

# UNITED STATES PATENT OFFICE.

LOUIS MEUNIER, OF LYON, FRANCE.

TREATMENT OF ANIMAL SUBSTANCES SUCH AS WOOL, SILK, OR HAIR.

998,370.

Specification of Letters Patent.

Patented July 18, 1911.

No Drawing.

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*To all whom it may concern:*

Be it known that I, LOUIS MEUNIER, a citizen of the French Republic, residing at Lyon, in France, have invented certain new and useful Improvements in the Treatment of Animal Substances such as Wool, Silk, or Hair, of which the following is a specification.

This invention relates to processes of treating animal textile fibers; and it comprises a process of treating animal textile fibers, such as wool, silk and hair, and the fabrics made therefrom or therewith with the products of the direct oxidation of phenols, such as the quinones, for the purpose of increasing their tensile strength and resistance to decay, heat, water and chemical agents; all as more fully hereinafter set forth and as claimed.

It is well known that the textile fibers, such as wool, silk and hair are subject to decay and chemical changes in time when moist, as, for example, when they are kept for long periods in contact with water or many aqueous solutions. For example, the felts used in paper-making are rapidly deteriorated by the tension to which they are submitted and by the action of water, heat and the chemical used in the manufacture of paper.

In the present invention I have devised a simple and ready method of increasing the tensile strength and the chemical resistance of fibers of this nature, and of the fabrics and threads made from or with such fibers, which embraces a treatment with the products of oxidation of the phenols, and more particularly with the oxidation products having a quinone structure, such as ordinary quinone. Experiment has shown that in treatment of such fibers with aqueous solutions of phenols, either neutral or acid, under exclusion of air or oxidizing influences, the fibers do not undergo any change useful for the present purposes; but if the treatment be conducted under oxidizing conditions the fibers are changed, taking on a coloration and becoming much more resistant to the action of water and chemicals. And if in lieu of treatment with phenols undergoing oxidation, the treatment be directly with preformed oxidation products, and particularly with products having a quinone structure, a much more rapid and

advantageous change is effected. Direct oxidation of phenols of the hydroquinone type gives quinones.

As a typical embodiment of the present process may be described the treatment of wool felts, such as are used in paper making, by ordinary quinone (benzoquinone). The felt is first thoroughly impregnated with water, which may be done by soaking it for, say, half an hour, and is then hung in a vat containing cold water to which is added ordinary quinone. The amount of quinone used may be about one per cent. of the weight of the felt and the total quantity may be added in successive small portions. It should be first dissolved in water. In this bath the felt is left immersed for 24 to 48 hours, according to its thickness. At the end of this time it is removed from the bath and allowed to dry. It then takes a violet-rose color. It may be incidentally noted that felt, and animal fibers generally, treated in this manner have an increased affinity for coloring matters and dye much more readily; so that after treatment they may be dyed if desirable. Instead of using the quinone in water solution, as in the preceding instance, advantage may be taken of the volatile nature of the simpler quinones, such as ordinary quinone. For this purpose woolen thread, etc., may be suspended in a closed chamber provided with means for volatilizing the quinone. There may be pans in the lower part of the chamber containing quinone and adapted to be heated by hot air at, say, about 40° C. The quinone is readily volatilized and acts directly on the wool, first coloring it a rose color, and thoroughly penetrating the thread or fiber. When the color becomes a violet-rose, the threads or the like are removed from the chamber and are left exposed to the air for a few days in order that the assimilation of the quinone and the reactions involved may go to completion. The process is also applicable to the treatment of silk and hair, either in a raw state or in the form of manufactured articles, such as silk cloth, camel hair bands or belts, felts and the like. Any of these fibers or materials when treated by the present process acquire an increased tenacity and elasticity and display a greater resistance to water and chemical agents. They also dis-



play an increased affinity for coloring matters.

Instead of using the preformed oxidation products such as quinones, the materials  
5 may be exposed to the action of phenols under conditions favorable to their oxidation. But, as stated, the use of the quinones is more advantageous.

What I claim is:—

10 1. The process of treating animal textile fiber which comprises subjecting such fiber to the action of the oxidation products of a phenol.

2. The process of treating animal textile  
15 fiber which comprises subjecting such fiber to the action of the oxidation products of a phenol of the hydroquinone type.

3. The process of treating animal textile

fiber which comprises subjecting such fiber to the action of a quinone.

4. The process of treating animal textile fiber which comprises subjecting such fiber to the action of benzoquinone.

5. The process of treating animal textile fiber which comprises subjecting such fiber to the action of a quinone in vapor form.

6. The process of treating animal textile fiber which comprises subjecting such fiber to the action of benzoquinone in vapor form.

In witness whereof I have signed this specification in the presence of two witnesses.

LOUIS MEUNIER.

Witnesses:

GASTON JEAUNIAUX,  
THOMAS N. BROWNE.