

UNITED STATES PATENT OFFICE.

FERDINAND VICTOR KALLAB, OF OFFENBACH, GERMANY, ASSIGNOR TO THE
FIRM OF K. OEHLER, OF SAME PLACE.

PRODUCING FIGURES ON ANILIN-BLACK.

SPECIFICATION forming part of Letters Patent No. 529,499, dated November 20, 1894.

Application filed November 24, 1893. Serial No. 491,865. (No specimens.) Patented in France December 12, 1891, No. 218,013; in Italy January 29, 1892, XXVI, 31,193, LXII, 321; in Spain April 8, 1892, No. 13,172; in Norway April 8, 1892, No. 2,760; in Belgium April 11, 1892, No. 99,184, and June 14, 1892, No. 100,119, and in England April 22, 1892, No. 7,638.

To all whom it may concern:

Be it known that I, FERDINAND VICTOR KALLAB, chemist, residing at Offenbach-on-the-Main, Germany, have invented a new and
5 useful improvement in methods of producing white or colored figures on anilin-black on fabrics of wool, hair, or other animal substances or mixed fabrics, of which the following is a specification, and for which patents
10 have been granted as follows, viz: in France, No. 218,013, dated December 12, 1891; in Italy, Vols. XXVI and LXII, Nos. 31,193 and 321, dated January 29, 1892; in Great Britain, No. 7,638, dated April 22, 1892; in Norway, No.
15 2,760, dated April 8, 1892; in Spain, No. 13,172, dated April 8, 1892, and in Belgium, No. 99,184, dated April 11, 1892, and No. 100,119, dated June 14, 1892.

My new process is the following: The goods
20 consisting of wool, hair or other animal fibers or mixed fabrics containing either of such fibers are well washed and treated while still moist, at the ordinary temperature for one half to one hour in a bath containing about
25 from six per cent. (for printing) to ten per cent. (for plain black) of hypochlorite of lime and about from nine to fifteen per cent. muriatic acid of 34° Twaddle of the weight of the goods. By this treatment an oxidation is produced which is so feeble that the white of the
30 wool is but little affected. After this oxidation the goods are well washed, dried and padded or printed with mixtures suitable for producing steam aniline black on cotton and
35 for producing discharging white or colored figures and are after that subjected to a steaming operation by which the simultaneous development of the black and the fixing of the discharging white or colors are effected. I
40 discharge the black for the production of raised colored figures in a similar way to that in use for calico printing (Prudhomme's system) and I combine this discharge (enlevage) with the fixation of a greater variety of colors than it would be possible to do on cotton.

Example 1.—Padding: Four hundred and five grams equal fourteen and one-third
50 ounces chlorhydrate of aniline or toluidine or a mixture of both. One hundred and fifty grams equal five and one-third ounces chlo-

rate of soda. Two hundred and sixty grams equal nine and one-quarter ounces yellow prussiate of potash, are dissolved, each by itself, in as little water as possible, mixed and diluted with water to three thousand one hundred and fifty cubic centimeters, equal two
55 and four-fifths pints of 1.096 density. A quantity of glycerine or sugar of about half the weight of the aniline salt added to this mixture produces a more intense black and
60 the wool remains softer. It is also of advantage to add some tartaric acid.

Example 2.—Printing: Eight hundred grams equal twenty-eight and one-third
65 ounces leiogomme water 1:1. Two hundred grams equal seven and one-tenth ounces chlorhydrate of aniline or toluidine or of a mixture of both. Seventy-five grams equal two and two-thirds ounces chlorate of soda. One hundred and thirty grams equal four and
70 two-thirds ounces yellow prussiate of potash. Two hundred and sixty grams equal nine and one-fourth ounces water. Forty grams equal one and four-tenths ounces tartaric acid.

Example 3.—Discharging: Five hundred
75 grams equal seventeen and three-fourths ounces leiogomme water 1:1. Two hundred grams equal seven and one-tenth ounces acetate of soda. Two hundred grams equal seven and one-tenth ounces sulphocyanate of potash. Sixteen cubic centimeters of a solution of sulphurated blue violet 1:100.

Example 4.—Discharging colors: Two hundred and fifty grams equal nine ounces water. Fifty grams equal one and three-fourths
85 ounces benzol green or a corresponding quantity of one of the other under mentioned dye stuffs. Fifty grams equal one and three-fourths ounces glycerine. Two hundred and fifty grams equal nine ounces leiogomme.
90 Four hundred grams equal fourteen and one-fourth ounces acetate of soda.

By the term "leiogomme" is to be understood a kind of dextrine obtained by simply
95 roasting potato starch. It is well known as a means for thickening dissolved or liquid dyes. The goods padded or printed are dried and the white or colored discharge is applied. The goods are then steamed for five to thirty
100 minutes and well washed. It is of advantage

to pass some colors through a weak acid bath for instance the alkaline blue, acid green and other sulphonated dye stuffs.

I do not confine myself to the use of chlorate of soda as equivalent quantities of the salts of potassium, ammonium or barium will serve as well; also the yellow prussiate of potash (respectively of soda or ammonium) can be replaced by the red prussiate or by a mixture of both and the chlorhydrate of aniline or toluidine by the nitrates.

The concentration of the padding solution or of the printing color can be varied according to the intensity of the black wanted. The proportion of the aniline salt to the oxidizing agents and that of the glycerine or sugar and tartaric acid is also variable.

Most of the artificial dye stuffs and the substantive natural dye stuffs are suitable as discharging or pattern colors, but those requiring mordants like alizarine, are less suitable. For mixed goods containing vegetable fibers I use basic dyes and the dyes of the Congo group alone or combined with acid dye stuffs. By reversing the order of operations the discharge serves as reserve.

Although I give the preference to the preparing process by the mixture of hypochlorite of lime and muriatic acid, I do not exclude the following modifications: muriatic acid and hypochlorite of lime, separately, cold or warm at 176° Fahrenheit; sulphuric acid and hypochlorite of lime separately or mixed in a bath, cold or warm, at 176° Fahrenheit; cold watery solution of chlorine. Mixtures developing hypochlorous acid instead of chlorine for instance the hypochlorite of lime and acetic acid, render the wool very yellow and can only be used for plain goods; and besides

hypochlorite of lime, other hypochlorites also and other oxidizing agents, for instance permanganate of potash or mixtures of chromic acid and hydrogen dioxide may serve as well. I would prefer the latter, using it at the temperature of 86° Fahrenheit in a concentrated solution of about three per cent. and neutralized with ammonium until it gives a slight alkaline reaction.

This process yields a new effect and opens a prospect for a new kind of manufacture, viz: beautiful discharging colors on wool and mixed goods containing wool with a ground of steam aniline black which does not become green.

What I claim as my invention, and desire to secure by Letters Patent, is—

The process herein described of producing white or colored figures on aniline black on fabrics of wool, hair or other animal substances or mixed fabrics containing such substances, consisting in first subjecting the goods to such a feeble oxidation that the white of the wool is but little affected, second padding or printing them with mixtures suitable for producing steam aniline black on cotton and for producing discharging white or colors, and finally subjecting them to a steaming operation by which the developing of the black and the fixing of the discharge colors are simultaneously effected.

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

FERDINAND VICTOR KALLAB.

Witnesses:

PAUL WALCH,
JEAN GRUND.