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TREATMENT OF WOOD

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This invention relates to an improved method of treating wood with anti-fungal and anti-bacterial treating agents.

Wood veneer employed for the manufacture of wire-bound crates and boxes, such as those commonly employed for the shipment of produce, is preferably used in a condition in which it has a high moisture content. The high moisture content makes the wood more flexible and tougher than wood of the same thickness in a dry condition. However, when moist wood is employed, molds and other fungi tend to grow on the surface of the wood, discoloring the containers and tending to make them aesthetically objectionable for the packaging of foodstuffs.

Accordingly, various germicidal and fungicidal agents have been employed in the prior art for the control of mold growth in moist wood. Such materials include pentachlorophenol and other phenols, 8-hydroxy quinolates such as zinc and copper quinolates, borax, and organotin compounds such as tri-alkyltin salts of a type taught in U.S. 2,580,473 to Sowa et al.

It has been found that for any treatment of freshly cut raw wood with an anti-fugal agent to be effective, the wood must be treated soon after cutting, that is within about 4–8 hours. When fungicides and fungistats in low concentrations are properly applied within about 4 hours of cutting, no fungal sporulation occurs. However, treatment of green wood with anti-fungal agents long after cutting will not permit effective control of mold growth without the use of excessively large quantities of treating agent. This is undesirable from the point of view of economy and possible transfer of the treating agent from the treated wood to neighboring materials.

Drying the green wood is an alternative to the rapid treatment of the wood with anti-fungal agents. It the wood is thorough dried, sporulation is inhibited. The wood can later be treated with anti-fungal and anti-bacterial agents at convenience.

The present invention relates to the treatment of dried wood with anti-fungal agents of the type described above. In particular, the applicant has found that the treatment of dried wood with anti-fungal agents can be rendered more uniform, more easily controllable, and more economical, if the moisture content of the dried wood is brought to a certain minimum level before contact with the treating agent.

In particular, the applicant has discovered that a brief contact of wet or dry wood with a solution of a biocidal treating agent to give a pickup of treating solution of about 6% to 8% by weight is quite sufficient for anti-fungal treatment of the wood. Complete saturation of the wood, for example by soaking for long periods of time, does not improve the protection obtained. Further, a pickup of 6% to 8% can be easily effected by simple dipping or rolling. Even 100% coverage of the wood surface with the treating solution is not necessary. If only 70% to 80% of the wood surface is treated, capillary action apparently brings about effective protection of the remainder of the surface.

The applicant has further found that the desirable 6% to 8% pickup of treating solution, preferably in dipping processes, is substantially independent of the moisture content of the wood, providing that a minimum moisture

content of at least about 28% to 35% by weight has been achieved. At moisture contents lower than this figure, the pickup of the treating solution by the overly dry wood is excessive and results in uneconomical consumption of the treating agent, non-uniform concentration of the treating agent in the treated wood, and other undesirable consequences.

According to the present invention, before dried wood is treated with an anti-fungal agent, its moisture content is brought to a minimum of at least about 28% to 35% by weight. This is easily effected by contacting the overly dried wood with water, either as liquid water by dipping, spraying or soaking, or in the form of water vapor such as steam or the like.

After the moisture content of the wood has been brought to a level of at least about 28% to 35% by weight, the moisturized wood is contacted with the treating solution to give a 6% to 8% by weight pickup of solution. The concentration of the solution treating agent in the solution is obviously chosen so that the 6% to 8% solution pickup will transfer effective amounts of the anti-fungal or anti-bacterial agent to the wood. The concentrations giving such a result will, of course, vary with the nature of the treating agent used and also with the degree of fungistatic or fungicidal activity desired in the treated product. Manipulation of these variables is well within the skill of the ordinary artisan.

A better understanding of the present invention and of its many advantages will be had by referring to the following example given by way of illustration:

Example

Dried wood having a moisture content of about 8–15% was treated by immersion in water for 10 minutes until the moisture content of the wood had reached a level of 30%. The moisturized wood was then briefly dipped in an aqueous solution of tri-n-butyltin salicylate. The concentration of the tin compound in the aqueous solution was 0.173% by weight.

A dipping of the moisturized wood into the solution for a period of 5 seconds resulted in a solution pickup of about 6%, corresponding with a concentration on the wood of fungicide of about 18 mg. per square foot. The treated wood was stacked and stored without further drying.

What is claimed is:

1. In the method of treating wood with an anti-fungal agent by contacting said wood with a solution of said agent, the improvement which comprises thoroughly drying green wood directly after cutting to inhibit the sporulation of fungi during storage prior to treatment with said anti-fungal agent, then, immediately prior to the treatment with the anti-fungal agent, adjusting the moisture content of the dried wood to at least about 28 to 35 percent by weight of said dried wood, but to less than saturation levels, and briefly contacting the moisturized wood with a solution of said anti-fungal agent until a solution pickup of 6 to 8 percent by weight of said dried wood has taken place, the concentration of said anti-fungal agent in said solution being such that said solution pickup of 6 to 8 percent transfers an effective amount of said anti-fungal agent to said wood.

2. A process as in claim 1 wherein said moisturized wood and treating agent are briefly contacted by dipping said wood in an aqueous solution of said treating agent.

3. A process as in claim 1 wherein said anti-fungal treating agent is a fungicidal tin compound.

4. In the method of treating wood with an anti-fungal agent by contacting said wood with a solution of said agent, the improvement which comprises thoroughly drying green wood directly after cutting to inhibit the sporula-

tion of fungi during storage prior to treatment with said anti-fungal agent, then, immediately prior to the treatment with the anti-fungal agent, contacting the dried wood with water to bring the moisture content of said wood to at least 28 to 35 percent by weight of said dried wood, but to less than saturation levels, and thereafter dipping the moisturized wood in an aqueous solution of a fungicidal tin compound until a solution pickup of 6 to 8 percent by weight of said dried wood has taken place, the concentration of said fungicidal tin compound in said solution being such that said solution pickup of 6 to 8 percent transfers an effective amount of said fungicidal tin compound to said wood.

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