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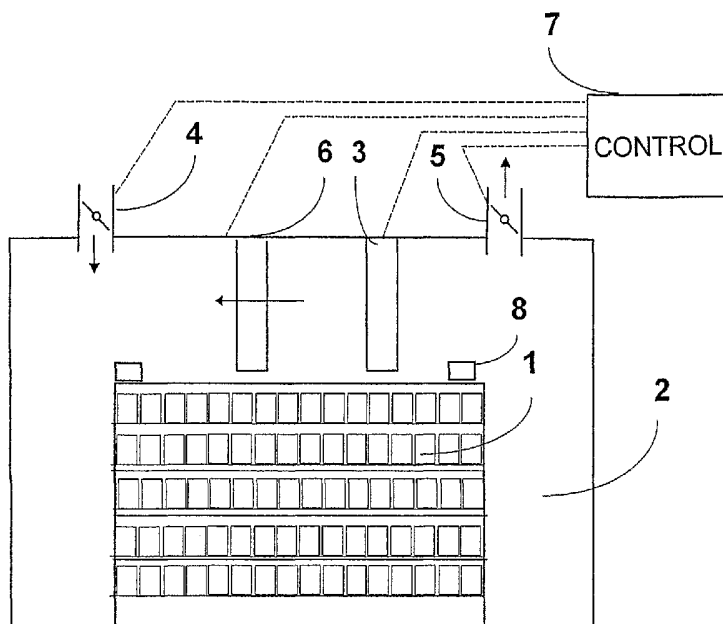
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(54) Title: METHOD AND APPARATUS FOR THE PROTECTION OF TIMBER



(57) Abstract: A method and an apparatus for the protection of timber via the use of a wood treatment material, wherein the wood treatment material is a wood treatment solution which is mixed in a moistening liquid and spread together with it into a drying chamber in conjunction with and/or after a drying process.

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METHOD AND APPARATUS FOR THE PROTECTION OF TIMBER

The present invention relates to a method and apparatus for the protection of timber via the use of a wood treatment material.

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At present, to protect timber e.g. against decay fungi, the timber is either immersed in a wood treatment liquid or pressure impregnated, which means having a wood treatment solution soaked into the timber / impregnating the timber with a wood treatment solution in conditions of under- or overpressure in a pressure chamber.

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In pressure impregnation, at present mainly copper, zinc, chrome or arsenic salts or a mixture of these is used. However, the use of heavy metals like these is very dangerous, and pressure impregnated timber as waste is hazardous waste.

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A further problem with pressure or immersion impregnation are expensive investments on equipment and additionally the need to dry the timber again after the soaking.

20

In immersion impregnation it is at present possible to use wood treatment solutions that do not contain any substances dangerous to health. A wood treatment solution of this type is disclosed in FI patent application 20011298. This application describes an environmentally friendly wood treatment solution that does not contain any heavy metals and that contains an impregnating agent consisting of an alkali metal or alkaline earth metal salt of formic acid or propionic acid. Such a salt can be used in an environmentally friendly manner as a wood preservative to protect timber especially against decay and termites. In addition, this material has excellent absorption properties, in other words, it soaks into wood faster than e.g. water.

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The object of the present invention is to overcome the drawbacks of prior art and to achieve a new type of method and apparatus for the protection of timber. The method of the invention is based on the good absorption properties of new wood treatment materials. These properties are utilized to soak the material into the timber by spraying the material in the form of fine mist e.g. together with the final moistening water into the drying chamber by means of equipment intended

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for spreading of the moistening water after the drying and then circulating it in the chamber by means of fans.

5 The amount of liquid soaked into timber in connection with final moistening may give desired properties to the timber. Thus, by applying the invention, impregnation of timber can be performed in a drying plant in conjunction with a drying process, and no separate impregnation apparatus is needed.

The details of the features of the invention are presented in the claims below.

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In the following, the invention will be described in detail with reference to an example and the attached drawing, wherein Fig. 1 presents a simplified view of the drying chamber of a timber drying plant.

15 Fig. 1 represents the heat treatment apparatus of a timber drying plant for the drying of timber 1, comprising a closeable chamber 2 where the timber 1 is arranged in a stack with laths between layers. The chamber 2 is provided with a heating unit 3 for heating the air and timber 1 in the chamber 2, a fresh air slide 4 for the supply of air into the chamber 2, an outlet slide 5 for passing the vapors produced by the heating out of the chamber and a fan apparatus 6 provided with an electric motor controlled by a frequency converter for enhancing air circulation in the chamber 2. In addition the apparatus comprises spraying nozzles 8 above the timber stack 1 for spraying final moistening water onto the bundle of timber. The heating unit 3, the slides 4, 5, the spraying nozzles 8 and
20 the fan apparatus 6 are controlled by a control unit 7.
25

During the drying of timber 1, the timber is heated to a temperature which is typically about 60 - 80 °C or in a special hot drying process over 100 °C in order to dry it (e.g. to a moisture of 10%).

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The method of the invention is based on the good absorption properties of the wood treatment material. These properties are utilized to soak the material into the timber by spraying the material in the form of fine mist together with the final moistening water into the drying chamber after the drying and circulating it in
35 the chamber by means of fans.

