

UNITED STATES PATENT OFFICE.

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PROCESS FOR PREPARING WOOD FOR MAKING PAPER-PULP.

SPECIFICATION forming part of Letters Patent No. 227,647, dated May 18, 1880.

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To all whom it may concern:

Be it known that I, WILLIAM R. PATRICK, of Marinette, in the county of Marinette and State of Wisconsin, have invented a certain new and useful Improvement in Processes for Preparing Wood for Making Paper - Pulp, which is fully described in the following specification.

My invention relates to a process of preparing wood for grinding in the manufacture of wood paper-pulp.

My invention consists in subjecting the wood to the combined action of hot water admitted through a sprinkling device to the top of the wood and steam admitted to the bottom of the same.

The mode of carrying out my process will be hereinafter fully described, and the special improvement, which is believed to be new, pointed out definitely in the claim.

I am aware that, for the purpose of preparing wood for grinding in the manufacture of wood paper-pulp, the wood has been boiled in water, either with or without the addition of chemicals, and has also been subjected to the action of hot water introduced into the tank containing it under pressure. In processes of this nature, if water alone is used, considerable time is required to thoroughly saturate and cleanse the wood of all injurious substances; and if it is boiled, or the water remains in the tank, the wood is more or less discolored and impaired for use in the manufacture of paper by contact with the water charged with the injurious matter washed out of the wood.

The object of my invention is to obviate both of these difficulties by shortening the time required for thorough cleansing of the wood and producing a clean white stock.

The wood is cut and prepared in the usual form for processes of this nature, and is then packed in a tank or chest of suitable construction, which is closed except the openings for the admission and outlet of water and steam, as hereinafter described.

In the top of the tank, or in any suitable location above the body of the wood, a perforated plate or other suitable sprinkling device is arranged, upon which the hot water is admitted, and through which it passes in a sprinkle

or spray upon the wood below. The water should be of about a boiling temperature, or somewhat below. As it is sprinkled upon the wood it gradually passes through the body, thoroughly saturating and softening the separate pieces and washing out all impurities. At the same time steam is introduced into the tank below or underneath the wood-body by means of suitable steam-pipes introduced into the bottom of the tank, and provided with suitable perforations through which the steam may flow out into the wood. The steam should be ordinary live steam, and its action upon the wood is more rapid than that of water in softening the wood and dissolving the resin, acids, &c., which are taken up by the water and carried off.

The tank is provided with a suitable opening at or near the bottom thereof, through which the water charged with the injurious substances removed from the wood is discharged as freely and rapidly as it flows into the tank. No pressure is used either in the introduction of the water or the steam, except such as is necessarily attendant upon the supply of steam to the tank—that is, the steam is not superheated or under high pressure, but is simply live steam discharged by free inlets into the bottom of the tank. The steam, mingling with the water, also keeps the latter hot during its entire passage through the wood, and the temperature throughout the mass will be about the same, as the water is, of course, hottest at the top, where admitted, and the steam at the bottom, where admitted.

This process is exceedingly efficient, and will satisfactorily prepare the wood for grinding in a very short time, and at the same time the stock will be clean and pure and suitable for the manufacture of white or nearly white paper, for the reason that the water with the injurious substances washed out of the wood is discharged continuously from the tank, while clean water is at the same time admitted above.

The process is applicable to the preparation of woods of all kinds; but, as is well known, the softer woods, like pine, poplar, &c., are more generally used for the manufacture of paper-pulp than others, and can be more readily prepared by this process. The operation

should be continued until the wood is thoroughly softened and cleaned, when it is ready for the grinding-machine.

5 The tank, if desired, may be provided with a safety-valve to relieve from undue pressure, if accidentally any should be occasioned by the too free admission of steam.

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

In the manufacture of wood paper-pulp, the herein-described process for softening and

cleansing the wood before grinding the same, consisting in placing the wood in a closed tank and subjecting it to the combined action of hot water admitted through a sprinkler to the top of the wood-body and steam admitted to the bottom of the wood-body, substantially as and for the purposes set forth. 5

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Witnesses:

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