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WOOD PRESERVATIVE

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This invention relates to the preservation of wood; and, more particularly, to the methods of preparing wood preservative pastes and the application of these products to the ground line section of standing wooden poles.

It has been found that standing poles and other timbers set in the ground are subject to attack by various kinds of decay fungi and by wood-destroying insects such as termites and wood borers and that the portion of the pole or other timber located at and near the ground line is subject to specially severe attack from fungi and insects. This invention provides a preservative material composed of substances which are toxic to fungi and insects and which provides an external toxic shield against the entry of decay and insects.

The primary object of the invention is to provide a novel wood preservative composed of substances which are toxic to decay fungi and wood-destroying insects and which may be applied to the ground line section of standing poles and other timbers in contact with the soil.

A further object of this invention is to provide a novel wood preservative in the form of an adhesive paste which may be readily applied to the external surfaces of standing poles and other timbers in contact with the soil.

A further object of the invention is to provide a novel preservative consisting of a water-in-oil emulsion containing toxic salts which are both water-soluble and slightly water-soluble.

Another object of this invention is to provide a novel preservative material comprising water-soluble and slightly water-soluble toxic salts dispersed and held in suspension in a mixture of preservative oil and waxy or pitchy substances.

A still further object of this invention is to provide a method of preserving wood by impregnating it with substances toxic to decay fungi and insects, the preservative being applied to the wood in the form of a paste.

Still another object of this invention is to provide improved methods of preparing wood preservatives.

Further objects and advantages of this invention will be apparent from a consideration of the following description.

As is known, timber may be preserved against the attack of fungi and wood-destroying insects by treating it with toxic oily liquids such as creosote, crude petroleum or tar mixed with oil soluble toxic materials, and the like; or the wood may be preserved from attack by applying aqueous solutions containing water-soluble toxic salts. It

is also known that more complete preservative effects may be produced by treating the timber with a combination of the foregoing classes of preservatives.

5 One part of the present invention relates to preserving the wood by applying to its external surfaces an emulsion of oil and water containing wood preserving agents. In the preferred form of this emulsion invention, the oily liquid constitutes the continuous phase and the aqueous liquid the dispersed phase. The oils may be liquids such as creosote, petroleum, or turpentine.

10 An emulsion for the impregnation of wood must possess certain characteristics. For instance, the emulsion must be sufficiently permanent so that it may be handled and stored without stratifying into layers of individual components. The ingredients of the emulsion must be in such proportion as to provide the desired variety and quantity of preserving agents necessary to most effectively preserve the timber. The ingredients of the emulsion must also have properties which will enable the toxic salts to slowly permeate the wood after application to the wood surfaces.

15 Emulsions of aqueous agents in oily agents prepared in accordance with this invention meet the above-mentioned requirements, in that the fungicidal and insecticidal salts are thoroughly dispersed and held in suspension in a viscous creamy emulsion, the emulsion being used as a carrier for the salts and permitting intimate contact of the salts with the surfaces of the timber. After application to the timber surfaces, the water-soluble salts slowly permeate the wood in the moist ground line section of the pole. The oil in the emulsion remains largely in the exterior of the pole surfaces and forms a non-leaching protective agent.

20 According to the invention the toxic ingredients may consist of only one, or a plurality of water soluble and slightly water soluble inorganic or organic compounds. Ordinarily, the use of sodium fluoride, or arsenious oxide and dinitrophenol are contemplated, but one or more of these may be omitted. Several other toxic ingredients may be added such as arsenic compounds of copper, zinc, or sodium, and so forth, chloride compounds of zinc, mercury, copper, aluminum, and so forth. Preservative substances, such as beta naphthol, chlorinated tar acids and chlorinated naphthalene chlorophenols and their derivatives, may also be added. In all cases the salt or salts are present in the preparation in amounts sufficient to produce a saturated

condition in the water phase of the emulsion and leave a substantial excess of undissolved salts held in suspension in the emulsion so that the resulting composition is in the form of a paste.

The emulsions used are of the water-in-oil type and are ordinarily prepared with the aid of ammonium linoleate, trihydroxyethylamine linoleate and other specialty soaps. The oil phase of the emulsions may be toxic oils such as chlorinated naphthalene, chlorinated tar acids, creosote, or a non-toxic oil such as petroleum or linseed oil, or turpentine.

The preservative material is prepared by first forming an emulsion of water in oil with the aid of one of the soaps mentioned above, the water constituting the disperse phase and the oils being in the continuous phase. One or more of the toxic salts is then added in sufficient quantities to saturate the water phase of the emulsion and to leave sufficient quantity suspended in the oil phase to form a thick, creamy paste.

