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(54) BUILDING PANEL WITH A MECHANICAL LOCKING SYSTEM

BAUPLATTE MIT EINEM MECHANISCHEN ARRETIERUNGSSYSTEM

PANNEAU DE CONSTRUCTION AYANT UN MÉCANISME DE VERROUILLAGE MÉCANIQUE

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(73) Proprietor: **Välinge Innovation AB**
263 65 Viken (SE)

(72) Inventor: **BOO, Christian**
S-268 77 Kågeröd (SE)

(74) Representative: **Engstrand, Ola**
Välinge Innovation AB
Patent Department
Prästavägen 513
263 65 Viken (SE)

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EP 2 852 722 B1

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Description

Field of the invention

[0001] The present invention relates to a building panel such as a floor panel, a wall panel, a ceiling panel, a furniture component or the like, which is provided with a mechanical locking system, and a method for producing said building panel with said locking system.

Technical background

[0002] Building panels provided with a mechanical locking system comprising a displaceable and resilient tongue cooperating with a tongue groove for vertical locking is known and disclosed in, e.g., WO2006/043893. The tongue is a separate part and is made of e.g. plastic and inserted in a displacement groove at an edge of a panel. The tongue is pushed into the displacement groove during a vertical assembling of the panels and springs back into the tongue groove of an adjacent panel when the panels have reached a locked position.

[0003] Also known is a locking system for panels comprising a tongue, which is displaceable along the edge of a panel, see, e.g., WO2009/116926, and cooperates with a tongue groove for vertical locking. The tongue is a separate part and is provided with several protrusions, which initially match recesses of the tongue groove. The panels may be assembled by a vertical movement and the tongue is displaced to a position in which the protrusions no longer match the recesses in order to obtain the vertical locking.

[0004] Although the description relates to floor panel, the description of techniques and problems thereof is applicable also for other applications, such as panels for other purposes, for example wall panels, ceiling panels, furniture etc.

[0005] A drawback with the known system is that a separate tongue must be produced and special inserting machines are required to position the tongue in the displacement groove with high precision. Another known prior art is WO2011/001326. The above description of various known aspects is the applicant's characterization of such, and is not an admission that any of the above description is considered as prior art.

Summary of the invention

[0006] It is an object of certain embodiments of the present invention to provide an improvement over the above described techniques and known art.

[0007] A further object is to provide a locking system with a flexible and displaceable tongue that may be formed out of the edge of the building panel. Such a system may simplify the production since no loose and additional part is necessary to produce and position at the correct position in the locking system.

[0008] Another object is to provide a more efficient production method and which requires less complicated production equipment.

[0009] At least some of these and other objects and advantages that will be apparent from the description have been achieved by building panels provided with a mechanical locking system comprising a tongue, at an edge of a first panel, cooperating with a tongue groove, at an edge of an adjacent second panel, for vertical locking of the building panels. The edge of the first panel may be provided with a displacement groove, which is downwardly open, and comprises an inner wall, an outer wall, and an upper wall. The tongue may be formed out of the edge of the first panel. A displaceable part of the tongue may be displaceable into the displacement groove and the upper wall may be vertically positioned at an upper surface of the displaceable part of the tongue.

[0010] The length of the displacement groove, along the edge of the first panel, is preferably smaller than the length of the edge of the first panel. The length of the displacement groove is preferably in the range of about 10% to about 90% of the length of the edge of the first panel

[0011] The resilient and displaceable part of the tongue makes it possible to assemble the first and the second panel by displacing the edges vertically in relation to each other. A part of the edge of the second panel may push the displaceable part of the tongue into the displacement groove. The resilient and displaceable part of the tongue is preferably configured to be displaced into the displacement groove by a lower lip of the tongue groove during assembling of the first and the second panel. The displaceable part of the tongue may spring at least partly back, when the first and the second panel are positioned in a locked position, and into the tongue groove of the second panel. The part of the edge and the displaceable tongue part are preferably configured such that the displaceable part is pushed in an essentially horizontal direction. An essentially horizontal displacement may decrease the risk that the displaceable part of the tongue gets stuck in the displacement groove.

[0012] The upper wall may cooperate, for guiding the displaceable part of the tongue and/or for the vertical locking, with the upper surface.

[0013] The upper wall may be positioned somewhat above the upper surface of the displaceable part, but a position at an essential equal level, may make the locking system more stable and stronger.

[0014] The displacement groove may be arranged in relation to the edge of the first panel so that a thin wall or sidewardly open groove is created, at the outer wall of the displacement groove, above and/or below the displaceable part of the tongue.

[0015] The thickness of the outer wall of the displacement groove at a first and upper part of the displacement groove, at the upper surface of the tongue, is preferably configured such that the outer wall at the first and upper part breaks during said assembling of the building panels when the displaceable part of the tongue is pushed into

the displacement groove.

[0016] The thickness of the outer wall of the displacement groove at a second part of the displacement groove, below the displaceable part of the tongue, is preferably configured such that such that the outer wall at second part breaks during said assembling of the building panels when the displaceable part of the tongue is pushed into the displacement groove.

[0017] The outer wall at the first and upper part of the displacement groove and/or the outer wall of the displacement groove at the second part of the displacement groove may also be broken by a tool, preferably a rotating wheel, before assembling. An alternative for breaking is to make a cut by a tool, e.g., a knife or preferably a rotating knife.

[0018] The displacement groove may also be sidewardly open at the first and/or second part of the displacement groove.

[0019] A wall that breaks may provide overlapping surfaces between the displacement groove and the displaceable part when the displaceable part is not pushed into the displacement groove. The overlapping surfaces make the locking system more stable and stronger.

[0020] A sidewardly open displacement groove makes it easier to push the displaceable part of the tongue into the displacement groove.

[0021] The broken outer wall of the displacement groove may cooperate, for guiding the displaceable part of the tongue and/or for the vertical locking, with the displaceable part of the tongue.

[0022] The tongue may comprise a fixed part at each side of the displaceable part of the tongue.

[0023] The tongue groove may comprise recesses, which match the fixed part of the tongue.

[0024] The recesses may be in a lower lip of the tongue groove. The length, along the edge of the second panel, of the lower lip between the recesses is preferably smaller than the length displacement groove.

[0025] A contact surface of the lower lip of the tongue groove may cooperate, for the vertical locking, with a lower surface of the displaceable part of the tongue.

[0026] The contact surface may be positioned such that when the displaceable part of the tongue springs back, during assembling of the building panels, the displaceable part is prevented to reach its original position. The lower surface of the displaceable part tongue may assert a force against the contact surface of lower lip in order to avoid a play between the panels.

[0027] The tongue may have several displaceable parts and the edge of the first panel may be provided with several displacement grooves.

[0028] The locking system may comprise a locking element, preferably arranged on a locking strip, at the edge of the first or the second panel, which cooperates with a locking groove at the edge of the other of the first or the second panel, for locking the panels horizontally.

[0029] The first and the second panel are preferably essential equal, thus an edge opposite said edge of the first panel is provided with the same parts of the locking system as said edge of the second panel.

[0030] The panels may be square-shaped and the edges between the said edge and said opposite edge are preferably provided with a locking system which enables assembling to an adjacent panel by an angling movement.

[0031] The displacement groove may be filled with a resilient material, such as plastic or rubber, to improve the resilient properties of the displaceable part and/or to make the locking system stronger.

[0032] The building panel may be a floor panel, a wall panel, a ceiling panel, a furniture component or the like.

[0033] The core of the building panels may be a wood-based core, preferably made of MDF, HDF, OSB, WPC, or particleboard or of plastic e.g. vinyl or PVC.

[0034] The edge of the panels, of which the locking system may be made, may comprise the core material.

[0035] A second aspect of the invention are building panels provided with a mechanical locking system comprising a tongue, at an edge of a first panel, cooperating with a tongue groove, at an edge of an adjacent second panel, for vertical locking of the building panels. The edge of the first panel may be provided with a displacement groove to obtain a resilient and displaceable tongue part. Said displacement groove may be downwardly open, and comprises an inner wall, an outer wall and an upper wall. The tongue may be formed out of the edge of the first panel. The resilient and displaceable part of the tongue may be configured to be displaced partly into the displacement groove by a lower lip of the tongue groove during assembling of the first and the second panel by a vertical displacement of the second panel toward the first panel.

