(No Model.) 2 Sheets—Sheet 1.

C. L. KLAUDER.

DYEING OR SCOURING MACHINE.

No. 411,504. Patented Sept. 24, 1889.

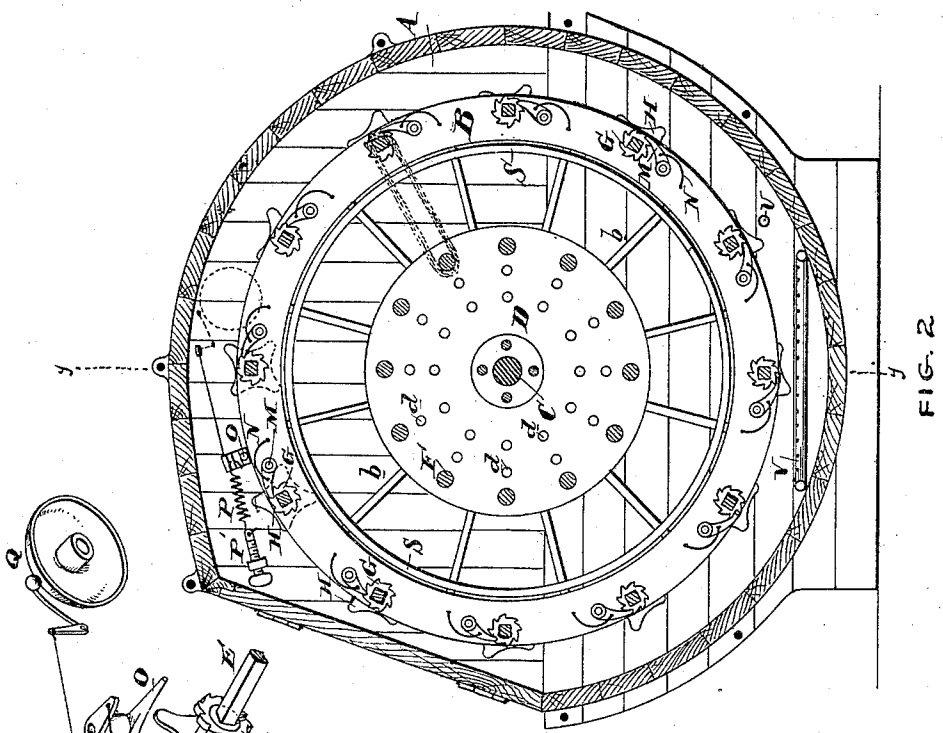


FIG. 2

FIG. 5

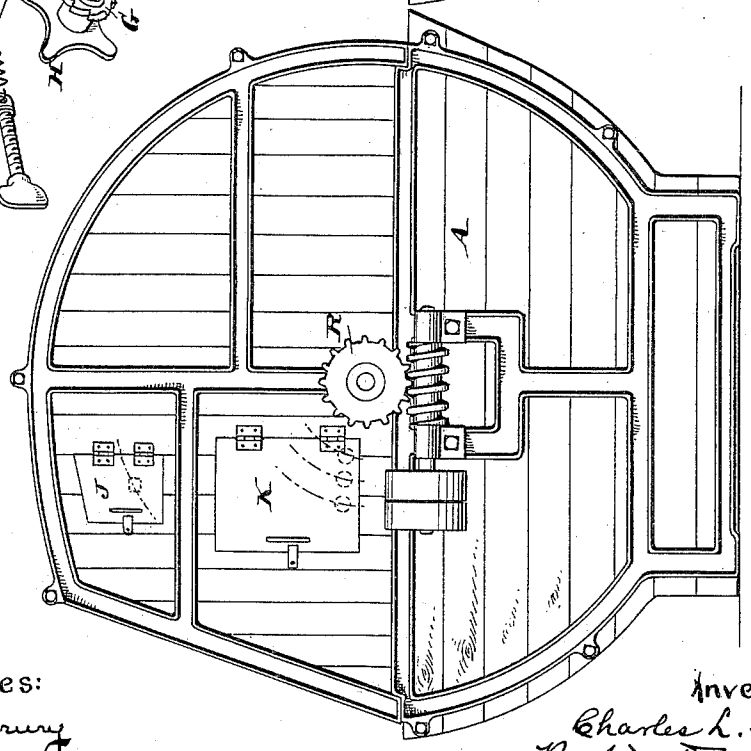


FIG. 1

Witnesses:
Henry Drury
C. M. Buckland

Inventor:
Charles L. Klauder
By his Attys
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N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

C. L. KLAUDER.

DYEING OR SCOURING MACHINE.

