

UNITED STATES PATENT OFFICE

2,091,683

CHROME TANNING

Eugen Immendoerfer, Ludwigshafen-on-the-Rhine, Germany, assignor to I. G. Farbenindustrie Aktiengesellschaft, Frankfurt-on-the-Main, Germany

No Drawing. Application January 3, 1936, Serial No. 57,363. In Germany January 19, 1935

18 Claims. (Cl. 149-5)

The present invention relates to improvements in chrome tanning by treating hides with tanning agents comprising chromium salts of non-tanning polybasic aromatic acids, as well as to the said tannings employed and the leather obtained therewith.

For chrome tanning by the single bath process, chromium salts of inorganic acids or of aliphatic acids, such as formic acid or oxalic acid, have hitherto been used. The addition of fatty acid derivatives (Turkey red oils) during the tanning has also been proposed. In order to obtain leather having certain desired properties, the chrome tanning has also been carried out in conjunction with vegetable or synthetic tanning agents.

I have now found that very good and especially full leather can be obtained by treating hides with chromium salts of non-tanning polybasic aromatic acids in the known manner. The term polybasic aromatic acids, whenever used, includes polybasic aromatic carboxylic and sulphonic acids. Suitable acids are for example phthalic acids, naphthalene-dicarboxylic acids, and naphthalene disulphonic acids and certain substitution products thereof. The chromium salts of these acids may be obtained, depending on the nature of the polybasic acid used, for example by the reaction of their alkali metal salts with neutral or basic chromium sulphate. In many cases the procedure may also be that the hides are pretreated with one component and then treated with the other component, the treatments being repeated if desired.

The tanning proceeds simply and rapidly. When desired, as much as 10 per cent of chromium oxide (calculated with reference to the finished leather) in combination with the corresponding amount of aromatic acid may be readily incorporated with the hides. Thus for example by tanning in short baths an increase in weight and volume of the leather of 20 per cent and more can be obtained so that full leather with the character of a combination tanning can be obtained in a simple manner. Pickling, neutralization at the conclusion of the tanning or deacidification of the hides, as for example before dyeing, may be dispensed with when the basicity of the bath is suitable, in particular when employing chromium salts of weak aromatic acids.

In order to obtain leather having special properties the said chromium salts can also be employed together or in any desired sequence with other tanning agents. Thus hides which had

been treated with vegetable or synthetic tanning agents, such as alkali salts of water soluble aromatic condensation products containing sulphonic acid groups, or alum, chrome or chamois leather can be aftertreated with the said chromium salts, whereby especially full leathers are obtained. In the same manner hides which had been tanned with the said chromium salts can still be treated with other tanning agents.

The following examples will further illustrate how the said invention may be carried out in practice but the invention is not restricted to these examples. The parts are by weight.

Example 1

222 parts of phthalic anhydride are dissolved in water with the addition of 120 parts of sodium hydroxide and the solution rendered neutral to litmus. From 450 to 500 parts of chromium alum are then added to the solution. Into the resulting solution (80 per cent of the weight of the unhaired hides) there are introduced delimited unhaired sheep hides, and the latter are treated in the usual manner according to the single bath tanning process. In order to obtain ripe tanning, a little soda may be added to the tanning liquor towards the end of the tanning if desired.

Example 2

148 parts of phthalic anhydride are dissolved in water with an addition of 80 parts of sodium hydroxide and the solution is rendered neutral to litmus. A solution of basic chromium sulphate ($\text{Cr}(\text{OH})\text{SO}_4$) corresponding to 76 parts of Cr_2O_3 is then added.

Delimed non-pickled unhaired hides are treated with the resulting tanning liquor in a short bath (45 per cent of the weight of the unhaired hides).

A ripe-tanned leather is obtained without any neutralization of the tanning liquor with soda being necessary.

Example 3

Delimed and bated unhaired calf hides are fully tanned in a short bath (60 per cent of the weight of the unhaired hides) with a solution of 276 parts of 1-nitronaphthalene-3,8-disulphonic acid sodium salt and a solution of basic chromium sulphate ($\text{Cr}(\text{OE})\text{SO}_4$) corresponding to 76 parts of Cr_2O_3 .

Example 4

1200 parts of shaved non-deacidified chrome

leather, which had been prepared according to the chrome-single- or -two-bath-process in the usual manner are treated with the tanning liquor described in Example 2 horsed up overnight, washed, dyed by any of the standard methods, fat-liquored and finished as usual. In order to obtain leather of an especially high fullness a treatment with synthetic tanning agents, as for example with condensation products of naphthalene sulphonie acid and formaldehyde can be inserted at any desired stage of the tanning process.

Instead of the tan prepared from phthalic acid anhydride described above there can also be employed the corresponding amount of a similar tan but prepared from tetrachlor phthalic acid.

Example 5

1000 parts of dry East-Indian sheep leather are thoroughly wetted with warm water, if desired with an addition of 5 parts of calcined sodium carbonate and treated in the same manner as described in Example 4.

Example 6

1000 parts of alum ripe leather are wetted and after-tanned in the manner described in Examples 4 and 5.

What I claim is:

1. The process of tanning which comprises treating hides with a chromium salt of a non-tanning polybasic aromatic carboxylic acid.
2. The process of tanning which comprises treating hides with a chromium salt of a non-tanning polybasic aromatic carboxylic acid and with a further tanning agent.
3. The process of tanning which comprises treating hides pretanned by means of known tanning agents with a chromium salt of a non-tanning polybasic aromatic carboxylic acid.
4. The process of tanning which comprises first treating hides with a chromium salt of a non-tanning polybasic aromatic carboxylic acid and then treating them with a known tanning agent.

5. The process of tanning which comprises treating hides with a chromium salt of a non-tanning polybasic carboxylic acid of the benzene series.

6. The process of tanning which comprises treating hides with a chromium salt of phthalic acid.

7. The process of tanning which comprises treating hides with a chromium salt of tetrachlor phthalic acid.

8. The process of tanning which comprises first treating hides with a tanning chromium salt and then with a non-tanning polybasic aromatic carboxylic acid compound.

9. The process of tanning which comprises first treating hides with a tanning chromium salt and then with a non-tanning polybasic aromatic carboxylic acid salt.

10. The process of tanning which comprises repeatedly first treating hides with a tanning chromium salt and then with a non-tanning polybasic aromatic carboxylic acid compound.

11. Leather containing a chromium salt of a non-tanning polybasic aromatic carboxylic acid.

12. Leather containing a chromium salt of a non-tanning polybasic carboxylic acid of the benzene series.

13. Leather containing a chromium salt of phthalic acid.

14. Leather containing a chromium salt of tetrachlor phthalic acid.

15. Chrome-tanning agents comprising a chromium salt of a non-esterified non-tanning polybasic aromatic carboxylic acid.

16. Chrome-tanning agents comprising a chromium salt of a non-esterified non-tanning polybasic carboxylic acid of the benzene series.

17. Chrome-tanning agents comprising a chromium salt of non-esterified phthalic acid.

18. Chrome-tanning agents comprising a chromium salt of non-esterified tetrachloro phthalic acid.

EUGEN IMMENDOERFER.