

(No Model.)

2 Sheets—Sheet 1.

C. T. CLEGG
APPARATUS FOR BLEACHING AND DYEING.

No. 507,995.

Patented Nov. 7, 1893.

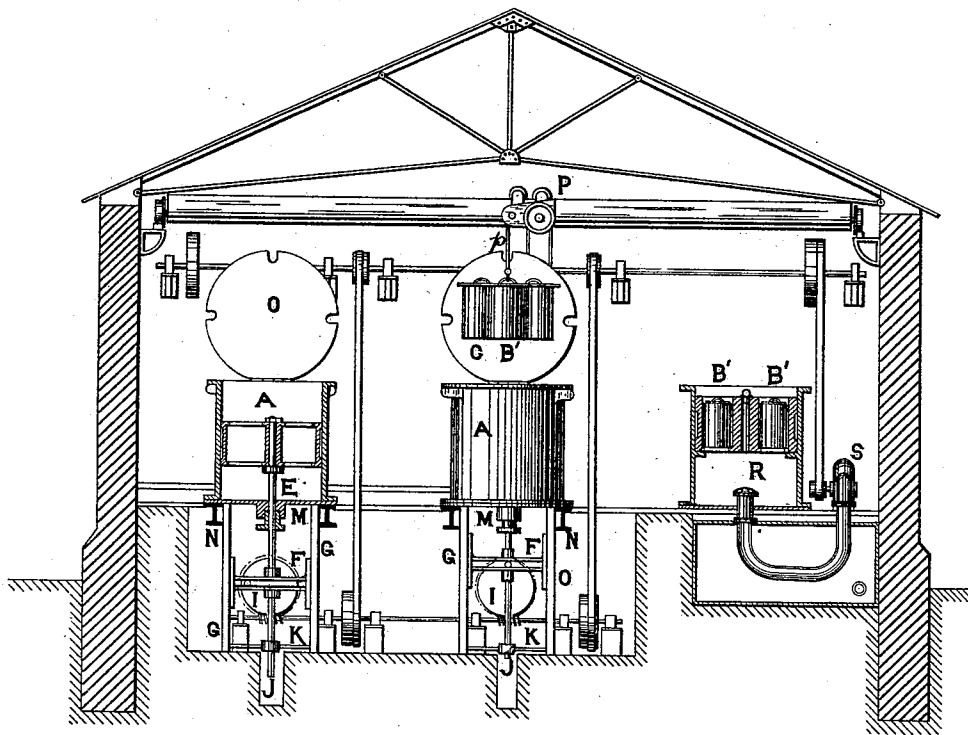


FIG. 1.

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Attys.

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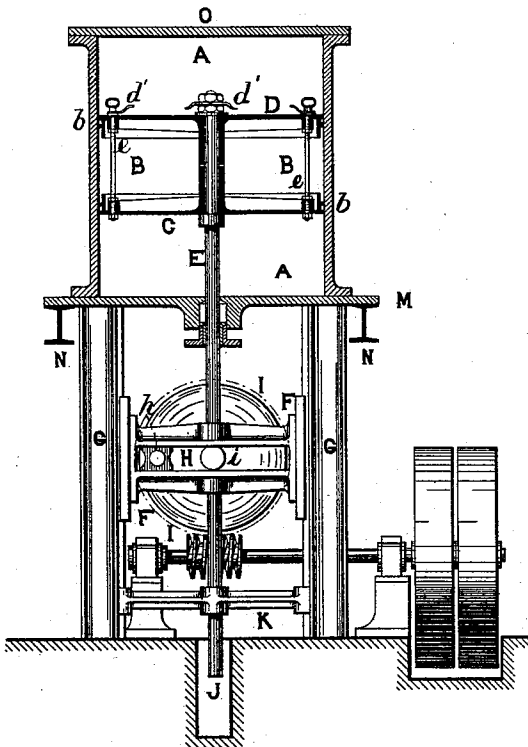


FIG. 3.

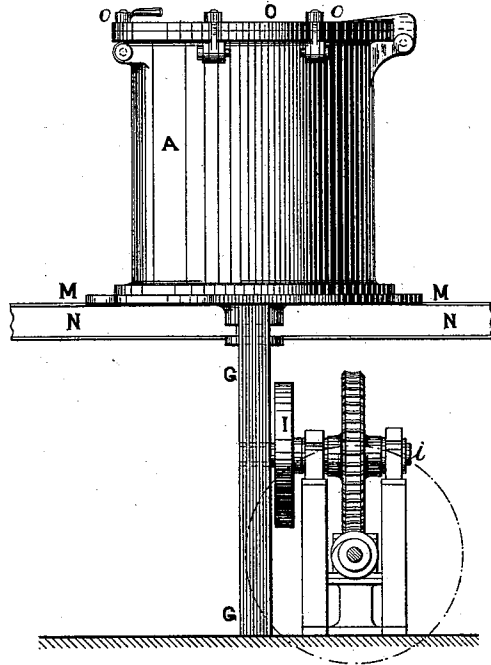


FIG. 2.