[0036] The thickness of the outer wall of the displacement groove at a first and upper part of the displacement groove, above the upper surface of the tongue, is configured such that the resilient and displaceable tongue part is obtained. Also the thickness of the outer wall of the displacement groove at a second part of the displacement groove, below the resilient and displaceable part of the tongue, is configured such that the resilient and displaceable tongue part is obtained. The outer wall at the first and upper part and at the second part is not, according to certain embodiments of the second aspect, intended to break. The purpose of the displacement groove and the outer wall at the first and upper part and at the second part is to make the resilient and displaceable tongue part more resilient and to provide an improved locking strength.

[0037] The tongue may comprise fixed parts at the side of the resilient and displaceable part of the tongue.

[0038] The tongue groove may comprise recesses, which match the fixed part of the tongue.

[0039] A contact surface of a lower lip of the tongue groove may cooperate, for the vertical locking, with a lower surface of the resilient and displaceable part of the tongue.

[0040] The contact surface may be arranged such that when the displaceable part of the tongue springs back, during the assembling of the building panels, the displaceable part is prevented from reaching its original position.

[0041] The tongue may have several displaceable parts and the edge of the first panel may be provided with several displacement grooves.

[0042] Also parts of the lower lip of the tongue groove may be made flexible and resilient. This may be achieved by providing a displacement groove also at the edge of the second panel.

[0043] The building panel may be a floor panel, a wall panel, a ceiling panel, a furniture component or the like.

[0044] The core of the building panels may be a wood-based core, preferably made of MDF, HDF, OSB, WPC, or particleboard or of plastic e.g. vinyl or PVC.

[0045] The edge of the panels, of which the locking system may be made, may comprise the core material.

[0046] A third aspect of the invention is a method to produce a building panel according to embodiments of the first or second aspect. The method may comprise the steps of:

- forming the tongue at the edge of the first panel.
- forming the displacement groove at the underside of the first panel, preferably by milling, sawing and/or drilling.
- milling the tongue groove at the opposite edge of said edge of the first panel.
- forming the recesses in the lower lip of the tongue groove, preferably by milling, sawing and/or drilling.

Brief description of the drawings

[0047] The present invention will by way of example be described in more detail with reference to the appended schematic drawings, which shows embodiments of the present invention.

FIG. 1 shows a known locking system with a separate and resilient tongue.

FIGS. 2A-C shows a cross section of a known locking system with a separate and displaceable tongue.

FIG. 3 shows a known locking system with a separate and displaceable tongue.

FIG. 4 shows a 3D view of building panels according to an embodiment of the invention.

FIG. 5 shows a 3D view of building panels according to an embodiment of the invention.

FIGS. 6A-B show cross sections of building panels according to an embodiment of the invention.

FIG. 6C shows a side view of building panels according to an embodiment of the invention.

FIGS. 7A-D shows an embodiment of assembling according to an embodiment of the invention.

FIGS. 8A-B show top views of the building panels according to embodiments of the invention.

FIGS. 9A-B show a cross of the building panels according to embodiments of the invention.

FIGS. 10A-B show a top view and a side view of the building panels according to an embodiment of the invention.

FIGS. 11A-D show a top view, a side view and two cross sections of building panels according to an embodiment of the invention.

FIGS. 12A-C show a side view and two cross-sections of building panels according to an embodiments of the invention.

Detailed description

[0048] A known locking system for building panels, which comprises a displaceable and resilient tongue 30 cooperating with a tongue groove 20 for vertical locking of the short edges is shown in FIG. 1. The tongue 30 is a separate part and is made of, e.g., plastic, and inserted in a displacement groove at a first short edge of a panel. The tongue is pushed into a displacement groove during a vertical assembling of the short edges of the panels and springs back into a tongue groove at a second short edge of an adjacent panel when the panels have reached a locked position. The long edges of the panels are provided with a locking system, which enables assembling to an adjacent panel by an angling movement, to obtain a simultaneous assembling of adjacent long and short edges.

[0049] FIGS. 2A-B show cross sections of different embodiments of the known displaceable and resilient tongue 30 during assembling of two adjacent short edges. The panel with the tongue groove is lowered in relation to the panel with tongue 30, which is pushed into the displacement groove by the lowered panel. The tongue springs back, and into the tongue groove, when the panels has reached an assembled position, and locks the panels vertically.

[0050] A known locking system for panels comprising a tongue 30, which is displaceable along the short edge 4a of a panel 1 in a displacement groove 40 and cooperates with a tongue groove 20 for vertical locking of adjacent short edges 4a, 4b is disclosed in FIG. 3. The tongue is a separate part and is provided with several protrusions 31 a, which initially match recesses 33b of the tongue groove 20. The panels 1, 1' may be assembled

by a vertical movement and the tongue is displaced, by applying a force at a part 32 of the tongue 30, to a position in which the protrusions no longer match the recesses in order to obtain the vertical locking. The long edges 5a, 5b of the panels are provided with a locking system, which enables assembling to an adjacent panel 1" by an angling movement, to obtain a simultaneous assembling of adjacent long 5a, 5b and short edges 4a, 4b.

[0051] Embodiments of the invention is shown in FIGS. 4, 5, 6A-C, 7A-D, 8A-B and 9A-B. A locking system is formed at adjacent edges of an adjacent first and second panel 1, 1' for locking the adjacent edges in a vertical and/or horizontal direction. An embodiment of the locking system enables assembling of panels at the adjacent edges by a vertical movement, see FIGS. 7A-D. The locking system is preferably formed by mechanical cutting, such as milling, drilling and/or sawing, of the edges of the panels.

[0052] A tongue 30 is formed at an edge of the first panel 1. The tongue 30 cooperates with a tongue groove 20, which is formed at an edge of an adjacent panel 1', for vertical locking of the panel 1, 1'. A locking strip 8 with a vertically protruding locking element is formed in the edge of the first panel. The locking element 6 cooperates with a locking groove 14, formed at the edge of the second panel 1', for horizontal locking of the panels 1, 1'.

[0053] A displacement groove 60 is formed in the edge of the first panel behind the tongue 30. The displacement groove 60 makes a part 66 of the tongue 30 displaceable. During assembling of the first and the second panel 1, 1' the displaceable part 66 is pushed into the displacement groove 60 by a lower lip 31 of the tongue groove 20. When the panels are in a locked position the displaceable part 66 springs back and into the tongue groove 20.

[0054] Other parts 68 of the tongue 30, beside the displacement groove 60 and the displaceable part 66 of the tongue 30, is fixed. To enable the panels 1, 1' to be assembled by a vertical movement, recesses 69 are formed in a lower lip 31 of the tongue groove 20. The recesses 69 match the fixed parts 68 of the tongue.

[0055] FIGS 4, 5, 6A-C, 7A-D and 8B show a first embodiment comprising a tongue 30 with two displaceable parts 66 and three fixed parts 68, two displacement grooves 60, and a lower lip 31 of a tongue groove 20 with three recesses 69. The cross section in FIG. 6A is at the D-D line indicated in FIG. 8A and the cross section in FIG. 6B is at the C-C line indicated in FIG. 8A.

[0056] FIG. 8A shows a second embodiment comprising a tongue 30 with one displaceable part 66 and two fixed parts 68, one displacement groove 60, and a lower lip of the tongue groove 20 with two recesses 69.

[0057] The first embodiment is shown in a 3D view in FIG. 4 and 5.

[0058] The cross sections in FIGS. 6A and B and the side view in FIG. 6C, show that a lower surface of the displaceable part 66 cooperates, for vertical locking of adjacent edges of the panels 1,1', with a contact surface 70 of the lower lip 31 of the tongue groove 20. A vertical movement of the displaceable part is restrained, since the displaceable part of the tongue is continuous with the fixed part 68 of the tongue 30a.

[0059] The displacement groove 60 is formed from the underside of the first panel 1' and comprises an inner wall 61, an outer wall 62, and an upper wall 67. The displacement groove 60 may be positioned, in relation to the edge of the first panel, such that the thickness of the outer wall at a first 64 and upper part of the displacement groove 60, at the upper surface 65 of the tongue 30, is configured such that the outer wall breaks during assembling of the building panels when the displaceable part 66 of the tongue is pushed into the displacement groove 60.

