No. 742,115. PATENTED OCT. 20, 1903.

W. T. FORBES.

APPARATUS FOR CONTINUOUSLY TANNING, BLEACHING, SCOURING, AND OILING LEATHER.

APPLICATION FILED SEPT. 29, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. I.

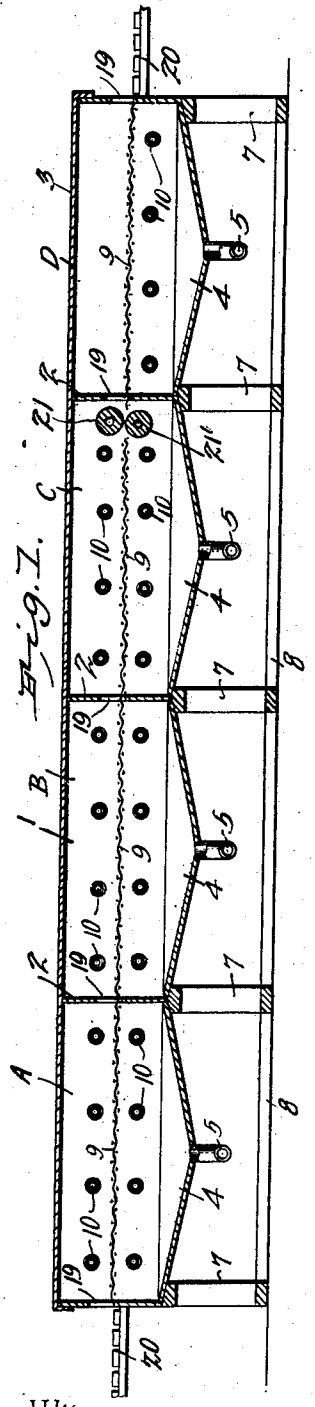
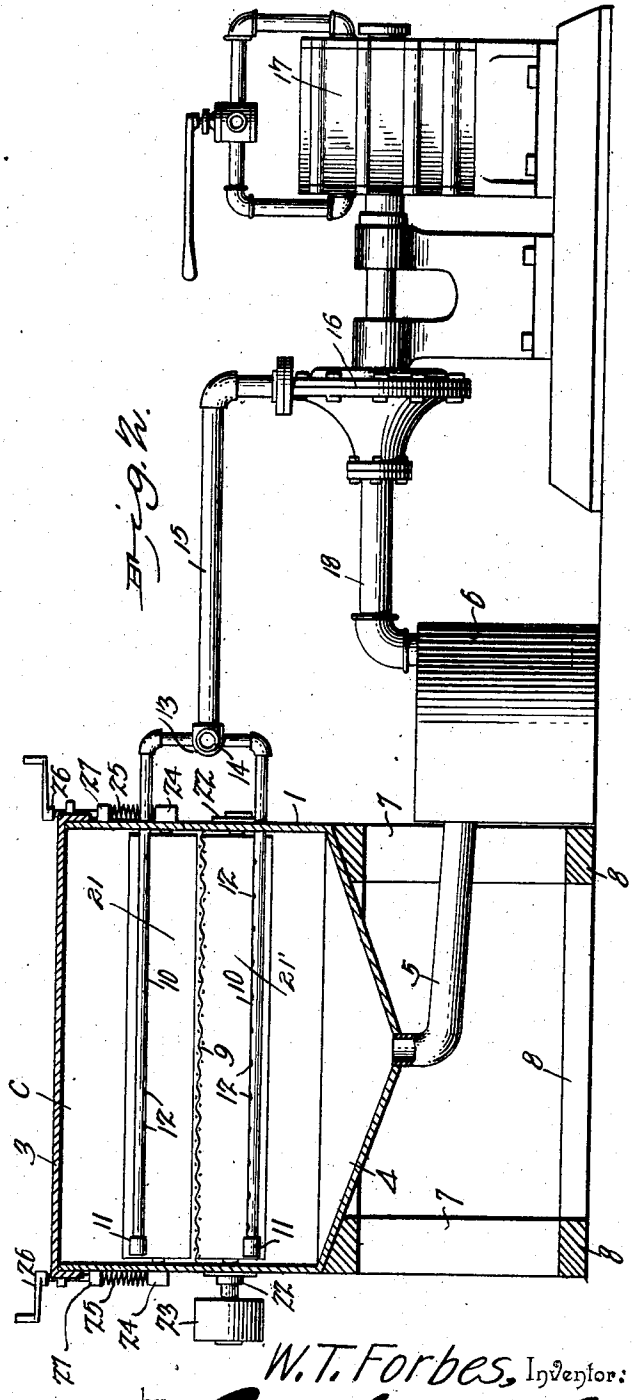