The wood treatment solution contains an impregnating agent, which is an alkali metal or alkaline earth metal salt of formic acid or propionic acid.

5 The alkali metal or alkaline earth metal salt of formic acid or propionic acid may be sodium formate, potassium formate, calcium formate or magnesium formate, and especially potassium formate or calcium formate. It is also possible to use mixtures of the aforesaid salts. The amount of alkali metal or alkaline earth metal salt of formic acid or propionic acid contained in the wood treatment solution is e.g. 2-40 weight-%.

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It is obvious to the person skilled in the art that different embodiments of the invention are not exclusively limited to the example described above, but that they may be varied within the scope of the claims presented below.

CLAIMS

1. A method for the protection of timber via the use of a wood treatment material, **characterized** in that the wood treatment material is a wood treatment solution which is mixed in a moistening liquid and spread together with it into a drying chamber in conjunction with and/or after a drying process.
5
2. A method according to claim 1, **characterized** in that the wood treatment material is spread with it into the drying chamber in the form of fine mist and circulated in the chamber by means of fans.
10
3. A method according to claim 1, **characterized** in that the wood treatment solution contains an impregnating material that easily soaks into wood.
- 15 4. An apparatus for the protection of timber via the use of a wood treatment material, **characterized** in that the apparatus is a drying apparatus comprising a drying chamber and heating devices, and the wood treatment material is a wood treatment solution which is mixed in a moistening liquid and spread with it into the drying chamber in conjunction with and/or after a drying process.
20
5. An apparatus according to claim 4, **characterized** in that the material is soaked into the wood by spraying the material e.g. together with final moistening water in the form of fine mist into the drying chamber by means of equipment intended for the spreading of moistening water after the drying, and circulated in the chamber by means of fans.
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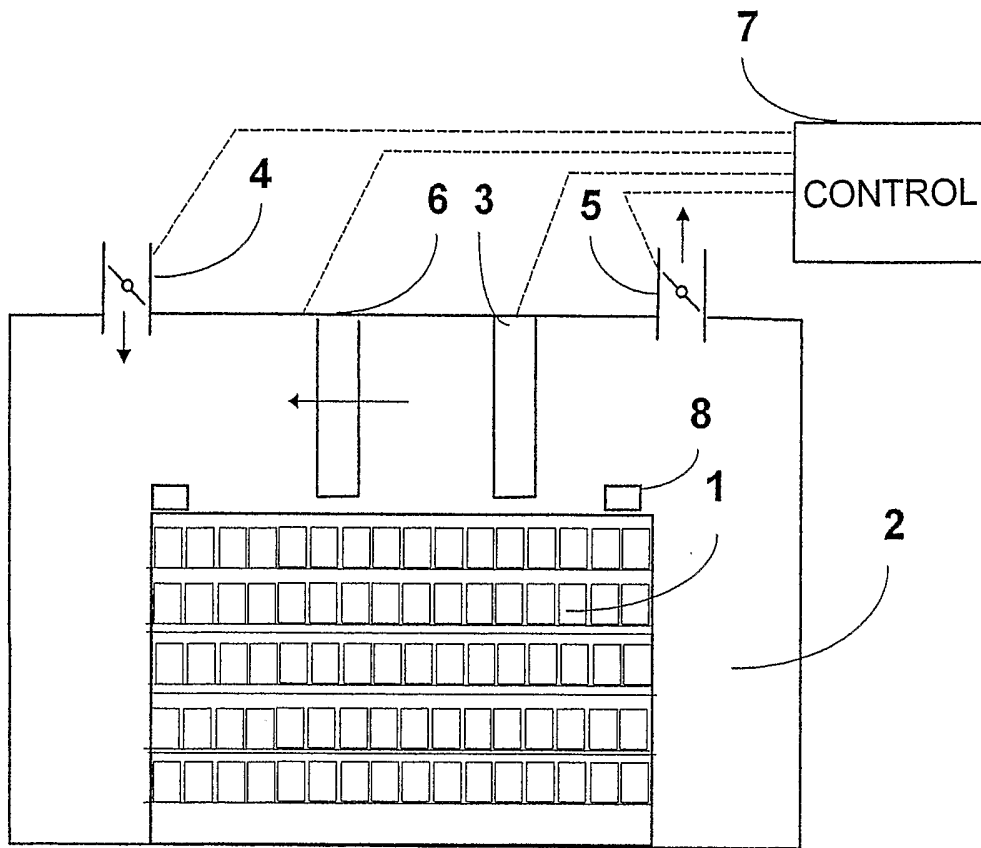


Fig. 1

INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER		
IPC: see extra sheet According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
IPC: B27K, F26B		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
SE,DK,FI,NO classes as above		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
EPO-INTERNAL, WPI DATA, PAJ, BIOSIS, COMPD		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 412175 A (HEINRICH ERNST WILL), 15 June 1934 (15.06.1934), page 3, line 30; page 1, line 74 - line 80, claim 1 --	1-5
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
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Date of the actual completion of the international search		Date of mailing of the international search report
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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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Cited literature, if any, will be enclosed in paper form.

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Information on patent family members

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