

UNITED STATES PATENT OFFICE.

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MANUFACTURE OF EMBOSSED FABRICS.

SPECIFICATION forming part of Letters Patent No. 294,731, dated March 4, 1884.

Application filed November 3, 1883. (No specimens.) Patented in France May 30, 1883, No. 155,776.

To all whom it may concern:

Be it known that we, CLAUDE GARNIER, a resident of Lyons, in the Republic of France, and PAUL DEPOULLY, a resident of Paris, in said Republic, both citizens of said Republic, have invented a new and useful Improvement in the Manufacture of Embossed Woven Fabrics, of which the following is a specification.

This invention consists in a novel method of applying water-proof dressings in the manufacture of embossed woven fabrics, whereby the quality and durability of the embossing are improved.

The invention also consists in a novel method of shrinking the woven fabrics preparatory to the embossing operation, whereby the liability of the fabrics to be torn in said operation is diminished; and it further consists in further means of preventing the tearing of the fabrics in the operation, as hereinafter described.

Our improved method of applying the water-proof dressing consists in a preparatory treatment of the fabric, before embossing, with a dressing which is softened by the heat of the embossing-rollers, and thereby is enabled to take, and enables the fabric to take, the impression of the embossing-rollers, and a treatment, subsequent to the embossing, with a solution or dressing for the purpose of fixing the embossing. We will give two examples of these preparatory and fixative dressings, viz:

First, the fabric is impregnated, by immersion or otherwise, with a solution of egg-albumen, then dried, then embossed between heated rollers, and afterward the albumen is coagulated and fixed by the immersion of the fabrics in alcohols, acetic acid, or a mixture of them.

Second, the fabric is impregnated with a solution of gum-lac, then dried, then embossed between heated rollers, and afterward the dressing given by the gum-lac is completed by the immersion of the embossed fabric in a solution of a resin or gum-resin—as hard copal, amber, or Zanzibar, Demerara, or Sierra Leone gums—in turpentine, hydrocarbon, or ether.

Gum-lac is especially suitable for the preliminary preparation, because of its faculty of being softened by heat, and therefore becoming plastic during its passage between the heated cylinders of the embossing-machine, and

takes itself, at the same time with the fabric, the exact impression of the designs engraved on said cylinders, preserving the said impression in cooling.

As certain of the agents hereinabove indicated have been heretofore employed to produce the impermeabilization of fabrics, it is essential to remark that it is not for such result that they are applied in carrying out this invention, the object of which is to obtain on all woven fabrics—stout or light, of wool, silk, cotton, and other fiber—an embossing which resists both dampness and rain.

In the manufacture of embossed fabrics a great inconvenience results from the want of sufficient strength in certain kinds of fabrics, especially light ones—such as gauzes and muslins—to bear the action of embossing. Such fabrics are cut and torn during the embossing operation by the pressure of the engraved cylinders, especially when the relief of the design is very pronounced. To remedy this inconvenience we apply to the fabrics the property which concentrated alkaline solutions have of contracting vegetable fibers and rendering them elastic. In effect vegetable tissues or fabrics by being immersed in alkaline solutions undergo a considerable shrinkage both in length and width. They also acquire greater strength without losing their original character. It may be understood, then, that the fabrics which have been subjected to this treatment by alkaline lyes may, by reason of the elasticity acquired, be prevented from being broken by the edges of the engraving, and that they may take more exactly the imprint of the engraving, especially when the reliefs thereof are very accentuated. The embossing operation in such case is not performed upon a stretched and fragile fabric, but upon yielding and elastic fibers. The alkaline lyes employed should be concentrated. It is difficult to give fixed proportions, for these will vary evidently according to the nature of the threads. The concentration may be 30° and even 36° density for caustic soda. The time of immersion may also vary. After having remained a sufficient length of time in the concentrated lye, the fabric is rinsed and dried without too much stretching to take out the elasticity desirable for em-

bossing. After drying, the fabric thus prepared is embossed by the hot process. It may, if necessary, be dyed before embossing. Vegetable fabrics embossed after this alkaline treatment may afterward be rendered proof against dampness and rain by the means which constitute the first part of this invention.

Besides the two principal parts of this invention, there is a third part, which is the natural consequence of the transformation which vegetable fabrics undergo in their treatment by concentrated alkaline solutions. It happens that the fabrics, after leaving the embossing-cylinders, have one of their faces—that which was in contact with the engraved metallic cylinder—much more glossy than that which was in contact with the paper cylinder. This difference of gloss on the two faces is a serious objection in the sale of the fabrics. We remedy this defect by interposing between the engraved metallic cylinder and the fabric to be embossed a piece of cotton cloth, known as a “blanket,” serving as an intermediary between the metal and the fabric.

The property acquired by fabrics of cotton treated by alkaline lyes, as hereinabove described, to resist the creasing produced by the engraved cylinders, renders them suitable as such intermediaries. Cotton cloths thus treated will bear passing between the cylinders a

great number of times, while if cotton cloth which has not been thus treated be used for this purpose it is likely to be cut the first time.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In the manufacture of embossed fabrics, first treating the fabric with a preparatory dressing which is softened by heat, next passing it between heated embossing-rollers, and finally passing it through a fixing or completing solution, substantially as herein described.

2. In the manufacture of embossed fabrics, the preparatory treatment of the fabric with an alkaline solution, for the purpose of shrinking it before embossing, substantially as herein described.

3. In the manufacture of embossed fabrics, the interposition between the engraved metallic embossing-cylinder and the fabric to be embossed of a blanket of cotton cloth which has been treated with an alkaline solution, substantially as herein described.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

CLAUDE GARNIER.

PAUL DEPOULLY.

Witnesses:

LOUIS BACHEHE,

J. P. A. MARTIN.