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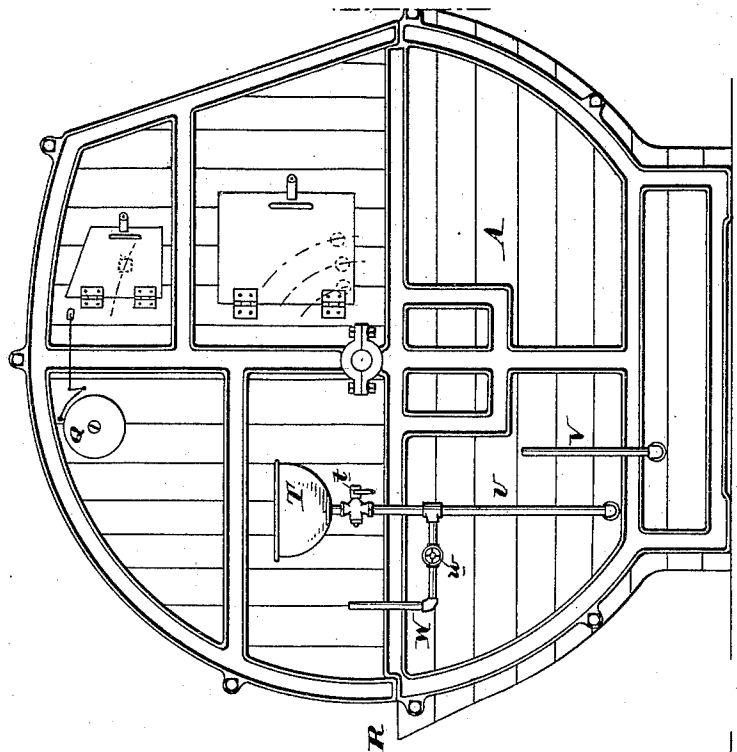


FIG. 4

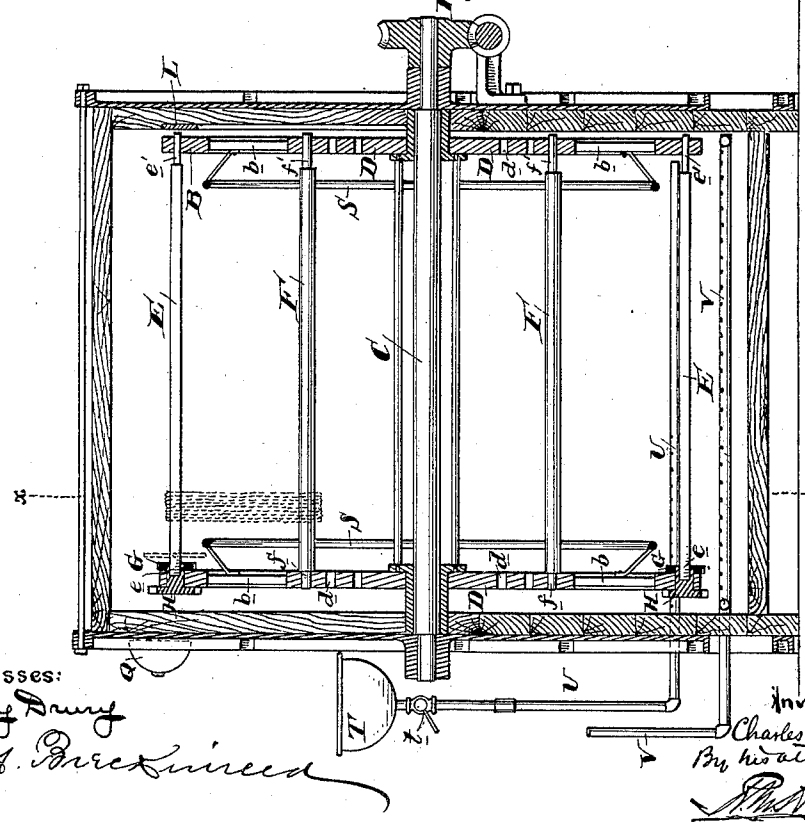


FIG. 3

Witnesses:
Henry Drury
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N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

CHARLES L. KLAUDER, OF PHILADELPHIA, PENNSYLVANIA.

DYEING OR SCOURING MACHINE.

SPECIFICATION forming part of Letters Patent No. 411,504, dated September 24, 1889.

