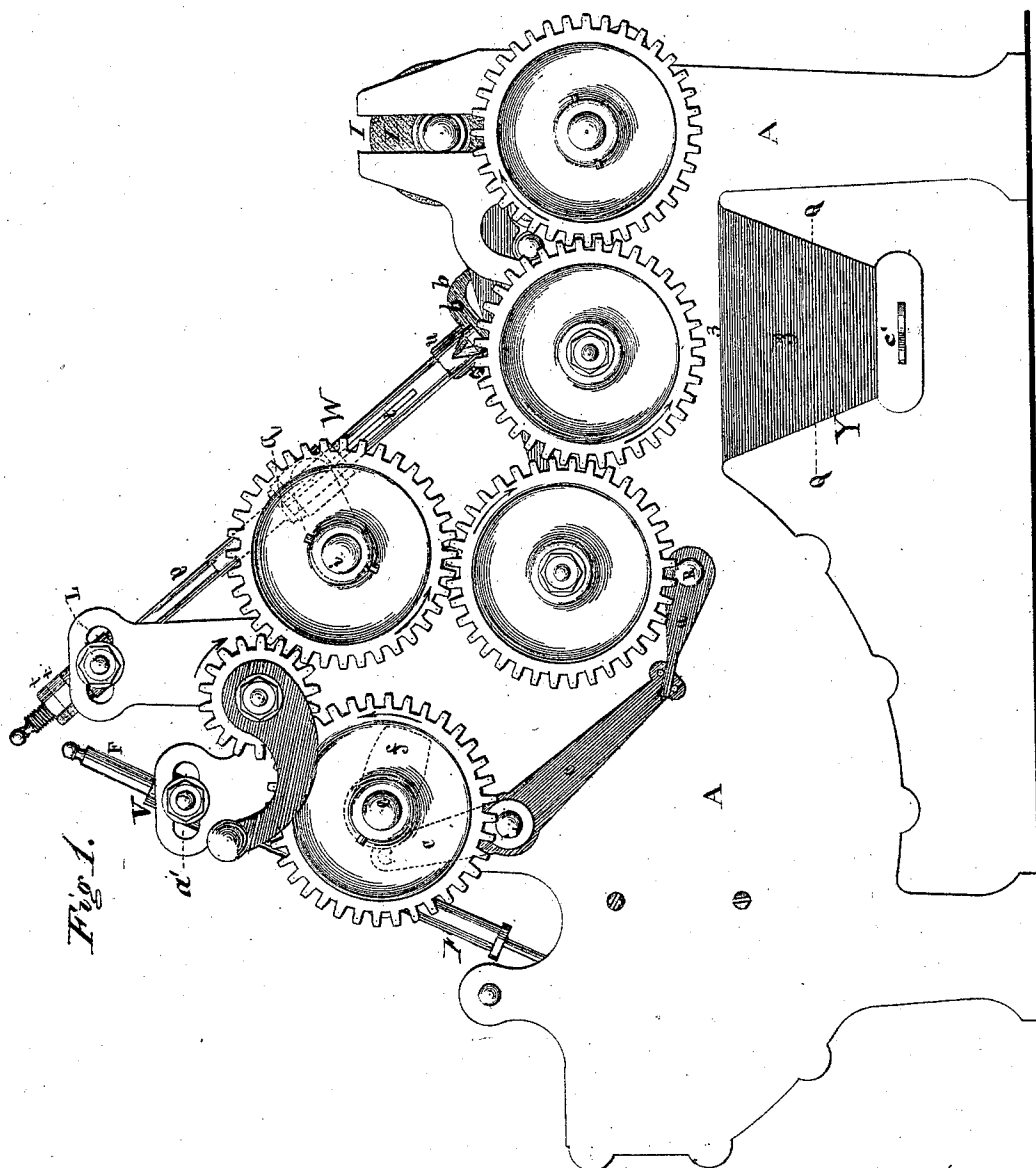


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Apparatus for Dyeing and Washing Fibrous Materials.

No. 134,935.

Patented Jan. 14, 1873.



Witnesses.

Harry King.
W. W. Dodge.

