

## UNITED STATES PATENT OFFICE

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## TREATING OF ANIMAL-SKIN PRODUCTS

No Drawing. Application filed May 24, 1929, Serial No. 365,780, and in Italy July 14, 1928.

This invention relates to a process of treating animal skin materials or animal skin products as distinguished from the treatment of wool, hair, etc., and has for one of its objects the provision of a process adapted for utilizing untanned hides and scraps and cuttings therefrom, as well as scraps and cuttings from tanned hides, whereby such materials may be converted into a useful and valuable product which in appearance, fibrous texture and flexibility resembles natural leather.

It will be apparent that my invention is of great economical value in that it salvages or utilizes materials which heretofore have generally been converted into glues or fertilizers or simply thrown away.

In the practice of my invention when treating untanned animal skin material or animal skin products, scraps and cuttings therefrom the fibers of the material are intimately and mechanically admixed with an aqueous medium until a thin flowing slurry of the fibers in aqueous suspension is obtained. The portion of the aqueous medium to the material being treated is necessarily large so as to obtain the desired thin mass or slurry which will readily flow, and which for purposes of description shall be referred to as a flowing or flowable slurry.

I next add to the slurry a tanning agent which may be a natural or a synthetic vegetable or mineral tanning agent, a fiber lubricant, and a suitable binding material containing a water insoluble binder, for example india rubber latex, gutta percha latex, balata latex or the like, as obtained from the trees and which may have been preserved by ammonia or any other suitable alkaline preserving material. A synthetic latex, or other binding material containing a water insoluble binder and which is in suitable condition for incorporation in the slurry may be substituted for the latices above mentioned.

A suitable substance is employed for preserving the binding material in the product.

When latex is used as a binding material I avoid the vulcanizing treatment otherwise required for preserving said latex by using

vegetable tannin, which is employed as a tanning agent in the tanning treatment mentioned above or is added to the material when a mineral tanning agent is being employed. Amongst the vegetable tannins I preferably employ those of the pyrogalllic series, more particularly sumach. As mineral tanning agents I can employ particularly those containing chromium.

A suitable fiber lubricant, i. e., an oil or grease emulsifiable in water, such as chrome (a sulphurated oil), for example, is added to the slurry either before, during or after the addition of the tanning agent and always before adding the binding material.

Upon the addition of the binding material to the slurry the binder thereof is precipitated upon the fibers being treated.

Inasmuch as the liquid of the slurry must be abstracted in the further practice of my process I may add to the slurry a material such as commercial sodium chloride, which contains magnesium and calcium chlorides and other impurities, or a suitable equivalent of sodium chloride, such as ammonium chloride, or the like, the addition of this material promoting the abstracting of the liquid of the slurry and being of material advantage in the making of sheets of substantial thickness. I have found also that sodium chloride or an equivalent thereof added directly after the latex and before abstracting the liquid improves the process and the product.

The slurry is then caused to flow upon a finely perforated support such as a wire gauze and the liquid of the slurry abstracted so that a sheet of fibers is obtained with the fibers disposed in felted relation. The material thus obtained is then rolled and pressed and subjected to the usual finishing operations employed in the finishing of natural leathers.

In the treatment of tanned animal skin products, as distinguished from untanned products such as those above referred to, when I employ cuttings of chrome tanned leather from which the acid has not yet been removed, the material is first subjected to a preliminary neutralization by treatment with an alkaline salt of a weak acid, such as



neutrol ( $\frac{2}{3}$  bicarbonate of soda and  $\frac{1}{3}$  sodium sulphate), borate of sodium, sodium hyposulphite, bicarbonate of soda, either separately or combined, at a temperature between 30 and 60° C., for example. The material is then washed and next mechanically and intimately admixed with an aqueous medium until a thin flowing slurry with the fibers of the material in suspension is obtained.

In this treatment of tanned fibers when chrome leather and a rubber latex binding material are used I add to the material vegetable tannin which will function as a preservative of the binder in the product, so that vulcanization is dispensed with.

In the treatment of vegetable tanned animal skin products, I prefer to add a mineral tanning agent, such as chrome, followed by a neutralization. I may next carry out a light vegetable tannage, preferably with sumach, for preserving the latex, but this is not strictly necessary, the animal skin products being treated already containing vegetable tannin which will act as a preservative of the binder.

In the treatment of mineral tanned animal skin products, if desired, and especially when a finished material of improved tensile and breaking strength is the desideratum, I add a detanning agent, such as an organic detanning salt, either to the aqueous suspension or during the admixing of the fibers with an aqueous medium and preferably after the neutralization above described. Examples of an organic detanning salt suitable for my purpose are Seignette's salt (sodium potassium tartrate), cream of tartar (acid potassium tartrate) and other organic detanning salts. From my own experience I prefer Seignette's salt.

