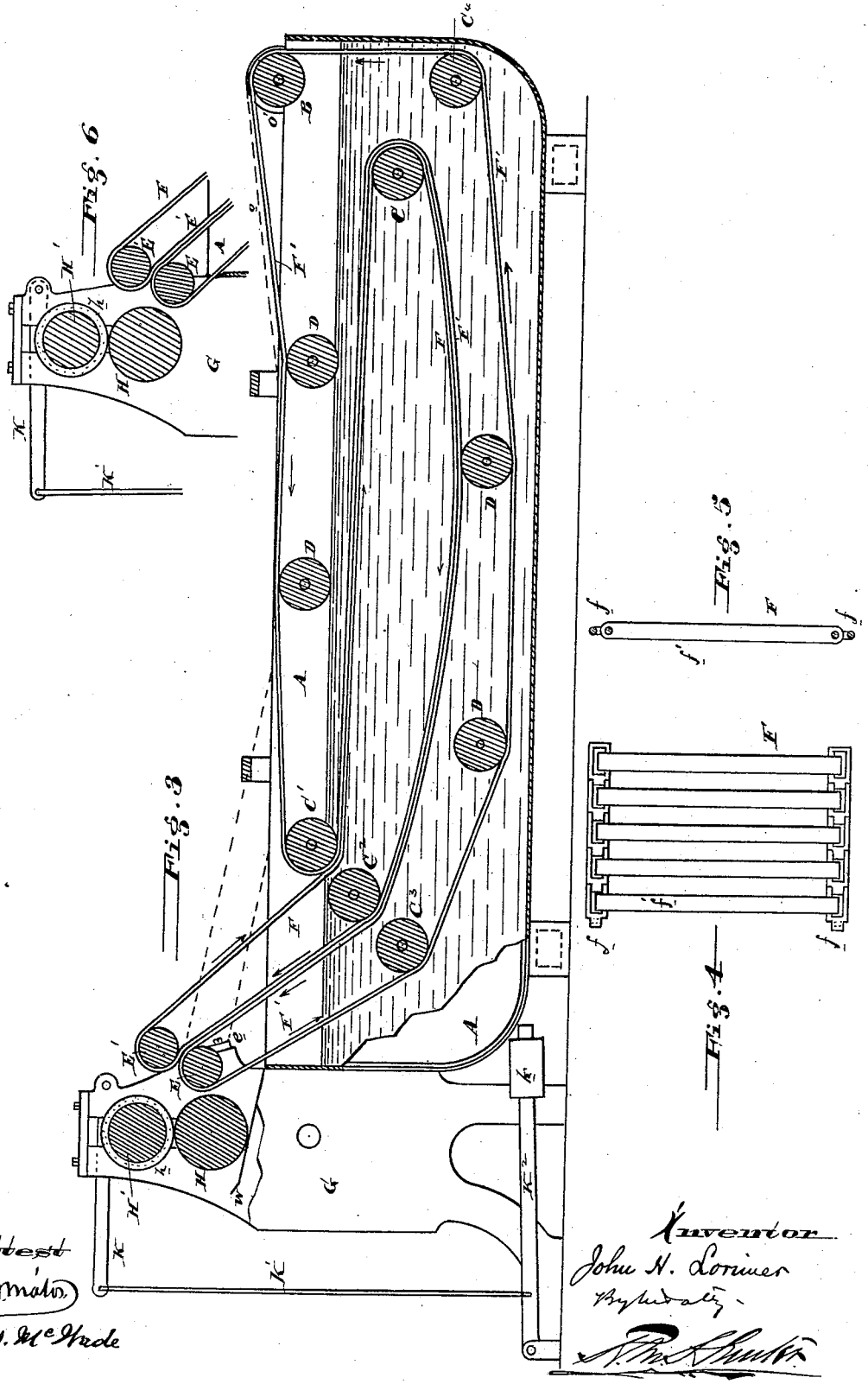

Fig. 6

Fig. 5

Fig. 3

Fig. 4

Witnesses
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Inventor
John H. Lorimer
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UNITED STATES PATENT OFFICE.

JOHN H. LORIMER, OF PHILADELPHIA, PENNSYLVANIA.

DYE-VAT.

SPECIFICATION forming part of Letters Patent No. 306,695, dated October 14, 1884.

Application filed January 26, 1884. (No model.) Patented in England November 1, 1883, No. 5,200.

To all whom it may concern:

Be it known that I, JOHN H. LORIMER, of the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Dyeing-Machines, of which the following is a specification.

My invention has reference to machines for dyeing or cleansing yarns, &c.; and it consists in improvements upon the machine set forth in the patent to Lyman A. Upson, dated May 17, 1881, and numbered 241,571, said improvements particularly having reference to the traveling apron and the delivery of the dyed or washed fabric or other goods to the wringing or squeeze rolls, all of which is fully set forth in the following specification and shown in the accompanying drawings, which form part thereof.

The object of my invention is to provide suitable aprons for carrying the goods to be dyed or scoured below the liquid line and up and deliver them to the squeeze or wringing rolls, the said aprons being made heavy and of metal, whereby strength, durability, and a more perfect squeezing action is effected during the passage of the goods through the liquid in the tank or vat.

My object is, further, to deliver the dyed goods to the wringing-rolls in such a manner that they shall be carried up into the said wringing-rolls and not allowed to fall down between said feed-rolls and wringing-rolls.

In the drawings, Figure 1 is a side elevation of my improved dyeing-machine. Fig. 2 is a diametrically-opposite side elevation of same. Fig. 3 is a longitudinal section of same. Fig. 4 is a plan view of a portion of the endless belt. Fig. 5 is a cross-section of same, and Fig. 6 is a sectional elevation of a modified arrangement of the feed and squeeze rolls.

