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METHOD OF PREVENTING WOOD DEGRADATION

Laurence A. Story, New Westminster, British Columbia,
Canada, assignor to SCM Corporation, Cleveland,
Ohio, a corporation of New York
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6 Claims

ABSTRACT OF THE DISCLOSURE

A method of maintaining the fresh-cut appearance of cut wood, either before or after it has become discolored, by treating the surface of the wood with an aqueous solution of a non-color producing acid, like oxalic acid, either alone or together with a weak solution of an alkali metal-containing phenolic material. The latter is converted by acid to a relatively water insoluble phenol which remains in the wood without discoloring it.

CROSS REFERENCE TO RELATED APPLICATION

This application is a continuation-in-part of an application entitled, "Method of Preventing Wood Degradation," filed Feb. 10, 1964 and assigned Ser. No. 344,778, now abandoned.

BACKGROUND OF THE INVENTION

This invention relates to methods of preventing or controlling the degradation of wood through color changes as a result of chemical reaction.

Different species of trees have traces of chemicals in the wood which, under a change in their chemical environment, react to form new compounds, the color of which is generally unlike that of freshly milled green lumber. Green lumber is acidic but if allowed to weather, the surface pH drifts to the basic side. When this occurs, certain chemical reactions result which produce a color change on the wood surface. For example, lignins and tannins darken under alkaline conditions but exhibit a light color under acid conditions. Continued weathering increases the intensity of the color change and allows the change to begin to penetrate into the wood from the surface.

SUMMARY OF THE INVENTION

Another discoloring problem in wood arises from mold growth, such as the so-called "blue mold." Bacteria reach the wood usually from the water with which the wood is almost constantly doused during a mill or cutting operation.

The method according to the present invention keeps the wood on the acid side, so that the appearance of freshly milled wood remains for an extended period of time. For this purpose, a suitable acid is added in aqueous concentrations up to a saturated solution, to the wood in order that it retains its freshly cut appearance. The acid must be one which does not discolor the wood or forms compounds similar in color to freshly milled green lumber. Oxalic acid has been found very suitable for this purpose. Other acids which may be used include acetic and phosphoric acids. Normally, no stronger than a 5 weight percent aqueous solution of the acid is used, and preferably about a 1 percent to about 3 percent solution. Treating fresh-cut wood with an acid like oxalic acid, retards any change in the wood to the basic side as a result of weathering, or as a result of being subjected to road dust which has been deposited on the

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wood and wetted out with water in the form of rain, mist, dew, etc. It has also been discovered that wood which has already suffered color degradation can be restored by a treatment with a solution of an acid like oxalic acid in concentration up to a saturated aqueous solution. The acid soluble compounds which caused the color degradation are converted to compounds similar in color to wood and/or liberated in the form of gas. Heavily stained wood requires a saturated solution, but weaker solutions, that is, 5 percent or less by weight, are used for much lesser stained wood.

It is common practice to treat freshly milled lumber with sap stain control agents. These chemicals are intended to control the propagation of parasitic fungi. In accordance with the present invention, a sap stain control agent which may be used in conjunction with an acid, such as oxalic acid, is an alkali metal-containing phenolic material that is preferably water soluble. This agent is normally applied in a relatively weak solution, for example, 5 percent by weight or less and preferably from about 1 percent to about 3 percent. The solvent is usually water but may be organic such as mineral spirits. The surface of a wooden substrate may be treated with the acid and the sap stain control agent in any order.

Useful alkali metals include sodium, potassium, and lithium. The phenol moiety may be unsubstituted or halogenated with any of the halogens such as chlorine, fluorine, iodine, or bromine. A preferred sap stain control agent is sodium pentachlorophenate.

When the treated wood is exposed to moisture in the form of rain, dew, etc., a portion of the water soluble chemicals is leached out of the wood, thereby leaving it unprotected. In the normal course, the alkali metal-containing phenolic material upon contact with the wood acid is slowly converted to a relatively long residual life for the phenolic material. It has been discovered that the application of an aqueous solution of an acid like oxalic acid, prior to or following the application of the sap stain control agent also converts this agent to a relatively water insoluble phenol form. Thus, not only is the wood protected against discoloration due to weathering, but the sap stain control agent is converted to a relatively water insoluble chemical which remains in the wood to do its job.

A method according to the present invention comprises treating the surface of wood with an aqueous solution of an acid like oxalic acid to prolong the acidity of the wood and to convert any acid soluble sulfides to compounds similar in color to fresh-cut wood and/or liberate sulfides in the form of gas. The concentration of the aqueous solution of the acid ranges up to saturated solutions.

Another method according to this invention comprises treating the surface of wood in any order with a weak solution of a sap stain control agent like sodium pentachlorophenate and with an aqueous solution of an acid like oxalic acid to convert the pentachlorophenate to the relatively water insoluble pentachlorophenol, and to prolong the acidity of the wood and convert any soluble sulfides to compounds similar in color to fresh-cut wood and/or liberate such sulfides in the form of gas.

A further method according to the present invention comprises subjecting wood that has been discolored as a result of being exposed to a wet and dirty atmosphere to either of the above-mentioned processes.

While the foregoing describes several embodiments of the invention, it is understood that the invention may be practiced in still other forms within the scope of the following claims.

What I claim as my invention is:

1. The method of maintaining the fresh-cut appear-

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ance of cut wood which comprises treating the surface of the wood in any order with a weak solution of sodium pentachlorophenate and with an aqueous solution of oxalic acid to convert the pentachlorophenate to relatively water insoluble pentachlorophenol and to prolong the acidity of the wood surface and to convert acid soluble sulfides to compounds similar in color to fresh-cut wood and liberate sulfides in the form of gas.

2. The method of claim 1 wherein the treatment of wood with the aqueous solution of oxalic acid is in concentrations up to saturated solutions.

3. The method of maintaining the fresh-cut appearance of wood which comprises treating the wood in any order with a weak solution of an alkali metal-containing phenolic sap stain control agent and with an acid that is non-color producing when applied to said wood and in concentrations ranging up to saturated solutions to at least maintain the acidity of the wood surface and to effect the conversion of said phenolic sap stain control agent to a relatively insoluble phenol, thereby delaying the formation of compounds which react in a basic medium to form colors unlike the color of freshly cut lumber.

4. The method of claim 3 wherein said alkali metal-containing phenolic sap stain control agent is sodium pentachlorophenate.

5. The method of claim 3 wherein said non-color producing acid is oxalic acid.

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6. The method of maintaining the fresh-cut appearance of cut wood which comprises treating the surface of the wood in any order with a weak solution of an alkali metal-containing phenate and with an aqueous solution of oxalic acid to convert the phenate to a less water-soluble material by acidulation and to prolong the acidity of the wood surface and convert any acid soluble sulfides to compounds similar in color to fresh-cut wood and liberate sulfides, if present, in the form of gas.

References Cited

UNITED STATES PATENTS

1,714,701	5/1929	Vannah et al.	117—59
2,031,973	2/1936	Mudge	117—147
3,061,508	10/1962	Morriss et al.	21—7 X
3,088,845	5/1963	Baker et al.	21—7 X
3,333,977	8/1967	Clark et al.	117—57
3,197,272	7/1965	Regutti	21—66

MORRIS O. WOLK, Primary Examiner

D. G. CONLIN, Assistant Examiner

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