

# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN DYEING AND PRINTING WITH ANILINE COLORS.

Specification forming part of Letters Patent No. 41,666, dated January 5, 1864.

*To all whom it may concern:*

Be it known that I, ROBERT HODGSON GRATRICK, of Salford, in the county of Lancaster and Kingdom of Great Britain, (at present residing at No. 69 East Twenty-Seventh street, in the city, county, and State of New York,) have invented certain new and useful Improvements in Dyeing and Printing Textile Materials and Fabrics; and I do hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to a mode or modes of applying the class of colors derived from aniline, naphthaline, nitro-benzine, cinchonine, and analogous substances to the obtaining of patterns or designs upon textile materials and fabrics.

This invention consists in the employment or use of a compound of tannin with the colors derived from aniline or analogous substances, formed either before or during the process of dyeing or printing, in combination with salts of tin or other suitable mordant or mordants for the purpose of fixing said colors onto textile materials and fabrics in such a manner that cheap and fast goods can be produced.

To enable those skilled in the art to make and use my invention, I will proceed to describe it.

The ordinary mode of fixing colors derived from aniline or analogous substances has been to use as mordants albumen, lacterine, or other azotized substances; but either from the cost of these materials or the loose and fugitive character of the applied colors, no cheap and fast goods could be produced. This difficulty is obviated by my invention, which is carried out in the following manner: I first form a compound of tannin with the color which I desire to employ, and thicken it with gum-senegal or other suitable thickening material. I then take the article to be operated upon—say, for example, the cloth known in the trade as “prepared cloth”—that is, cloth on which tin, antimony, or other suitable metallic base has been precipitated by any of the well-known preparation processes—and I impress upon this cloth the prepared or combined color by means of printing-blocks, engraved rollers, or other suitable mechanical appliances; or, as a modification of this improved process, I take the prepared cloth intended to receive a pattern or device and print upon it the desired pattern

with thickened solution of gall-nuts. By these means I form on those parts of the fabric to be printed only which are intended to carry the colored pattern a combination of tannin with oxide of tin or other suitable base. I then submit the fabric to a bath composed by preference of a dilute acid solution of any desired color derived from aniline or other analogous substances.

In order to form compounds of tannin with the color to be employed, I add to a solution of blue, purple, or red colors, or their combinations derived from aniline or analogous substances, so much of a strong solution of galls (a newly-made solution being preferred) as is sufficient to precipitate all the coloring-matter; or I use the pure tannin by preference, if the expense be not objectionable. I then collect the precipitate upon a filter and wash it, and then dry it or not, as may be thought desirable. I redissolve this precipitate in acetic acid, alcohol, methylated spirits, or other suitable solvent, and thicken it with gum-senegal or other suitable thickening. It is then ready to be used for printing upon cloth prepared with salts of tin or other suitable mordant or mordants. When the fabric has been printed, it is to be steamed, and then washed with or without the use of soap, according to the color under operation, the red color more particularly requiring such treatment with soap.

Instead of first preparing the precipitate of the color and tannin, and applying this precipitate for printing, the precipitate may be formed during the process of printing in the following manner: I take cloth prepared with stannate of soda or other well-known and suitable mordant or mordants, and upon this cloth I print the desired pattern with a solution of gall-nuts or other tannin matter thickened with gum-senegal or other materials that will give it a suitable consistence. The fabric thus prepared I then submit to steam heat, beginning at a low pressure and ending at from eight to ten pounds to the inch. I then clear off the gummy matter by passing the fabric through the ordinary fixing-bath, or such as is used for madder, and having well washed the fabric it is ready for the dye-vat. This fabric I now “enter” into a madder-dyeing vessel filled with water slightly acidulated with acetic or other suitable acid, and heated to 140° Fahrenheit. I then add a small quantity of color-



ing-matter previously dissolved in acetic acid or other suitable solvent, and continue to supply the color by degrees until the parts prepared to receive it are completely filled. At the same time I bring the liquor gradually to the boiling-point, and maintain this heat for about half an hour or more, when the pattern will show up a beautiful clear color, according to the strength of the tannin printed on the fabric. The white parts will, however, be slightly tinged with the coloring-matters used. To remove this tinge I boil the article in water slightly acidulated with acetic, sulphuric, or other suitable acid; or soap may be used, or bran, or any other suitable material. This operation is repeated until the white is sufficiently pure. The fabric is then washed and ready for the stiffening and finishing operation.

It is obvious that this process admits of many modifications without altering the principle of my invention. For instance, the cloth or other material may be passed through a solution of tin, antimony, or other suitable metallic base in the ordinary manner, then through a solu-

tion of pure tannin of suitable strength, and when washed, it may be printed or dyed in the usual manner; or the cloth may be passed through the solution of tannin first, and afterward through that of tin, antimony, or other metallic base, and washed and printed, or dyed; or the preparation material might be combined with tannin to constitute the printing material.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The employment or use of a compound of tannin with the colors derived from aniline or analogous substances, formed either before or during the process of dyeing or printing, substantially in the manner herein specified, in combination with salts of tin or other suitable mordant or mordants, for the purposes set forth.

R. HODGSON GRATRIX.

Witnesses:

EDW. W. HODGSON,  
JAMES LAIRD.