Application filed September 17, 1888. Serial No. 285,587. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. KLAUDER, of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Dyeing or Scouring Machines, of which the following is a specification.

My invention relates to machines for dyeing or scouring yarns; and it consists of certain improvements, which are fully set forth in the following specification, and shown in the accompanying drawings, which form part thereof.

The object of my invention is to accomplish in a simple and inexpensive manner what has heretofore been done by hand in a very laborious process; and to this end my invention consists of certain improvements upon the dyeing or scouring machine exhibited in Letters Patent No. 377,393, granted to me on the 7th day of February, 1888. In that machine the yarn is supported upon transverse bars in a suitable frame or wheel, which is adapted to rotate to move the yarn into and out of the dye-liquor, and to insure all portions of the yarn being treated alike one at least of the transverse bars is caused to rotate slowly and thereby shift the position of the yarn. In order to suit the supporting-bars to skeins of different lengths it is necessary that they be made adjustable to or from each other. To accomplish this more easily and simply and also to more readily produce the desired rotation of the transverse support or bar to shift the position of the yarn this invention is particularly intended, as well as embodying certain other improvements hereinafter set out. It not infrequently happens that the yarn becomes caught in this rotating mechanism, or through some other accident the rotation of the transverse bar or support is not accomplished and the yarn shifted. By my improvements herein set out, when this occurs, an alarm is sounded, so that the attention of the operator is directed to the machine and he may at once correct the fault. These and other improvements are more fully set forth and disclosed in the description of the drawings.

Figure 1 is a side elevation of my improved dyeing or scouring machine. Fig. 2 is a sectional view of the same through the line *x x* of Fig. 3. Fig. 3 is a cross-sectional view of the same through the line *y y* of Fig. 2. Fig. 4 is a side elevation showing the opposite side to that shown in Fig. 1, and Fig. 5 is a perspective view of the mechanism for rotating the transverse bar and the alarm detached from the machine.

A is the main body or casing of the machine, the lower portion of which constitutes the dye-vat and contains the liquor. Journaled in this vat is an axle C, to which are secured two wheels or lateral frames B B, having the arms *b* and the central or disk portions D. Supported by and between these frames B are the transverse bars or rollers E and F, preferably arranged in two series and concentric with the axle C. The outer series of rollers or transverse bars E are preferably polygonal in shape, so as to more readily move the yarn, which is stretched upon them. The ends of these bars E are made with journals *e e'*, which fit into the frame B.

Loosely journaled in the frame B are the ratchet G and star-wheel H, preferably arranged on opposite faces of one side of the frame B and connected so that a turning of the star-wheel H will produce a similar turning of the ratchet G. In this ratchet G is journaled the end *e* of the bar E, so that a turning of the star-wheel H will turn the bar E. The journaled ends *e'* of the bars E fit in the opposite side of the frame B. To insert these bars into the frame the journal or end *e'* is first thrust into the bearing adapted to receive it in the frame B, and the bar is moved until the journal or end *e* comes within its bearing in the ratchet G, when it is shifted into the position shown in Fig. 3. By this means the bar may be easily removed for the purpose of changing the skeins of yarn. As, however, I prefer to construct my machine closed, as shown, it is necessary to provide doors J and K in the upper half of the machine, located in the line of travel of the ends of the bars or supports, to allow room for their removal in the manner above described. It is also apparent that the particular location of the star-wheel H and ratchet G may be varied from that shown. Nor is it necessary that the star-wheels H be used at all, though I prefer this construction; but

in place thereof pins or projections upon the transverse bars E, similar to those shown in Letters Patent No. 377,393, might be used in connection with the pivoted spring-stop O, hereinafter described. (See dotted lines, Fig. 3.) The inner set of bars F is also provided with journals *f* and *f'*, by which they are inserted in the bearings *d* on the disk portions D; and to readily accomplish the adjustment of these bars to or from the bars E to suit the skeins of different lengths I provide the disk portions D of the frames B with concentric series of these bearings *d*, so that by changing the bars F from one set of bearings to another the distance from the bars E may be increased or diminished, as desired. These bars F are inserted and removed in a manner similar to the bars E with the assistance of the door K. Ordinarily the bars E and F cannot be removed or become loosened from the frame B, one side of which is located near the side of the main casing A, which acts as a guide for the bars and does not give sufficient space for them to work loose or be removed except through the agency of the doors J and K.

