

UNITED STATES PATENT OFFICE.

ARTHUR EDWARD KELK, OF LOUISVILLE, KENTUCKY.

ART OF CONVERTING HIDES OR SKINS INTO LEATHER.

No. 881,246.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ARTHUR EDWARD KELK, a subject of Great Britain, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented new and useful Improvements in the Art of Converting Hides or Skins into Leather, of which the following is a specification.

It is well known that in the present processes of tanning, the hides or skins remain in the tanning liquor for about four to six months, this being the period required for said liquor to penetrate the hide and perform its function on all parts thereof. A process, or step of a process, which will materially reduce such time without injuriously affecting the product is, obviously, of the utmost importance for the reason that it will correspondingly reduce the cost of the production of the leather. Again, it is the practice in tanning processes to subject the hides to a depilatory step prior to the immersion of the same in the tanning bath. This step, as ordinarily practiced, consists in immersing the hides for several days in a bath of lime and water, which acts so to loosen the hair that the same may readily be scraped from the skin. After the hair has been thus removed it is necessary to wash the lime from the hide before it is immersed in the tanning liquor. The obviation of this depilatory step will also introduce economies in the production of the leather and is of obvious importance.

My present invention, therefore, has for one of its important objects the provision of certain improvements in processes of tanning which will materially reduce the time now required for the conversion of the hide or skin into leather without impairing the quality of the leather: and it has for a further important object the provision, in the art of converting hides or skins into leather, of a step or process which, without impairing the quality of the product, will act to loosen the hair and to shorten the time of tanning.

My invention is based on the discovery that hides subjected to the action of aqueous or other suitable solutions containing nicotin become much more permeable by, or susceptible to, the action of ordinary tanning

agents: so that a hide which has been "nicotinized", as it may be expressed for the sake of convenience, may be tanned in a much shorter period of time than otherwise. As to the exact nature of this facilitating action upon the hides or skins, I can state no definite theory. It may be that the pores are opened up, or it may be that some sort of chemical combination ensues between nicotin, or its compounds, and the hide fiber or gelatin, facilitating reaction with tanning agents subsequently, or it may be that nicotin really partially tans the fiber or gelatin. I have also discovered that it is possible so to use the solution containing nicotin, that it will serve the additional purpose of loosening the hair from the hide, and thereby obviate the necessity of employing another, or further, depilatory step in the process. These constitute several important features of the present invention. By "solution containing nicotin" as herein employed, is meant any suitable solution comprising nicotin in water or other menstruum, or a similar solution comprising a compound or compounds of nicotin, such as tobacco extract commonly so known.

I have found that among the materials which are suitable for my purposes are commercial tobacco extracts, well known in the trade as insecticides or sheep dips, but as many of such extracts have a stated low percentage of nicotin, which would require a comparatively large quantity thereof to produce the desired result, I prefer to use a solution which, so to speak, has been improved by purifying or removing non-nicotinous extractive substances in any suitable manner, even up to the point of producing a pure nicotin. Such very pure nicotin solutions, however, are at present unduly expensive, and a solution up to about ninety (90) per cent. purity, that is, with about ten (10) parts of other extractive matters to ninety (90) parts nicotin, has proved to be entirely satisfactory. Some of these extracts when alkaline contain some or all of the nicotin as such, that is, as free base, and others, which are neutral or acid, as nicotin salts. The particular state in which the nicotin exists, however, is not essential.

In the practice of my process I have found

that from half a pound to a pound and a half of nicotin suffices to treat one-hundred pounds of hide or skin, enough water being used with it to cover the hides or skins. To produce this bath, any of the commercial nicotins or tobacco extracts may be employed in proportions sufficient to yield the stated amounts of real nicotin, as determined by analysis. The foregoing quantities may be found to be excessive and may be varied without departing from the spirit of the invention.

I have found that thoroughly satisfactory results may be obtained from the use of a nicotin solution having the following composition as shown by analysis:

	Nicotin, alkaloid, $C_{10}H_{14}N_2$...	90.00
	Extractive matter, gum &c.	3.00
	Fat	1.00
20	Water	6.00
		100

The percentage of water may of course be increased without affecting the purity of the nicotin, for example the same solution may be diluted with water so as to analyze:

	Nicotin, alkaloid, $C_{10}H_{14}N_2$...	45.00
	Extractive matter, gum &c.	1.50
30	Fat50
	Water	53.00
		100

The solution referred to will put the raw hides or skins in such condition that the tanning process may be completely effected in from two weeks to three months. I have found that when the raw hides or skins are subjected to the nicotinizing treatment prior to the final step of tanning, it results in putting such hides or skins in such condition that the tan bark or other tanning liquor employed in the ordinary tanning processes is enabled to penetrate the hide or skin in from one-fourth to one-half of the time now required for such penetration.

The period of time required for the raw hides or skins to receive the most beneficial effect possible from the nicotin may vary, as may also the strength of the solution employed. It may be stated as a general rule, however, that with a solution of the strength hereinbefore named, immersion for about six hours is sufficient if the hair has been previously removed, but when it is desired to cause the depilation of the hide, said immersion should be prolonged to periods varying from twelve hours to three or four days, according to the nature of the hides under treatment.

While the invention has been particularly described as related to tanning processes, it

will be apparent that it will not be a departure from the spirit or scope thereof to employ it upon skins which are to be subjected to a tawing process, or any other process of treating hides or skins of which it may form a useful part or with which it may be usefully employed. The term tanning is used herein in its full generic sense, and as including all baths and materials with which the present invention may be usefully employed, whether said baths or materials include tannin or those used in tawing, or others employed in any suitable process of converting hides or skins into leather.

Having thus described the invention what I believe to be new and desire to secure by Letters Patent, is:—

1. In a process of converting hides or skins into leather, the step of nicotinizing the hide or skin prior to the completion of the tanning operation for the purpose specified.

2. In the manufacture of leather, the process which consists in treating a hide or skin to the action of a bath containing nicotin prior to the completion of the tanning operation.

3. In the manufacture of leather, the process which consists in treating a hide or skin to the action of a bath containing nicotin and prolonging the contact of hide and solution until the hair of the hide loosens.

4. In the manufacture of leather, the process which consists in subjecting the same to a solution containing nicotin, prior to the actual tanning operation.

5. In the manufacture of leather, the process which consists in subjecting the same to a solution containing nicotin, prior to the actual tanning operation and prolonging the contact of hide and solution until the hair of the hide loosens.

6. The process of making leather which consists in treating a hide with a solution containing nicotin and subsequently tanning the nicotinized hide.

7. The process of making leather which consists in treating a hide with a solution containing nicotin, prolonging the contact of hide and solution until the hair of the hide loosens and subsequently tanning the nicotinized hide.

8. In the manufacture of leather, the process which consists in treating hide or skin with a tobacco extract prior to the completion of the tanning operation.

9. In the manufacture of leather, the process which consists in treating hide or skin, prior to the completion of the tanning operation, with a nicotinous solution of approximately the strength indicated.

10. In the manufacture of leather, the process which consists in treating hide or

skin with a solution containing approximately not more than one pound of nicotin for a hundred pounds of hide or skin.

11. In the manufacture of leather, the
5 process which consists in treating the hide with nicotin, removing the hair and tanning the hide.

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

ARTHUR EDWARD KELK.

Witnesses:

SAMUEL K. BEARD,
M. BURKE.