

# UNITED STATES PATENT OFFICE.

JOHN BRACEWELL, OF NORTH ADAMS, MASSACHUSETTS.

## ANILINE-BLACK DISCHARGE.

SPECIFICATION forming part of Letters Patent No. 409,819, dated August 27, 1889.

Application filed February 9, 1889. Serial No. 299,319. (No specimens.)

*To all whom it may concern:*

Be it known that I, JOHN BRACEWELL, of North Adams, in the county of Berkshire and State of Massachusetts, have invented a new and useful Improvement in the Method of Printing and Producing Discharges on Aniline-Black Grounds, of which the following is a specification.

My invention relates to a new and useful method of printing discharge-mixtures on aniline-black grounds, and producing the discharge of the aniline color therefrom; and it consists in certain new and useful improvements in said method, substantially as hereinafter described and claimed.

The printing of discharge-mixtures upon aniline-black grounds has heretofore been very difficult, and been pronounced practically impossible by some, because in the process of drying the cloth after the application of the aniline-black color preparatory to printing the discharge in patterns thereon, the oxidation of the aniline proceeded so rapidly that the discharge failed to set thereon properly. I have discovered that this oxidation of the aniline during the drying process can be retarded or prevented by conducting the final drying of the cloth in air of a certain maximum temperature, so that not only does it not proceed during the drying process sufficiently to prevent the proper action of the discharge, but the cloth may be kept for some hours, or days even, before applying the latter. This not only insures the perfect action of the discharge in giving clear and beautifully-defined patterns in white or colors on the parts of the cloth where it acts, but it enables the processes of coloring, drying, printing, and fixing the patterns on the fabrics to be carried on practically, steadily, and economically in the print-works, which would not be the case if dried with steam or hot air in the usual way. To prevent these difficulties, I first print or pad the cloth on the face only, or I slop-pad or dye the cloth until it is thoroughly saturated with the aniline-black color. I then partially dry the cloth on ordinary steam drying-cans, at a temperature of steam at about ten pounds pressure to the inch, or, say, 190° to 230° Fahrenheit, until it is in a moist state. I then suspend or hang the cloth in a cool atmosphere—

say about 55° Fahrenheit temperature—and complete the drying process. A higher or lower temperature than 55° degrees Fahrenheit may be employed with good results; but in no case should it be above 90° Fahrenheit. The preliminary partial drying on the steam-cans is to expedite the process, as the oxidation of the aniline-black color does not begin, under usual methods of drying, until the latter part of the process. If time is not material, the cloth may be entirely dried in air below 90° Fahrenheit temperature, as the final drying of it after it has reached the moist stage would be in that temperature, or below, the same as before. This final drying requires from one to twelve hours, according to the amount of moisture in the atmosphere.

Instead of partially drying on steam drums or cans, the cloth may be partially dried in hot air, in the usual manner—say at about 160° Fahrenheit down to the moist stage—and then have the final drying in the cooler air, as above specified. This drying may also be accomplished by passing the partially-dried goods through a box or chamber of the lower temperature I name, and thus completing the drying in that way; but I prefer to suspend or hang them in a room to so complete the drying. When the cloth is thus properly dried for printing, it is taken to the printing-machine and the discharge-mixture is printed thereon in the desired figures or patterns. This discharge-mixture consists in a combination of an alkali with a gum solution of the usual thickness for printing properly. Colors, especially pigments, may be mixed therewith, as hereinafter specified, if the pattern is to be in colors, or omitted if it is to be white on a black ground. After the discharge-mixture is printed on the cloth it is passed once or more through an aging-machine—i. e., one in which it is exposed to the action of steam and air under little, if any, pressure—in case the aniline-black color be of the type requiring development by that means; or it may be developed further by hanging in the air and then passing it through a weak solution of bichromate of potash, or an iron solution, or a mixture of them. In case the aniline-black color is what is known as a “steam” color it is exposed to steam and a pressure in a steaming-



box, or run through a so-called "continuous" steamer, in either case preceded, if preferred, by passing it once or more through an aging-machine. This is the method I prefer in using  
5 steam colors, and I have devised the mixture of color and process therefor, hereinafter given, for which I shall apply for patents immediately after this one.

The following proportions of ingredients  
10 may be employed for the aniline-black color, to be developed by the aging-machine or room, as above described.

Dissolve in a copper color-pan four pounds of chlorate of potash and six pounds of ferro-  
15 cyanide-of-soda crystals in six gallons of water. Then add three pounds of corn-starch and boil till thickened, and cool. Then add seven pounds of aniline-salt crystals dissolved in one and one-half gallons of water. Then add six  
20 ounces of aniline-oil. After thorough mixing the color is ready for use. By using a larger amount of corn-starch the above color can then be employed for producing the black on one side of the fabric by the means of a pad  
25 copper-roller in a printing-machine. It can also be used for producing cover effects.

For the discharge-mixture, to be printed on the aniline-black ground, as above described, take gum substitute, four pounds; acetate of  
30 soda, four pounds; water, eight pounds. Dissolve and mix thoroughly.

If the pattern is to be in color, mix with the above the desired pigment, and use albumen,

either egg or blood, in place of the gum substitute. Chromate of soda and other soda  
35 and potash salts can be used in place of acetate of soda for pigment color-discharge. Other soda and potash salts can be used in place of acetate of soda for white discharge.

What I claim as new and of my invention  
40 is—

1. The described process of drying and printing discharges on aniline-black colors—that is to say, first treating the cloth with the  
45 prepared solution of aniline-black color, as described, then drying the same in an atmosphere at a temperature below 90° Fahrenheit, and finally printing an alkali discharge thereon in patterns before the oxidation of the aniline  
50 color, substantially as described.

2. The described process of drying and printing discharges on aniline-black colors—that is to say, first treating the cloth with the  
55 prepared solution of aniline-black color, as described, then drying the same to a moist state by steam or atmospheric heat above 90° Fahrenheit, and completing the drying in an  
60 atmosphere at a temperature of less than 90° Fahrenheit, and finally printing an alkali discharge thereon in patterns before the oxidation of the aniline color, substantially as described.

JOHN BRACEWELL.

Witnesses:

L. F. CHAPIN,  
DAVID HALL RICE.