

UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN DYEING BLACK WITH ANILINE COLORS.

Specification forming part of Letters Patent No. **134,066**, dated December 17, 1872.

To all whom it may concern:

Be it known that we, LEON JAROSSON, of Lille, France, and JEAN JACQUES MÜLLER-PACK, of Basel, Switzerland, have invented an Improved Mode of Fixing or Developing Aniline Black or other fast colors derived from coal-tar products and generated by process of oxidation in animal or vegetable fibers, textile fabrics, or yarns, (patented in France on the 3d day of June, 1872,) of which the following is a specification:

Prior to the date of this invention it has been the practice to fix or develop fast colors derived from coal-tar products, such as aniline black or naphthylamine chocolate, in animal or vegetable fibers, fabrics, or yarns, or in mixtures of the same by the process known as "aging," which consists in hanging them in an open room after having been dyed with the proper chemicals, and in there exposing them to the action of the atmosphere at a temperature usually ranging from 16° to 21° centigrade, whereby the required oxidation of the aniline, naphthylamine, or kindred coal-tar products, is gradually effected; but such process has been attended with considerable inconvenience in order to produce the result desired.

The invention herein set forth is designed to facilitate the chemical changes which take place in the fibers, textile fabrics, or yarns so dyed, and to materially lessen the inconvenience consequent upon the usual process of aging; and it consists substantially in placing such dyed fibers, fabrics, or yarns within a close vessel so constructed and operated as to keep them in motion while subjecting them to a temperature exceeding that of the ordinary aging-room, but not so high as to generate chemical action injurious to the quality or strength of the fiber, fabrics, or yarns themselves.

In order to more clearly make known the nature of this improvement, we will describe it in connection with the process of dyeing fibers, textile fabrics, or yarns aniline black.

We prepare, in the first place, a solution composed of chloride of iron thus: Boiling water, ten liters; hydrochloric acid, ten kilograms;

in which we dissolve about three kilograms of clean iron turnings. We treat the cloth or material to be dyed, after the usual preparation, in a bath of this chloride of iron reduced to 12° Baumé. We work the material, if yarn, upon battens for a couple of hours, or if tissues in bundles, and we leave the mordant on them for twelve hours; then press out the excess. It is then ready for dyeing. For thirty kilograms of the material to be dyed we take thirty kilograms of boiling water, in which two and one-tenth kilograms of chlorate of potash is dissolved, or chlorate of soda or chlorate of ammonia. In another vessel we take three kilograms of aniline and five kilograms of hydrochloric acid, or an equivalent of hydrochlorate or other salt of aniline suitable for dyeing. Into this we immerse the material to be dyed, after adding the chlorate-of-potash solution. We now place the said material in a closed vessel, which is rotated and also heated exteriorly. A convenient form of such vessel is a cylinder of, say, four feet in length and two feet in diameter, made of sheet-iron or other material, supported at each end by an axis, and turning on its axis in suitable bearings. It can be driven by either hand or power, by a handle or pulley. It should be fitted with a large man-hole and tight-fitting cover and a small spring safety-valve if excess of pressure is feared. It may revolve in an outer case or cistern supplied with hot water kept at the proper temperature by a jet of steam or other suitable means. We subject the material to be dyed to from three to five hours' treatment in this cylinder, according to the material being dyed, and during this time we heat the apparatus, commencing at 30° centigrade, gradually up to 50° centigrade. After the oxidation and the formation of the color which has thus been produced in the vessel, we withdraw the material, and we leave it in a heap several hours, during which the fixing of the color is complete. We then pass the material into a weak bath of acidulated bichromate of potash, heated to 50° centigrade, from twenty to thirty minutes, and afterward wash in running water. Lastly, we give it a softening bath (called a white bath) composed of a salt of soda and olive-oil, in the ordinary

and well-known proportions for weak solution of soap. The temperature of this bath should be about 50° centigrade, and the time from twenty to thirty minutes. The material is then well washed in cold water, hung to dry, and the operation is finished.

To freshen or give a slight shade of blue, we give a weakly acid bath of sulphuric acid, and wash cold, neutralizing the acid with the water slightly alkaline.

We have described our invention as applied to aniline black, but other fast colors derived from coal-tar products may be dyed in the same manner; for instance, the fast chocolate

obtained by using hydrochlorate of naphthaline in place of hydrochlorate of aniline.

We claim—

The improved mode of fixing or developing aniline black or other fast colors derived from coal-tar products, in fibers, textile fabrics, or yarns, by inclosing them within a close vessel, and there subjecting them to heat and motion, substantially as described.

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Witnesses:

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