UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN TANNING LEATHER BY TANNIN AND ACIDS.

Specification forming part of Letters Patent No. **6,790**, dated October 16, 1849.

To all whom it may concern:

Be it known that I, HARMON HIBBARD, of the town of Henrietta, in the county of Monroe and State of New York, have invented new and useful Improvements in the Art of Tanning and Dressing Light Skins, such as are used in making leather for thin shoes, boots, gloves, mittens, linings, bindings, and similar purposes, of which the following is a specification.

The nature of my invention consists—

First. In the use of a composition of lime, wood-ashes, (or potash,) and salt for the purpose of removing hair or wool; also, for the purpose of "liming," so called, instead of using lime alone, as in the old method. Lime and ashes have been used separately for the purpose of removing hair, wool, grease, mucous, and other impurities from skins, also for the process called "liming;" but lime alone requires several days, and in cold weather weeks, to effect these several objects, so that the muscular fiber of the skin is often materially injured. On the other hand, ashes alone acts too rapidly, and would soon destroy the skin altogether; but when lime, ashes, and salt are combined in proper proportions the salt modifies the action of the alkalies and protects the skin from their caustic properties, so that the processes of unhairing and liming are both rendered more expeditious and safe than by the old method. The texture of the skins is injured much less, and consequently the leather is much stronger.

Second. In the use of a composition of salt, sulphuric acid, and sumac, oak-bark, or any other tannin for the process of tanning. The salt, sulphuric acid, and tannin being mixed together in water in certain proportions, hereinafter mentioned, a portion of the salt is decomposed by the sulphuric acid, forming sulphate of soda and setting muriatic acid free, which, (the muriatic acid,) being absorbed by the water, acts directly and rapidly on the skin, opening its pores, and prepares it for the tannin, which, being present also in the mixture, immediately and rapidly unites with the gelatine of the skin, forming leather more expeditiously and perfectly than by the old methods of tanning.

To enable others skilled in the art of tanning to use my invention, I will describe my method of proceeding.

I assort each kind of skins in parcels of equal size and thickness, so that they may undergo an equal operation of the different processes to which they may be subjected. The skins may be prepared for the tanning process after the usual method; but for removing the hair or wool and for the lining process, instead of lime alone, I use the following composition, which I shall denominate

Composition No. 1.—Fresh-slaked lime, one-half bushel; good wood-ashes, one-half bushel; chloride of sodium, three pounds; or for the wod-ashes substitute sixteen ounces of potash of commerce.

For removing the hair or wool the above composition No. 1 is to be mixed with water sufficient to make a thick paste, and applied to the fresh sides of the skins in the usual way, the skins to be folded and kept in a temperature of summer-heat. In a few hours they will be ready to pull.

For the lining process I use the same composition, No. 1, mixed with a sufficiency of water in a vat to immerse the number of skins proposed to be limed. One bushel of this mixture is about equivalent to one bushel of lime alone. The liming process should be conducted at a temperature between 40° and 50° Fahrenheit.

For gloves or thin leather with the grain on, the skins should be low limed with composition No. 1; but for white, russet, or morocco leather they should be high limed, and after liming in all cases should be thoroughly worked on the flesh and grain sides to free them of lime.

For buck or imitation of buckskins the skins should be very high limed and then frizzed, and after frizzing should be put into the composition again to plump them and to destroy the grease that may yet remain. Then work them well, flesh and grain, to free them of the lime, &c., and they need no drench or pure.

For the tanning process I make and use the following composition, say, for six dozens of full-sized sheep, deer, goat, or similar skins of similar size:

Composition No. 2.—Chloride of sodium,

eighteen pounds; sulphuric acid, two pounds; Sicily sumac or quercitron-bark, thirty-six pounds; muriatic acid, two ounces; dried clover, eighteen pounds; soft water, seventy-two gallons.

N. B.—The two ounces of muriatic acid of commerce is added to give a yellow tint to the leather, and when this tint is not desired the two ounces of muriatic acid may be omitted. For the dried clover, also, may be substituted wheat-bran or any other substance containing starch or mucilage. The insoluble materials should all be pulverized or ground and the soluble ones all dissolved, and the whole well blended together before being applied to the skins.

