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(54) **Method for manufacturing wooden parts**

(57) Method for manufacturing wooden parts, such as boards, particularly floorboards, having a worn look, wherein wooden parts of so-called fresh wood are planed at at least one of the main sides and subsequently are subjected to a drying process. Subsequently at least the planed main side can be subjected to a mechanical treatment for artificially ageing it. Method for

artificially ageing wooden parts, such as boards, particularly floorboards, comprising placing the wooden parts of dried wood in a container filled with a bed of elements provided with smooth convexly curved surfaces, after which the container is brought into repetitive motion and the wooden parts are brought into intensive contact with the bed.

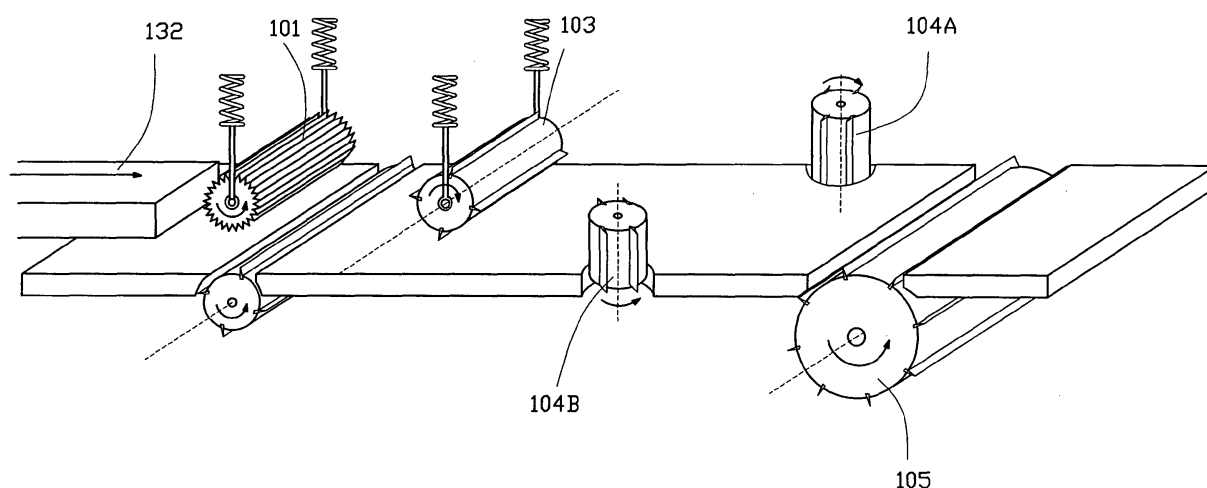


FIG. 8A

Description

[0001] The invention relates to a method for manufacturing wooden parts, such as floorboards, casing parts and furniture parts, having a worn look. The invention furthermore relates to a device for carrying out such a method.

[0002] It is known to subject wooden parts, particularly boards, to a mechanical treatment in order to damage them, particularly the sight side of the boards, and to treat the boards simultaneously or afterwards in order to change their colour, for instance using a liquid such as lye or a lime solution, in order to realise an enhanced aged effect therewith.

[0003] Such processes have been used in many embodiments.

[0004] It is an object of the invention to provide a new process for manufacturing wooden parts having a worn look, with which method said wooden parts can be provided with a particular look (3D).

[0005] According to one aspect the invention provides a method for manufacturing wooden parts having a worn look, wherein wooden parts of so-called fresh wood, having a rectangular cross-section, are planed at at least one of the sides and subsequently are subjected to a drying process.

[0006] During drying, the softer areas (summer year rings) of the wood of the wooden part will lie recessed with respect to the harder areas (winter year rings and knots) of the wood. By letting the drying process take place after planing the relief arising at the side of the wooden part due to drying will remain intact. This relief gives the wooden part a particular look, strongly resembling a wooden part that has been used for a long time and has dried in.

[0007] Preferably the wooden part is fully planed at the sight side(s) in a pre-planing treatment and a post-planing treatment prior to the drying process, due to which the sight side is smooth to such an extent that a (more or less regular) profile also known as machine waves is prevented. The method is particularly effective and simple when the post-planing treatment is carried out at a cutting speed that is considerably (dozens of %) higher than the cutting speed of the pre-planing treatment.

[0008] In a particular embodiment the wooden part is divided into two boards prior to the drying process, which two boards are thinner as regards thickness and have a sight side, which is planed prior to the drying process. Such boards can be sold as pairs, wherein they have mirrored patterns that go together. The person laying the floor can glue them in the project onto a permanent floor. According to the invention the two boards preferably are attached to each other, for instance by gluing, at their longitudinal edges originating from the same side and then they are planed at their sight side prior to the drying process. After the drying process the side opposite the sight side can be planed flat, and the

two boards can be attached to a carrier plate with glue. In that way they can be sold as a unity and easily be placed in the project, as a part having a double width in comparison with the raw wooden part.

[0009] The assembly of the boards and the carrier plate can also be profiled at the longitudinal edges, preferably with tongue and groove.

[0010] In one embodiment all sides of the wooden part are pre-planed prior to the drying process.

[0011] In this way a wooden part is obtained having the said relief at the sight side, yet which is dimensionally stable as regards thickness, due to which unacceptable differences in thickness and/or differences in width in the floor are counteracted. An exemplary embodiment thereof is the treatment of floorboards. In this way the wooden part, for instance a floorboard, becomes dimensionally stable as regards width, which enhances, and which is expected in, the laying of a floor or the assembling of a piece of furniture.

