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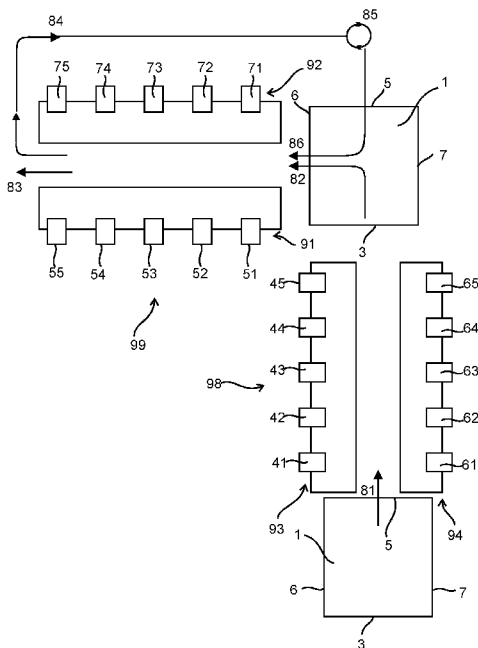
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(54) Title: A METHOD FOR FORMING A PANEL FOR A FURNITURE PRODUCT

FIG 4



(57) Abstract: A method for forming a panel (1) for an assembled product including, such as a furniture product, wherein the method includes: displacing the first panel in a feeding direction (82) by a conveyor through a first edge machine (99), working, by a first tool (5) of the first edge machine (99), on a first edge (3) of the first panel to obtain a decided location of the first edge (3), attaching, by a second tool (52) of the first edge machine (99), a covering material (4), such as a laminate strip, a thermoplastic strip or a veneer strip, on the first edge (3), and forming a first edge groove (21), by a third tool (53) of the first edge machine (99), along the first edge (3) and on a first main surface (11) of the first panel (1), wherein the first edge groove is configured to be a part of a locking device.

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## A METHOD FOR FORMING A PANEL FOR A FURNITURE PRODUCT

### Field of the Invention

Embodiments of the present invention relates to panels that are configured to be  
5 arranged perpendicular to each other and locked together. The panels may be assembled and locked together to obtain a furniture product, such as a bookshelf, a cupboard, a wardrobe, a box, a drawer or a furniture component. The locking may comprise a flexible tongue.

### Background of the Invention

10 A conventional furniture product may be assembled by a plurality of elements or panels. The panels may be assembled with a mechanical locking system, such as disclosed in, for example, WO 2012/154113 A1. The product comprises a first panel connected perpendicularly to a second panel by a mechanical locking system comprising, an edge tongue at the first panel, an edge groove at the  
15 second panel and a flexible tongue in an insertion groove.

For some embodiment situations, it may be desired to cover parts, such as grooves, of a locking system of an assembled furniture product. WO2010/070605 discloses a product assembled by a plurality of panels that are locked by a mechanical locking system. A strip covers some of the edges of the panels.

### 20 Summary of the Invention

Accordingly, embodiments of the present invention preferably seek to mitigate or eliminate one or more deficiencies, disadvantages or issues in the art. A further object of embodiments of the invention is to provide a method for producing a panel for a furniture product that may have the advantage that the locking system  
25 is formed and the edges are covered by a covering material in the same production line, and preferably with a continuous flow. Panels may be provided that may be locked together with a mechanical locking system with improved precision.

At least some of these and other objects and advantages that will be apparent from the description have been achieved by a first aspect of the invention including method for forming a first panel for an assembled product, such as a furniture product, wherein the method comprises:

- 5
- displacing the first panel in a feeding direction, e.g., by a conveyor through a first edge machine,
  - working, by a first tool of the first edge machine, on a first edge of the first panel to obtain a decided location of the first edge,
  - attaching, by a second tool of the first edge machine, a covering material,

10

  - such as a laminate strip, a thermoplastic strip or a veneer strip, on the first edge, and
  - forming a first edge groove, by a third tool, e.g., of the first edge machine, along the first edge and on a first main surface of the first panel, wherein the first edge groove is a part of a locking device.

- 15
- The first edge groove is preferably configured to cooperate with an edge tongue of a second panel for locking the first panel to the second panel, wherein a second main surface of the second panel is essentially perpendicular to the first main surface of the first panel.

The method may provide the advantage that the edge groove may be positioned

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with improved precision relative an outer surface of the covering material.

The method preferably comprises positioning of the first panel by a positioning device, such that the first panel is at a same position relative the conveyor at least between said the attaching of the covering material by the second tool and said forming of the first edge groove by the third tool. The positioning device may be a

25

part protruding from the conveyor. The conveyor may comprise a lower chain track and an upper belt. The positioning device may protrude from the lower chain track.

The working by the first tool is preferably performed before the attaching of the covering material by the second tool, and the attaching of the covering material by the second tool is preferably performed before the forming the first edge groove by

the third tool. This may mitigate or eliminate the problem that a crack arises at the edge groove when the covering material attached.

The method may comprise forming, by a fourth tool of the machine, an inserting groove in the first edge groove.

- 5 The method may comprise inserting a tongue, by a fifth tool of the machine, in the inserting groove.

The method may comprise displacing the third tool in a direction with an angle to the first main surface of the first panel, the angle is preferably an essentially right angle, such that the first edge groove may end at a distance from a third edge,  
10 which is adjacent to the first edge.

The method may comprise:

- working, by a sixth tool of the first edge machine, on a second edge of the first panel to obtain a decided location of the second edge, which is opposite the first edge,
- 15 • attaching, by a seventh tool of the first edge machine, a covering material, such as a laminate strip, a thermoplastic strip or a veneer strip, on the second edge,
- forming a second edge groove, by an eighth tool of the first edge machine, along the second edge and on the first main surface of the first panel,  
20 wherein the second edge groove is configured to be a part of a locking device.

The second edge groove is preferably configured to cooperate with an edge tongue of a second panel for locking the first panel to the second panel, wherein a second main surface of the second panel is essentially perpendicular to the first  
25 main surface of the first panel.

The method comprises positioning of the first panel by a positioning device, such that the first panel is at a same position relative the conveyor at least between said

attaching of the covering material by seventh tool and said forming of the second edge groove by the eighth tool.

The working by the sixth tool is preferably performed before the attaching of the covering material by the seventh tool, and the attaching of the covering material by  
5 the seventh tool is performed before the forming the second edge groove by the eighth tool.