The skins being limed, cleaned, &c., as already described, those designed for shoe, morocco, russet, buck, or imitation of buckskins should be immersed in composition No. 2; or they may be sewed up and filled with said composition, as in morocco-tanning. It should be lukewarm. The skins may be filled several times till the tanning is completed. The process should commence with a weaker liquid and gradually increase to the full strength as above given till the process of tanning is perfected. For russet-leather substitute hemlock-bark for sumac.

For tanning white and thin leather for gloves, linings, bindings, &c., I add to the salt, sulphuric acid, and sumac acetate of lead and acetous oxide, and use the following proportions for six dozens of skins:

Composition No. 3.—Chloride of sodium, eighteen pounds; sulphuric acid, eighteen ounces; Sicily sumac, eighteen pounds; acetate of lead, three ounces; acetous acid, (vinegar,) three pints; soft water, seventy-two gallons. The skins may be immersed or sewed and filled with this composition, as already described in tanning morocco-leather.

Finishing process.—For shoe, morocco, white, and russet leather, after the skins are tanned as above described, then rip, strike them out, and hang them on the hooks in the shade to be dried in the atmosphere. Then dip and wet them in a weak solution of alum at a lukewarm temperature. When dry and fit to finish they should be put in season, then finished and colored by the usual method, according to the kind of leather required. For finishing buck and glove leather, take good soft soap, one quart; good lamp-oil, one-half pint; soft water, (warm,) one gallon. Mix and dissolve the soap in the water. With a sponge apply to the surface of the skins in a uniform manner. Next fold and pack them together till they are uniformly dampened or seasoned. In this state those designed for buck or glove leather must be milled or fulled, adding in the process a little sapo fluid to keep them damp. When sufficiently fulled wash with clean soft water, and when nearly dry work with a perch, moon-knife, and pumice-stone; but those skins designed for thin gloves and tanned with the grain on, after being thoroughly seasoned, as above described, must be washed in clean water, and when nearly dry should be shaved or finished with a perch, moon-knife, and pumice-stone.

Those skins designed to be blacked should be blacked and finished when nearly dry. For blacking use acetate of iron. Before applying it first give a light coat of a mixture of blood and potash to prevent the cold from striking through. To get a good black it may sometimes be necessary to give a coat of strong sumac-liquor before applying the acetate of iron.

Lime alone acts more slowly on animal fiber and grease than does potash; but potash of ashes, being more soluble and more caustic than lime, would, if used alone, act too violently and endanger the texture of the skin. The salt seems to modify the action of both, serves to protect the skin from the too caustic properties of the alkalies, and thus produces a stronger leather. By a due mixture of these materials we gain a more rapid process of lining and save the strength of the texture of the skin.

By the old methods of preparing skins for the tan the process of plumping or opening the pores of the skin is done before the application of the tannin. If much time intervenes between the liming, drenching, and tanning processes, the skins begin to fall or the pores to close, so that by the time they are put into the tan-vats their porosity is partially destroyed, and the tannin does not readily unite with the skin. But by my process the action of the muriatic acid, generated by the mixture of salt and sulphuric acid, is direct and at the very moment when the tannin is presented to the skin, so that the skin is being opened by the muriatic acid and sulphate of soda at the time the tanning process is going on. Hence the saving of time and material. The salt being in excess, the sulphuric acid decomposes only a portion of it, forming sulphate of soda and setting muriatic acid free. The sulphate of soda and muriatic acid tends to the same result—viz., to open the pores of the skin—while the excess of salt aids in the tanning process, producing a species of tanning, and adds greatly to the strength of the leather.

Glove-leather requires to be thin, soft, and elastic. The acetous acid makes it thin or prevents it from becoming thick. The acetate of lead renders it soft and silky. Being thin and soft, and care being taken that too much tannin is not used, its elasticity is secured.

What I claim, and desire to secure by Letters Patent, is—

1. The process of removing hair and wool from skins and of liming them preparatory to tanning by the use of the composition of lime, wood-ashes, and salt, called composition No. 1, in the manner above described; but I

do not claim either of these materials separately by itself.

2. The process of tanning skins by the use of tannin, in combination with muriatic acid, generated by a mixture of sulphuric acid and chloride of sodium in water with the tannin, in the manner substantially as above described.

3. The use of the acetate of lead in the above process of tanning, as described.

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Witnesses:
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