

UNITED STATES PATENT OFFICE

HERBERT PLATT, OF CUMBERLAND, MARYLAND, ASSIGNOR TO CELANESE CORPORATION OF AMERICA, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE

PRINTING OF FABRICS CONTAINING ORGANIC DERIVATIVES OF CELLULOSE

No Drawing.

Application filed November 2, 1927. Serial No. 230,682.

This invention relates to an improvement applicable to processes for printing and stencilling of fabrics containing yarns or fibres of organic derivatives of cellulose in order to obtain superior results.

An object of this invention is to devise a process for printing fabrics containing organic derivatives of cellulose whereby the dye-stuff applied to the fabric will be prevented from creeping.

Another object of this invention is to provide a process for obtaining sharp and well defined prints on fabrics containing organic derivatives of cellulose. Still another object of my invention is to provide a process for obtaining well defined and clear cut patterns on fabrics containing cellulose acetate. Other objects and advantages will appear from the specification and claims in which specific embodiments of my invention are disclosed.

It is well known that good prints can be obtained on fabrics consisting wholly or partially of yarns or threads of organic derivatives of cellulose such as cellulose acetate, cellulose propionate, ethyl cellulose, etc. However, such prints are frequently marred because the differently colored portions of the pattern are not sharply defined. That is, the junction or dividing line between two differently colored portions of the design is somewhat blurred or cloudy. This phenomenon is due to the dye or dyes running or rather creeping along the fibre, with the result that instead of having well defined colors on both sides of the junction line, there is an appreciable area along this line which has a cloudy or murky appearance due to the mixing of the different colors.

I have now found that this objectionable creeping can be avoided if the fabric containing the organic derivatives of cellulose is first treated with basic aluminum acetate and then dried before being subjected to the usual printing treatment. The theoretical reaction of the aluminum acetate upon the fabric is not understood but this is not necessary for the carrying out of my invention. Actually the aluminum acetate treatment serves to prevent the creeping of the dye-

stuff giving prints with their respective colors clear cut and well defined. The fabric, when treated with the basic aluminum acetate solution, retains some of the aluminum in the form of an aluminum compound, which is probably aluminum oxide.

The following examples indicate methods for carrying out my invention. These examples are illustrative only and not in any way limitative.

Example 1.—A fabric containing cellulose acetate and cotton was impregnated with a solution containing 15 grams per litre of basic aluminum acetate. The treatment was carried out at a temperature of 75° C. for a period of $\frac{3}{4}$ of an hour. After this treatment the fabric was dried and the fabric then subjected to usual printing operations. The various colors of the pattern were found to be clear cut and sharply defined in all instances.

Example 2.—A fabric consisting entirely of cellulose acetate was impregnated with a solution containing 40 grams per litre of basic aluminum acetate. The treatment was continued for 2 hours at a temperature of 40° C. and the treated fabric then dried. After drying, portions of the fabric were subjected to well known printing operations and in all instances gave clear, well defined printings.

Example 3.—A fabric containing ethyl cellulose was treated as outlined in Example 2. The prints obtained in this case also were clear cut and well defined.

Example 4.—A fabric containing cellulose acetate was treated in a bath containing 30 grams of basic aluminum acetate and 20 to 40 cc., say 30 cc. of acetic acid per litre. The bath was maintained at a temperature of 50° C. and the treatment conducted for one hour. The fabric was removed from the bath, dried and then subjected to the usual printing operations. The results were excellent, the acetic acid apparently having a beneficial effect upon the printing of the fabric.

The above examples merely indicate a few of the many ways in which my invention can be carried out. Instead of impregnating the fabric with the aluminum acetate solution the

fabric can be run through a bath containing the aluminum acetate or the fabric may be padded with the aluminum acetate solution.

This is also true where acetic acid is added to the bath. The temperature and concentration of the bath can be varied within wide limits as can the duration of the treatment. Usually the higher the temperature of the bath the lower the concentration of the aluminum acetate solution employed. And in like manner, the higher the concentration of the aluminum acetate solution employed, the shorter the time required to sufficiently impregnate the fabric.

Other basic metallic acetates can be used but the results obtained are not quite as good as when basic aluminum acetate is employed. In a similar manner the acetic acid of Example 4 can be replaced by other similar acting organic acids such as formic acid, butyric acid, etc. This process is also applicable to mixed fabrics of organic derivatives of cellulose and cotton, wool, silk, etc., as well as to fabrics made wholly from yarns of organic derivatives of cellulose.

