UNITED STATES PATENT OFFICE.

GEORGE DONALD, OF NORTH ADAMS, MASSACHUSETTS, ASSIGNOR TO THE ARNOLD PRINT WORKS, OF SAME PLACE.

PRINTING COLORS WITH ANILINE-BLACK.

SPECIFICATION forming part of Letters Patent No. 491,961, dated February 14, 1893.

Application filed January 16, 1893. Serial No. 458,526. (No specimens.)

To all whom it may concern:

Be it known that I, GEORGE DONALD, of North Adams, in the county of Berkshire and Commonwealth of Massachusetts, have invented certain Improvements in the Process of Producing and Fixing Colored Figures in Conjunction with Aniline-Black upon Cotton Materials, of which the following is a specification.

This invention relates to improvements in the process of producing colored figures in conjunction with aniline black upon cotton materials, described in the specifications accompanying applications Serial Nos. 441,727 and 453,517, and consists in certain modifications hereinafter set forth.

In the process described in the former of said applications the mordant is applied to the cotton material, before the color which has chemical affinity therefor; in the latter of said applications one of the ingredients which is to form the mordant is applied simultaneously with the color and the other ingredient after steaming the padded and printed goods, the essential thing, however, when a mordant is used which is produced by the action of an astringent, such as tannic acid, upon a metallic salt, such as a salt of antimony, is to apply them successively to the material, in order that the chemical action of one upon the other may take place in the material, which would not be the case if the astringent and metallic salt were first mixed together, thereby forming an insoluble salt which, when applied to the material, would not be chemically fixed therein.

By my improvements, substantially the same result is obtained with a modification in the steps of the process and a reduction in the number, whereby a saving in both time and labor is effected and consists in: First, padding the cotton material with the astringent solution, then drying. Second, padding it with an aniline black mixture containing a suitable metallic salt, such as a salt of antimony, then drying and, third, printing with the color-resist, and then aging and finishing in the usual manner. Or, in first, padding the material with an aniline black mixture combined with an astringent solution, then drying, and second, printing with a color-resist mixed with the suitable metallic salt, then steaming and finishing.

By the first modification, one of the preliminary operations described in the said application, Serial No. 441,727 is dispensed with, namely, the separate treatment of the material with the metallic salt.

By the second modification, the two preliminary operations of treating with the mordant ingredients are dispensed with, the astringent being combined with the aniline-black mixture and the metallic salt with the color-resist, thus reducing the process to two operations, thereby effecting a still further saving of time and labor, and with substantially the same result.

A specific illustration of my improved process is as follows:—First, treat the material with a solution containing from one and one-half to two ounces of tannic acid to each gallon of water, then dry. Second, pad with a standard solution for aniline black, mixed with about two ounces of a salt of antimony to each gallon of the solution, dry at a low temperature. Third, print, in the figures desired, with a color-resist, composed of say, one ounce of aniline green dissolved in eight ounces of alcohol, (for economy, methyl alcohol,) to this add four ounces of hot water. Then add, seven pints of a thickened "resist" containing about four ounces and two-thirds of acetate of soda and two ounces and two-thirds of British gum to each half pint, after printing with the above, dry and finally, steam, wash and finish in the usual manner. Or, the material may be treated as follows: first, pad with an aniline black mixture to which has been added tannic acid in the proportion of one and one-half to two ounces to each gallon of mixture, then dry at a low temperature. Second, print, in the figures desired, with the color-resist above described to which has been added from two to three ounces of a salt of antimony.

It will be understood by the calico printer that the ingredients and proportions of ingredients used in the several solutions and mixtures above mentioned may be varied according to the formulas used in each establishment and the particular kind of work which is to be done; that is, any astringent

may be employed and any of the various metallic salts which are suitable mordants for the colors derived from coal-tar. The sequence in the application of the astringent and metallic salt to the cotton material may be reversed and obtain good results, that is, the metallic salt may be first applied and the astringent mixed with the aniline black mixture; or the metallic salt applied first with the aniline black mixture and then the astringent with the color-resist: but thus far the action which takes place by having the astringent first upon the material and afterward the metallic salt, has been found preferable.

I claim as my invention—

1. The process of producing and fixing in cotton material, colored figures in conjunction with aniline black, which consists in, mordanting the material with an astringent solution and a metallic salt, and padding it with aniline black, by first applying one of said mordant ingredients, second, padding the material with an aniline black mixture containing the other of said mordant ingredients, third, printing upon the material in the desired figures, with an aniline-black resist containing a color for which said mordant has chemical affinity, and finally, steaming to develop and fix said colors, substantially as described.

2. The process of producing and fixing in cotton materials colored figures in conjunction with aniline black, by means of a mordant composed of an astringent and a metallic salt, which consists in first, padding the material with an aniline black mixture containing one of said mordant ingredients, second, printing upon the material in the desired figures with an aniline black resist containing the other of said mordant ingredients, and a color for which said mordant has chemical affinity, and finally, steaming to develop and fix the colors, substantially as described.

GEORGE DONALD.

Witnesses:
F. E. WHITE,
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