

UNITED STATES PATENT OFFICE.

RENÉ BOHN, OF LUDWIGSHAFEN-ON-THE-RHINE, ASSIGNOR TO THE
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PROCESS OF DYEING WITH GALLACETOPHENONE.

SPECIFICATION forming part of Letters Patent No. 452,210, dated May 12, 1891.

Application filed June 5, 1890. Serial No. 354,376. (No specimens.) Patented in Germany May 28, 1889, No. 50,238; in England June 6, 1889, No. 9,429, and in France June 11, 1889, No. 198,866.

To all whom it may concern:

Be it known that I, RENÉ BOHN, a citizen of Switzerland, residing at Ludwigshafen-on-the-Rhine, in the Kingdom of Bavaria and Empire of Germany, have invented new and useful Improvements in Dyeing and Printing Animal and Vegetable Fiber with Gallacetophenone, (for which I have obtained Letters Patent in Germany, dated May 28, 1889, No. 50,238; in France, dated June 11, 1889, No. 198,866, and in Great Britain, dated June 6, 1889, No. 9,429,) of which the following is a specification.

My invention relates to the production of new compounds or lakes of gallacetophenone with certain metallic oxides or mordants within or upon animal or vegetable fiber and thus dyeing the material.

Gallacetophenone was discovered by M. v. Nencki, (*Journal für Praktische Chemie*, XXIII, pp. 151, 537, *et seq.*) but it is not a coloring-matter in its free or uncombined condition, and up to the date of my invention it was not known that it could in any way be used for dyeing and printing. Now I have found that it can be made to impart fast and useful colors to both animal and vegetable fiber by causing it to combine with metallic oxides or mordants within or upon the said fibrous materials. All the known metallic mordants may be used. The following appear at present to be most important: alumina, with which fast yellow shades are obtained; chrome, which gives brown colors; and iron, with which the shades vary from slate color to black. The results obtained by the use of alumina mordants may in some cases be improved by the employment therewith of calcium, and superior results may be produced on cotton by previously impregnating it with the well-known Turkey-red oil mordant.

In the following examples I give an exact description of the preparation of print-colors for use in printing calico various shades of yellow, brown, and black, and I prefer to use gallacetophenone in a finely-divided condition—say in the form of a thin paste or pulp containing about ten per cent. of dry gallacetophenone and ninety per cent. of water.

I. For yellow the print-color is compounded

from thirty-seven and one-half parts (the parts are by weight) of gallacetophenone - paste (containing about ten per cent. dry substance,) fifteen parts solution of aluminium thiocyanate (rhodanate) of 1.15 specific gravity, seven and one-half parts acetate-of-lime solution of 1.075 specific gravity, seven and one-half parts of acetic acid of 1.045 specific gravity, and thirty-two and one-half parts of thickening.

II. For yellowish-brown mix as print-color thirty-seven and one-half parts gallacetophenone-paste, (ten per cent. dry,) fifteen parts solution of chromium thiocyanate (rhodanate) of 1.2 specific gravity, seven and one-half parts of acetic acid of 1.045 specific gravity, and forty parts of thickening.

III. To obtain a print-color for black, take thirty-seven and one-half parts gallacetophenone-paste, (ten per cent. dry,) fifteen parts acetate of iron solution of 1.116 specific gravity, seven and one-half parts of acetic acid of 1.045 specific gravity, and forty parts of thickening.

After printing with the above-described colors the goods are steamed (at ordinary or increased pressure) in a manner similar to that in use for the development of the colored compounds or lakes of the alizarine dyes. The goods are afterward soaped, washed, and dried.

Now although I have only described in detail the preparation of print-colors of gallacetophenone more particularly suited for printing calico, inasmuch as this appears likely to be its principal application, still it must not be considered that my invention is confined to this application; but since I have discovered that the metallic lakes can also readily be formed within or upon the animal fiber it is possible for every dyer skilled in the art to which this appertains, and with the information conveyed to him by this specification to readily produce upon wool and silk by dyeing or printing, with the aid of mordants, shades similar to those mentioned above.

Goods dyed or printed with gallacetophenone can be readily recognized by the following tests: The yellow color produced upon an alumina mordant (the nature of the mordant

can be ascertained by the analysis of the ashes of the material) is destroyed by weak and strong hydrochloric acid, weak and strong nitric acid, weak and strong sulphuric acid. 5 It is turned reddish by caustic soda and greenish by ferric chloride, but does not change color with ammonia. The yellowish brown color produced with a chrome mordant shows no change with dilute hydrochloric, nitric, and 10 sulphuric acid, but is turned greenish by strong hydrochloric and sulphuric acids and brown by strong nitric acid. Caustic soda and iron chloride turn it brown, but ammonia does not change the color. The black or 15 slate shades produced on iron mordant turn yellowish with strong hydrochloric acid and are decolorized by weak hydrochloric acid. Weak nitric acid and weak and strong sulphuric acid turn them brown and weak nitric 20 acid decolorizes them. Sodium hydrate turns them brown. Ferric chloride decolorizes, and ammonia produces no change of color.

A very striking test characteristic to goods dyed or printed with gallacetophenone is the

following: By boiling such goods with diluted 25 hydrochloric acid they are stripped of some of their color, and the solution so obtained yields a characteristic reaction with caustic alkalies. At first on addition of the caustic alkali a yellow color is produced, which on 30 standing turns a dirty green. By this test goods dyed or printed with gallacetophenone can be readily distinguished from goods dyed or printed with other coloring-matters.

What I claim as new, and desire to secure 35 by Letters Patent, is—

The within-described process of dyeing or printing animal and vegetable fiber, which consists in exposing the fiber to the action of gallacetophenone in the presence of a suit- 40 able mordant.

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

RENÉ BOIIN.

Witnesses:

ERNEST F. EHRHARDT,
HERMANN HANG.