A natural vegetable tanning agent such as sumach or a synthetic tanning agent having equivalent properties and a binding material containing a natural or synthetic latex binder in suitable condition for addition to the slurry are then added to the slurry. A grease or oil capable of emulsifying when added to water is also added to the slurry either before, during or after the addition of the tanning agent.

If detanning has previously been resorted to as above described then the amount of vegetable tannin employed as tanning and latex preserving agent should not be sufficient to destroy the effect of the detanning. In order to permit a uniform absorption of this reduced amount of vegetable tannin through all the fibrous particles in the aqueous suspension, I previously add the fiber lubricant. In order to prevent shrinkage of the previously detanned fibers during greasing, more especially when chromine is used, I add to the oil or grease a certain amount of soap.

The binding material used, as above noted, must comprise a water insoluble binder and as examples of a suitable binding material I

may mention rubber latex, gutta percha latex, balata latex or the like as obtained from the trees and which may be preserved by ammonia or other suitable alkaline preserving material. A synthetic latex, or other binding material containing a water insoluble binder which is in suitable condition for incorporation in the slurry, however, may be used satisfactorily.

The latex is added to the aqueous slurry after the addition of the oil or grease and after the supplementary tanning treatment.

The grease or oil above mentioned, these terms having been used synonymously, is one capable of emulsifying when added to water, of which chromine is an example, this material being added at a temperature between 30° and 60° C.

In some instances I add alum and a tanning agent such as chrome liquor to the aqueous slurry and neutralize before the addition of the binder.

In the treatment of tanned fibers as above mentioned in connection with the treatment of untanned fibers I may add commercial sodium chloride, or its equivalent, such as ammonium chloride or the like, to the aqueous suspension of the fibres in order to promote the abstracting of the liquid of the slurry, when sheets of substantial thickness are desired in the finished product.

It is to be understood that the amount of sodium chloride will vary depending upon the material being treated and also depending upon the separation or abstracting of the liquid of the slurry that is desired in the felting of the product into sheets.

I have ascertained also that the addition of sodium chloride or its equivalent directly after the addition of latex and before the liquid of the slurry is abstracted highly improves the process and the product.

I find in the practice of my invention both with respect to the treatment of untanned as well as tanned materials some care must be exercised so as not to allow coagulation of the binder employed to proceed to a detrimental degree before the liquid of the slurry is abstracted, inasmuch as such detrimental coagulation renders the felting and the properties of the product unsatisfactory. In employing latex as a binding material I prefer to abstract the liquid of the slurry, i. e., felt, within an hour of the addition of the binding material to the slurry.

In some cases, particularly when a soft finished product is desired, I add pure or impure glucose or a mixture of glucose and dextrine, or potato starch or other leather nourishing substances, to the slurry, or to the tanning agent, or to the grease.

In all cases some choice is left to the operator as to the various proportions of materials used and a great deal depends upon the use to

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which the particular product in course of making is to be put.

Merely by way of examples the following are cited:

5 In the making of artificial leather for sweat bands, ladies' bags, book binding, art and fancy work, etc.:

	Kilograms
Chrome tanned leather-----	69
10 Neutrol ( $\frac{2}{3}$ bicarbonate of soda and $\frac{1}{3}$ sodium sulphate)-----	9.800
Chromine (a sulphurated oil)-----	18.400
Sumach extract-----	69
40% latex-----	20
15 Sodium chloride-----	30

In the manufacture of materials suitable for suit cases, upholstery, car bodies, etc.:

	Kilograms
20 Chrome tanned leather-----	60
Neutrol-----	8.500
Seignette's salt-----	2
Chromine 12 kg., soap 6 kg., glycerine 3 kg.-----	21
25 Sumach extract-----	10
40% latex-----	30
Sodium chloride-----	30

30 When it is desired to employ the finished product as sole leather or for other purposes requiring a considerable stiffness in the product the addition of grease may be omitted.

Dyeing is effected preferably by the addition of a dye to the slurry, and acid aniline dyes are preferred.

35 The invention above described in which specific mention is made of the treatment of mineral tanned products wherein the material is first neutralized, then washed, after which it is mixed with water to form a slurry to which grease, a binder and a preservative for the binder and if desired sodium chloride are added, has been made the basis of my copending divisional application Serial No. 468,122, filed July 15, 1930.

45 The invention above described in which mineral tanned animal skin products are first neutralized, washed, reduced to a flowing aqueous slurry and then treated with a detanning agent, after which grease, a binder and a preservative for the binder, and if desired sodium chloride are added to the slurry constitutes the subject matter of my copending divisional application Serial No. 468,123, filed July 15, 1930.

