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E. S. & D. Bell

Preparing Hides.

Patented July 28, 1834.

Fig 2.

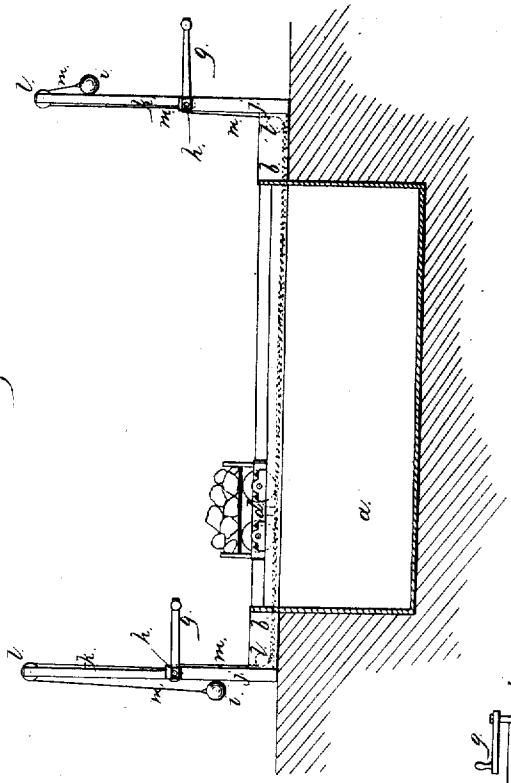
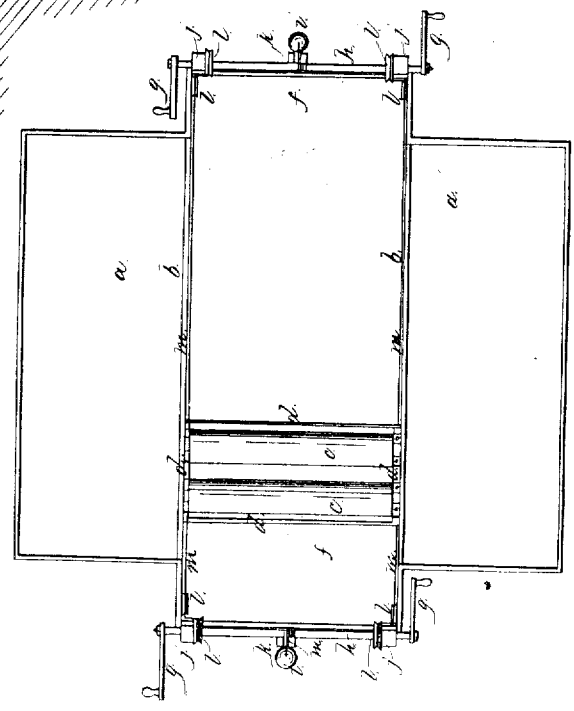


Fig 1.



N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

July 28. 1834

Edward J. Bell and Daniel Bell. Smithfield Virginia

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Letters Patent

The Schedule referred to in these Letters Patent and making part of the same containing a description in the words of the said Edward J. Bell and Daniel Bell themselves of their improvement in the process of tanning hides and skins

To all to whom these presents shall come.

Be it known that We Edward J. and Daniel Bell of Smithfield in the County of Jefferson and State of Virginia have invented a new and useful improvement in the process of tanning hides and skins and that the following is a full and exact description of the construction and operation of the said improvement as invented by us

The objects contemplated by our improvement are 1st softening the hides or skins and freeing them from grease &c. 2nd expanding the hides from the state preparatory to their receiving the tan 3d Freeing the tannine or tanning principle from the ooze from by filtering — 4th causing the tanning lixivium more readily to enter the hides or skins by the use of mechanical compression of the hides or skins under the surface of the ooze or out of the ooze thereby shortening the operation.

1st. First, for softening the hides — To every 200 cubic feet of water add 2½ pounds of caustic or unslacked lime (Quicklime) 10 pounds of Carbonate of potash and 1 pound of Carbonate of soda. These are made to dissolve by stirring them well. This mixture affords a pure alkaline liquor in which the hides are suspended or immersed in the usual manner. and they will become completely softened and the grease neutralized in 24 or 36 hours.

2nd. For expanding the hides commonly tan-liquor. To every 100 cubic feet of pure water add one pound tartaric acid and one pound Sulphuric acid in which suspend or immerse the hides in the usual manner. and a complete expansion

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will take place in say eight hours. Third to procure pure tannin liquorium by filtering the ooze. When the ooze obtained from the bark by any of the usual methods found most convenient either by heat or otherwise has sufficient time to acidify and settle it is thrown upon a filter in form resembling an ash or common hair form hopper with about eight inches of raw cotton at the bottom and sides and then filled in to its top with the fine inner parts of the exhausted bark or efferentan. This filter should of course be placed in the most convenient position for receiving the ooze from the receiver by a cock and by delivering in like manner the pure tannin liquorium which nearly alone passes through it into the proper vessel from which it is to be drawn for use.