Fig. II.



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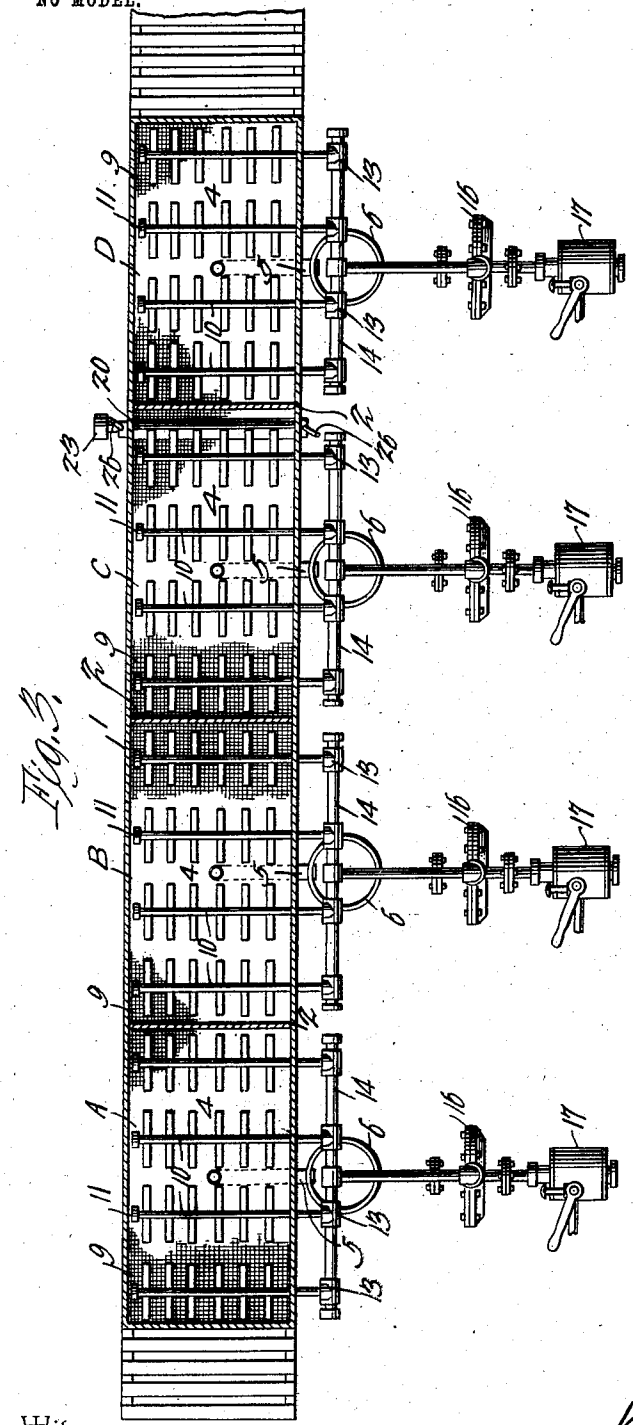


Fig. 3.

