

UNITED STATES PATENT OFFICE.

OTTOKAR HENRY NOWAK, OF CHICAGO, ILLINOIS, ASSIGNOR TO DERMIFORMA COMPANY OF AMERICA, A CORPORATION OF ILLINOIS.

TANNING PROCESS.

996,509.

Specification of Letters Patent. Patented June 27, 1911.

No Drawing.

Application filed June 14, 1905. Serial No. 265,282.

To all whom it may concern:

Be it known that I, OTTOKAR HENRY NOWAK, a subject of the Emperor of Austria-Hungary, residing at Chicago, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Tanning Processes, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates in general to the manufacture of leather and more particularly to an improved process of preparing and tanning hides and skins.

The primary object of my invention is to provide a process for quickly converting hides and skins into leather which will not involve the use of mineral acids and which, consequently, will be free from the injurious effects of the present so-called "quick" process.

A further object of my invention is to provide a tanning process the practice of which will require comparatively little time, which will preserve the texture of the hides and skins, and which will result in a soft, firm, durable, and high quality of leather.

My invention generally described consists in employing in lieu of mineral or other acids during the process of tanning sour milk whey wherein bacteria have been developed and which has been caused to ferment for a sufficient period to convert at least 1% thereof into lactic acid. This fermented sour whey and the process of making the same forms the subject of a separate application which has matured into Patent No. 873,074, granted on the 10th day of December, 1907; and the present description will therefore be confined to the method of using it. This whey liquor may be employed in either or all of the operations of unliming, pickling or preserving, plumping, and tanning and filling, since it produces advantageous results in connection with any one of these operations even though it be not employed in the remaining operations which go to make up the complete process. However, the best results, both as to the speed and cost of the process and as to the character and quality of the product are obtained

when the whey is employed in each of the operations to which it is adapted, for the use of whey in an operation which is followed by another operation wherein whey is again used greatly expedites and cheapens the latter operation because of the freedom of the skin or hide from acids which will act detrimentally to the bacteria in the whey.

In the step of unliming hides and skins I have found that by using even a liquor containing but little of the aforesaid whey a very heavily limed hide or skin becomes so thoroughly saturated with the liquor in the space of a fraction of an hour that no trace of lime remains, while at the same time the hides and skins commence to plump without being injuriously affected.

In the step of pickling or preserving I have found that the aforesaid whey, when added to the salt liquor, not only helps to preserve but, even at this stage of the process, helps to open the pores of the hides and skins. I have also found that the step of plumping or swelling the hides or skins for holding the pores open to better receive the tanning liquor can be accomplished in a most satisfactory manner by using a liquor containing considerable of the aforesaid fermented sour whey in concentrated form, the plumping commencing instantly and progressing in several hours to a marked extent. By concentrated fermented sour whey I mean fermented sour whey produced in the manner heretofore specified from which some of the moisture has been evaporated so as to increase the density. This concentration may be effected in any suitable manner, preferably in the manner described in my aforesaid patent. The grain of the material becomes bright and rich, the gelatin is unaffected, and the exterior of the hide or skin remains plump or open for the reception of the tanning liquors. Moreover, the pores remain open and the plumpness is retained for a considerable period thereafter, so that the final step of tanning and filling can be accomplished successfully even though some time elapse between it and the plumping operation.

In the final step in converting hides and skins into leather, namely that of tanning and filling, a great improvement is effected

by adding to the tanning solution some of the aforesaid fermented sour whey, as the required bacterial life is produced in the tanning liquor, not only in bark tanning, but more noticeably in the so-called sweet liquor or extract tannage, comprising extracts of oak bark, hemlock, quebracho, chestnut, etc. No matter how strong the tanning liquor may be, the plump hides and skins are filled in a short time and a leather produced of mellow and unsurpassed quality. Heretofore it has been impossible, in using any concentrated tanning extracts, which in their preparation have been subjected to high temperatures, to obtain the desired bacterial action, on account of the bacteria having been destroyed by heat. By the addition of the aforesaid fermented sour whey, however, the desired bacterial action is produced in the tanning liquor and, furthermore, the sugar of milk in the whey forms an excellent food for the bacteria introduced into the tanning liquor by such addition of fermented sour whey.

