

UNITED STATES PATENT OFFICE.

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PROCESS OF DYEING CELLULOSE ACETATES.

No Drawing.

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To all whom it may concern:

Be it known that I, RENÉ CLAVEL, a citizen of the Swiss Republic, of Basel, Switzerland, have invented a certain new and useful Improved Process of Dyeing Cellulose Acetates, of which the following is a specification.

In the specification of a previous United States Patent No. 1,378,443, I have described a process according to which cellulose acetates in artificial silk, film or other form can be dyed with acid, basic or direct dyestuffs, in presence of relatively large quantities of one or more water-soluble chlorides such as zinc chloride, stannous chloride, magnesium chloride, ammonium chloride, etc., and of acids, preferably organic, such as formic acid or acetic acid, etc., one or more protective colloids being preferably added, such for example as gelatine, gelatine soaps, albumen, boiled off liquor, tannates or saponified or sulphonated fatty acids.

It has been proposed in U. S. patent specification 979,966 to produce azo dyes on cellulose acetate goods by development on the fibre or material, and according to one example of the said specification the employment of sodium acetate was suggested to facilitate the absorption of the base by the material.

It has now been found that advantages and improved results can be obtained in the dyeing of cellulose acetates with the developing dyes or so-called ice colours by employing in the base baths or the developer baths, or in both kinds of bath a relatively large quantity of a water-soluble chloride or water-soluble chlorides such as referred to, together with protective colloid.

The protective colloids such as gelatine, gelatine soaps, soaps, boiled-off liquor and so forth, are especially of advantage in cases where the bases or the developers are employed in the neutral or alkaline condition. As is known, many bases and developers cannot be employed either neutral or alkaline, because precipitation occurs.

By the employment of the protective colloids, precipitations or separations are prevented and the bodies in question can be reliably maintained in suspension. Moreover, the protective colloids enable the bases, and developers to be taken up regularly by the fibre. Also it is possible with the aid of the protective colloids to limit the alkalinity considerably in cases where alkalinity was necessary according to the customary process.

The water-soluble chlorides (which may be employed singly or more than one together) may consist by way of example of the chlorides of magnesium or calcium. Chloride of magnesium in particular may be used with advantage by reason of its low molecular weight and cheapness.

Example.

1 kg. of cellulose acetate artificial silk to be dyed black is treated for $\frac{1}{2}$ - $\frac{3}{4}$ hour in a vessel with 20-25 litres of a bath containing 20 gms. of dianisidine hydrochloride, 40 gms. magnesium chloride, and 40 gms. of sodium bicarbonate. The goods are washed once with soft water and once with hard water and are then brought into a diazotizing bath of the same volume of liquid as the first bath, this diazotizing bath containing 50 gms. sodium nitrite and 200 cc. concentrated hydrochloric acid, and are vigorously moved in same for about half an hour at 15° C. The succeeding developing bath consists of 20 gms. naphthylamine chlorhydrate and 8 gms. sodium bicarbonate. The goods are treated in the developing bath for one hour, then washed for a short time, and then introduced into the second diazotizing bath, which is of the same composition as the first diazotizing bath. The goods then receive one washing in soft water and one in hard water. Then follows a second weakly alkaline developing bath, consisting of 20 litres of water, 5 litres boiled-off liquor, 30 gms. of amino naphthol and 5% magnesium chloride, all calculated on the weight of the goods. The

goods are developed to full black in this bath in about an hour. Then follow one washing in soft water, one in hard water, one in hot soap at 60° C., and finally one brightening bath.

What I claim and desire to secure by Letters Patent is:—

1. Process of dyeing cellulose acetates in artificial silk, film or other form, with developing dyes, comprising applying at least one of the components to be coupled in

presence of soluble chloride and protective colloid.

2. Process of dyeing cellulose acetates in artificial silk, film or other form, with developing dyes, comprising applying both base and developer in presence of soluble chloride and protective colloid.

In testimony whereof I have hereunto subscribed my name.

DR. RENÉ CLAVEL.