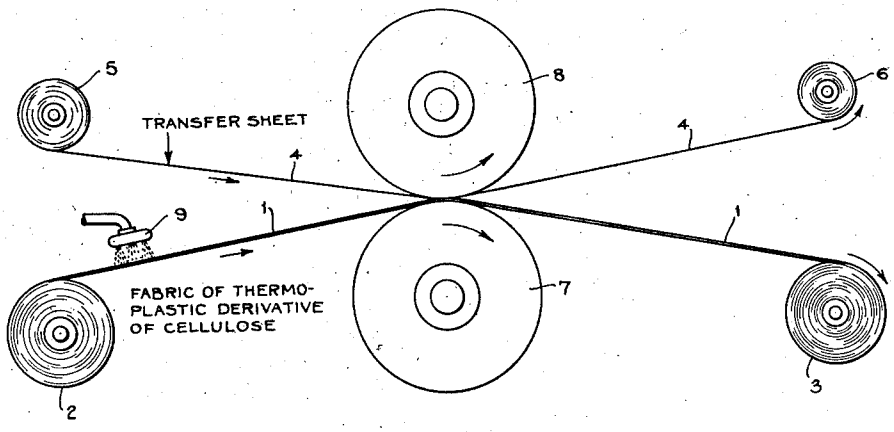
Dec. 2, 1930. C. DREYFUS 1,783,606

PROCESS OF PRINTING FABRICS

Filed June 30, 1927

FIG. 1



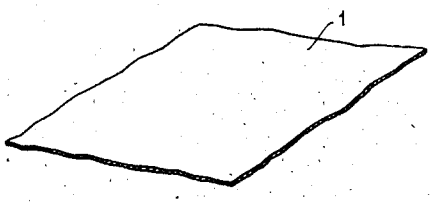


FIG. 2

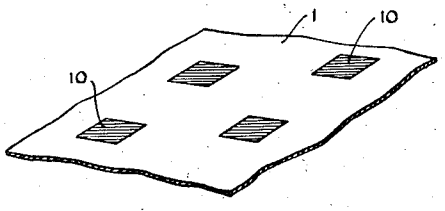


FIG. 3

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CAMILLE DREYFUS, OF NEW YORK, N. Y.

PROCESS OF PRINTING FABRICS

Application filed June 30, 1927. Serial No. 202,746.

This invention relates to new and improved methods of printing, dyeing or stencilling fabrics whether the same be made of silk, wool, cotton, thermoplastic derivatives of cellulose such as cellulose esters and ethers, artificial silk of the cellulose type, etc., or mixtures of the same. The term printing as used in the specification and claims is to be considered as including within its scope dyeing, printing, stencilling, etc.

An object of this invention is to dispense with the application of pastes, thickeners, agglutinants, etc. on the fabrics to be printed. Another object of this invention is to provide a process for the printing of fabrics by the transfer of the dyestuff or coloring matter from a transfer sheet to the fabric which is to be printed. Still another object of this invention is to obtain printing on fabrics which will be fast and which will not rub.

There are known today several methods of printing fabrics. These various methods can be classified under the broad headings of direct printing, discharge printing and resist printing. All of these known processes involve or depend upon the use of gums, pastes, etc., to prepare the dyestuff in such form that it can be applied to a fabric. Unless these pastes are of exactly the proper consistency the fabric does not take the design clearly and distinctly.

The present invention does away with the application of these pastes etc., on the fabric to be printed in the printing of textiles and similar materials. This is accomplished by "transferring" the dyestuff from any suitable transfer sheet or medium to the fabric to be printed.

The dye or dyes with which it is desired to print, dye or stencil the fabric are dissolved in any volatile solvent or diluent, or made into a paste and sprayed or otherwise applied to a transfer medium which may consist of paper, fabric, flexible metal etc. The transfer medium will thus be impregnated or coated with the dye or dyes, serving merely as a carrying means for the dye. After the solution of the dye or dyes is sprayed or the dye otherwise applied to the transfer medium, the solvent is allowed to evaporate, leaving the dye or dyes either as such or in paste form upon the transfer medium. The dye or dyes selected should be such that they have an affinity for or are capable of coloring the particular fabric which is to be printed. Where different colors are to be applied a transfer medium for each color may be utilized or different portions of the transfer medium may have different colored dyes applied thereto.