[0060] The displacement groove 60 may also be positioned, in relation to the edge of the first panel, such that the thickness of the outer wall of the displacement groove 60 at a second part 63 of the displacement groove 60, below the displaceable part 66 of the tongue 30, is configured such that outer wall breaks during assembling of the building panels when the displaceable part 66 of the tongue is pushed into the displacement groove 60.

[0061] The walls at the at the first 64 and upper part of the displacement groove 60 and/or the second part 63 of the displacement groove 60 may also be broken before assembling of the building panels by pushing the displaceable part 66 of the tongue 30 into the displacement groove by a tool, such as a rotating wheel. An alternative is to use a cutting tool, such as a rotating wheel to separate the displaceable part 66 from the walls.

[0062] The broken outer wall of the displacement groove may cooperate with the displaceable part of the tongue and thereby improve the guiding of the displaceable part 66 of the tongue 30 and/or improve the vertical locking.

[0063] If the displacement groove 60 is positioned, relation to the edge of the first panel, such that a sidewardly open groove is formed at the first and/or second part 64, 63 of the displacement groove, the force required to push the displaceable part 66 of the tongue 30 into the displacement groove 60 is lowered.

[0064] The contact surface 70 of the lower lip 31 may be positioned such that the displaceable part 66 of the tongue 30 is prevented to spring back to its initial position before assembling and thereby remains, in an assembled and locked position of the panels 1, 1', partly in the displacement groove 66. This position of the contact surface 70 result in that the lower surface of the displaceable part of the tongue asserts a force against the contact surface of lower lip in the locked position of the panels 1,1', which is shown in FIGS. 9A and 9B. The asserted force improves the locking and a play between the panels may be possibly avoided or reduced.

[0065] To decrease the force applied on the tongue when a load is applied on the building panels and to further improve the strength and tolerances of the locking system, the edges of the adjacent panels may be provided with upper overlapping surfaces 90, which are shown

in FIG. 9B. The upper overlapping surfaces are preferably essentially horizontal.

[0066] If the tongue remains in the displacement groove 60 the upper wall 67 of the displacement groove 60 may cooperate, for an improved vertical locking of the adjacent edges of the first and second panels 1,1', with an upper surface 65 of the displaceable part 66 of the tongue 30.

[0067] In order to improve the spring properties of the displaceable part 66 of the tongue 30, the displacement groove 60 may be filled or provided with an elastic material such as plastic or rubber. The improved spring properties may result in an improved locking.

[0068] An embodiment comprising a displacement groove 60 with an outer wall, which is not intended to break during assembling, is shown in FIG. 10A. The side view in FIG. 10A shows that the distance from the edge of the first panel 1 is increased. The displacement groove has the result that a resilient and displaceable tongue part 66 is obtained. The top view in FIG. 10B shows an embodiment with an edge of a first panel 1 comprising two displacement grooves 60 and a tongue 30 with two resilient and displaceable parts 66 and three fixed parts 68 and an adjacent edge of a second panel 1' comprising a tongue groove with a lower lip provided with three recesses 69 that matches the fixed parts 68 of the tongue. The tongue comprises an upper essentially horizontal surface 90, which preferably extends along the whole edge. The upper essentially horizontal surface increases the strength of the locking system. FIG. 12A shows in a side view that the size of the tongue may be increased for building panels comprising favourably resilient material.

[0069] FIGS. 11A-C show an embodiment in which also parts of the lower lip of the tongue groove is made flexible and resilient. This is achieved by providing a displacement groove also at the edge of the second panel. The side view in FIG. 11A and the cross section in FIG. 11C show an embodiment comprising a displacement groove 71 which downwardly open at a distance from the tongue groove. The cross section in FIG.11C is indicated in the top view in FIG.11B by the A-A line. The cross section in FIG.11D is indicated in the top view in FIG.11B by the B-B line. The top view in FIG. 11B shows an embodiment with an edge of a first panel 1 comprising two displacement grooves 60 and a tongue with two resilient and displaceable parts 66 and three fixed parts 68 at an edge of a first panel 1, and an adjacent edge of a second panel 1' comprising a tongue groove with a lower lip provided with three recesses 69 that correspond to fixed parts 68 of the tongue, and two displacement grooves 71, to obtain two flexible parts at the lower lip of the tongue groove.

[0070] Alternative shapes of displacement grooves 60, 71 at the edge of the first and second panel 1, 1' are shown in FIGS. 12B-C. The upper wall of the displacement groove is of a rounded shape in order to increase the strength of the displacement groove.

Claims

1. Building panels (1, 1') provided with a mechanical locking system comprising a tongue (30), at an edge of a first panel (1), cooperating with a tongue groove (20), at an edge of an adjacent second panel (1'), for vertical locking of the building panels **characterized in**
that the edge of the first panel is provided with a displacement groove (60) to obtain a resilient and displaceable tongue part (66), said displacement groove is downwardly open, and comprises an inner wall (61), an outer wall (62) and an upper wall (67),
that the tongue (30) is formed out of the edge of the first panel,
that the resilient and displaceable part (66) of the tongue (30) is configured to be displaced into the displacement groove (60) by a lower lip of the tongue groove during assembling of the first and the second panel (1, 1') by a vertical displacement of the second panel toward the first panel,
that the thickness of the outer wall of the displacement groove (60) at a first and upper part (64) of the displacement groove (60), at the upper surface of the tongue (30), is configured such that the outer wall at the first and upper part (64) breaks during said assembling, and
that the thickness of the outer wall of the displacement groove (60) at a second part (63) of the displacement groove (60), below the resilient and displaceable part (66) of the tongue (30), is configured such that the outer wall at the second part (63) breaks during said assembling.

2. Building panels as claimed in claim 1, wherein the upper wall (67) is vertically positioned at an upper surface (65) of the resilient and displaceable part (66) of the tongue (30).

3. Building panels as claimed in claim 2, wherein the upper wall (67) is configured to guide the resilient and displaceable part (66) of the tongue (30).

4. Building panels as claimed in claim 2 or 3, wherein the upper wall (67) is configured to cooperate with the upper surface (65) of the resilient and displaceable part (66) for the vertical locking.

5. Building panels as claimed in claim 1, wherein the broken outer wall at the first and upper part (64) and/or at the second part is / are configured to guide the resilient and displaceable part (66) of the tongue (30) during the assembling.

6. Building panels as claimed in claim 1, wherein the broken outer wall at the first and upper part (64) and/or at the second part cooperate(s) with the resilient and displaceable part (66) of the tongue (30)

for the vertical locking.

7. Building panels as claimed in any one of the preceding claims, wherein the tongue (30) comprises fixed parts (68) at the side of the resilient and displaceable part (66) of the tongue (30).

8. Building panels as claimed in claim 7, wherein the tongue groove comprises recesses, which correspond to the fixed part (68) of the tongue (30).

9. Building panels as claimed in any one of the preceding claims, wherein a contact surface (70) of a lower lip (31) of the tongue groove (20) cooperates, for the vertical locking, with a lower surface of the displaceable part (66) of the tongue (30).

10. Building panels as claimed in claim 9, wherein the contact surface is arranged such that when the resilient and displaceable part (66) of the tongue springs back, during the assembling of the building panels, the displaceable part (66) is prevented from reaching its original position.

11. Building panels as claimed in any one of the preceding claims, wherein the tongue (30) has several displaceable parts (66) and that the edge of the first panel is provided with several displacement grooves (60).

Patentansprüche

1. Gebäudepaneele (1, 1'), versehen mit einem mechanischen Arretierungssystem, umfassend eine Feder (30) an einer Kante eines ersten Paneels (1), die mit einer Federnut (20) an einer Kante eines benachbarten zweiten Paneels (1') für eine vertikale Arretierung der Gebäudepaneele zusammenwirkt,
dadurch gekennzeichnet, dass
die Kante des ersten Paneels mit einer Verschiebungsnut (60) versehen ist, um ein federndes und verschiebbares Federteil (66) zu erhalten, wobei die Verschiebungsnut nach unten offen ist, und eine Innenwand (61), eine Außenwand (62) und eine obere Wand (67) umfasst,
die Feder (30) aus der Kante des ersten Paneels ausgebildet ist,
der federnde und verschiebbare Teil (66) der Feder (30) so gestaltet ist, dass er durch eine untere Lippe der Federnut während des Zusammenfügens des ersten und des zweiten Paneels (1, 1') durch eine vertikale Verschiebung des zweiten Paneels hin zum ersten Paneels in die Verschiebungsnut (60) verschoben werden kann,
die Dicke der Außenwand der Verschiebungsnut (60) an einem ersten und oberen Teil (64) der Verschiebungsnut (60), an der oberen Fläche der Feder (30), so gestaltet ist, dass die Außenwand an dem ersten und dem oberen Teil (64) während des Zusammenfügens bricht, und
die Dicke der Außenwand der Verschiebungsnut (60) an dem zweiten Teil (63) der Verschiebungsnut (60), unterhalb des federnden und verschiebbaren Teiles (66) der Feder (30), so gestaltet ist, dass die Außenwand an dem zweiten Teil (63) während des Zusammenfügens bricht.

