No. 676,151. Patented June 11, 1901.

E. E. PLANTROU.

APPARATUS FOR DYEING.

(Application filed July 26, 1899.)

(No Model.)

Fig. 1.

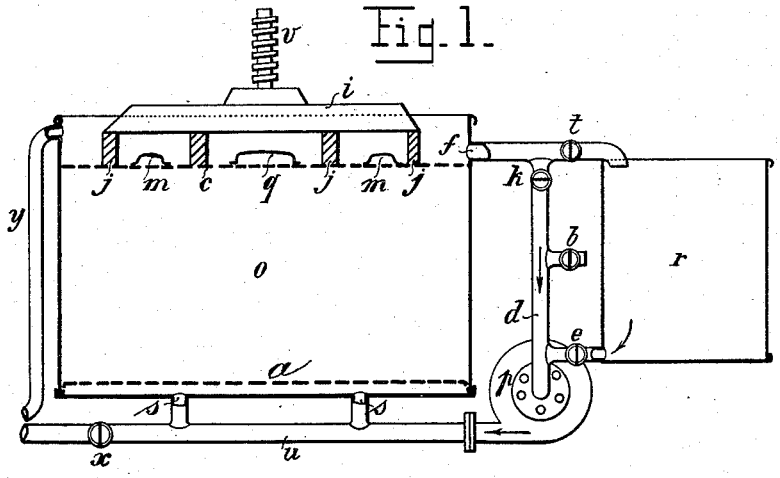


Fig. 2.

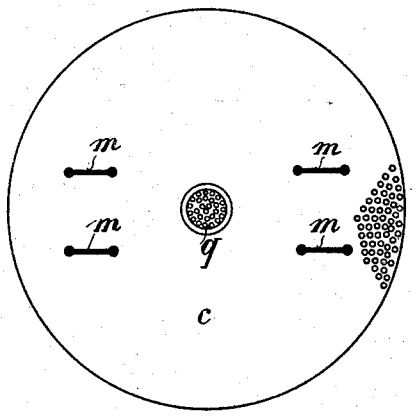
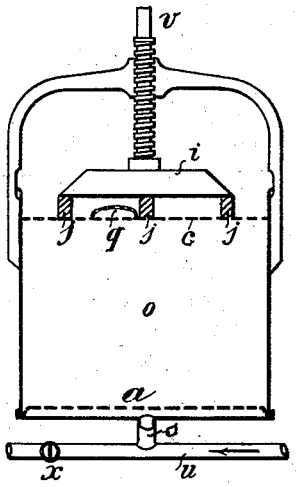


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

EUGENE EMILE PLANTROU, OF OISSEL, FRANCE.

APPARATUS FOR DYEING.

SPECIFICATION forming part of Letters Patent No. 676,151, dated June 11, 1901.

Application filed July 26, 1899. Serial No. 725,165. (No model.)

To all whom it may concern:

Be it known that I, EUGENE EMILE PLANTROU, a citizen of the French Republic, and a resident of Oissel, department of Seine-Inférieure, France, have invented certain new and useful Improvements in Bleaching, Dyeing, Washing, and Similarly Treating all Kinds of Textile Materials, of which the following is a specification.

This invention, which relates to bleaching, dyeing, washing, and similarly treating all kinds of textile materials in whatever state of preparation, is based upon the utilization and application of a unique principle of great simplicity. This principle consists in the introduction of the liquids by which the treatments are to be effected, which liquid is hereinafter called the "bath," under pressure below the compressed mass of material to be treated in such a manner that the bath thus introduced rises throughout its whole extent and traverses the materials in a vertical direction, thus naturally extruding the air contained in the materials and effecting an absolutely complete wetting. It is easily understood that if it be desired to wet any such dry materials as wool, silk, cotton, and the like by passing the liquid downward through them, as at present practiced, or even horizontally, unwetted parts are found when the liquid has passed, since the travel of the liquid prevents the escape of the whole of the air. My process alone permits the complete expulsion of the air, because it is normally attacked from below by a body having a considerably greater density. I have devised an apparatus, which is hereinafter described, for the industrial application of this principle. This apparatus is much more simple and is capable of a larger output than any other apparatus of a similar kind hitherto known. It supersedes apparatus in connection with which a vacuum or the use of keirs and autoclaves is necessary.

