

UNITED STATES PATENT OFFICE.

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PROCESS OF OBTAINING METALLIC EFFECTS ON FABRICS CONTAINING ORGANIC DERIVATIVES OF CELLULOSE.

No Drawing.

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The object of this invention is to provide a process for treating fabrics made from or containing organic derivatives of cellulose to produce metallic effects on the fabric.

Another object of the invention is to obtain fabrics which very closely resemble old Venetian metallic tapestries of the Renaissance period. Another object of the invention is to provide a process for treating fabrics of or containing organic derivatives of cellulose with mineral powders or dye stuff powders to obtain variegated effects on the fabric.

There are several different methods for obtaining metallic silver and gold effects on cloth known today. Of these processes the one most often employed is one wherein a paste of gum or gums, such as are commonly employed in printing processes, and a metallic powder is printed on the fabric and then fixed by a subsequent steaming operation. Of if desired the fine metallic powder, in paste form, is spread on the fabric and the latter is then subjected to a calendering operation. The above steaming or calendering operations serve to fix the metallic powder in the fabric.

It has now been discovered by the applicant that fabrics containing organic derivatives of cellulose can be treated so as to obtain unusual metallic effects. In the old processes no change in the structure of the fabric is brought about whereas in the applicant's process the structure of the fabric is materially altered and novel and unexpected effects are obtained as a result of this change. The new process constituting the applicant's invention consists in distributing, for example, by means of a vertical "doctor blade" or by general printing methods, a paste containing a metallic or mineral powder and a liquid to the fabric, the liquid being a solvent for the organic derivative of cellulose forming a part of the fabric.

The liquid dissolves, partially or completely, depending on the conditions of treatment, the organic derivatives of cellulose and enables the metallic or mineral powder or other material to be fixed completely or permanently by the subsequent drying process. The fabric after the above treatment can be dyed and/or calendered as desired.

The following examples illustrate two processes or methods of carrying out my invention on fabric made of a heavy crepe of cotton and cellulose acetate.

Example 1.—500 grams of gum arabic are dissolved in $\frac{1}{2}$ a litre of water and to this is added 5 litres of acetone. To this mixture, which is well stirred, so as to form an emulsion, 200 grams of powdered gold substitute is added. The mixture is well stirred until the powdered metal (or other material which may be added) is entirely and uniformly distributed in the resulting paste. This paste is then uniformly applied to the fabric by means of a vertical "doctor blade" and the fabric is then very rapidly dried. This drying serves to fix the metallic powder in the fabric. After the fabric is completely dried it can be dyed, preferably at high temperatures (80 to 100° C.), with a mixture of cotton and cellulose acetate dyestuffs or with cotton dyestuffs alone or even with cellulose acetate dyestuffs alone. The fabric at this stage of the process presents a uniform solid and unbroken metallic surface due to the fixing of the metallic powder therein.

The fabric, after the above treatment, is then washed and put on a stretching frame and greatly stretched. This stretching causes some of the partially or completely dissolved cellulose acetate threads to break and that portion of fabric which has been previously dyed shows itself in the dyed shade. That is to say the dyed portions of the fabric appear as a background to the metallic surface, which surface as a result of the stretching operation is no longer a continuous solid mass but is broken up to a considerable degree. After the stretching treatment, as above set out, the fabric may be calendered if desired in order to give it a smoother appearance and feel.

Example 2.—500 grams of Sericose are dissolved in a mixture of $6\frac{1}{2}$ litres of acetone, $11\frac{1}{2}$ litres of ethyl alcohol and $2\frac{1}{2}$ litres of benzol. To this solution is added 300 grams of powdered gold or silver substitute and the mixture well stirred until the powdered metal is entirely and evenly distributed in the resulting paste. The fabric is then treated with the paste as described in Example No. 1.

The above examples of the process can be modified by substituting any other powder, or mixture of powders, suitable for obtaining the effects desired—thus for example powdered bronze and powdered aluminum can be used where one wishes both gold and silver effects on the same fabric. Also the fabric treated may contain fibres of more than one derivative of cellulose—that is fibres of both

esters and ethers of cellulose. Nor is a mixed fabric of cotton and an organic derivative of cellulose the only class of mixed fabric which can be treated by the applicant's process. Mixed fabrics of wool and organic derivatives of cellulose or of real silk and organic derivatives of cellulose or of rayon and organic derivatives of cellulose, etc. can also be treated by this process to obtain the peculiar and characteristic metallic effects resulting from the application of the applicant's process to a mixed fabric of cotton and cellulose acetate.