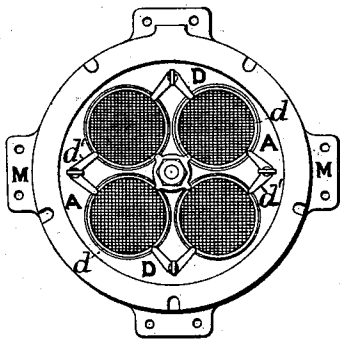
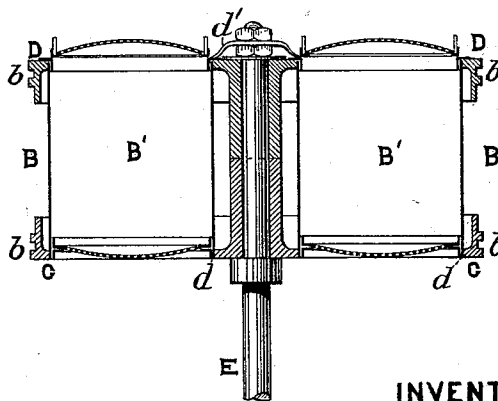


FIG. 4.

FIG. 5.



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UNITED STATES PATENT OFFICE.

CHARLES THEO. CLEGG, OF MANCHESTER, ENGLAND.

APPARATUS FOR BLEACHING AND DYEING.

SPECIFICATION forming part of Letters Patent No. 507,995, dated November 7, 1893.

Application filed July 14, 1891. Serial No. 399,464. (No model.) Patented in England September 17, 1887, No. 12,602; in Germany December 14, 1887, No. 44,367; in Belgium December 14, 1887, No. 79,901, and in Austria-Hungary February 27, 1889, No. 37,288 and No. 59,757.

To all whom it may concern:

Be it known that I, CHARLES THEODORE CLEGG, a subject of the Queen of England, residing at Manchester, in the county of Lancaster, England, have invented certain new and useful Improvements in Apparatus for Dyeing, Scouring, Bleaching, or Boiling Wool, Cotton, Silk, Flax, Rhea, or other Similar Fibrous Material, (for which I have obtained Letters Patent in England, No. 12,602, dated September 17, 1887; in Germany, No. 44,367, dated December 14, 1887; in Belgium, No. 79,901, dated December 14, 1887, and in Austria-Hungary, No. 37,288 and No. 59,757, dated February 27, 1889,) of which the following is a specification.

This invention is chiefly designed for dyeing wool when wound or rolled into balls or bundles in the form known as "tops." It is also, however, applicable for dyeing, bleaching, scouring or otherwise treating wool, silk, cotton, flax, rhea or other fibrous or textile material when in any state either raw or partially manufactured such as yarn or piece goods, and for treating such materials with other liquids for scouring, bleaching, washing, or other purposes for which they are at present treated in the course of manufacture or preparation therefor. In apparatus at present in use for the purpose it is customary either to allow the dye liquor to soak into the mass while the latter is being agitated in a vat or to force it through the material under pressure by means of a pump or the like while the material is at rest. Of these two the former is a slow and tedious and the latter a more or less costly or expensive method.

This invention consists essentially of a machine,—in which fibrous or textile materials are treated or saturated by dye or other liquors,—wherein the material is carried or caused to pass to and fro through the liquor in such a way that the liquor is forced or caused to pass through the material as it is displaced by the movement of the carrier the reciprocating movement being transmitted thereto by an eccentric or crank device, by the reciprocating rod of a piston and steam cylinder or by other suitable mechanism.

Referring to the annexed drawings, Figure 1. shows an elevation partly in section of a dye house fitted with the machine. Fig. 2. is a front elevation of the apparatus; Fig. 3. a

sectional elevation; Fig. 4. a plan with lid removed; Fig. 5. a sectional elevation through the bucket which holds the material, drawn to an enlarged scale.

The apparatus is constructed with a tank or chamber A to receive the liquor, preferably cylindrical in shape as shown though that is not essential as it may be octagonal or rectangular if desired, and may be made of cast iron, copper, wood, or other material suitable to withstand any chemical action of the liquor which it is intended for. Internally the chamber is fitted to receive a movable cage or carrier B which is made to fit closely to the sides of the chamber. In the machine shown the carrier B is in the form of a double piston packed tightly at B to prevent the passage of the liquor between it and the sides of the chamber A. The piston B forms a carrier for the material. It may be formed in several ways either to carry the material packed inside it or to receive small buckets, boxes, cages, or trays into or upon which the material is packed. The latter is the way I prefer for dyeing wool, and is that shown in the drawings. The bottom plate C and top plate D of the carrier B are made of metal preferably cast in the shape shown and fitted to the central shaft or piston rod E. They are made separately for convenience and are secured together by the rods or distance pieces *e*. The plates C and D are fitted with holes *d* to receive the buckets or boxes B' Fig. 5 into which the wool "tops" are packed. The buckets B' are formed with perforated ends to allow free passage of the liquor through them, the top being removable to allow of the insertion of the material. These buckets are packed with the material and then placed in the piston carrier B and a catch *d'* placed on top to secure them in position. The buckets B' are made with plain metallic sides and fit closely into the holes *d* in the respective plates C, D, so that as the piston carrier B moves to and fro in the chamber A the liquor as it is displaced is forced directly through the material in the buckets.

