(No Model.)

L. WELDON.

DYEING MACHINE.

No. 531,350. Patented Dec. 25, 1894.

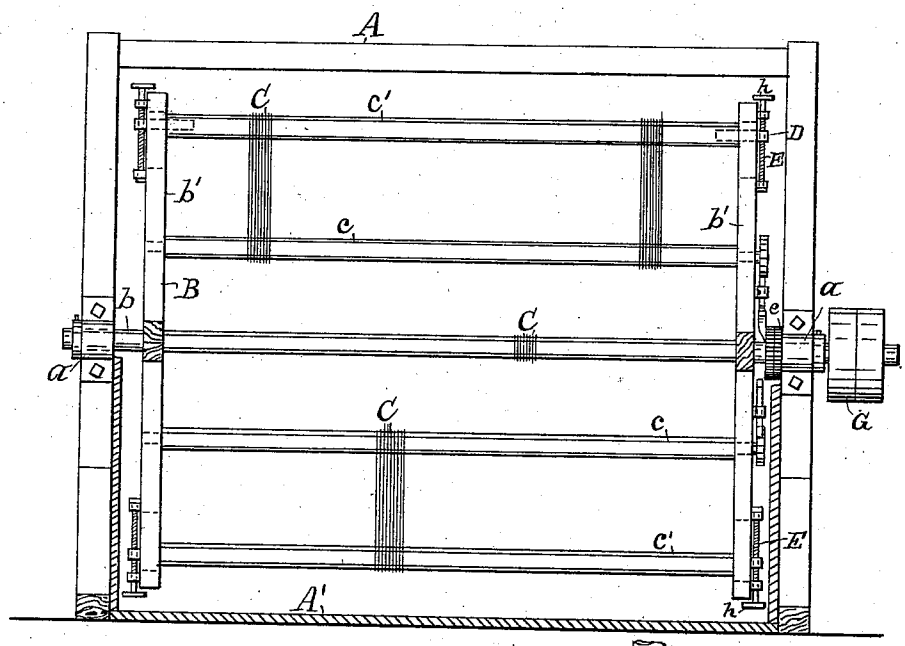

Fig. 1.

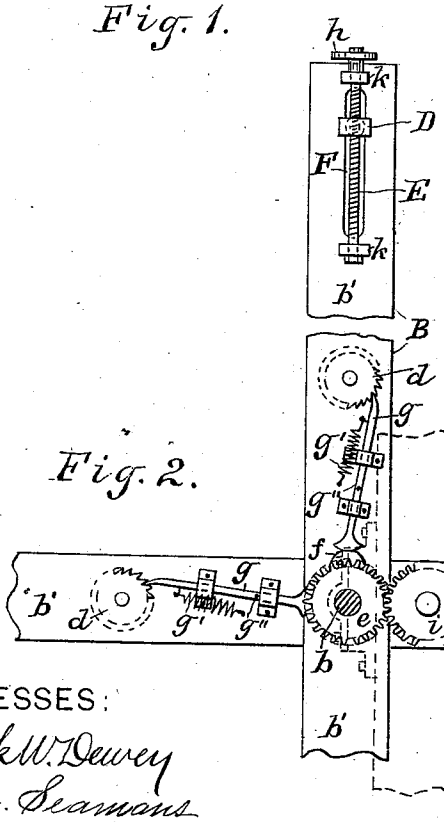

Fig. 2.

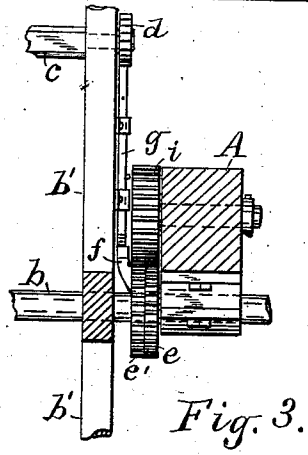

Fig. 3.

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UNITED STATES PATENT OFFICE.

LEONARD WELDON, OF AMSTERDAM, NEW YORK.

DYEING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 531,350, dated December 25, 1894.

Application filed February 7, 1894. Serial No. 499,386. (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 Dyeing-Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to yarn dyeing or drying machines of the class provided with a revoluble frame for supporting the skeins of yarn, and the object is to provide more simple and efficient means for turning the cross-bars supporting the skeins, and adjusting the bars to the length of the skeins.

My invention consists in the combination with the revoluble frame for supporting the skeins of yarn, of a shaft for said frame, a gear wheel keyed to said shaft, a gear wheel loose on said shaft and having a different number of teeth from the other, a gear wheel meshing with the first two gear wheels, a cam carried by the loose gear wheel, a pawl operated by the cam, and a ratchet wheel engaging the pawl and secured to a revoluble cross-bar supporting the skeins.

My invention consists also in the combination with the frame provided with pairs of cross-bars to support the skeins of yarn, one cross-bar of each pair adapted to be moved toward and from the center of the frame and a screw at each end of said frame and engaging the bar to move the same toward and from the other bar; and my invention consists also in certain other combinations of parts hereinafter described and specifically set forth in the claims.

Referring to the drawings hereto annexed and forming a part of this specification, Figure 1 is a side elevation of a dyeing machine provided with my invention. Fig. 2 is an enlarged end view of a portion of the revoluble frame and the gear wheel secured to the stationary frame, and Fig. 3 is a plan view of the gear wheels showing the stationary frame in section and with parts of the revoluble frame broken away.