Inventor

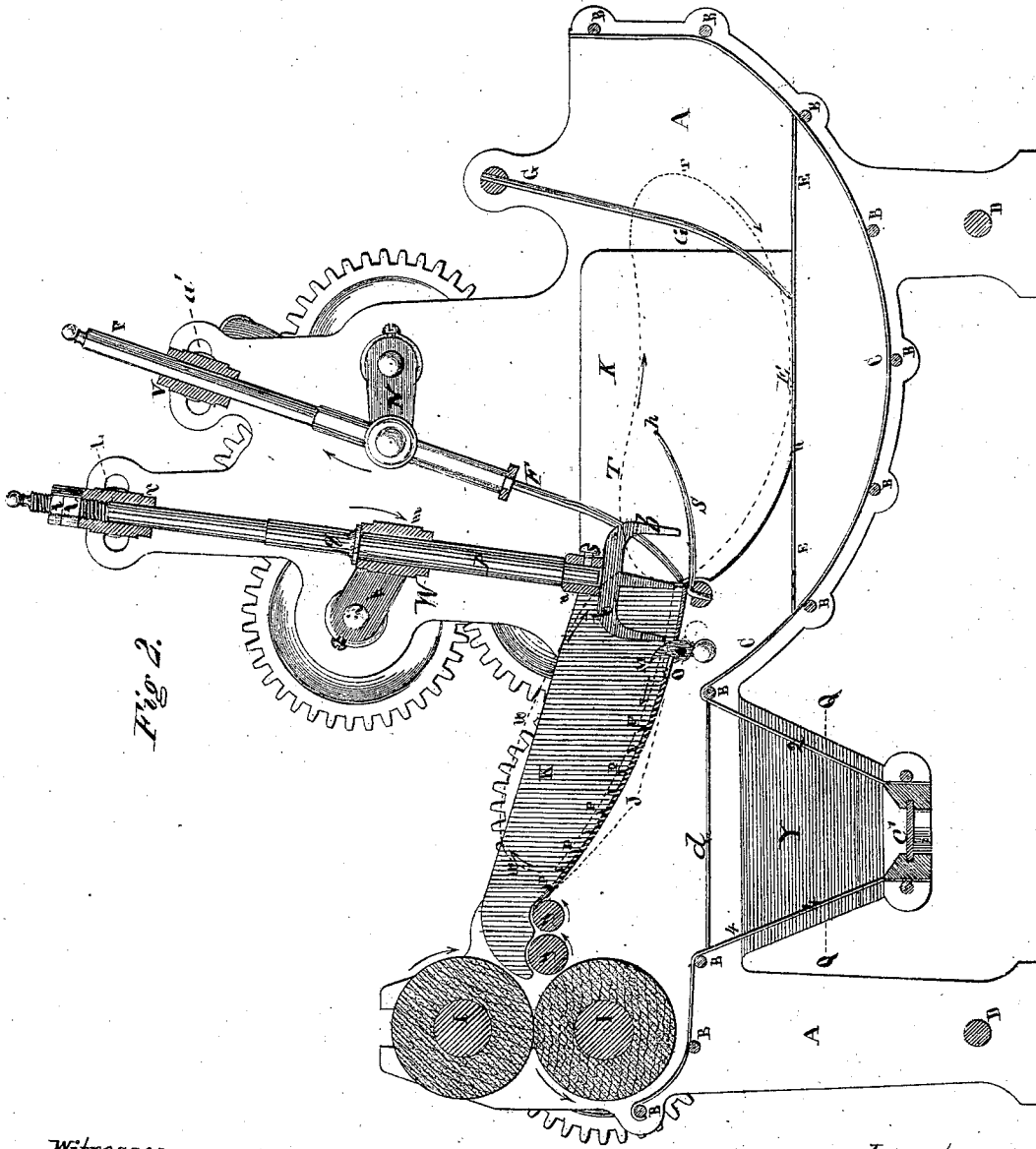
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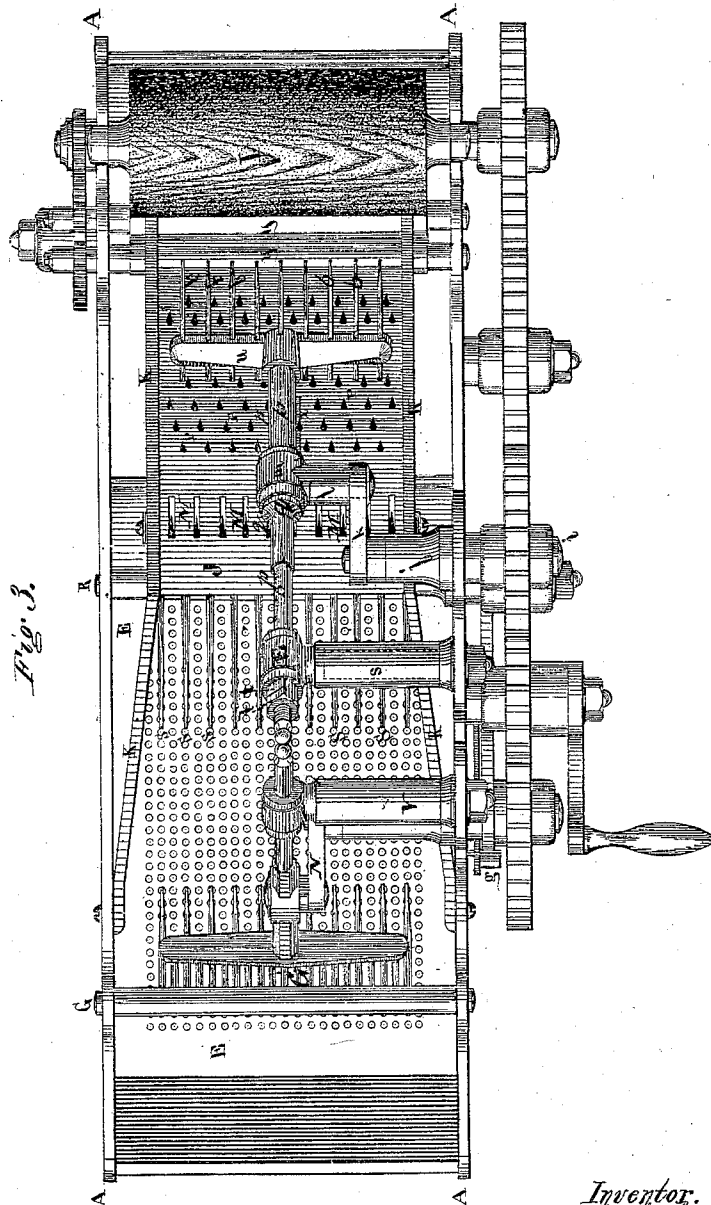
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