The fabric which is to be printed is now prepared by passing the same through a bath containing a liquid which is a solvent for the particular dye or dyes present on the transfer medium. Needless to say the solvent for the dye above referred to should be one which will not deleteriously affect the fabric. An excellent solvent for the dye in cases where thermoplastic derivatives of cellulose are used comprises an aqueous solution of acetone, preferably a 50% aqueous acetone solution. The surplus liquid is then preferably, but not necessarily, removed from the fabric in any suitable manner such as by passing the same through rollers. The moistened fabric is then brought in contact with a transfer medium prepared as previously set out, by conducting it together with the transfer medium between rollers, preferably heated, under pressure. Since the dye selected is one which has an affinity for the particular type of fabric treated, those portions of the fabric which come in intimate contact with the transfer medium will be colored due to the fact that the dye on the transfer medium will be dissolved by the solvent in the fabric.

When printing in accordance with the present invention care must be taken that the fabric is not too moist. The fabric should be so dry that the dye upon the transfer medium will be dissolved only at those portions which are brought into intimate contact with the dampened fabric through the application of pressure. In utilizing the present invention for dyeing extreme care must be exercised to see that the fabric is evenly brought into contact with the transfer medium in order to avoid uneven dyeing.

The fabric after being treated as above is dried or allowed to dry so that the liquid with

which it has been wetted will evaporate. The dye will of course remain on the fabric permanently, having combined with the latter in the same manner as in any ordinary dyeing operation.

This invention has the additional a vantage that it also does away with the need of subjecting the fabric to further operations after the printing to remove the extraneous agents such as gums, pastes etc., which are employed in the known processes. Also this improvement makes possible the use of a much wider range of dyestuffs for printing purposes and makes it possible for a larger variety of fabrics to be printed successfully.

This improved process is applicable to all types of fabrics such as cotton, silk, wool, linens, artificial silks of the cellulose type, artificial silks made from organic derivatives of cellulose, and to mixed fabrics containing the above. The nature of the fabric to be printed will very naturally determine the various dyes and solvents to be used in the process.

The transfer sheet or medium upon which the dye is deposited, later to be transferred to the fabric to be printed, can be made of paper, fabric or flexible metal sheets etc. The preferable procedure is the use of a fabric as a transfer medium. Preferably, but not necessarily, it should be a fabric different in nature from the fabric which is to be printed in order that it should not be colored or dyed by the dye deposited thereon. Where a fabric is to be printed with a design containing different colors the same can be effected by having different portions of the transfer sheet impregnated with different colored dyes or a different transfer sheet may be employed for each dye. Where a uni-colored design is to be printed the transfer sheet may be uniformly coated with the dye and portions only of the fabric to be printed brought into intimate contact with the dye-containing transfer sheet at the points of pressure or the dye may be applied to the transfer sheet in the desired design and the sheet brought into contact with the fabric.

Where the fabric which is to be printed consists of or contains thermoplastic derivatives of cellulose the liquid used for wetting the fabric may also be a swelling or softening agent for such thermoplastic cellulose derivative. By thermoplastic derivatives of cellulose we mean nitro cellulose, cellulose acetate, ethyl cellulose and/or other esters and ethers of cellulose. This is of especial advantage where it is desired to permanently emboss and print the fabric simultaneously, in which case suitable rollers or blocks having the desired design embossed or engraved thereon will be used.

Further to clarify the description of this invention, reference is had to the accompanying drawing showing one form of carrying out my invention.

In the drawing:—

Figure 1 is a diagrammatic view of an apparatus adapted to carry out the process,

Figure 2 is a perspective view of a piece of fabric as it appears prior to treatment, and

Figure 3 is a perspective view of the fabric as it appears after it has been subjected to the process.