The following table shows an example of the ingredients used in the preservative composition, the ingredients being shown in percentage by weight. It is, of course, understood that the proportions may be varied over a wide range and that preservative salts mentioned above may be added to or removed from the list shown.

	Percent
Arsenious oxide-----	5 to 30
Sodium fluoride-----	30 to 70
Dinitrophenol-----	2 to 10
Ammonium linoleate-----	2 to 8
Turpentine-----	10 to 20

In addition to the above ingredients, water is used in the composition for the purpose of preparing the emulsion and providing suitable consistency of the paste.

In the application of the preservative composition to poles set in the ground, the soil is normally excavated to a depth of eighteen to twenty-four inches below ground level, and all decayed wood and foreign matter is removed from the pole surfaces in the section extending from the bottom of the excavation to 2-6 inches above the ground. After this, the paste is applied to all portions of the cleaned section of the pole, particular care being taken to apply the composition to all checks and openings in the wood. The preservative applied to the pole may be shielded from direct contact with the soil by means of a bandage of tarred paper or other protective material which is placed around the treated section of the pole immediately after the application of the preservative paste.

The foregoing invention refers to fungicidal and insecticidal ingredients which are thoroughly dispersed and held in suspension in an emulsion of water and oil. It has also been discovered that toxic salts may be thoroughly dispersed and held in suspension in a liquid which does not necessarily constitute an emulsion but which consists of a preservative oil such as creosote mixed with waxy or pitchy substances such as paraffin, gilsonite, beeswax, glycol stearate and Montan wax, to increase the viscosity of the preservative liquid. As an example, it is found that where creosote is mixed with hot paraffin in suitable proportions, the resultant liquid will carry in a thoroughly dispersed form a relatively large quantity of salts such as sodium fluoride, arsenious oxide, dinitrophenol, zinc chloride, potassium dichromate, and so forth. The resultant com-

position can be prepared in the form of a heavy paste which is applied directly to the surface of the wood. This paste provides direct and intimate contact of the preservative salts with the timber and also furnishes a preservative oil which tends to increase the preservative life of the application.

From the foregoing disclosure of this invention it is evident that I have provided a new and useful method of preserving wood, a new and useful preservative material, and a new and useful method of preparing preservative material, which is not only easily applied to the timber or wood but provides ample protection against fungicidal decay and attack from insects, such as termites.

Furthermore, it will be evident to those skilled in the art that various modifications and advantages are possible within the scope of the appended claims.

What is claimed is:

1. A wood preserving composition comprising an emulsion of water, and at least one of the materials selected from the group consisting of chlorinated naphthalene, chlorinated tar acids, creosote, beta naphthol, chlorophenols and their derivatives, petroleum oil, linseed oil, and turpentine, the water phase of said emulsion containing at least one of the materials selected from the group consisting of sodium fluoride, arsenious oxide, dinitrophenol, an arsenic compound of copper, zinc, and sodium and a chloride compound of zinc, mercury, copper and aluminum, the oil phase of said emulsion containing sufficient quantity of said salts to form a paste.

2. A wood preserving composition which comprises a paste which includes a water in turpentine emulsion and 5 to 30% arsenious oxide, 30 to 70% sodium fluoride, 2 to 10% dinitrophenol and 2 to 8% ammonium linoleate.

3. A wood preserving composition comprising a mixture of creosote and paraffin and at least one of the toxic materials selected from the group consisting of sodium fluoride, arsenious oxide, dinitrophenol, zinc chloride, and potassium dichromate, said mixture including sufficient paraffin to enable the resultant liquid to carry in a thoroughly dispersed form a relatively large quantity of the toxic materials.

4. A wood preserving composition in the form of a heavy adhesive paste which includes a mixture of creosote and paraffin and at least one of the toxic materials selected from the group consisting of sodium fluoride, arsenious oxide, dinitrophenol, zinc chloride, and potassium dichromate to form a heavy adhesive paste, said mixture including sufficient paraffin to enable the resultant liquid to carry in a thoroughly dispersed form a relatively large quantity of the toxic materials.

5. A wood preserving composition comprising a mixture of creosote and one of the waxy or pitchy materials selected from the group consisting of paraffin, gilsonite, beeswax, glycol stearate and montan wax, and a toxic material selected from the group consisting of sodium fluoride, arsenic compounds of copper, zinc and sodium, chloride compounds of zinc, copper and aluminum and dichromate compounds of sodium and potassium, said mixture including a sufficient amount of the waxy or pitchy substance to enable the resultant liquid to carry in thoroughly dispersed form a relatively large quantity of the toxic materials.

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