May 28, 1946. T. G. HAWLEY, JR 2,400,990

METHOD OF MAKING POROUS COATED FABRICS

Filed June 24, 1943

Fig. 1

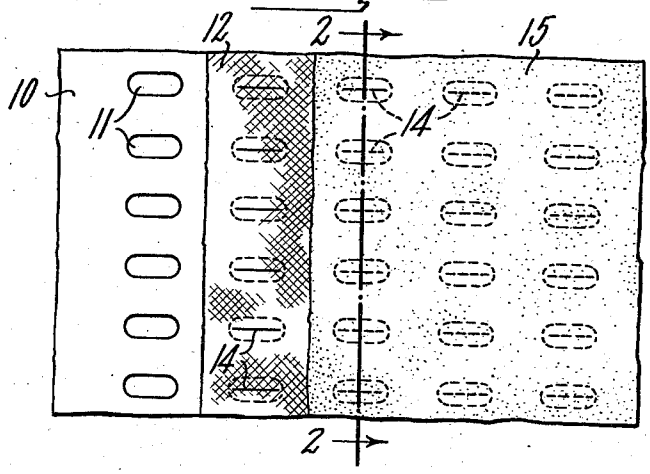


Fig. 2

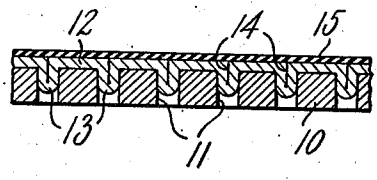
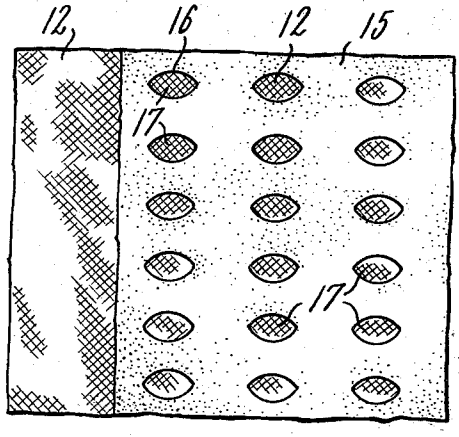


Fig. 3



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METHOD OF MAKING POROUS COATED FABRICS

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2 Claims. (Cl. 117—38)

This invention relates to an improved method of making porous coated fabrics or forming openings in the coating deposited thereon. The improvement relates particularly to the method of forming openings in the coating by masking spaced areas of the fabric by employing the fabric itself as a masking means, and then coating the fabric on the side from which the areas have been masked.

Fabrics heretofore have been coated with different materials for the purpose of improving their appearance, their wearing qualities, and to give them elasticity. Most of the materials which have been used are impervious to air to a more or less degree. For certain purposes, such as clothing and seat coverings, it is desirable to render the coatings on the fabrics porous so that the coated fabric will be air pervious, and have that characteristic which is normally referred to as being able to breathe. The present invention is applicable to, and useful in that field.

Various methods have been proposed heretofore for making porous coated fabrics. Some of the prior methods involve coating the fabric over its entire surface, and then removing portions of the coating by cutting through the coating and the fabric, or by removing portions of the coating from the fabric after it has been applied. In the first mentioned method the fabric is weakened by the severence of some of its yarns, and in the second method very accurate control and handling of the coating material is required in order to produce the openings therein without causing the coating material to be visible on the uncoated side of the fabric.

In accordance with the present method employing this invention, the fabric to be coated is masked in spaced areas by pinching such areas together and the coating is then applied to the side of the fabric from which such areas have been concealed. The pinched together areas are then smoothed out so as to break the coating around the concealed areas and form openings in the coating. In producing the openings, the fabric is neither cut, nor is the fabric opposite the openings so smeared with the coating material that it shows through to the opposite side. In other words, a clean opening is formed in the coating material without deleteriously affecting, or altering the porosity of the fabric opposite the openings.

The invention is further described in connection with the accompanying drawing, in which:

Fig. 1 is a plan view of a portion of the supporting surface which is adapted for carrying out the method employing this invention, in which a piece of fabric is superimposed on the surface, masked, and coated with a coating material;

Fig. 2 is a cross-section of Fig. 1 on line 2—2; and

Fig. 3 is a plan view of the finished porous fabric after it has been removed with the porous coating thereon from the supporting surface shown in Fig. 1.