2. Gebäudepaneele nach Anspruch 1, wobei die obere Wand (67) vertikal an einer oberen Fläche (65) des federnden und verschiebbaren Teiles (66) der Feder (30) angeordnet ist.

3. Gebäudepaneele nach Anspruch 2, wobei die obere Wand (67) gestaltet ist, um den federnden und verschiebbaren Teil (66) der Feder (30) zu führen.

4. Gebäudepaneele nach Anspruch 2 oder 3, wobei die obere Wand (67) gestaltet ist, um mit der oberen Fläche (65) des federnden und verschiebbaren Teils (66) für die vertikale Arretierung zusammenzuwirken.

5. Gebäudepaneele nach Anspruch 1, wobei die gebrochene Außenwand an dem ersten und oberen Teil (64) und/oder an dem zweiten Teil gestaltet ist, um den federnden und verschiebbaren Teil (66) der Feder (30) während des Zusammenfügens zu führen.

6. Gebäudepaneele nach Anspruch 1, wobei die gebrochene Außenwand an dem ersten und oberen Teil (64) und/oder an dem zweiten Teil mit dem federnden und verschiebbaren Teil (66) der Feder (30) für die vertikale Arretierung zusammenwirkt.

7. Gebäudepaneele nach einem der vorstehenden Ansprüche, wobei die Feder (30) feststehende Teile (68) auf der Seite des federnden und verschiebbaren Teils (66) der Feder (30) umfasst.

8. Gebäudepaneele nach Anspruch 7, wobei die Federnut Ausnehmungen umfasst, die dem feststehenden Teil (68) der Feder (30) entsprechen.

9. Gebäudepaneele nach einem der vorstehenden Ansprüche, wobei eine Kontaktfläche (70) einer untere Lippe (31) der Federnut (20) mit einer unteren Fläche des verschiebbaren Teils (66) der Feder (30) für eine vertikale Arretierung zusammenwirkt.

10. Gebäudepaneele nach Anspruch 9, wobei die Kontaktfläche so angeordnet ist, dass der verschiebbare Teil (66), wenn der federnde und verschiebbare Teil (66) der Feder während des Zusammenfügens der Gebäudepaneele zurückfedert, daran gehindert

wird, seine Ausgangsposition einzunehmen.

11. Gebäudepaneele nach einem der vorstehenden Ansprüche, wobei die Feder (30) mehrere verschiebbare Teile (66) aufweist und die Kante der ersten Platte mit mehreren Verschiebungsnuten (60) versehen ist.

Revendications

1. Panneaux de construction (1, 1') prévus avec un système de verrouillage mécanique comprenant une languette (30), au niveau d'un bord d'un premier panneau (1), coopérant avec une rainure de languette (20), au niveau d'un bord d'un second panneau (1') adjacent, pour le verrouillage vertical des panneaux de construction, **caractérisés en ce que** :

le bord du premier panneau est prévu avec une rainure de déplacement (60) afin d'obtenir une partie de languette résiliente et déplaçable (66), ladite rainure de déplacement est ouverte vers le bas et comprend une paroi interne (61), une paroi externe (62) et une paroi supérieure (67), **en ce que** la languette (30) est formée avec le bord du premier panneau,
en ce que la partie résiliente et déplaçable (66) de la languette (30) est configurée pour être déplacée dans la rainure de déplacement (60) par une lèvre inférieure de la rainure de languette pendant l'assemblage du premier et du second panneau (1, 1') par un déplacement vertical du second panneau vers le premier panneau,
en ce que l'épaisseur de la paroi externe de la rainure de déplacement (60) au niveau d'une première partie supérieure (64) de la rainure de déplacement (60), au niveau de la surface supérieure de la languette (30) est configurée de sorte que la paroi externe au niveau de la première partie supérieure (64) se casse pendant ledit assemblage, et
en ce que l'épaisseur de la paroi externe de la rainure de déplacement (60) au niveau d'une seconde partie (63) de la rainure de déplacement (60), au-dessous de la partie résiliente et déplaçable (66) de la languette (30), est configurée de sorte que la paroi externe, au niveau de la seconde partie (63), se casse pendant ledit assemblage.

2. Panneaux de construction selon la revendication 1, dans lesquels la paroi supérieure (67) est positionnée verticalement au niveau d'une surface supérieure (65) de la partie résiliente et déplaçable (66) de la languette (30).

3. Panneaux de construction selon la revendication 2, dans lesquels la paroi supérieure (67) est configurée pour guider la partie résiliente et déplaçable (66) de la languette (30).

4. Panneaux de construction selon la revendication 2 ou 3, dans lesquels la paroi supérieure (67) est configurée pour coopérer avec la surface supérieure (65) de la partie résiliente et déplaçable (66) pour le verrouillage vertical.

5. Panneaux de construction selon la revendication 1, dans lesquels la paroi externe cassée au niveau de la première partie supérieure (64) et/ou au niveau de la seconde partie, est configurée pour guider la partie résiliente et déplaçable (66) de la languette (30) pendant l'assemblage.

6. Panneaux de construction selon la revendication 1, dans lesquels la paroi externe cassée au niveau de la première partie supérieure (64) et/ou au niveau de la seconde partie coopère avec la partie résiliente et déplaçable (66) de la languette (30) pour le verrouillage vertical.

7. Panneaux de construction selon l'une quelconque des revendications précédentes, dans lesquels la languette (30) comprend des parties fixes (68) du côté de la partie résiliente et déplaçable (66) de la languette (30).

8. Panneaux de construction selon la revendication 7, dans lesquels la rainure de languette comprend des évidements qui correspondent à la partie fixe (68) de la languette (30).

9. Panneaux de construction selon l'une quelconque des revendications précédentes, dans lesquels une surface de contact (70) d'une lèvre inférieure (31) de la rainure de languette (20) coopère, pour le verrouillage vertical, avec une surface inférieure de la partie déplaçable (66) de la languette (30) .

10. Panneaux de construction selon la revendication 9, dans lesquels la surface de contact est agencée de sorte que, lorsque la partie résiliente et déplaçable (66) de la languette revient, pendant l'assemblage des panneaux de construction, la partie déplaçable (66) ne peut pas atteindre sa position d'origine.

11. Panneaux de construction selon l'une quelconque des revendications précédentes, dans lesquels la languette (30) a plusieurs parties déplaçables (66) et en ce que le bord du premier panneau est prévu avec plusieurs rainures de déplacement (60).

