UNITED STATES PATENT OFFICE.

GOTTFRIED GRÜN, OF ELBERFELD, GERMANY, ASSIGNOR TO THE FARBEN-FABRIKEN, VORMALS FR. BAYER & CO., OF SAME PLACE.

PRINTING OF INDULINE DYE-STUFFS.

SPECIFICATION forming part of Letters Patent No. 396,692, dated January 22, 1889.

Application filed February 21, 1888. Serial No. 264,837. (Specimens.)

To all whom it may concern:

Be it known that I, GOTTFRIED GRÜN, a subject of the Emperor of Austria, residing at Elberfeld, in the Empire of Germany, have invented a new and useful Improvement in the Printing of Induline Dye-Stuffs, of which the following is a specification.

The process for printing the induline dye-stuffs is now found in the levuline acid, the acetine, acetochlorhydrine, and chlorhydrine of glycerine. These processes are not sufficient, however, for technical exploration on account of their inherent defects. For manufacturing on a large scale, levuline acid is too expensive, and also does not dissolve the induline dye-stuffs sufficiently. The acetines, which are cheaper and dissolve the indulines better, cannot be used without disadvantage to the iron and copper machines, because, on account of the free acetic acid, (which is absolutely necessary for the printing process,) the machines become too quickly corroded and unfit for use. I have now found that the acetines may be substituted by other ethers, which, like the acetines, acetochlorhydrine, and chlorhydrine of glycerine, can be manufactured in a cheap manner, but which, like those, are not accompanied by a free strong acid, which corrodes the machines in the printing process. I understand under this the formylethers of glycerine, as may be manufactured by heating oxalic acid with glycerine to 110° until the development of carbonic acid is beginning. The ethers of glycerine so obtained dissolve the basic colors very easily, and one can print with the so prepared induline solution in neutral, as also in acidulated thickening. The formic acid, which is present in acidulated thickening, is without any pernicious effects, because in the printing process it is decomposed in its components. Through this absence of any injurious working of a free strong acid the outlines are more completely preserved than has been the case with the known processes. The advantage and novelty of the process I have found consists, therefore, in my using for the dissolving of the basic colors of ethers which just possess sufficiently acetic properties to dissolve the induline dye-stuffs, but which are not accompanied by a free strong acid, which can become disagreeable in the printing process by its acid character, because it is easily, if present, decomposed into its components.

In carrying out my process practically I proceed as follows: One hundred parts, by weight, of induline paste of forty to forty-five per cent. solid matter are ground fine in a mill, and to this are added slowly, at a temperature of 40°, twenty-five parts, by weight, of the formylethers, (prepared after above-mentioned process.) The mixture so obtained must then be ground until the indulines are completely dissolved. This operation lasts several hours and a deep-blue solution results, which in every respect reacts the same as the induline dye-stuffs themselves. It dissolves in sulphuric acid with blue color, but is discolored on adding reducing agents. The solution thus obtained is very good for printing cotton cloths. It is, however, not necessary to manufacture a solution of induline dye-stuff with the formylethers of glycerine; but it can also be operated with the same result by adding the formylethers of glycerine to the printing induline paste.

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

1. The process for producing a new printing-color of the induline dye-stuffs herein described, which consists in mixing the induline paste with the formylethers of glycerine to form a dark-blue solution having the qualities for printing cotton cloths, and showing the same properties to chemical bodies as the induline dye-stuffs themselves, substantially as hereinbefore described.

2. Printing the above-described induline paste by adding the formylethers of glycerine to the printing-paste, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two witnesses.

GOTTFRIED GRÜN.

Witnesses:
ANTON KEUTER,
OTTO V. WANSKY.