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METHOD AND APPARATUS FOR TANNING LEATHER

Filed April 17, 1930

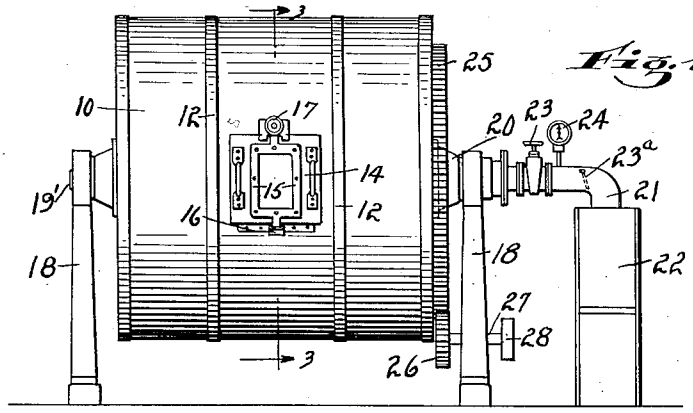


Fig. 1.

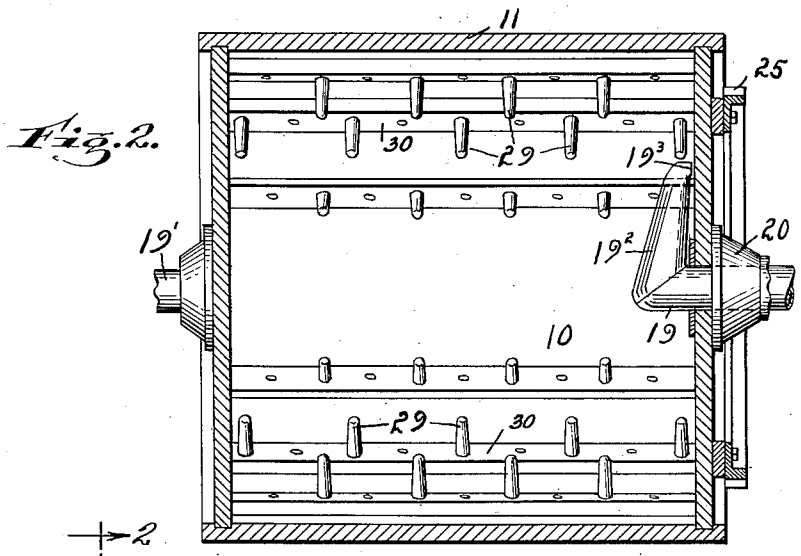


Fig. 2.

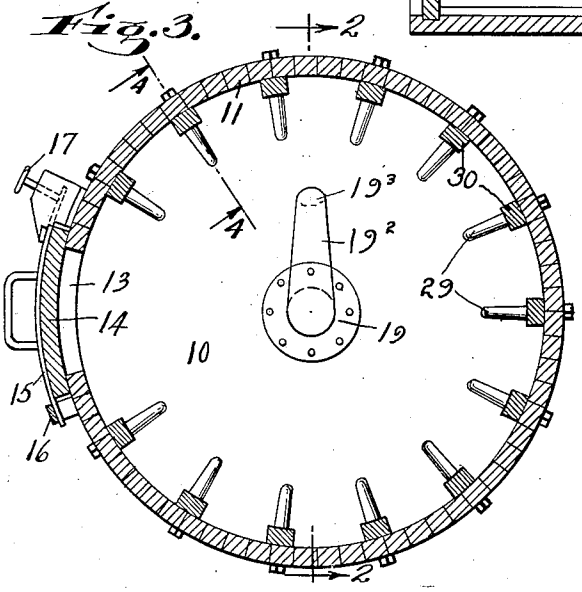


Fig. 3.

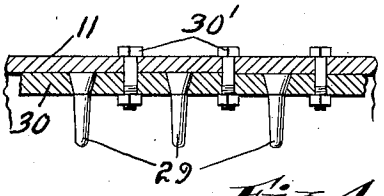


Fig. 4.

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UNITED STATES PATENT OFFICE

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METHOD AND APPARATUS FOR TANNING LEATHER

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The present invention relates to a method and apparatus for tanning leather such as sole leather, belting and harness leather.

