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UNITED STATES PATENT OFFICE

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PROCESS FOR PRINTING ACETATE SILK OR MATERIALS CONTAINING AN ORGANIC CELLULOSE ETHER OR ESTER

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It is known that non-sulfonated aminoanthraquinones in aqueous suspension or solution can dye acetyl-cellulose fast colors. When these products are used in printing acetyl-cellulose they have the disagreeable property during the steaming operation to penetrate more or less through the material to be printed and at the same time to dye the back grey.

The present invention is based on the observation that when acetate silk or material containing a colloid of the cellulose series of the group of the organic esters or ethers of the cellulose is printed with such sulfonic acids of aminoanthraquinones, the amino groups of which stand in the α-positions of the anthraquinone nucleus, and which contain aromatically bound sulfo groups the material is colored fast and full tints, while during the steaming operation there is no appreciable dyeing of the back greys. This fact is very surprising, because in the case of soluble dyestuffs it was more than ever to be expected that they would penetrate through the material to be printed. It is further to be remarked that, while the aminoanthraquinone sulfonic acids in question are yielding only weak dyeings which are of no use, because the dyeing-baths are not sufficiently exhausted, the same sulfonic acids will behave very much more advantageously in printing, because essentially more productive prints are obtained.

Among the sulfonic acids of aminoanthraquinones in question there come into consideration particularly those which derive from 1:4-diamino-anthraquinone, and in which at least one of the amino-groups is substituted by an aryl or aralkyl residue. With such dyestuffs blue to green prints of remarkable beauty are obtained. The sulfonic acids of aminoanthraquinones may of course also carry other substituents besides the amino-groups, such as OH, halogen, O-alkyl, etc.; the sulfo-group may be in the anthraquinone nucleus or in a side-chain.

For example, 20 parts of the sodium salt of 1-methylamino-4-benzylamino-sulfonic acid of anthraquinone are finely ground in a suitable mill with 80 parts of water in presence of a suitable dispersing agent, such as sulfite cellulose liquor.

The paste thus obtained is mixed intimately with 200 parts of water and 700 parts of a gum arabic or British gum thickening 1:1.

The goods are printed with this printing color, dried, steamed for ¾ of an hour at ¼ atmosphere pressure and then thoroughly washed. Full, pure blue tints are printed.

Like results are obtained with the following compounds:—1-(4'-acetylamino) phenylamino-4-aminoanthraquinone-3-sulfonic acid, 1-phenylamino-4-aminoanthraquinone-3-sulfonic acid, 1-phenylamino-4-aminoanthraquinone-3-sulfonic acid, 1:5-diamino-4:8-dihydroxyanthraquinone-3-sulfonic acid, 1:5-dimethylamino-4:8-dihydroxyanthraquinone-3-sulfonic acid, 1-(4'-methyl-3'-sulfo) phenylamino-4-methylaminoanthraquinone, 1-(4'-methyl-3'-sulfo) phenylamino-4-amino-3-methylanthraquinone. Green prints are obtained with 1:4-(4':4''-dimethyl-3':3''-disulfo)-diphenylaminoanthraquinone or with a monosulfonic acid of a 1:4-diarylido-anthraquinone; red violet with 1-amino-4-hydroxyanthraquinone-5-sulfonic acid, and orange with 1-aminoanthraquinone-5-sulfonic acid.

The same results are quite generally obtained with the group of textile materials which consist of the ester and the ether of cellulose.

What I claim is:—

1. A process of printing the group of textile materials consisting of colloids of the cellulose series of the group of the organic esters and ethers of cellulose, which consists in printing the material with such sulfonic acids of α-aminoanthraquinones which contain aromatically bound sulfo groups, and then steaming the material.

2. A process of printing the textile materials consisting of organic cellulose esters, which consists in printing the material with such sulfonic acids of di-α-aminoanthraquinones which contain aromatically bound sulfo groups, and then steaming the material.

3. A process of printing the textile ma-

terials consisting of cellulose acetate, which consists in printing the material with such sulfonic acids of 1:4-diaminoanthraquinones which contain aromatically bound sulfo groups, and then steaming the material.

4. A process of printing acetate silk, which consists in printing the material with such sulfonic acids of 1:4-diaminoanthraquinones which contain aromatically bound sulfo groups, and in which at least one of the NH_2-groups is substituted by an aryl or aralkyl residue, and then steaming the material.

5. A process of printing acetate silk, which consists in printing the material with such monosulfonic acids of 1:4-diaminoanthraquinones which contain aromatically bound sulfo groups and in which at least one of the NH_2-groups is substituted by an aryl or aralkyl residue, and then steaming the material.

6. A process of printing acetate silk, which consists in printing the material with 1-amino-4-(4'-acetylamino)-phenylaminoanthraquinone-2-sulfonic acid and then steaming the material.

In witness whereof I have hereunto signed my name this 18th day of September 1929.

OSCAR BALLY.