United States Patent Office 2,760,841 Patented Aug. 28, 1956

2,760,841

DYEING OF MIXED CELLULOSE DERIVATIVE-WOOL FABRICS

Victor S. Salvin, Irvington, and Paul A. Studer, Millburn, N. J., assignors to Celanese Corporation of America, New York, N. Y., a corporation of Delaware

No Drawing. Application April 18, 1952, Serial No. 283,120

2 Claims. (Cl. 8—24)

This invention relates to dyeing and relates more particularly to the union dyeing of textile materials containing both wool and organic derivative of cellulose or polyester materials.

The union dyeing of textile materials comprising mixtures or blends of wool and organic derivative of cellulose or polyester materials, such as cellulose acetate materials, presents a number of special problems. Dyestuffs of the type that will dye wool do not dye cellulose acetate materials. While dyestuffs of the type that will dye cellulose acetate materials do dye wool to some extent, the coloration of the wool dyeings so obtained has rather poor properties with respect to light fastness, wash fastness and crocking. When dyestuffs of both types are incorporated in a single dyebath for the union dyeing of these blended textile materials, it is found that the dyeings obtained are unsatisfactory in that they show a poor light fastness and exhibit a considerable degree of crocking, although the same dyestuffs produce satisfactory dyeings when they are used for the dyeing of wool or cellulose acetate textile materials separately. To overcome or minimize these difficulties, use has been made of a two-bath dyeing procedure, according to which the cellulose acetate in the blended textile materials is dyed first in one dyebath containing cellulose acetate dyestuffs, and the wool in the blended textile materials is dyed in a second dyebath containing wool dyestuffs. As will be readily apparent, there is a considerable additional expense involved in carrying out such a two-bath dyeing process as compared with a one-bath dyeing process.

It is an important object of this invention to provide a process and dyebath for the dyeing of textile materials containing both wool and organic derivative of cellulose or polyester materials which will be free from the foregoing and other difficulties.

A further object of this invention is to provide a process and dyebath for the union dyeing of textile materials containing both wool and organic derivative of cellulose or polyester materials in a single dyebath that will yield dyeings which show a good light fastness and exhibit substantially no crocking.

Other objects of this invention will be apparent from the following detailed description and claims.

It has now been found that the unsatisfactory dyeings previously obtained in the dyeing of textile materials containing both wool and cellulose acetate materials in a single dyebath containing both wool and cellulose acetate dyestuffs is due, in large part, to the staining of the wool by the cellulose acetate dyestuffs during the dyeing process. The stain on the wool has a poor light fastness and also exhibits a tendency to crocking so that the dyeings on the blended textile materials are not acceptable on a commercial basis.

According to the present invention, satisfactory union dyeings of a textile material containing both wool and cellulose acetate are obtained in a single dyebath containing both wool and cellulose acetate dyestuffs by incorporating in said dyebaths a mixture of selected non-

ionic and anionic dispersing agents. Dyebaths of this composition show little or no tendency to stain the wool with the cellulose acetate dyestuff during the dyeing process and what slight stain is produced on the wool does not materially affect the properties of the dyed materials. In certain cases, it may be desirable to aftertreat the textile material with an aqueous bath containing a mixture of a soap and a selected anionic dispersing agent, which treatment has been found to remove a portion of the cellulose acetate dyestuff stain on the wool, thereby minimizing even further crocking of the dyed material.

Anionic dispersing agents that have been found suitable for preparing the dyebaths of this invention include, for example, sulfonated naphthalene-formaldehyde condensation products available under the names Tamol N and Lomar PW. Non-ionic dispersing agents suitable for preparing the dyebaths of this invention include, for example, polyethylene oxide esters of long chain fatty acids available under the name Quakester 236; and polyvinyl alcohol available under the name Elvanol. For best results, each liter of the dyebath should contain between about 0.5 and 2.0 grams of the anionic dispersing agent, and between about 0.5 and 2.0 grams of the non-ionic dispersing agent.

For dyeing the wool in the blended textile materials, there may be employed, for example, the following dyestuffs, D. P. Anthraquinone Blue SKY (Color Index 1088), Palatine Fast Blue GGNA (Pr. 144), Palatine Pink RS–CS (Pr. 389), Neutracyl Red B, Neutracyl Yellow N and Supernylite Orange C. For dyeing the cellulose acetate in the blended textile materials, there may be employed, for example, the following dyestuffs, a mixture of 1-amino-4-arylamino anthraquinone and equal parts by weight of 1,4-di-oxyethylamino-5,8-dihydroxy anthraquinone, also 1-amino-4-acetylamino anthraquinone, 2-nitro-4-sulfonanilidodiphenylamine, and 2-nitro-4 sulfonamid-4-ethoxydiphenylamine. The term "cellulose acetate dyestuffs" is employed herein to designate the well known class of disperse dyestuffs that have an affinity for and will dye organic derivative of cellulose materials such as organic acid ester of cellulose materials as well as polyester materials such as polyethylene glycol terephthalate; while the term "wool dyestuffs" is employed to designate the well known class of dyestuffs that have an affinity for and will dye wool. The dyebaths containing these dyestuffs and the mixture of dispersing agents may be compounded and employed for dyeing the blended textile materials in conventional manner.