The method may comprise forming, by a ninth tool of the first edge machine, an inserting groove in the second edge groove.

The method may comprise inserting a tongue, by a tenth tool of the first edge  
10 machine, in the inserting groove.

The method comprises may comprise displacing the eighth tool in a direction with an angle to the first main surface of the first, the angle is preferably an essentially right angle, such that the first edge groove ends at a distance from a third edge, which is adjacent to the first edge.

15 The method may comprise:

- displacing the first panel in a feeding direction by a conveyor through a fourth edge machine,
- working, by a 11th tool of the fourth edge machine, on a fourth edge of the first panel to obtain a decided location of the fourth edge, wherein the fourth  
20 edge is adjacent the first edge, and
- forming a third edge groove, by a 13th tool of the fourth edge machine, along the fourth edge and on a first main surface of the first panel, wherein the third edge groove is configured to be a part of a locking device.

The third edge groove is preferably configured to cooperate with an edge tongue of  
25 a second panel for locking the first panel to the second panel, wherein a second main surface of the second panel is essentially perpendicular to the first main surface of the first panel.

The method may comprise displacing the 13th tool in a direction with an angle to the first main surface of the first panel, the angle is preferably an essentially right angle, such that the third edge groove ends at a distance from the first edge and at a distance from a second edge which is adjacent to the fourth edge.

5 The method may comprise:

- working, by a 16th tool of a fourth edge machine, on a third edge of the first panel to obtain a decided location of the third edge, which is adjacent the first edge,
- attaching, by a 17th tool of the fourth edge machine, a covering material,  
10 such as a laminate strip, a thermoplastic strip or a veneer strip, on the third edge.

A core material of the first and/or the second panel may comprise a wood fibre based board, such as a HDF, MDF, plywood, solid wood or particleboard, or a reinforced plastic board or a wood fibre composite board.

15 The core may be provided with a decorative layer.

The furniture product may be a cabinet, such as a kitchen cabinet, bookshelves, a drawer, a table, a wardrobe or similar.

A second aspect of the invention is a furniture product comprising the first panel produced according to the first aspect. The set of panels may be a part of a frame  
20 of the furniture product.

### **Brief Description of the Drawings**

These and other aspects, features and advantages of which embodiments of the invention are capable of, will be apparent and elucidated from the following description of embodiments of the present invention, reference being made to the  
25 accompanying drawings, in which

FIGS 1A-1C show an embodiment of a panel that may be produced according to an embodiment of the invention

FIGS 2A-2D show an embodiment of a panel that may be produced according to an embodiment of the invention

FIG 3 shows an embodiment of a first panel, which may be produced according to an embodiment of the invention, locked together with an embodiment of a second panel

FIG 4 shows an embodiment of a production line comprising a first edge machine and a fourth edge machine

FIG 5 shows an embodiment of a production line.

### **Description of embodiments**

Specific embodiments of the invention will now be described with reference to the accompanying drawings. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. The terminology used in the detailed description of the embodiments illustrated in the accompanying drawings is not intended to be limiting of the invention. In the drawings, like numbers refer to like elements.

Embodiments of the first panel are shown in FIGS 1A-1C and FIGS 2A-2D that may be produced according to embodiments of the invention.

FIG 1A shows an embodiment of the first panel 1 in a 3D-view. FIG 1B shows a top view and FIG 1C shows a side view. The first panel comprises a first edge 3 comprising a first edge groove 21 and a second edge 5 comprising a second edge groove 22. The first edge groove extends along the whole first edge and comprises an opening at an adjacent third edge 7 and an opening at an adjacent fourth edge 6. The second edge groove extends along the whole second edge 5 and comprises an opening at the adjacent third edge 7 and an opening at the adjacent fourth edge 6. The first and the second edges are covered by a covering material. The first and the second edges 3,5 may be side edges of a furniture product and the fourth edge 6 may be a back edge. The third edge 7 may be a front edge that

may be covered with a covering material (not shown) that covers the openings of the first edge groove and the second edge groove, respectively. The fourth edge 6 may comprise a third edge groove 23, which preferably ends at a distance 9 from the first edge and the second edge, respectively.

- 5 FIG 2A shows an embodiment of the first panel 1 in a 3D-view. FIG 2C shows a top view and FIG 2B shows a side view. FIG 2D shows a cross cut at the dotted line 24 shown in FIG 2C.

The first panel comprises a first edge 3 comprising a first edge groove 21 and a second edge 5 comprising a second edge groove 22. The first edge groove  
10 extends along the first edge and comprises an opening at an adjacent fourth edge 6. The second edge groove extends along the second edge 5 and comprises an opening at the adjacent fourth edge 6. The first and the second edges are covered by a covering material. The first and the second edges 3,5 may be side edges of a furniture product and the fourth 6 edge may be a back edge. The first and the  
15 second edge groove may end at a distance 8 from the third edge 7. The fourth edge may comprise a third edge groove 23, which preferably ends at a distance 9 from the first edge and the second edge, respectively.

FIG 3 shows an end piece of an embodiment of the first panel. The first panel 1 is locked together by a locking device to a second panel 2. A second main surface 13  
20 of the second panel 2 is essentially perpendicular to a first main surface 11 of the first panel 1 in the shown locked position. The first edge groove 21 is configured to cooperate with an edge tongue 32 of the second panel 2 for locking the first panel 1 to the second panel 2 in a first direction, which is perpendicular to the second main surface 13 of the second panel. The locking device may comprise a flexible  
25 tongue 30, which may be arranged in an insertion groove 20 formed in the first edge groove 21, and a tongue groove 10 that may be formed in the edge tongue 32. The flexible tongue is configured to cooperate with the tongue groove for locking the first panel to the second panel in second direction which is perpendicular to the first main surface 11 of the first panel. The first panel 1  
30 comprises a second main surface 12, which is opposite to the first main surface of the first panel. The second panel 2 comprises a first main surface 14, which

opposite to the second main surface 13 of the second panel. The first edge 3 is covered by a covering material 4. The first and the second main surfaces of the first and the second panels may each be covered by a decorative layer. An outer surface of the covering material may be in line with an outer surface of the first  
5 main surface 14 of the second panel.

Another panel may be locked to the second edge groove of the first panel 1 in the same way as shown in FIG 3.

Another panel may be locked also to the third edge groove of the first panel in the same way as shown in FIG 3. For example, three panels may be locked to the first  
10 panel.