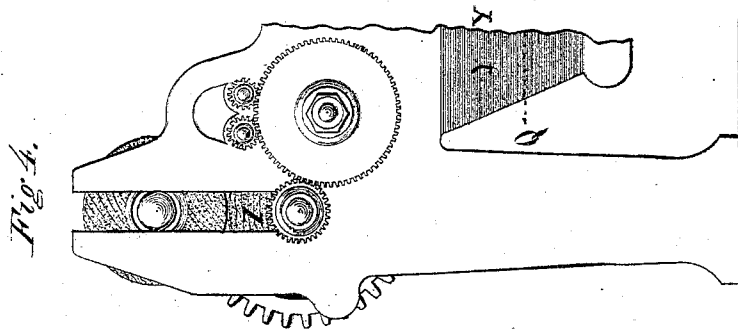
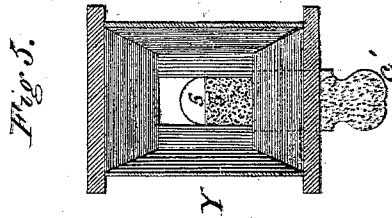
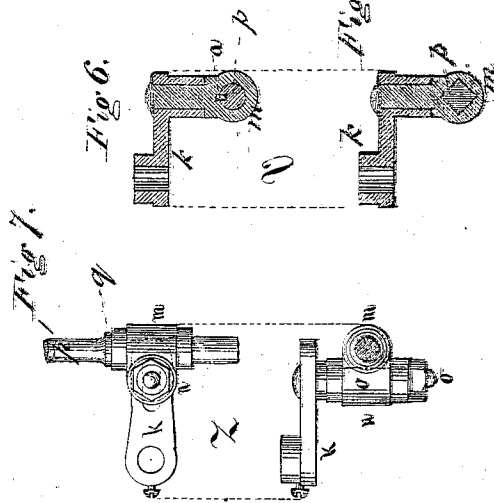
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UNITED STATES PATENT OFFICE.