FIG. 1

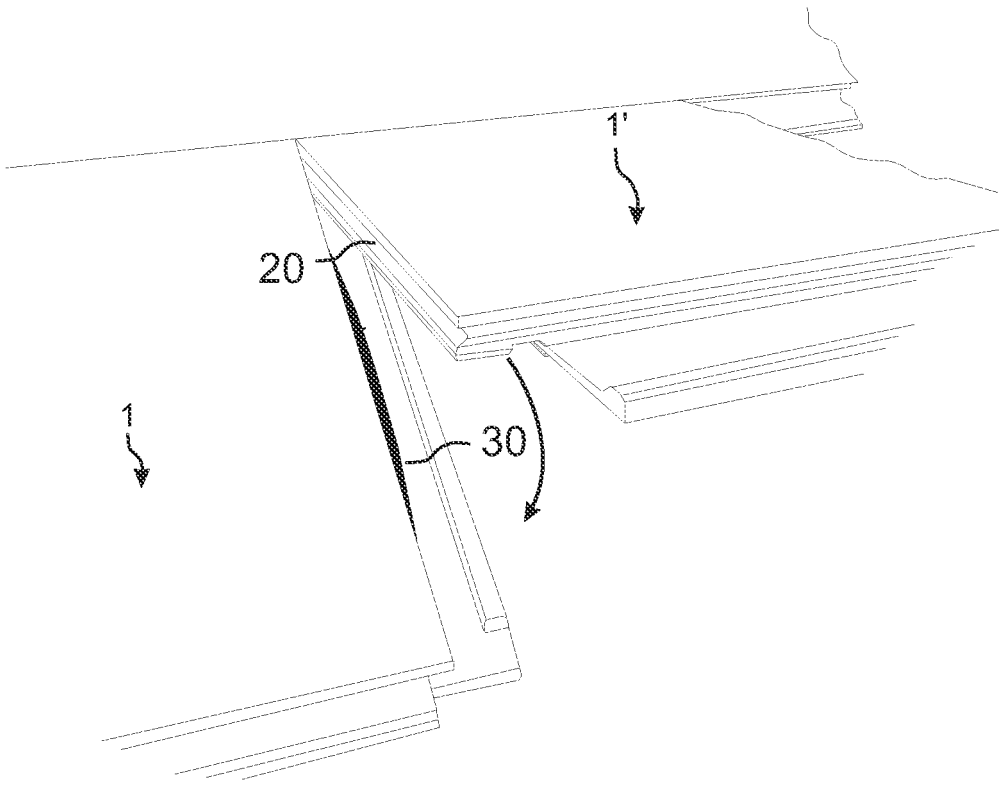


FIG. 2A

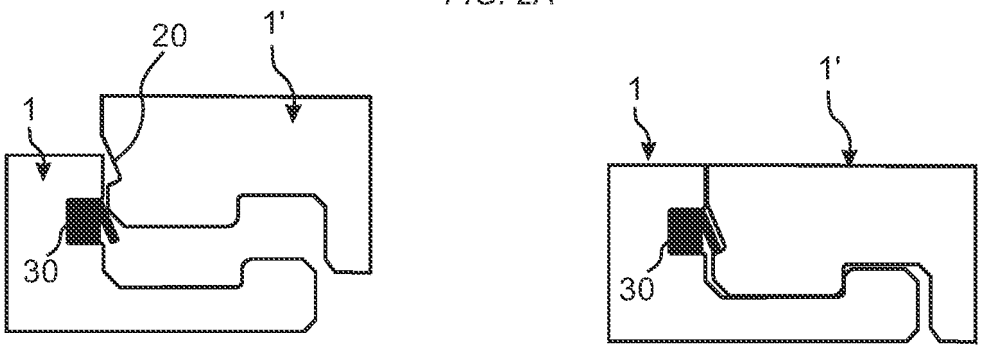


FIG. 2B

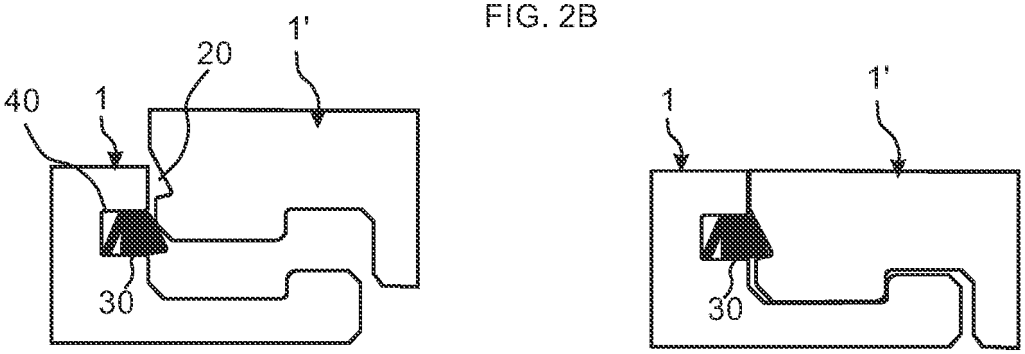


FIG. 2C

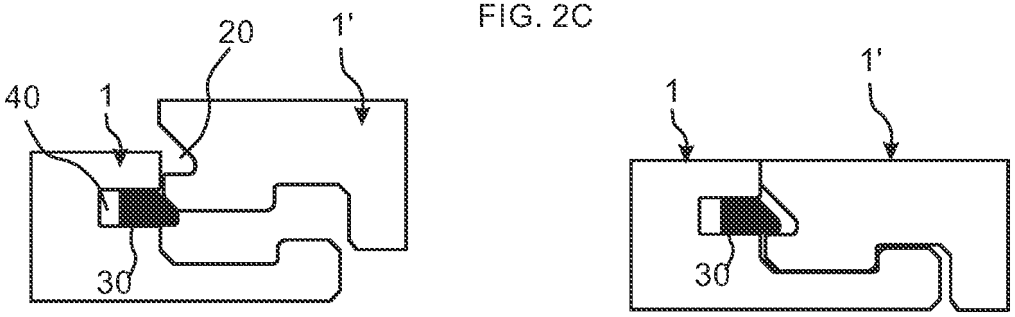


FIG. 3

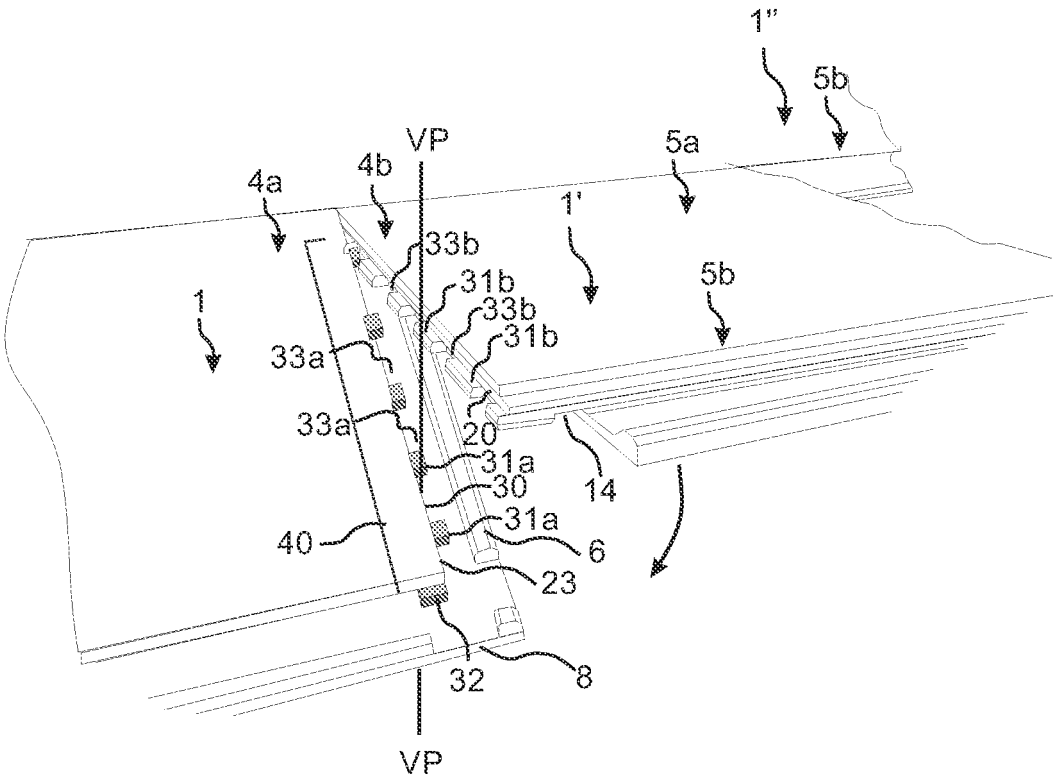

1"
5b
VP
5a
4b
4a
1'
33b
5b
31b
1
33b
31b
33a
20
33a
31a
14
30
31a
40
6
23
32
8
VP

