UNITED STATES PATENT OFFICE.

ALVIN FÄHRMANN, OF LUDWIGSHAFEN. GERMANY, ASSIGNOR TO THE BADISCHE ANILIN AND SODA FABRIK, OF SAME PLACE.

MORDANT.

SPECIFICATION forming part of Letters Patent No. 661,859, dated November 13, 1900.

Original application filed October 18, 1899, Serial No. 733,989. Divided and this application filed September 11, 1900. Serial No. 29,703. (No specimens.)

To all whom it may concern:

Be it known that I, ALVIN FÄHRMANN, a subject of the King of Saxony, residing at Ludwigshafen-on-the-Rhine, in the Kingdom of Bavaria and Empire of Germany, have invented new and useful Improvements in Compositions of Matter for Use in Mordanting or Dyeing, of which the following is a specification.

I have invented a simplified process for dyeing the color called "Turkey red" upon cotton and other vegetable fiber, and I claim this process in the application for Letters Patent, Serial No. 733,989, filed on the 18th of October, 1899, and of which the present application is a division. In arriving at the said simplified process I have invented a new composition of matter for use therein, and I desire to claim the said new composition of matter in the present application for Letters Patent.

Many attempts have been made to simplify and improve the process of dyeing the color known as "Turkey red;" but the simplest process in general use to-day is still very complicated, expensive, and requires a long time to carry it out. Perhaps the process which is now most generally used is the so-called "new-red" process, which can be carried out in the following manner: After the cotton has been prepared in the usual way by boiling it it is at first thoroughly impregnated with Turkey-red oil. For dark shades this operation is preferably repeated. The goods are then thoroughly dried at a temperature of 50° to 70° centigrade. They are then treated with the mordant solution, acetate or basic sulfate of alumina. After this they are dried once more and then treated with chalk to thoroughly fix the mordant. This is succeeded by a washing operation, and only after this complicated treatment, involving two drying operations, can the dyeing process be begun. The dyeing can be effected in a boiling bath; but if it is desired to obtain the brightest shades it is necessary to dye at a temperature of about 65° centigrade and then to steam the goods under pressure to develop the color. Finally the dyed goods are brightened by boiling with a soap solution, preferably under pressure, whereby the shade is rendered more beautiful and fresh and the goods are freed from coloring-matter deposited on the surface and from impurities.

The process above sketched is much simpler than the older Turkey-red mordanting and dyeing process; but nevertheless it is very complicated, and the drying operations take a considerable time and render the process expensive.

My new process claimed in the application for Letters Patent No. 733,989 is much simpler than that described. It consists, first, in treating the goods in a special oiling-bath, and I have invented the new composition of matter used in the preparation of this bath, which I desire to protect by the present application for Letters Patent. The said new product consists of a definite mixture or combination of castor-oil, caustic soda, stannate of soda, sodium aluminate, and sodium phosphate. If desired, these ingredients or some of them can be supplied to the dyer ready mixed in the proportions I hereinafter set forth, or the dyer may prepare the product in the dye-house itself. Thus, for instance, a mixture of caustic soda, stannate of soda, sodium aluminate, and sodium phosphate in the right proportions, which I have discovered, could be supplied to the dyer and he could in the dye-house effect the boiling of the castor-oil with this new mixture, or the boiled soap mixture could be supplied to the dyer ready for use.

The following example will serve to illustrate the manner in which I prepare my new composition of matter and at the same time illustrate the way in which it is used in oiling cotton goods. In this example the best treatment is described for oiling about one hundred pounds of cotton yarn, and I would add that I do not restrict myself to the exact proportions given in this example.

Example: The preliminary boiling out of the yarn can be effected in the usual way by heating under pressure for two hours in a solution containing one (1) kilogram calcined soda or one (1) kilogram calcined soda and one-half ($\frac{1}{2}$) kilogram sodium-silicate solution possessing a density of 40° Baumé. After this boiling-out treatment the goods are swilled and freed from the excess of water

in a centrifugal machine. The next operation is the treatment in the special oiling-bath according to this invention. For this purpose make the following composition of matter: fourteen (14) kilograms of caustic soda, twenty-five (25) kilograms of sodium stannate, fifteen (15) kilograms of sodium aluminate, (commercial,) and ten (10) kilograms of sodium phosphate. This mixture constitutes the new composition of matter with which the castor-oil is treated according to my invention. For this purpose dissolve the said mixture in two hundred (200) liters of boiling water. Then add one hundred (100) kilograms of castor-oil and boil until the oil is completely saponified. In this way what may be called a new "castor-oil soap" which I have invented is prepared. In order to use this in my oiling and mordanting process, I prepare a stock solution by diluting that obtained as above described, so as to make up the mixture to eight hundred and fifty (850) liters. If the mixture is rightly prepared and the operations have proceeded properly, the oiling solution thus obtained should show a density of 10° Baumé. The oiling can be effected in a small vat with a broad rim or a machine can be used in which the goods are passed through the solution. It is recommended that about two pounds of cotton should be treated simultaneously with six liters of the oiling solution obtained as above described and two liters of water, which must be as free from chalk as well may be. For every further two pounds of yarn one-half liter of oiling solution is added. After passing the goods a second time through the solution the yarn is thoroughly and evenly wrung out and dried at about 60° to 70° centigrade. The cotton-yarn treated in this way is now oiled and ready for the actual mordanting in accordance with my special process claimed in the application for Letters Patent Serial No. 733,989.

Now what I claim is—

1. The new composition of matter consisting substantially of: fourteen (14) parts of caustic soda, twenty-five (25) parts of sodium stannate, fifteen (15) parts of sodium aluminate (commercial), ten (10) parts of sodium phosphate and water.

2. The new composition of matter consisting of: fourteen (14) parts of caustic soda, twenty-five (25) parts of sodium stannate, fifteen (15) parts of sodium aluminate (commercial), ten (10) parts of sodium phosphate, one hundred (100) parts of castor-oil, and water substantially as hereinbefore described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ALVIN FÄHRMANN.

Witnesses:
ERNEST F. EHRHARDT,
JACOB ADRIAN.