

UNITED STATES PATENT OFFICE.

LUDWIG LICHTENSTEIN, OF KÖNIGINHOF-ON-THE-ELBE, AUSTRIA-HUNGARY.

PROCESS OF FIXING SULFID COLORS.

960,975.

Specification of Letters Patent.

Patented June 7, 1910.

No Drawing.

Application filed August 13, 1909. Serial No. 512,754.

To all whom it may concern:

Be it known that I, LUDWIG LICHTENSTEIN, doctor of philosophy, a subject of the Empire of Austria-Hungary, and a resident of Königinhof-on-the-Elbe, in the Province of Bohemia, of the Austro-Hungarian Empire, have invented some new and useful Improvements in Processes of Fixing Sulfid Colors During Printing and Dyeing, of which the following is a full description.

I have discovered that sulfid colors may be precipitated by animal colloids.

All the methods known so far for printing sulfid colors, show the drawback that the dyestuffs do not become fixed sufficiently well on the fiber, especially on unmercerized goods.

I have found that sulfid colors may be precipitated with animal colloids, such as for instance glue, albumen, casein, etc. The fiber is for this purpose impregnated with the colloids, the goods being dyed or printed with sulfid colors during or after the fixing of the colloids.

The process is illustrated by the following example: The piece-goods are impregnated on the hot flue with a solution of glue, for deep shades for instance, 1 part glue and 6 parts water or 1 part pure gelatin and 15 parts water. The goods are then printed with a print paste composed of the sulfid color, a reducing agent and formaldehyde, passed up to 5 minutes through the Mather & Platt steamer, and finished. The print paste has for instance the following composition:

	30-100 parts by weight of dyestuff
80	" " " " lye
40	" " " " soda
80	" " " " syrup
5	" " " " Turkey red oil
40	" " " " formaldehyde

brought to 1000 parts by weight by the addition of 50% solution of yellow dextrin. Finally, it is advisable to give the goods a passage through a hot liquor containing 2 lbs. glue and 4½ oz. bichromate of potash per 10 gallons liquor, and then to pass them through soap liquors.

If sulfid colors are to be printed alongside of ice colors, the goods are impregnated with 10 gallons of a solution containing 1 part glue in 6 parts water in which solution

are dissolved 3 lbs. beta naphthol, 5 lbs. caustic-soda lye 22 deg. Bé, and 1 gallon of a 25% water solution of castor oil soap.

The rapid dyeing of sulfid colors by the new method is carried out for instance in combination with a reserve method in the following manner: The pieces are prepared on a hot flue with a solution of 8 lbs. gelatin or 20 lbs. glue in 10 gallons water to which have been added 2½ lbs. formaldehyde 40%, and then printed with the reserves. The goods printed in this manner are dyed in the padding machine in one passage lasting from 3 to 5 seconds; the goods are then developed by an air passage and finally passed through hot diluted hydrochloric acid, and soaped. It may be an advantage sometimes to pass the goods after the air passage through a covered vat heated by the introduction of live steam.

If ice color reserves are to be printed on, 3 lbs. beta naphthol, 5 lbs. caustic-soda lye 22 deg. Bé and 1 gallon of a 25% water solution of castor oil soap are to be added to the glue-formaldehyde solution prepared in the manner described before. In this case it is an advantage to give the goods a passage through the Mather & Platt after the dyeing, or to prepare the goods first with a glue-formaldehyde solution, then with a common naphtholate solution, and then dye in the padding machine, as before stated.

The dye-liquor may be of a similar composition as the print color, for instance:

30 to 100 parts by weight of dyestuff	
80 " " " " lye	90
40 " " " " soda	
80 " " " " syrup	
5 " " " " Turkey red oil	
50 parts by weight of dextrin dissolved in 50 parts by weight of water, and if necessary, 40 parts by weight of sodium sulfid brought to 1000 parts by weight with water.	95

According to the method described in German Patent No. 200298, fabrics are treated with colloids, for instance starch thickening, for the sole purpose of assisting the fixing of the reserves in a mechanical manner. In this case colloids are applied with a finish, but it is neither intended to fix the sulfid colors more rapidly or in a better manner, nor is this effect produced, because the colloids must for this purpose

be precipitated on the fiber, and because the finish easily separates from the fiber.

In German Patent No. 106958 a method for weighting silk by a treatment with glue and formaldehyde is described, but from this patent application it cannot be deduced that the sulfid colors have a better affinity for silk prepared in this manner than for ordinary, prepared silk. It is further mentioned on page 61 of "*Lehne's Faerber-Zeitung*" 1906 that fabrics are mordanted with casein and formaldehyde in order to allow of fast dyeings being produced on such goods by means of acid or basic colors. Sulfid colors are, however, not mentioned in this publication, and from the afore-stated details it could not be concluded that such a preparatory treatment could be of any advantage to sulfid colors, because this preparatory treatment is used as a mordant for the acid and basic dyestuffs which have no affinity for the unmordanted cotton fiber, whereas sulfid colors require no mordant for dyeing on cotton, the preparatory treatment serving in the case of the before cited application only as

a means to accelerate the exhaustion of the dyestuff.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A process for fixing sulfid colors in dyeing and printing by means of animal colloids, said process consisting in impregnating the fiber with a solution of an animal colloid, and dyeing or printing with sulfid colors together with a fixing agent of the colloid.

2. A process for fixing sulfid colors in dyeing and printing by means of animal colloids, said process consisting in impregnating the fiber with a solution of an animal colloid, precipitating the same on the fiber, and dyeing or printing with sulfid colors.

In witness whereof I have hereunto signed my name this 26 day of July 1909, in the presence of two subscribing witnesses.

LUDWIG LICHTENSTEIN.

Witnesses:

JOHANN ZEIDLER,
JULIUS CATZKER.