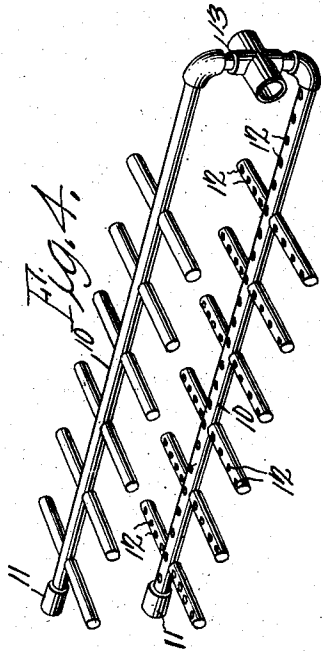


Fig. 4.

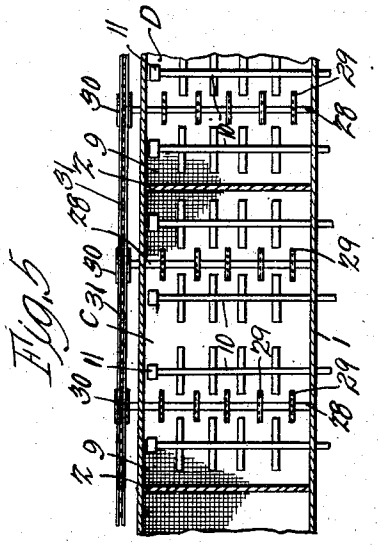


Fig. 5.

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No. 742,115. Patented October 20, 1903.

UNITED STATES PATENT OFFICE.

WALTER T. FORBES, OF COLLEGEPARK, GEORGIA.

APPARATUS FOR CONTINUOUSLY TANNING, BLEACHING, SCOURING, AND OILING LEATHER.

SPECIFICATION forming part of Letters Patent No. 742,115, dated October 20, 1903.

Application filed September 29, 1902. Serial No. 125,275. (No model.)

To all whom it may concern:

Be it known that I, WALTER T. FORBES, a citizen of the United States, residing at Collegepark, in the county of Fulton and State of Georgia, have invented a new and useful Apparatus for Continuously Tanning, Bleaching, Scouring, and Oiling Leather, of which the following is a specification.

This invention relates to a process of and apparatus for scouring, washing, and bleaching heavy leather or for washing, tanning, and oiling and dyeing such leather.

The object of the invention is in a ready, rapid, thoroughly-feasible, and practical manner and without the necessity of handling the leather either to effect scouring, washing, and bleaching thereof, or, if preferred, the tanning, oiling, and dyeing, or merely the scouring and washing of leather.

With these and other objects in view, as will appear as the nature of the invention is better understood, the same consists in the novel construction and combination of parts of an apparatus for carrying into effect the above-named steps and in the process of treating leather, as will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which like characters of reference indicate corresponding parts, there is illustrated one form of embodiment of the invention capable of carrying the same into practical operation, it being understood that the elements therein exhibited may be varied or changed as to shape, proportion, and exact manner of assemblage without departing from the spirit thereof, and in these drawings—

Figure 1 is a view in sectional elevation of an apparatus embodying the essential features of the present invention. Fig. 2 is a view in transverse section, showing more particularly the arrangement of the engine and pumping mechanism with relation to the apparatus. Fig. 3 is a view in top plan, the roof of the apparatus being removed. Fig. 4 is a perspective detail view of one of the spraying devices. Fig. 5 is a view in plan of a slightly-modified form of mechanism for feeding the skins or hides through the apparatus.

The essential feature of the present invention is the continuous treatment of leather or skins either to effect scouring, washing, bleaching, and oiling thereof or tanning, oiling, and dyeing, the same apparatus being adapted for either purpose merely by a change in the agents employed. The agents are to be sprayed under high pressure against the surfaces of the skin or side, thereby to cause rapid assimilation by the skin or leather of the agents. As stated, the operation is continuous—that is to say, a skin or side of leather is not removed from the apparatus from the start to the finish of the procedure, but is moved in a step-by-step manner from one vat or tank into another one until all of the steps have been completed. Under these conditions, as will be apparent, handling of the skins or hides is obviated, all the attendant has to do being to keep the different agents employed at the proper strength.