[0012] If the wooden part will have to offer several sight sides, said sight sides can all be treated in the said manner. An example of this is a board or lath or plate for a piece of furniture, such as an open cabinet.

[0013] In one embodiment the other than the sight sides are pre-planed but not post-planed.

[0014] In one embodiment the wooden parts are placed in pairs with the planed sight sides upon/against each other and in that condition are dried in a preferably climate-controlled drying chamber, for instance in stacked condition having spacers in between the pairs of wooden parts. In view of the object to be achieved, an aged look, the drying process preferably is carried out in a drying chamber containing air, wherein during drying air is discharged and/or supplied. The stack of (oak) wooden parts may be subjected to the drying process as a free stack, that means without pressing, or without particular pressure.

[0015] In case of floorboards its longitudinal edges may thus after the drying process be provided with for instance grooves (for mutual connection with a feather) or with a tongue and groove and/or with a bevelled edge. A particular effect is achieved when after the drying process the sight corners of the longitudinal edges are locally chopped for forming damages in them.

[0016] According to a further aspect the invention provides a method for manufacturing wooden parts having a worn look, wherein raw wooden parts, such as a thick board or beam, having a rectangular cross-section, of so-called fresh wood, are sawn through the middle in longitudinal direction according to a division plane, parallel to the largest plane, after which the sides of the division plane of the boards are pre-planed and post-planed or planed smooth and the boards with their longitudinal edges originating from the same side are attached to each other, such as by gluing, such that the sides of the division plane of the boards are in the same plane, after which the obtained board assemblies are dried, preferably in stacks wherein the wooden parts are

placed in pairs with their sight sides placed against each other.

[0017] Preferably, prior to sawing it through the middle, the relatively thick board or beam is pre-planed at four sides at the sides that are transverse to the division plane.

[0018] The side opposite the sides of the division plane can be planed flat after the drying process and that side can be attached to a carrier, for instance by gluing.

[0019] The wooden parts treated in accordance with the method according to the invention described above, may at least with their planed main side subsequently be subjected to a mechanical treatment for artificially ageing it, particularly according to the description stated below.

[0020] According to a further aspect the invention provides a method for artificially ageing wooden parts, particularly boards, comprising placing the wooden parts of dried wood in a container filled with a bed of elements provided with smooth convexly curved surfaces, after which the container is brought into repetitive motion and the wooden parts are brought into intensive contact with the bed.

[0021] The elements provided with smooth convexly curved surfaces exert pressure forces on the surfaces of the wooden parts, particularly boards, as a result of which a particular visible effect is achieved, particularly in the treated largest planes.

[0022] In a combination of the method according to the invention as described above with drying process after planing the sight side, this results in a particular look of the wooden part, such as the floorboard, that is comparable with a wooden part that has been used for a long time.

[0023] The container may be designed like a drum, with which the bed of elements and the wooden parts are rotated/revolved.

[0024] The container may also be positioned on shaking means or vibrating means.

[0025] The frequency of the repetitive motion preferably can be varied.

[0026] The effect of the elements is enhanced when use is made of elements that have been provided with surfaces that are convexly curved in two directions perpendicular to each other. Preferably use is made of elements having an at least almost fully curved surface, particularly of elements having an at least almost fully convexly curved surface, in which way a kind of roller bearing is obtained between the wooden parts and the wooden parts, such as boards, are able to roll along and over each other while impression forces are exerted on their free main surfaces. In one embodiment use is made of spherical elements.

[0027] It is preferred here that a dry lubricant is added to the elements for the bed, particularly for a polishing treatment.

[0028] In an alternative embodiment use is made of

kidney-shaped elements.

[0029] In another alternative embodiment use is made of disk-shaped elements having convex main sides. In this way more of a sliding movement along the free surfaces of the wooden parts is realised, with which in addition to impression effects wear effects are also realised.

[0030] A particular effect is achieved if a dry abrasive is added to the elements for the bed, particularly for a grinding treatment.

[0031] In an embodiment the smallest diameter of the elements is smaller than 5 cm, preferably smaller than 3 cm. The elements preferably are such that they cannot end up in a tongue of a board.

[0032] A lively effect is achieved when use is made of elements having different diameters.

[0033] When use is made of elements having an identical shape a regular image may be achieved, depending on the shape of the elements used. In this way a desired image can be accurately selected.

[0034] The elements preferably are made of a material having a hardness exceeding the hardness of the wood of the wooden parts.

[0035] In one embodiment use is made of metal elements, optionally provided with rust.

[0036] In an alternative embodiment use is made of elements of synthetic material, such as nylon.

[0037] In a further alternative embodiment use is made of elements of a ceramic material or of glass.

[0038] Various substances may be added to the bed of elements for achieving further combined effects. For instance a bleeding look in the surface of the wooden part may be achieved when charcoal is added to the bed, preferably charcoal soaked in a caustic soda solution.

[0039] In a number of other embodiments a lime-water solution, an ammonia solution or a colourant or stain is added to the bed.

[0040] The invention further provides a device for treating wooden parts, such as boards for providing them with a used look, comprising a container and means for moving, wherein the container has an accommodation space for a bed of elements or objects for surrounding the wooden parts, wherein the container is provided with an access opening for the elements and the wooden parts, which access opening can be closed off, wherein the elements correspond to the elements according to the invention. The device preferably is provided with means for rotating the container about a longitudinal axis, with means for shaking/vibrating the container and/or with means for varying the frequency of the repetitive motion.

[0041] From a further aspect the invention provides a method for manufacturing wooden parts having a worn look, wherein wooden parts of so-called fresh wood are planed at at least one of the sides and are subsequently subjected to a drying process, after which at least the said planed side is subjected to a mechanical treatment

for artificially ageing it.

