

UNITED STATES PATENT OFFICE.

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TREATING HIDES OR SKINS.

SPECIFICATION forming part of Letters Patent No. 721,553, dated February 24, 1903.

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To all whom it may concern:

Be it known that I, SAMUEL K. FELTON, Jr., a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented
5 certain Improvements in Treating Hides or Skins, of which the following is a specification.

The object of my invention is to so conduct the process of unhairing hides or skins (including in this term the treatment preceding
10 "puring" or "bating") that said process will be improved and shortened and the hides or skins will be in better condition than usual for the bating and subsequent treatments and the finished leather will be tougher, stronger,
15 and cleaner than leather produced from hides or skins treated by the processes now in use.

My invention is applicable to the treatment of hides or skins generally of the class usually employed in the preparation of light
20 leather for the uppers of boots and shoes and like uses; but for convenience I will herein-after use the term "skin" to indicate the same.

In carrying out my invention I first soak
25 and "mill" the skins in the usual manner, and then for an ordinary pack of about six hundred pounds I slake one hundred and fifty pounds of lime, and during the process of slaking and while the lime is still hot I add
30 twenty-four pounds of red arsenic and thoroughly stir the mixture, to which after the same is cool I add water until it assumes the consistency of thin paste or cream. Each skin is then spread out and treated on the
35 flesh side with the compound thus produced, after which said skins are placed in a pile, flesh to flesh, and allowed to remain for about twenty-four hours, at which time the hair is so loosened that it can be readily removed
40 from the skin either by hand or machine.

The treatment of the flesh side of the skin may be effected by painting or daubing the same with the lime-and-arsenic compound if the same is in the form of a paste or by pass-
45 ing the flesh side of the skin in contact with the compound if the latter is in fluid condition, and the skins may be packed with the flesh side of one against that of another, or each skin may be folded with the flesh side in.

When the preservation of the hair or fleece 50 in good condition is not important, the application of the liming compound to the flesh side of the skin only need not be adhered to.

After being unhaird the skins are placed in a closed drum, into which is introduced a
55 solution consisting of ninety pounds of sulfid of sodium (Na_2S) dissolved in a few gallons of hot water, to which is then added enough water to make one hundred and fifty gallons, the temperature of the solution being pref-
60 erably from 90° to 100° Fahrenheit. The drum is then rotated for about two hours, after which the skins are removed and stacked in a pile, in which condition they are per-
65 mitted to remain for about twenty-four hours, and are then without washing removed to a receptacle and there subjected to the action of a solution of hyposulfite of soda or its equivalent—such as sulfite, bisulfite, &c.—
70 and after being thoroughly stirred about in such solution for a short time are permitted to remain therein for about twenty-four hours. In preparing this solution I dissolve ninety
75 pounds of commercial hyposulfite of soda (sodium thiosulfate $\text{Na}_2\text{S}_2\text{O}_3$) in sufficient water to dissolve the same and then add water sufficient to increase the solution to two hun-
80 dred and twenty-five gallons, the temperature of the solution being preferably about 60° Fahrenheit. By thus immediately following the sulfid-of-sodium treatment with the hy-
85 posulfite-of-soda treatment I secure all of the beneficial action of the sulfid-of-sodium with-
90 out any of its undesirable results.

The stock after the sulfid-of-sodium treat- 85 ment is swollen to its fullest extent, the fibers of the skins being differentiated into finer fibrils and the stock thoroughly opened up, the natural fat of the skins being converted into a soluble soap, which can be subsequently
90 washed out.

By subjecting the skins to the action of a sulfid-of-sodium solution after the same have been unhaird it naturally follows that no in-
95 jury to hair or fleece can result therefrom, as is liable to occur when the sodium sulfid is used in connection with the lime or before the unhairing operation. Moreover, I can use

a relatively weak sulfid solution, which will effect the desired "plumping" of the skin without injurious action upon the tissues.

After the hyposulfite treatment the skins
5 are "fleshed" by hand or machine and then placed in a vat which contains for each six hundred pounds of stock two hundred and ten pounds of lime and four and one-half pounds of red arsenic dissolved, as described
10 before, in a suitable amount of water, in which bath the skins remain for from two to five days, more or less, depending upon the character of the skins, after which they are removed, washed, pured, bated, drenched, or otherwise
15 treated as may be necessary to prepare them for tanning.

The hyposulfite treatment following the treatment with the sulfid of sodium has the effect of neutralizing the sulfid remaining
20 in the skin and preventing injury to the same by any subsequent washing to which it may be subjected. Such treatment, however, has the effect of leaving the skins in a condition which prevents the proper action there-
25 upon of the pure or bating compound subsequently applied thereto. This resistance to the action of the pure or bating compound I consider to be due to the presence of sulfur compounds in the skin, and the sub-
30 sequent treatment with lime and arsenic has the effect of removing or so diminishing these sulfur compounds that the objection due to their presence is overcome.

I have found that the proportions of materials which I have given, the temperatures prescribed, and the time of the various treat-
35 ments noted give the best results; but I do not wish to limit myself thereto, as all of these factors may be modified to a considerable extent without departing from the main
40 purpose of my invention.

Skins treated in accordance with my invention preparatory to tanning can be finished into what are known as "fancy colors" with
45 much better result than skins which have been subjected to the ordinary treatment preceding the treatment with the pure or bating compound.

Having thus described my invention, I claim and desire to secure by Letters Pat- 50 ent—

1. The within-described improvement in treating skins, which consists in subjecting them, after being limed, and unhaired, to the action of a sodium-sulfid bath, and then to 55 a hyposulfite-of-soda solution, substantially as specified.

2. The within-described improvement in treating skins which consists in subjecting them, after being limed and unhaired, to the 60 action of a sodium-sulfid bath, then to a hyposulfite-of-soda solution, and then to a desulfurizing treatment, substantially as specified.

3. The within-described improvement in 65 treating skins, which consists in applying to the flesh side of the skin a liming compound, then removing the hair, then subjecting the unhaired skin to a sodium-sulfid bath, and then to a hyposulfite-of-soda solution, sub- 70 stantially as specified.

4. The within-described improvement in treating skins which consists in applying to the flesh side of the skin a liming compound, then removing the hair, then subjecting the 75 unhaired skin to the action of a sodium-sulfid bath, then to a hyposulfite-of-soda solution, and then to a desulfurizing treatment, substantially as specified.

5. The within-described improvement in 80 treating skins, which consists in first applying to the flesh side of the same a compound of lime and arsenic, then removing the hair from the skin, then subjecting the unhaired skin to the action of a sodium-sulfid bath, 85 then to a hyposulfite-of-soda solution, and finally to the action of a bath containing lime and arsenic, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of 90 two subscribing witnesses.

SAMUEL K. FELTON, JR.

Witnesses:

WALTER CHISM,
JOS. H. KLEIN.