FIG. 4

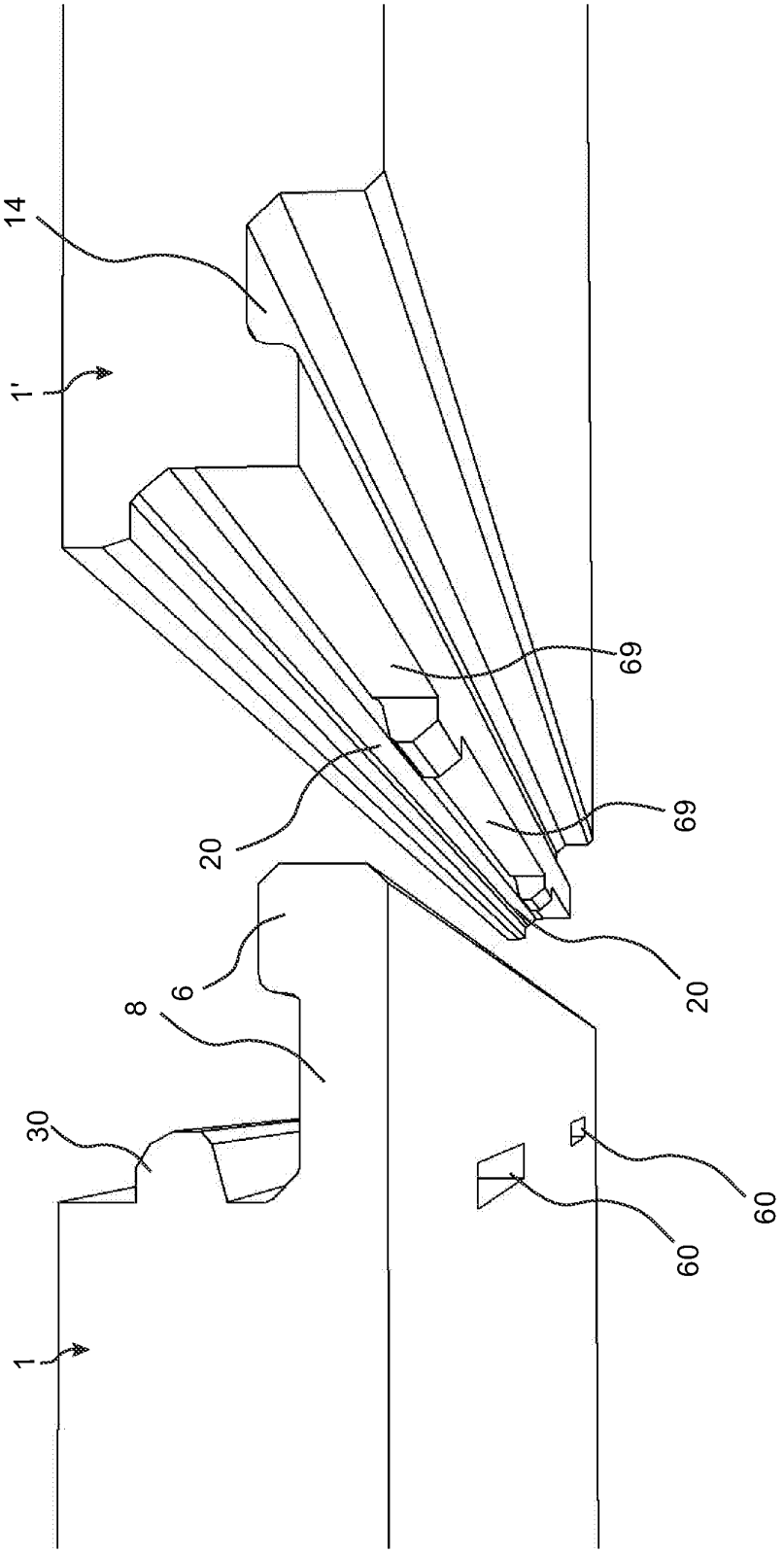


FIG. 5

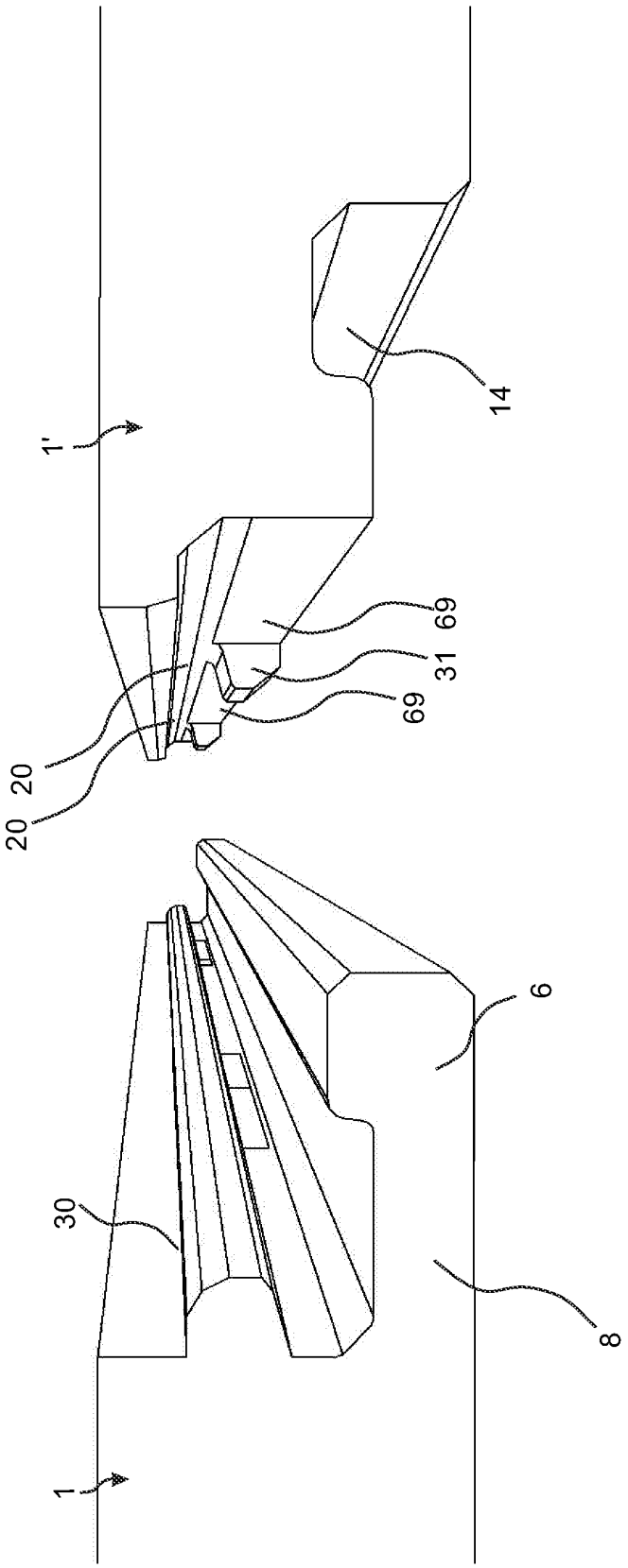


FIG. 6A

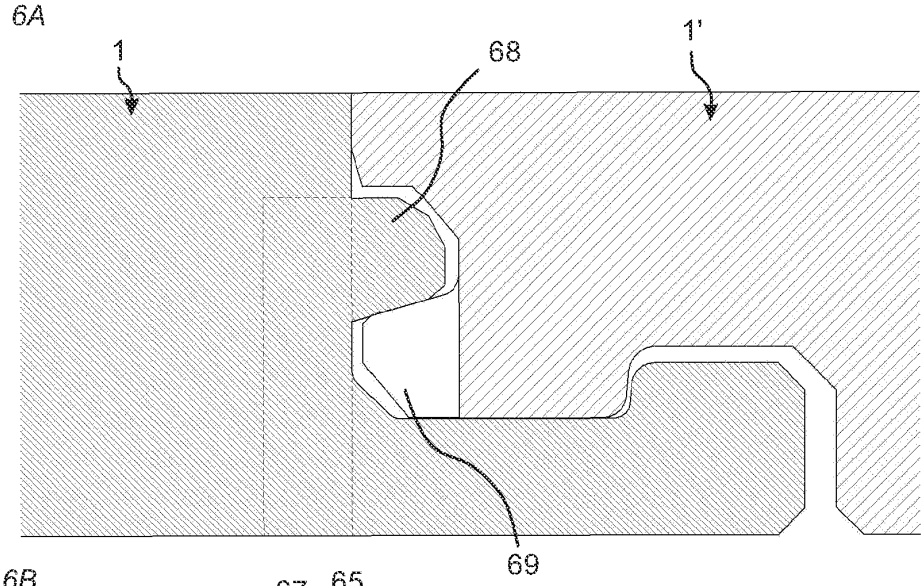


FIG. 6B

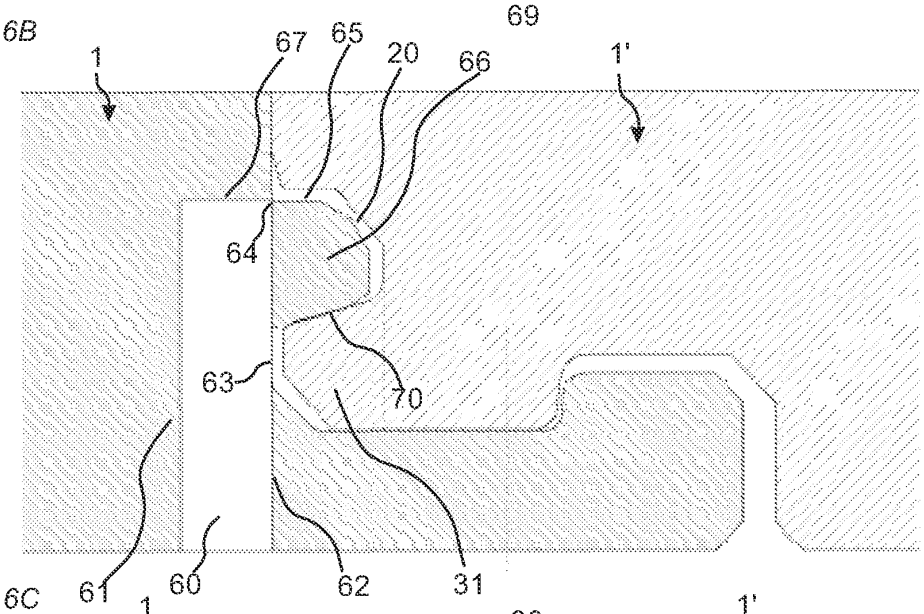