Referring to Figure 1, the fabric 1 containing yarn of thermoplastic derivatives of cellulose, such as cellulose acetate, is passed from the roll 2 to the roll 3. During its passage, the transfer sheet 4 having a design of dyestuff thereon is superposed on the fabric 1, and this transfer sheet is passed from the roll 5 to the roll 6. In their passage, the fabric 1 and transfer sheet 4 pass between the pressure rolls 7 and 8, which cause the thermoplastic derivative of cellulose fabric to take up the dye from the transfer sheet. In order to obtain better transfer, a solvent for the dyestuff is sprayed onto the fabric by means of the rose 9 prior to the application of the pressure by the rolls 7 and 8.

In Figure 3, the fabric 1 is shown having the colored design 10 thereon where it has taken the dyestuff from the transfer sheet 4.

The process is applicable to various types of fabrics and also any kind of transfer sheets or mediums may be used. The dyes, too, can be varied depending upon the fabric used and the color desired. Any solvent of the dye, preferably one which will not affect the transfer medium, can be used in applying the dye to the latter and similarly any solvent for the dye may be used to wet the fabric to be printed if said solvent does not deleteriously affect the fabric to be dyed or printed. It should be noted that no pastes, gums, thickeners etc., need be or are applied to the fabric to be treated in the present process. Neither is it necessary to employ dyestuffs dissolved in oil such as are usually utilized when "transferring" a color or dye to a fabric. As a result of this invention "rubbing" of the dye, which occurs when an oil soluble dye is "transferred" to a fabric, is avoided.

A fabric which has been dyed, printed or stencilled in accordance with this invention may be treated in any known manner, such as, steaming etc., for permanently fixing the color or colors in the fabric. Any other treatments which are usually applied to printed fabrics may also be applied to fabrics which have been printed in accordance with the present invention.

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

1. A process of printing fabrics which comprises spraying the fabric to be printed with a solvent for the dye on a transfer medium, applying the wetted fabric to a trans-

fer medium, having a dye that is capable of dyeing the fabric to be printed under pressure, whereby the dye on those portions of the transfer medium, which come into intimate contact with the wetted fabric, will be dissolved and will combine with the fabric to color the latter.

2. A process of printing fabrics which comprises supplying the fabric to be printed with a solvent for the dye on the transfer medium, removing the excess of said solvent from the fabric in any suitable manner, applying to the thus treated fabric a transfer medium having a dye that is capable of dyeing the fabric to be printed, whereby the dye on those portions of the transfer medium which come in contact with the damp fabric will be dissolved and will combine with the fabric to color the latter.

3. A process of printing fabrics which comprises spraying the fabric to be printed with a solvent for dye on a transfer sheet, removing the excess liquid from said fabric in any suitable manner, applying the thus treated fabric to that portion of a transfer medium containing a design of a dye that is capable of dyeing the fabric to be printed thereon, whereby the dye on those portions of the transfer medium which come in contact with the wetted fabric will be dissolved and will combine with the fabric to color the latter, evaporating the solvent from the moist fabric to permanently fix the dye in said fabric.

4. A process of printing fabrics containing thermoplastic derivatives of cellulose which comprises wetting the fabric containing thermoplastic derivatives of cellulose to be printed with a liquid which is a solvent for the dye on a transfer sheet but which has no deleterious effect upon the fabric, applying the wetted fabric to a transfer sheet, having thereon a dye that is capable of dyeing thermoplastic derivatives of cellulose whereby the dye on those portions of the transfer sheet contacting under pressure with the wet fabric will be dissolved and will unite with the thermoplastic derivative of cellulose to color the same.

5. A process of printing fabrics containing thermoplastic derivatives of cellulose which comprises wetting the fabric to be printed with a liquid which is a solvent for the dye on a transfer sheet but which has no deleterious effect upon the fabric, removing the excess of said liquid from the fabric in any suitable manner, applying the thus treated fabric to a transfer medium having thereon a dye that is capable of dyeing thermoplastic derivatives of cellulose, whereby the dyestuff on the portions of the transfer medium which come into contact under pressure with the moist fabric will be dissolved and will combine with the cellulose derivative portions of the fabric to color the same.

