

UNITED STATES PATENT OFFICE.

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ART OF TREATING WOOD FOR LUMBER.

No. 901,096.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM A. HALL, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented or discovered certain new and useful Improvements in the Art of Treating Wood for Lumber, of which the following is a specification.

This invention has for its object to produce, from comparatively inexpensive woods, products closely resembling black walnut, mahogany, or other high-priced woods, both in appearance and texture, as also to render the same fireproof. This object is accomplished by a novel method of treating the inexpensive woods so as to give them the appearance and texture, throughout their bodies, of the more costly woods, this being in contradistinction to the more common method of making imitations of the high-priced woods merely by surface finishings with substances which do not penetrate throughout the body of the wood.

Attempts have heretofore been made to produce imitations of mahogany and other high-priced woods, from less expensive hard woods, of such a character that the appearance and texture of the bodies of the woods were changed throughout, so that the wood, in being treated as lumber, could be worked up into any desired shape or in the manufacture of any desired articles. In these attempts, however, various difficulties have been encountered, so that such low priced woods, colored throughout to resemble the high-priced woods, have never been successfully produced commercially, so far as I am informed, and consequently have never gone into actual practical use.

My invention has for its object to overcome the difficulties heretofore encountered in this line, and in this I have been so far successful that my improved process is now in commercial use on a large scale with the prospects of great increase or extent, so that large quantities of lumber made from the cheaper woods, but having the appearance and texture of high-priced woods, are now available in the market.

In carrying the invention or discovery into effect the green lumber is preferably first sawed into boards, planks, flitches or deals of any convenient size, and is then dried as

thoroughly as practicable, either by seasoning in the open air, or by kiln-drying, or by both. It is then subjected, in a closed receptacle, to the action of a vacuum above twenty-five inches of mercury, and which will be sufficiently powerful and sufficiently long continued to remove from the wood practically all the air therein contained, so as to make it absorbent or receptive to the fluids to be later applied. It is found preferable, during the vacuum process, to subject the wood to a moderate heat of approximately 90° F., which has a tendency to open the pores and enable a better withdrawal of the air with a vacuum pump.

Any desired coloring or coloring and fireproofing solutions are then drawn or pumped into the receptacle, while the vacuum is maintained, until the receptacle is full. These solutions may be applied either hot, warm or cold, according to their characteristics, and the solutions are absorbed more or less rapidly by the absorbent wood or lumber from which the air has been withdrawn by the vacuum process. As soon as the receptacle is completely filled with the solution a high hydraulic or air pressure (preferably from 300 to 800 pounds to the square inch) is applied and maintained until the wood is impregnated to as great a degree as possible, the time required for this varying from two or three hours to twenty-four hours, according to the thickness and hardness of the lumber under treatment and the amount of pressure maintained. This pressure causes the coloring or coloring and fireproofing solutions to completely impregnate the more porous portions of the wood, and, to some extent, the body or denser portions of the wood. If the wood be removed from the receptacle at this stage, and dried out, the coloring is not uniform throughout, but is deeper in the grain cells and in the more porous portions of the wood than it is in the denser portions, giving the wood a more or less mottled or grained appearance, which, for some purposes, is desirable. In order, however, to give the wood a more uniform color throughout, whereby the more dense portions are colored very much the same as are the more porous portions, it has been found desirable or necessary to boil the wood for a short time, under considerable pressure and at a high temperature; not long

enough, however, to impair the strength of the wood, but just long enough to diffuse the coloring matter in the solution throughout all portions of the wood, dense as well as porous, or
 5 hard as well as soft. This boiling process will preferably be carried on at temperatures considerably over 212° F., and preferably at temperatures ranging from 225° to 280° F. It is
 10 found desirable not to subject the wood to this high temperature until after the coloring matter is distributed throughout the more porous portions of the wood by the high pressure, as otherwise the action of the high temperature is likely to precipitate or affect some
 15 of the coloring matters used, and it is not desirable to so affect them until they are quite well distributed throughout the wood.

Any suitable coloring materials or solutions may be employed to artificially color
 20 the wood, according to the colors which it may be desired that the lumber should have. For example, if it be desired to produce an imitation mahogany, a liquid coloring matter, which will preferably contain spruce bark
 25 extract, hemlock bark extract, or mahogany bark extract, will be employed; and for the production of this imitation mahogany yellow birch is considered the most suitable inexpensive hard wood to employ for this purpose, in that the grain or texture of this wood
 30 is quite similar to mahogany, particularly after having been treated as above described, and finally dried out or seasoned.

If it be desired to render the colored lumber fireproof any suitable fireproofing salts, as
 35 tungstate of soda or phosphate of ammonia, may be mixed with the coloring liquid and thus be forced into the wood simultaneously with the coloring matter.

40 In carrying out the improved process it has been found essential that the wood should be thoroughly dried or seasoned before attempting to force the coloring matter into the same, as any moisture in any parts of the wood has
 45 a tendency to resist the entrance of the coloring solution and thereby prevent a uniform coloring of the wood throughout.

The boiling or cooking process, by which the coloring matter is uniformly diffused throughout
 50 out the wood, being effected at a high temperature of over 212° F. renders the wood darker than it would be if carried on at low temperatures, and thus deep shades can be secured with the use of comparatively little

coloring matter, thereby not only saving coloring material but really securing darker shades than would otherwise result.

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

1. In the art of treating wood for lumber, 60 that improvement which consists in subjecting dry wood to the action of a vacuum in a closed receptacle for the purpose of removing the air therefrom, then forcing a coloring solution into and throughout the wood by a
 65 high pressure, and then boiling the colored wood to diffuse the coloring matter in the wood and thus give the colored product a practically uniform shade throughout.

2. In the art of treating wood for lumber, 70 that improvement which consists in subjecting dry wood to the simultaneous action of a vacuum and a moderate heat in a closed receptacle, for the purpose of removing the air therefrom, then forcing a coloring solution
 75 into and throughout the wood by high pressure, and then cooking or boiling the wood to diffuse the coloring matter throughout the body of the same.

3. In the art of treating wood for lumber, 80 that improvement which consists in subjecting dry wood to a vacuum process in a closed tank or receptacle, for the purpose of removing the air therefrom, then introducing a coloring solution into the tank or receptacle
 85 and applying a high pressure to the tank or receptacle for the purpose of forcing the coloring material into and partially throughout the wood, and then boiling the wood under considerable pressure and at a high temperature
 90 to diffuse the coloring matter throughout the body of the same and darken the shades of color.

4. The herein described artificially colored wood the entire body of which is impreg- 95 nated with a coloring material foreign to the natural wood and which coloring material is spread or uniformly diffused throughout the texture of the wood; thus avoiding streaky appearance and giving the colored wood a
 100 uniform shade.

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

WILLIAM A. HALL.

Witnesses:

JOHN C. McCUSKER,
 C. M. SWEENEY.