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(54) **A METHOD FOR PROVIDING A HIRSUTE SURFACE ON WOOD**

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PROCEDE SERVANT POURVOIR DU BOIS D'UNE SURFACE HIRSUTE

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**EP-A2- 0 157 530 US-A- 4 354 538
US-A- 5 882 427**

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Description

[0001] This invention relates to a method for treating a the surface of a piece of wood in order to provide a special texture, the method comprising the steps of: taking a shaped piece of wood; spraying water in a form of a pressurized jet against the surface of the piece of wood.

[0002] There are previously known surface treatments using e.g. sand blasting. As an improvement over sand blasting, the patent US-5 257 655 suggests blowing an air flow of crushed glass at a high rate against the surface of the wood piece, so that the softer parts of the growth rings in the wood or the otherwise softer parts of the wood are more rapidly dressed off than the harder parts of the growth rings in the wood or the otherwise harder parts of the wood. Pine is suggested as the species in the patent specification. This method aims at emphasizing the differences between winter and summer growth that is specific for the tree, i.e. the grain pattern, and at imparting the wood an artificial patina. After the treatment, the wood surface looks old and worn. Similar artificial aging is the aim of the method of EP-0 157 530, which, however, proposes the use of a gas jet at high rate and high temperature, such as flue gases from a burner, so that the wood surface is scorched. Such wood surface textures are by no means always desired.

[0003] The patent US-4 354 538 proposes the aging of timber in various ways, with a special view to reducing twisting and bending of the wood, perhaps achieving improved insect and decay resistance.

[0004] The patent US-5 882 427 proposes cleaning of the surface layer of a piece of wood from impregnants and any other impurities with a thermo-chemical method in order to provide a wood surface that is as good as a new one. In this method, the piece of wood is immersed in water or in an aqueous solution until the moisture content of the surface layer of the wood reaches at least 30%, followed by a treatment under vapour atmosphere in the temperature range 100°C - 160°C. Finally the soaked wood surface layer is removed with a water jet, rotating brushes or the like, resulting in a very even and smooth wood surface that can be refinished. In the publication NL-8 403 097, again, proposes pre-treatment especially of species of the *Intsia* genus in the *Leguminosae* family, commonly known under the business name "Merbau" and "Hintsy" - general name "Moluccan Ironwood", with a high-pressure water jet at a temperature above 40 °C and under a pressure of more than 15 kg/cm² (=14.7 bar). These tree species are extremely heavy and hard, having properties resembling those of Teak. The purpose of the patent specification is to prevent red and brown components, i.e. tints in these wooden species from leaking during ulterior use, because otherwise these components would badly stain other surrounding materials, such as concrete, rock, coating materials and the like.

[0005] The purpose of the invention is firstly to provide a method that achieves a novel surface texture having a pleasant look on pieces of wood. A second purpose of

the invention is to provide such a method that does not break the growth ring pattern of the wood and does not at least substantially emphasize the grain pattern. A third purpose of the invention is to provide such a method, which achieves a wood surface texture from which splinters do not at least easily stick to the hands, fingers or elsewhere on the skin of a person who touches or strokes it. A further purpose of the invention is to provide such a method, which, if desired, allows subsequent additional treatment of the wood or the wood surface or surface layer, such as staining etc. The method should also have a reasonable price per timber area unit and provide technically reliable operation.

[0006] To achieve the effects mentioned above, the invention provides a method as defined in claim 1.

[0007] It has now been surprisingly found that the surface texture of wood can be appropriately made "hirsute" or "napped" with a specific treatment. The wood surface will then look slightly like a fur or the like, even though its "hair" is somewhat thicker and perhaps shorter than fur originating from animals. Such a texture is achieved in accordance with the invention by spraying water under high pressure against the wood surface, so that wood fibers are partly removed from the basic material merely with pressurized water. Winter and summer growth wood is simultaneously broken to the same extent as water hits the wood in the cross-direction of the grains, with the wood material still attached to the tree surface after the treatment of the invention, forming a furry surface both on winter and summer wood. The shape and route of the water jet and the angle of incidence of water have an impact on the hirsute nature and density on the wood surface. This method is operable both for fresh and dried wood.

Figure 1 is a general view of directing a pressurized water jet in accordance with the invention to one surface to be treated on a piece of wood in a preferred embodiment of the method, and a schematic view of the "hairy" wood surface obtained with the method of the invention, in an axonometric projection.

Figure 2 is a general view of directing one or more pressurized water jets on several surfaces to be treated on a piece of wood and a schematic view of the "hairy" surface obtained with the method of the invention, viewed from the end of the piece of wood and in direction I of figure 1.

Figure 3 shows the preferred shape of the route for the pressurized water jet of the invention, viewed from above the piece of wood in directions II of figures 1 and 2.

Figure 4 shows the shape and route of the pressurized water jet of the invention viewed in cross-section from the end in plane III-III of figure 3.

Figure 5 shows the shape of the pressurized water jet of the invention and the route of this or the piece of wood viewed laterally in longitudinal section in plane IV-IV of figure 3.