[0042] The aspects and measures described and/or shown in the application may where possible also be used independent from each other. Said individual aspects, such as the mechanical artificial ageing by means of the said elements, and other aspects may be the subject of divisional patent applications relating thereto.

[0043] The invention will be elucidated on the basis of a number of exemplary embodiments shown in the attached drawings, in which:

Figure 1 shows a schematic isometric view of a device suitable for use in carrying out a method according to the invention;

Figure 2 shows a schematic cross-section of the device of figure 1, prior to the start of the process;

Figure 3 shows the device of figure 1 during a process according to the invention;

Figures 4A-C show some possible embodiments of elements for accommodation in the device of figure 1;

Figure 5 shows a schematic view of a (part of the) process according to the invention;

Figure 6 and 6A show details of a sight surface of a board obtained by means of the invention;

Figure 7 shows a view of a floorboard according to the invention;

Figure 8A shows a schematic view of a planing process preceding the drying process;

Figure 8B shows a schematic view of a possible -partially- additional process preceding the drying process, for making a so-called book bond; and

Figure 9 shows an isometric view of such a book bond.

[0044] The device 1 shown in figure 1 in this example comprises a container in the form of an in cross-section octagonal drum 4, which by means of posts 3 is attached to a floor slab 2. The drum 4 is driven by a motor 8 for rotation about centre line S. The drum is provided with end walls 5, permanent side walls 6, and side wall 7 that can be folded upwards in the direction A (figure 2).

[0045] By folding the lid 7 open, an opening is provided for supply in the direction B of relatively small treatment elements 11 that form a bed 10 in the drum 4. On the bed 10 the wooden parts to be treated, in this example boards 20, can be placed as shown in figure 2.

[0046] After closing the lid 7 the drum 4 can be rotated in the direction C by means of motor 8, wherein the

boards 20 are incorporated in the bed 10 of the elements 11, and closely contact them.

[0047] The elements may have different shapes, provided with convex curves. Examples are shown in figures 4A-C, wherein figure 4A shows a large and a small sphere 11a, 11b.

[0048] Figure 4B shows elements having a large and a small kidney shape 12a, 12b. Figure 4C shows large and small lentil-shaped elements 13a, 13b.

[0049] The material of the elements 11 is harder than the material of the treated wood of the boards. The material may be metal, but for instance may also be nylon.

[0050] The elements exert a pressure force on the surface of the boards 20, and during rotation (relatively) slide or roll along the surfaces of the boards 20. Due to the shape of the elements a surface contact will substantially take place between a convex surface of the elements and the flat main surface of the boards.

[0051] At the location of the winter rings and the knots the elements will be less effective than at the location of the summer rings, as the wood at the location of the summer rings is softer. As a result a recess between the winter rings and knots can be achieved or enhanced which is characteristic.

[0052] If the boards 20 have such a length, that they cannot assume a position transverse to the centre line S, but remain substantially in line therewith, then the elements can also form shallow transverse channels or grooves in the boards.

[0053] Various agents can be added to the bed of elements 11. In case of the elements shown in the figures 4A and 4B, having fully round surfaces, a dry lubricant may be added, as a result of which shearing forces between the elements and the boards are counteracted and substantially a single impression action will take place on the surface of the boards (polishing). In case of the disks/lentils shown in figure 4C, when there will be question of a substantially sliding contact with the boards, a dry abrasive may be added (grinding).

[0054] In case the elements that are not fully round, such as in figure 4C, are used, the transitions or discontinuities in the said contact with the surface of the boards may result in damages (upward abrasion effect).

[0055] In figure 5 it is shown that from an oak tree 30 (E) boards 31 are sawn, that are subsequently transported to a treatment station (direction F) for consecutively, at least in so-called fresh condition (more than approximately 25 % by weight of moisture content) as oak boards 32 on the surface 38, that will later on form the sight surface, be passed in the direction G past a scraping blade 40 or past known, traditional machining-active planing means, also see figures 8A and 8B. In figure 5 it is indicated that just the only sight side 38 is fully planed, that means that no machine waves are recognisable any more, for which purpose a pre-planing treatment is followed by a post-planing treatment. In other cases, in which there is question of several sight sides, said several sides are (fully) planed. After that the

boards (direction H) are stored in stack 33, to be dried, naturally or forced, in a surrounding of air. The boards can be stacked in pairs, having the sight sides against each other, with spacers such as laths in between the pairs of boards. The sight sides are then free from impressions by the laths. The drying process may take several days to a few dozens of days. The stack can be dried in a climate-controlled chamber.

[0056] The sight side of the boards, as shown in figure 5, gets a relief, wherein the harder areas such as the winter rings 34 with their surface extend higher (34a) in the sight side 38 than the surface 33a of the summer rings 33.

[0057] After drying the board 32 is also planed at the longitudinal edges and at the opposite main side.

[0058] In case of a floorboard (figure 7) a groove 36 is made at the one longitudinal edge and a tongue 37 is made at the other longitudinal edge. Alternatively a groove 36 can be made at both longitudinal edges, in order to be able to join the floorboards with each other by means of a feather (not shown). At the side situated at the sight side 38 bevelled edges 36a, 37a, may be provided at the location of the groove 36 and the tongue 37, respectively, which edges can be chopped with a hand scraper.

[0059] In the condition where all sides have been planed, the boards 32, which are already characteristic per se at their sight side 38, can be placed in the drum 1 shown in figure 1, in accordance with figure 2. The treatment in it described above -which can also be carried out per se ensures enhancement of the (micro)relief shown in figure 6, as a result of which the worn look of the board is even more enhanced, not just at the sight side 38 but also at the optional bevelled edges 36a, 37a.