The dyed textile material may, if desired, be aftertreated with an aqueous bath containing per liter from about 1 to 4 grams of soap and from about 1 to 4 grams of the anionic dispersing agent listed above. The treatment may be effected by immersing the dyed textile material in the aqueous bath maintained at a temperature between about 30 and 50° C. for a period of between about 10 and 30 minutes. This treatment effects a further reduction in the tendency of the dyed textile material to exhibit crocking, apparently by removing at least a portion of the cellulose acetate dyestuff stain on the wool.

The process of this invention will now be described specifically in the following examples in connection with the dyeing of textile materials containing both wool and cellulose acetate fibers. It may also be employed for the dyeing of textile materials in which the cellulose acetate fibers are replaced in whole or in part by other organic derivative of cellulose fibers such as, for example, other organic acid ester of cellulose fibers such as cellulose propionate, cellulose butyrate, cellulose acetate propionate and cellulose acetate butyrate fibers, or by polyester fibers such as polyethylene glycol terephthalate fibers.

Example I

A fabric made of yarns containing a 50:50 blend of wool and cellulose acetate fibers is dyed for two hours in a dyebath maintained at 80° C. and containing 1% by weight on the weight of the wool fibers of Anthraquinone Blue SKY (40% of 100% dyestuff), 1% by weight on the weight of the cellulose acetate fibers of a mixture of equal parts by weight of 1-amino-4-arylamino anthraquinone and 1,4-di-oxyethylamino-5,8-dihydroxy anthraquinone (40% oil color), 0.5 gram per liter of sulfonated naphthalene-formaldehyde condensation product (Tamol N), 0.5 grams per liter of the dioleate ester of a polyethylene oxide chain, said chain having a molecular weight of 600 (Quakester 236), 5% by weight on the weight of wool fibers of ammonium acetate, 10% by weight on the weight of the wool fibers of Glauber's salt and sufficient water to bring the weight of the dyebath to 50 times the weight of the fabric. The dyed fabric is then immersed for 15 minutes in an aqueous bath maintained at 35 to 40° C. and containing 1 gram per liter of green soap and 1 gram per liter of sulfonated naphthalene-formaldehyde condensation product (Tamol N), following which the fabric is rinsed with water and dried.

The fabric is dyed in a good blue shade which shows a good fastness to light and exhibits no tendency to crocking.

Example II

A fabric made of yarns containing a 50:50 blend of wool and cellulose acetate fibers is dyed for 2 hours in a dyebath maintained at 80° C. and containing 0.5% by weight on the weight of the wool fibers of Palatine Pink RS–CS (40% of 100% dyestuff), 0.5% by weight on the weight of the cellulose acetate fibers of 1-amino-4-acetylamino anthraquinone (40% oil color), 0.5 grams per liter of sulfonated naphthalene-formaldehyde condensation product (Tamol N), 0.5 grams per liter of polyvinyl alcohol (Elvanol), 5% by weight on the weight of the wool fibers of ammonium acetate, 10% by weight on the weight of the wool fibers of Glauber's salt and sufficient water to bring the weight of the dyebath to 50 times the weight of the fabric. The dyed fabric is then immersed for 15 minutes in an aqueous bath maintained at 35 to 40° C. and containing 1 gram per liter of soap and 1 gram per liter of sulfonated naphthalene-condensation product (Tamol N), following which the fabric is washed and dried.

The fabric is dyed in a good shade of red which shows a good fastness to light and exhibits no tendency to crocking.

It is to be understood that the foregoing detailed description is given merely by way of illustration and that many variations may be made therein without departing from the spirit of our invention.

Having described our invention, what we desire to secure by Letters Patent is:

1. A process for the union dyeing of textile materials containing both wool and at least one member selected from the group consisting of organic derivative of cellulose and fiber-forming linear polyester materials which comprises immersing said textile materials in an aqueous dyebath containing a wool dyestuff, a cellulose acetate disperse dyestuff, from about 0.5 to 2.0 grams per liter of a sulfonated naphthalene-formaldehyde condensation product and from about 0.5 to 2.0 grams per liter of a non-ionic dispersing agent, and treating the dyed textile material with an aqueous bath containing a sulfonated naphthalene-formaldehyde condensation product and soap.

2. A process as in claim 1 wherein the textile material contains cellulose acetate and wool.

References Cited in the file of this patent

UNITED STATES PATENTS

1,483,797	Green	Feb. 12, 1924
1,534,019	Baddiley	Apr. 21, 1925
2,107,898	McNally	Feb. 8, 1938
2,310,074	Gotte	Feb. 2, 1943

FOREIGN PATENTS

646,001	Germany	June 7, 1937
273,819	Great Britain	July 11, 1927
365,170	Great Britain	Jan. 18, 1932
388,270	Canada	Apr. 23, 1940