Tanning of leather in drums is well known but the leather so produced is for most part of inferior quality, dark in color, having a brittle and weak grain and being short in fibre. The chief reason for these defects is that this leather has been rotated and run too long in the tanning drum which causes the leather to acquire these defects. Furthermore, the finished leather will show all sorts of damage markings resulting from the shearing of the grain during the period of rotation in the drum.

One object of my invention is to simplify the drum tanning method and to make a leather which will not have the defects above named and which will be of a fine quality.

A second object is to provide a tanning method in which the tanning time will be reduced considerably.

A further object is to provide special new tanning apparatus for carrying out my new method.

Yet another object is to provide means for increasing the life of the tanning apparatus.

With the above and other objects in view my invention consists in the novel method and the novel combination, arrangement and constructions of elements to be hereinafter described.

In the drawing which forms part of this specification and in which similar reference characters denote corresponding parts:—

Fig. 1 is a front elevation of the new tanning drum.

Fig. 2 is a section along line 2—2 of Fig. 3 seen in the direction of the arrows;

Fig. 3 is a full section along line 3—3 of Fig. 1 also seen in the direction of the arrows; and

Fig. 4 is a partial sectional view along line 4—4 of Fig. 2.

The process by which my hides are tanned comprises the following steps. After the hides have been limed and treated to remove the hair and surplus flesh they are placed in a bath containing substantially for every 100 quarts of water, 250 grams of potassium chromate, 200 grams of boric acid, 250 grams of sulphuric acid or an equivalent amount of similarly acting acid such as 180 grams of formic acid or 210 grams of butyric acid, and to the bath may be added about 50 grams of glycerine. The hides are soaked in this bath for from about 12 to 24 hours. By this treatment in the bath the hides are in the first place delimed and cleaned without any loss of hide substances and secondly, they are rendered insensitive to injury by the highly concentrated tanning liquids which are to be used in the tanning method and on the other hand are rendered very receptive of the tanning materials in said liquids.

Upon removal of said skins from the said bath they are placed into a suitable reinforced vessel to be presently described, which contains a tanning solution of 12 to 14° Baumé and said vessel is kept in rotation. During the treatment in the tanning vessel injurious gases such as carbon dioxide are formed which render the leather brittle. To eliminate the harmful effect of the said gases, they are continuously withdrawn from said vessel.

It is possible because of the pretreatment given the skins to complete the tanning process in a period of from 12 to 16 ho and the product derived therefrom is of the best quality equal to that hitherto produced by the long drawn out complicated tanning processes.

In addition there is a great saving of tanning material which in long lasting treatments are lost because of the carbonic acid formed. Since in the applicant's process the carbon dioxide is removed as formed, the tanning materials last longer. Further, there is a large saving of hide substances which previously were destroyed or dissolved by all the hitherto known treatments of deliming the same in preparation for the regular tanning treatments.

For carrying out the tanning portion of my process, I have invented a new type of tanning drum which is illustrated in the drawing.

My drum comprises a cylindrical barrel 10

made up of wooden staves 11 or of other suitable material suitably bound together by bands 12 of steel or the like. A suitable opening 13 is provided for charging said drum and a door or gate 14 which is adapted to hermetically seal said opening after a charge is inserted into said drum is provided. A cross bar 15, which at one end engages in a loop 16 is provided on the outside of said drum and at the other end is adapted to be tightened by suitable means such as bolt 17 to the said drum, may serve to clamp said door to so hermetically seal said opening.

The drum is adapted to be rotatably mounted between two standards 18 by means of a hollow axle 19 mounted at one end of said drum and a second axle 19′ at the other end and having their projecting ends suitably journaled in said standards. Said hollow axle 19 is provided at its interior projecting end with an upwardly extending tubular portion 19^2 interiorly of said drum and having an opening 19^3 at its upper end near the end wall of said drum. The other end of said axle 19 is connected through a suitable stuffing box arrangement 20 to an exhaust pump line 21 which connects with an exhaust pump 22. In said pump line is a valve 23^a which is adapted to open automatically when the exhaust pump operates and to close immediately when the latter ceases to operate. A second manually operated valve 23 for opening and closing the exhaust line may be provided. A suitable gauge 24 for determining the pressure in said drum may be mounted in said line 21. The pipe 19^2 remains stationary while the drum rotates.

