UNITED STATES PATENT OFFICE.

OSCAR BALLY, OF MANNHEIM, GERMANY, ASSIGNOR TO BADISCHE ANILIN & SODA FABRIK, OF LUDWIGSHAFEN-ON-THE-RHINE, GERMANY, A CORPORATION OF GERMANY.

PROCESS FOR DYEING TEXTILE FIBER VIOLET-BLUE.

No. 840,419. Specification of Letters Patent. Patented Jan. 1, 1907.

Application filed February 21, 1905. Serial No. 246,764.

To all whom it may concern:

Be it known that I, OSCAR BALLY, doctor of philosophy and chemist, a citizen of the Swiss Republic, residing at Mannheim, in the Grand Duchy of Baden, German Empire, have invented new and useful Improvements in Processes for Dyeing Textile Fiber Violet-Blue, of which the following is a specification.

My invention relates to methods of dyeing and printing with certain coloring-matters.

In the specifications of Letters Patent Nos. 809,892, 818,992, and 820,379 is described the production of violet-blue coloring-matters by heating with caustic alkali a compound containing a benzanthrone group.

I have now discovered that when both dyeing and printing the coloring-matters have to be reduced in the presence of an alkali. When printing, the dyes can be printed in a mixture with the reducing agent and an alkali onto the fiber and then steamed, or they can be printed in admixture with the reducing agent without the addition of an alkali and the printed material subsequently passed through the alkali. Fiber which has been thus incorporated with one of the aforementioned violet-blue coloring-matters can be recognized, since it yields the following reactions: Upon boiling with hydrochloric acid it remains practically unaltered in color, upon treatment with caustic-soda solution it becomes redder, and upon treatment with concentrated sulfuric acid it changes to a color ranging between greenish-blue and red-violet, and upon subsequent treatment with water it shows a violet color.

The following examples will serve to further illustrate the nature of my invention, which, however, is not confined to these examples: The parts are by weight.

Example 1—Process for dyeing with the dyestuff from the condensation product of beta-amido-anthraquinone and glycerin.—Suspend about fifteen (15) parts of a ten (10) per cent. paste of the coloring-matter obtained from the condensation product of beta-amido-anthraquinone and glycerin in about one thousand (1,000) parts of water at a temperature of from ninety to ninety-five degrees centigrade (90° to 95° centigrade) and treat this suspension product with about fifty-five (55) parts of sodium hydrosulfite (containing about five (5) or six (6) per cent. of the salt) and about sixty-five (65) parts of caustic-soda lye, (containing about twenty-three and a half (23.5) per cent. of NaOH,) so as to produce a vat. Dye about fifty (50) parts of cotton goods in this vat by manipulating them therein for about three-quarters of an hour (45 minutes) while maintaining the temperature at from ninety to ninety-five degrees centigrade (90° to 95° centigrade.) Wash and dry the goods, acidify, and wash again. By this process a dark-violet-blue shade of exceptional fastness against the action of light, washing, and chlorin is obtained.

Example 2—Process for dyeing with the dyestuff from the condensation product of anthranol and glycerin.—Suspend about fifteen (15) parts of a ten (10) per cent. paste of the dyestuff obtained in the alkali melt from the condensation product of anthranol and glycerin in about one thousand (1,000) parts of water at a temperature of from sixty to sixty-five degrees centigrade (60° to 65° centigrade) and treat this suspension product with about thirty-five (35) parts of a solution of sodium hydrosulfite (containing about five (5) or six (6) per cent. of the salt) and about twenty-five (25) parts of caustic-soda lye, (containing about twenty-three and a half (23.5) per cent. of NaOH,) so as to obtain a vat. Dye about fifty (50) parts of cotton goods in this vat for about three-quarters of an hour (45 minutes) at a temperature of from sixty to sixty-five degrees centigrade (60° to 65° centigrade.) Wash the dyed goods, acidify, and rinse them once more. By this method a dark-violet-blue shade of superior fastness against the action of light, washing, and chlorin is obtained.

Example 3—Process for printing.—Prepare a printing-paste from sixty (60) parts of gum-arabic, seventy (70) parts of dextrin, one hundred and ten (110) parts of water, five hundred (500) parts of caustic-soda lye, (containing about forty-one (41) per cent. of NaOH,) fifty (50) parts of glycerin, sixty (60) parts of stannous oxid paste, (or a corresponding quantity of stannous chlorid,) and one hundred and fifty (150) parts of a ten (10) per cent. paste of either of the dyestuffs employed in the foregoing Examples 1 and 2. Print the goods with this paste, dry, and steam for from five (5) to ten (10) minutes in

an apparatus suitable for quickly steaming and in the absence of air. Rinse with water and wash with soda. Instead of stannous oxid or stannous chlorid, hydrosulfite or other reducing agent can be used.

Example 4—Process for printing without alkali in the printing-paste.—Prepare a printing-paste with two hundred and twenty (220) parts of British gum, seventy-five (75) parts of gum-arabic, four hundred and fifty (450) parts of water, fifteen (15) parts of stannous chlorid, (tin salt,) ninety (90) parts of ferrous-sulfate, (iron vitriol,) and one hundred and fifty (150) parts of a ten (10) per cent. paste of either of the dyestuffs used in the preceding Examples 1 and 2. Print the material with this printing-paste, dry it, and pass it for about half a minute (30 seconds) through a warm solution of caustic soda (containing from ten (10) to twelve (12) per cent. of NaOH) at a temperature of from sixty-five to seventy-five degrees centigrade, (65° to 75° centigrade.) Wash the goods first with water and then, in order to remove the iron with a suitable acid.

In order to prevent the white parts of the goods upon which no coloring-matter is printed from becoming slightly dyed, a little manganese peroxid can be added to the caustic soda in which the color is fixed.

Now what I claim is—

1. The process of producing violet-blue shades on textile fiber by converting a coloring-matter, obtainable by heating with caustic alkali a compound containing a benzanthrone group, into its soluble form by acting on it with a suitable reducing agent and treating the fiber with the reduction product so obtained.

2. The process of producing violet-blue shades on textile fiber by exposing the said fiber to the action of the soluble form of a coloring-matter obtainable by heating with caustic alkali a compound containing a benzanthrone group, which soluble form can be obtained from the coloring-matter and sodium hydrosulfite.

3. As a new article of manufacture textile fiber incorporated with a violet-blue coloring-matter which can be obtained by heating with caustic alkali a compound containing a benzanthrone group, which incorporated fiber remains practically unaltered in color upon boiling with hydrochloric acid, and upon treatment with caustic-soda solution becomes redder and upon treatment with concentrated sulfuric acid and subsequent treatment with water shows a violet color.

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

OSCAR BALLY.

Witnesses:
ERNEST F. EHRHARDT,
JOS. H. LEUTE.