(No Model.)

L. WELDON.

MACHINE FOR DYEING.

No. 529,539. Patented Nov. 20, 1894.

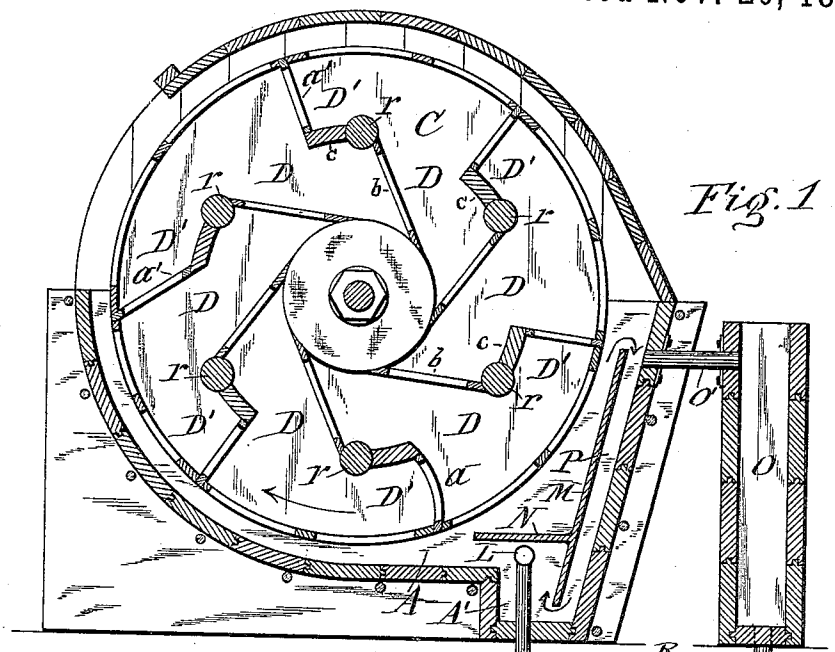

Fig. 1

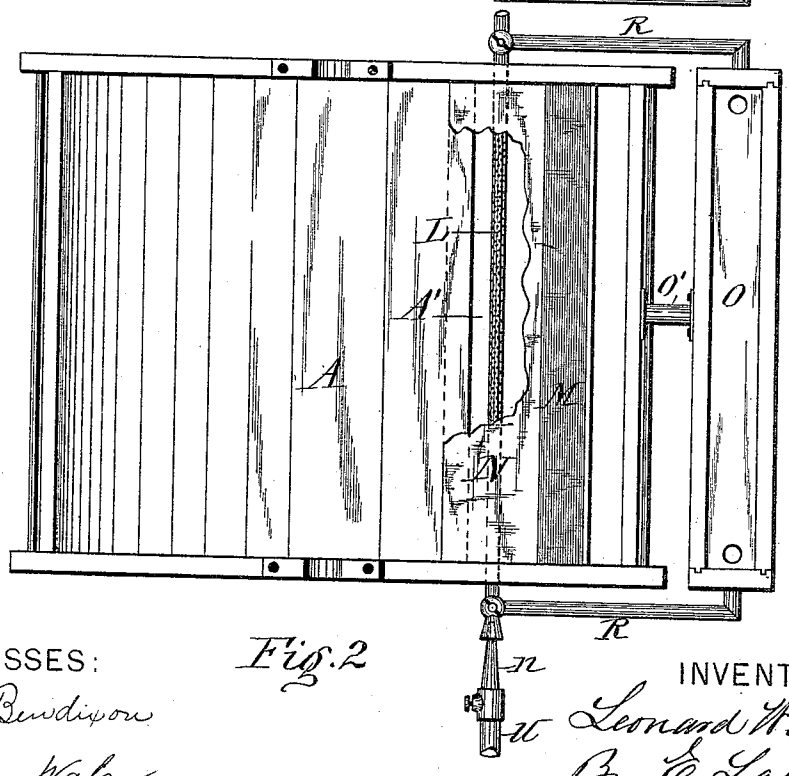

Fig. 2

WITNESSES:

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UNITED STATES PATENT OFFICE.