[0008] In the method of the invention, the surface of a piece of wood, whose wood material has been selected among specific types of species, is treated by spraying water 2 in a special manner as a pressurized jet 5 against it, the desired surface texture being obtained on the surface of the piece, i.e. a hirsute surface. The method starts by making a piece of wood 1 by machining to the shape corresponding to the end product with a method known *per se* or a new method and/or device, which are consequently not explained in detail. The figures show board used as an example, which comprises an upper surface 3a facing the surface of the original tree stem, i.e. the surface wood, a lower surface 3d facing the central part of the original tree stem, i.e. the heart wood, and sides 3b and 3c transverse to these. As shown in the figure, the convex sides of the growth rings are directed towards the surface wood, as a person skilled in the art understands. The piece of wood 1 has the main grain direction G, corresponding to the longitudinal direction of the original tree stem, as a person skilled in the art understands. If the piece of wood 1 is a deal, a board, a lath or the like, the main or average grain direction G will be generally parallel with the length of this piece. It should be understood that the invention is not by any means restricted to such pieces, but is applicable to pieces of woods of any shape.

[0009] The process steps of the invention comprise at least the following operations. First, it uses a pressurized water jet 5 having an area A1 at the surface 3a, 3b, 3c... of the piece of wood 1 to be treated that is substantially smaller than the area A2 of the surface 3a, 3b, 3c... of the piece of wood 1 to be treated. This means that the surface of the piece of wood is treated point by point with such a jet of pressurized water. The jet of pressurized water 5 is generated with a suitable pump and nozzle 6, whose design may be of any type suitable for the purpose, so that they are not explained in detail here. Tests have been made of commercially available "pressure washers". The pressurized water jet 5 is directed to the wood surface 3a, 3b, 3c... at a spraying angle or spraying angles α in the range of 90° to 60° , or in the range of 90° to 60° relative to the normal N to the surface. The spraying angles α are preferably in the range $90^\circ - 45^\circ$ relative to the normal N to the surface. The size of the spraying angle α affects the type of hirsuteness provided on the wood surface, especially its length, i.e. the length of the detached portion of the wooden fibers 4. On principle, it would be possible to change the spraying angle even during the spraying of water 2 under pressure P, say in order to achieve a surface that has as homogenous hirsuteness as possible over the points of different hardness of the wood, or else to achieve a surface with non-homogenous hirsuteness; however, it is probably useful to

generally keep the spraying angle α constant at least for each individual piece.

[0010] Further in accordance with the invention, said pressurized water jet 5 is moved along a route R parallel with the surface 3a, 3b, 3c... As a result of this, the wooden fibers 4 on the surface of the piece of wood 1 are partly detached and partly remain attached to the piece of wood 1, whereby the partly detached wooden fibers form a hirsuteness K on the wood surface. We note particularly that material is not removed from the piece of wood surface at least in significant amounts, but the wooden fibers 4 are detached only over part of their length, so that the surface substantially preserves its shape. In this respect, there is no damage even if a small amount of fibers would come off the treated piece of wood surface entirely. However, the invention is characterized by winter and summer growth wood being detached under the action of said jet 5 of water 2 substantially in the same manner, so that the grain pattern is not emphasized

[0011] Said pressurized water jet 5 is generated under a spraying pressure P per area unit of said piece of wood surface, i.e. under surface pressure $P/A1$, which, in accordance with the invention, is at least 0.2 bar/mm^2 , or typically at least 0.4 bar/mm^2 , or preferably at least 0.75 bar/mm^2 , i.e. the spraying has a minimum surface pressure. Accordingly, under the spraying pressure P of the pressurized water jet 5, a maximum surface pressure is generated per area unit of said surface of the piece of wood, i.e. a spraying surface pressure of $P/A1$, which, in accordance with the invention, is 16 bar/mm^2 at the most, or typically 8 bar/mm^2 at the most, or preferably 3.6 bar/mm^2 at the most. Such surface pressures of the pressurized water jet 5 can be achieved with a device having an internal spraying pressure P of at least 40 bar or at least 60 bar up to 100 bar and 250 bar at the most or 230 bar at the most. Such a pressurized water jet 5 can preferably be used, which is flat in cross-section, so that it has a predetermined thickness S and a width W perpendicular to this. This predetermined thickness S is under 11 mm, or the thickness S is typically 6 mm at the most. Tests have proved also such pressurized water jets 5 to work excellently that vary in thickness in the range 4-5 mm, or 2-3 mm. A pressurized water jet having a thickness of only 1 mm is still usable. Since the pressurized water jets 5 had an almost even thickness in the test equipment, but a conical width W, as is understood from figures 4 and 5, the jet width W changes along with a change in the distance H between the nozzle 6 and the surface 3a, 3b, 3c..., whereas the distance H has hardly any effect on the jet thickness S. The internal spraying pressures P above yielded excellent results, i.e. a distinct but still well retained hirsuteness K over the distance $H = 38 \text{ mm}$, with the nozzle 6 having an angle of beam β of about 24° , the width W on the piece of wood surface being about 16 mm. The cross-sectional area A 1 of the pressurized water jet 5 = $W \times S$ at the treated surface of the piece of wood 1 may thus vary within the range $176 \text{ mm}^2 - 16 \text{ mm}^2$ with the internal spraying pressure varying

in the range mentioned above, 40 bar - 250 bar. Different internal spraying pressures and different water jet cross-sectional areas A_1 may, of course, yield the same surface pressures P/A_1 as defined above. It is understood that the pressurized water jet 5 may have a general cross-sectional shape different from the one described above, provided that it is flat. i.e. $W > S$. The flatness is typically relatively distinct, i.e. $W > 1.3 \times S$ and preferably $W \geq 3 \times S$.

