

UNITED STATES PATENT OFFICE.

JOHN LIGHTFOOT, OF ACCRINGTON, ENGLAND.

IMPROVEMENT IN DYEING AND PRINTING A BLACK COLOR ON FABRICS WITH ANILINE COMPOUNDS.

Specification forming part of Letters Patent No. 38,589, dated May 19, 1863.

To all whom it may concern:

Be it known that I, JOHN LIGHTFOOT, of Accrington, in the county of Lancaster and Kingdom of England, chemist, have invented or discovered new and useful Improvements in Printing and Dyeing Textile Fabrics and Yarns; and I do hereby declare that the following is a full and exact description thereof—that is to say:

These improvements consist in the production of a black dye on textile fabrics or yarns by printing or staining them with a salt or salts of aniline or any analogous homologous or isomeric compounds mixed with certain metallic salts or their oxides as a mordant, as hereinafter described. I take one gallon of water and dissolve in it four ounces chlorate of potash. To this I add aniline or any analogous homologous or isomeric matters, using by preference aniline in the proportion of eight ounces, previously combining it with eight ounces of hydrochloric acid at 32° Twaddle. After stirring well I add one pint of acetic acid and eight ounces, measure, of perchloride of copper at 88° Twaddle. Then I add four ounces sal-ammoniac or an equivalent quantity of other suitable alkaline chloride. I steep the fabric or yarn in this solution, wring out, and dry. Then I expose the goods in a room at from 60° to 70° Fahrenheit for two or three days. The goods are now passed through water alone or a solution containing alkaline or metallic salts, (which develop the black much sooner and better.) The alkalies and alkaline earths may be used for raising the black, such as caustic soda, caustic potash, caustic ammonia, caustic lime in solution in water; or the goods may be passed, after "printing" and dyeing, through a box containing rollers supplied with "ammoniacal gas," (which I prefer when the black is printed along with "steam colors" prior to steaming the goods.) When the black is printed along with "madder" or "garancine" colors they are aged or exposed in a room at from 60° to 70° Fahrenheit for three days, and dunged, dyed, washed, and passed through a solution of soap or dilute hypochlorite of lime, whereby an intense black is produced.

For printing on fabrics or yarns, I take one gallon of starch-paste (containing one pound, weight, starch per gallon) or other suitable thickening ingredient and dissolve in it four ounces chlorate of potash and eight ounces aniline previously combined with eight ounces hydrochloric acid. I then add four ounces,

measure, of perchloride of copper at 88° Twaddle and two ounces sal-ammoniac or an equivalent quantity of other suitable alkaline chloride. After printing this color I age for three nights and raise in water alone, or weak alkali, or soap, or hypochlorite of lime, as before.

I do not confine myself to perchloride of copper, as many other salts of copper will produce the same result. Neither do I confine myself to the use of alkaline chlorides, for they can be dispensed with when certain metallic salts are used, such as sulphate of copper, chloride of copper, chloride of antimony, nitrate of nickel, nitrate of bismuth, &c. The salts of several other metals may also be substituted for those of copper for producing a black dye or printing material for black, such as soluble compounds of antimony, bismuth, chromium, iron, manganese, nickel; and in some cases I pad the cloth in a solution of any of the metallic salts named, either separately or mixed together, dry, and print or pad on a thickened salt of aniline in combination with chlorate of potash, age three to four nights, and finish as previously stated; or I pad the cloth in a solution of any of the metallic salts named, as before. I then precipitate the oxide of the metal or metals used in the cloth by passing through a solution of alkali suitable to the metal used, wash, dry, and print or pad on a thickened acid salt of aniline in combination with chlorate of potash, age three to four nights, and finish as before.

I do not confine myself to the precise details herein mentioned, nor to the exact quantities herein stated, as they may be slightly modified without departing from the spirit of my invention; but

What I claim as my invention is—

The use of certain metallic salts or their oxides, as herein stated, either alone or combined with chlorate of potash and then mixed with a salt or salts of aniline or any analogous homologous or isomeric compounds, either singly or mixed together, as well as the process or series of processes, as previously described, for the production of a black dye or stain.

Done at the city of Manchester, England, this 21st day of February, 1863.

JOHN LIGHTFOOT.

In presence of—

EDWARD JOSEPH HUGHES,

JOHN BLOODWORTH;

Patent Agents, 20 Cross Street, Manchester.