UNITED STATES PATENT OFFICE.

THOMAS BARROWS, OF DEDHAM, MASSACHUSETTS.

IMPROVEMENT IN PROCESSES FOR TREATING WOOL.

Specification forming part of Letters Patent No. **13,206,** dated July 10, 1855.

To all whom it may concern:

Be it known that I, THOMAS BARROWS, of Dedham, in the county of Norfolk and State of Massachusetts, have made a new and useful invention or improvement whereby wool may be not only cleansed, softened, and prepared in an improved manner for perfecting the finish of wool goods, but enabled to take dyes uniformly and to great advantage; and I do hereby declare that the same is hereinafter fully described.

After wool has been cleansed in the usual way by washing in warm brine, or soap and water or weak alkaline solutions, there remains at the points where the imbrications of the fibers are most close a certain portion of grease or "yolk," combined with an earthy base, which neither of the agents above named will remove, and this substance, usually passing all the operations of manufacturing and dyeing, can be found in the finished cloths, preventing the softness of carefully-purified wool from being observable in them. The locks of the wool and portions of every fleece, from the adhesion of manure or other causes, present curled and yellow ends, called "dead wool," which do not readily receive dyes—a fact which is more especially evident in dyeing with indigo. The most carefully-cleansed wool of any fleece takes under the same conditions of treatment various shades of color, some portions even remaining nearly white.

It has been the general impression among wool-manufacturers that the parts of the fleece which have thus become dead wool were oxidized and changed in a manner preventing them from being restored to their former condition or natural state. I find from experiments made on many varieties of wool, both foreign and domestic, that the property of deadness and general injury is due to a reductive or hydrogenating effect, often the result of putrefactive fermentation, and that by proper oxidizing agents the natural condition can be restored.

Having thus premised, I will proceed to detail the steps of a method by which wool can be rendered much softer than usual and prepared to receive dyes quite uniformly throughout the fleece.

Two hundred pounds of sorted fleece-wool, having been cleansed, will when dried weigh about one hundred and fifty pounds. In cases where the wool loses less weight in the scouring operation I have regard to this loss in proportioning the quantity of the oxidizing agent employed, using so much more of the latter as will make it equal for a given weight of clean, dry wool. The wet wool resulting from two hundred pounds of fleece-wool which has been scoured by brine or soap, or in any ordinary manner, is to be passed after a careful rinsing into a bath prepared as follows: In a scouring-tub of wood, fitted, as usual, for heating by steam and containing so much water as will cover the wool, I dissolve six pounds of saltpeter, nitrate of soda, chlorate of potash, or other oxidizing salt—such as nitrate of ammonia or an equivalent—which will cause the deoxidized wool to receive oxygen in the air, raising the temperature of the bath to 150° or 160° Fahrenheit. Into this bath the rinsed wool from two hundred pounds of fleece-wool is passed, and, with occasional moving by the "pole," is allowed to repose thirty or forty minutes. It is next to be removed to the extractor, when the water is expelled, and afterward dried as usual. Successive parcels, each resulting from two hundred pounds of fleece-wool, are thus to be passed through the oxidizing-bath, an addition of two pounds of the saltpeter or other oxidizing-salt being made before each parcel of wool is placed in it. Very bad wool, or that containing much dead wool, requires longer time in the bath, practice enabling any one to apportion time to quality. The effect of this bath of a hot solution of saltpeter is to produce a decomposition of the earthy soap existing in the closest interstices between the lapping of the scales or imbrications of the fibers, a soluble earthy salt being formed with the acid of the oxidizing-salt at the same time that the alkali of this salt unites to the organic acid of the soap or yolk to form another soluble or miscible salt, so that the matter is mostly removed. The saltpeter or other oxidizing-salt left in the wool, as it dries, also acts on any remaining portion of insoluble soap to render it soluble in subsequent operations, and experiments show the presence in the bath-liquor of the changed salts. Another effect of the oxidizing-bath explains why I use

oxidizing-salts instead of saline compounds of another class—such as sal-ammoniac—which will partially remove the earthy soap. It is a specific oxidizing or changing effect on the "hurls," "dead ends," or dead wool which is thus produced in the use of oxidizing-salts. The dead wool after treatment in the oxidizing-bath will take the dyes generally as well as the natural wool, and so well marked is this effect that I can produce it in the mordanting-bath, or even dye-bath, on wool which has not been treated in the oxidizing-bath; but prefer the use of the latter in all cases. The wool to be dyed need not be dried from the oxidizing-bath, it being sufficient to extract the water or allow the wool to drain over night.

What I claim as my invention or discovery is—

The application of niter or any of its equivalent salts, as set forth, to wool in a warm bath, for the purpose of restoring the wool when it has become changed, as well as for cleansing, softening, and preparing it so as to better adapt it to receive dyes and to be finished in fabrics.

In testimony whereof I have hereunto set my signature this 12th day of May, A. D. 1855.

THOMAS BARROWS.

Witnesses:
R. H. EDDY,
F. P. HALE, Jr.