[0012] The pressurized water jet 5 is directed towards the surface 3a, 3b, 3c... of the piece of wood 1 to be treated such that the jet width W is at a motion angle χ of at least 50° with the main grain direction G of the wood piece. A smaller motion angle value χ does not yield good results. It is advantageous to provide a motion angle χ of 90° , with the width W being substantially perpendicular to the main grain direction G of the wooden material, or at least approaching 90° . The pressurized water jet 5 is moved along a route R parallel with the surface such that comprises a plurality of substantially parallel sections $R_1, R_2 \dots R_n$, having mutual distances L and at a motion angle χ of at least 50° with the main grain direction G of the piece of wood. Hence these substantially parallel sections $R_1, R_2 \dots R_n$, i.e. the nozzle has the same direction of movement or movements D_1, D_2 relative to the main grain direction G as the width W of the pressurized water jet 5, implying that the pressurized water jet 5 is moved in alignment with its width W , as shown in figure 3. Reasonable variations, i.e. tolerances are naturally allowed here. The pressurized water jet 5 is advantageously moved reciprocating in opposite directions D_1 and D_2 while either the piece of wood 1 is moved in a direction D_3 transverse to these or the pressurized water jet 5 itself is moved in a direction D_4 transverse to these. In both cases, the result is an effective route R of the pressurized water jet, which resembles a meandering line. The pressurized water jet can be moved across the surface of the piece of wood with unidirectional sweeps alone, in direction D_1 , for instance. The rate of movement of the pressurized water jet 5 in transverse directions D_1, D_2 is higher than the rate of movement D_4 or D_3 of this or of the piece 1 substantially in the main grain direction G , so that the sections $R_1, R_2 \dots R_n$ are parallel with sufficient accuracy.

[0013] In accordance with the invention, the mutual distances L explained above may firstly be equal to said thickness S of the pressurized water jet at the most, resulting in substantially homogenous hirsuteness K . Secondly, in accordance with the invention, the mutual distances L may optionally be greater than said thickness S of the pressurized water jet, resulting in non-homogenous hirsuteness K , in which hirsute areas alternate with non-hirsute areas or less hirsute areas on the surface of the piece of wood. Said pressurized water jet 5 is used to treat at least the upper surface 3a of the piece of wood facing the surface wood, because at this point hairiness with good quality is most reliably obtained, in other words, the wood fibers 4 are partly detached in a homogenous

way. However, using the method of the invention, all the sides or surfaces 3a, 3b, 3c... of the piece of wood 1 can be treated, either one side at a time or all the surfaces at the same time, as is understood from figure 1 and figure 2. The water used in the pressurized water jet may have a maximum temperature of 95°C , a temperature that should not yet have a "roasting" effect on wood. Most preferably water is used at a maximum temperature of 80°C , which has not been found to have any detrimental effects. However, one can, and sometimes it is even preferably to do so, use normal water from the water distribution system, allowing the water 2 temperature to be very freely set approximately in the range $10^\circ\text{C} - 65^\circ\text{C}$, depending on the incoming water temperature. Water below 10°C is usable as such, however, $> 0^\circ\text{C}$, provided that such tap water is available. The water temperature has a certain impact on the outcome, which can partly be compensated with other variables, such as surface pressure and movement speeds. However, the upper limit of 95°C or 80°C mentioned above should not be exceeded.

[0014] The spraying pressure P and/or spraying angle α of the pressurized water jet 5 is selected such, and/or the pressurized water jet 5 is moved along said route R at a speed such that winter and summer growth wood is detached from the surface 3a, 3b, 3c... of the piece of wood 1 substantially in the same way under the effect of the jet 5. The pressurized water jet 5 is directed at least once and not more than four times to each point to be treated on the surface 3a, 3b, 3c... of the piece of wood 1, depending on the thickness S of the pressurized water jet and the mutual distances L between the substantially parallel sections $R_1, R_2 \dots R_n$ of its route R . The speeds of movement of the pressurized water jet 5 and the piece of wood 1 in directions D_1, D_2 and D_3 or D_4 explained above are arranged such relative to the cross-sectional area A_1 of the jet 5 that said cycle directed to each of the points to be treated on the surface of the piece of wood 1 has a maximum duration of 2 seconds or a maximum duration of 1 second. Then the overall spraying period directed to each point of the surface, i.e. each point of the surface 3a, 3b, 3c... to be treated, varies in the range 1 second - 8 seconds.