Fourth. The compression of the hides under the surface of the ooze or out of the ooze containing liquorium. This may be effected in various ways. The method which we have found to be most convenient for composing under ooze is described as follows. a substantial smooth level wooden platform say 16 feet long by 6 feet wide (or the dimensions as also all others here given may be made to suit the size of the skins &c) is constructed and being supported at the ends on strong feet or pillars or mason work so as to raise it about 2 feet from the floor or ground. near the middle and on opposite sides of the platform are placed two vats having a heater in each of sufficient depth and breadth to admit the skins being suspended therein and sunk in the floor so as to bring their top edge six or eight inches above the surface of the platform. The edges of the vats next to the platform being on a level with it and joined thereto water tight (or the vats may be continuous under the platform forming but one vessel and therefore requiring but one heater) so that by the addition of an edge board six or eight inches high raised on the margin of the platform except where it connects with the vats when they are filled with ooze or liquor to the height of their highest edges the liquid will have flown over the platform and will stand to the depth of six or eight inches upon it. Vats as in accompanying

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to the edges of the platform that adjoin the coats two ways or guides are constructed on the upper surface thereof and running its whole length nearly. these guides are intended to direct the rollers herein after mentioned and at both ends of each are small leading pulleys for uses hereafter explained. Two wooden brass or copper rollers of ten or twelve inches diameter and of a length equal to the distance between the guides are placed crosswise on the platform their journals (if wooden rollers) should be brass or copper and are to be fixed in two substantial wooden bridges or end pieces upon which latter are raised two upright cross frames which serve as bearings to support a heavy weight (which may be diminished or altogether dispensed with by the use of metallic rollers are used) placed on a plane that joins their upright angles also at the centre of each of these bridges and on their outside an arm is ~~formed~~ let in and firmly secured which descends to within a short distance of the surface of the platform for the purpose of attaching four strong cords two to each arm. that run in opposite directions along the outside of the guides. to the leading pulleys above mentioned. their use being to draw the rollers and their incumbent weight back and forth on the platform. At each end of the platform and immediately behind the leading pulleys uprights are raised that form the bearings of two transverse shafts ~~for~~ having a pulley on each end inside of the bearings placed in a line with the leading pulleys above mentioned to which the cords above mentioned are attached and around which they are wound up at one end of the platform at the same time that they unwind at the other by which contrivance by turning two cranks placed on the extremities of each shaft the shaft may be put in motion and the rollers and weight drawn alternately from one end of the platform to the other with great facility. for the purpose of taking up the slacks of the cords additional cords are attached to the centre of the shafts each of which after two turns remain around the shafts passes upward over small sheaves in the uppers extremity of a small portable

from the end of the platform descending on the other side and has a sufficient weight attached thereto. Operation. The vats on either side of the platform are filled to within 4 or 6 inches with the tanning liquirium (obtained as above directed) which by means of the heaters we raise to 98° degrees of Farenheit — or blood heat the temperature which we apply to the hides in all the mixtures herein described) the hides after being prepared for tanning are suspended therein. Then each taken in its turn and one or more spread out smoothly on the platform between the guides the rollers are passed over it or them back and forth (varying its or their position if necessary) a number of times proportionable to its thickness or their thickness by which operation any watery or foreign substance that may occupy its or their pores are pressed out it or they are then drawn over the edge of the platform without lifting out of the liquid which must be avoided as much as possible (if pressed under ooze) and suspended in the vat where they are suffered to expand which they do in 6 or 8 hours and by the act of expansion or swelling the pores and ducts &c are charged with the tanning liquirium which having deposited its tannin the succeeding pressure of the rollers expels the exhausted or watery part that now only remains and prepares them to receive fresh charge, and so with every compression and expansion until the process of tanning is completed or so much of it as that liquor is deemed capable of performing. after which it or they are taken to a stronger where they are treated in like manner, and thence again to a stronger until the operation is finished which for heavy leather takes place in 6 or 8 weeks and for light skins from 6 to 14 days. For the purpose of economising time and labour we place a series of platforms & vats in their continuation so as to enable the workmen to commence the operation at the first or weakest, which should mark from 1 to 2 degrees on the hydrometer, and bring the hides out perfectly tanned at the last or strongest marking from 6 to 8 degrees. However a little experience and observation will point out the best practical course better than any written directions on the subject. It is necessary to remark that the weight used for compression must be according to the thickness of the hides and be light-
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and as the tanning progress. This also must be committed to the judgment of the operator — Now What We claim as new and our invention is. First. The mixture or compound of the ingredients as herein described for softening the hides and neutralizing the grease — Second the mixture or compound of the ingredients as herein described for expanding or swelling the hides preparatory to saturating the tanning liquor — Third. The procuring the pure tanning liquor by filtering the ooze as herein described — Fourth — the compressing the hides separately or collectively by mechanical means under the ooze or out of the ooze and suffering them to expand alternately or so as to cause the tanning liquor to enter and to expell it when exhausted and also the apparatus or machine herein described to be used for that purpose.

In testimony that the foregoing is a true description of our said invention or improvement We have hereunto subscribed our names this 22nd day of July 1834.

Witness
S. B. Caty
Nath[l] Seargin

Edward S. Hall
Daniel Hall

Exd.

Drawing

1836 Mar 6

Patented July 28. 1834