FIG. 6C

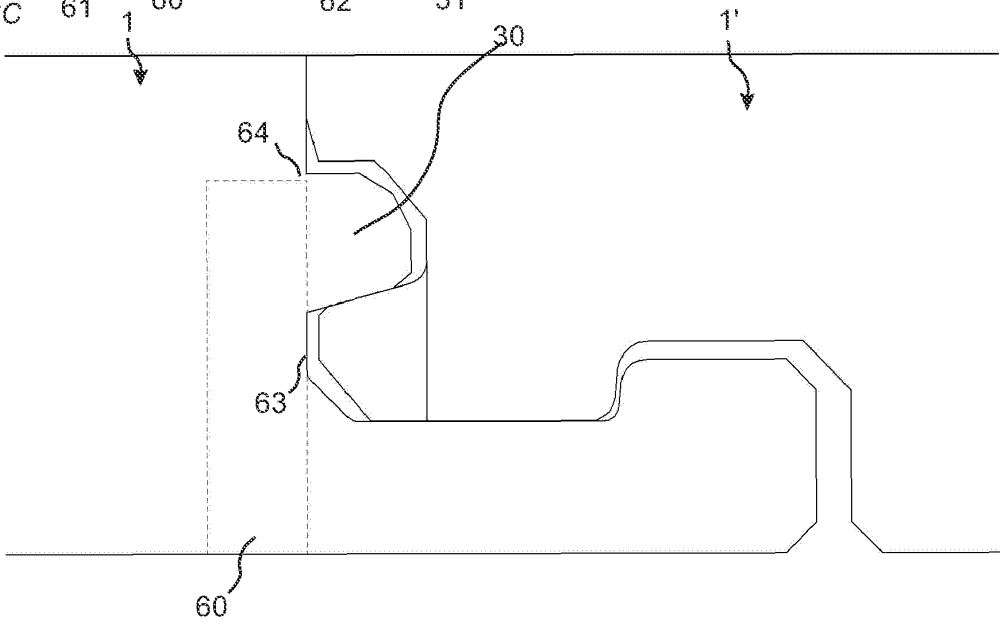


FIG. 7A

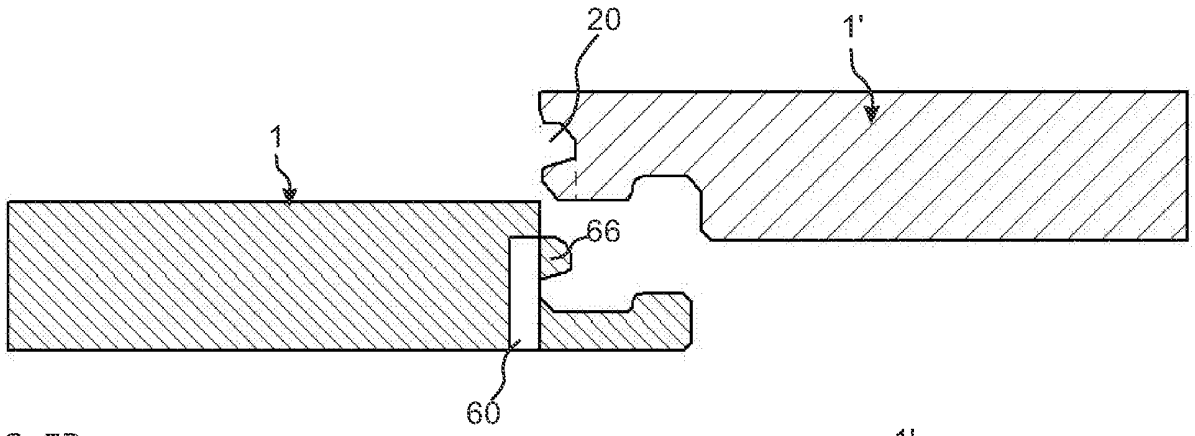


FIG. 7B

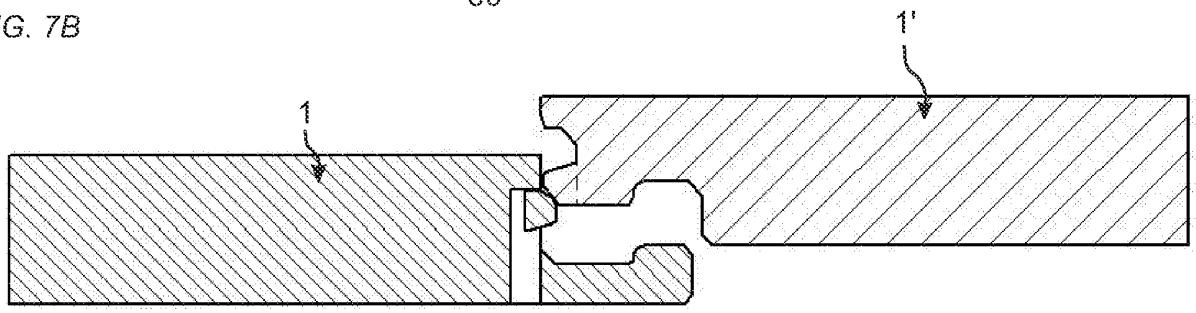


FIG. 7C

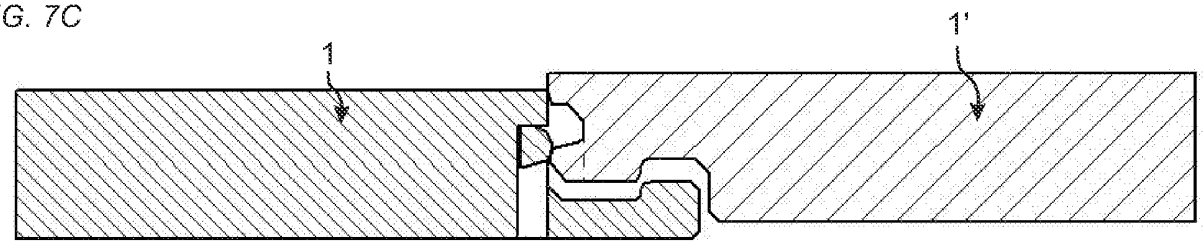


FIG. 7D

