

UNITED STATES PATENT OFFICE.

EMIL KNOEVENAGEL, OF HEIDELBERG, GERMANY.

PROCESS OF DYEING ACETYL-CELLULOSE.

979,966.

Specification of Letters Patent. Patented Dec. 27, 1910.

No Drawing.

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To all whom it may concern:

Be it known that I, EMIL KNOEVENAGEL, professor of chemistry, a subject of the German Emperor, residing at Heidelberg, in the Grand Duchy of Baden, Germany, have invented certain new and useful Improvements in Processes of Dyeing Acetyl-Cellulose, of which the following is a specification.

Acetyl-cellulose, being more or less water-repellent, cannot be dyed at all or only very feebly by the ordinary processes of dyeing in aqueous solution. I have discovered, however, that acetyl-cellulose and products such as filaments made from the same are capable of absorbing a great variety of phenols and derivatives of these compounds, and that acetyl-cellulose abstracts these substances even from dilute aqueous solutions. In this manner it is possible, to produce in acetyl-cellulose, in the presence of water, solutions of phenols, even of those, which are very sparingly soluble in water, and to utilize these solid solutions for the production of coloring matter on the fiber or filament in the known manner. For instance, the solid solutions of phenols in acetyl-cellulose may be utilized for producing coloring matters on the fiber by coupling with aqueous solutions of diazonium-salts.

In the process of dissolving phenols in acetyl-cellulose I may transform or decompose salts of the phenols by means of the equivalent quantity of bases or acids, or I may promote the liberation of the phenols by the presence of suitable bases or acids in such a manner that said phenols are simultaneously absorbed by the acetyl-cellulose.

In some cases the absorption of the phenols by acetyl-cellulose takes place directly from the solutions of their salts, but as a rule the absorption is facilitated by previously liberating the phenol from its salts, as mentioned above.

Salts of coloring matters are frequently

absorbed by the acetyl-cellulose more easily in the presence of ammonia, in case we are dealing with salts of bases, and in the presence of acetic acid, etc., if salts of acids are dealt with, than would be the case with the salts alone.

The following examples will serve to explain the process:—

1. *Impregnation with beta naphthol.*—Filaments of acetyl-cellulose were impregnated for half-an hour at the temperature of a water bath in about a 0.5% solution of beta-naphthol and briefly rinsed with water.

1^a. Filaments treated according to 1 were coupled in about a 1.5% of p-nitranilin hydrochlorid solution, which had been diazotized and mixed with sodium acetate. Nitranilin red was formed on the fiber.

1^b. In filaments treated according to 1 alpha-naphthylamin bordeaux was produced on the fiber by means of alpha-naphthylamin similarly to 1^a.

2. *Impregnation with p-aminophenol.*—Acetyl-cellulose was impregnated with about a 0.5% aqueous solution of p-aminophenol at water bath temperature for about 10 minutes. By diazotizing and coupling with faintly alkaline pyrogallol solution azochromin was produced.

What I claim is:—

The improvement in the art of dyeing acetyl-cellulose, which consists in treating the acetyl-cellulose with a phenol in aqueous solution, then rinsing it with water and then dyeing it in the dye-bath, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

EMIL KNOEVENAGEL.

Witnesses:

WALTER WEBER,
HERMANN TAEGER.