[0060] Other elements, such as for instance charcoal soaked in a caustic soda solution, may be added to the elements 11 in the drum 1. This renders the charcoal tougher. Due to the caustic soda solution the wood will bleed, which gives the sight side of the boards a particular look.

[0061] Other special effects and/or tones of colour are achieved if a lime-water solution or an ammonia solution or a colourant or stain is added to the bed.

[0062] In figure 8A a planing station 100 is shown, through which the wooden parts are passed prior to the drying process. The planing station 100 comprises a support plate 110, in which successively a transport roller 101 with a lowermost pre-planing roller 102 underneath it are placed for treating the sight side of the board 38, an uppermost pre-planing roller 103, two side pre-planing rollers 104a, b and a post-planing roller 105. The pre-planing rollers 102, 103, 104a, b are usual planing rollers, in this example having four straight blades and a diameter of 10 cm. The speed of rotation can be 6000-9000 revolutions a minute.

[0063] The post-planing roller 105 has a larger diameter, such as 20 cm, and a larger number of blades that may optionally be helically curved. The speed of rotation

is such that the cutting speed of the blades is considerably (for instance 50%) higher than the cutting speed of the blades of the rollers 102, 103. As a result any machine waves resulting from the pre-planing rollers are planed away.

[0064] Figure 8B shows a partial continuation of the planing station 100, for making book bonds. After passing through the station part of figure 8A, but before the post-planing roller 105 is reached, a thick board or beam 132, for instance 25 mm thick, is sawn through the middle in the largest plane into boards 132a, 132b in saw station 160, supported on work surface 163, using saw ribbon 161, that circulates about driven roller 162a, b. Each board 132a, b at the sight side is subsequently subjected to a double planing treatment with pre-planing roller 102 and post-planing roller 105. The opposite side had already been subjected before to a treatment with the pre-planing roller 103.

[0065] The boards 132a, b with their longitudinal edges originating from the same sides are then attached to each other, such as by gluing, such that the sides of the division plane of the boards are in the same plane, after which the board assemblies obtained are dried in the said manner. Thus so-called book bonds having a particular look are obtained. The side opposite the sides of the division plane is attached to a carrier plate, by gluing, such as shown in figure 9, in which a multiplex carrier plate 150 having boards 132a, b attached thereto via glue layer 152 are shown. The boards 132a, b are attached to each other with a glue layer 151. The assembly shown is provided with a groove 139 at one longitudinal edge and with a tongue 140 at the other longitudinal edge.

Claims

1. Method for manufacturing wooden parts having a worn look, wherein wooden parts of so-called fresh wood, having a rectangular cross-section, are planed at at least one of the sides and subsequently are subjected to a drying process.
2. Method according to claim 1, wherein the wooden part is intended to be used with at least one sight side, such as a floorboard, wherein the sight side prior to the drying process is fully planed in a pre-planing treatment and a post-planing treatment.
3. Method according to claim 2, wherein the post-planing treatment is carried out at a cutting speed that is considerably higher than the cutting speed of the pre-planing treatment.
4. Method according to claim 1, 2 or 3, wherein the wooden part prior to the drying process is divided into two boards by sawing, the two boards having a sight side which prior to the drying process is

planed, particularly pre- and post planed.

5. Method according to claim 4, wherein the two boards at their longitudinal edges originating from the same side are attached to each other, for instance by gluing, and then are planed at their sight side prior to the drying process.

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6. Method according to claim 5, wherein after the drying process the side opposite the sight side is planed, and the two boards are attached to a carrier plate.

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7. Method according to claim 6, wherein the assembly of the boards and the carrier plate is profiled at the longitudinal edges, preferably with tongue and groove.

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8. Method according to any one of the preceding claims, wherein prior to the drying process all sides of the wooden part are pre-planed.

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9. Method according to any one of the preceding claims, wherein the wooden parts are placed in pairs with the planed sight sides against each other and in that condition are dried in a preferably climate-controlled drying chamber, for instance in stacked condition having spacers in between the pairs of wooden parts.

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10. Method according to claim 9, wherein the drying chamber contains air, wherein during drying air is discharged and/or supplied.

11. Method according to any one of the preceding claims, wherein the other than the sight sides are pre-planed but not post-planed.

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12. Method according to claim 1, wherein the wooden parts form boards, laths or plates for a piece of furniture, such as an open cabinet.

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13. Method according to claim 1, 2 or 3, wherein the wooden parts are boards and the longitudinal edges are profiled after the drying process, wherein they are provided with grooves (for mutual connection with a separate feather) or with a tongue and groove and/or with a bevelled edge, wherein after the drying process optionally the longitudinal edges can be chopped locally, at the sight corners.

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14. Method for manufacturing wooden parts having a worn look, wherein raw wooden parts, such as a thick board or beam, having a rectangular cross-section, of so-called fresh wood, are sawn through the middle in longitudinal direction according to a division plane, parallel to the largest plane, after which the sides of the division plane of the boards

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are pre-planed and post-planed or planed smooth and the boards with their longitudinal edges originating from the same side are attached to each other, such as by gluing, such that the sides of the division plane of the boards are in the same plane, after which the obtained board assemblies are dried.

15. Method according to claim 14, wherein the relatively thick board or beam prior to sawing it through the middle is pre-planed at four sides at the sides that are transverse to the division plane.

16. Method according to claim 14 or 15, wherein the side opposite the sides of the division plane is planed after the drying process and that side is attached to a carrier, for instance by gluing.