FIG 4 shows an embodiment of a production line for producing embodiments of the first panel 1. The production line comprises a first edge machine 99. The first panel is formed by:

- displacing the first panel in a feeding direction 82 by a conveyor through a  
15 first edge machine 99,
- working, by a first tool 51 of the first edge machine 99, on a first edge 3 of the first panel to obtain a decided location of the first edge 3,
- attaching, by a second tool 52 of the first edge machine 99, a covering  
20 material 4, such as a laminate strip, a thermoplastic strip or a veneer strip, on the first edge 3, and
- forming a first edge groove 21, by a third tool 53 of the first edge machine 99, along the first edge 3 and on a first main surface 11 of the first panel 1.

The first panel may be positioned by a positioning device, such that the first panel is at a same position relative the conveyor at least between said attaching of the  
25 covering material by the second tool 52 and said forming of the first edge groove by the third tool 53. The positioning device may be a part protruding from the conveyor. The conveyor may comprise a lower chain track and an upper belt. The positioning device may protrude from the lower chain track. The first panel may be

arranged with the first main surface facing the lower chain track. This may have the advantage that thickness variations of the first panel may not affect a location of the first edge groove relative the first main surface.

The working by the first tool 51 is performed before the attaching of the covering material 4 by the second tool 52, and the attaching of the covering material 4 by the second tool 52 is performed before the forming the first edge groove 21 by the third tool 53.

The forming of the first edge groove 21, by the third tool 53, may comprise mechanical cutting, such as milling.

10 The third tool may be displaced in a direction with an angle to the first main surface, the angle is may be an essentially right angle, e.g., about 90 degrees, such that the first edge groove ends at a distance 8 from a third edge 7, which is adjacent to the first edge 3. The direction is preferably perpendicular to an axis of rotation of the third tool.

15 An insertion groove 20 is formed, by a fourth tool 54 of the first edge machine 99, in the first edge groove 21. The forming may comprise displacing the fourth tool in a direction, which is preferably essentially perpendicular to an axis of rotation of the fourth tool, such that the insertion groove 20 ends at a distance from the third edge.

20 A tongue 30 is inserted, by a fifth tool 55 of the first machine, in the insertion groove 20.

A first tool setup comprising the first, second, third, fourth and fifth tools of the first edge machine are arranged on a first side 91 of the first edge machine 99. The shown first edge machine may comprise the same tool setup on a second side 92, 25 which is opposite to the first side, for forming a second edge of the first panel.

Forming of a second edge at a second side 92 of the first edge machine may comprise:

- working, by a sixth tool 71 of the first edge machine 99, on a second edge 5 of the first panel to obtain a decided location of the second edge 5, which is opposite the first edge,
- attaching, by a seventh tool 72 of the first edge machine 99, a covering material, such as a laminate strip, a thermoplastic strip or a veneer strip, on the second edge 5,
- forming a second edge groove 22, by an eighth tool 73 of the first edge machine 99, along the second edge 5 and on the first main surface 11 of the first panel 1, wherein the second edge groove is configured to be a part of a locking device.

The forming may further comprise positioning of the first panel by a positioning device, such that the first panel is at a same position relative the conveyor at least between said attaching of the covering material by seventh tool 72 and said forming of the second edge groove by the eighth tool 73. The positioning device on the second side may be configured as on the first side.

The working by the sixth tool 71 is performed before the attaching of the covering material 4 by the seventh tool 72, and the attaching of the covering material 4 by the seventh tool 72 is performed before the forming the second edge groove 22 by the eighth tool 73.

The eighth tool may be displaced in a direction with an angle to the first main surface of the first panel, the angle is preferably an essentially right angle, e.g., about 90 degrees, such that the first edge groove ends at a distance 8 from a third edge 7, which is adjacent to the first edge 3. The direction is preferably perpendicular to an axis of rotation of the eighth tool.

The forming may comprise forming, by a ninth tool 74 of the first edge machine 99, an inserting groove 20 in the second edge groove 22. The forming may comprise displacing the ninth tool in a direction, which is preferably essentially perpendicular to an axis of rotation of the ninth tool, such that the inserting groove 20 ends at a distance from the third edge.

The forming may comprise inserting a tongue 30, by a tenth tool 75 of the first edge machine 99, in the inserting groove 20.

A second tool setup comprising the sixth, seventh, eighth, ninth and tenth tools of the first edge machine is arranged on the second side 92, which is opposite the  
5 first side, of the first edge machine 99.

The embodiment of the production line shown in FIG 4 comprises a fourth edge machine 98 for forming a third and/or fourth edge 7, 6 of the first panel 1. An alternative embodiment of the production is lacking the fourth edge machine 98. The method for forming a third and/or fourth edge 7, 6 may for the alternative  
10 production line comprise the step of a feeding 84 the first panel from the outlet of the first edge machine, rotating the first panel 90 degrees, a feeding 86 into the inlet of the first edge machine and using the first and/or second tool setup for forming the third and/or fourth edge of the first panel. The width of the first edge machine may have to be adjusted before a forming of the third and/or fourth edge.  
15 Also the tools may have to be adjusted to another shape of the third and or fourth edge. In order to avoid adjustment it is therefore preferred to have the fourth edge machine 98 in the production line.

The forming of the first panel 1 may comprise:

- displacing the first panel 1 in a feeding direction 81 by a conveyor through a  
20 fourth edge machine 98,
- working, by a 11th tool 41 of the fourth edge machine 98, on a fourth edge 6 of the first panel to obtain a decided location of the fourth edge 6, wherein the fourth edge is adjacent the first edge 3, and
- forming a third edge groove 23, by a 13th tool 43 of the fourth edge machine  
25 98, along the fourth edge 6 and on a first main surface 11 of the first panel 1, wherein the third edge groove is configured to be a part of a locking device.

The forming may further comprise displacing the 13th tool in a direction with an angle to the first main surface of the first panel, the angle is preferably an

essentially right angle, e.g., about 90 degrees, such that the third edge groove ends at a distance 9 from the first edge 3 and at a distance from a second edge which is adjacent to the fourth edge 6. The direction is preferably perpendicular to an axis of rotation of the 13th tool.

5 The forming may further comprise:

- working, by a 16th tool 61 of a fourth edge machine 98, on a third edge 7 of the first panel to obtain a decided location of the third edge 7, which is adjacent the first edge 3,
- attaching, by a 17th tool 62 of the fourth edge machine 98, a covering  
10 material 4, such as a laminate strip, a thermoplastic strip or a veneer strip, on the third edge 7.