An important advantage resulting from the use of said fermented sour whey, whether in concentrated or unconcentrated form, is that the sugar of milk contained in the whey enters the hides or skins, thereby not only preserving the weight of the hides and skins by leaving therein the gelatin, but increasing the same through the added sugar of milk. The practice of my improved process therefore obviates the necessity of treating the hides or skins with glucose to give the leather greater weight as is now the custom in the preparation of sole leather.

My invention may be utilized in various ways in tanning and may readily be adapted to the various processes of treating hides and skins in the manufacture of all kinds of leather, and I therefore do not wish to limit myself to any particular proportions of whey to be used in the various steps or operations of tanning processes. I have found, however, that in bating or unliming one pound of concentrated or 6 pounds of said whey in unconcentrated form added to approximately 1000 gallons of water, is sufficient for 100 pounds of raw hides or skins. Even larger quantities of whey will have no injurious effect and smaller quantities will also effect the desired result if given sufficient time. In the step of pickling or preserving approximately one-half pound of concentrated or three pounds of unconcentrated whey of the character heretofore specified may be used for 100 pounds of raw hides or skins in connection with the required amount of salt; the whey being preferably added to about 100 gallons of salt solution having a density of from 15 degrees to 16 degrees Baumé. For plumping or swelling the hides or skins, either 3 pounds of concentrated or 18 pounds of uncon-

trated whey produced in the manner heretofore specified may successfully be used, the whey being preferably added to approximately 2000 gallons of either natural sour tanning bark liquor or sweet extract liquor. However, the said whey may be used without water even when concentrated without injuring the hides or skins by deteriorating the grain or affecting the gelatin, and will accomplish the plumping very rapidly. In the tanning or filling step an addition of three pounds of concentrated or 18 pounds of the unconcentrated whey of the character heretofore specified in about 2000 gallons of tannic liquor is sufficient for the required fermentation, but a greater or less quantity may be used with excellent results.

I have found that the finest quality of leathers may quickly and cheaply be produced by employing the said whey in each of the several steps constituting the tanning processes. The use of the aforesaid whey in any step improves the tanning process and also the product but the finest product is obtained when the whey is used in all of the steps for the reason that there is in such case no need for employing any substance which will act injuriously to the gelatin in the hides or to the fiber of the hides. Furthermore when one of the steps is carried out in the old way and is followed by an operation wherein the said whey is employed, there is apt to be a retardation of the latter step due to the injurious effect upon the bacteria in the whey by substances which have been retained within the pores of the hides or skins from the previous step.

What I claim:

1. In the art of manufacturing leather, the step of treating the hide or skin with a substance derived from milk which has been caused to ferment until at least 1% thereof has been converted into acid calculated as lactic acid.

2. In the art of manufacturing leather, the step of treating the hide or skin with concentrated whey which has been caused to ferment until it contains at least 1% acidity calculated as lactic acid before concentration, mixed with a quantity of such whey in unconcentrated form.

3. In the art of tanning leather, the process of treating the hide or skin with tanning liquors to which have been added concentrated whey which has been caused to ferment until it contains at least 1% acidity calculated as lactic acid before concentration, together with a quantity of such whey in unconcentrated form.

4. In the art of manufacturing leather, the process of treating hides or skins with a substance derived from milk which has been caused to ferment until at least 1% thereof has been converted into acid calculated as lactic acid in order to unlime the

hide or skin; preserving the material in a
solution of salt liquor containing some of
said substance derived from milk; again
treating the hide or skin with said substance
5 derived from milk; and then treating the
hide or skin to a solution of tanning liquor
containing said substance derived from milk.

In testimony whereof, I sign this specifi-
cation in the presence of two witnesses.

OTTOKAR HENRY NOWAK.

Witnesses:

GEO. L. WILKINSON,
C. A. MULLEN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