6. A process of printing fabrics containing thermoplastic derivatives of cellulose which comprises impregnating the fabric to be printed with a liquid which is a solvent for the dye on a transfer sheet but which has no deleterious effect upon the fabric, removing the excess liquid from said fabric in any suitable manner, applying the thus treated fabric to that portion of the transfer sheet containing a design of a dye that is capable of dyeing thermoplastic derivatives of cellulose thereon, whereby the dye on those portions of the transfer medium which come into contact with the moist fabric will be dissolved and will combine with the fabric to color the same, evaporating the solvent from the moist fabric to permanently fix the dye in said fabric.

7. A process of printing fabrics containing cellulose acetate which comprises wetting the fabric to be printed with a liquid which is a solvent for the dye on a transfer sheet but which has no deleterious effect upon the fabric, applying the wetted fabric to a transfer sheet having thereon a dye that is capable of dyeing cellulose acetate material under pressure, whereby the dye on those portions of the transfer sheet contacting with the wetted fabric will be dissolved and will unite with cellulose acetate to dye the same.

8. A process of printing fabrics containing cellulose acetate which comprises impregnating the fabric to be printed with a liquid which is a solvent for the dye on a transfer sheet but which has no effect upon the fabric, removing the excess liquid from said fabric in any suitable manner, applying the thus treated fabric to that portion of a transfer sheet containing a design of a dye that is capable of dyeing cellulose acetate material, thereon, whereby the dye on these portions of the transfer sheet which come into contact with the moist fabric will be dissolved and will combine with the cellulose acetate portions of the fabric to color the same, evaporating the solvent from the moist fabric to permanently fix the dye in said fabric.

9. A process of printing fabrics containing cellulose acetate which comprises impregnating the fabric to be printed with an aqueous solution of acetone, removing the excess acetone solution from said fabric in any suitable manner, applying the thus treated fabric to that portion of a transfer sheet containing a design of dye that is capable of dyeing cellulose acetate material thereon, whereby the dye on those portions of the transfer sheet which come into contact with the moist fabric will be dissolved and will combine with the cellulose acetate portions of the fabric to color the same, evaporating the acetone from the moist fabric to permanently fix the dye in said fabric.

10. A process of printing fabrics containing cellulose acetate which comprises impreg-

nating the fabric to be printed with a 50% aqueous solution of acetone, removing the excess acetone solution from said fabric in any suitable manner, applying the thus treated fabric to that portion of a transfer sheet containing a design of a dye that is capable of dyeing cellulose acetate material thereon, whereby the dye on those portions of the transfer sheet which come into contact with the moist fabric will be dissolved and will combine with the cellulose acetate portions of the fabric to color the same, evaporating the acetone from the moist fabric to permanently fix the dye in said fabric.

11. Method of printing fabric containing yarns of organic derivatives of cellulose comprising wetting the fabric to be printed with an organic solvent for the dyestuff on a transfer sheet and applying under pressure the so wetted fabric to a transfer sheet having a water insoluble dye that is capable of dyeing the organic derivative of cellulose yarns.

12. Method of printing fabric containing yarns of cellulose acetate comprising wetting the fabric to be printed with an organic solvent for the dyestuff on a transfer sheet and applying under pressure the so wetted fabric to a transfer sheet having a water insoluble dye that is capable of dyeing the cellulose acetate yarns.

13. Method of printing fabric containing yarns of cellulose acetate comprising wetting the fabric to be printed with an aqueous solution of acetone which is a solvent for the dyestuff on a transfer sheet, and applying under pressure the so wetted fabric to a transfer sheet having a water insoluble dye that is capable of dyeing the cellulose acetate yarn.

In testimony whereof, he has hereunto subscribed his name.

CAMILLE DREYFUS.