In accordance with this invention, the normal porosity of the fabric is retained opposite the openings in the coating which is applied thereto. This advantageous result is obtained by masking spaced areas of the fabric by pinching folds of the fabric together and then coating the surface of the fabric on the side having the spaced areas masked in the folds. After the coating has been applied, and before it has been set, the folds are smoothed out so as to break the coating around the edges of the masked areas. When the masked folds are pulled out, the untreated fabric is visible opposite the openings or pores, formed in the coating. The coated fabric is thus rendered porous and the coating may then be set in a final condition.

As shown in the drawing, the method may be performed in connection with a supporting surface, or plate 10 having a plurality of spaced openings, slits or cavities 11 formed therein, which may be arranged in rows, or any suitable design, so as to produce corresponding designs in the coating on the fabric. In carrying out the method a textile fabric layer 12 is superimposed upon the plate 10, and the areas opposite the openings 11 are masked in the openings by projecting portions 13 of the fabric into the openings 11. The fabric may be wedged into the openings 11 with a tool, such as a thin dull blade. In doing so, the fabric will be folded along the lines 14, and the folds will be pinched together so as to produce small closed pockets in the fabric.

The fabric is then coated with the desirable coating material 15. Before the coating material is set, preferably immediately after the fabric has been coated, the fabric is removed from the surface 10, and the previously masked portions 13 of the fabric are unfolded along the lines 14 so as to break the coating around the edges 16 of the previously masked areas, and form openings or pores 17 in the coating 12, as shown at Fig. 3. As will be noted the fabric 12 is visible through the openings 17. The coated fabric may now be treated to set the coating in the desired permanent condition.

Knitted fabrics are particularly adapted to be

coated by this process, because they can be projected into the openings in the supporting surface without being torn, or producing permanent deformation therein. Other types of fabric may be treated by this method, particularly those, which are loosely constructed, or which may be gathered together in small folds or puckers without permanent deformation. Any suitable coating material may be used, but this method is particularly applicable for making elastic fabric from knitted goods, wherein a fluid coating of compounded rubber latex, or other rubber-like material is applied to the knitted fabric so as to deposit an elastic coating thereon, which may be treated and cured in the usual manner.

It is contemplated that the supporting surface for the fabric may be in the form of a cylinder having holes formed therein, and the fabric may be projected into the holes by projections having their ends arranged on a cylindrical surface and geared to mesh with the holes in the supporting surface for the fabric as the fabric is passed over the revolving cylindrical supporting surface. It has been found that elastic rubber having narrow slits formed therein makes an excellent supporting and masking surface for the fabric layer 12. The slits are stretched when the fabric is projected into them and the fabric is held securely in the slits by the tension of the rubber after the removal of the projecting tool, and until the coating has been applied and the fabric removed from the supporting surface.

The coated fabric may be removed from the supporting surface by pulling the fabric away from it, and it may be smoothed out by drawing it under tension over a bar or roller. In the event the supporting surface on which the fabric has been coated is the surface of a cylinder, it may be drawn from such surface and smoothed out by drawing it over a stripping roll adjacent to the masking cylinder and after the fabric 12 has passed over the masking surface 10 of the cylinder.

While the preferred form of this invention has been described, it will be understood that changes in the details as described herein may be made without departing from the spirit of the invention and the scope of the appended claims, and it is desired to claim the invention as broadly as permitted by the prior art.

Having thus described my invention, what I claim and desire to protect by Letters Patent is:

1. Method of making porous coated fabrics comprising the steps of superimposing a layer of fabric upon an elastic supporting surface having spaced slits therein, wedging small areas of the fabric into said slits and retaining said areas masked therein under the tension of said slits, coating the fabric on the side from which said areas have been masked, removing the fabric from said slits, smoothing the fabric out and thereby breaking the coating around the edges of the masked areas, and drying said coating.

2. Method of making porous coated elastic fabrics comprising the steps of projecting areas of a layer of fabric into slits in a rubber supporting surface, stretching said slits and retaining said areas masked therein under the tension of said rubber, coating the fabric with a rubber latex compound on the side from which said areas have been masked, removing the fabric from said slits, restoring the fabric to a substantially flat condition, and thereby breaking the coating around the edges of the masked areas, and vulcanizing said coating to render it elastic.

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