

# UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN UTILIZING SOUR TAN-LIQUOR BY DISTILLATION FOR PLUMPING HIDES.

Specification forming part of Letters Patent No. **195,790**, dated October 2, 1877; application filed August 3, 1877.

*To all whom it may concern:*

Be it known that I, HENRY J. BOTCHFORD, of the town of Leyden, county of Lewis, and State of New York, have discovered a new and useful process for economizing and utilizing the waste liquors which come from the vat in the process of tanning hides into leather, which process is set forth in the following specification.

The barks of many wooded plants, shrubs, and trees, when subject to infusion or decoction, yield, among other soluble virtues, a substance known in the arts as "tannin," and in chemistry as tannic acid, and it is to this principle, held in solution, that the tanner looks for the accomplishment of his art in the preparation of leather from the raw hide, the act of tanning being the combining of the gelatine of the skin with the tannic acid held in solution in the liquors used by the artisan.

In practical work these solutions of the tannin, after a short time, become changed in their character and nature, and the resultant is a liquid in which we find tannic, gallic, and acetic acids in varying proportions, combined with decaying vegetable and putrescent animal matter, the presence of the latter substances seriously interfering with the exhibition of those active principles which the tanner seeks to utilize from his liquors.

In the heavier class of hides, those which are used to manufacture sole-leather, after the hide has been relieved of its hair and properly "fleshed," it is subjected to a process technically termed "plumping"—*i. e.*, extending the fiber of the skin, so as to permit the tannin to have fuller access to the gelatine of the same.

There are at present two methods in common use by which this plumping is accomplished. In one of these the tanning-liquor, which has been in use for some time, and in which the gallic and acetic acids have been developed, is made use of under the name of "tailings," or sour liquor, and in which the rawhide is first placed. This is the slower and more tedious method, and attended with some risks to the leather.

The second method is to steep the hides in a cold dilute sulphuric-acid liquor. But while the latter method expedites the work, it has the effect to render the leather harsh, liable to be brittle, and to give a dark grain to the same, it being conceded by all practical tanners that the process in which the plumping is wrought by the presence of the acetic or aceto-gallic acid principle in the tailings is far preferable, could the same be divested of the trouble arising from the aforementioned animal and vegetable substances present in all tanning-liquors which have been used for any length of time.

This is just what is proposed in my discovery, in which I take the sour liquors and subject them to a distillation in a still suitably constructed, by which the acetic and gallic acids are recovered in a pure form, freed from the other substances of the liquors. The distillate thus resulting is now taken, and, in a properly dilute form, is again used as a liquid in which the plumping of the hides may be very expeditiously and satisfactorily accomplished.

In practical working of this process the distillation is best accomplished by the use of a still in which the liquors from which the acid products are to be recovered are heated by means of a steam-worm coiled within the body of the retort containing the said liquors, the vapors of the acids thus liberated being conducted from the head of the retort through a tubular condenser whose temperature is maintained at a sufficiently low point for the proper condensation of the acid vapors by surrounding the same with water at a low degree of heat. Yet the discoverer herewith distinctly disavows any novelty in the form of apparatus made use of, as the vaporization of the acid products and their recovery from the sour liquors constitute the merits of the process, and not the appliances by which the result may be accomplished, as any apparatus ordinarily termed a "still" will answer, so long as its materials are arranged to be proof against the attack of the acids to be recovered, and the heat of which can be maintained equally.

Having thus described my discovery and its workings, what I claim as novel, and desire to secure by Letters Patent, is—

The distillation, from the sour liquors of the tanner's vat, by the ordinary process of evaporation and condensation of the same, of the acetic and gallic and aceto-gallic acids therein contained, and the immediate utilization of

the resultant in their solutions for the plumping of hides in the process of tanning into leather.

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Witnesses:

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