This process is applicable to fabrics containing organic derivatives of cellulose other than those mentioned in the specific examples such as for example, cellulose propionate, ethyl cellulose, benzyl cellulose, etc. all of which are included in the claims in the term organic derivative of cellulose. Mixtures of such organic derivatives of cellulose with each other or with other classes of fibres such as silk, wool, rayon, and cotton can be treated in accordance with my process and are to be considered within the scope of my invention.

The aluminum acetate employed in my process has no deleterious effect upon the printing or dyeing of the fabric. Its use as indicated results in the beneficial prevention of the creeping of the dye-stuff in the printing paste along the fibres. This process by its prevention of creeping makes it possible to use a large number of dyes in printing pastes which heretofore could not be so used because of their pronounced tendency to creep.

Having described my invention what I claim and desire to secure by Letters Patent is:

1. Process of printing fabrics containing organic derivatives of cellulose which comprises treating the fabric with a heated solution containing basic aluminum acetate and then subjecting the fabric to a printing operation.

2. Process of printing fabrics containing organic derivatives of cellulose which comprises treating the fabric with a solution containing basic aluminum acetate at elevated temperatures, drying the fabric and then subjecting it to a printing operation.

3. Process of printing fabrics contains organic derivatives of cellulose which com-

prises treating the fabric with a heated solution containing basic aluminum acetate and a small amount of a lower fatty acid, and then subjecting the fabric to a printing operation.

4. Process of printing fabrics containing organic derivatives of cellulose which comprises treating the fabric with a solution containing basic aluminum acetate and a small amount of acetic acid at elevated temperatures, drying the fabric and then subjecting it to a printing operation.

5. Process of printing fabrics containing organic derivatives of cellulose which comprises treating the fabric with a solution containing 15-40 grams of basic aluminum acetate per litre and then subjecting the fabric to a printing operation.

6. Process of printing fabrics containing organic derivatives of cellulose which comprises treating the fabric with a solution containing 15-40 grams of basic aluminum acetate per litre at elevated temperatures and then subjecting the fabric to a printing operation.

7. Process of printing fabrics containing organic derivatives of cellulose which comprises treating the fabric with a solution containing 15-40 grams of basic aluminum acetate per litre at elevated temperatures, drying the fabric and then subjecting it to a printing operation.

8. Process of printing fabrics containing organic derivatives of cellulose which comprises treating the fabric for an hour in a bath containing 30 grams of basic aluminum acetate and 20-40 cc. of a fatty acid per litre, the bath being maintained at a temperature of 50° C., and then subjecting the fabric to a printing operation.

9. Process of printing fabrics containing organic derivatives of cellulose which comprises treating the fabric for an hour in a bath containing 30 grams of basic aluminum acetate and 30 cc. of acetic acid per litre, the bath being maintained at a temperature of 50° C., drying the fabric and then subjecting it to a printing operation.

10. Process of treating fabrics containing cellulose acetate which comprises treating the fabric with a heated solution containing basic aluminum acetate, drying the fabric and then subjecting it to a printing operation.

11. Process of printing fabrics containing cellulose acetate which comprises treating the fabric with a heated solution containing basic aluminum acetate and a small amount of a lower fatty acid, and then subjecting the fabric to a printing operation.

12. Process of printing fabrics containing cellulose acetate which comprises treating the fabric with a solution containing basic aluminum acetate and a small amount of acetic acid at elevated temperatures, drying the fabric and then subjecting it to a printing operation.

13. Process of printing fabrics containing cellulose acetate which comprises treating the fabric with a solution containing 15-40 grams of basic aluminum acetate per litre at elevated temperatures, drying the fabric and then subjecting it to a printing operation.

14. Process of printing fabrics containing cellulose acetate which comprises treating the fabric for an hour in a bath containing 30 grams of basic aluminum acetate and 30 cc. of acetic acid per litre, the bath being maintained at a temperature of 50° C., drying the fabric and then subjecting it to a printing operation.

15. In a process of printing fabrics containing organic derivatives of cellulose the step of treating the fabric with a solution containing basic aluminum acetate before subjecting the fabric to a printing operation.

16. In a process of printing fabrics containing cellulose acetate the step of treating the fabric with a solution containing basic aluminum acetate.

17. In a process for printing fabrics containing cellulose acetate the step of treating the fabric with a heated solution containing basic aluminum acetate and acetic acid.

18. A printed fabric containing an organic derivative of cellulose having an aluminum compound deposited thereon.

19. A printed fabric containing cellulose acetate having an aluminum compound deposited thereon.

In testimony whereof, I have hereunto subscribed my name.

HERBERT PLATT.