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WOOD TREATMENT

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This invention relates to wood treatment and more particularly to an improved agent for treating wood.

As is known there is a real need for a cheap and effective material for treating wood to waterproof the wood and prevent its deterioration under service conditions. Many such agents have been proposed in the past, of which creosote or similar oily bodies is typical. This type of material is subjected to many disadvantages among which are a rather short period of effective life due to the tendency of the impregnated creosote to leach out of the wood as well as to bleed out under elevated temperatures.

As a result of considerable experimentation it has been found that chromium trioxide solutions have a very marked and unexpected effect on wood. It has been found, for example, that when an aqueous solution of chromium trioxide containing of the order of about 1% to about 8% of the salt is applied to wood, marked chemical and/or physical changes occur which distinctly beneficiates the wood. The wood treated with such a solution acquires a dark stain and develops a distinct waterproofness. Such treated wood, furthermore, has a lower flammability than the untreated wood. The impregnations by the treating solution greatly diminishes the tendency of the wood to burn with the usual flame and reduces the typical form of burning to a slow charring.

A particularly unique feature of the improved type of wood treatment is its effect on green wood. It has been found as a matter of actual tests that when green wood is treated with a chromium oxide-containing solution, the solution rapidly penetrates the wood and greatly diminishes checking, cracking or shrinking of the wood during subsequent drying. While no specific rationale of this effect is proposed it would appear that the aqueous solution definitely modifies the liquid content of the green wood possibly by its effect in the osmosis phenomenon.

When wood is treated as above described, the treated surface acquires a type of oleaginous texture. This is evidenced when the treated wood is immersed in water. When thus immersed and withdrawn it is observed that the adherent water tends to accumulate in droplets; the described treatment therefore appears to have a definite effect on the interfacial tension between the wood and the surface film of water. A particularly unique feature of the new method is the extremely high coverage of the solution.

In studying the effect of aqueous solutions of chromium trioxide upon wood it was observed that some type of definite reaction obtained as was evidenced by the change and color of the wood and the striking modification of the moisture resistance of the wood. It is believed that the unique properties imparted to the wood are the result of the formation of definite complexes of the salt with components of the wood and possibly with the ligneous constituents.

It is further found that cellulosic material such as wood, paper, hemp fibers and the like, may be beneficiated by utilizing the above described concept in another form. It is found, for example, that improved wood treating solutions may be produced by treating or leaching sawdust with hot chromium trioxide solutions of varying concentrations and preferably of from about 2 to 8% of chromium trioxide. In producing this solution the sawdust is preferably agitated in contact with the hot salt solution and heated for a few hours.

It is found that a definite action ensues. The original red color of the solution changes to a dark brown and the solution foams. When the heat is discontinued and the mass allowed to cool an oleaginous scum appears on the liquid surface. If now the solution is boiled and the surface scum disappears, the solution becomes more turbid or muddy and the sawdust tends to become sticky.

At this point it is advisable to add a fresh solution of the chromium salt in an amount at least sufficient to make up for evaporation losses during boiling. The mass is again heated for a period of from about one-half to about two hours and the solution separated from the residual sawdust as for example by filtration. The filtrate, which is of a darkish brown color is a clear solution free from suspended particles and is directly available as a wood treating agent.

The solution thus prepared forms an excellent wood treating agent and imparts to wood the novel characteristics described above, particularly greatly improved water resistance, and lowered flammability. In making up the novel solution it is found that the concentration of the chromium trioxide in the aqueous solution and the proportion of the solution to the sawdust are not critical. In preferred operations solutions of from about 3% to about 8% of chromium trioxide may be employed with from about 5 to about 30 or more parts by weight of the sawdust to the weight of the salt.

The novel wood treating solutions thus prepared may be applied to the wood in any desired

manner, i. e. by immersion, brushing or spraying. If desired the wood to be treated may be impregnated with the solution by utilizing a closed vessel and establishing a high hydrostatic pressure on the solution.

It is found that in addition to its other advantages the wood treated with the new preserving composition accepts paint and lacquer films or coatings most satisfactorily. The new compositions described herein are most satisfactory for the treatment of marine piling and similar units subjected to the action of salt water and marine organisms and appear to present a definite protective effect against the latter.

It will be understood that in utilizing the novel wood preservative solutions they may be made up and marketed as an aqueous concentrate which is diluted to the required degree prior to actual use. It will also be appreciated that, if desired, there may be incorporated in the treating solution any additional compatible compounds the specific effect of which is desired in the ultimately treated cellulosic material. In operating under the invention the solutions employed may be derived as the extract liquor from a sawdust corresponding to the wood to be treated or from a sawdust produced from a different type of wood.

While preferred embodiments of the invention have been described it will be understood that these are given to explain the underlying principles involved and not as limiting the useful scope of the invention to the described illustrative examples.

I claim:

1. A method of treating wood to improve its resistance to water which comprises applying to the surface a treating agent consisting essentially of dissolved chromium trioxide.

2. A method of producing wood treating solution which comprises extracting ground wood with a hot aqueous solution of chromium trioxide and separating the extract from the solid wood residue.

3. A method of producing a wood treating solution which comprises dissolving chromium trioxide in water, heating the solution in contact with sawdust and separating the aqueous extract from residual sawdust.

4. A method of producing a wood treating solution which comprises extracting sawdust with a hot aqueous solution of chromium trioxide for a period of approximately two hours; adding a fresh solution of chromium trioxide solution to the extract and separating the resulting solution from the residual sawdust.

5. A method of waterproofing and preserving wood which comprises applying to the wood a preserving solution derived by extracting sawdust with an aqueous solution of chromium trioxide.

6. A method of waterproofing and preserving wood which comprises applying to the wood a solution derived by extracting sawdust with a hot aqueous solution of chromium trioxide.

7. A method of treating wood to enhance its water resistance which comprises applying thereto an aqueous solution of from about 2% to 8% of chromium trioxide.

8. A wood preservative composition comprising an aqueous solution derived by extracting sawdust with a hot aqueous chromium trioxide in the proportions of from about 5 to 30 parts by weight of the sawdust to one part by weight of the salt.

9. A wood preservative composition comprising, an aqueous solution derived by extracting sawdust with an aqueous solution of chromium trioxide.

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