Figure 1 of the accompanying drawings represents a longitudinal section through my new apparatus; Fig. 2, a plan view of the cover-plate, and Fig. 3 a longitudinal section of part of a smaller similar apparatus.

The body of the apparatus may be cylindrical in form and constructed of any suitable material. At its lower part there is arranged a perforated false bottom *a*, which may be in one or more pieces, according to the size of the apparatus. The textile materials which are to be treated, in the form of flocks, yarn, ribbons, threads, cloth, and the like, are packed together by hand in the part *o* and are then compressed by the screw *v*, which is caused to exert pressure upon the perforated cover *c* through the plate *i* and its inferior webs *j j* or by other means. The cover *c* is provided with handles *m m* and has exactly the same form as the false bottom *a*, like which, also, it is perforated. The under sides of the webs *j j* are channeled, so as to leave free passage for the bath. The diameters and numbers of the perforations in the cover and false bottom have no importance. It suffices if the sum of the areas of the perforations in each plate greatly exceeds the area of the pump-inlets, so that the textile materials alone offer resistance to the passage of the bath, and thus institute the pressure.

The bath prepared for the dyeing, bleaching, or other operation is contained in the reservoir at the side of the apparatus and flows therefrom into the suction-pipe *d*, the valve *e* being open. The pump *p*, being started, forces the bath by the pipe *u* and the openings *s* into the space *o* under high pressure. The bath thus rises, chasing out the air, which, being lighter, escapes at the top. The pipe *u* may be continued to other apparatus and be closable by the valve *x*. When the bath has its level a little above the opening *f*, the valve *e* is closed and the valve *k* is opened. A circulating current is thus established, the pump deriving the liquid from the upper part of the apparatus and forcing it into the under part below the material during the whole continuance of the operation.

If at the end of the operation it is desired to preserve the bath, the valve *k* is closed and communication with the reservoir *r* is established by opening the valve *t*.

To provide for rinsing the goods, a branch pipe *b*, controlled by a valve, communicates with a suitable source of water-supply. The valves *t* and *e* being closed and the valve in *b* being open, a continuous flow of water passes through the goods and escapes by the

overflow *y*. When the rinsing is ended, the emptying-valve, which may be that indicated at *x*, is opened and the contents of the apparatus are removed preparatory to a fresh operation.

Above the perforated cover *c* there may be arranged a small concave perforated holder *q*, having a diameter of from six to eight inches, arranged convex side upward, which may be retained in place during use by a weight. Within the cavity thus formed there is placed a sample of the material to be treated, which may be examined from time to time with great facility to ascertain the progress and completion of the operation.

It is easily deduced from the preceding description that the apparatus is very simple and that the wetting of the materials is very perfect, because of the ascending direction of the bath over its whole horizontal extent. As the bath traverses the mass of material vertically from bottom to top, it necessarily carries with it all the little air-bells, which under any other system of circulation would inevitably remain imprisoned in the goods and prevent a perfectly-uniform wetting.

If it be desired to treat the goods in a warm bath or by boiling, it will suffice to heat the bath in the reservoir *r* and to further heat it in the apparatus by means of a steam-coil or equivalent device arranged between the bottom and false bottom of the apparatus.

Having now described my said invention, I declare that what I claim is—

An apparatus for the purpose set forth, consisting of a tank having a liquid-inlet at its lower end, and a multiperforated covering-diaphragm, said diaphragm having a chamber from which a sample of the treated material can be obtained at any stage in the process, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

EUGENE EMILE PLANTROU.

Witnesses:
T. MARTIN GAUDIT,
E. DELAUNAY.