UNITED STATES PATENT OFFICE.

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APPARATUS FOR CHROMING FABRICS.

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To all whom it may concern:

Be it known that I, VICTOR M. C. LALLEMEND, of Chester, in the county of Delaware and State of Pennsylvania, have invented new and useful Improvements in Apparatus for Chroming Fabrics, of which the following is a specification.

My improvements relate to apparatus used in the process of chroming fabrics or raising plain black or other plain shades of color that need to be chromed after padding and drying.

In the usual process the pieces, after being padded and dried, are run through a tub of considerable length, fitted with top and bottom rolls and squeezing-rolls at the end to remove the excess of liquor. In starting, the tub contains a foot depth of water, and the same depth of a solution of bichromate of potash and sal-soda heated to about 170° Fahrenheit. The padded pieces run continuously through the tub, while the heat is maintained and a stream of the chrome solution kept flowing into the tub, so that after a time the tub becomes filled. In this process the pieces necessarily are somewhat washed by the bath and dirtied by passing through the dirtied solution, so that the last pieces of a run are of a poor shade, and the liquor becomes practically worthless by that time. In this process, with the large quantity of liquor used to obtain satisfactory results, it is necessary to use a solution of the proportions of twelve ounces of bichromate and eight ounces of sal-soda in ten pounds of water.

The object of my invention is to avoid the difficulties named, prevent variations in shade, and reduce the required quantity of bichromate, to which ends my invention consists in an apparatus containing these essential features—viz., a chroming-box of small capacity, a single roll for the fabric, and a feed-pipe supplying a regular and constant stream of chroming-liquor. These features are combined with squeezing-rollers and a suitable steaming-box.

Figure 1 of the drawings is a vertical longitudinal section of an apparatus embodying my invention. Fig. 2 represents details.

A is the chroming-box, containing roll *a*. This box is to be of the smallest size possible consistent with the space necessary for the required quantity of liquid.

Above and to the rear of the box A are squeezing-rollers *b b*, and back of the box A is a steam-chest, B, containing top and bottom rolls, *c*. The steam-chest B is fitted with perforated steam-pipes for supply of steam, and a discharge-pipe for water of condensation. Next to the steam-chest is a water-box, C, fitted with a water-supply pipe at the bottom and overflowing-pipe at the top. Over the opening, between chest B and box C, is a lip or flange, *d*, projecting below the water-line, so as to prevent escape of steam from the chest and protect the fabric from the air.

In the lower part of box C is a roller, *e*, and above it are two squeezing-rolls, *f f*, of the same diameter as the first squeezing-rollers. Above and at the rear of rollers *f* is a reel, *g*, over which the fabric passes finally.

In the lower part of the chroming-box A, and at the front of roller *a*, is a pipe, *h*, formed with a fine slit its whole length, as shown most clearly in Fig. 2. This pipe extends the full length of the box, parallel with the roll *a*. A pipe, *i*, extends from pipe *h* to a reservoir, *k*, that will contain the bichromate solution.

In operation the goods are passed down at the front of and beneath roll *a*, thence upward to and between the squeezing-rolls *b*, and from there into and through the steam-chest and water-box, as shown by the dotted line. In starting, the solution is allowed to run into the box A until it covers the roll *a*, after which the flow is to be regulated to supply the loss by what is carried out by the fabric. The clear liquor is thus constantly and evenly distributed at the front of the roll, so that the fabric first comes in contact with the solution comparatively pure, and passes through dirty liquor only at the back of the roll.

It will be seen that the fabric passes but once through the liquor. There will consequently be but little coloring-matter loosened in the fabric, and such loosened material will be carried out by the fabric. The shade produced will be uniform, and the operation can be continued as long as desired without interruptions to change the liquid in the box. At the completion of work only the liquor in box A has to be wasted. The solution used will contain the bichromate in proportions suited to the shade desired. In any case the average quan-

tity required is less by one-half than that necessary in the usual process, thus effecting a large saving in material used, besides giving a better result.

I do not limit myself to the apparatus constructed and arranged as shown. Various modifications can be made without departing from the essential features. The comparative size of the chroming-box and relative location of the squeezing-rolls and pipe for supplying the solution are of the first importance.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of chroming-box A, roll *a*, pipe *h*, squeezing-rolls *b*, and steam-chest B, containing rolls *c*, substantially as shown and described.

2. The water-box C and squeezing-rollers *f*, in combination with the steam-chest B and chroming-box A, substantially as shown and described.

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

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Witnesses:
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