The fourth edge machine 98 may comprise a third tool setup, comprising the 11th tool and the 13th tool, that is arranged on a first side 93 of the fourth edge machine 98. The third tool set up may also comprise one or more of a 12th tool 42, a 14th  
15 tool 44 and a 15th tool 45, which corresponds to the second tool 52, the fourth tool 54 and a fifth tool 55, respectively, of the first tool setup. One or more of the tools of the third tool setup may be used for the forming of the fourth edge of the first panel.

The fourth edge machine 98 may comprise a fourth tool setup, comprising the 16th  
20 tool and the 17th tool, that is arranged on a second side 94, which is opposite the first side, of the fourth edge machine 98. The third tool set up may also comprise one or more of a 18th tool 63, a 19th tool 64 and a 20th tool 65, which corresponds to the eighth tool 73, the ninth tool 74 and a tenth tool 75, respectively, of the second tool setup. One or more of the tools of the fourth tool setup may be used  
25 for the forming of the third edge of the first panel.

The fourth edge machine 98 may comprise a positioning device on the first and the second side, such that the first panel is at a same position relative the conveyor during the forming. The positioning device may be a part protruding from the conveyor. The conveyor may comprise a lower chain track and an upper belt. The

positioning device may protrude from the lower chain track. The fourth edge machine 98 may comprise a guiding device along the first and/or the second side, such that the third edge and the fourth edge are formed parallel.

5 An alternative production line shown in FIG 5 which comprises a first machine 95, which comprises a tool set up that corresponds to the first tool setup of the first edge machine 99, and/or a second machine 96 with a tool setup that corresponds to second tool setup of the first edge machine 99. The first and the second machine may have a conveyor of the same type as the first edge machine.

10 The first panel 1 may be formed on the first edge 3 and the second edge 5 by displacing 81 the first panel through the first machine 9 and the second machine. The third edge and the fourth edge may be formed by displacing 87 the first panel from the outlet of the second machine to the inlet of the first machine and rotating 88 the first panel 90 degrees before beginning a forming of the third and the fourth edges.

15 Another embodiment of the alternative production line is lacking the second machine. The first edge may be formed by displacing 86 the first panel 1 through the first machine 95. The second edge may be formed by displacing 87 the first panel from the outlet of the first machine to the inlet of the first machine and rotating 88 the first panel 180 degrees before beginning a forming of the second  
20 edge. The third edge may be formed by displacing 89 the first panel from the outlet of the first machine to the inlet of the first machine and rotating 88 the first panel 90 degrees before beginning a forming of the third edge. The fourth edge may be formed by displacing 89 the first panel from the outlet of the first machine to the inlet of the first machine and rotating 88 the first panel 180 degrees before  
25 beginning a forming of the fourth edge.

An advantage with this alternative production line may be that an adjustment of the first and/or the second machine due to different widths of the first panel may not be needed. A disadvantage may be that the first panel may have to be displaced two or more times through the first and/or second machine.

One or more of the first tool, the fifth tool, 11th tool and the 16th tool may each comprise a mechanical cutting unit, such as a milling unit, and/or preferably a sanding unit.

5 One or more of the second tool, the seventh tool, the 12th tool and the 17th tool may each comprise a gluing section.

One or more of the third tool, the eighth tool, the 13th tool, the 18th tool and the 23th may each comprise a mechanical cutting unit, such as a milling unit, and/or preferably

10 The order of the any of the tools, and number of tools, in any of the toll setups may differ from each other, depending of the desired shapes of the first panel.

Forming of the first panel in any of the production lines described above may result in a same final shape of the first panel.

The furniture product may be a cabinet, such as a kitchen cabinet, bookshelves, a drawer, a table, a wardrobe or similar

15 The set of panels described above may be a part of a furniture product, such as a frame.

**CLAIMS**

1. A method for forming a first panel (1) for an assembled product, such as a furniture product, wherein the method comprises:

- 5       • displacing the first panel (1) in a feeding direction (82) by a conveyor through a first edge machine (99),
- working, by a first tool (51) of the first edge machine (99), on a first edge (3) of the first panel to obtain a decided location of the first edge (3),
- 10       • attaching, by a second tool (52) of the first edge machine (99), a covering material (4), such as a laminate strip, a thermoplastic strip or a veneer strip, on the first edge (3), and
- forming a first edge groove (21), by a third tool (53) of the first edge machine (99), along the first edge (3) and on a first main surface (11) of the first panel (1), wherein the first edge groove is configured to be a part of a locking device.

15   2. The method as claimed in claim 1, wherein the method comprises positioning of the first panel by a positioning device, such that the first panel is at a same position relative the conveyor at least between said attaching of the covering material by the second tool (52) and said forming of the first edge groove by the third tool (53).

20   3. The method as claimed in claim 1 or 2, wherein the working by the first tool (51) is performed before the attaching of the covering material (4) by the second tool (52), and the attaching of the covering material (4) by the second tool (52) is performed before the forming the first edge groove (21) by the third tool (53).

25   4. The method as claimed in any one of the claims 1-3, wherein the method comprises forming, by a fourth tool (54) of the first edge machine (99), an inserting groove (20) in the first edge groove (21).

5. The method as claimed in claim 4, wherein the method comprises inserting a tongue (30), by a fifth tool (55) of the first edge machine (99), in the inserting groove (20).

6. The method as claimed in any one of the claims 1-6, wherein the method  
5 comprising displacing the third tool in a direction with an angle to the first main surface of the first panel, the angle is preferably an essentially right angle, such that the first edge groove ends at a distance (8) from a third edge (7), which is adjacent to the first edge (3).

7. The method as claimed in any one of the claims 1-6, wherein the method  
10 comprises:

- working, by a sixth tool (71) of the first edge machine (99), on a second edge (5) of the first panel to obtain a decided location of the second edge (5), which is opposite the first edge,
- attaching, by a seventh tool (72) of the first edge machine (99), a covering  
15 material (4), such as a laminate strip, a thermoplastic strip or a veneer strip, on the second edge (5),
- forming a second edge groove (22), by an eighth tool (73) of the first edge machine (99), along the second edge (5) and on the first main surface (11) of the first panel (1), wherein the second edge groove is configured to be a  
20 part of a locking device.

8. The method as claimed in claim 7, wherein the method comprises positioning of the first panel by a positioning device, such that the first panel is at a same position relative the conveyor at least between said attaching of the covering material by seventh tool (72) and said forming of the second edge groove by the eighth tool  
25 (73).