LEONARD WELDON, OF AMSTERDAM, NEW YORK, ASSIGNOR TO THE KLAUDER-WELDON DYEING MACHINE COMPANY, OF SAME PLACE.

MACHINE FOR DYEING.

SPECIFICATION forming part of Letters Patent No. 529,539, dated November 20, 1894.

Application filed March 21, 1893. Serial No. 467,070. (No model.)

To all whom it may concern:

Be it known that I, LEONARD WELDON, of Amsterdam, in the county of Montgomery, in the State of New York, have invented new and useful Improvements in Machines for Dyeing Garments, Yarn, &c., of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the class of dyeing machines in which a wheel or openwork drum is pivoted to the dye liquor vat and carries the articles to be dyed, and rotating on its pivots it intermittently dips said articles in the dye-liquor.

The invention consists, first, in an improved construction of the dipping wheel designed for dyeing either garments or raw stock and which is provided with rollers situated in the compartments so as to guard against the rolling of the garments or other articles during their transfer from the inner portions of the compartments to the outer portions thereof as the same is carried over the center of the rotating dipping wheel; and the invention consists, secondly, in novel devices for replenishing the dye-vat with dye-liquor and at the same time introducing the steam for heating said liquor in the vat in such a manner as to guard against the direct impingement of the steam against the articles in process of being dyed and also cause the dye-liquor to circulate more thoroughly in the vat.

The invention is fully illustrated in the annexed drawings, in which—

Figure 1 is a vertical transverse section of a dyeing machine embodying my invention, and Fig. 2 is a top plan view of the empty dye-vat and its replenishing apparatus, a portion of the deflecting plate in the vat being broken away to illustrate the subjacent supply-pipe.

A— represents the vat containing the dye liquor, and —C— denotes the rotary openwork wheel or drum which is arranged axially horizontal and with its lower half in the aforesaid vat. Said wheel is designed for dyeing either garments or raw-stock, and in some respects it resembles the dyeing wheel shown in my prior Patent No. 354,281, dated December 14, 1886.

My present improvement in the dipping wheel pertains to such wheels or drums which have their interiors divided into compartments and said compartments perforated either throughout or only in such places as will cause a suction through the lower part of each compartment as it passes through and out of the dye-liquor in the vat.

The object of my present improvement in the dipping wheel is to guard against the rolling and consequent entanglement of the material under treatment as it falls from one side of the compartment to the opposite side thereof in its passage over the top of the apparatus; and to that end my said invention consists in constructing the interior of the dipping wheel —C— with partitions *a'*—*b*— extending from end to end of the wheel and zig-zag across the same to form benches *c*, *c*, in said partitions. The wheel is thus divided into compartments —D—D—D— each of which is formed flaring radially from the central portion of the wheel outward and with a perforated or open work recess —D'— adjacent to the periphery of the wheel in the side of the compartment which last leaves the dye-liquor. At the junction of the inner portion of the compartment —D— and recessed outer portion, D', thereof I place a roller, *r*, extending lengthwise of the bench, *c*, adjacent to the inner portion of the compartment and pivoted to the ends of the wheel. Said roller is of a diameter to project with its periphery into two adjacent compartments as shown in Fig. 1 of the drawings. The radial side of the recess may be curved as shown at —*a*— or disposed obliquely to the radial line as shown at —*a'*— if desired.

In the operation of the machine the wheel —C— rotates in the direction indicated by the arrow in Fig. 1. That portion of the material under treatment which is contained in the lower portion of the wheel is carried into the recesses —D'—D'— of the compartments by the resistance of the dye-liquor opposed to the movement of the wheel and by the suction of the dye liquor through the perforations or openings in the back of the recess as

the compartments are carried through and out of the dye liquor. As each compartment approaches the top of the machine the roller —*r*— retains the material under treatment in the recess until said recess passes over the top of the machine, when the entire mass of the material starts at once over the pivoted roller and falls upon the opposite side of the compartment without rolling during said transfer.