Referring now to the drawings, 1 designates a chamber divided by partitions 2—in this instance, into four compartments or tanks, in each of which a different step in the procedure is effected. The chamber may be made of any suitable material, preferably of a non-corrosive metal, and is provided with a top 3, which may be hinged to the chamber to permit of its being turned back, if desired, for the purpose of gaining access to the interior of the chamber. The bottoms 4 of the compartments are by preference hopper-shaped, and at the apex of each bottom is connected a pipe 5, which communicates with a vat 6, containing the agent, there being a separate and independent vat for each compartment. The chamber is herein shown as supported by uprights 7, secured to a suitable foundation 8. For convenience of description the compartments will be hereinafter referred to under the reference-letters A, B, C, and D.

Arranged in a horizontal plane within the compartments and preferably about midway of the height thereof is a screen 9, which is designed to support the skins or sides while being subjected to treatment, and above and below the screens in each of the compartments, except compartment D, there are arranged a plurality of spray-pipes 10, disposed transversely of the compartments, one end of each of the pipes being closed by a cap or plug 11, as clearly shown in Fig. 4. The op-

posed faces of these pipes are provided with jet-orifices 12, through which the liquor is discharged in fine sprays or jets upon the skin or leather to be treated. In this instance eight of these pipes are shown in each compartment, except in compartment D, which has but four, and these disposed below the skin for a purpose that will presently appear. The pairs of pipes are connected through unions 13 with a feed-pipe 14, there being one of these feed-pipes to each compartment, and these feed-pipes connect through branch pipes 15 with pumps 16, preferably of the rotary type and driven by an engine 17, also of the rotary type, although any other form of engine may be employed that may be found preferable, or the pump-shafts may be driven from a belt connecting with a suitable source of power. With each pump there is connected a pipe 18, which dips down into one of the vats 6, the purpose of this arrangement being to permit constant reuse of the agents by withdrawing them from the vats, spraying them into the compartments, and then returning them to the vats through the pipes 5, tapped into the bottom of the compartments.

The reason for providing but four spray-pipes in compartment D and disposing these beneath the screen is that it is designed in this compartment to oil or dye the grained side of the leather, and as this side is generally disposed downward the spray-pipes are disposed beneath the screen in order that superfluous oil or dye will drop down upon the bottom of compartment D and be conserved for reuse.

The ends of the chamber as well as the partitions are provided with transverse slots 19, through which the skins or sides pass from one compartment to another, there being a slatted platform 20 at each end of the chamber to support the sides or skins before entry into and after passing from the chamber.

The step of rolling the leather either before or after oiling or dyeing is necessary, and to effect this there is a pair of pressure-rollers 21 and 21′, arranged within the compartment C adjacent to its discharge end, as clearly shown in Fig. 1. The lower roller 21′ has a shaft arranged in fixed bearings 22 in the sides of the chamber and carries a pulley 23, around which passes a belt to a suitable source of power. The upper roller 21 has the ends of its shaft mounted in spring-pressed boxes 24, by which arrangement the said roller will automatically adjust itself to hides or skins of different thicknesses, springs 25, associated with the bearings of the roller 21 and being adjustable to various tensions through the medium of cranks 26 and followers 27, bearing on the upper ends of the springs, operating to vary the pressure between the rollers as may be desired. It is to be understood that the means herein shown for increasing or diminishing the pressure of the roller 21 with relation to the roller 21′ is one of many that may be employed, and the invention is not to be limited to the construction shown.

