UNITED STATES PATENT OFFICE.

OSCAR BIELSCHOWSKI, OF NEW YORK, N. Y.

DYEING COTTON FIBER.

SPECIFICATION forming part of Letters Patent No. 343,793, dated June 15, 1886.

Application filed February 1, 1886. Serial No. 190,513. (Specimens.)

To all whom it may concern:

Be it known that I, OSCAR BIELSCHOWSKI, of the city, county, and State of New York, have invented certain new and useful Improvements in Processes of Dyeing Cotton and other Fibers, of which the following is a specification.

This invention relates to a process for dyeing and printing cotton and other textile fabrics in a brown color, either by fixing the coloring-matter directly on the fiber or by printing on the fabric and developing the color by heat and moisture.

The invention consists of a process of dyeing cotton and other fibers and textile fabrics by steeping said fibers or fabrics in a solution of alpha-naphthylamine and slowly adding to said solution an oxidizing solution for developing the color on the fibers.

In carrying out my invention I prepare, first, a solution of one hundred grams of commercial alpha-naphthylamine, and one hundred grams of concentrated hydrochloric acid of 22° to 22.5° Baumé, and ten liters of water. The materials to be dyed are first submitted to the usual preparatory treatment to adapt them to receive dyes. They are then placed in the above-described alpha-naphthylamine solution and allowed to remain long enough in the same to become thoroughly impregnated therewith. An oxidizing solution consisting of one hundred grams of bichromate of potash, one hundred grams of sulphuric acid of 66° Baumé, and ten liters of water is then gradually added to the alpha-naphthylamine solution, care being taken that the oxidizing solution is very slowly added, as the quick addition of the same would cause a precipitate of oxynaphthylamine, which has to be avoided. The oxidizing-bath develops the colors on the fibers, and is applied at ordinary temperature. After the entire oxidizing solution has been added to the alpha-naphthylamine solution the mixture is finally heated up to about 80° Celsius, at which temperature the oxidation and the development of the color are entirely completed. The cotton or other materials are then washed, first in cold and afterward in hot water, and finally again in hot water to which a small quantity of natrium carbonate or soap has been added, that is afterward washed out again.

If it be desired to carry out the oxidizing operation in a quicker manner, a solution of four hundred grams of alum and forty grams of natrium carbonate is dissolved in water, and four hundred grams of acetate of lead added, which solution is heated for some time on a water bath, so as to produce a solution of acetate of aluminum, which is decanted from the sulphate of lead and diluted with as much water, so that one liter is obtained. Of this solution two hundred and fifty grams are added to the alpha-naphthylamine solution, whereby the oxidation of the same is accelerated when the oxidizing solution is added. Other mordants may be used for accelerating the oxidizing process.

In place of the oxidizing solution of bichromate of potash any other oxidizing substance may be used.

In place of the alpha-naphthylamine ($C_{10}H_7NH_2$) the derivatives of the same—such as alpha-naphthylamine sulpho-acid ($C_{10}H_6(NH_2)SO_3H$)—may be used for imparting to cotton yarns, wool, and other textile fabrics a rich brown color.

For printing on fibers, one hundred grams of alpha-naphthylamine are mixed with thirty grams of concentrated sulphuric acid, and with a suitable mucilaginous substance, so as to produce a thick paste. This paste is printed on the fabric, so that the same can act on the fiber. A thickened mucilaginous solution of bichromate of potash is then printed on the layer of the alpha-naphthylamine, upon which the cotton or other textile fabric is hung up in rooms heated by steam, so that the color is developed in a short time by the influence of heat and moisture, after which the fiber is dried and treated in the usual manner.

The process described produces a rich brown color on the fiber or fabrics, which can be varied in tints, and which resists the influence of light, air, soap, and acids.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The process herein described of dyeing or printing cotton or other textile fibers or fabrics, which consists in steeping said fibers or fabrics in a solution of alpha-naphthylamine, and then adding to said solution an oxidizing solution, so as to develop the color on the fibers or fabrics, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

OSCAR BIELSCHOWSKI.

Witnesses:
PAUL GOEPEL,
SIDNEY MANN.

Correction in Letters Patent No. 343,793.

It is hereby certified that in Letters Patent No. 343,793, granted June 15, 1886, upon the application of Oscar Bielschowski, of New York, New York, for an improvement in "Dyeing Cotton Fiber," an error appears in the printed specification requiring the following correction, viz: In lines 38–9, page 1, the word "oxynaphthylamine" should read *oxynaphthamine;* and that the Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 22d day of June, A. D. 1886.

[SEAL.]

D. L. HAWKINS,
Acting Secretary of the Interior.

Countersigned:

M. V. MONTGOMERY,
Commissioner of Patents.