

# UNITED STATES PATENT OFFICE.

PROSPER MONNET, OF LYONS, FRANCE.

DYEING COLORS BY THE SIMULTANEOUS OXIDATION OF DIAMINES AND MONAMINES.

SPECIFICATION forming part of Letters Patent No. 387,097, dated July 31, 1888.

Application filed December 15, 1887. Serial No. 957,987. (No specimens.) Patented in France December 17, 1885, No. 172,985; in Germany January 24, 1886, and in England April 19, 1887, No. 10,113.

To all whom it may concern:

Be it known that I, PROSPER MONNET, a citizen of the French Republic, and a resident of Lyons, (Rhône,) France, have invented certain Improvements in the Art of Dyeing Fabrics and Materials, (for which I have obtained patents in France December 17, 1885, No. 172,985; in Germany January 24, 1886, and in England April 19, 1887, No. 10,113,) of which the following is a specification.

My invention relates to the formation or deposition of the coloring-matter directly upon the fabric or material to be dyed; and it consists in producing certain colors or tints on the fabric or material—as blacks, more or less brown, and blue—by the simultaneous oxidation of a diamine and an amine.

By the oxidation of a molecule of a salt of a simple diamine, (as the chlorohydrate of paraphenylene-diamine,) and of one or more molecules of a salt of a simple monamine, (as the chlorohydrate of aniline,) and of ortho-toluidine or of a substituted monamine, (as the thioaniline,) we obtain directly on the fabric or material to be dyed tints varying from brown-black to blue-black, according to the proportions employed. By the addition to the chlorohydrate of a substituted diamine of an equivalent quantity of salts of monamines or diamines—as, for example, of chlorohydrates of aniline or ortho-toluidine—we obtain also color-tints more or less blue, according to the equivalent proportions employed.

I will indicate the preparation of the mixtures and products which yield coloring-matters by oxidation directly on the fabrics or materials.

## EXAMPLES OF THE PREPARATION OF THE MIXTURES AND PRODUCTS EMPLOYED.

*Preparation of the mixtures of salts of simple monamines and diamines.*—Following is an example of a mixture: Commercial chlorohydrate of paraphenylene-diamine, 55.47 kilos; chlorohydrate of aniline, 44.53 kilos; total, 100 kilos. These quantities correspond to the molecular weight of the substances, and the mixture yields, by oxidation, a very solid brown-black color or tint. By doubling the quantity of chlorohydrate of aniline the tint of the black becomes bluish. We can replace the chlorohydrate of aniline in the same pro-

portions by that of another simple monamine.

*Oxidation on the fabric or materials.*—For this oxidation I employ as a special mordant for oxidation a solution composed of chlorate of soda, 3 kilos; vanadate of ammonia, previously dissolved in water slightly acidulated with chlorohydric acid, 0.0078 kilos; ordinary water in quantity sufficient to complete 50 liters. I call this solution "No. 1."

*Preparation of the solution of the product for oxidizing.*—Whatever may be the product for effecting the oxidation, a solution is made of six kilos of same in a sufficient quantity of cold water to make fifty liters of the solution, which I will call "No. 2."

*Dyeing.*—I take, for example, loose or picked cotton. This cotton is steeped in pure water and wrung out until it contains not more than fifty per cent. of its weight of water. It is then dipped into a mixture of equal volumes of solutions Nos. 1 and 2, before described. It is then wrung out until it retains only its own weight (the cotton considered dry) of the liquid of the bath. Thus impregnated, the cotton is put, in portions of about 100 kilos each, into open wooden boxes or chests and left at a mild temperature of perhaps +15° to +20° centigrade. After lying about twenty-four hours in the boxes the oxidation will be completed, and the cotton dyed black is scoured and dried.

My method of dyeing may be applied to silk, wool, or cotton, singly or mixed together, and either in the fiber or in the fabric or yarn. It may also be employed in printing fabrics.

Having thus described my invention, I claim—

The herein-described method of dyeing, which consists in producing colors or tints of the character described directly on the materials by the oxidation of a mixture of a salt of simple diamine and the salt of a simple monamine, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

PROSPER MONNET.

Witnesses:

PIERRE CARTIER,  
LOUIS VANDENESSE.