

UNITED STATES PATENT OFFICE.

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PROCESS OF DYEING.

SPECIFICATION forming part of Letters Patent No. 523,560, dated July 24, 1894.

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To all whom it may concern:

Be it known that we, MARTIN E. WALDSTEIN, of the city, county, and State of New York, and ARNOLD H. PETER, of Newark, county of Essex, and State of New Jersey, have invented a new and useful Improvement in Processes of Dyeing, of which the following is a specification.

Our invention relates especially to that class of dyeing in which stannic acid or oxid is used.

In describing our invention we shall hereinafter use the words "stannic acid" but we wish to be understood to mean by those words "stannic acid or oxid."

Stannic acid is largely used in dyeing and a common mode is to use it in the form of tetrachlorid of tin to cause the stannic acid to fasten on or in the fiber being dyed. The stannic acid thus retained by the fiber in time renders the fiber brittle and rotten; and it becomes to a greater or less extent destroyed and unfit for use.

The injurious action of the stannic acid on the fiber we have found can be entirely overcome by treating the fiber, subjected to this stannic acid process of dyeing, with a chemical which will combine with the stannic acid in such a manner as to form an insoluble or sparingly soluble salt, whereby all the benefits of the stannic acid process are preserved while the injurious action does not occur. The chemical which we use to thus neutralize as it were, the stannic acid is, what is known as an oxid of a metal in one of the following forms: first, as a soluble salt of an organic acid; second, as a soluble salt of an inorganic acid in an alkaline solution; third, as oxid or hydroxide in a basic state; fourth, as a double salt.

It should be clearly understood that our process is carried out in the stannic acid process of dyeing which is carried on in the usual way, our process being a separate step and having as above explained in view the object of neutralizing the injurious effects of such stannic acid process on fiber subjected thereto.

One way in which our invention can be carried out, and which we have found highly satisfactory, is the following: After passing the fiber through the tin salts which are used for this purpose, the fiber is then passed through a bath (constituting our improve-

ment in this process of dyeing) which said bath is composed of a soluble salt of barium, made alkaline, preferably by ammonia; or through a bath composed of acetate of lead.

Of course it is understood that the ammoniacal solution of barium or the solution of organic salt of lead, just spoken of, are only illustrative of our process. Any other salts, coming within the description heretofore given can be substituted for those named in this paragraph.

It is well known that some metals form with stannic acid soluble salts. Of course our invention does not relate to those and we desire to be understood as including only the metals which will combine with stannic acid forming only insoluble or very sparingly soluble salts.

The quantity of the oxid of the metal used in preparing this neutralizing bath is immaterial, because the action taking place, when the fiber which has been treated by the stannic acid process is submitted to this bath, is a true combination, and the fiber will only take up enough of the neutralizing chemical to effect the change in the stannic acid above spoken of. It is therefore only necessary to see that there is enough of the neutralizing chemical in the bath.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The process of treating fiber consisting in immersing it in a suitable stannic acid solution; and then subjecting it to the action of a metallic oxid which will form with stannic acid a salt insoluble or sparingly soluble in water, alkaline or acid solutions such as lead acetate, and then dyeing the same, substantially as described.

2. The process of treating fiber which consists in first immersing it in a suitable stannic acid bath, and in then subjecting it to the action of acetate of lead, and in then dyeing the same, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

MARTIN E. WALDSTEIN.
ARNOLD H. PETER.

Witnesses:

ANTHONY GREF,
WM. A. POLLOCK.