L is a guide-plate, which may be secured on the upper portion of the interior of the main casing A to guide the ends of the bars E in their rotation out of the dye-liquor. This guide L presents a smooth surface to the ends of the cross-bars, whereas the sides of the case are inclined to be rough, and thus interfere with the easy travel of the cross-bars.

M are pawls pivoted on the frame B and adapted to engage in the ratchets G to prevent the turning of the star-wheels H and the transverse bars E in the opposite or backward direction. N are springs attached to these pawls to force them normally against the ratchets G.

O is a pivoted stop in the main casing A immediately above the frame B and in the path of the star-wheels H, the projections of which come in contact with it. Attached to this stop is a spring P, which normally holds the stop in position, but allows it to be moved or pushed by the projections of the star-wheel H to prevent breakage, if by any means the wheel is caught and cannot rotate. A lug upon the base of the stop prevents the spring drawing it out of the line of the star-wheel projections.

P' is an adjusting-screw by which the tension of the spring may be regulated.

Extending from the pivoted stop O is an arm *o*, having a connection with a bell Q, so that when the stop O is moved the arm or extension *o*, being also moved, operates the bell-hammer to sound the alarm and indicates that the bar E has not rotated. While I prefer a bell or gong such as shown for this purpose, it is apparent that any other suitable means might be used, operated by the pivoted stop O, to indicate the failure of a transverse bar E to rotate, without in any way departing from my invention. It will be seen that as the frame B rotates each of the bars E in turn comes under the stop O, and the projections of the star-wheel coming in contact with the stop will be rotated, so that these bars E will have an intermittent rotation during their travel around the axis C. If, however, the yarn becomes tangled, so as to prevent the rotation of the bar E when the projection of the star-wheel H comes in contact with the stop O, it will not be rotated by it, but will overcome the tension of the spring O and push over or past the stop, thereby sounding the alarm, as heretofore stated. The operator may then open the door in the front of the machine, and, observing the fault, may stop the rotation of the skein-carrying frame B and correct it. The rotation of this frame B is accomplished by a worm and worm-wheel gearing R, or by any other suitable means. To prevent the yarn slipping to the ends of the bars E and F and thus becoming tangled with them and preventing their rotation, circular guides S may be secured on the inner sides of the frames B.

T is a tank for the dye-liquor, provided with a valve *t* and leading into the dye-vat through a pipe U, whereby the liquor is introduced.

V is a steam-pipe, which may be arranged at the bottom of the tank or vat to heat the liquor by forcing steam through it. A pipe W, having a valve *w*, may also be used opening into the pipe U, through which steam or air may be blown into the vat with the dye-liquor from the tank T.

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

1. In a dyeing or scouring machine, the combination of a dye or liquor tank, a frame partly supported therein, inner and outer sets of cross-bars carried by the frame upon which the skeins of yarn to be treated are hung, one of said sets of bars being adapted to rotate to gradually turn the yarn, projections moved with said rotatable cross-bars, a pivoted stop in the path of said projections, and a spring to normally hold said stop in position, whereby as the frame carries the cross-bars past the stop the projections thereof strike the stop and impart to the bar a portion of a revolution, but when the bar is not free to rotate the pivoted stop is pushed aside by said projection and returns again to its normal position after the projection has passed it.

2. In a dyeing or scouring machine, the combination of a dye or liquor tank, a frame partly supported therein, inner and outer sets of cross-bars carried by the frame upon which the skeins of yarn to be treated are hung, one of said sets of bars being adapted to rotate to gradually turn the yarn, projections moved with said rotatable cross-bars, a pivoted stop in the path of said projections, a spring to normally hold said stop in position, whereby as the frame carries the cross-bars past the

stop the projections thereof strike the stop and impart to the bar a portion of a revolution, but when the bar is not free to rotate the pivoted stop is pushed aside by said projection and returns again to its normal position after the projection has passed it, and an adjusting-screw to regulate the tension of said spring.

3. In a dyeing or scouring machine, the combination of a dye or liquor tank, a frame partly supported therein, inner and outer sets of cross-bars carried by the frame upon which the skeins of yarn to be treated are hung, one of said sets of bars being adapted to rotate to gradually turn the yarn, projections moved with said rotatable cross-bars, a pivoted stop in the path of said projections, a spring to normally hold said stop in position, whereby as the frame carries the cross-bars past the stop the projections thereof strike the stop and impart to the bar a portion of a revolution, but when the bar is not free to rotate the pivoted stop is pushed aside by said projection and returns again to its normal position after the projection has passed it, and an indicator operated by said pivoted stop when moved.