CHARLES G. SARGENT, OF GRANITEVILLE, MASSACHUSETTS.

IMPROVEMENT IN APPARATUS FOR DYEING AND WASHING FIBROUS MATERIALS.

Specification forming part of Letters Patent No. 134,935, dated January 14, 1873.

To all whom it may concern:

Be it known that I, CHARLES G. SARGENT, of Graniteville, in the county of Middlesex and State of Massachusetts, have invented certain Improvements in Machines for Washing and Dyeing Fibrous Materials, of which the following is a specification:

My present invention relates to certain improvements in the machines for which I have heretofore obtained Letters Patent, but more especially upon the patent dated May 24, 1870, No. 103,506; and consists mainly in a novel arrangement of parts for conveying the fiber from the liquor to the squeezing-rolls; in conveying-rolls arranged to travel at different velocities to distribute the fiber and present it in a sheet to the squeezer-rolls; in a tank or vat arranged to receive and retain the heavy dirt pressed from the fiber by the squeezing-rolls, so as to prevent it from passing back into the washing or dyeing liquor; in providing the stirrer-rake with an adjustable fulcrum; and in various other minor details, as hereinafter described.

Figure 1 is a side elevation of my improved machine, looking from the right hand. Fig. 2 is a longitudinal vertical section of the machine, looking from the left hand. Fig. 3 is a top-plan view of the machine; and Figs. 4, 5, 6, 7, and 8, detail views hereinafter more fully described.

In constructing my present machine, I first build the frame or body by taking suitably-shaped side plates A and clamping them firmly and tightly against the edges of a curved bottom plate, C, by means of transverse rods or bolts B, as shown in Fig. 2. The rods, besides serving to hold the body together, form braces or girts to stiffen it and supports for the bottom plate. The side plates, in connection with the bottom, form a tank, or, as it is technically called, a bowl, to contain the washing or dyeing liquor. From one end of the machine nearly to the other the bottom is made of a concave form, and above it there is mounted a horizontal perforated false bottom, E, which serves to support the fiber, while at the same time it permits the dirt and impure matters removed therefrom to pass through into the space below. In the bowl, near one end, I mount the hanging rake G, pivoted at its upper end, so that the fiber introduced on

its outer side may be drawn through under it by the stirrer-rake, as heretofore. The stirrer-rake F is also constructed as in my last machine, except that the fulcrum at its upper end is made adjustable. The rake consists simply of a rod or arm provided at its lower end with tines or teeth, mounted at its middle on a crank, N, and arranged to slide at its upper end through a sleeve, V, as shown in Fig. 2. When the crank is rotated the teeth of the rake are caused to describe the course indicated by dotted lines, so as to pass between the teeth of the stationary rake G and draw the fiber thereunder and carry it through the liquor to the opposite end of the bowl.

As I have found in practice that it is sometimes necessary to vary slightly the movement of this rake, I mount the journal on which its fulcrum or sleeve V turns in a horizontal slot, *a'*, as shown in Fig. 2, and secure it by a nut, so that it may be adjusted sidewise.

