

UNITED STATES PATENT OFFICE.

CHARLES N. WAITE, OF MEDFORD, MASSACHUSETTS.

MORDANT.

SPECIFICATION forming part of Letters Patent No. 341,294, dated May 4, 1886.

Application filed February 17, 1886. Serial No. 192,263. (Specimens.)

To all whom it may concern:

Be it known that I, CHARLES N. WAITE, of Medford, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Mordants, of which the following is a specification.

This invention relates to a new and improved mordant for fixing aniline or other dyes on cotton yarn or cloth; and it consists in a mordant composed of antimony dissolved in lactic acid, and is used in combination with tannin or other suitable materials, as I will now proceed to describe.

I take of lactic acid (preferably twenty-five per cent. strength) four hundred pounds, and add thereto nitric acid, full strength, fifty pounds, and some powdered antimony, using not less than the acids are capable of dissolving. Heat to 150° Fahrenheit. The nitric acid converts the antimony into antimonious oxide, which is dissolved by the lactic acid, the nitric acid being destroyed. Raise the heat slowly and boil at the end until all further action on the antimony ceases. Care must be taken not to raise the heat too much at first, or some of the antimonious oxide (Sb_2O_3) is converted into antimonic oxide, (Sb_2O_5) which is insoluble in lactic acid. When the action has ceased, pour off the liquor from the undissolved antimony, and add seventy pounds of dry carbonate of soda or its equivalent. This neutralizes two-thirds of the lactic acid, but does not precipitate the antimony.

In cases where an acid mordant is not hurtful I do not add the soda.

In using my mordant for dyeing I first run the cotton yarn or cloth through a tannin bath of suitable strength, and then slightly wash it to remove the loose tannin from the outside of the fiber. I then pass the yarn or cloth through a bath of the above-described lactate of antimony of suitable strength, to which I prefer to add some carbonated alkali to neutralize a part of the lactic acid. The cloth is then thoroughly washed to remove the loose mordant, when it is ready for the dye-bath. For deep shades I use four or five pounds of lactate of antimony for one hundred pounds of yarn or cloth. The antimony remains in solution if the bath be cold, even though all the acid has been neutralized, and is in the most perfect state to combine with the tannin in the cotton fiber, allowing the bath to be completely exhausted of antimony. This bath

may also be diluted to any extent desired without the antimony separating in any insoluble form, as is the case when oxymuriate of antimony is used.

This compound may be used in calico-printing whenever antimony is a desirable mordant, the neutral properties of the improved compound especially fitting it for such use. Heretofore antimony mordants composed of tartar-emetic or the double oxalate of antimony and potash have been used. The use of these compounds soon renders the bath so acid as to prevent the further or complete union of antimony and tannin, at the same time injuring the tone of the color. This objection does not apply to my improved lactate compound. Oxymuriate of antimony—a trade name for SbCl_3 , made in a manner well known to dyers—has also been used; but it cannot be used advantageously on account of its highly acid character and its property of forming an insoluble oxychloride, SbOCl , when diluted with water. This objection does not apply to the lactate compound, because, as before stated, the lactate of antimony may be diluted to any desired extent without separation. The lactate, being non-crystallizable, may be dissolved in water readily to any extent, so that it is especially useful where a concentrated neutral solution of antimony is required.

The lactate of antimony is much cheaper than the antimony mordants heretofore employed, and is free from the objections which apply to said mordants—viz., the insolubility of the oxymuriates in dilute solutions, and the property which all have of becoming acid when the bath is partially exhausted, the acid preventing the union of the antimony with the tannin.

I claim—

1. An improved mordant for dyeing or calico-printing, consisting of antimonious oxide dissolved in lactic acid.

2. An improved mordant for dyeing or calico-printing, consisting of antimonious oxide dissolved in lactic acid wholly or partially neutralized by an alkali, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 12th day of February, 1886.

Witnesses: CHARLES N. WAITE.
C. F. BROWN,
ARTHUR W. CROSSLEY.