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# UNITED STATES PATENT OFFICE

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## RESERVING OF ANIMAL FIBERS

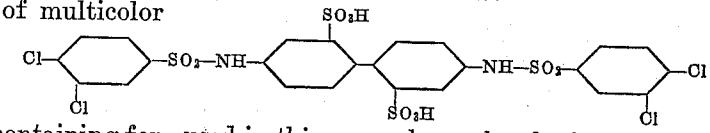
No Drawing. Application filed March 26, 1930, Serial No. 439,216, and in Germany March 30, 1929.

The present invention relates to the reserving of animal fibers such as wool or silk and the like in mixed textile fabrics with vegetable fibers such as cotton against the taking up of substantive dyestuffs.

In the process the reserve effect is produced by adding to the dye-bath a water soluble aryl-sulfonic or aryl-carboxylic-acid-amide or derivative or substitution product thereof, in which the hydrogen atoms of the amino groups are replaced wholly or in part by alkyl-, aryl- or aralkyl groups and which cannot be coupled with diazo compounds. The incorporation of the reserving agents with animal fibers in mixed textile fabrics with vegetable fibers can be performed from their neutral or weakly acid or alkaline aqueous solutions, advantageously in the manner of a dyeing process. In this latter case, especially for the production of multicolor effects in mixed textile fabrics, containing for instance wool and cotton or silk and cotton and the like, it will be possible to combine the reserving process with a dyeing process, the wool or silk being in all these cases protected against the taking up of substantive dyestuffs to a far reaching extent.

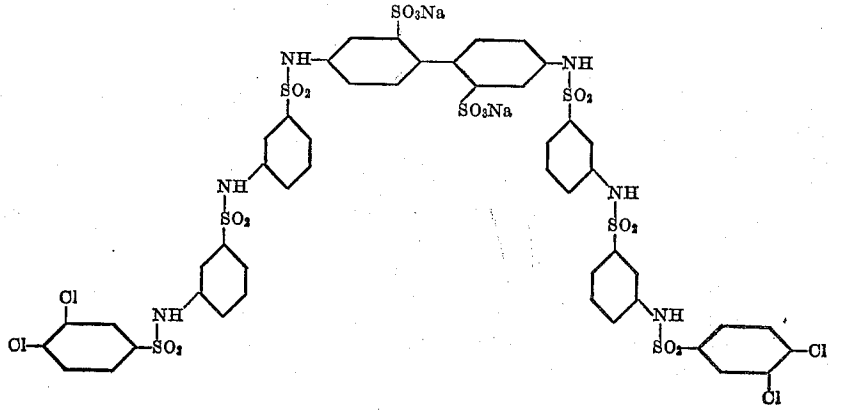
The following examples illustrate our invention without limiting it thereto:—

*Example 1.*—Half wool is first dyed at the boil for one hour in a dyeing-bath, charged with 3% of sulfuric acid, 10% of sodium sulfate and 1% of Orange II (Colour Index, first edition 1924, page 35, No. 151), all calculated on the weight of the material. The material is well rinsed and then introduced into a dye-bath, in which are dissolved in the customary proportions 2% of brilliant benzo blue 6 B (Colour Index, first edition 1924, page 134, No. 518), 30% of sodium sulfate and 3% of the sodium salt of bis-(1.2-dichlorobenzene-4-sulfonyl)-benzidine - m.m′ - disulfonic acid. The dyeing operation proceeds for one hour at 50° C., after which the material is rinsed and dried, when it is found that on dyeing the cotton with the substantive blue dyestuff the orange shade of the wool fibers in the mixed fabric has retained its purity unchanged. The bis-(1.2-dichlorobenzene-4-sulfonyl)-benzidine - m.m′ - disulfonic acid of the formula:—



used in this example can be obtained, for example, by causing 1.2 - dichlorobenzene - 4 - sulfochloride to interact with benzidine-m.m′-disulfonic acid in the presence of an agent which neutralizes the hydrochloric acid split off.

*Example 2.*—A mixed fabric of cotton and silk is mordanted at 90° C. with 10% of sodium salt of bis-(1.2-dichlorobenzene-4-sulfonyl-3′-aminobenzene - 1′ - sulfonyl - 3″-aminobenzene-1″-sulfonyl)-benzidine- m.m′-disulfonic acid of the formula:—



and 4% of formic acid, then rinsed and finally dyed with a direct black, for instance, direct black RW extra (Colour Index, first edition 1924, page 151, No. 582) in the presence of 30% of sodium sulfate. The dyestuff exclusively goes on the cotton and the silk remains in a pure white state.

The bis-(1.2-dichlorobenzene-4-sulfonyl-3'-aminobenzene-1'-sulfonyl-3''-aminobenzene-1''-sulfonyl)-benzidine-m.m'-disulfonic acid used in this example can be obtained by causing m-nitrobenzene-sulfochloride to interact with benzidine-m.m'-disulfonic acid, reducing the condensation product thus obtained to the corresponding diamino compound, furthermore by causing this compound to interact with m-nitrobenzene-sulfochloride, then reducing the reaction product thus produced and finally by condensing the bis-(3-aminobenzene-1-sulfonyl-3'-aminobenzene-1'-sulfonyl)-benzidine-m.m'-disulfonic acid with 1.2 dichlorobenzene-4-sulfochloride.

