

# UNITED STATES PATENT OFFICE.

HUGO SCHWEITZER, OF ENGLEWOOD, NEW JERSEY.

## PROCESS OF TANNING.

SPECIFICATION forming part of Letters Patent No. 573,362, dated December 15, 1896.

Application filed January 27, 1896. Serial No. 577,052. (No specimens.)

*To all whom it may concern:*

Be it known that I, HUGO SCHWEITZER, of Englewood, in the county of Bergen and State of New Jersey, have invented a certain new and useful Improvement in Processes of Tanning, of which the following is a specification.

My invention consists in an improved process of tanning or tawing hides or skins by using first a bath of a chromate with an acid, such as hydrochloric acid, and then a bath containing hydroxylamin ( $\text{NH}_2\text{OH}$ ) or salts thereof, such as the hydrochloric-acid salt  $\text{NH}_2\text{OH} \cdot \text{HCl}$ , the sulfuric-acid salt  $(\text{NH}_2\text{OH})_2 \text{H}_2\text{SO}_4$ , or sulfo-acids of hydroxylamin and their salts, for example, hydroxylamin disulfo-

acid  $(\text{HO}-\text{N} \begin{smallmatrix} \text{SO}_3\text{H} \\ \text{SO}_3\text{H} \end{smallmatrix})$  or its potash salt  $(\text{HO}-\text{N} \begin{smallmatrix} \text{SO}_3\text{K} \\ \text{SO}_3\text{K} \end{smallmatrix})$  or mixtures of these bodies,

or using a bath containing crude hydroxylamin disulfo-acid and its salts, in the raw solution of which there are present small quantities of various nitrogen-sulfone acids, such

as nitrilosulfonic acid,  $(\text{N} \begin{smallmatrix} \text{SO}_3\text{H} \\ \text{SO}_3\text{H} \\ \text{SO}_3\text{H} \end{smallmatrix})$  imido-

sulfonic acid,  $(\text{NH} \begin{smallmatrix} \text{SO}_3\text{H} \\ \text{SO}_3\text{H} \end{smallmatrix})$  amidosulfonic acid,  $(\text{NH}_2-\text{SO}_3\text{H})$  (*Annalen der Chemie*, 241, pp. 161 to 252.)

To carry out my process practically I proceed as follows: I subject hides or skins to the well-known processes preceding the tawing or tanning operation—viz., the soaking, liming, unhairing, bating, and washing. I then introduce the skins or hides into a liquid prepared as follows:

Example 1: For one hundred pounds of skins or hides five pounds of bichromate of potash are dissolved, under the addition of two and one-half pounds of commercial hydrochloric acid, in as much water as is necessary to cover the skins suspended in the liquid. The skins or hides are allowed to remain in this solution until the liquid has thoroughly penetrated even the thickest parts of the skins. The end of the reaction is recognized when sample pieces cut off the thickest parts of the skins show an even yellow color. Then the skins are removed from the bath,

allowed to drain, pressed out, and placed into a second bath. This second bath consists of a watery solution of hydroxylamin or salts thereof, which may be kept neutral or slightly acid. For five pounds of bichromate of potash, used in the first bath, about one-half to one pound of hydroxylamin, or one to two pounds of the hydrochlorate, or one and one-half to three pounds of the sulfate of hydroxylamin, are employed. The skins or hides are allowed to remain in this bath until the reaction between the chromium compound and the hydroxylamin is complete, which is recognized by the change of color from yellowish to greenish taking place in the hides. After removing the skins from this second bath the same are allowed to drain. They are then pressed out and subjected to the ordinary processes of staining, fat-liquoring, coloring, and finishing employed for chrome-tanned leather and well known in the arts.

Example 2: The only difference between the process described in this example and the one mentioned above is the composition of the second bath. A watery solution of hydroxylamin disulfo-acid in the form of its potassium salt, which may be kept neutral or slightly acid, is employed. For every five pounds of bichromate of potash in the first bath from five to ten pounds of hydroxylamin disulfonate of potassium are used. The mode of proceeding is otherwise the same as that given above. Instead of hydroxylamin and its salts I may employ the crude hydroxylamin obtained from hydroxylamin disulfo-acid and its salts, either by heating the neutral solutions of these salts or by treating the alkaline solution of these salts first with dilute acids and subsequently by heating the thus-treated solution to higher temperatures.

Example 3: Instead of the hydroxylamin disulfo-acid and its salts in the second bath I may employ directly the crude hydroxylamin disulfo-acid and its salts, without previously isolating the pure bodies. In this case it does not make any practical difference for the execution of my process whether such solutions also contain salts of other nitrogen-sulfone acids, which are usually by-products of the same reactions or products of similar reactions. For every five pounds of bichromate

of potash in the first bath I employ so much of the crude hydroxylamin disulfo-acid or its salts as corresponds to approximately five to ten pounds of hydroxylamin disulfonate of potassium or sodium. The mode of proceeding is otherwise the same as that given in Example 1.

I do not restrict myself to the above-given quantities, but mean to include any reasonable change of the proportions.

The chemical interaction between the chromium compound and the hydroxylamin and the hydroxylamin disulfonic acid and their salts is the same. The active principle in the hydroxylamin disulfonate of sodium is nothing else than sulfate of hydroxylamin. Hydroxylamin disulfonate of sodium is easily decomposed under the formation of sulfate of hydroxylamin, watery solutions of the former salts being converted into the latter compound by merely standing at a little more elevated temperature.

What I claim as my invention, and desire to secure by Letters Patent, is—

The herein-described process of tawing or tanning skins or hides, consisting in the reduction on the animal fiber of bichromate of potash by means of hydroxylamin compounds, such as hydroxylamin, its sulfo-acids and salts, in the presence or absence of any of the nitrogen-sulfone acids which are formed to some extent in the same reaction which produces sulfo-acids of hydroxylamin thereby permitting the use of neutral, weakly-alkaline or weakly-acid solutions for the second bath.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HUGO SCHWEITZER.

Witnesses:

H. CONTANT,  
JAMES T. LAW.