17. Method according to any one of the preceding claims, wherein the wooden parts after drying are subjected to a treatment for artificially ageing them, comprising placing the wooden parts of dried wood in a container filled with a bed of elements provided with smooth convexly curved surfaces, after which the container is brought into repetitive motion and the wooden parts are brought into intensive contact with the bed.

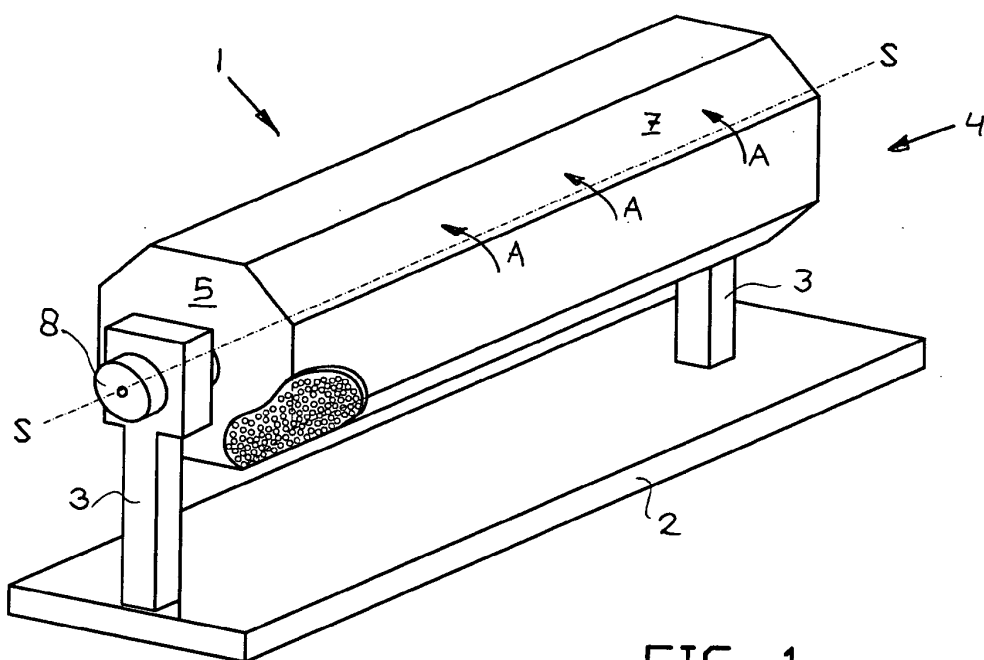


FIG. 1

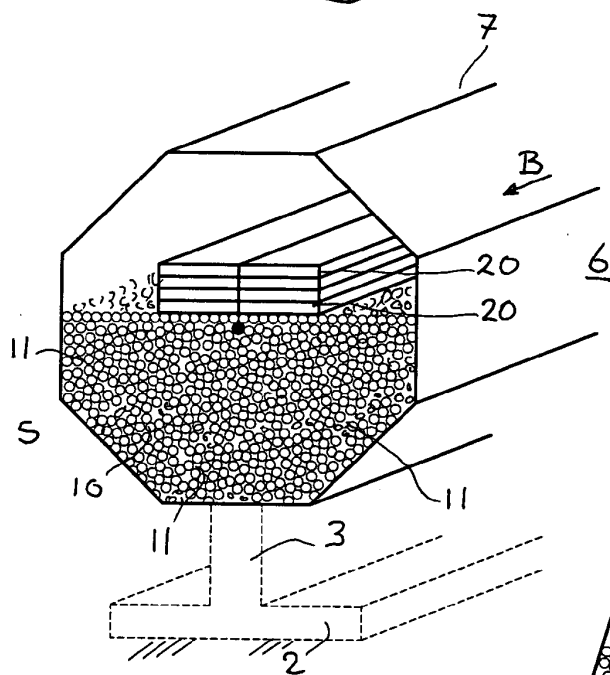
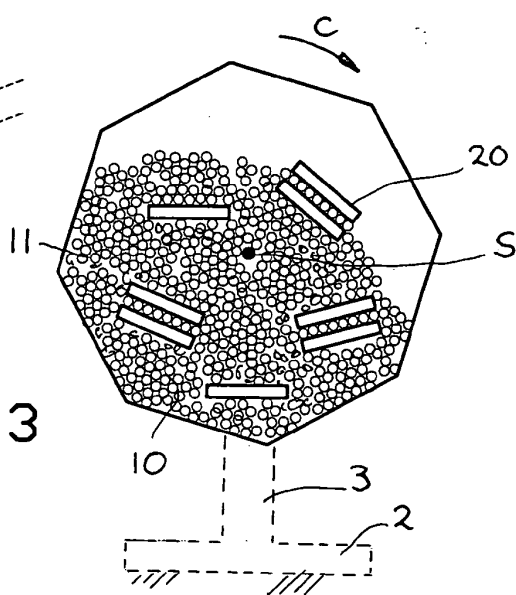


FIG. 2

FIG. 3



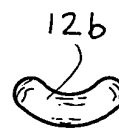
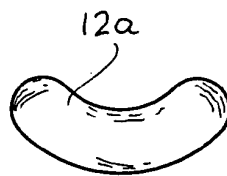
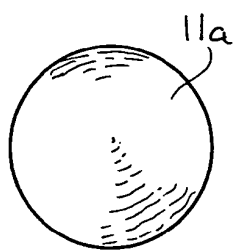


