

PUBLISHED
JUNE 22, 1943.
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MANUFACTURE OF FABRIC LAYERS PROVIDED
WITH WATER REPELLENT COATINGS
Filed Feb. 3, 1938

Serial No.
188,585

Fig.2

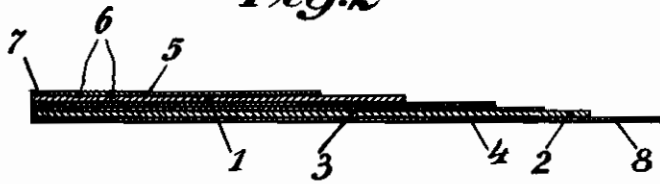
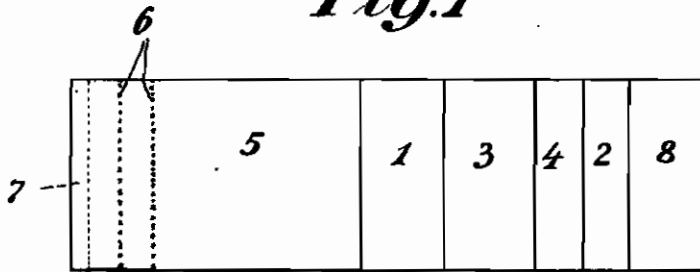


Fig.1



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ALIEN PROPERTY CUSTODIAN

MANUFACTURE OF FABRIC LAYERS PROVIDED WITH WATER REPELLENT COATINGS

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Application filed February 3, 1938

The invention relates to the manufacture of fabric layers provided with a water repellent coating, consisting advantageously of a solid cellulose derivative such as Celluloid or cellon, which goods are more particularly used for manufacturing collars, cuffs, chemisettes, shoe uppers, covers, curtains and the like. In this process the problem is met with to obtain a firm and reliable union between the fabric and the covering coating and more particularly to obtain at the edges of the goods a water repellent smooth closure. Especially on applying very thin Celluloid or cellon coatings to comparatively thick fabrics it is found that the layers do not properly adhere to one another and that there are always loose ends of thread of the fabrics which interfere with the object of the Celluloid or cellon coating to make the article water repellent.

In order to avoid these drawbacks solvents or agglutinants have heretofore been used; however the production becomes thereby more complicated and expensive and the quality of the product is frequently affected in an undesirable manner.

By the process forming the subject matter of the invention a firm union between the fabric and the covering coating is obtained without the use of a solvent or agglutinant by pressing the cover coating onto the fabric and heating at the same time such cover coating to a temperature at which the cover coating is softened by the beginning melting. If thin foils of cellon are used it is sufficient to heat the press plates or press cylinders to 140° centigrade in order to obtain a superficial melting of the cellon foils. By pressing the softened cellon foils on the fabric the cellon is penetrating partly into the meshes of the fabric so that a uniform plate is obtained which resists any stresses tending to separate the united layers.

It was also found that the adhesion of the layers is further notably increased if prior to their union with the Celluloid or cellon coating the fabrics are impregnated with a casein solution. For the impregnation advantageously a solution of casein in an alkali, for instance in caustic soda diluted with water, is used.

The impregnation imparts to the fabric a certain stiffness which is often desirable especially for collars and cuffs and more particularly prevents distortions, warpings and formation of folds which would interfere with a good union with the covering coating. Besides increasing the adhesion the impregnation also results in so uniting the threads of the fabric that loose ends of

these threads at the edges of the article are no more met with.

If white fabrics are treated in this way it will be found that the product is discoloured having become yellowish to brown which may be undesirable more particularly with linen goods such as collars, cuffs and the like. This drawback may be done away with in the process according to the invention by incorporating into the casein solution a pigment which does not impair the increased adhesion due to the casein solution. For this purpose more particularly the dioxide of titanium (TiO_2) is suitable which is added in the form of a powder in the ratio of two parts by weight of the powder to five parts by weight of the solution.