The drum is adapted to be rotated through means of a large gear 25 which may be fixed to one end of said drum and which meshes with another gear 26 which is keyed to a shaft 27 which may be mounted in one of the standards 18 and which may be driven through a suitable belt pulley 28 fixed to said shaft. Any other drive may be employed if desired. The drum is designed to rotate with a speed of at least from 8 to 12 revolutions per minute.

Interiorly of said drum I provide means for picking up and carrying the hides to the top of the tank so that when said hides fall from said top into the tanning solution penetration of said tanning materials into said hides is made easier. The means I provide for accomplishing this comprise pin members 29 of a length of 8 to 12 inches which are adapted to project into the said drum.

In order to prevent danger of leakage which would occur if the pins were mounted directly into the staves of the drum I provide a novel manner of mounting the same. A plurality of said pin members 29 are mounted in a shelf 30 in any suitable manner and then the shelf itself is rigidly mounted to the drum on the inside by firmly bolting it to latter as by means of a plurality of evenly spaced bolts 30′. A plurality of said shelves are mounted in said drum at spaced intervals and to produce a staggered effect of said pins, alternate shelves may have different numbers of pins mounted thereon as for instance, 4 pins and 5 pins on said respective shelves. By the new pin mounting arrangement the strain on each pin is not directly borne by the stave and the danger of leaks, which used to occur when the pins were mounted directly in holes in the staves, has been eliminated. This is of importance because the tanning operation goes on at reduced pressure resulting from the continuous exhaust of the gases from the drum.

By the provision of the large sized pins, hitherto pins have not exceeded 6 inches in length, the skins are kept in continuous agitation and the tanning process is carried on at a very rapid rate. There is no injury to the skins due to the frictional heat developed because of their previous special pretreatment as described above.

It will be seen therefore that by the provision of the special pretreating process, the provision of the special new drum wherein the injurious gases may be continuously removed as they form, and by the provision of the special pin arrangement in the drums that it is possible to produce very quickly a leather of the highest quality.

My invention may be modified in many ways and I do not wish to be limited to the details shown and described.

What I claim is:—

1. In a rotatable tanning drum, means for lifting the hide contents thereof, said means comprising a plurality of inwardly projecting pin members mounted on shelves inside said drum, said pin members being over six inches in length and said shelves being directly attached to the drum wall.

2. In a rotatable tanning drum, means for hermetically sealing the same, means for removing gases from said drum and maintaining the interior thereof at reduced pressure and means in said drum for lifting the hides therein, said means comprising pin members mounted to shelves, said shelves being fastened directly into said drum wall.

3. In a tanning drum as per claim 2, in which said gas removing means includes a hollow shaft on which said drum rotates, said shaft having an upwardly extending portion with an opening at its top inside said drum.

4. In a rotatable tanning drum, means for rotating said drum, the latter being adapted to rotate at more than six revolutions per minute, means for withdrawing gases therefrom as they form during the tanning process and means for lifting the hides in said drum, said last named means including a plurality of pins more than six inches long mounted on a

plurality of shelves, said shelves being directly attached to said drum.

5. Apparatus for tanning hides comprising a drum, means for rotatably mounting said drum including a hollow axle, evacuating means for withdrawing gases from said drum connected to the outer end of said hollow axle, and an upwardly extending hollow arm connected to the inner end of said axle, through which said gases are withdrawn, means for rotating said drum and means inside of said drum for lifting the hides therein, said last named means comprising a plurality of inwardly projecting pin members more than six inches long mounted on shelves, said shelves being directly attached to said drum.

6. Apparatus for tanning hides comprising a drum, means for rotatably mounting said drum including a hollow axle on which is rotatably mounted one end of said drum, evacuating means for withdrawing gases from said drum connected to the outer end of said hollow axle and an upwardly extending hollow arm open at its upper end connected to the inner end of said axle, means for rotating said drum, the latter being adapted to rotate at more than six revolutions per minute and means inside of said drum for lifting the hides therein, said last named means comprising a plurality of inwardly projecting pin members mounted on shelves, said shelves being directly attached to said drum.

In testimony whereof I affix my signature.

CHARLES KANNEL.