FIG. 4A

FIG. 4B



FIG. 4C

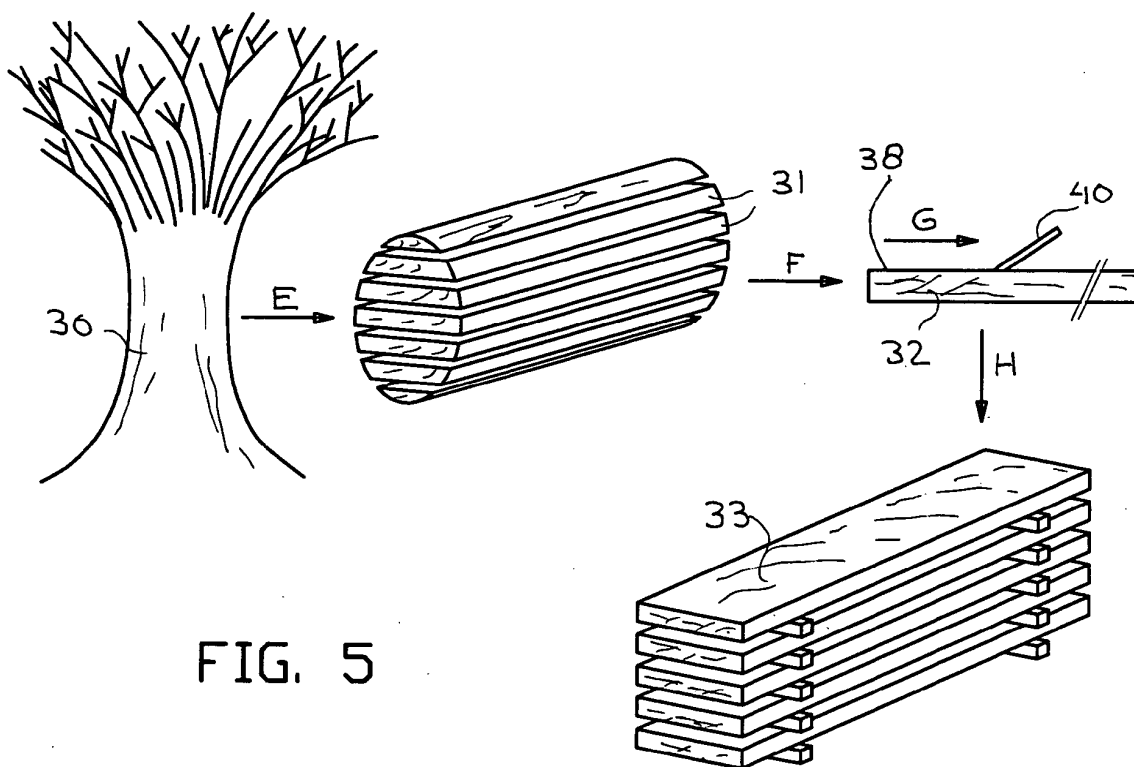


FIG. 5

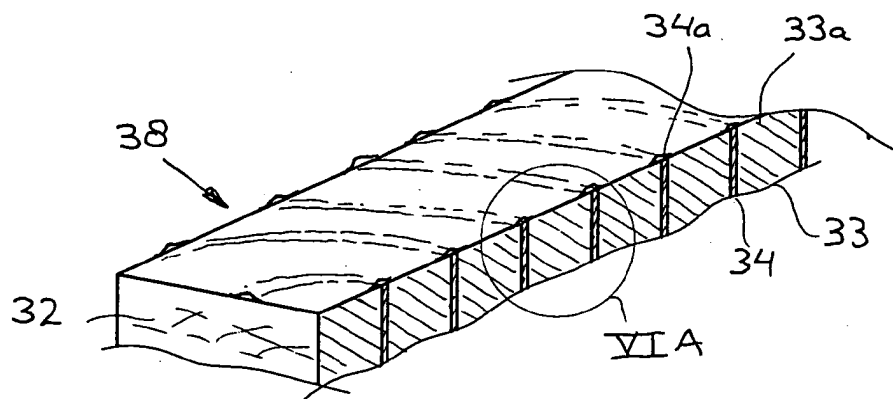


FIG. 6

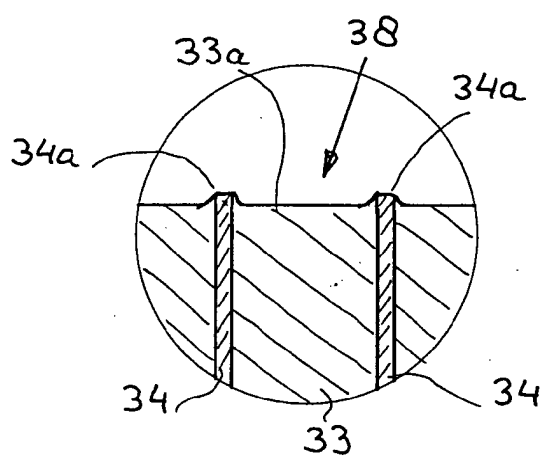


