

UNITED STATES PATENT OFFICE.

GIDEON HAMILTON, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN THE TREATMENT OF ANIMAL HAIR.

Specification forming part of Letters Patent No. **220,533**, dated October 14, 1879; application filed August 22, 1879.

To all whom it may concern:

Be it known that I, GIDEON HAMILTON, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in the Treatment of Animal Hair, of which the following is a specification.

It is the object of my invention to obtain from coarse animal hair a product which can be spun or woven, and which possesses, in a greater or less degree, the felting properties characteristic of wool or fur, and also possessing, in a greater or less degree, the curl and spring suitable for and adapted to upholstering purposes, thus furnishing a new and cheap substitute for wools and furs in various manufactures in which they are used alone or together or mixed with other fibers, and a new and cheap material useful for mattresses and other upholstery, thereby extending the economical use of a fiber to which improved textile, felting, and other useful properties have been imparted to many branches of the arts in which the cost of wools or furs would be restrictive or prohibitory; and this object I accomplish by subjecting to the novel process hereinafter described the raw material mentioned, to wit, coarse animal hair, which, in its normal or commercial condition, does not possess these improved properties.

I have discovered, and by a series of experiments have demonstrated, that the coarse hair which forms the coats of certain animals—to wit, the hair of cows, calves, bulls, oxen, horses, and goats, which, either in its ordinary or in its commercial condition, does not possess the characteristics of the finer animal fibers which are classed as furs or wools—can, by a certain chemical treatment, have such characteristics imparted to it to such an extent as to make it amenable to the same treatment as wools or furs, and to render it available for uses similar to those which heretofore have been peculiar to wools or furs—that is to say, such animal hair by said treatment is refined and softened, is made lustrous and waved, curled, crimped or twisted, to a greater or less degree, according to the particular purpose for which it is intended to be used, and rendered capable of being felted, spun, woven, carded, and formed into bats or wadding.

As well as I can determine, some of the qualities imparted by this chemical treatment are derived from a change which takes place in the fibers, and which either consists of the development on the exterior of said fibers of serrations or imbrications, like those peculiar to wools or furs, or else imparts to the treated fiber some equivalent irregularity (not incident to their natural state) which makes them susceptible of substantially the same felting, spinning, and weaving processes to which wools or furs are subjected.

In addition to this change in its surface, the fiber derives from the process a spiral, wavy, curly, or twisted form. The treatment also rids the fiber of its coarse, harsh, stiff, horny, dull, unyielding, and straight character, and gives it fineness, flexibility, softness, and luster.

Upon this discovery I have based my invention, which I now proceed to describe. I take carbolic acid of commercial strength, and make therewith, in a suitable vessel, a solution consisting of five parts of said acid and one hundred parts of water by volume. This solution I raise to a boiling temperature, and then immerse therein animal hair, of the kind hereinbefore specified, in the condition in which it is found on sale, (or, if it is unduly loaded with foreign matters, I previously open it out, and wash it with water to remove said foreign matters,) and boil the hair in said solution for from two to three hours; at the end of which time I remove it from the solution and plunge it in a bath of cold water made slightly alkaline by an infusion of sal-soda, caustic alkali, bicarbonate of soda or borax. This alkaline solution should be weak—for example say, when caustic soda is used, of a strength of from one-quarter of one degree to one degree Baumé's hydrometer. The hair, after being immersed in this alkaline solution, is removed and allowed to dry slowly in the air.

Instead of the above-described bath of carbolic acid, I use, as an equivalent thereof, two and one-half parts of commercial nitric acid to one hundred parts of water by volume, and in this case boil the hair in said bath for from one hour to an hour and a half, and then remove it to an alkaline solution, as above described.

Again I use as an equivalent for the carbolic-acid bath, or for the nitric-acid bath above described, a bath composed of from half a pound to two pounds of nitrate of copper to each gallon of water, bring it to a boil, immerse the hair in it, and boil it therein for about three hours; then remove it to the alkaline bath, as before mentioned.

From the above examples it will be seen that the stronger the bath in which the hair is boiled the shorter the time during which the hair is subjected to the boiling operation therein.

My improved process consists essentially in boiling the hair in an acid bath such as is

described, and then washing it in a cold alkaline bath, substantially such as described.

Having thus described the nature and object of my improvement, what I claim herein as new, and desire to secure by Letters Patent, is—

The hereinbefore-described process of treating animal hair, such as hereinbefore specified, by boiling it in an acid solution, and then immersing it in an alkaline solution, substantially as and for the purposes described.

GIDEON HAMILTON.

Witnesses:

WESLEY W. HAMILTON,
CHAS. L. COHN.