

# UNITED STATES PATENT OFFICE.

LEON RAPPE, OF NEWARK, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO LIZZIE S. PIERSON, OF WILMINGTON, DELAWARE.

CHROME-TANNED LEATHER AND PROCESS OF PREPARING THE SAME.

SPECIFICATION forming part of Letters Patent No. 409,336, dated August 20, 1889.

Application filed September 24, 1887. Serial No. 250,604. (No specimens.)

*To all whom it may concern:*

Be it known that I, LEON RAPPE, a citizen of France, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Chrome-Tanned Leather and Processes of Preparing the Same; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in chrome-tanned leather and in the art of finishing the same by rendering it permanently soft and flexible by charging and filling its pores with sesquioxide of chromium in a pure state and of minute division and perfectly cold, and causing it to receive thoroughly and quickly and to retain the color given to it after the filling operation, as I will now more fully describe and explain preparatory to a specific designation of the matters and things claimed as my invention.

My invention has for its object to give a permanent softness and flexibility to tanned leather and skins without the aid of oils or of fatty or greasy materials, and to give them a fixed color which will not change by contact with the air.

The process which constitutes part of this invention consists in the employment of a chemical preparation which operates upon the leather and skins in a manner entirely different from the processes employed up to this day.

For the purpose of rendering the hides soft and flexible, as well as durable, I employ the following process subsequent to the tanning process, viz: I have various methods of obtaining the hydrated sesquioxide of chromium (chromic hydrate) which forms the base of my process. I will commence by describing the cheapest method, which consists in taking the residue from bichromate batteries and by means of a carbonate of soda precipitating this chrome-alum which leaves the batteries, and I obtain two distinct products—viz., a liquid sulphate of soda and a sesquioxide of chromium, (chromic hydrate,) which by washing and decanting is rendered completely neutral—that is, neither

alkaline, acid, nor containing any salt. If this residue is not obtainable, I can take a bichromate of soda, potash, or ammonia, which I separate, and by the aid of a reducing agent—such as sugar, flour, or sawdust—and an addition of sulphuric acid, I produce a chrome-alum, which I precipitate in the same manner as the alum from the batteries. After having obtained this hydrated sesquioxide of chromium (chromic hydrate) I combine it with hot sulphuric acid of a specific gravity of 16° to 18° Baumé, which gives me an absolutely-pure sulphate of chromium. I subject this sulphate to the same operations as the alum, the same washing and decanting, and I have now hydrated sesquioxide of chromium (chromic hydrate) in a perfect condition. A vat or receptacle is now provided of a suitable size, according to the quantity of leather or skins to be treated, and of a depth exceeding by two feet the length of the hides or skins placed vertically in the vat. I thereupon make a bath of water, adding sulphuric acid or nitric acid, or any other suitable acid to give it a specific gravity of 4° Baumé, stirring the liquid well and allowing it to stand for about three days for the purpose of allowing it to cool perfectly. I now add my perfectly neutral hydrated sesquioxide of chromium (chromic hydrate) to the bath; but although I am not able to establish the exact proportions of the solution and the hydrated sesquioxide, (chromic hydrate,) I have a very easy test, as the liquid dissolves as much as its character and affinity will permit, and the surplus exceeding its capacity will be deposited upon the bottom of the vat, being heavier than the liquid. It is now essential in preparing a new vat to agitate the solution for about four consecutive days, so as to keep the hydrated sesquioxide chromium (chromic hydrate) suspended during the entire period and to allow the liquid time to become saturated with the same. After now the bath has been prepared in this manner and the surplus of hydrated sesquioxide (chromic hydrate) has had time to settle I immerse the leather or skins vertically into the liquid and allow them to remain therein from twelve to eighteen hours, according to the nature of the tanning to which they have



been previously subjected. The hides or skins are now removed by any suitable means and the liquid is immediately again agitated, so that a quantity of the surplus of hydrated sesquioxide (chromic hydrate) at the bottom of the vat will be absorbed by the acid set free. The organic nature of the leather or skins having a great affinity for metallic oxides, they destroy the combination in my liquid and fill the pores and cells with the hydrated sesquioxide of chromium (chromic hydrate) and free the acid, which will drop off when the skins are suspended in space.

In contradistinction to all other processes heretofore employed for tanning skins, my process consists of softening leather and skins and rendering them absolutely flexible, and giving them a fixed color. After leaving my solution, and after all the liquid has run off from the skins, they are subjected to the action of a solution of warm logwood, which permanently sets the sesquioxide of chromium in the skin. The leather or skins remain for a space of time, governed by the nature of the skins and of the tanning which they have received, in the said solution with surplus supply for the purpose of introducing into the pores and cells of the organic matter a sufficient quantity of sesquioxide of chromium, which prevents by its presence the gelatine of the skin from combining, and keeps the leather or skins continually soft and flexible.

By my process of finishing the leather it is rendered much more impervious than by any of the finishing operations usually practiced for stuffing the leather and rendering it pliable by means of greasy and other similar matters, for the reason that the oxide of chromium is introduced and set in the pores of the leather and cannot be removed under atmospheric influences, so that the leather is impermeable so long as it lasts.

In conclusion, the operation of my invention may be concisely stated as follows, viz: The leather, after being tanned in any manner previously known, is dipped into a solution containing the sesquioxide of chromium (chromic hydrate) in solution, which is renewed by agitating the surplus of the finely-

divided sesquioxide of chromium (chromic oxide) and setting the oxide of chromium permanently in the pores of the leather by treating it with a solution of logwood, so as to render it impenetrable to water, and finally coloring it, fixing its color, and protecting it against the oxidizing effects of the atmosphere. This completes one of the sets of skins. The process is then continued in the same vat for fresh sets of skins by agitating the solution and its surplus of hydrated oxide of chromium (chromic hydrate) previous to each fresh treatment, the subsequent steps being continued, as before mentioned, until the sesquioxide of chromium (chromic hydrate) is entirely consumed.

I claim—

1. The process herein described of treating leather after tanning for the purpose of softening, coloring, and fixing the color thereof, the same consisting in subjecting the leather to a cold solution of sesquioxide of chromium, (chromic hydrate,) then subjecting it to the action of a bath of logwood, substantially as described.

2. The process herein described of successively restoring the cold solution of sesquioxide of chromium (chromic hydrate) by agitating a surplus body thereof at the bottoms of said cold solution previous to treating each batch of leather, so that the cold solution will reabsorb and hold in solution the proper proportion of chromic hydrate, substantially as specified.

3. As a new article of manufacture, a skin previously tanned with vegetable tanning-matter and impregnated with the oxide of chromium, as set forth.

4. As a new article of manufacture, a skin previously tanned with vegetable tanning-matter, having its pores impregnated with oxide of chromium and dyed with a color partly combined with the chromium oxide as a mordant, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

LEON RAPPE.

Witnesses:

OLIVER H. PERRY,  
CHARLES M. LUM.