In the manufacture of collars, cuffs and the like fabric layers treated in accordance with the invention various means may be used for obtaining the desired degree of stiffness and impregnation of the product. Thus rows of stitches may be sewn in the fabrics or reinforcing pieces, strips or bars may be sewn to the fabric and then the cellon sheets may be pressed on the fabric. For facilitating the sewing patterns may be used which advantageously consist of a piece of fabric containing rows of stitches in the arrangements which it may be desired to produce on the impregnated layers. The pattern is pressed onto the impregnated fabric the rows of stitches on the pattern leaving impressions for the stitches to be made on the impregnated fabric. After sewing the rows of stitches and the reinforcing strips on the impregnated fabric the cellon sheets may be placed on the impregnated layer and secured in position by pressing with the aid of heating in the same press in which the lines of rows of stitches were printed on the impregnated fabric. The said pressing of the sheet of cellon by pressing in the heat takes preferably place between elastic surfaces such as rubber plates, fabrics impregnated with rubber or the like, the plates being either placed on the cellon sheet or on the pressing plates. By the use of such rubber plates it is also avoided that the cellon foils adhere after pressing on the press plates or cylinders.

The same press may also be used for obtaining the desired lustre on the surface of the articles manufactured. For this purpose metal plates preferably of stainless steel are used, the surface of which has been made more or less smooth by polishing or treatment by means of sand blower according to the desired nature of the articles to be manufactured. After pressing with the aid

of heat the fabric provided with the cellon coating adheres to the metal plate but can be readily removed after cooling.

If by the process described articles of a soft nature or of a comparatively low stiffness have to be manufactured, difficulties may arise because the cellon coatings treated with the known softening agents lose their softness after some time and become comparatively stiff. In order to avoid these drawbacks the fabric core is impregnated with any one of the known liquid softening agents for derivatives of cellulose before the covering coating is applied thereto, so that this agent acts only gradually on the covering coating.

The process is advantageously carried out in the following manner:

Onto both sides of a cellon foil of a thickness of 0.1 to 0.15 millimetres a layer of fabric made of comparatively thick yarn and with small mesh is pressed with the aid of heat so that the layers of fabric firmly adhere to the cellon foil. The product thus obtained is impregnated with a softening agent, such for instance as tricresyl phosphate, triacetine or the like. The impregnation may be brought about by immersion or by brushing or sprinkling. The compound layer obtained as above described may be, prior to the impregnation, provided with quilting seams or with reinforcing pieces, strips or bars. Then onto both sides of the impregnated combined layer thin cellon foils are placed and pressed thereon in the same press that had served for pressing the fabric layers onto the core foil the combined layers being heated to about 110° to 140° centigrade.

In order to further increase the efficiency of the softening agent a comparatively small quantity say 20% of a solvent for the cellulose derivative such as acetone may be added to said agent.

It has been found that in a product obtained by the process described the covering coating keeps its softness even if the article is kept on store or is in use for a long time. The impregnated fabric acts like a store for the softening agent so that comparatively stiff covering coatings become soft only gradually after their application and retain their softness for a long time of use.

The process according to the invention may be used both for white and for coloured fabrics.

For the latter a method is especially suitable which is illustrated by way of example in the annexed drawings. Fig. 1 is a plan view and Fig. 2 a transverse section of a structure composed of two layers of coloured fabric and three layers or foils of a derivative such as cellon alternating with said two layers of fabric.

Two coloured fabric layers 1 and 2 are coated each on one side only with a white cellon foil 3 and 4 respectively and heated when pressed on the fabric as above described. On the cellon foil of the outside fabric of the article to be manufactured the lines 6 for the stitches are printed by means of a pattern as above set forth whereupon rows of the stitches and stiffening pieces, strips or rods 7, if at all required, are sewn or fixed respectively on the fabric. Then one of the fabric layers is laid on a thin transparent cellon foil 5 and the second fabric layer is laid on the first fabric layer so that the white cellon foils 3, 4 are in contact with one another. Finally on the free side of the second fabric layer also a thin transparent cellon foil 8 is laid. The layers built up in this manner are then pressed together and heated to the temperature of beginning melting of the cellon foils so that the core foils 3, 4 are firmly united with one another and both the core foils and the covering coatings 5, 8, are united to the fabric layers 1, 2. The product thus obtained forms a uniform smooth plate, the outer faces of which show the desired colours, owing to the transparency of the outer covering coating 5, 8 and the white background formed by the core foils.

The process according to the invention may be used in the manufacture of various articles made of fabric layers. It is also possible to treat only parts of an article by the described method. For example collars or cuffs permanently fixed on shirts, or cuffs fixed on detachable sleeves may be treated in a similar way.

The most important advantage obtained by the present invention consists in the simplicity and the rapidity of the process resulting from the absence of any solvent or agglutinant which would have to be dried so that the different steps of manufacture can immediately follow one another.

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