[0015] The piece of wood 1 used is a species having a tensile strength σ_{Tt} transversal to the main grain of 2.7 MPa at the most, or possibly less than 2.5 MPa, or preferably 2.3 MPa at the most, this relatively low value being currently supposed to contribute to the detachment of wood fibers 4 from adjacent wood fibers adhering to the piece of wood 1. In aspen, this transverse tensile strength σ_{Tt} is 1.8 MPa, so that species having a tensile strength of at least this order or of the order of magnitude ≤ 2 MPa act as intended in connection with the method of the invention. It has further been found that the species of the piece of wood 1 is preferably selected among broadleaf trees. Test have shown that the hirsuteness obtained on coniferous wood is not particularly good, however satisfactory K in some cases. Most preferably, the species is

selected among the species belonging to the following genera: *Populus*, *Tilia*, *Salix*, *Triplochiton*, *Aucoumea* or hybrids of these. With aspen, i.e. trees pertaining to the family *Populus*, the best result is achieved when the aspen has an equilibrium-moisture content of about 12% but less than 20% before the treatment is started. Good results are achieved also with higher equilibrium moisture contents, which may be of the same order as that of freshly cut wood. The genus *Populus* includes at least tens of species, of which we cite just a few: *Populus Tremula*, *Populus Alba*, *Populus Deltoides*, etc. Linden trees, i.e. trees of the genus *Tilia*, also yield excellent hirsuteness. The genus *Tilia* also includes at least tens of species, of which we cite just a few: *Tilia Cordata*, *Tilia Vulgaris*, *Tilia Americana* etc. Willow and sallow trees, i.e. species of the genus *Salix*, are substantially equal to the species of the genera *Populus* and *Tilia*, and we cite only a few examples of these at least tens of species: *Salix Capre* and *Salix Viminalis*. Trees known under the business name Okume and Gaboon, i.e. belonging to the genus *Aucoumea*, also yield excellent results, whereas trees pertaining to the genus *Triplochiton* and known under the business name Abachi only yield a mediocre result.

[0016] It is also possible to use a piece of wood 1 of some other type than those described above, however, it should be thermally treated in advance. Thermal treatment is a previously known technique *per se*, and is thus not explained in detail. It is also possible, and in many cases even advisable, to use wood that has been appropriately jointed to form the piece of wood 1, and in this case, a finger joint, in particular, will not be visible in the final, i.e. in a product with hirsuteness K.

[0017] The surface 3a, 3b, 3c... of the piece of wood 1 can be stained either by incorporating a suitable colouring agent in the water 2 sprayed as a pressurized water jet 5, and then the piece is coloured or partly coloured in connection with the method of the invention, or by subsequently treating the surface made hirsute K with the method of the invention with a suitable dye or paint. Paints based on linseed oil, for instance, are perfectly suitable for after-treatment. A surface that has been treated in accordance with the invention absorbs dyes or paints efficiently.

Claims

1. A method for treating the surface of a piece of wood for providing it with a surface texture, the method comprising the steps of:

- providing a shaped piece of wood (1),
- spraying water (2) in the form of a pressurized water jet (5) against surface of the piece of wood,

characterized in that the method additionally comprises the steps of:

- applying a pressurized water jet (5) having a cross-sectional area (A1) that is substantially smaller than the area (A2) of a surface to be treated on the piece of wood (1);
- directing said pressurized water jet (5) to the wood surface (3a, 3b, 3c...) at a spraying angle or angles (α), which is/are between 90° and 60° relative to the normal (N) to the surface; and
- moving said pressurized water jet (5) along a route (R) parallel the surface to be treated so that the wood fibers (4) are partly detached from said surface and partly stay adhered to the piece of wood (1), the partly detached wood fibers making the wood surface hirsute (K).

2. A method as defined in claim 1, **characterized in that** said pressurized water jet (5) generates a spraying surface pressure (P/A1) of at minimum 0.2 bar/mm², or at minimum 0.4 bar/mm², or at minimum 0.75 bar/mm²; and that said pressurized water jet (5) generates a spraying surface pressure (P/A1) of at maximum 16 bar/mm², or at maximum 8 bar/mm², or at maximum 3.6 bar/mm².

3. A method as defined in claim 1, **characterized in that** a pressurized water jet (5) is used that is flat in cross-section, having a predetermined thickness (S) and a width (W) perpendicular to this; and that said thickness (S) is less than 11 mm, or said thickness (S) is 6 mm at maximum.

4. A method as defined in claim 3, **characterized in that** the pressurized water jet (5) is directed against the surface (3a, 3b, 3c...) to be treated on the piece of wood with said width (W) of the jet being at a motion angle (χ) of at least 50° in respect to the main grain direction (G) of the piece of wood.

5. A method as defined in claim 1, **characterized in that** the pressurized water jet (5) is moved along a route (R) parallel to the surface comprising a plurality of substantially parallel sections (R1, R2...Rn) spaced by mutual distances (L) and forming a motion angle (χ) of at least 50° with the main grain direction (G) of the piece of wood.

6. A method as defined in claim 5, **characterized in that** said mutual distances (L) are:

- at maximum equal to said thickness (S) of the pressurized water jet for obtaining substantially homogenous hirsuteness (K); and
- larger than said thickness (S) of the pressurized water jet for obtaining substantially non-homogenous hirsuteness (K).