A is the tank, which may be made of metal, and supports within the same a series of rollers, B, C, C′, C^2, C^3, C^4, and D, of which B is a drive-roller, and C, C′, C^2, C^3, C^4, and D guide-rollers.

F F′ are two endless aprons made of metal slats *f*″, hinged at each end to two endless chains, *f*. The apron F passes around roller C under rollers C′ C^2 and around the feed-roller E′, located above the tank A. The apron F′ passes over the drive-roller B, runs upon rollers D, then passes around roller C′, lies in contact with apron F, passing around roller C, then around roller C^2, then around feed-roller E below roller E′, then it leaves the apron F, passing down around roller C^3 under rollers D, around roller C^4, and back to roller B. From this it is seen that the heavy aprons are in contact from roller C′ to rollers E E′, and during their passage from roller C′ to roller C^2 they are under the dyeing or cleaning liquid. If the aprons sag, they may rest loosely upon rollers D close to the bottom of the tank A. The arrows, Fig. 3, indicate the line of travel of the aprons. The rollers E E′ can be adjusted to or from each other by adjustable boxes *e*, which carry the roller E′.

H H′ are the squeezing or wringing rolls, one of which may be covered with rubber *h*, while the other is of metal. These rollers are geared together by gears H^2, and are pressed together by a weight, *k*, and series of levers and rods K K′ K^2, which press down on sliding boxes J, carrying the upper roller, H′. These rollers and power mechanism are located in a frame, G, which is bolted to the end of the tank A. Under the rollers H H′ a pan, W, may be secured to cause the expressed liquid to run back into the tank.

In practice it is desirable that the feed-rollers E E be so arranged with respect to the rollers H H′ that their line of contact come substantially on a line with the axle of the lower roll, H, as shown in Fig. 6, for then as the yarns are fed to the wringing-rolls they will be carried up between said rolls, and will have no tendency to fall down between said rolls E and H and be carried back to the tank by apron F′.

M is the driving or band wheel, and L is its shaft. Pinion P is secured upon that shaft L, and meshes with spur-wheel Q on the shaft of the lower squeeze-roll, H, and by which said rolls H H′ obtain their motion. Also secured to shaft L is a sprocket-wheel, N, over which a chain, *n*, passes to drive wheel N′, and this in turn drives the sprocket-wheels O, from which chains *o* and *o*′ pass to wheel O′ on roller B and E^2 on feed-roller E, and which latter in turn is geared with roller E′ by spur-wheels E^3. By this means the wringing-rolls and endless aprons are rotated or made to travel with uniform velocity. Steam may be admitted to the liquor in the tank by pipe R and branches R′,

and controlled by a valve, *r*. The liquor may be run off from the tank A by a valve, S, which may be actuated by a rod, S′, lever S^2, and hand-lever S^3, and the latter may be secured tightly to a segmental arm, T, by a screw, *t*, to keep the valve up or down.

The operation is as follows: The yarns are laid upon the apron F′ as it passes over roller B, and they are then carried down between the aprons F′ and F, passing below the liquid dye, and finally up and discharged by feed-rollers E E′ to the squeezing-rollers H H, which extract the excess of liquid dye and run it back into the tank by pan W, the pressure between the aprons being irregular, the slight compression and expansion necessary to the yarn to make it absorb the dye is given, and the use of compressing and expanding rollers under the liquid becomes unnecessary. As the metallic aprons pass over the guide-rolls C, C′, and C^2, the fabric is pinched to a great extent; but the ordinary effect of the heavy aprons is sufficient.

If desired, the slats of the aprons may be made of wood.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the squeeze-rollers with two endless feed-aprons, a tank, and feed-rolls, the latter of which are so set with the squeeze-rolls that their line of contact is considerably below the line of contact between said squeeze-rolls, but above the liquid in the tank, substantially as and for the purpose specified.

2. The combination of a dye-tank with two endless aprons made of bars hinged at each end to endless chains, and guide-rollers to guide said aprons through the dye-liquor and then above the same, the said aprons running face to face in part of their length, substantially as and for the purpose specified.

3. The combination of a dye-tank with two endless aprons made of metal bars hinged at each end to endless chains, and guide-rollers for said aprons, whereby they are made to run face to face below the level, substantially as and for the purpose specified.

4. The combination of the squeeze-rollers, feed-rollers, a dye-tank, and two endless aprons made of bars hinged to endless chains, substantially as and for the purpose specified.

5. A dye-tank, in combination with two heavy endless aprons, and guide-rolls so arranged that the said aprons are separated to receive and discharge the yarns, but are pressed together by their own weight when carrying the yarn below the liquid-line, substantially as and for the purpose specified.

6. The combination of tank A, rollers B, C, C′, C^2, C^3, C^4, and D, feed-rolls E E′, located mainly in front of the lower squeeze-roll, endless aprons F F′, and wringing or squeeze rolls, all constructed substantially as set forth.

7. The combination of the two squeeze or wringing rolls with the two endless aprons, a tank, feed-rolls, and means to adjust said feed-rolls, levers K, rods K′, levers K^2, and weights *k*, substantially as and for the purpose specified.

8. The combination, with squeezing and feed rolls, two endless aprons, and a tank, of band-wheel M, shaft L, sprocket-wheel N, chain *n*, wheels N′ O, chains *o* and *e*′, wheel O′, and wheel E^2, substantially as set forth.

In testimony of which invention I hereunto set my hand.

JOHN H. LORIMER.

Witnesses:
R. M. HUNTER,
FRANCIS S. BROWN.