In a similar manner wool or silk or the like can be reserved to a far reaching extent by means of other water soluble substituted amide derivatives of aryl-sulfonic acid or aryl-carboxylic acid, for instance,

3-sulfonic acidbenzoyl-3'-amino-benzene-1'-sulfonylbenzylamine,

1.2-dichlorobenzene-4-sulfonyl-3'-aminobenzene-1'-sulfonyl-3''-aminobenzene-1''-sulfonyl-1'''-aminobenzene-3'''-sulfonic acid,

1.2-dichlorobenzene-4-sulfonyl-3'-aminobenzene-1'-sulfonyl-3''-aminobenzene-1''-sulfonyl-3'''-aminobenzene-1'''-sulfonyl-1''''-aminobenzene-3''''-sulfonic acid,

Bis-(2.4-dichlorobenzoyl)-1'.3'-phenylenediamine-4'-sulfonic acid,

Bis-(2.4-dichlorobenzoyl)-2'.4'-toluylenediamine-6'-sulfonic acid,

Bis-(3-chloro-4-toluene-1-sulfonyl)-benzidine-m.m'-disulfonic acid,

Bis-(1.2.3-trichlorobenzene-4-sulfonyl)-benzidine-m.m'-disulfonic acid,

Bis-(3-chlorophenoxyacetyl)-benzidine-m.m'-disulfonic acid,

Bis-(1.2-dichlorobenzene-4-sulfonyl-3'-aminobenzene-1'-sulfonyl)-benzidine-m.m'-disulfonic acid,

Bis-(naphthalene-1-sulfonyl-3'-aminobenzene-1'-sulfonyl)-benzidine-m.m'-disulfonic acid,

Bis-(naphthalene-2-sulfonyl-3'-aminobenzene-1'-sulfonyl)-benzidine-m.m'-disulfonic acid,

Bis-(1.2-dichlorobenzene-4-sulfonyl-4'-amino-1'-chlorobenzene-2'-sulfonyl)-benzidine-m.m'-disulfonic acid,

Bis-(1.2-dichlorobenzene-4-sulfonyl-3'-aminobenzene-1'-sulfonyl)-diamino-stilbene-disulfonic acid,

Bis-(benzenesulfonyl-3'-aminobenzene-1'-sulfonyl)-4''-4'''-diamino-diphenylether-2''-sulfonic acid,

Bis-(benzenesulfonyl-3'-aminobenzene-1'-sulfonyl)-1''.5''-naphthylenediamine-3''.7''-disulfonic acid,

Bis-(1.2-dichlorobenzene-4-sulfonyl-4'-amino-1'-chlorobenzene-2'-sulfonyl)-2''.4''-toluylene-diamine-6''-sulfonic acid,

Bis-(1.2-dichlorobenzene-4-sulfonyl-3'-aminobenzene-1'-sulfonyl-3''-aminobenzene-1''-sulfonyl)-diaminostilbenedisulfonic acid,

Bis-(3-chlorophenoxyacetyl-3'-aminobenzene-1'-sulfonyl)-benzidine-m.m'-disulfonic acid,

Bis-(3-sulfonic acid-benzoyl-3'-aminobenzene-1'-sulfonyl)-ethylene-diamide,

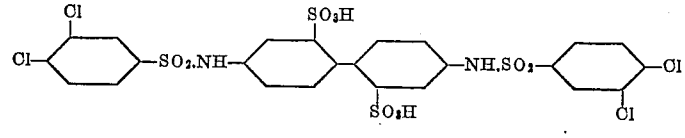
Bis-(3-sulfonic acid-benzoyl)-2'.2''-dichlorobenzidine, and many others.

We claim:

1. Process for reserving animal fibers in mixed textile fabrics with vegetable fibers which comprises applying to the fibers a water soluble aryl-sulfonic or aryl-carboxylic acid amide in which at least one hydrogen atom of the amino group is replaced by a substituent of the group consisting of alkyl, aryl and aralkyl and which cannot be coupled with diazo compounds.

2. Process for reserving animal fibers in mixed textile fabrics with vegetable fibers which comprises treating the fibers in a dyeing-bath to which has been added a water soluble aryl-sulfonic or aryl-carboxylic acid amide in which at least one hydrogen atom of the amino group is replaced by a substituent of the group consisting of alkyl, aryl and aralkyl and which cannot be coupled with diazo compounds.

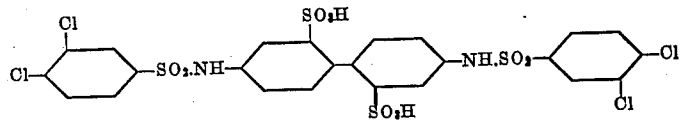
3. Process for reserving wool which comprises dyeing half wool in a dyeing-bath containing about 3% of the sodium salt of bis-(1.2-dichlorobenzene-4-sulfonyl)-benzidine-m.m'-disulfonic acid of the probable formula:—




4. Animal fibers in mixed textile fabrics with vegetable fibers having incorporated therewith a water soluble aryl-sulfonic—or aryl-carboxylic acid-amide in which at least one hydrogen atom of the amino group is replaced by a substituent of the group consisting of alkyl, aryl and aralkyl and which cannot be coupled with diazo compounds.

5. Half-wool having incorporated about 3% of the sodium salt of bis-(1.2-dichloro-

benzene - 4 - sulfonyl) - benzidine-m.m'-disulfonic acid of the probable formula:—




In testimony whereof, we affix our signatures.

JOHANN HUISMANN.
HUGO SCHWEITZER.