7. A method as defined in claim 1, **characterized in that** said pressurized water jet (5) is applied for treat-

ing at least that surface (3a) on the piece of wood, which is facing the surface wood.

8. A method as defined in claim 1, **characterized in that** the piece of wood (1) is one of a species whose tensile strength transversal to the grain direction is at maximum 2.7 MPa, or at maximum 2.3 MPa; that the species of the piece of wood (1) is selected among broadleaved trees; and that said species is selected in the group consisting of the following species: *Populus*, *Tilia*, *Salix*, *Triplochiton*, *Aaucoumea*, or hybrids of these. 5
9. A method as defined in claim 1, **characterized in that** the spraying pressure (P) and/or spraying angle (α) of the pressurized water jet (5) is selected such and/or the pressurized water jet (5) is moved along said route (R) at a rate such that winter and summer growth wood is detached from said surface (3a, 3b, 3c...) of the piece of wood (1) under the action of said jet (5) of water (2) substantially in the same manner. 10
10. A method as defined in any of the preceding claims, **characterized in that** the pressurized water jet (5) is directed at least once and at maximum four times to each point to be treated on the surface (3a, 3b, 3c...) of the piece of wood (1); and that said one cycle of directing the pressurized water jet (5) to each point to be treated on the surface of the piece of wood (1) has a duration of at maximum 2 s, or at maximum 1 s. 15

Patentansprüche

1. Verfahren zur Behandlung der Oberfläche eines Holzteiles, um diesem eine O-berflächentextur zu verleihen, wobei das Verfahren die Schritte umfasst: 25
 - Bereitstellen eines geformten Holzteiles (1),
 - Sprühen von Wasser (2) in Form eines Druckwasserstrahles (5) gegen die Oberfläche des Holzteiles, 30

dadurch gekennzeichnet, dass das Verfahren zusätzlich die Schritte umfasst: 35

 - Anwenden eines Druckwasserstrahls (5) mit einer Querschnittsfläche (A1), die wesentlich kleiner ist als die Fläche (A2) einer zu behandelnden Oberfläche auf einem Holzteil (1);
 - Richten des Druckwasserstrahls (5) auf die Holzoberfläche (3a, 3b, 3c ...) in einem Sprühwinkel oder in Sprühwinkeln (α), der/die zwischen 90° und 60° in Bezug auf die Normale (N) der Oberfläche beträgt/betragen; und
 - Bewegen des Druckwasserstrahls (5) entlang eines Weges (R) parallel zu der zu behandelnden 40

den Oberfläche, so dass die Holzfasern (4) teilweise von der Oberfläche gelöst werden und teilweise an dem Holzteil (1) haften bleiben, wobei die teilweise gelösten Holzfasern die Holzoberfläche struppig werden lassen (K).

2. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** der Wasserdrukstrahl (5) einen Sprühflächendruck (P/A1) von wenigstens 0,2 Bar/mm² oder von wenigstens 0,4 Bar/mm² oder von wenigstens 0,75 Bar/mm² erzeugt und dass der Druckwasserstrahl (5) einen Sprühflächendruck (P/A1) von höchstens 16 Bar/mm² oder von höchstens 8 Bar/mm² oder von höchstens 3,6 Bar/mm² erzeugt. 45
3. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** ein Druckwasserstrahl (5) verwendet wird, der im Querschnitt flach ist, der eine vorbestimmte Dicke (S) und eine Breite (W) senkrecht dazu hat, und dass die Dicke (S) kleiner ist als 11 mm bzw. dass die Dicke (S) höchstens 6 mm beträgt. 50
4. Verfahren nach Anspruch 3, **dadurch gekennzeichnet, dass** der Druckwasserstrahl (5) gegen die zu behandelnde Oberfläche (3a, 3b, 3c ...) auf dem Holzteil gerichtet wird, wobei die Breite (W) des Strahls in einem Bewegungswinkel (χ) von wenigstens 50° in Bezug auf die Hauptfaserrichtung (G) des Holzteiles vorliegt. 55
5. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** der Druckwasserstrahl (5) entlang eines Weges (R) parallel zu der Oberfläche bewegt wird, die eine Vielzahl von im Wesentlichen parallelen Abschnitten (R1, R2 ... Rn) umfasst, die in gegenseitigen Abständen (L) beabstandet sind und einen Bewegungswinkel (χ) von wenigstens 50° mit der Hauptfaserrichtung (G) des Holzteiles bilden. 60
6. Verfahren nach Anspruch 5, **dadurch gekennzeichnet, dass** die gegenseitigen Abstände (L):
 - höchstens gleich der Dicke (S) des Druckwasserstrahls sind, um im Wesentlichen homogene Struppigkeit (K) zu erzielen, und
 - größer sind als die Dicke (S) des Druckwasserstrahls, um im Wesentlichen nichthomogene Struppigkeit (K) zu erzielen. 65
7. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** der Druckwasser strahl (5) angewendet wird, um wenigstens die Fläche (3a) auf dem Holzteil zu behandeln, die dem Oberflächenholz zugewandt ist. 70
8. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** das Holzteil (1) von einer Holzart ist, 75

dessen Zugfestigkeit quer zu der Faserrichtung höchstens 2,7 MPa bzw. höchstens 2,3 MPa beträgt; dass die Holzart des Holzteiles (1) aus breitblättrigen Bäumen ausgewählt wird; und dass die Holzart aus den folgenden Holzarten ausgewählt wird: *Populus* (Pappel), *Tilia* (Linde), *Salix* (Weide), *Triplochiton* (Abachi-Baum), *Aucoumea* (Okoumé) oder Hybriden derselben.

9. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** der Sprühdruk (P) und/oder der Sprühwinkel (α) des Druckwasserstrahls (5) so gewählt wird und/oder der Druckwasserstrahl (5) so mit einer Geschwindigkeit entlang des Weges (R) bewegt wird, dass Sommerholz und Winterholz von der Oberfläche (3a, 3b, 3c ...) des Holzteiles (1) unter der Einwirkung des Strahls (5) von Wasser (2) im Wesentlichen auf die gleiche Weise gelöst werden.
10. Verfahren nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Druckwasserstrahl (5) wenigstens einmal und höchstens vier Mal auf einen jeden Punkt der zu behandelnden Oberfläche (3a, 3b, 3c ...) des Holzteiles (1) gerichtet wird; und dass der eine Zyklus des Richtens des Druckwasserstrahls (5) auf einen jeden zu behandelnden Punkt auf der Oberfläche des Holzteiles (1) eine Dauer von höchstens 2 s bzw. von höchstens 1 s hat.

Revendications

1. Procédé pour traiter la surface d'une pièce de bois pour lui procurer une texture en surface, le procédé comprenant les étapes consistant à :

- fournir une pièce de bois formée (1),
- pulvériser de l'eau (2) sous la forme d'un jet d'eau sous pression (5) contre la surface de la pièce de bois,

caractérisé en ce que le procédé comprend, de plus, les étapes consistant à :

- appliquer un jet d'eau sous pression (5) ayant une surface en section transversale (A1) qui est sensiblement plus petite que la surface (A2) de la surface à traiter sur la pièce de bois (1) ;
- diriger ledit jet d'eau sous pression (5) vers la surface de bois (3a, 3b, 3c...) à un angle ou à des angles de pulvérisation (α), qui est/sont entre 90° et 60° par rapport à la normale (N) à la surface ; et
- déplacer ledit jet d'eau sous pression (5) le long d'un chemin (R) parallèle à la surface à traiter de sorte que les fibres de bois (4) sont partiellement détachées de ladite surface et de-

meurent partiellement en adhérence avec la pièce de bois (1), les fibres de bois partiellement détachées rendant la surface de bois hirsute (K).

2. Procédé selon la revendication 1, **caractérisé en ce que** ledit jet d'eau sous pression (5) génère une pression superficielle de pulvérisation (P/A1) de 0,2 bar/mm² minimum ou de 0,4 bar/mm² minimum ou de 0,75 bar/mm² minimum ; et que ledit jet d'eau sous pression (5) génère une pression superficielle de pulvérisation (P/A1) de 16 bars/mm² maximum ou de 8 bars/mm² maximum ou de 3,6 bars/mm² maximum.
3. Procédé selon la revendication 1, **caractérisé en ce que** le jet d'eau sous pression (5) est utilisé qui est plat en section transversale, ayant une épaisseur prédéterminée (S) et une largeur (W) perpendiculaire à celle-ci, et **en ce que** ladite épaisseur (S) est inférieure à 11 mm, ou que ladite épaisseur (S) est de 6 mm au maximum.
4. Procédé selon la revendication 3, **caractérisé en ce que** le jet d'eau sous pression (5) est dirigé contre la surface (3a, 3b, 3c...) à traiter sur la pièce de bois avec ladite largeur (W) du jet étant à un angle de mouvement (X) d'au moins 50° par rapport à la direction granulaire principale (G) de la pièce de bois.
5. Procédé selon la revendication 1, **caractérisé en ce que** le jet d'eau sous pression (5) est déplacé le long d'un chemin (R) parallèle à la surface comprenant une pluralité de sections sensiblement parallèles (R1, R2... Rn) espacées par des distances mutuelles (L) et formant un angle de mouvement (X) d'au moins 50° avec la direction granulaire principale (G) de la pièce de bois.
6. Procédé selon la revendication (5), **caractérisé en ce que** lesdites distances mutuelles (L) sont :
 - au maximum égales à ladite épaisseur (S) du jet d'eau sous pression pour obtenir une forme hirsute sensiblement homogène (K) ; et
 - plus grandes que ladite épaisseur (S) du jet d'eau sous pression pour obtenir une forme hirsute sensiblement non homogène (K).
7. Procédé selon la revendication 1, **caractérisé en ce que** ledit jet d'eau sous pression (5) est appliqué pour traiter au moins cette surface (3a) sur la pièce de bois, qui est en regard du bois superficiel.
8. Procédé selon la revendication 1, **caractérisé en ce que** la pièce de bois (1) est une d'une espèce dont la résistance à la traction transversale à la direction du grain est de 2,7 MPa au maximum ou de 2,3 MPa au maximum ; que les espèces de la pièce

de bois (1) sont choisies parmi des arbres à feuilles larges et que les espèces sont choisies dans le groupe qui est constitué des espèces suivantes : *Populus*, *Tilia*, *Salix*, *Triplochiton*, *Aaucoumea* ou des hybrides de ceux-ci.