In the form of apparatus shown in Figs. 1 and 2 the hides or skins are linked or otherwise secured together and may be moved through the apparatus by attaching ropes to the forward skin of the series and passing these out through the slot at the rear end of the apparatus, and after the said forward skin reaches the compartment D the feeding of the chain of skins or sides through the apparatus may readily be effected. If, however, it be preferred to feed these skins separately or independently of each other through the apparatus, this may be effected by the provision of a plurality of transverse shafts 28 in each compartment, as shown in Fig. 5, said shafts bearing toothed wheels 29, adapted to bite into the flesh side of the skin or hide, and thus move it from compartment to compartment. One end of each of these shafts carries a sprocket-wheel 30, around which passes a sprocket-chain 31, to be driven in any suitable manner.

Where the apparatus is used for scouring, washing, bleaching, and oil-spraying the leather, the vat or compartment A will be supplied with a suitable detergent, such as carbonate of soda and water in the proportion of about one pound of the soda to one hundred and fifty gallons of water. The vat or compartment B will be continuously supplied with water, that of compartment C with a sumac solution of about 10° barkometer, and that of compartment D with oil. The skins or sides are first passed to compartment A, where they are thoroughly scoured, thence to compartment B, where they are washed, thence to compartment C, where they are bleached by the sumac solution, and thence to compartment D, where they are oiled on the grained side. These operations are continuous, and by reason of the high pressure at which the agents are projected against the leather the various steps are accomplished in the shortest space of time and with the best results.

Where the leather is to be tanned, oiled, and dyed, the skins immediately after depilation are passed to compartment A, where they are subjected to the action of a water-spray on one or both sides to remove the lime. They are then passed to compartment B, where they are subjected to treatment by a chrome tanning-liquor sprayed against them, as described. They are then passed to compartment C, where they may receive treatment from a tannic-acid bath under spray-pressure, and thence to compartment D, where they are oiled, having been previously rolled in the manner before described, or, if preferred, the leather may first be oiled, then rolled, and then dyed.

It is to be understood that all of the steps herein defined are not necessary at all times, as in some instances the process may stop after scouring and washing, or after scour-

ing, washing, and oiling, or after bleaching, the procedure observed being governed by the demand for the leather.

If preferred, the limed skins may be passed through the apparatus and be unhaired by water-pressure.

While the apparatus of this invention is exceedingly simple of construction, it will be found thoroughly efficient in use for the purpose designed and may be relied upon for carrying out the various steps described in a rapid and thoroughly satisfactory manner.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An apparatus of the class described, comprising a plurality of compartments, horizontally-arranged leather-supporting means disposed therein, liquid-spraying devices arranged adjacent to the leather-supporting means, and mechanism for circulating the tanning or other agents employed, under high pressure, through the compartments.

2. An apparatus of the class described, comprising a plurality of connected compartments, open-work leather-supporting means arranged within the compartments, liquid-spraying devices arranged adjacent to the leather-supporting means and discharging toward the same, means for supplying liquid under pressure to the spraying devices, and leather-rolling mechanism disposed adjacent to the end of one of the compartments.

3. An apparatus of the class described, comprising a plurality of communicating chambers, horizontally-disposed open-work leather-supporting means arranged within the compartments, liquid-spraying devices disposed above and below the leather-supporting means in each of the compartments but one, a liquid-containing vat for each of the compartments, a force-pump communicating with each of the vats and with the liquid-spraying devices, and a conduit connecting the bottom of each of the compartments with the vats.

4. An apparatus of the class described, comprising a plurality of communicating chambers, open-work leather-supporting means arranged therein, automatically-adjustable leather-rolling mechanism disposed in one of the compartments, spraying devices arranged in each of the compartments, and means for supplying the agents employed, under pressure, to each of the spraying devices.

5. An apparatus of the class described, comprising a plurality of communicating chambers, open-work leather-supporting means arranged therein, and positively-driven mechanism for feeding the leather from one compartment to the other throughout the apparatus.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WALTER T. FORBES.

Witnesses:

WARREN G. LEWIS,

ANDREW FITZ.