55 The invention above described in which a tanning agent, a material such as ammonium chloride and a water insoluble binder are added to an aqueous slurry of untanned animal skin products constitutes the subject matter of my copending divisional application Serial No. 468,124, filed July 15, 1930.

65 The invention herein described in which a grease, ammonium chloride, a water insoluble binder and a preservative therefor are added to an aqueous slurry of tanned

animal skin fibers constitutes the subject matter of my copending divisional application Serial No. 468,125, filed July 15, 1930.

The invention herein described in which a tanning agent, a grease, a water insoluble binder and if desired a material such as sodium chloride are added to an aqueous slurry of tanned fibers has been made the subject matter of my copending divisional application Serial No. 468,126, filed July 15, 1930.

The invention above described in which a tanning agent, material such as ammonium chloride, etc. are added to an aqueous slurry of tanned animal skin fibers constitutes the subject matter of my copending divisional application Serial No. 468,127, filed July 15, 1930.

The invention above described in which dextrine is added to an aqueous slurry of animal skin products has been made the subject matter of my copending divisional application Serial No. 468,128, filed July 15, 1930.

The invention above described in which potato starch is added to an aqueous slurry of animal skin products has been made the subject matter of my copending divisional application Serial No. 468,129, filed July 15, 1930.

What I claim is:—

1. The process which comprises adding a mineral tanning agent and a grease to a flowing aqueous slurry containing the fibrous portions of animal skin products in suspension, adding a water insoluble binder and a preservative therefor to the slurry, and abstracting the liquid of the slurry.

2. The process which comprises mechanically and intimately admixing untanned animal skin products and an aqueous medium until a thin flowing slurry containing the fibrous portions of the animal skin products being treated in suspension is obtained, adding a mineral tanning agent, a neutralizing agent and a grease and thereupon adding vegetable tannin and latex to the slurry thus obtained, and abstracting the liquid of the slurry.

3. The process which comprises mechanically and intimately admixing untanned animal skin products and an aqueous medium until a thin flowing slurry containing the fibrous portions of the animal skin products being treated in suspension is obtained, adding a vegetable tannin and a grease and latex to the slurry thus obtained, and abstracting the liquid of the slurry.

4. The process which comprises adding a mineral tanning agent containing chromium, a neutralizing agent, and a grease to a flowing aqueous slurry containing the fibrous portions of untanned animal skin products in suspension, adding a vegetable tannin and



rubber latex to the slurry, and abstracting the liquid of the slurry.

5. The process which comprises adding a vegetable tanning agent of the pyrogallie series and a grease to a flowing aqueous slurry containing the fibrous portions of untanned animal skin products in suspension, adding latex to the slurry, and abstracting the liquid of the slurry.

6. The process which comprises adding a mineral tanning agent and a grease to a flowing aqueous slurry containing the fibrous portions of untanned animal skin products in suspension, adding sodium chloride and thereupon a water insoluble binder and a preservative therefor to the slurry, and abstracting the liquid of the slurry.

7. The process which comprises adding a mineral tanning agent and a grease to a flowing aqueous slurry containing the fibrous portions of untanned animal skin products in suspension, adding a water insoluble binder, a preservative therefor and sodium chloride to the slurry, and abstracting the liquid of the slurry.

8. The process which comprises adding chrome liquor and alum to a flowing aqueous slurry containing the fibrous portions of animal skin products in suspension, adding a neutralizing agent, a fiber lubricant and latex, and abstracting the liquid of the slurry.

9. The process which comprises adding a tanning agent and chromine to a flowing aqueous slurry containing the fibrous portions of animal skin products in suspension, adding a water insoluble binder and a preservative therefor to the slurry, and abstracting the liquid of the slurry.

10. The process which comprises adding a tanning agent, a grease and glucose to a flowing aqueous slurry containing the fibrous portions of animal skin products in suspension, adding a water insoluble binder and a preservative therefor to the slurry, and abstracting the liquid of the slurry.

11. The process which comprises mechanically and intimately admixing animal skin products and an aqueous medium until a flowing slurry containing the fibrous portions of the animal skin products being treated in suspension is obtained, adding a tanning agent, a grease, a water insoluble binding material and a preservative therefor, the binder of the binding material precipitating and coagulating upon the fibers of the slurry, and abstracting the liquid from the slurry to obtain a sheet before coagulation has progressed to a detrimental degree.

12. The process of treating animal skin products which comprises adding a tanning agent, a grease and a latex to a flowing slurry containing the fibers of the skin products being treated in aqueous suspension, and ab-

stracting the liquid from the slurry within an hour of the addition of the latex.

This specification signed this 11th day of May, 1929.

ANTONIO FERRETTI.

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