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9. Procédé selon la revendication 1, **caractérisé en ce que** la pression de la pulvérisation (P) et/ou l'angle de pulvérisation (α) du jet d'eau sous pression (5) est sélectionné de sorte que et/ou le jet d'eau sous pression (5) est déplacé le long du chemin (R) à une vitesse telle que le bois mis à croître pendant l'hiver et l'été est détaché de ladite surface (3a, 3b, 3c...) de la pièce de bois sous l'action dudit jet (5) d'eau (2) sensiblement de la même manière.
10. Procédé selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le jet d'eau sous pression (5) est dirigé au moins une fois et au maximum quatre fois à chaque point qui doit être traité sur la surface (3a, 3b, 3c...) de la pièce de bois (1) ; et **en ce que** ledit un cycle de direction du jet d'eau sous pression (5) sur chaque point à traiter sur la surface de la pièce de bois (1) a une durée au maximum de 2 s ou au maximum de 1 s.

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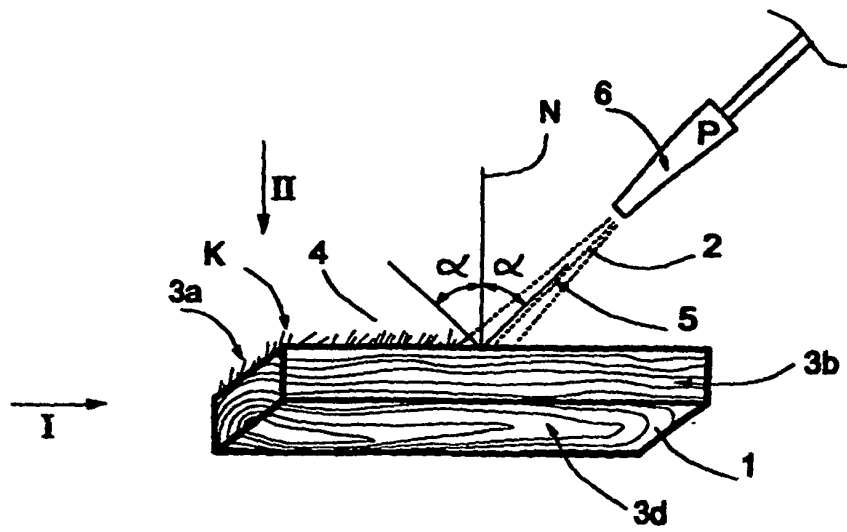