9. The method as claimed in claim 7 or 8, wherein the working by the sixth tool (71) is performed before the attaching of the covering material (4) by the seventh tool (72), and the attaching of the covering material (4) by the seventh tool (72) is performed before the forming the second edge groove (22) by the eighth tool (73).

10. The method as claimed in any one of the claims 7-8, wherein the method comprises forming, by a ninth tool (74) of the first edge machine (99), an inserting groove (20) in the second edge groove (22).

11. The method as claimed in claim 10, wherein the method comprises inserting a tongue (30), by a tenth tool (75) of the first edge machine (99), in the inserting groove (20).

12. The method as claimed in any one of the claims 7-11, wherein the method comprises displacing the eighth tool in a direction with an angle to the first main surface of the first panel, the angle is preferably an essentially right angle, such that the second edge groove ends at a distance (8) from a third edge (7), which is adjacent to the first edge (3).

13. The method as claimed in any one of the claims 1-12, wherein the method comprises:

- displacing the first panel (1) in a feeding direction (81) by a conveyor through a fourth edge machine (98),
- working, by a 11th tool (41) of the fourth edge machine (98), on a fourth edge (6) of the first panel to obtain a decided location of the fourth edge (6), wherein the fourth edge is adjacent the first edge (3), and
- forming a third edge groove (23), by a 13th tool (43) of the fourth edge machine (98), along the fourth edge (6) and on a first main surface (11) of the first panel (1), wherein the third edge groove is configured to be a part of a locking device.

14. The method as claimed in any one of the claims 13, wherein the method comprising displacing the 13th tool in a direction with an angle to the first main surface of the first panel, the angle is preferably an essentially right angle, such that the third edge groove ends at a distance (9) from the first edge (3) and at a distance from a second edge which is adjacent to the fourth edge (6).

15. The method as claimed in any one of the claims 1-14, wherein the method comprises:

- working, by a 16th tool (61) of a fourth edge machine (98), on a third edge (7) of the first panel to obtain a decided location of the third edge (7), which is adjacent the first edge (3),
- attaching, by a 17th tool (62) of the fourth edge machine (98), a covering material (4), such as a laminate strip, a thermoplastic strip or a veneer strip, on the third edge (7).