Referring specifically to the drawings, A indicates the stationary frame of the machine consisting preferably, as shown, of two upright posts and a cross-beam extending between and connecting the posts together at the top.

A′ represents the vat for containing the dye liquor, in section.

B represents the revoluble frame consisting of a shaft, *b*, extending horizontally and adapted to turn in bearings *a*, *a*, on the sides of the posts, arms *b′* extending radially from the said shaft near each end thereof and between the posts, and preferably formed by pieces crossing each other at right angles giving four arms at each end of the shaft, as shown in the drawings, and two cross-bars *c*, *c′*, extending between each pair of arms a distance apart to support the skeins of yarn C. The said cross-bars extend parallel to the shaft *b*, one of each pair being placed nearer the shaft than the other depending upon the length of the skeins to be held thereon. In order that the skeins may be dyed evenly the said cross-bars are made to revolve so that all parts of the skeins will be exposed to the dye liquor alike.

The means for effecting the rotation of the cross-bars will now be described. On one end of each of the inner cross-bars *c*, between the arms and the post of the stationary frame I secure a ratchet wheel *d*. On the shaft *b* close to the post is keyed a cog wheel, *e*. By the side of this cog wheel is another cog-wheel *e′* loose on the shaft and of the same or about the same size as the other, but differing from the other in the number of teeth in its periphery, that is, the loose cog wheel has a greater or less number of teeth, which is accomplished, when the wheels *e* and *e′* are the same size, by making the teeth on one wheel thinner than those on the other wheel. As the skeins are revolved very slowly a difference of one or two teeth is generally sufficient. The loose cog wheel is provided with a cam *f* on its side and extending beyond its periphery. Extending upon each arm and engaging the ratchet wheel *d* thereon is a longitudinally movable pawl *g*. These pawls are shown secured to the arms by straps in which they slide. One end of each pawl engages its ratchet wheel and the other extends into the path of the said cam and is operated by the cam and made to turn the ratchet wheel one tooth at each contact. The pawls are operated in

succession and their ends which engage the cam are broadened and curved somewhat, so that they will slide easily over the cam. Each pawl has a retracting spring g' connected to it and is provided with a stop g'' to limit the movement of the pawl by the spring. The stop is shown as a pin projecting from the pawl between the straps to make contact with the inner strap. It will be obvious, however, that other suitable and well known means may be employed for this purpose.

The loose cog-wheel e' carrying the cam f is rotated by means of a cog-wheel i journaled in the post of the stationary frame and having a broad periphery engaging both cog-wheels on the shaft b. By this means the loose cog-wheel will be turned slowly either in one direction or the other, depending upon whether the number of its teeth is greater or less than the number of the teeth on the wheel keyed to the shafts.

G is a pulley on the shaft for a belt.

In order to vary the distance between the pairs of cross-bars c, c', to accommodate various lengths of skeins, I make the bars nearest the ends of the arms movable toward and from the inner bars and this I effect by extending the gudgeons D, upon which the bars turn, through slots F in the arms. These gudgeons are provided on their projecting ends with nuts or threaded perforations to receive threaded screws or bolts E, which are swiveled in lugs, k, projecting from the arms, one at each end of each of the slots. The said threaded bolts extend opposite and lengthwise of the slots and are turned to move the gudgeons by small wheels h on their outer ends. Each of the arms is provided with the described adjusting device.

It will be obvious that my invention may be applied to either dyeing or drying machines, and I therefore do not limit myself to the use of the vat, as a vat or covering for the revoluble frame may be dispensed with when used for drying yarn.

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

1. In a dyeing machine, the combination with the revoluble frame for supporting the skeins of yarn, of a shaft for said frame, a gear wheel keyed to said shaft, a gear wheel loose on said shaft and having a different number of teeth in its periphery, a gear wheel meshing with the two other gear wheels, a cam carried by the loose gear wheel, a pawl operated by the cam, and a ratchet wheel engaging the pawl and secured to a revoluble cross-bar supporting the skeins, as set forth.

2. In a dyeing machine, the combination with the revoluble frame for supporting the skeins of yarn, of a shaft for said frame, a gear wheel keyed to said shaft, a gear wheel loose on said shaft and having a different number of teeth in its periphery, a gear wheel meshing with the two other gear wheels, a cam carried by the loose gear wheel, a plurality of pawls carried by the frame and operated by the cam, a ratchet wheel engaging each pawl and revoluble cross-bars operated by the ratchet wheels, substantially as described.

3. In a dyeing machine, the combination with the revoluble frame for supporting the skeins of yarn, of a shaft for said frame, a gear wheel keyed to said shaft, a gear wheel loose on said shaft and having a different number of teeth in its periphery, a gear wheel meshing with the two other gear wheels, a cam carried by the loose gear wheel, a longitudinally movable pawl operated by the cam, and a ratchet wheel engaging the pawl and secured to a revoluble cross bar supporting the skeins, as set forth.

4. In a dyeing machine, the combination with the revoluble frame for supporting the skeins of yarn, of a shaft for said frame, a gear wheel keyed to said shaft, a gear wheel loose on said shaft and having a different number of teeth in its periphery, a gear wheel meshing with the two other gear wheels, a cam carried by the loose gear wheel, a pawl provided with bearing on one end to engage the cam and with its opposite end engaging a ratchet wheel on a revoluble cross-bar supporting the skeins, a spring to retract the pawl and a stop, as and for the purpose described.

In testimony whereof I have hereunto signed my name.

LEONARD WELDON. [L. S.]

Witnesses:

THOS. HANSON,

JAMES JOHNSON.