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UNITED STATES PATENT OFFICE.

FELIX BINDER, OF MÜLHAUSEN, GERMANY, ASSIGNOR TO FARBENFABRIKEN VORM. FRIEDR. BAYER & CO., OF ELBERFELD, GERMANY, A CORPORATION OF GERMANY.

PROCESS OF DYEING.

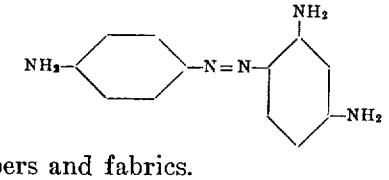
996,396. Specification of Letters Patent. Patented June 27, 1911.

No Drawing. Application filed November 29, 1910. Serial No. 594,667.

To all whom it may concern:

Be it known that I, FELIX BINDER, chemist, a citizen of the German Empire, residing at Mülhausen, Alsace, Germany, have invented new and useful Improvements in Processes of Dyeing, of which the following is a specification.

My invention relates to the manufacture and production of shades fast to washing by oxidation of para-aminobenzene-azo-meta-phenylenediamin of the following formula:



on fibers and fabrics.

In carrying out this invention the fiber is either impregnated with a solution of para-aminobenzene - azo - meta - phenylenediamin (which solution contains an oxidizing agent) and the goods are steamed after being dried, or the fiber is first impregnated with the said dye and then treated with oxidizing agents, or the oxidizing agents are deposited on the fiber and the latter is then treated with aminoazo compound.

In order to illustrate the new process more fully the following examples are given, the parts being by weight: 20 parts of para-aminobenzene - azo - meta - phenylenediamin hydrochlorid are dissolved in 500 parts of water, 20 parts of sodium chlorate ($NaClO_3$) and 10 parts of ammonium chlorid NH_4Cl) are added and the solution is made up to 1000 parts. The cotton goods are padded with this solution and dried at ordinary temperature, steamed, washed and soaped. For printing purposes water is replaced by a thickening agent, such as tragacanth, starch, etc. A deep brown results remarkable for its brightness and fastness to washing. When discharge designs are to be produced discharging agents *e. g.* hydrosulfite are printed on the impregnated air dry, but not yet steamed tissue which on steaming destroy the dye and the oxidizing agent. As an alternative the hydrosulfite can be printed as a reserve, on the white goods and the goods are then treated as above described, a white pattern being then obtained in the brown. Furthermore the finally developed dye can also be discharged white by means of hydrosulfite.

The fiber is padded with a solution of 20 parts of para-aminobenzene-azo-meta-phenylenediamin, dried and passed through a solution heated to 40—50° C. containing 40 grams of K_2CrO_4 per liter, rinsed, passed through a diluted solution of sodium carbonate, rinsed again and dried. A dark brown which can be discharged with hydrosulfite is obtained.

A fabric upon which manganese dioxid has been deposited is treated with an aqueous solution, slightly acidulated with hydrochloric acid and heated to 50° C. containing 10 grams of para-aminobenzene-azo-meta-phenylenediamin per liter. The fabric is then washed and treated with a dilute solution of bisulfite. Subsequently the goods are rinsed, passed through a solution of sodium carbonate, rinsed again and dried. A beautiful brown results which can be discharged white with hydrosulfite.

Other oxidizing agents can be used, *e. g.* potassium ferricyanid, persulfates, percarbonates, vanadates, etc.

I claim:—

1. In the art of producing brown shades fast to washing the process consisting of precipitating on the fiber the oxidation products of para-aminobenzene-azo-meta-phenylenediamin.

2. In the art of producing brown shades fast to washing the process consisting of first padding the fabric with a solution of para-aminobenzene - azo - meta - phenylenediamin which solution contains an oxidizing agent and then drying and steaming the goods in the usual manner, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

FELIX BINDER.

Witnesses:
GEO. GIFFORD,
ARNOLD ZUBER.