

UNITED STATES PATENT OFFICE.

VICTOR G. BLOEDE, OF BALTIMORE, MARYLAND, ASSIGNOR TO THE VICTOR G. BLOEDE COMPANY, OF SAME PLACE.

PROCESS OF DYEING BLACK.

SPECIFICATION forming part of Letters Patent No. 506,663, dated October 17, 1893.

Application filed April 27, 1891. Serial No. 390,647. (No specimens.)

To all whom it may concern:

Be it known that I, VICTOR G. BLOEDE, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented a certain new and useful Process for the Production of Black upon Silk and other Fibers; and I do hereby declare that the following is a full, clear, and exact description, which will enable others skilled in the art to which it appertains to make and use the same.

Heretofore it has been found impossible to produce a good and permanent black color (especially in combination with others) upon silk tissue by the direct printing or padding of a color composition upon such tissue, as is generally done in other lines of tissue printing. The method heretofore employed for the production of black in silk printing consists in first printing the color in resist, and then dyeing the unprotected portion, or ground, black, by any of the ordinary methods known to the dyer. This process is exceedingly operose, difficult, and expensive, besides which, the results are uncertain and irregular. To overcome the difficulties attending this indirect method of pattern printing on silk with black ground or figure, various expedients have been resorted to, such as the direct printing or padding of a combination of various aniline colors, orange, yellow, red, and blue, combined in proper proportions to produce a black shade. All of such compositions while under favorable conditions capable of producing a more or less deep shade of black, are extremely expensive, and open to objections which render their use impracticable and unsatisfactory, namely, great irregularity and variability of the shade, as well as lack of stability, or fastness, of the black so produced. I have succeeded in overcoming all of these difficulties by a composition that after full, practical, trials has been found to answer all requirements, and that produces a direct black that may be printed and developed by the ordinary methods employed for other colors, and alongside of, or in conjunction with such other colors, and produces a black color of extraordinary fastness, and one that leaves nothing to be desired in the matter of brilliancy and fullness.

By the use of my composition, any number or variety of shades and patterns can therefore be printed in one piece and in one operation, that is to say, either colored figures upon a black ground, or black figures upon colored grounds.

My invention is based upon the fact that some of the colors of the violaniline series, such as are known in commerce as induline, nigrosine, solid blue, fast blue, &c., can be combined in the cold with vegetable yellow, such as fustic, quercitron, and mordants of iron and alumina, without undergoing decomposition, or forming insoluble combinations while maintained at normal temperatures, and that when such compositions made up in suitable proportions are exposed to an elevated temperature, they form insoluble combinations of a jet black color, and extreme solidity or fastness.

In carrying out my process in practice I, find it desirable to employ the violaniline colors in paste or pulp form, that is to say, in the original form in which they are obtained by salting out their solutions, and without having been reduced to the dry state. The precipitate or paste thus obtained is drained as thoroughly as possible, and the percentage of dry color, or the coloring power of the paste, having been accurately determined, it is ready for use.

Where the production of the violaniline paste direct from aniline is not expedient, the dry colors of commerce may be substituted, but owing to their irregularity and inferior mechanical condition and solubility, this is not desirable. If the dry color is used, it should be first dissolved, the solution strained, and the color re-precipitated by salting, or the solution of the dry color may be used direct after clarification or filtration. The violaniline colors cover a wide range of shade varying from a clear blue to a brownish slate according to the character of the paste used, as well as the manipulation, and the character of the black produced by my process is therefore largely dependent upon the proper selection of the shade.

I have found that the clearest and best blacks are obtained by the use of a bright

violet blue, or reddish blue shade of violaniline, although by varying the proportions of the mordant and modifying colors, a wide range in the shade of the violaniline is permissible.

Having prepared a soluble violaniline in pulp or paste of known percentage, or coloring power, it is put into a suitable vessel, and gum arabic, or other gum suited to the requirements of silk printing, is added in sufficient proportions to effect the necessary thickening required, the materials being preferably heated to secure a complete solution of the gum and its proper blending with the color. The quantity of gum added depends upon the character of the work to be done with the composition, and will vary from twenty-five to fifty per cent. of the weight of paste color containing say twenty-five per cent. of dry color. The office of the gum being simply that of a thickener, the practical color mixer readily adjusts the quantity to suit any requirements. The composition of gum and coloring matter when completed are ready for blending with the other materials required to produce the black, should show about the following relative proportions in one hundred parts:

	Parts.
30 Soluble violaniline, dry.....	25
Gum.....	25
Water.....	50
Total.....	100

35 The composition of vegetable yellow and mordants may also be largely varied, but I have obtained the best results by using a combination of a proto salt of iron and salts of alumina, and bark or fustic liquor, with a small addition of acetic acid.

The following may be taken as a typical composition, both as to character of materials, and proportions in one hundred parts:

	Parts.
45 Refined or clarified fustic or bark liquor.....	44
Acetate of iron.....	25
Acetate of alumina.....	21
Acetic acid.....	10
50 Total.....	100

If the vegetable coloring matter has been very carefully refined, the composition may for ordinary purposes be used immediately after the combination of materials has been effected, but for finer work, the removal of all sedimentary matter from the composition is desirable. This may be effected by allowing the mixture of mordants and vegetable

color to settle for some time, and then decanting the clear liquor for use; or the composition may be purified by filtration.

The order and manner of combination of the several ingredients should preferably be the following: Add the acetic acid to the vegetable extract, then add slowly with constant stirring the iron liquor and acetate of alumina.

To make a composition that will produce a fine, clear, black upon silk, it will require about equal parts of the violaniline composition and the last named mordant composition. These compositions are thoroughly blended in an agitator or mixing vessel, and the compound resulting is then ready for application to the tissue by printing or padding, being previously diluted to the shade and strength desired with gum water or mucilage of suitable density. The goods after printing or padding with the black composition are steamed, washed, and finished in the customary manner.

In the production of my black composition, I do not of course confine myself to the exact proportions of materials herein given, as these are necessarily varied according to the shade of black desired, and the character of the tissue operated upon.

I am aware that orange, yellow and brown coloring matters have been produced by combinations of the coloring principles of fustic and other woods with diazotized aniline compounds and their homologues but in this case the diazotizing is an essential feature in the formation of the coloring compound, while it is inadmissible in the execution of my process. Furthermore the character, properties, and uses, of my composition do not in any way resemble such diazotized compositions.

Having now fully described my invention, what I desire to claim and secure by Letters Patent is—

1. The process herein described for the production of a fast black color upon silk and other tissues, consisting in the application to the fiber or fabric of a composition of violaniline, vegetable yellow, (such as fustic and bark) and mordants of iron and alumina in suitable proportions, then steaming the fabric until the color becomes fixed.

2. The herein described composition for the production of black upon silk or other fibers consisting of violaniline and vegetable yellows (such as fustic and bark) combined with mordants in suitable proportions.

VICTOR G. BLOEDE.

Witnesses:

JEANNIE DEAN,
JOHN BROWN.