In the rear end of the frame I mount, as before, the squeezing-rolls I to press the liquor from the fiber as it leaves the machine. Between these rolls and the body of the bowl I mount an inclined chute, J, having raised sides K to support and guide the fiber from the bowl or tank to the squeezing-rolls. The lower end of the chute is above the false bottom of the bowl, and I therefore provide at its lower end an inclined rake or grate, S, which extends from the edge of the chute down against the false bottom E, as shown, for the purpose of supporting the fiber and guiding it up onto the chute as the carrier-rake moves it forward, as hereinafter described. The rake or grate S consists of a transverse shaft having one side flattened, and the ends of the teeth secured to said side in any suitable manner. By thus flattening the shaft and attaching the teeth I am enabled to set the upper ends of the teeth up in close contact with the edge of the chute, so that the fiber will pass over thereon without catching at the edge. The rake S is so curved and located that the teeth or tines of the stirrer-rake F pass closely over and at a uniform distance from its face, as shown by the dotted lines in Fig. 2, so that as the stirrer-rake moves forward it carries the fiber before it up the rake S onto the lower end of the chute J, where it is seized by the carrier-rake and conveyed to the squeezing-rolls, as here-

inafter explained. The rake or grate S may be made stationary; but it is preferred to have it turn up just as the stirrer-rake finishes its stroke and delivers the fiber onto the chute, as shown in Fig. 2. In order to thus operate the rake S, I provide one of the outer ends of its shaft with an arm, *a*, and connect said arm to the end of a lever, *c*, which is pivoted on the outside of the body, and tripped at the proper intervals by a cam, *f*, attached to the shaft of crank N. When the cam trips the lever *c* it in turn moves the arm *a* and turns the shaft of the rake so as to raise the teeth. For the purpose of taking the fiber as it is delivered onto the lower end of the chute by the stirrer-rake F and conveying it to the squeezing-rolls I provide a carrier-rake, W, as shown in Figs. 1 and 2. The rake consists essentially of a rod or lever, *q*, which is provided at its lower end with teeth or tines *b*, mounted at its upper end so as to slide in a pivoted sleeve or bearing, L, and operated by a loose sleeve, *m*, which encircles its middle, and is pivoted to a crank, *k*, as shown. The rake lever or rod *p* is provided at its middle with a shoulder, *g*, and on its upper end with a pair of jam-nuts, *t*, as shown in Fig. 2. During the lower half of the revolution of crank *k* the rake-lever is sustained from the pivoted sleeve L by the nuts *t* bearing thereon, while the sleeve *m* slides downward on the lever, and swings it forward so as to carry the teeth *b* up over the face of the chute J. During the upper half of the crank's revolution it lifts the sleeve *m* so as to bear under the shoulder *g* and raise the rake from the face of the chute and at the same time carry it backward to the lower end of the same. Thus it will be seen that the rake-teeth *b* are carried upward close to the face of the chute so as to take the fiber from the rake F to the rolls, and then raised and carried back at a considerable distance above the face so as not to carry back the fiber that may chance to be lying thereon. The course described by the rake-teeth is clearly shown in Fig. 2 by the dotted lines.

It will be observed that while the rake is passing upward over the face of the chute it swings from the pivot of sleeve L as a center, and that consequently the teeth move in the arc of a circle.

In order that the teeth, during their upward movement, may swing parallel with the face of the chute, I curve its face in the arc of a circle from the point that the rake swings on—that is to say, the center or pivot of the sleeve L. By thus arranging the parts I am enabled to adjust the rake as close to the face of the chute or the teeth thereon as desired, without there being any danger of the rake striking them. The crank *k* of the rake has its shaft supported in a pipe-box, *j*, which affords it a firm support. The crank is provided at its end with a hollow wrist or sleeve, *l*, and the sleeve *m* on the rake-lever provided with an arm or journal which extends through said wrist, as shown in Figs. 3 and 6.

Instead, however, of this arrangement, the crank may be provided with a solid wrist, *o*, extending through a boss or sleeve, *n*, on the side of sleeve *m*, as shown in Fig. 8. The two sleeves *m* and *n* are formed in one piece, and constitute what is known as a right-angled box. In this last arrangement the wrist may be made adjustable in a slot, as shown, in order to allow the throw of the rake to be varied in length. In order to prevent the rake-head from turning out of position it may be provided with a spline or made square where it passes through the sleeve *m*. The sleeve L which guides the upper end of the rake-lever is provided with a hub or boss, which is mounted on a stud, *s*, as shown in Fig. 3. The stud is mounted in a slot and held by a nut so that it may be adjusted laterally to vary the stroke of the rake. The teeth *b* of the rake consist of plates each having three teeth arranged crosswise on the rake-head, as shown. The teeth may be constructed and arranged in any other suitable manner, if preferred.