4. In a dyeing or scouring machine, the combination of a dye or liquor tank, a frame partly supported therein, inner and outer sets of cross-bars carried by the frame upon which the skeins of yarn to be treated are hung, one of said sets of bars being adapted to rotate to gradually turn the yarn, projections moved with said rotatable cross-bars, a pivoted stop in the path of said projection, a spring to normally hold said stop in position, whereby as the frame carries the cross-bars past the stop the projections thereof strike the stop and impart to the bar a portion of a revolution, but when the bar is not free to rotate the pivoted stop is pushed aside by said projection and returns again to its normal position after the projection has passed it, an alarm or indicator consisting of a gong and hammer, and a connection between said pivoted stop and hammer.

5. In a dyeing or scouring machine, the combination of a dye or liquor tank, a frame partly supported therein, inner and outer sets of cross-bars carried by the frame upon which the skeins of yarn to be treated are hung, one of said sets of bars being adapted to rotate to gradually turn the yarn, star-wheels loosely journaled in said frame acting as bearings for said rotatable cross-bars, a stop in the path of the projections of said star-wheels, whereby as the frame carries the cross-bars past the stop the projections of the star-wheels strike the stop and impart to the bar a portion of a revolution, ratchets connected with said star-wheels and rotating with them, and pawls upon the frame to engage in said ratchet to prevent backward rotation of the cross-bars.

6. The combination of a dye or liquor tank, a frame partly supported therein, inner and outer sets of cross-bars carried by the frame upon which the skeins of yarn to be treated are hung, and circular guides on the inner faces of said supporting-frame to keep the skeins away from said faces of the frame.

7. The combination of a dye or liquor tank, a frame partly supported therein, inner and outer sets of cross-bars carried by the frame upon which the skeins of yarn to be treated are hung, one of said sets of bars being adapted to rotate to gradually turn the yarn, suitable means to rotate the frame and move the cross-bars through the liquor, and an indicator operated by said rotatable cross-bars to indicate when through any accident one of said bars has not been rotated.

8. In a dyeing or scouring machine, the combination of a rotatable frame, inner and outer sets of cross-bars carried by said frame and removable therefrom and having their ends projecting through one end of said frame, upon which bars the yarn to be dyed or scoured is hung, a closed case for said rotating frame, the lower portion of which is adapted to contain the dye or other liquor, said case being provided with guiding-surfaces adjacent to the ends of said bars, and doors located in the said guide-surfaces and in the paths of the ends of said cross-bars, through which doors said bars may be inserted in or removed from said frame or adjusted in it.

9. In a dyeing or scouring machine, the combination of a rotating frame, supporting-bars for the yarn adapted to rotate and carried by said frame, a dye-vat for the liquor through which said supporting-bars are carried, and a spring-stop arranged in the path of said rotatable supporting-bars adapted to strike against them and impart to them a portion of a revolution, but, if any of said bars is not free to rotate, to be pushed aside and return again to its normal position after the bar has passed it.

10. The combination of the dye tank or vat, a rotating frame having journals therein, longitudinally-movable cross-bars for carrying the yarn, whereby they may be removed or inserted in the rotating frame, and a circular guide to prevent the longitudinal movement of the cross-bars to lock them in operative position on the rotating frame.

11. The combination of the dye tank or vat, a rotating frame having journals therein, longitudinally-movable cross-bars for carrying the yarn, whereby they may be removed or inserted in the rotating frame, a circular guide to prevent the longitudinal movement of the cross-bars to lock them in operative position on the rotating frame, and removable doors or sections formed in said guides to permit the removal of the cross-bars.

12. The combination of the dye-vat, a rotating frame, cross-bars journaled therein for holding the skeins of yarn and carrying them through the liquor in the vat, mechanism for rotating said cross-bars, and a gong or indicator to indicate when either of said cross-

bars becomes fast against rotation, and a connection between the gong or indicator and cross-bars adapted to be operated by the cross-bars.

13. The combination of the dye-vat, a rotating frame, cross-bars journaled therein for holding the skeins of yarn and carrying them through the liquor in the vat, mechanism for rotating said cross-bar, ratchet-wheels connected to and rotating with said cross-bars, and pawls to prevent backward movement to said ratchet-wheels.

In testimony of which invention I hereunto set my hand.

CHARLES L. KLAUDER.

Witnesses:

ERNEST HOWARD HUNTER,

E. M. BRECKINREED.