

# UNITED STATES PATENT OFFICE.

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## TANNING PROCESS.

No. 804,450.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, JOHN CAMPBELL, a citizen of the United States, residing in the city of Chicago, county of Cook, and State of Illinois, have invented a new and useful Improvement in Tanning Processes, of which the following is a specification.

This invention relates to processes of tanning the hides of animals in the manufacture of leather; and the object of the invention is to improve the quality of the leather and at the same time reduce the period of time required to complete the process.

It is well known that tannic acid is a strong astringent and that when hides are immersed in a solution containing too great a proportion of it the pores at the surface of the hides will become closed to such an extent as to retard or even prevent the tanning liquor from gaining access to the interior parts of the hides. In the processes now in common use it is necessary to use at first a weak tanning liquor and to permit the hides to remain in the vats for a long period of time—for example, for a period ranging from two to four months—depending upon the thickness of hide and other conditions. I overcome this difficulty by immersing the hides in a liquor which contains nitrate of soda in addition to a vegetable tanning agent or agents, the effect of the nitrate of soda being to open the pores of the hide, and thereby permit the tanning liquor to readily penetrate into the innermost parts thereof.

In general my process consists in immersing a dehaired hide in a solution containing astringent vegetable tanning agents and nitrate of soda; but in order that my invention may be hereafter practiced without the necessity of experiment or risk of failure it may be stated that a typical example of the practicing of the process is as follows:

In tanning heavy hides I first immerse them in a rocker in a solution containing two and one-half pounds of tannic acid or its equivalent vegetable tanning agent and three and one-half pounds of nitrate of soda for every one hundred pounds of water. The hides are allowed to remain in the rocker for two days. Then they are removed and placed in the handlers, where a solution is obtained which contains five pounds of tannic acid and seven pounds of nitrate of soda per one hundred pounds of water. The hides are kept in the handlers for four days and are then placed in

a lay-away vat, where the strength of the tanning solution is increased to seven and one-half pounds of tannic acid per one hundred pounds of water, and the nitrate of soda is increased to ten pounds per one hundred pounds of water. The hides are permitted to remain in this solution for about twelve days, when they are transferred to another vat, where the solution contains ten and one-half pounds of tannic acid or its equivalent vegetable tanning agent to one hundred pounds of water and fifteen pounds of nitrate of soda per one hundred pounds of water. The hides should remain in this last vat for about twenty-four days, at the end of which time they will be completely tanned.

As the strength or specific gravity of the solution decreases by reason of the solid matter entering the hide, the deficiency should be supplied by introducing into the solution tannic acid and nitrate of soda in approximately equal proportions.

A greater number of lay-aways or soakings may be employed, if desired, with the time of soaking in each lay-away commensurately decreased.

Good results may be procured by taking hides which have been half tanned by the ordinary process and immersing them in a solution containing ten pounds of tannic acid and fifteen pounds of nitrate of soda per one hundred pounds of water. The hides should lie in this last-described solution for a period of about fifteen days. The large proportion of nitrate of soda will sufficiently open up the pores to permit the entrance thereto of the tannic acid.

The composition of the tanning liquor is not essential so long as it is derived from vegetable matter, for the nitrate of soda is operative in the presence of all of the forms of vegetable tanning liquor now ordinarily employed.

The percentage of nitrate of soda depends upon the strength of the tanning solution, and I employ just enough of such nitrate of soda to keep the hide well plumped and the pores thereof open in counteraction to the astringent tendencies of the tanning liquor. Inasmuch as the nitrate of soda maintains the pores in an open condition, a much stronger tanning liquor may be employed, and I have ascertained by experiment that leather may be produced by my process in a period of thirty days, which under ordinary



circumstances would require a period of three months or upward by the processes now in use.

5 It will thus be seen that my process comprises two operations which are concurrent and complementary in their nature, the nitrate of soda operating to hold the pores open against the tendency of the tanning agent to close them. It may be conceived that the re-  
10 sult of my process could be produced by operations not concurrent, but by immersing the hide first for a short period in a purely tanning solution and then for a short period in a sodium-nitrate solution and repeating  
15 the operations alternately many times; but it is preferable that both operations occur simultaneously, as much time and labor is thereby saved.

My process is not concerned with the de-hairing or so-called "beam-house" part of 20 the tanning process, but commences after the hair is removed from the hide.

Having thus described my invention, what I claim as new, and desire to secure by Letters 25 Patent, is—

1. The process of tanning hides consisting in soaking the hides in a water solution of a vegetable tanning agent and nitrate of soda.

2. The process of tanning hides consisting in soaking the hides in a vegetable tanning 30 solution to which is added nitrate of soda.

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Witnesses:

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