fig. 1

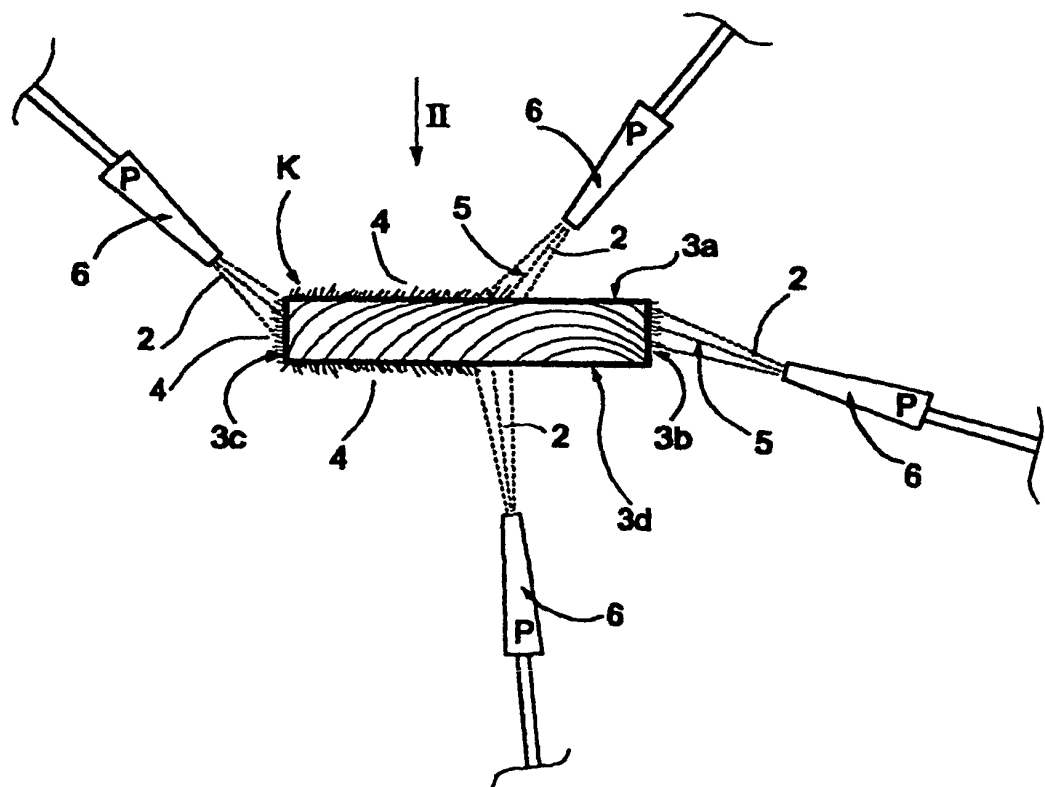


fig. 2

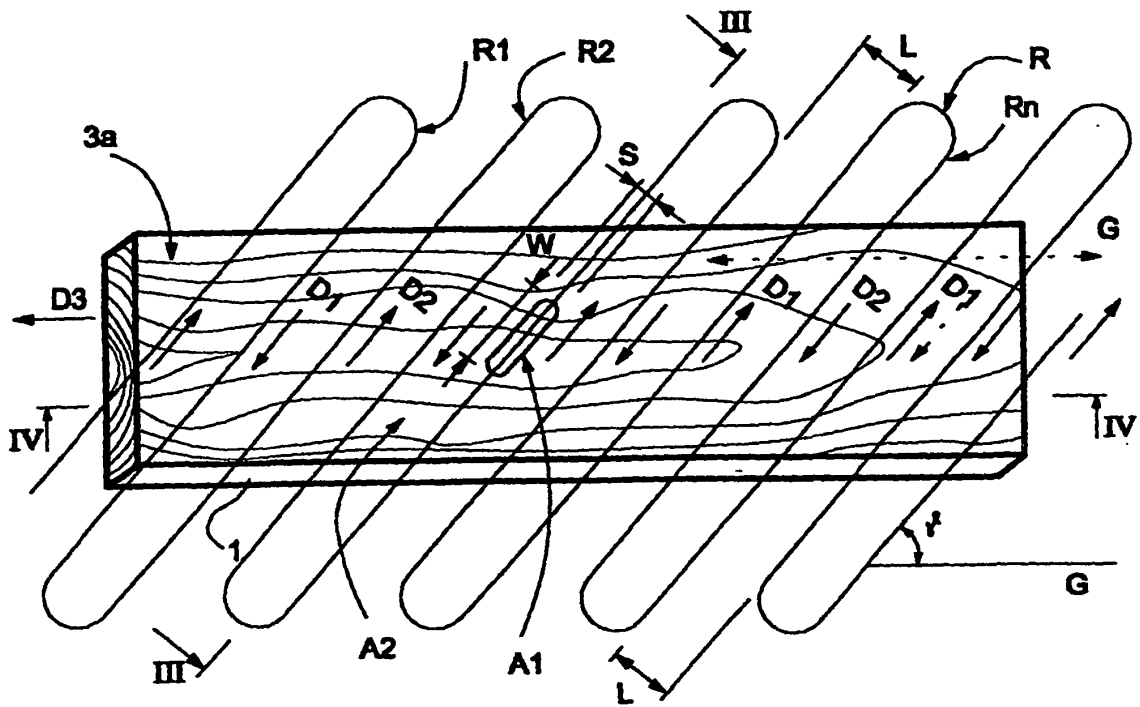


fig. 3

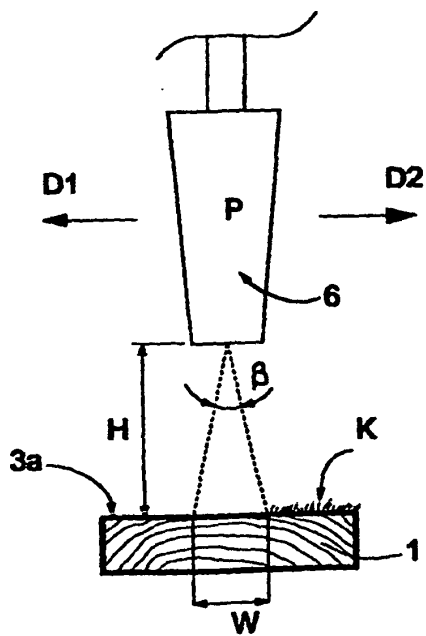


fig. 4

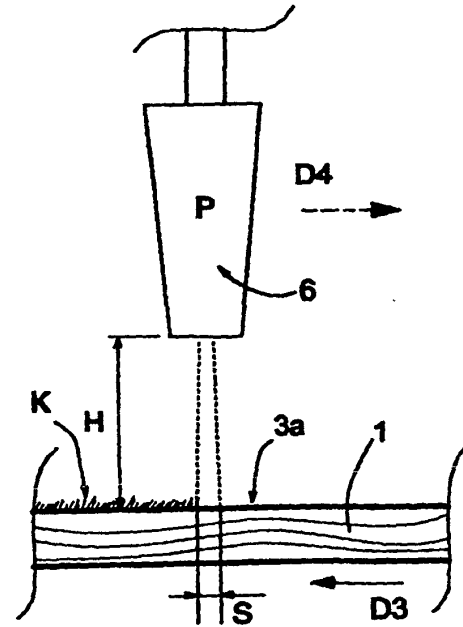


fig. 5