In order to prevent the fiber that may lodge on the chute from passing back into the tank or bowl I provide the upper portion of the chute with numerous fixed pointed teeth P, and its lower edge with a row of pivoted and weighted teeth or dogs, M. All the teeth, both the stationary and the pivoted ones, are inclined or rounded in the direction in which the fiber is to be carried, so that while they permit it to pass freely upward they effectually prevent it from passing backward into the bowl or tank. Each of the pivoted teeth is mounted in a slot, O, and is provided on its lower end, below the pivot, with a weight, which serves to hold it, in an upright position, so that its upper pointed end projects above the face of the chute, as shown in Figs. 2 and 3. In case of a strong pressure of the fiber upward toward the squeezing-rolls the pivoted teeth turn down out of the way in order to give it a free passage; but in case the fiber is drawn backward it engages with the teeth and turns them up so that they lock against the ends of the slots and offer a strong resistance. The entire row of pivoted teeth is, for the sake of cheapness and convenience, mounted on a single rod, as shown. If found desirable, two or more rows of the teeth may be used. At the upper end of the chute, between it and the squeezing-rolls, I mount two or more horizontal conveying-rolls, *y*, which take the fiber from the end of the chute and convey it between the squeezing-rolls. Each of these rolls, passing from the chute toward the squeezers, is arranged so that its surface travels faster than that of the one next before, so that as the fiber passes from one to another it is drawn out and spread into a sheet, in which form it passes between the squeezing-rolls. The different velocities of the roller-surfaces may be attained by using rollers of the same size and driving them at different rates of speed, or by using rollers of different sizes and driving them at a uniform

speed. In the present machine the rolls are made of different sizes, as shown in Fig. 2, and driven by pinions of equal size from one and the same gear-wheel, as shown in Figs. 3 and 4. The gear-wheel which drives the roller-pinions is operated by a pinion on the lower squeezer-roll, as shown in Figs. 3 and 4. The squeezer-roll is driven by the train of gearing of the machine, in the same manner as heretofore. In order to prevent the coarse particles of dirt contained in the water removed by the squeezing-rolls from passing back into the body of liquor in the bowl or tank, I mount a tank or receptacle, Y, below the chute J, between the squeezing-rolls and the main tank or bowl. The water removed by the squeezing-rolls flows down into this receptacle, and deposits the coarse dirt and impurities therein. The receptacle is made in the form of a hopper, with its sides inclining inward to a mouth or throat at the bottom. The mouth is closed by a slide or gate, *c'*, as shown in Figs. 2 and 5, by opening which the dirt and sediment may be discharged. In order to prevent the fiber that may be contained in the water from passing down into the receptacle Y, I place over its top a perforated plate or cover, *d'*, as shown in Fig. 2.

Having thus described my invention, what I claim is—

1. The lifting-rake S, arranged at the foot of the inclined chute J, as and for the purposes set forth.

2. The inclined chute J, provided with the

fixed inclined teeth or projections P, substantially as shown and described.

3. The pivoted weighted teeth M, mounted in slots in the chute J, substantially as shown and described.

4. The curved chute J, in combination with the swinging carrier-rake W, for conveying the fiber toward the squeezing-rolls.

5. The rake-lever *p*, having its upper end mounted in the sleeve L and provided with the nuts *t*, and its middle provided with the shoulder *g*, in combination with the sleeve *m* attached to crank *k*, as shown and described.

6. The carrier-rake W, in combination with the curved chute J having fixed inclined teeth, the stirring-rake F, and the squeezing-rolls I.

7. The combination of the stirring-rake F, lifting-rake S, chute J, carrier-rake W, and squeezing-rolls I.

8. The conveying-rolls *y*, having their surfaces arranged to travel at different rates of speed, as and for the purpose set forth.

9. The tank or receptacle Y, arranged below the chute, between the main tank or bowl and the squeezing-rolls, as and for the purpose set forth.

10. The rakes F and W, having the sleeves which support their upper ends made adjustable laterally, as described.

CHAS. G. SARGENT.

Witnesses:

JOHN. W. ABBOT,
SILAS H. JAQUES.