

boiled with quick lime in water, for the purpose of extracting the colouring matter, and separating its fibres. Castic potash, soda, or ammonia may be employed for this purpose instead of lime."

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*Specification of the mode of extracting Tannin from Bark. Patented by JOSEPH GILES, of Guildford, Vermont. April 11, 1827.*

*Specification.*—This lixivium, or tanning principle, is obtained by soaking and digesting the proper materials, such as fine ground oak, or hemlock bark, &c. in an apparatus designed particularly for the purpose: that is to say, I take twelve leaches or vats, of any convenient capacity, each filled with ground bark, and so placed, as to draw by a cock, with suitable convenience, from each of the twelve leaches into one common receiver; I then place one cistern above the leaches, so as to draw from said cistern, into all the twelve leaches. Into this said upper cistern, I have a common engine for generating steam, operating so as to heat the liquor therein, to a boiling heat; which liquor, thus heated, I draw upon and fill the first of the said twelve leaches. I take care in filling the leaches with ground bark, that it be loose and be not crowded; but so that the liquor will freely fill the whole leach, and become saturated with the tanning principle of the bark; after thus lying upon the bark, and soaking it a convenient time, I draw it from the leach into the receiver; I then pump it from the receiver, back in the cistern, and heat it again with the steam engine, as before; then I draw the liquor upon the second leach, and while it is soaking there, I heat water, or weak liquor, drawn from the leach, after the first process, and draw the same from the cistern upon the first leach; I then draw the strong liquor from the second leach, into the receiver, and from thence, pump it again, into the cistern; I again heat it as before, and then draw it upon the third leach, and so continue the liquor—repeating the process through the whole twelve leaches, following on with the second, and third, and sometimes fourth addition, to the first leach—taking care that none of the weak liquor or subsequent runnings become mixed with the first running and strong lixivium. As often as the tanning principle becomes entirely exhausted from the leach in any of the leaches, throw away the leach, and fill with fresh. By continuing this process, I reduce the entire tanning principle and strength of three, and even four cords of the best bark, into one hogshead of tanning lixivium. I then add two pounds of saltpetre, and one pound of common salt, to each hogshead of my lixivium, and bung it up, air-tight, for use.

One hogshead of this lixivium will, in three days time, sufficiently tan five dozen of calf-skins, and heavy skins and hides, in the same proportion. In addition to the great saving of time, and labour of workmen, produced by the use of this powerful lixivium, the leather will be more completely tanned, will weigh heavier, will be more

solid and close, and be less subject to be soaked with water, and grow spongy, than leather tanned in the ordinary manner.

This lixivium, may also be usefully applied to cables, to all sorts of ropes, sails, canvass, and the tackle of ships, made from hemp, or flax: charged and impregnated with this principle, they will support a greater weight, obtain a greater strength, will wear longer and smoother than the common tanned rope or cable. It may be transported to all parts of the United States in a perfect state of preservation, and be at all times ready for use, either for tanning, or other purposes, and thus, supersede the use of bark in the ordinary way.

JOSEPH GILES.

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*Specification of an improved mode of impressing figures on the rollers for calico printers, by etching; invented by DAVID H. MASON and MATTHIAS W. BALDWIN, of Philadelphia.*

THE former method of making these mills was by punches, with figures of rosets, leaves, circles, pins, or other figures. The punches having on them the figure or device required, are driven into the steel cylinders or mill, and the metal raised up by the punch is faced off, and the parts united and trimmed with a graver; or the whole figure or device was cut in with a graver.

The improvement of the petitioners consists in *etching* the device on the mill, which we do in the following manner: A steel cylinder or mill is prepared, of suitable size, with pivots or journals, in the usual manner of making such mills; the mill is then coated with varnish, or etching ground, such as is used by engravers for covering their plates, in etching; the device is then traced through the varnish or etching ground, with an etching needle, or steel point: the device being thus traced, the pivots or journals are coated with a varnish made with asphaltum and spirits of turpentine, so as to prevent the acid from acting on the mill except where the device has been marked through the varnish with the etching needle, or steel point; the mill is then immersed in a prepared acid, in making which, we use the same kind of acid (*viz.* aqua fortis, or nitrous acid,) which is used for etching on copper; but are careful not to have any copper in it. Our mode of preparing the acid is as follows: we dilute the acid in the proportion of four or five of spring water, to one of acid, and then dissolve in it as much tinfoil, or block tin, as it will take up, or until it ceases to effervesce; while in this operation, it must be in a bottle with the stopper out: this mixture is diluted in the proportion of from eight to fifteen parts of water, to one of the acid used in the first instance, according to the kind of work to be etched. For coarse work, the prepared acid should be strong; and for delicate work, it should be weak. This prepared acid is managed, in all respects, as nitrous acid is managed, by engravers on copper, except that generally, in the prepared acid, there are no bubbles by its action on the steel.

This process may be performed by any of the other preparations