

UNITED STATES PATENT OFFICE.

JOHANNES C. BOOT, OF NEW YORK, N. Y.

PROCESS OF DYEING HAIR.

SPECIFICATION forming part of Letters Patent No. 629,231, dated July 18, 1899.

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To all whom it may concern:

Be it known that I, JOHANNES C. BOOT, a citizen of the Kingdom of the Netherlands, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Processes of Dyeing Hair, of which the following is a specification.

The invention relates to improvements in processes of dyeing hair, whether human hair or hair of furs, in such a manner that a permanent dye is imparted to the hair without exerting any injurious effect on the same or irritation of the skin.

The nature of my invention consists, first, in the process of dyeing human hair or the hair of furs by treating it with a solution of a nickel salt, an organic oxy-acid, and an alkaline hydrate, and then with a suitable mordant.

The invention consists, secondly, of a dye solution composed of a solution of nickel salt, an organic oxy-acid, and an alkaline hydrate.

In preparing my improved dye solution a soluble salt or compound of nickel is used, nitrate of nickel being preferred. The nickel salt is dissolved in water, then tartaric acid or any other organic oxy-acid of the formula $AAA(OH)_n(COOH)_m$, such as malic or citric acid, added to the solution, and then an alkaline hydrate, such as sodium or potassium hydrate. The oxy-acid prevents the precipitation of the nickel salt by the sodium or potassium hydrate.

In place of tartaric or other oxy-acid the soluble salts of these acids may be used, such as sodium tartrate or potassium citrate.

To prepare my improved dye solution, the soluble nickel salt is obtained by dissolving nickel in a suitable acid and adding water or other solvent until the salt is dissolved and the solution brought to the required strength. Tartaric acid or tartrate of sodium or potassium is then added in such quantities as is necessary for preventing the precipitation of nickel. Sodium or potassium hydrate is then added to the solution in such a quantity as may be necessary to form an alkaline solution of the nickel salt. The proportion of nickel varies according to the intensity of the color to be produced; but the following proportions have given good results—namely, a solution of one part of nickel nitrate and two

parts of sodium tartrate in five parts of water or other suitable solvent, to which one part of a ten-per-cent. solution of sodium hydrate is added. The mixture is permitted to stand for some time and is then decanted or filtered.

After the dye solution is applied to the hair it is fixed by a mordant, such as pyrogallie acid or hydro-quinone. The mordant fixes the dye solution on the hair and brings out the color. It consists, preferably, of a solution of one part pyrogallie acid in forty parts of water. When applying the dye solution, the hair is first carefully cleaned with a soda solution, after which the dye solution is applied by carefully moistening the hair with the same, and after drying the mordant is applied. In most cases thirty-six hours will be sufficient to carry out the process of dyeing the hair. The excess of dye is then washed from the hair with soap and water. When a darker color is desired, the dyeing operation has to be repeated until finally a bright brown color of lighter or darker shade is obtained. By diluting the dye solution and the mordant liquids are obtained by which various shades of color can be imparted to the hair or fur, according to the strength of the solution used and the number of applications made to the hair.

I am aware that solutions of nickel salts have been used before for dyeing hair. I am also aware that the use of a mordant for fixing the dye solution on the hair is well known, and I do not lay any claim to these steps broadly; but I am not aware that a dye solution composed of a soluble nickel salt, an organic oxy-acid or a salt of the same, and sodium or potassium hydrate has ever been used heretofore for this purpose. This solution being alkaline and containing tartaric acid has the advantage of remaining stable for any length of time without precipitating any portion of the nickel contained therein. As the dye solution is not volatile, it has the further advantage that it will dye the hair uniformly whether the same contains some greasy matter or not, which heretofore prevented the application of the dye, so that the dyeing was accomplished only in part or in so-called "specks." The main advantage of my dye solution, however, consists in the permanency of the same and its non-liability to decompo-

sition and deterioration, by which its original strength is retained, so that it can be used at any time. Furthermore, it is not in the least injurious to the hair or scalp.

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

The process herein described of dyeing human or other hair, which consists, first, in
10 treating it with a solution of a nickel salt,

an organic oxy-acid, and an alkaline hydrate, and then with a suitable mordant, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

JOHANNES C. BOOT.

Witnesses:

PAUL GOEPEL,

GEO. W. JAEKEL.