Patented Mar. 1, 1938 2,109,572

UNITED STATES PATENT OFFICE

2,109,572

PROCESS OF TANNING SKINS AND HIDES

George Freeman Lloyd, Brighton, Victoria, Australia, assignor to "Zetta" Proprietary Limited, South Melbourne, Victoria, Australia

No Drawing. Application June 23, 1936, Serial No. 86,891. In Australia June 25, 1935

3 Claims. (Cl. 149—4)

This invention refers to an improved process of chemically tanning skins, hides, pelts, furred skins, skins of reptiles, fish and the like and the product thereof.

One object of the invention is to ensure that the skins and the like will be thoroughly impregnated with the tanning solution in considerably less time than usual and will permanently remain tanned.

According to one known process of treating pickled hides and skins with vegetable solutions, pits are necessary and much labor is involved in frequent handling of the skins during several weeks in which the skins are being soaked. Furthermore during such process it frequently happens that some skins or the like are rendered valueless and the dyeing of the skins is blotchy.

According to this invention the tanning process can be completed within an hour with very little handling of the skins or the like, and as a consequence the cost of the process is considerably less than that employed wherein the skins are soaked for a long period in a bark or vegetable extract solution in pits.

Another advantage of the present invention is that the fibre of the skin or the like is undamaged under the process.

According to one form of the invention the skin or the like when tanned is nearly white or ivory white and the same color throughout, so that it can be readily and uniformly colored by analine or vegetable dyes.

According to one form of the process a skin or the like can be dyed in delicate tints during the tanning process.

Another advantage of the invention is that the product has no objectionable odor which is a desideratum in regard to furred skins or the like, and furthermore it is found that hair or fur does not readily fall out of the skin or hide.

According to another form of the process the hide or skin can be increased in weight, and either hardened or made flexible so that the product is suitable for soles and heels of boots and shoes or harness.

There are many known formalin processes but such have proved unsatisfactory owing to difficulty in control and by reason of the heat generated, defects in the hides or skins occur, and moreover the tanning process takes days instead of less than an hour according to this invention.

The advantages of the present process are derived primarily by utilizing in the tanning solution a medium to break down or reduce the surface tension of said solution, and it has been demonstrated that alcohol or chemical combinations containing alcohol included in the tanning solution produces this desired result.

The breaking down or reducing of the surface tension of the tanning solution ensures the latter passing expeditiously through and thoroughly impregnating the skins, hides and the like. Associated with this improvement is the action of the sulphuric acid present when the skins, hides and the like have been preliminarily bated and pickled in the fellmongary process. The sulphuric acid on the skins and the like maintain the pores of same open, thus facilitating speedy penetration of the tanning solution through the fibres.

Another feature of the invention is the final step according to one example of the process whereby the hides or skins are drummed in a solution consisting of carbonate of soda or another suitable alkali and a quantity of water to completely neutralize the acid and make the solution slightly alkaline and so close the pores of the skins or hides and swell same and moreover retain the tanning ingredients therein.

Another advantage of the alcohol in the primary step of the process is that it ensures emulsification of the unsulphonated oil if used in the tanning mixture and enables it to readily pass into the skin or hide.

The use of alcohol is known for the purpose of dehydration and for preventing skin-fibres remaining gummed together and also for the purpose of dehydrating skins and hides to render same porous so that they may readily absorb solvents, as for instance those of an asphaltic or resinous nature to act as a filler in order to produce leather possessing a moisture-resisting quality.

On the contrary according to the first step of this improved process alcohol is included in the tanning solution as a medium or carrier of the tannin in liquid form for impregnating the hides and skins, and may be effected by drumming or by painting or spraying the solution on one or both sides of the hides, pelts or the like. The subsequent step consists in steeping the impregnated hides or skins in an alkaline solution to close the pores in the hides or skins and so ensure permanent retention of the tannin therein.

As a result of this process which is completed within a fraction of the time required by any hitherto known method of tanning, not only is leather produced in a most economical manner but a decidedly improved product results through the process being carried out on a scientifically correct basis.

According to known methods of tanning the hides or pelts are actually immersed in large quantities of tanning liquid, and for a considerable time, but according to this invention, as an example, approximately only about 3½ gallons of tanning solution is employed for tanning 8 to 10 dozen sheep pelts (approximately 240 lbs. weight). Consequently, almost immediately after drumming has started the solution is entirely absorbed in the hides or pelts which after a drumming period of half an hour are removed in a practically dry condition, consequently there is no loss of hide substance and the full strength of the skin fibre is retained.

According to one form of the improved tanning process skins, hides and the like that have been previously bated and pickled in the preliminary fellmongery process are lifted from the sulphuric acid pickling solution and placed in a revolving drum containing the tanning solution, said solution incorporating the medium such as alcohol, for breaking down or reducing surface tension of such solution. If a soft leather is desired the solution may contain formalin and water, unsulphonated, vegetable, animal or mineral oil such as castor, olive, neat's-foot, fish or the like or sulphonated vegetable, animal or mineral oil such as sulphonated castor, olive, neat's-foot or fish oil, formalin, and if desired the solution may contain a filler such as French chalk to increase weight and hardness of the leather and make it suitable for boot soles and heels.