Instead of metallic powders, mineral powders, such as ultra-marine, iron oxide, etc. or insoluble dyestuff powders can be mixed in the paste. Also different solvents of high boiling points and softening agents for the particular cellulose derivatives in the fabric can be utilized. This makes it possible to obtain different effects and appearances on the fabric on which the powders are fixed and also enables one to obtain fabrics of varying degrees of softness. As examples of such high boiling point solvents or softeners, the following are mentioned: Turkey red oil, triacetin, tricresylphosphate and mono-oil.

The above examples are merely illustrative of the applicant's invention and his invention is to be construed as limited only by the scope of the appended claims.

What I claim and desire to secure by Letters Patent is:

1. A process for treating fabrics containing organic derivatives of cellulose in order to obtain metallic or similar effects thereon which comprises applying to the surface of the fabric a paste containing a gum, a solvent for the organic derivatives in the fabric and a powder suitable for obtaining the desired effects to form a thin breakable film, and fixing the paste on the fabric.

2. A process for treating fabrics containing an organic derivative of cellulose in order to obtain metallic or similar effects thereon which comprises applying to the surface of the fabric a paste containing a gum, a solvent for the organic derivative in the fabric and a mineral powder suitable for obtaining the desired effects to form a thin breakable film and fixing the paste on the fabric.

3. A process for treating fabrics containing an organic derivative of cellulose in order to obtain metallic or similar effects thereon which comprises supplying to the surface of the fabric a paste containing a gum, a solvent for the organic derivative in the fabric and a metallic powder to form a thin breakable film and fixing the paste on the fabric.

4. A process for treating fabrics containing an organic derivative of cellulose in order to obtain metallic or similar effects thereon which comprises applying to the surface of the fabric a paste containing a gum, a solvent for the organic derivative in the fabric and

powdered gold to form a thin breakable film and fixing the paste on the fabric.

5. A process for treating fabrics containing an organic ester of cellulose in order to obtain metallic or similar effects thereon which comprises applying to the surface of the fabric a paste containing a gum, a solvent for the organic ester and a powder suitable for obtaining desired effects to form a thin breakable film and fixing the paste on the fabric.

6. A process for treating fabrics containing cellulose acetate in order to obtain metallic or similar effects thereon which comprises applying to the surface of the fabric a paste containing a gum, a solvent for the cellulose acetate and a mineral powder suitable for obtaining desired effects to form a thin breakable film and fixing the paste on the fabric.

7. A process for treating fabrics containing an organic derivative of cellulose yarn in order to obtain metallic or similar effects thereon which comprises applying to the surface of the fabric a paste containing gum arabic and acetone and a powder suitable for obtaining the desired effects to form a thin breakable film and fixing the paste on the fabric.

8. A process for treating fabrics containing an organic derivative of cellulose and yarn of other fibre in order to obtain metallic or similar effects thereon which comprises applying to the surface of the fabric a paste containing a gum, a solvent for the organic derivative in the fabric and a powder suitable for obtaining the desired effects and drying the fabric to form a thin breakable film, thereby fixing the paste on the fabric.

9. A process for treating fabrics containing an organic derivative of cellulose and yarn of other fibre in order to obtain metallic or similar effects thereon which comprises applying to the surface of the fabric a paste containing a gum, a solvent for the organic derivative in the fabric and a powder suitable for obtaining the desired effects and, drying the fabric to form a thin breakable film, thereby fixing the paste on the fabric and then dyeing the fabric with the powder fixed thereon.

10. A process for treating fabrics containing an organic derivative of cellulose and yarn of other fibre in order to obtain metallic or similar effects thereon which comprises applying to the surface of the fabric a paste containing a gum, a solvent for the organic derivative in the fabric and a powder suitable for obtaining the desired effects and, drying the fabric to form a thin breakable film, thereby fixing the paste on the fabric and then dyeing, at elevated temperatures, the fabric with the powder fixed thereon.

