Patented Sept. 6, 1932 1,876,052

UNITED STATES PATENT OFFICE

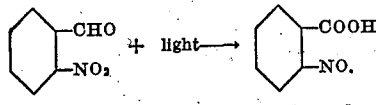
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PROCESS FOR DYEING AND FIGURING WOVEN, KNITTED AND PLAITED FABRICS, LEATHER, AND OTHER MATERIALS

No Drawing. Application filed March 28, 1929, Serial No. 350,820, and in Germany April 7, 1928.

The present invention relates to a photochemical process for dyeing and figuring supports of any kind, in which light-sensitive bodies are applied to the support and then the latter is subjected to the action of light. The essence of the invention consists in this that, more particularly for producing coloured patterns on dark ground two compounds are applied to the support, one of which forms dyes only on exposure to light, whilst the other on the contrary, is capable of producing the dye only in the dark.

The advantage of the new process consists in this, that two different colours can be produced in one operative process by a single illumination. For forming one colour a light-sensitive sulphonated body is suitable. For the other colour, which forms in the dark, other dyestuffs are available, for instance the indigo investigated by F. Sachs, and produced by Baeyer's synthesis from nitrobenzaldehyde and acetone. As is well known nitrobenzaldehyde when exposed to light is converted into nitrosobenzoic acid:



An intermediate product in the above synthesis is a phenyl-lactic acid ketone with the reactive nitro group. This nitro-ketone, when acted on by fixed alkali, forms indigo, while under the action of light it is destroyed in the same way as described above and loses this capacity.

For dyeing and figuring materials by the process described above, the following method is adopted. The material is treated with the sulphonic diazo compound and nitrophenyl-lactic ketone. The support is now exposed to light in a single operative process, those places which are not to be influenced by the light being covered over by means of a stencil or an imprint. This imprint consists of a light absorbing covering colour which does not dye the fabric. At the exposed places the azo dyestuff will then be formed, while at the non-exposed places, indigo will be formed under the action of phenol-alkali.

It is also possible to combine the processes usually employed in printing with dyestuffs with the new process described above. Thus, for instance, the cover negative printing process may be carried out in such a manner that the dye ground of the material is formed photochemically, that is that the material is first treated with the light-sensitive colourless dyestuff components (for instance with sodium phenyl-diazo-sulphonate and phenol alkali), the pattern is then printed on in the usual way, that is with the finished dyestuff and the usual additions, and the whole is then exposed. The printed on pattern acts in this case as a light-protective colour, that is partially protects the light-sensitive dyestuff components which produce the coloured ground from being exposed and at the same time forms the colour of the pattern.

The light-sensitive compounds may for instance be produced as follows:

1. Sodium phenol-diazo sulphonate for the yellow partial impression. 9.3 grms. of aniline are dissolved in hydrochloric acid having a HCl content of 10 grms. are cooled to 3° to 5° C. and are quickly mixed with 7.2 grms. sodium nitrite dissolved in a little water. During this operation care should be taken that the temperature does not rise above 5° C. Phenyl-diazochloride is formed, which may be readily converted into the sulphonic salt by being mixed with sodium sulphite. For this purpose sodium bisulphite and sodium hydroxide are used with advantage. As this recipe is carried out for $\frac{1}{10}$ mol., the two latter reagents are of course also used in this quantity, that is 10.4 grms. bisulphite and 4 grms. sodium hydroxide.

For treating the material a mixture of sodium phenyl-diazosulphonate, phenol and sodium hydroxide are used in molecular quantities.

2. Sodium diphenyltetrazosulphonate for the red partial impression. Commencing with benzidine the process is carried out with double molecular quantities in the manner described in paragraph 1. For exposure a mixture of this compound with resorzin and sodium hydroxide in molecular quantities is used.

3. Sodium ditollyltetrazosulphonate for

the blue partial impression. Commencing with tolidine, the process is carried out as with benzidine by coupling for the exposure with 1.8 amidonaphthol—2.4 disulphonic acid and β naphtylamine each in half molecular quantities. The tone and the fastness of the colours may be subsequently influenced by treating with metallic salts, such as cupric chloride, ferric chloride, and potassium bichromate.

In the manner described every $-N=N-$ compound may be converted into a sulphonated compound and developed on the material into a dyestuff by the photo-chemical process above described. It is also possible further to diazotize either before or after sulphonation a tetrazo salt coupled half molecularly with an amine and thus to build up complex molecules. The sulphonated $-N=N-$ salts are without exception considerably more stable than the hydrochlorides, most of them even to an unlimited extent and may therefore be made for stock.

What I claim is:

1. A process for producing a coloured pattern on a dark ground on woven, knitted and plaited fabrics, leather and other materials, consisting in treating the material with two compounds, one of which is capable of forming a dyestuff only under the action of light and the other of which is capable of retaining its capacity to form a dyestuff only in the dark, and thereupon exposing the material to the action of light, modulated by a pattern as set forth.

2. A process for producing a coloured pattern on a dark ground on woven, knitted and plaited fabrics, leather and other materials, consisting in treating the material with two compounds, one of which is capable of forming a dyestuff only under the action of light and the other of which is capable of retaining its capacity to form a dyestuff only in the dark, printing on the material thus treated a negative in the form of a light-absorbing covering colour which does not dye the material and thereupon exposing the material to the action of light, modulated by a pattern as and for the purpose set forth.

In testimony whereof I have signed my name to this specification.

WALTER HAENDEL.