The apparatus although primarily designed for the dyeing of wool may also be used for the dyeing of other materials, or for treating other fibrous or textile materials for bleaching, scouring, washing, or other purposes, and

would answer among other things for the treatment of rhea, china grass, and similar fibers with chemical liquors for removal of the gum and resin from the stalks preparatory to being manufactured.

In the dyeing of wool "tops" the material should be tightly packed into the buckets B'. For the treating of other materials the material may be packed directly into the piston carrier or the carrier may be otherwise formed with vertical or horizontal compartments wherein are placed cages or trays into or upon which the material may be placed. The top and bottom plates C and D of the carrier would then be made perforated.

The carrier B has a reciprocating movement in the chamber A. A suitable arrangement of mechanism for giving movement to it is shown in the drawings. To the lower end of the piston rod E is attached a cross head F sliding in guides G. The cross head is formed with a slide block H working in it. The slide block receives a crank pin *h* on the face of a disk I which revolves with the shaft *i*. The rotary movement of the shaft thus gives to the rod E and carrier B a reciprocating motion. The guide rod J passes downward into the guide bracket K to give steadiness to the movement of the cross head.

Other arrangements of mechanism for communicating the required movement to the carrier B will readily suggest themselves to the mind of the engineer such as an ordinary eccentric, or a revolving screw, or it may be connected to a reciprocating beam or direct to the rod of a piston working in a steam cylinder similar to what are used in steam hammers. On the admission of steam the piston would travel slowly and by means of suitable valve gear or connecting levers the valves would be moved and the admission of steam reversed at each stroke.

To heat the liquor in the chamber A steam may be admitted to the interior, or the tank may be provided with a steam jacket or a coil of pipes through which steam will be passed.

The apparatus may be constructed precisely as shown with the chamber or tank A placed vertically on the bed or base plate M, and secured to the brickwork pillars or supports N with the actuating mechanism placed below it, and this construction I prefer as it allows of the tank A being opened at top. It is inclosed by a plate or cover O held in position by the screws *o*. Instead of this arrangement, however, it is evident that the actuating mechanism may be placed above the tank A and actuate the carrier B from above, or the apparatus may be arranged so that the carrier may work horizontally.

To raise the lid O a small crab or winch P may be placed in any convenient position or affixed to the side of the chamber A and provided with a chain *p* passing down over a pulley. The same winch may be employed for lifting the buckets B' in and out.

In operation the apparatus is simple. A single chamber may be used or two or more may be constructed side by side and if desired the liquor may be run from one to the other or the material when treated in one may be removed to the next. If the chambers A are all of one size the carrier B may be lifted out of one and with the material it contained removed to the next. The material, or the buckets, cages, or trays containing the material to be treated in the apparatus are packed into the carrier B and the tank A filled with the liquor. The materials are so packed that the liquor must pass through them and not at the sides. The actuating mechanism is set in motion and the piston carrier B caused to move slowly to and fro through the liquor in the tank A. The piston B is packed at *b* against the sides of the tank and as it travels it displaces the liquor and forces it direct through the material. The operation is quickly completed as the liquor soon penetrates and reaches each part of the material and may then be placed in another chamber R where moisture is drawn off by a fan S. The material or the buckets or cages containing it are then removed from the piston carrier and a fresh charge packed in.

It is to be understood that I do not claim broadly the dyeing or treating of fibrous materials by forcing a liquor through them or by immersing or agitating them in the liquor; but

What I desire to claim and secure by Letters Patent is—

1. In apparatus for dyeing bleaching scouring or boiling wool silk cotton flax rhea or other fibrous material the combination with the tank A to contain the liquor of the reciprocating piston carrier B fitting closely to the sides of the tank and packed tightly therein to prevent any flow of liquor between the piston and sides of the tank, the buckets B' to receive the material which fit into the piston carrier B and the top and bottom plates C and D which hold the buckets B' substantially as described.

2. In apparatus for treating fibrous material with dye or other liquor the combination with the liquor containing tank A and reciprocating carrier piston B of the buckets B' which receive the material the top and bottom plates C, D provided with holes *d* into which the buckets B' fit the central shaft or piston rod E the rods or distance pieces *e* and the catch *d'* substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

C. THEO. CLEGG.

Witnesses:

I. OWDEN O'BRIEN,
CHAS. OVENDALE.