UNITED STATES PATENT OFFICE.

THOMAS SIMPSON, OF PHILADELPHIA, PENNSYLVANIA.

APPARATUS FOR CHROMING FABRICS.

SPECIFICATION forming part of Letters Patent No. 268,556, dated December 5, 1882.

Application filed January 5, 1882. (No model.)

To all whom it may concern:

Be it known that I, THOMAS SIMPSON, a citizen of the United States, residing in the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Chroming Fabrics, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

My invention relates to an apparatus for chroming fabrics; and it consists of certain appliances, fully described hereinafter, whereby the fabric is first passed through a very limited volume of chroming solution supplied as fast as it is used from the main body, then heated, and then submitted to a bath, whereby the chroming action is arrested.

In the drawings, Figure 1 is a sectional elevation of the apparatus; Fig. 2, a detached sectional view; and Fig. 3 represents a modification.

The apparatus consists of a tank, A, a heating-box, B, a bath-tank, C, suitable feed and squeezing rollers, *n n g g*, and conducting-rollers *k*, or their equivalents, and a reservoir, H, of chroming solution communicating with the supplemental chroming-tank A. The fabric *x*, suitably guided, is passed from the bundle to the tank A, round a roller, *a*, therein, and thence between feeding and squeezing rolls *n n* and guide-rolls, through a slit, *i*, in the box B, round conducting-rolls *b b*, arranged in said box, as shown, out of the box round a roller, *k*, and through an opening, *d*, which is covered by a hood, *c*, extending below the opening and below the level of the water in the bath-tank C. The fabric then passes round a roller, *k*, at the bottom of said tank and between squeezing-rollers *g g*. The box B is heated by steam injected through perforated pipes *h*, and flowing upward through a perforated plate, *l*, the steam being retained in the chamber by the hood *c*. The chroming-tank, instead of containing the entire body of chromate solution, as heretofore, is of very limited capacity, preferably of such a small size as to hold only about sufficient of the solution to saturate the fabric as it passes rapidly through it, and the solution is fed to the tank as fast as it is taken up, so that each portion of the fabric as it enters the tank is practically treated with a fresh volume of solution. The fabric, after it is heated in the box B, is bathed in the tank C, a constant flow of water through the latter being maintained. The fabric is then squeezed, soaped, washed, and dried, as usual.

To prevent the unequal distribution of the solution to the tank A, I may use a feed-pipe, *p*, communicating with the reservoir H, which pipe has a horizontal extension, *t*, parallel to the roll *a*, and with a series of perforations at one side, Fig. 2. It will be apparent that other means of securing this result may be employed. For instance, the tank A may be arranged in connection with a reservoir, H, closed at the top, as shown in Fig. 3, the solution flowing from the reservoir into the supplemental tank through a series of perforations parallel to the tank uniformly and as fast as it is used.

Instead of the box B, a revolving box with a perforated periphery may be used, the steam passing through the box and through the fabric carried upon the periphery.

By the use of a supplemental tank, so as to divide the chroming liquid into two bodies, I avoid passing the strip of fabric through the main volume and submit it to the action of such a very limited quantity that none of the padding can be dissolved or washed off, there being consequently no precipitate in the chroming-tank, and the uniform quality of the chroming solution is maintained.

It is desirable that the volume of liquid through which the traveling strip of fabric passes be as much reduced as is practicable, it being only necessary that it shall be sufficient to insure a thorough saturation of the fabric at the rate at which it passes through it. If the speed of the fabric is reduced, the volume of liquid in the supplemental tank A may likewise be reduced; but when the fabric is carried rapidly through the tank there should be sufficient liquid maintained therein to thoroughly charge the strip during the limited time for which it is immersed. Whatever liquid is taken up by the saturation of the fabric is supplied from the main tank, so as to maintain a constant quantity in the supplemental tank. The heating of the strip after passing it through the chroming-tank facilitates the chroming action, and the immersion

of the strip in the water bath arrests this action when it has reached the proper stage, preventing any further change or deterioration of color. I am thus able to insure the most absolute uniformity in the treatment of the goods, and thus secure the production of goods of uniform color.

I do not here claim the process described, as it forms the subject of a separate application for Letters Patent; but

I claim—

1. The combination of the chroming-tank A, roller *a*, squeezing-rolls *n n*, independent steam-box B, and carrying-rolls *b*, substantially as set forth.

2. The bath-tank C and squeezing-rolls *g g*, in combination with the steam-box B and independent chroming-tank A, substantially as set forth.

3. The combination, with the chroming-box A and roller *a*, of the perforated pipe placed at the front of the roller, and extending lengthwise of the box for supplying liquor, as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

THOS. SIMPSON.

Witnesses:
CHARLES E. FOSTER,
T. H. PALMER.