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FIG 1A

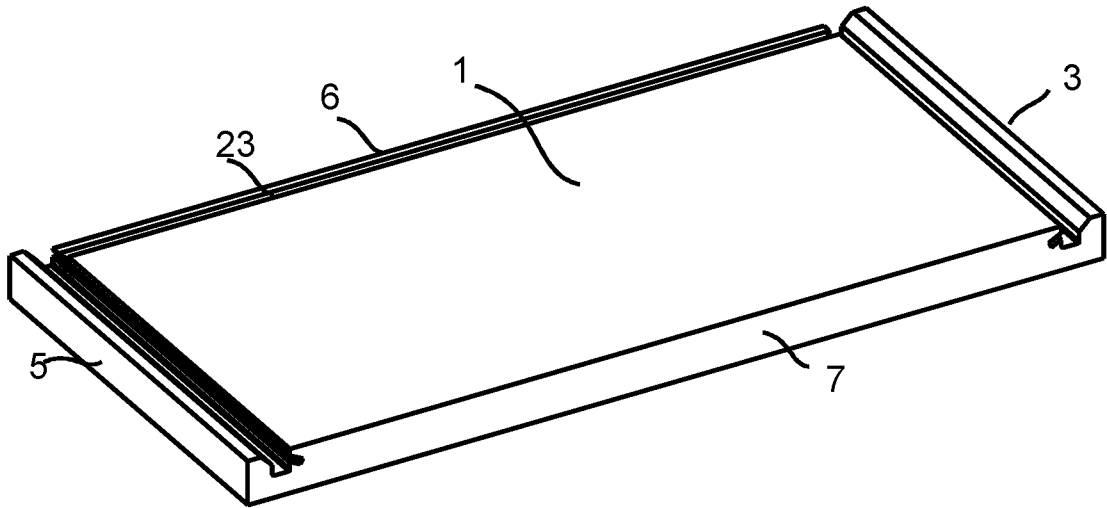


FIG 1B

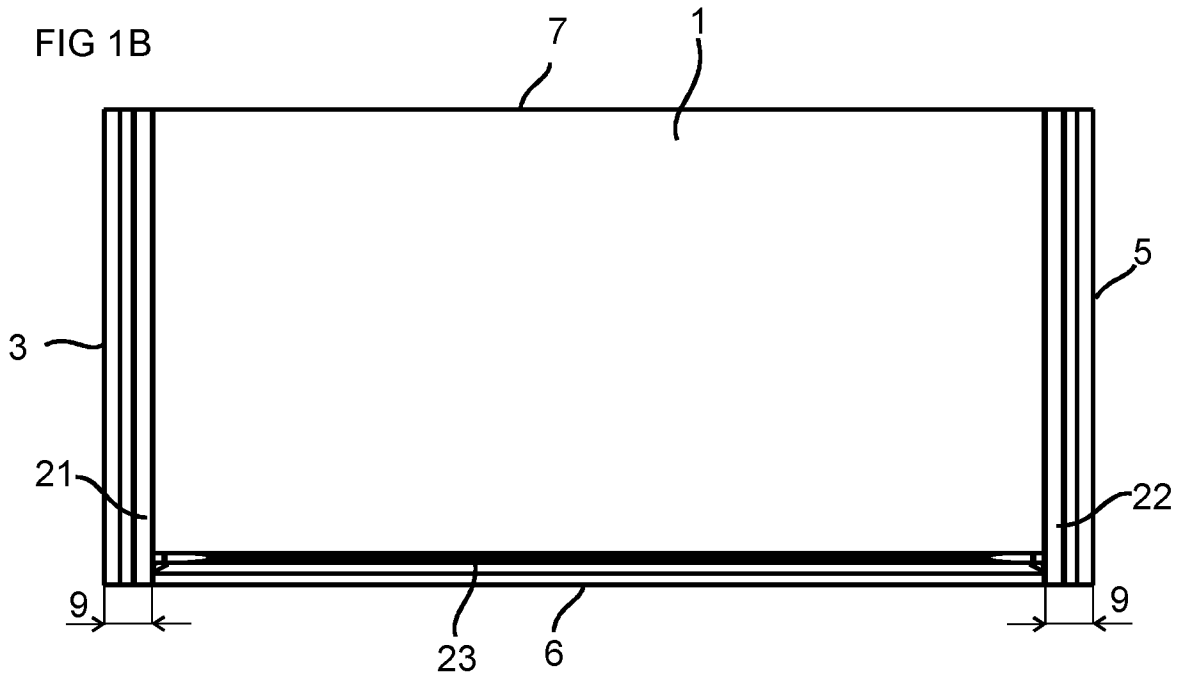


FIG 1C

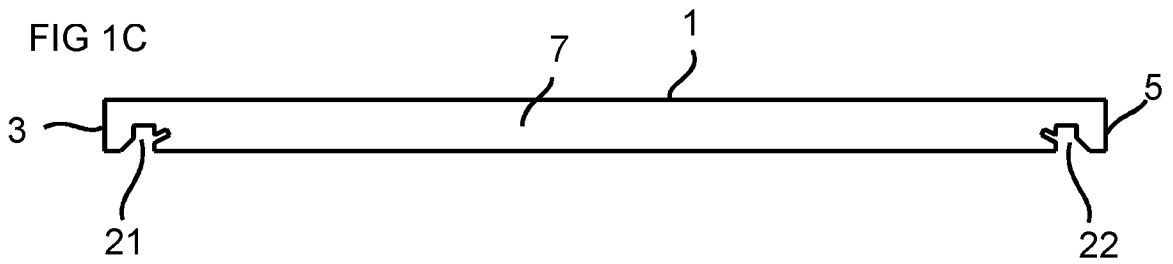


FIG 2A

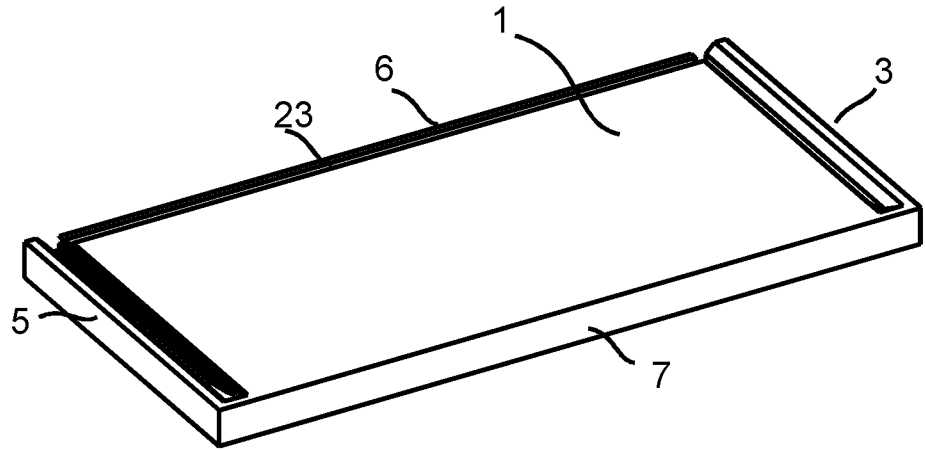


FIG 2B

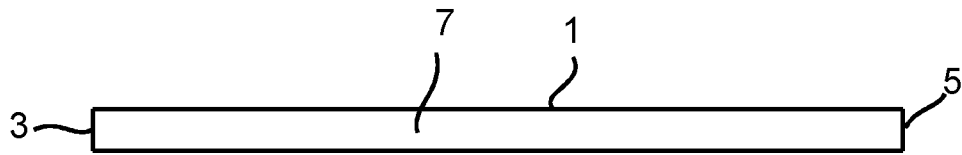


FIG 2C

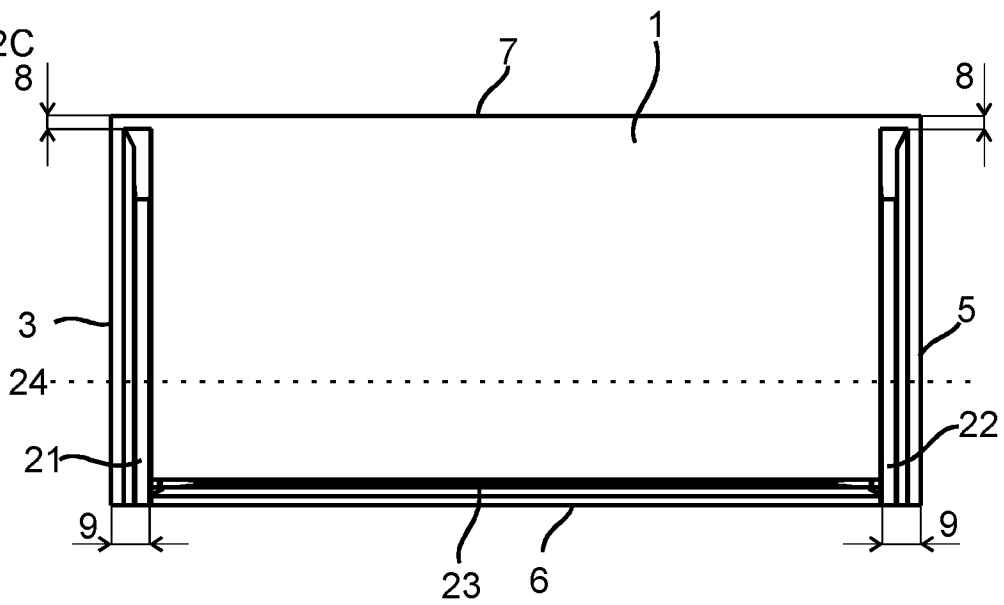


FIG 2D

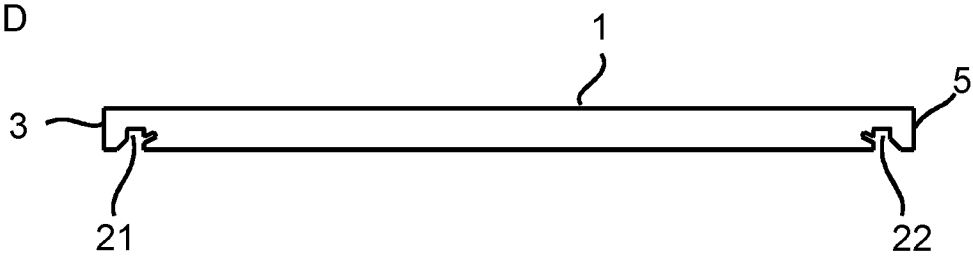


FIG 3

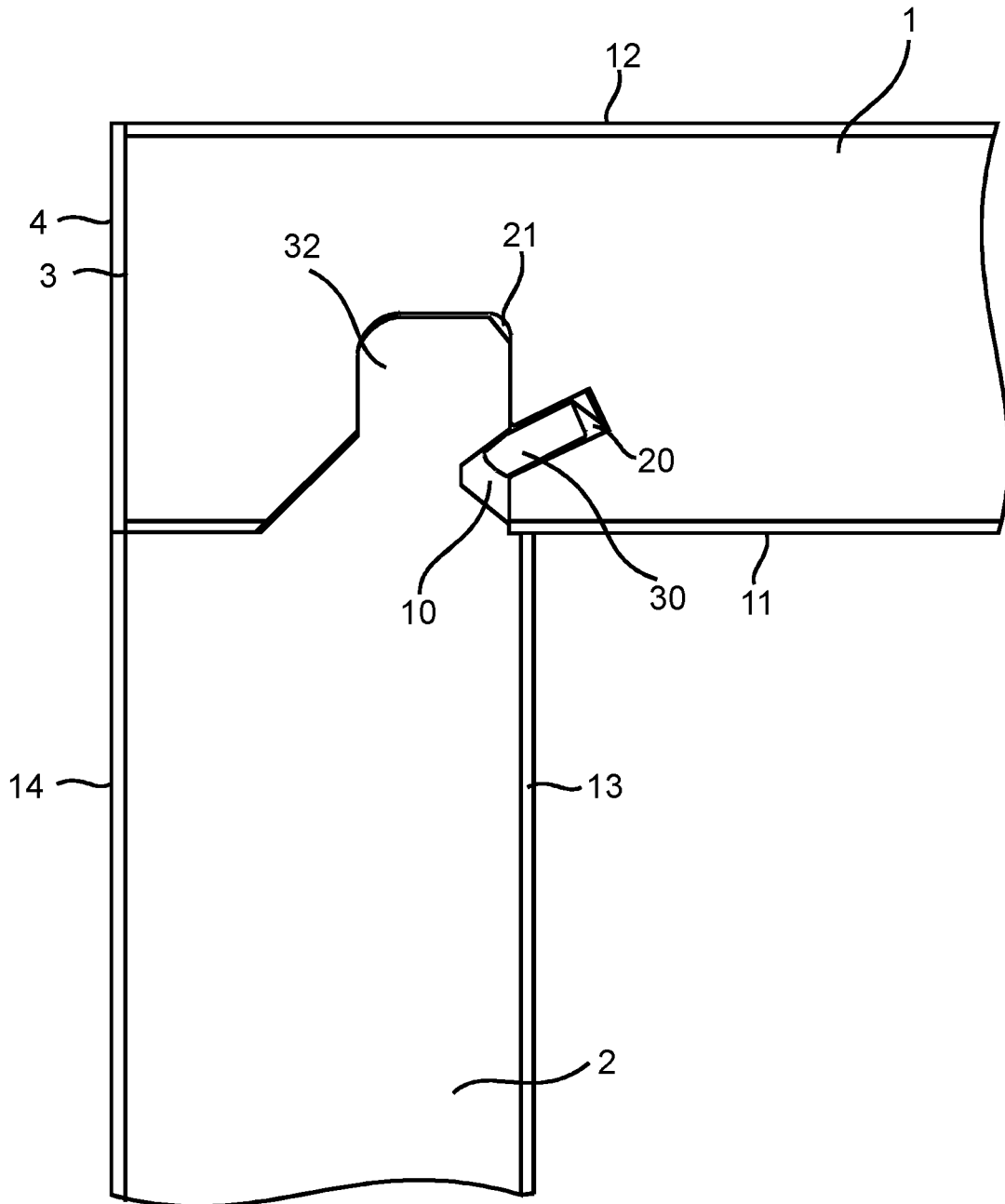


FIG 4

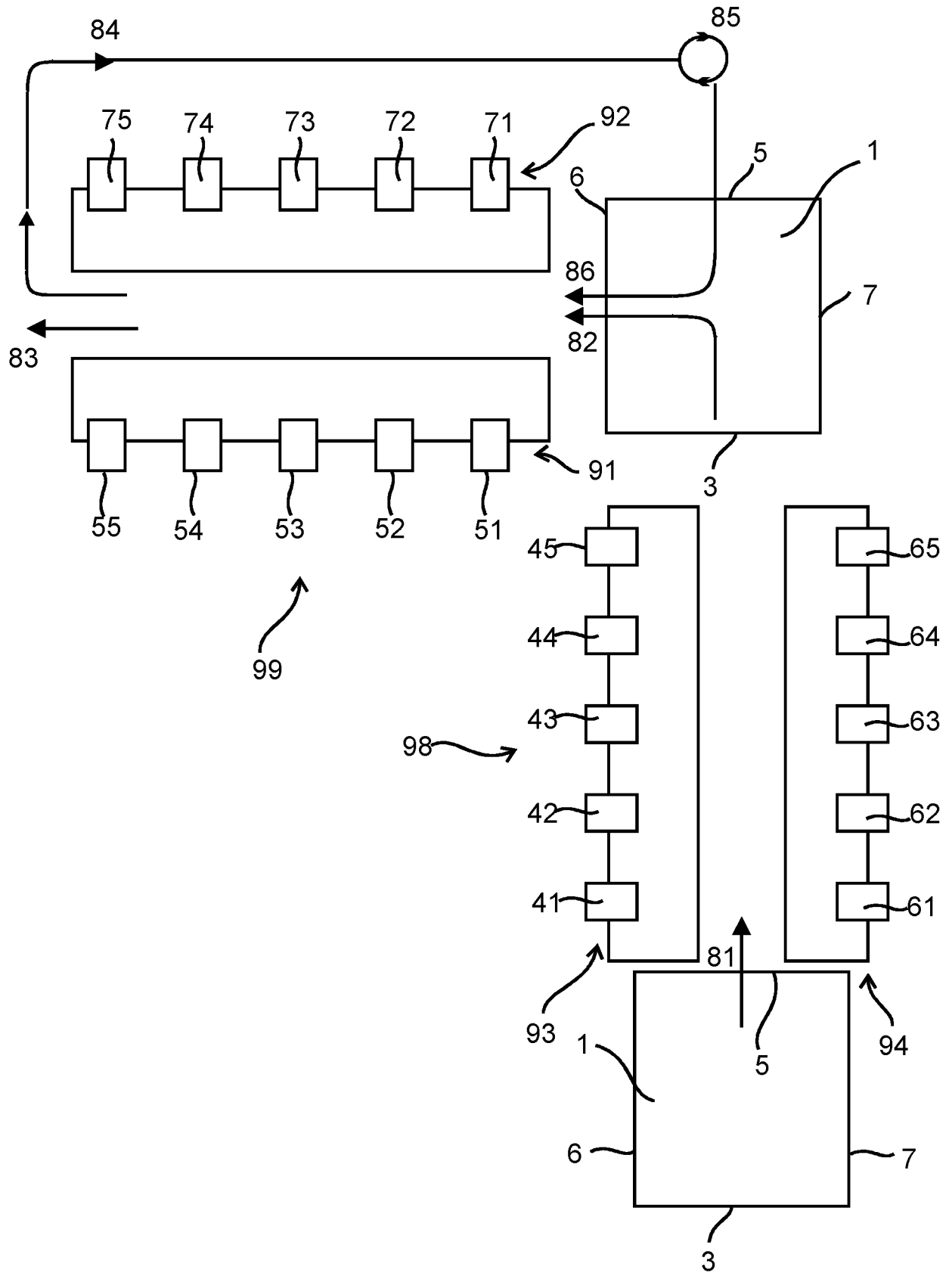
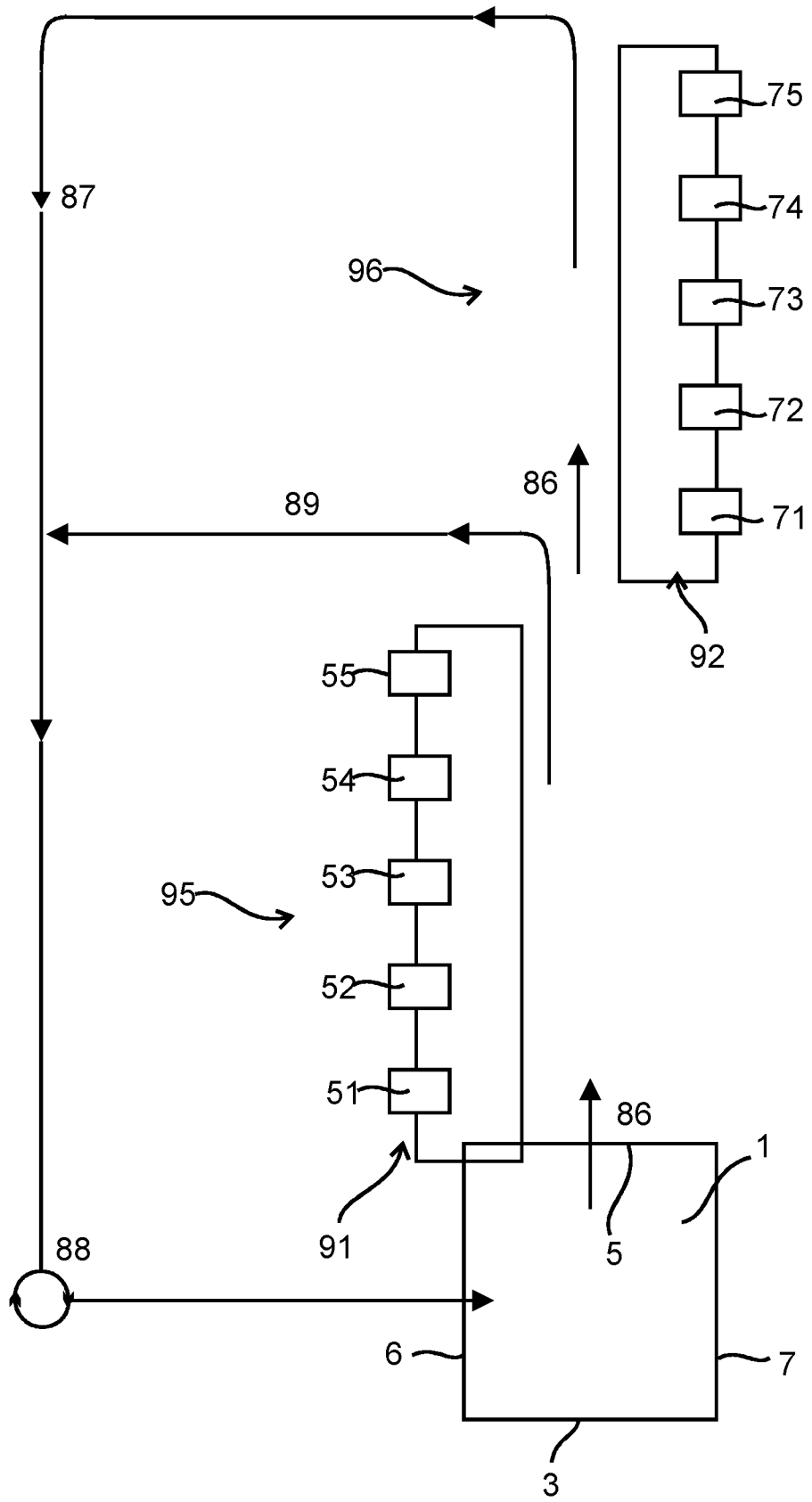


FIG 5

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## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/SE2017/050135

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: A47B, B27C, B27D, B27F, B27M		
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, PAJ, WPI data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 20140042314 A (HANSSEM CO LTD), 7 April 2014 (2014-04-07); whole document --	1-15
A	KR 101147274 B1 (HANSSEM CO LTD), 18 May 2012 (2012-05-18); whole document --	1-15
A	DE 202009008825 U1 (UNILIN B V B A), 15 October 2009 (2009-10-15); abstract; figures -- -----	1-15
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 09-05-2017		Date of mailing of the international search report 09-05-2017
Name and mailing address of the ISA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. + 46 8 666 02 86		Authorized officer Yvonne Grebäck Telephone No. + 46 8 782 28 00

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/SE2017/050135**

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

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WO	2010070472	A3	20/01/2011
ZA	201103232	B	25/01/2012

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**Continuation of:** second sheet

**International Patent Classification (IPC)**

- B27M 3/18*** (2006.01)
- A47B 47/00*** (2006.01)
- B27C 5/00*** (2006.01)
- B27D 5/00*** (2006.01)
- B27F 1/02*** (2006.01)