(No Model.)

# W. BIRCH.

## APPARATUS FOR WASHING, DYEING, &c.

No. 261,654. Patented July 25, 1882.

*FIG: 1.*

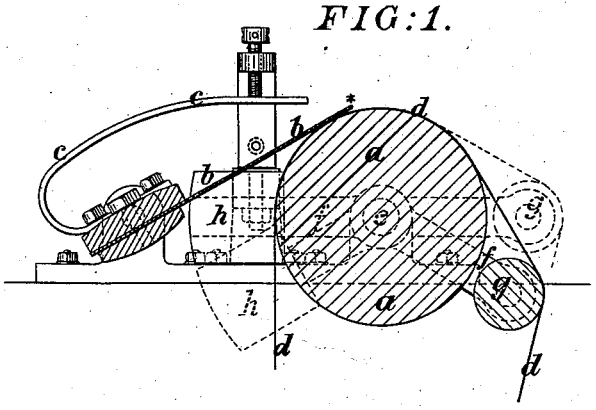
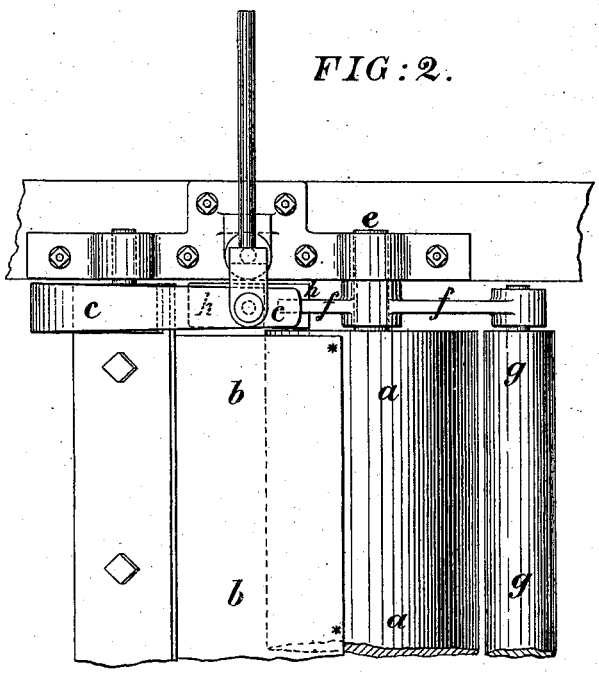



*FIG: 2.*




Witnesses.
James F. Johns
Harry Drury

Inventor:
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# UNITED STATES PATENT OFFICE.

WILLIAM BIRCH, OF SALFORD, COUNTY OF LANCASTER, ENGLAND.

## APPARATUS FOR WASHING, DYEING, &c.

SPECIFICATION forming part of Letters Patent No. 261,654, dated July 25, 1882.

Application filed April 15, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM BIRCH, a subject of the Queen of Great Britain, and residing at Salford, in the county of Lancaster, England, have invented Improvements in the Construction of Apparatus Employed in Washing, Soaping, Dyeing, and other Similar Operations, of which the following is a specification.

This invention relates to the construction of apparatus employed in washing, soaping, and dyeing woven fabrics, and for other similar operations wherein the fabric operated upon is required to be squeezed in passing into or out of a vessel, or from one vessel or compartment to another, to remove the superfluous liquid. In such cases it is usual to employ a pair of squeezing-rollers, the lower one of which, or "draw-roller," is driven by gearing, and the upper one, or "squeezing-roller," is pressed into contact therewith more or less forcibly by means of springs or weights, and is either driven by gearing also or by friction of contact.

The object of the present invention is to dispense with the top roller and at the same time to provide a self-acting means whereby the tension of the fabric under operation is kept equal.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is a section, and Fig. 2 a plan view, representing a draw-roller with my improvements applied thereto.

*a a* is the draw-roller.

In place of the top or squeezing roller, I employ a thin, flat, flexible bar or plate, *b b*, resting upon the fabric above the bottom or draw roller, *a a*, and pressed down either by its own weight simply or by additional weights, or by a spring or springs, *c c*, as shown on the drawings, so as to give the pressure required. The bar or plate *b b* is so mounted that its edge is past the center of the roller *a a* and does not come into contact with the fabric *d d* at all, so that there is no scraping action, but the flat part of the under side of the bar or plate *b b* rests upon the draw-roller *a a* (see Fig. 1) and gives the required pressure to the fabric *d d*.

Upon the axis or shaft *e e* of the draw-roller I mount two levers, *f f*, one at each end of the draw-roller *a a*. One arm of these levers carries a tension-bar or small roller, *g g*, which is parallel with and close to the circumference of the draw-roller *a a*, over which the fabric *d d* passes. The other arm of each lever is provided with a weight, *h h*, or a spring suitable to the tension required to be given to the fabric *d d*.

Instead of passing the fabric direct from the draw-roller *a a* to the next friction-roller or other support, I pass it first over the bar or small roller *g g*, above mentioned, in such a manner that the tension of the fabric *d d* shall hold the bar or roller *g g* down against the force of the weights *h h* or springs. (See Fig. 1.)

Should the fabric become too slack, the action of the weights *h h* or springs will cause the levers *f f* to raise up the bar or small roller *g g* sufficiently to take up the slack of the fabric, as shown in dotted lines, and at the same time the bar or roller *g g* will raise a certain portion of the fabric *d d* off the draw-roller *a a*, and thus by diminishing the amount of lap of the fabric *d d* on the roller *a a* will decrease the friction between the two till it becomes insufficient for the draw-roller *a a* to propel the fabric *d d*. The draw-roller *a a* then slips, (the fabric being held by the pressure of the squeezing bar or plate *b b*,) and the fabric *d d* between the draw-roller *a a* and the next support will be gradually drawn tight again by the succeeding draw-roller, the increasing tension of the fabric gradually pressing down the tension-bar or small roller *g g* against the pressure of the weights or springs into its original position, as drawn in full lines, and thus restoring the previous amount of lap on the draw-roller *a a* necessary for the forward movement of the fabric *d d*.

To prevent the fabric from becoming too tight I decrease the surface speed of the last or of each succeeding draw-roller slightly, either by decreasing the number of revolutions or by diminishing the diameter thereof, and thus the fabric is kept at or about one uniform state of tension throughout the operation.

I claim as my invention—

1. In an apparatus for washing, dyeing, and similarly treating fabrics, the combination of a rotating roller with a thin flexible pressing

bar or plate adapted to bear on the roller and remove superfluous liquid from the fabric as it passes between the roller and plate.

2. The combination of the rotating roller and presser-plate with a tension-bar carried by weighted levers mounted on the axis of the said roller, substantially as set forth.

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

WILLIAM BIRCH.

Witnesses:
GEORGE DAVIES,
JNO. HUGHES.