UNITED STATES PATENT OFFICE.

EDMUND TWEEDY, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO EMMA R. TWEEDY, OF NEW YORK, N. Y., AND ONE-HALF TO MATTEAWAN MANUFACTURING COMPANY, A CORPORATION OF NEW YORK.

ART OF PREPARING FUR FOR FELTING.

1,085,391. Specification of Letters Patent. Patented Jan. 27, 1914.

No Drawing. Application filed February 16, 1912, Serial No. 678,025. Renewed July 5, 1913. Serial No. 777,498.

To all whom it may concern:

Be it known that I, EDMUND TWEEDY, a citizen of the United States, of 25 Broad street, New York, county of New York, and State of New York, have invented certain new and useful Improvements in the Art of Preparing Fur for Felting, fully described and represented in the following specification.

My invention relates to the treatment of fur by means of ozone, in order to prepare it for felting; and the object of the invention is to substitute for the poisonous agent commonly used (nitrate of mercury) an agent that shall be economical and effective in disposing the fur-fibers to felt strongly together and have no injurious effect upon either the fibers themselves or upon the workmen employed in such treatment and in the subsequent felting of the fur. I have discovered such an agent in ozone which, when brought into contact with the fur in a suitable manner, at a proper degree of concentration, and for a sufficient length of time, will put it into superior condition for felting, without any of the injurious effects which result from nitrate of mercury treatment. It is well known that fur in its natural condition, with possibly some rare exceptions, will not felt to any satisfactory degree, and before it will do so it is necessary to subject it to the preliminary operation technically known as the "carroting" process. This process, as it has been practised immemorially, consists in applying to the fur while on the skin a solution of nitrate of mercury, by means of a brush, by which it is rubbed thoroughly into the mass of fibers. The fur is then dried, either at normal temperatures or by artificial heat, and is then cut from the skin. Fur so treated will felt readily. There are many objections to this process, the principal one being that the mercury contained in the solution has a very injurious effect upon the workmen employed in applying it to the fur, and upon those who cut it from the skin, and also upon those who manufacture it into hats. The solution also harshens or roughens the fur-fibers, so that the smoothness and satiny feel of the felt made from them are impaired. It also diminishes the strength and elasticity of the felted fibers. It discolors the fur, particularly when dried by artificial heat, and thus affects its susceptibility to delicate shades of color.

The rubbing necessary to work the solution into the mass of fibers causes many of them to become matted together, so that they cannot be separated in the operation of blowing, and thus are formed into the hat-bodies and become what are known as "carrot dags" in the finished hats, which are a source of great annoyance and loss to the hat manufacturer.

Fur-fibers which are used in felting are protected throughout nearly their entire length by scales overlapping one another, which grow out of the walls of the fiber, with their roots toward the butt or base ends of the fiber. In the operation of felting, these scales cause the fibers to travel butt or base-end foremost. The outer surfaces of the fibers are coated by some kind of material, probably animal grease, which is water repellent. Before fur can felt to any satisfactory degree, the outer ends of the scales must be released from their confinement under this water repellent covering, and this is the function of the carrot, which oxidizes it and produces such a chemical change in it that it becomes soluble in the hot water and is washed away.

My invention provides an oxidizing agent that will oxidize the water-repellent covering of the fur fibers, and make it soluble in the hot water used in the felting operation; and free from any injurious qualities after the treatment with ozone.

In the preferred method of carrying out my invention, I hang the skins with the fur upon them in a chamber, or, if cut fur is to be treated, I place it upon trays in such chamber, such trays being preferably provided with sieved bottoms, and in such chamber I also place an electrical ozone generator of suitable capacity which is connected with a source of electricity. I then turn the electric current upon the generator and close the chamber so as to confine the ozone generated therein. By the action of the generator, a portion of the oxygen of the air confined in the chamber is converted into ozone, which being a very powerful oxidizer, particularly of organic substances, attacks the fur and oxidizes the water repellent covering of the fibers. The molecule of ozone

(O_3) is composed of three atoms of oxygen. In the presence of oxidizable matter, like fur, the gas, being very unstable, readily decomposes into oxygen (O_2), while the third atom forms a compound with the oxidizable substance present. This treatment is continued until the desired effect is produced upon the fur, when the current is turned off from the generator, the chamber opened, and the fur removed. Thus I have found in practice that by subjecting the furs usually employed in the manufacture of hats to the action of thirty grams of ozone per pound of fur treated, they make excellent felts. The yield of the ozone generator for any given length of time being known, it is very easy to determine when the required amount has been generated.

For reasons of efficiency and economy, I prefer to treat the fur with the ozone in an inclosed chamber in which the generator is also placed, but it is not necessary that either the fur or the generator should be so confined. The essential requirement is to bring the ozone into contact with the fur, and this may be done in any convenient manner.

While I find it preferable to generate ozone by electrical means, I do not confine myself to the use of ozone so generated, the primary and essential feature of my invention being the oxidation of fur by means of ozone, however produced.

I hereby disclaim the use of chemical fumes, as such fumes produce injurious results which are avoided by the use of ozone.

Having thus set forth the nature of the invention what is claimed herein is:

1. The method of preparing fur to render it feltable, which consists in subjecting the same to the action of ozone, and carroting the fur thereby.

2. The method of preparing fur to make it feltable, which consists in placing the fur in a receptacle and subjecting it therein to the action of ozone, and carroting the fur thereby.

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

EDMUND TWEEDY.

Witnesses:
L. Lee,
Thos. S. Crane.