11. A process for treating fabrics containing an organic derivative of cellulose in order to obtain metallic or similar effects there-

on, which comprises applying to the surface of the fabric a paste containing a gum, a solvent for the organic derivative in the fabric and a powder suitable for obtaining the desired effects, quickly drying the fabric thereby fixing the paste on the fabric, and subsequently stretching the fabric, causing some of the partially or completely dissolved threads to break.

12. A process for treating fabrics containing an organic derivative of cellulose in order to obtain metallic or similar effects thereon which comprises applying to the surface of the fabric a paste containing a gum, a solvent for the organic derivative in the fabric and a powder suitable for obtaining the desired effects and, quickly drying the fabric, thereby fixing the paste on the fabric, then dyeing the fabric with the powder fixed thereon and subsequently stretching the fabric, causing some of the partially or completely dissolved threads to break, thus exposing portions of the dyed fabric.

13. A process for treating fabrics containing an organic derivative of cellulose in order to obtain metallic or similar effects thereon which comprises applying to the surface of the fabric a paste containing a gum, a solvent for the organic derivative in the fabric and a powder suitable for obtaining the desired effects, and quickly drying the fabric, thereby fixing the paste on the fabric, then dyeing the fabric with the powder fixed thereon, subsequently stretching the fabric causing some of the partially or completely dissolved threads to break, thus exposing portions of the dyed fabric and finally calendering the stretched fabric.

14. A process for treating a mixed fabric of cotton and cellulose acetate yarns in order to obtain metallic or similar effects thereon which comprises applying to the fabric a paste containing a gum, a solvent for the cellulose acetate and a powder suitable for obtaining the desired effects to form a thin film and fixing the paste on the fabric.

15. A process for treating a mixed fabric of cotton and cellulose acetate yarns in order to obtain metallic or similar effects thereon which comprises applying to the fabric a paste containing a gum, a solvent for the cellulose acetate and powdered gold to form a thin film and fixing the paste on the fabric.

16. A process for treating a mixed fabric of cotton and cellulose acetate yarns in order to obtain metallic or similar effects thereon which comprises applying to the surface of

the fabric a paste containing a gum, a solvent for the cellulose acetate and a mineral powder suitable for obtaining the desired effect and quickly drying the fabric to form a thin film, thereby fixing the paste on the fabric.

17. A process for treating a mixed fabric of cotton and cellulose acetate yarns in order to obtain metallic or similar effects thereon which comprises applying to the surface of the fabric a paste containing a gum, a solvent for the cellulose acetate and a mineral powder suitable for obtaining desired effects, quickly drying the fabric thereby fixing the paste on the fabric to form a thin film, and then dyeing the fabric, with the powder fixed thereon, at elevated temperatures.

18. A process for treating a mixed fabric of cotton and an organic ester of cellulose in order to obtain metallic or similar effects thereon which comprises applying to the surface of the fabric, a paste containing a gum, a solvent for the cellulose ester, and a powder suitable for obtaining the desired effect, quickly drying the fabric, thereby fixing the paste on the fabric, dyeing the fabric with the powder fixed thereon and subsequently stretching the fabric, causing some of the partially or completely dissolved threads to break thus exposing portion of the dyed fabric.

19. A mixed fabric containing an organic derivative of cellulose having a metallic powder fixed therein in the form of a thin breakable film and presenting a metallic effect.

20. A mixed fabric of cotton and an organic derivative of cellulose having a metallic powder fixed therein in the form of a thin breakable film and presenting a metallic effect.

21. A mixed fabric of cotton and cellulose acetate having a metallic powder fixed therein and presenting a metallic effect in the form of a broken thin film similar to old Venetian metallic tapestry.

22. Process of treating a fabric, which fabric has a thin breakable film of metallic powder fixed thereon comprising dyeing the said fabric.

23. Process of treating a fabric which fabric has a thin breakable film of metallic powder fixed thereon comprising stretching the fabric to cause part of the metallic film to break.

In testimony whereof, I have hereunto subscribed my name.

RENÉ CLAVEL.