FIG. 6A

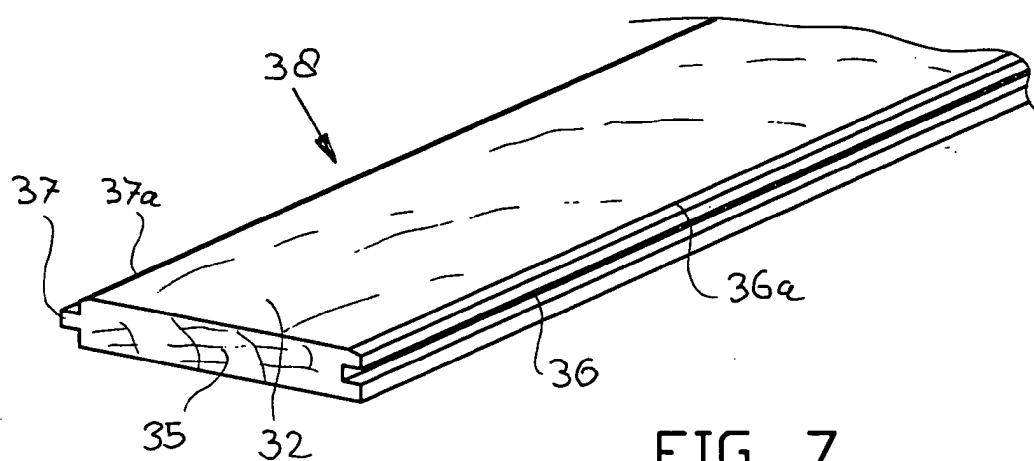


FIG. 7

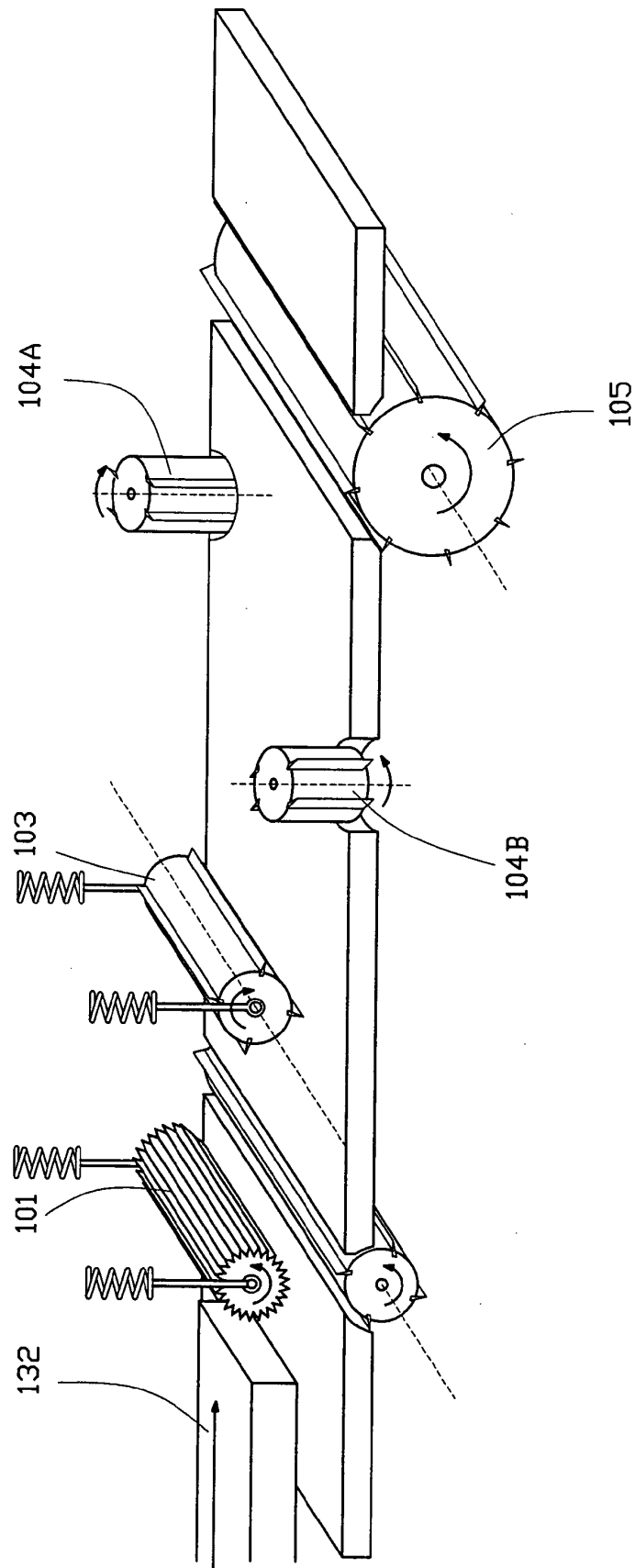
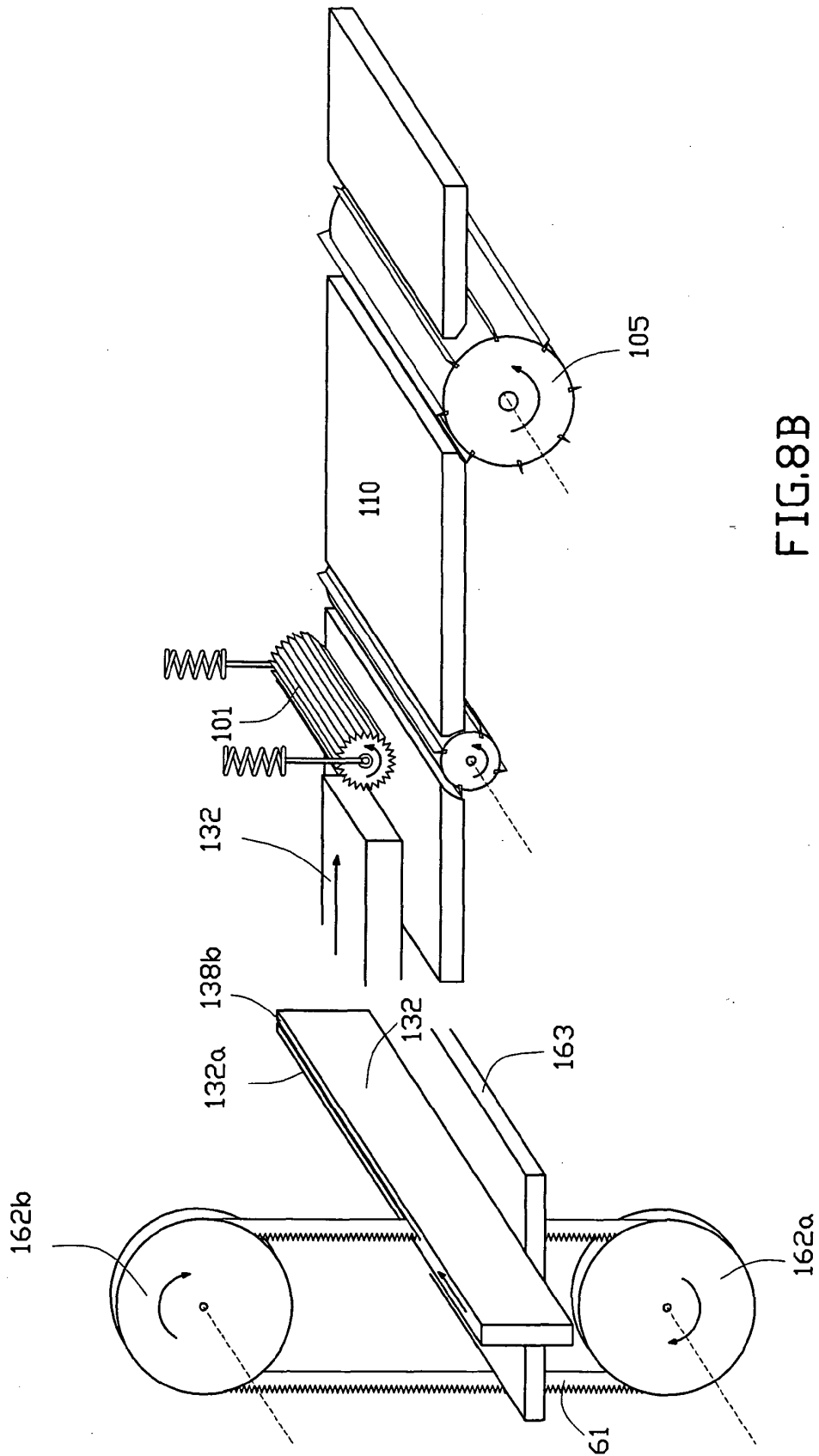