After a short period of treatment in said solution the hides or skins may be drummed in a solution cor taining an alkali to close the pores of the skin and retain the tanning ingredients in the fibre of the skin or hide which ensures lasting quality of same. As an example carbonate of soda or caustic soda or caustic potash may be used to produce alkalinity. The skins or hides thus thoroughly tanned throughout are removed from the drum and dried, the whole process taking less than one hour.

An example of the above described tanning solution employed may contain the ingredients and approximate relative proportion of same as follows:—

(1) Water 1½ gallons.
(2) Alcohol 1½ gallons.
(3) Formalin (40% concn. of formaldehyde) 3 pints.

If desired to produce softness in the leather the solution may also contain sulphonated or unsulphonated oil 5 pints. It may also contain a filler such as French chalk 4 lbs.

If the skins have been drawn from a pickling solution the sulphuric acid maintains open the pores of the skins or hides and the reduction of the surface tension of the solution by the action of an alcohol, which, owing to its comparative cheapness may be commercial methylated spirits, permits immediate penetration of the tanning solution throughout the fibre of the skins or hides. Furthermore when oil is used it ensures softness of the leather product and permits it to freely bend without fracture, and moreover it may dye same in certain shades.

After the hides or skins have been thoroughly impregnated during a short period of drumming with the above described solution, the skins or hides are placed in a solution containing an alkali such as carbonate of soda 5½ lbs., and water 1½ gallons and the drumming action continued for a further short period. Said alkali neutralizes the acid, renders the formalin basic and closes the pores of the tanned hide or skin.

It is to be understood that the proportions of liquids and materials stated in the example above given may vary and produce satisfactory results.

The product of the form of the process described is obtained in a very short period, as for instance 30 minutes, and is a substantially white or ivory colored leather of a character that is durable and lasting in color and can be readily colored by analine or vegetable dyes which may, if desired, be added to the solution used for tanning or applied after the tanning process has been completed.

According to a slight variation of the process above described known vegetable tanning extracts or substances such as chestnut extracts, sumach and the like may be added to the primary tanning solution which contains alcohol and formalin and subsequently the hides or skins are steeped in an alkaline solution.

Furthermore with reference to the first described form of the process if formalin is omitted from the tanning mixture incorporating oil or sulphonated oil, vegetable tanning extracts and alcohol or the like, it is not essential that an alkali be finally added to the mixture.

An example of the ingredients of a solution to tan 200 lbs. of pelt skins or hides may consist of the following in the approximate proportions stated.

15 lbs. chestnut extract.
1½ gallons methylated spirits.
½ gallon cold water.

To this solution may be added 4 lbs. sulphonated or unsulphonated oil if a soft leather is desired.

Furthermore to increase weight of the leather a filler such as French chalk may be added, and if desired the oil may be omitted.

It is to be understood that unsulphonated oil can be used in any of the mixtures described for the reason that the medium such as alcohol, for breaking down the surface tension satisfactorily emulsifies the oil.

The hides, skins and the like after absorbing the tanning solution are steeped in an alkali solution for a few minutes.

The tanning solution may also be sprayed, brushed or otherwise applied to one or both sides of the hides, skins, pelts or the like, and after the first portion of the process has been completed, a short interval is allowed before the hides or the like are similarly treated with a solution of carbonate of soda and water.

It is to be understood by the foregoing description of some forms of the improved process that primarily the successful result of the process is achieved by using a medium for reducing or breaking down the surface tension of the tanning solution, and it is desirable that the hides or skins do not contain an excess of water.

I claim:—

1. A process of tanning skins and hides which have been previously pickled, carried out in two steps within a period of one hour, the first step of which process consists in tanning the skins or hides by means of a solution containing a vegetable extract and alcohol and the second step of the process consists in drumming the tanned skins or hides in an alkaline solution to close the pores of the skins and hides and retain the tanning ingredients therein.

2. A process of tanning skins and hides which have been previously pickled, carried out in two steps within a period of one hour, the first step of which process consists in tanning the skins or

hides by means of a solution containing formalin, a vegetable extract and alcohol and the second step of the process consists in drumming the tanned skins or hides in an alkaline solution to close the pores of the skins and hides and retain the tanning ingredients therein.

3. A process of tanning skins and hides which have been previously pickled, carried out in two steps within a period of one hour, the first step of which process consists in tanning the skins or hides in a solution containing the following ingredients in approximately the proportions of formalin 1 quart, vegetable extract 15 pounds, oil 4 pounds, chalk 4 pounds, alcohol 1½ gallons, and cold water ½ gallon, and the second step of the process consists in steeping the tanned skins or hides in an alkaline solution to close the pores of the skins and hides and retain the tanning ingredients therein.

GEORGE FREEMAN LLOYD.