

UNITED STATES PATENT OFFICE.

ARTHUR W. FISHER, OF PULTNEYVILLE, NEW YORK.

DYAD DYE.

1,209,423.

Specification of Letters Patent. Patented Dec. 19, 1916.

No Drawing.

Application filed April 1, 1916. Serial No. 88,315.

To all whom it may concern:

Be it known that I, ARTHUR W. FISHER, a citizen of the United States, residing at Pultneyville, in the county of Wayne and State of New York, have invented a new and useful dyad dye especially adapted for dyeing textile material a delicate blue and to serve as an admixture of dyestuffs or of color-test compounds, of which the following is a specification.

My dyad dye consists of the following two ingredients, combined in the proportion stated; viz.:

Crystal violet	1 part.
Malachite green	17 parts.

These two chemicals are basic colors derivative of triphenylmethane. Malachite green is a diamid and crystal violet a triamid derivative of triphenylmethane. Each of these two chemicals, malachite green in particular, is manufactured in several grades and therefore varies considerably in its combining power. The above proportion is for the particular one of the commercial grades I am using at the present.

The dyeing bath.—In compounding the dyad dye I dissolve the malachite green and the crystal violet separately in clear water. Of the crystal violet I make a one-tenth per cent. solution, and of the malachite green I make a solution of such a strength as that when the two solutions are taken in equal amounts will produce the full combining power of the two chemicals. With the particular grade of malachite green I am now using that strength is one and seven-tenths per cent. solution, as the proportion is 1:17. After determining the amount of the thus prepared fluids to be used in any given case, I take equal parts of the two solutions and mix them together, allow them to stand for about one hour, then gently heat them to complete the reaction and add them to the water for the dye bath. The quantity of fluid in the dyeing bath—i. e., water and solutions—should not exceed one hundred and fifty gallons for one hundred pounds of textile material to be dyed. As the depth of the color depends on the amount of dye used, less water is to be used when a deeper shade of blue is desired. When the material is ready for the dye the dye bath is warmed to about thirty or thirty-five degrees centigrade and kept at about that temperature until

the material is well saturated. The time required for the material to suck up the fluid is usually less than forty-five minutes. The material is next wrung out, rinsed in several clear waters, and dried.

For dyeing silk, soap to the amount of three to six ounces for each ten gallons of dye fluid is added to the dye bath described. After dyeing the material is brightened in an acetic acid bath, composed of one pint acetic acid and ten gallons of water.

For dyeing wool, the material is either first treated in a weak acid bath, such as hydrochloric or acetic, or a small quantity of the acid is added to the dye bath.

Cotton must first be mordanted before being treated in the dye bath. One of the ways of accomplishing this is to put the cotton in a boiling tannic acid bath and allow the bath to cool down before the cotton is removed therefrom. For pale shades one per cent. of tannic acid may be used, for deeper shades three to four per cent. may be used. After the tannic bath the material is immersed in the fixing bath. The latter is a solution of tartar emetic the amount of which is to be varied according to the shade desired and usually varies from one-fourth to four per cent.

The dyad dye imparts to the materials thus treated an exquisite shade of blue. To obtain a different shade or hue, the materials treated as described are dyed again by the process technically termed "topping"; that is to say, they are treated with another dye which deepens or modifies the color obtained from the first dyeing. The delicate blue imparted to the material by my dyad dye may be converted into a greenish blue by topping the previously dyed material with unmixed malachite green, using from ten to twenty-five per cent. as much as was used in the dyeing bath. The precise amount will vary with the grade of greenness desired. Topping may also be effected with unmixed crystal violet, using from five to twenty per cent. of the amount used in the dyeing bath when a deeper blue is desired.

The dyad dye described is available for use as an admixture of dyestuffs when a basic blue is desired to deepen or vary the previous color of the material. One hundred pounds of textile material dyed in a bath composed of $1\frac{1}{2}$ pounds diamino azo blue R, 1 pound sodium carbonate and 20 pounds

sodium sulfate and about 150 gallons of water and topped with one or two ounces of the dyad dye described above dyed in a fine shade of blue.

- 5 The adaptability of the dyad dye described as an admixture of color-test compounds is illustrated in my pending application, Serial No. 865,012, in which it was first disclosed to the Office.
- 10 To save the user of the dyad dye described the time and trouble of weighing or otherwise proportioning the crystal violet and the malachite green, and the time and trouble of dissolving them separately, I prefer to mix
- 15 the said ingredients in the proportion stated and evaporate the mixture down to dryness on a water bath. The product thus obtained may then be marketed in cake or flake form

ready for use as a dye or as admixture as described.

Having described my invention, I claim—

1. A dyad dye consisting of crystal violet and malachite green, substantially as described.

2. The herein described dye and admixture of dyestuffs consisting of one part of crystal violet and seventeen parts of malachite green, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses March 27, 1916.

ARTHUR W. FISHER.

Witnesses:

HARRY FISHER,
HOWARD E. COLBY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."