

# UNITED STATES PATENT OFFICE.

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## MANUFACTURE OF SHEETS OF VENEER.

SPECIFICATION forming part of Letters Patent No. 348,051, dated August 24, 1886.

Application filed October 7, 1885. Serial No. 179,361. (No model.)

*To all whom it may concern:*

Be it known that I, LEIGHTON PINE, a citizen of the United States, residing at South Bend, in the county of St. Joseph and State of Indiana, have invented certain new and useful Improvements in the Manufacture of Sheets or Veneers of Wood, of which the following is a specification.

In the manufacture of what is known as "built-up" wood-work--such as is used in sewing-machine tables and other furniture--the boards from which the furniture is made are composed of several layers of thin material firmly glued together, the different layers being so placed relative to each other that the grain of the wood in one layer will cross the grain in the contiguous layers, thereby preventing warping and splitting of the resulting work. In the preparation of these sheets or layers of wood, (which are known as "veneers,") the logs from which they are cut are first boiled or steamed, and are then placed in a cutting-machine, which either cuts off the sheets of the desired thickness around the logs or slices them off the sides of the logs, according to the action of the machine used. Logs of all kinds vary in texture, some portions being much softer than others, owing to the irregular growth of the trees, the fiber being comparatively open and spongy in some places and close and hard in others. The boiling or steaming to which the logs are subjected has less effect on the close fiber or hard spots than on the open fiber or soft spots; and in cutting, the knives of the cutting-machines naturally run deeper into the soft than into the hard places in the wood, so that the cut sheets are more or less irregular in thickness. After being cut the sheets are next dried, and this drying, whether done in the open air or in a kiln or between steam-heated plates, makes the sheets hard and brittle, curls or warps them seriously, and renders it difficult to glue them solidly together in making the built-up boards, as the thin spots in some sheets frequently fail to come into direct contact with the surfaces of the adjacent sheets, thus resulting in blisters in the glued wood. The moisture that is absorbed by the logs during boiling or steaming mixes with the albumen of the sap of the wood, and the drying of the

cut sheets, when done in the open air, is a lengthy process, owing to the large quantity of moisture that has to be evaporated, and kiln or steam-plate drying is so expensive as to be objectionable; but while any process of drying will evaporate the water held in the cut sheets the albumen of the wood is retained therein, filling the pores and making the sheets hard and brittle, so that it is difficult to handle the dried sheets without breaking them. The albumen also renders the sheets more or less repellant to the moisture of the glue, so that defective work is liable to result.

The object of my invention is to obviate these existing difficulties. This I accomplish by passing the wet sheets of wood, as they come from the cutting-machines, between rollers, which are preferably of metal and made solid. The rollers are rigidly secured a distance apart about equal to two-thirds of the thickness of the sheets to be rolled. Thus for rolling sheets that are three-sixteenths of an inch in thickness the rollers are separated one-eighth of an inch. In placing the sheets between the rollers they are preferably entered with the grain of the wood running lengthwise of the rollers. When so placed between the rollers, the sheets resume about their usual thickness in drying; but if rolled with the grain of the wood transverse to or crosswise of the rollers the sheets remain about as thin, when dried, as they first came from the rollers. Several advantageous results are secured by this rolling process to which the sheets of wood are subjected. Most of the water is squeezed out of the wood, carrying with it much of the albumen of the sap, so that the rolled sheets dry much more quickly than unrolled sheets, thereby saving time, if the drying is done in the open air, and saving both time and fuel if the drying is effected by artificial heat. As the fiber of the wood is crushed by the rolling its continuity is broken and warping is prevented, and as nearly all of the albumen is squeezed out of the wood with the water, the sheets, when dry, are soft and pliable, so that they will lie flat while being glued, and are not liable to be broken by handling. Moreover, the rolling process reduces the irregularities in the thickness of the sheets caused in cutting and due to soft



and hard places in the wood, and the sheets being thus reduced to a uniform thickness the trouble from blistering in the built-up work is avoided. The rolling also destroys the tenacity of knots and other irregular places in the wood, so that they occasion little or no trouble in the subsequent working of the wood, the solid knots in the sheets that have not been rolled being liable to round up in drying, causing defects in the work.

It will be obvious that my invention is more particularly useful in connection with woods containing considerable albumen in the sap and which are known in the art as "gum-woods;" but it may be advantageously practiced in connection with all kinds of veneers used in the manufacture of built-up work, and also for other purposes.

I am aware that it is not broadly new to hasten the drying and seasoning of lumber by passing boards or planks lengthwise between pressure-rolls for the purpose of removing the sap and rendering them compact and dense. I am also aware that sheets or veneers of wood have heretofore been subjected to pressure in rolling, for the purpose of straightening or flattening them; and also that veneers have, in a measure, been rendered pliable by being passed lengthwise between hot rollers for the purpose of forming a calendered surface, and at the same time compressing them to render them compact. In all of these instances, however, the wood after being rolled remained permanently condensed, for the reason that pressure was applied at right angles to the grain or fiber; but by the practice of my method, as hereinbefore described, certain advantages not heretofore attained are secured. By rolling the veneers while the fiber of the wood is yet filled with the water absorbed during the process of boiling or steaming the logs, and while the sap of the wood is thus still diluted by the artificially-added moisture, I am enabled to remove the objectionable albuminous gum more perfectly than would be possible if the wood contained only the natural moisture of the sap, the latter and the added moisture being expelled together by the process of rolling the veneers while wet. As it is this albuminous gum in the sap which renders the veneers, when dry, hard and brittle, so that they have a tendency to shed the glue and to break easily

when being handled, it is obvious that the more fully it is removed the softer and more pliable the veneers will be. Moreover, it has been demonstrated by the practice of my method that the veneers resume their original thickness in the drying or seasoning subsequent to the rolling when they have been passed between the rollers with the grain or fiber of the wood lengthwise of the rollers. As the condensation of the wood in rolling is about one-third, and as it is desirable not to lose this amount in the thickness of the work when making the veneers into the built-up boards, this saving in the thickness of material is an important advantage. It is also obvious that as the veneers thus spring back to their original thickness they will be softer and more pliable than they would be if they remained permanently condensed, and they are thus better adapted to absorb the glue and to be handled without being broken in working. A considerable advantage thus results from rolling the veneers with the grain lengthwise of the rollers, instead of crosswise of the rollers, as heretofore practiced.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The method hereinbefore described of removing the albuminous sap or gum from sheets or veneers of wood and of rendering such veneers soft and pliable and of a uniform thickness and texture, consisting in diluting the sap or gum by applying steam or water to the wood and then expelling the sap and the added moisture from the sheets or veneers by passing the latter while artificially wet between pressure-rolls, substantially as set forth.

2. The method hereinbefore described of removing the albuminous sap or gum from sheets or veneers of wood and of rendering such veneers soft and pliable and of a uniform thickness and texture, consisting in passing the sheets or veneers while artificially wet between pressure-rollers with the grain of the wood lengthwise of the rollers, substantially as set forth.

In testimony whereof I affix my signature in the presence of two witnesses.

LEIGHTON PINE.

Witnesses:

S. F. ALLEN,  
FRANK P. CANNANY.