

# UNITED STATES PATENT OFFICE.

ADOLPHE CLÉMENT MAROT AND ANTOINE BONNET, OF TROYES, FRANCE.

## PROCESS OF MORDANTING COTTON.

SPECIFICATION forming part of Letters Patent No. 671,560, dated April 9, 1901.

Application filed November 30, 1897. Serial No. 660,280. (No specimens.)

*To all whom it may concern:*

Be it known that we, ADOLPHE CLÉMENT MAROT, dyer, and ANTOINE BONNET, chemist, citizens of the Republic of France, residing at Troyes, department of Aube, France, have invented certain new and useful Improvements in Processes of Mordanting Cotton for Anilin-Black, of which the following is a specification.

The impregnation of cotton for dyeing with anilin-black with oxidation ordinarily takes place for cotton in hanks as well as for loose cotton or cotton in the piece after the fiber has been boiled for a suitable time. In regard to cotton in hanks, to which we refer more particularly, this operation is rather expensive. In fact, it is necessary for the purpose of thoroughly impregnating the cotton in the anilin-bath to have the cotton dried after boiling it, or if it is not dried it is necessary to have the amount of moisture which it contains always the same, so as to get proper results afterward. Therefore the doing away with the boiling is an advantage. We omit this preliminary work of preparing the cotton by modifying the composition of the impregnation-baths used, not as far as their contents in different active materials, such as anilin salt and oxidizing products, is concerned, but we modify their amount in water, substituting alcohol for the removed water. We take the loose cotton fiber or the hanks of cotton in their normal condition (that is, without washing or washing and drying, as above described) and place it directly in the impregnating-bath.

In the following formula, which gives good results, there is employed in making a bath of impregnation of one hundred liters five kilos of anilin-oil, five kilos of hydrochloric acid at 21° to 22° Baumé, one kilo of sal-ammoniac, two kilos of chlorate of potash, .750 kilo of sulfate of copper, .750 kilo of tartaric acid, and 85.50 liters of water.

We substitute for forty liters of water in the above formula forty liters of alcohol (preferably methylic alcohol) at 90°. Thus our bath contains approximately as many parts of water as of alcohol. By thus substituting alcohol for water we are enabled to immediately place the unboiled cotton in the impregnation-bath just as if it had been boiled or boiled and dried, and thereby we also secure the following additional advantages:

First, the unboiled fiber gives on the dynamometer a resistance always superior to that of boiled cotton, the surplus of resistance attaining and surpassing some times six per cent., and we preserve it by directly impregnating unboiled cotton; second, the fineness of the fiber, its silky qualities, its softness, and especially its regularity are better preserved by the suppression of the boiling than by impregnating previously-boiled fiber; third, the oxidizing of the cotton in chambers or apparatus for oxidizing is either quicker or may be done at a lower temperature in consequence of the more rapid desiccation of the fiber, and, fourth, the formation at the moment of desiccation of the fiber, or rather during the concentration of the products employed upon the fiber, of a certain quantity of formic aldehyde resulting from the action of the oxidizers upon the alcohol, the moderating power of which is well known, constitutes a natural protection for the fiber and leaves to the latter a much greater solidity than in the case of the usual processes wherein alcohol is not employed. Independent of its physical function of promoting the impregnation of cotton the alcohol also performs a chemical function by reducing the usual effects of combustion of the fiber which appear at various degrees in the oxidation-chambers during the development of emeraldin, which is the first step in the oxidation of the anilin in the methods of black oxidation.

Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed, we declare that what we claim is—

In the process of dyeing cotton fiber anilin-black, passing such cotton directly into a bath containing anilin salt and oxidizing materials, and approximately five parts anilin-oil, five parts hydrochloric acid at 21° to 22° Baumé, one part sal-ammoniac, two parts chlorate of potash, .75 part sulfate of copper, .75 part tartaric acid, 43.50 parts water, and forty parts alcohol.

Signed at Paris, France, this 17th day of November, 1897.

ADOLPHE CLÉMENT MAROT.  
ANTOINE BONNET.

Witnesses:

ABEL JULIEN,  
EDWARD P. MACLEAN.