In the operation of the machine steam is admitted into the vat —A— to heat the dye-liquor, which has to be replenished occasionally. In order to cause said dye-liquor to thoroughly circulate through the vat and thus render said liquor of a uniform color throughout and to also prevent the steam from directly impinging the articles in process of being dyed, I resort to the following construction of the vat and appliances connected thereto.

The bottom of the vat —A— I form with a recess or well —A'— extending along one side of the vat, and near the same side I place a partition —M— which extends from near the top of the vat part way into the well —A'— as shown in Fig. 2 of the drawings, thereby forming a passage —P— from the upper part of the vat down along one side of the vat and beneath the bottom thereof, and thence upward into the main portion of the vat. To prevent the dye liquor from rising again at the same side of the vat I attach to the partition —M— a horizontal deflecting plate —N— which is a short distance above the bottom of the vat and projects over the top of the well —A'— sufficiently to form a passage part way toward the opposite side of the vat.

O— represents an extra feed-tank, from which the vat —A— is replenished with fresh dye-liquor. This tank communicates with the interior of the vat —A— near the top thereof by a pipe —O'. To the bottom of the tank —O— are connected the pipes —R—R— which extend in a plane below the well —A'— and thence up to a pipe —L— to which they are connected and which is extended lengthwise through the well —A'— and is perforated in its side facing toward the opposite side of the vat —A.

U— denotes the steam-pipe which conducts steam into the vat to heat the dye-liquor therein. This pipe I terminate with a nozzle —*n*— which is inserted into the pipe —L— at its junction with the pipe —R— as represented in Fig. 2 of the drawings and thereby forms an injector which forces the dye-liquor through the perforations of the pipe —L.

In emerging from the pipe —L— the dye-liquor heated by the injected steam is deflected toward the opposite side of the vat —A— by the plate —N— and is thus caused to circulate first through the lower portion of the vat and back over the top portion thereof and down through the passage —P— into the well —A'— as indicated by dotted arrows in Fig. 1 of the drawings. The pipe —O'— serves as an overflow which carries the surplus dye-liquor from the vat back to the tank —O.

The depressions of the well —A'— and pipe —R— form a trap which prevents the steam from backing up and entering the tank —O.

I do not limit myself to the use of the described vat in connection with only garment dyeing machines, inasmuch as the same is equally as useful in yarn dyeing machines.

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

1. In combination with the vat, an axially horizontal dipping-wheel formed with partitions extending from end to end of said wheel and in zig-zag directions across the radius of the same, and having at the intermediate corners of the partitions rollers extending lengthwise thereof as set forth.

2. The improved dipping-wheel divided into comparments D, D, formed with recesses, D', D', in the outer portions of said compartments and with benches *c*, *c*, at the junction of the recesses and inner portions of the compartments, and having rollers, *r*, *r*, extending lengthwise of the benches adjacent to the inner portions of the compartments substantially as and for the purpose specified.

3. The combination with the dye liquor vat, of the partition —M— extending along one side of the vat, the deflecting plate —N— on said partition, and the feed pipe —L— under the deflecting plate, as set forth and shown.

4. The vat —A— formed with the well —A'—, the partition —M— extending into said well, and the deflecting plate —N— over the well, in combination with the perforated pipe —L—, feed pipe —R— connected to the perforated pipe, and the steam pipe communicating with the perforated pipe at its junction with the feed pipe as set forth and shown.

5. The combination of the vat —A— formed with the well —A'— the partition —M— extending into said well, the deflecting plate —N— extending from the partition over the well, the supply-tank —O—, overflow pipe —O'—, the feed pipes —R—R— extending from the bottom of the supply tank beneath the well —A'— and into the same, and the perforated pipe —L— extending lengthwise of the well and connected to the pipes —R—R—, substantially as described and shown.

In testimony whereof I have hereunto signed my name this 23d day of January, 1893.

LEONARD WELDON. [L. S.]

Witnesses:
H. M. SEAMANS,
J. J. LAASS.