FIG. 8A



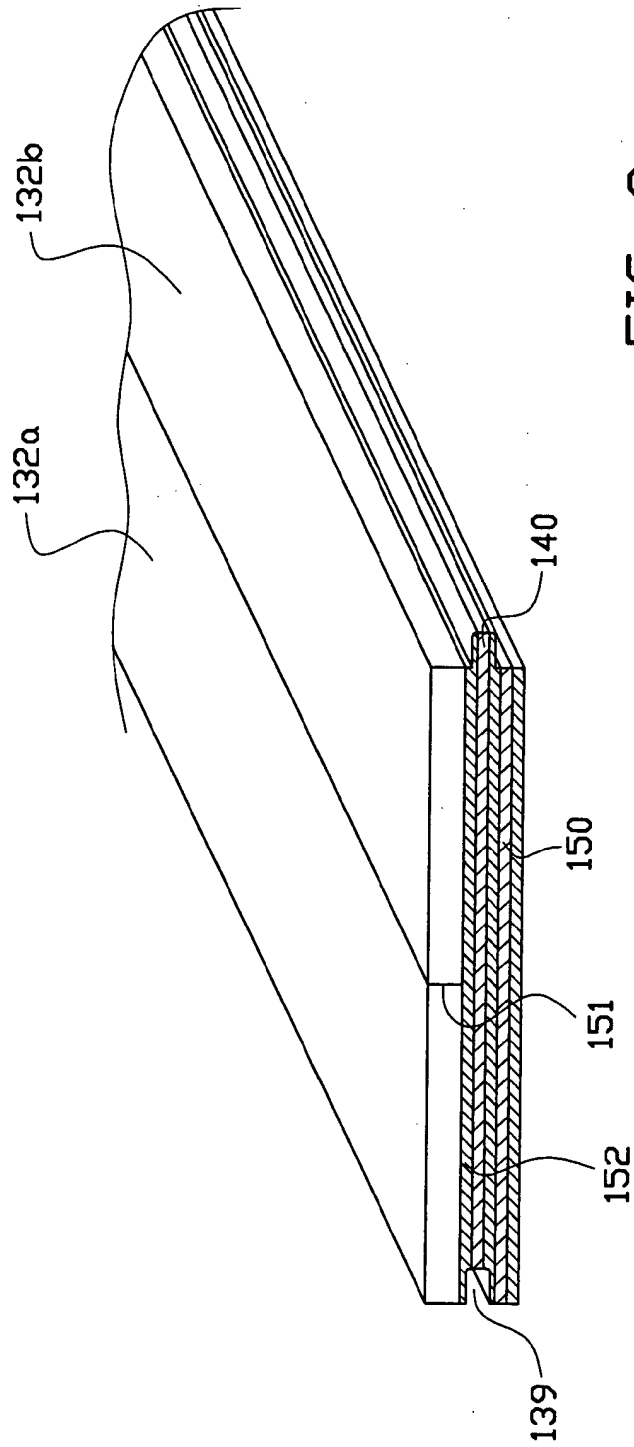


FIG. 9