UNITED STATES PATENT OFFICE.

CHRISTIAN HEINZERLING, OF BIEDENKOPF, GERMANY.

MANUFACTURE OF LEATHER.

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To all whom it may concern:

Be it known that I, CHRISTIAN HEINZERLING, of Biedenkopf, Germany, have invented a new and useful Improvement in the Manufacture of Leather; and I do hereby declare that the following is a full, clear, and exact description of the same.

My said invention relates more particularly to the treatment of the hides by chromic combinations or compounds, for the purpose specified, in combination with a subsequent treatment of the hides by dissolved fats.

It is well known that chromic acid, chromates, and also chrome oxide salts, have the property of converting hides into leather. In consequence of this knowledge it has already been proposed to employ these chromic compounds in combination with iron salts and other substances as a substitute for the tannin of the bark. Experiments, however, which have been made in that direction have clearly shown that by this method prepared leather could not withstand the action of moisture, but that it becomes hard and brittle after exposure to the action of water, and that in consequence it could not be used for practical purposes. In order to avoid this inconvenience, and to produce a leather suitable for practical purposes which can withstand the action of moisture, my invention consists in treating the chrome-tanned hides with the dissolved fats, as hereinafter described. The action of these dissolved fats is to fill out the pores or interstices of the hide, and, after the dissolving medium has been evaporated, to form a protecting surface to the chromic compound which has been brought into the hide. By this the leather becomes water-tight, and cannot be partly reconverted into its original untanned state by any action of moisture, and it will further retain its softness. If chromic acid has been used directly, or set free from chromic salts, (as the case may be,) the subsequent treatment of the hide by dissolved fats has still the further effect that these fats precipitated on the fiber are oxidized by the acid, the latter being then reduced to chrome oxide, while the fats are oxidized to acidulous compounds, which latter form insoluble compounds with the chrome oxide, which insoluble compounds are firmly united with the fiber. It is a matter of course that, without departing from my invention, beside the said chromic compounds and the mentioned dissolved fats, other substances may advantageously be used to promote the tanning process.

In order that others skilled in the art may clearly understand my invention and the manner in which the same is to be put into practice, I will now describe the method of proceeding which I have found the most suitable.

The raw hides, after having in the old well-known manner been unhaired and soaked, are brought in a solution of one-quarter per cent. of chromic acid or in a solution of one-half per cent. of acid chromate of potash, or acid chromate of soda, or acid chromate of magnesia, or any other acid or neutral chromate, or in a solution of one-half per cent. of any salt of chrome oxide, as, for instance, sulphate of peroxide of chrome, or any other. To this solution I prefer to add one per cent. alum or sulphate of alumina or other aluminium salt, and one per cent. chloride of sodium, (common salt.) I prefer to add the said aluminium compounds and the chloride of sodium for the tanning properties of these substances, which, in consequence, promote the tanning action of the chromic compounds, and at the same time, in consequence of their low price, render the whole process cheaper than it would be if only chromic compounds were used. In the said solution of chromic compounds mixed with the aluminium compounds and the chloride of sodium the hides are left a shorter or longer time, according to their nature. (For instance, calf-skins are left four to six days, and heavy sole-hides up to fourteen days.) During this time the solution is successively made more concentrated until it contains five per cent. of chromates or other chromic compounds, and ten per cent. alum or other aluminium salt, and ten per cent. common salt. The same result, of course, is obtained by bringing the hides successively into several solutions, of which the one is always stronger than the preceding.

If leather is made which afterward is required to be blacked, I prefer to add to the mentioned solution two or three per cent. of yellow or red prussiate of potash, which substances have the property to give, with the afterward-applied iron stain, a compound of a

dark blue color. In order to obtain a partial fixing of the said tanning substances on the hide, I prefer to bring the hides, after they leave the tanning solution, into a solution of four to five per cent. of chloride of barium, or of protoxide of lead, or of soap, which substances, with the first-named tanning substances, give insoluble salts or soaps. In this solution of chloride of barium, &c., the hides are allowed to remain four to eight hours, (more or less,) when they are taken out of the solution and partially dried and stretched. The hides when not yet quite dry are now subjected to the impregnation with fats. For this purpose the hides are brought into stearine or other fats which have been dissolved in benzine or other volatile liquids which have dissolving action on the said substances. In this solution the hides are left twelve to twenty-four hours, more or less, when they are taken out and finished in the old well-known manner—that is to say, upper leather is greased, tramped, and finished, while sole-leather is dried, hammered, or rolled.

It is a matter of course that, without departing from the nature of my invention, to the above-named tanning solution of chromic compounds also any metallic salts, as for instance sulphate of copper or any other, may be added, both for the tanning action of these salts and for their property of producing special colors on the leather.

Having now described the nature of my invention and the manner in which the same is to be carried out into practice, I wish it to be understood that I do not claim, broadly, the use of chromic compounds in general for tanning purposes, as I am well aware that some of such compounds have already been used for the same purpose. I do not know, however, that the chromic compounds have ever been used in connection with the fats as described, and these two old steps, when combined, secure the new result of causing the chromic acid to be reduced to chrome oxide, and the fats to become oxidized to acidulous compounds, which unite with the chrome oxide to form a third and new insoluble compound, that becomes fixed in the fibers of the hide to complete the tanning effect and to render the leather pliant and water-proof.

What I claim as new is—

The method of converting hides into leather which consists in subjecting them to the action of a compound containing chromic acid and then treating the hides by a solution of stearine or similar fats, as described.

DR. CHR. HEINZERLING.

Witnesses:
FRANZ WIRTH,
FRANZ HASSLACHER.