UNITED STATES PATENT OFFICE.

LEWIS CHEESEMAN, OF SCRANTON, PENNSYLVANIA.

METHOD OF REMOVING HAIR FROM HIDES.

945,221. Specification of Letters Patent. Patented Jan. 4, 1910.

No Drawing. Application filed September 16, 1907. Serial No. 393,210.

To all whom it may concern:

Be it known that I, LEWIS CHEESEMAN, a citizen of the United States, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented new and useful Improvements in Methods of Removing Hair from Hides, of which the following is a specification.

The object of my invention is the provision of an improved method of removing hair from hides preparatory to tanning the same, which method shall effect a saving in time and reduce the cost as compared with common methods now in use for a similar purpose.

I have ascertained that the animal fat acids at the base of the hair in a hide will be saponified by the action of hydrated oxid of barium forming salts miscible in water. The reaction effectively loosens the hair so that it will fall out or be easily removable.

To commercially and thus practically employ the hydrated oxid of barium for removing the hair from hides I have devised two specific methods. In carrying out the first specific method a bath is formed by adding barium sulfid to water. In the bath the barium sulfid is at once decomposed, forming a solution of hydrated oxid of barium and barium sulf-hydrate. To convert the barium sulf-hydrate into the hydrated oxid of barium, and so make available all the barium without any waste, sufficient lime, preferably in the form of milk of lime, is added to the bath, thus converting the sulf-hydrate into the hydrated oxid of barium.

The reaction upon the addition of the lime is as follows:

$$Ba(SH_2+(Ca(OH)_2)_2= Ba(OH)_2+(H_2O)_2+(CaS)_2.$$

The calcium sulfid is but slightly soluble in water, the greater portion forming a precipitate.

The original bath contains hydrate and sulf-hydrate of barium in equal proportions and is made to approximate a certain specific gravity, generally measured by a Twaddell hydrometer. 5° would be the strength suitable for use in a majority of cases, the specific gravity being slightly modified by circumstances. The amount of lime preferably as hydrated oxid of lime added should be sufficient to convert approximately all the sulf-hydrate of barium into hydrated oxid of barium. The amount will, of course, depend upon the size of the bath. To determine when sufficient lime has been added, from time to time a small quantity of the solution may be removed from the bath and treated in a small vessel with lime, and when this reagent fails to throw down a precipitate of sulfid of calcium sufficient lime has been added to effect the conversion of the sulf-hydrate of barium into the hydrated oxid. The quantity of lime to be added may also be determined experimentally by observing the effect of the solution upon the hides therein. When the hair fails to loosen obviously the hydrated oxid of barium has become exhauted or exists only in a small amount, and lime should be added until sufficient barium sulf-hydrate is converted into the hydrated oxid to loosen the hair. When the further attention of lime is not accompanied with the loosening of the hair the barium in the bath has become exhausted and a new bath is necessary.

The sulfid of barium may be produced by grinding the sulfate of barium to a fine powder, mixing it with fine coal, and roasting the mixture in a furnace, reducing the sulfate to sulfid.

The hides, whether green or salted or cured, are preferably soaked in water to soften them and to remove all dirt and chemicals, and then they are immersed in the bath and allowed to remain until the hydrated oxid of barium has acted upon the fat acids at the follicles or base of the hair and decomposed the same. The hides are then withdrawn from the bath and the hair which has not already fallen out removed in any convenient way. In some cases the hides prepared for the bath may be immersed in the primary solution containing the hydrated oxid of barium and the sulf-hydrate of barium, and when the hydrated oxid has become exhausted the lime or milk of lime be added to convert the sulf-hydrate into the hydrated oxid of barium.

In carrying out the second specific method a thorough mixture is formed of lime preferably as hydrated oxid of water slaked lime, barium sulfid, some inert finely ground material, such as sandstone, and a quantity of water sufficient to make a paste or composition of creamy consistency. Seventy four parts of hydrated oxid of lime, one hundred and sixty nine parts of barium

sulfid, and a sufficient quantity of the powdered material and water to form a paste will in practice constitute a desirable composition for the purpose intended.

The chemical reactions in the mixture are as follows:

$(BaS)_2 + (H_2O)_2 = Ba(OH)_2 + Ba(SH)_2$, and $Ba(SH)_2 + (Ca(OH)_2)_2 = (CaS)_2 + Ba(OH)_2 + (H_2O)_2$.

The hides having been cleaned and all chemicals removed, as in the first specific method, the paste is applied with a brush or otherwise to the fleshy side of the hides where it is allowed to remain until the depilation is effected. The action of the hydrated oxid of barium upon the fatty acids present at the roots of the hair is the same as hereinbefore specified.

From the foregoing description of the two specific methods of procedure it becomes clear that all the barium in the sulfid of barium is made available as hydrated oxid, and consequently great economy is attained which makes the method commercially successful.

It is well known that barium sulf-hydrate can be converted into barium hydrate by the action of calcium hydrate, but it remained for me to discover that a bath or paste for removing hair from hides and skins could be produced which would not disintegrate or destroy to an injurious degree the hair or hides present, thus obviating the difficulties met with in the prior art, by exposing the hides and skins to the action of a depilating bath or paste free to an injurious extent from active sulfur containing compounds of alkali or alkali earth metals, and that substantially all sulfur from compositions initially containing such sulfur containing compounds, as barium sulf-hydrate soluble or in solution could be rendered inert in the bath or paste by subjecting them to the action of calcium hydrate or substances capable of forming the same, such as lime and water, in sufficient quantity to convert substantially all of the sulfur into calcium sulfid, with calcium sulfid is practically insoluble in solutions of alkaline nature containing traces of calcium hydrate or more.

Superior results are obtained in employing the desulfurized depilators as before described and as revealed and claimed in the present application, in that barium hydrate free from sulfur containing compounds in an active state readily combines with and saponifies the fatty acid esters or salts surrounding the follicle of the hair, and converts the same into a miscible condition admitting of the ready removal or dislodgement of said hair, and without destroying the hair or the skin or hide to which the composition is applied for depilating purposes. By this procedure the saponifying action of the barium hydrate is not retarded nor the hair destroyed, as in compositions disclosed by the prior art, and which facts distinguish and differentiate my invention therefrom—particular attention being called to the fact that my depilating solution or paste contains no sulfur in an active state, the compositions of which retard the action and destroy the hair and skin in the prior art, the whole of the sulfur being rendered inert in the bath or paste in my method.

What I claim is:

1. The method of removing hair from hides consisting in treating the same with a composition of barium sulf-hydrate, barium hydrate, calcium oxid and water; the quantity of calcium hydroxid being sufficient only to convert substantially all the sulf-hydrate of barium into hydrated oxid of barium.

2. The method of removing hair from hides consisting in forming a composition containing sulfid of barium, adding thereto calcium oxid and water in proportions sufficient only to precipitate substantially all the sulfur therefrom, and thereafter subjecting the hides to the action of the residual compound.

3. The method of removing hair from hides consisting in forming a composition containing sulfid of barium and inert material, adding thereto calcium oxid and water in proportions sufficient only to precipitate substantially all the sulfur therefrom, and thereafter subjecting the hides to the action of the residual compound.

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

LEWIS CHEESEMAN.

Witnesses:
CHAS. H. WELLES, Jr.,
CHAS. D. SANDERSON.