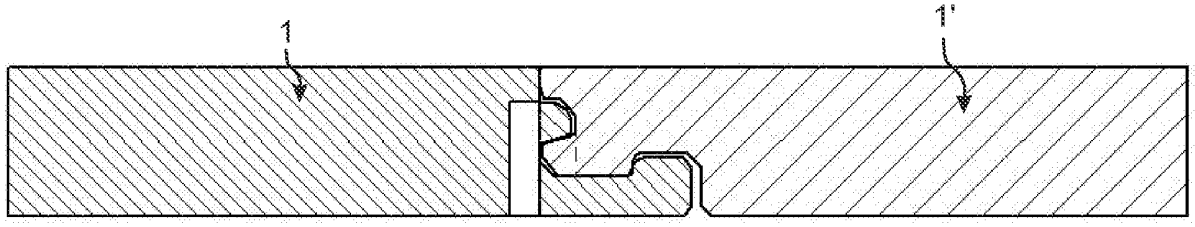


FIG. 8A

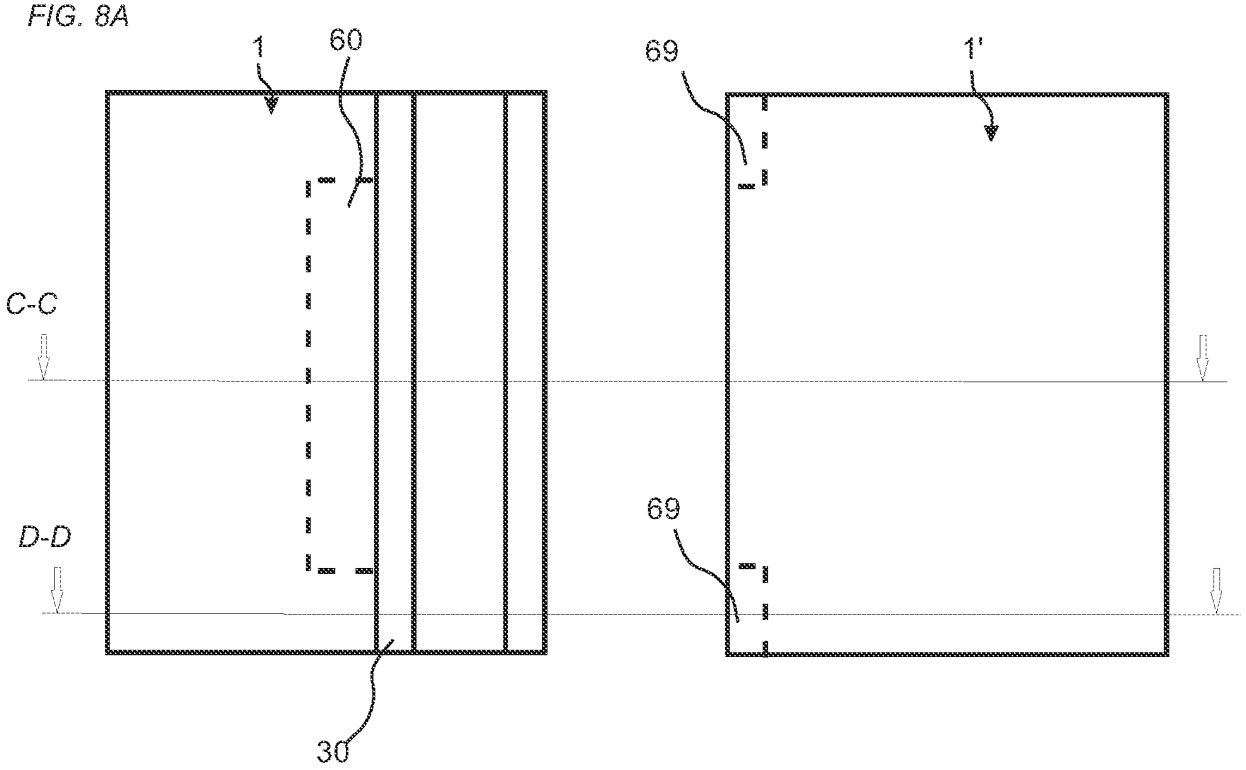


FIG. 8B

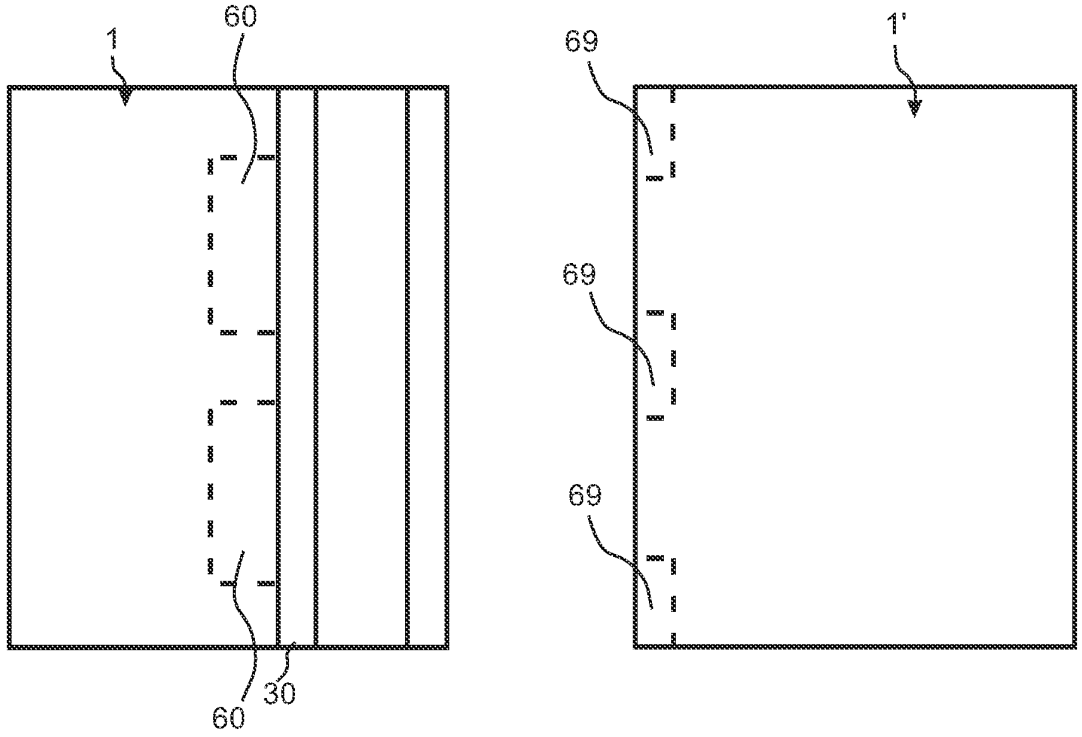


FIG. 9A

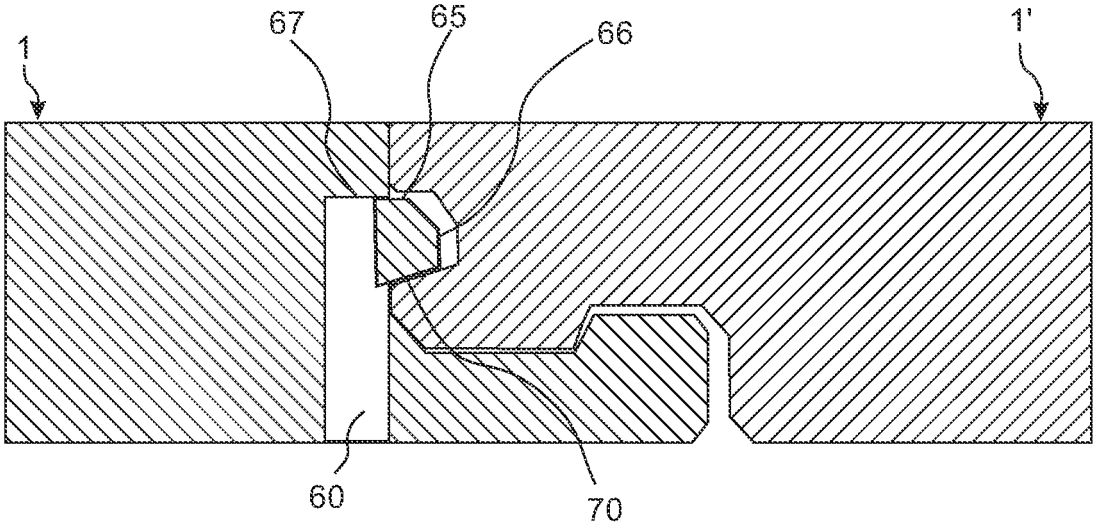


FIG. 9B

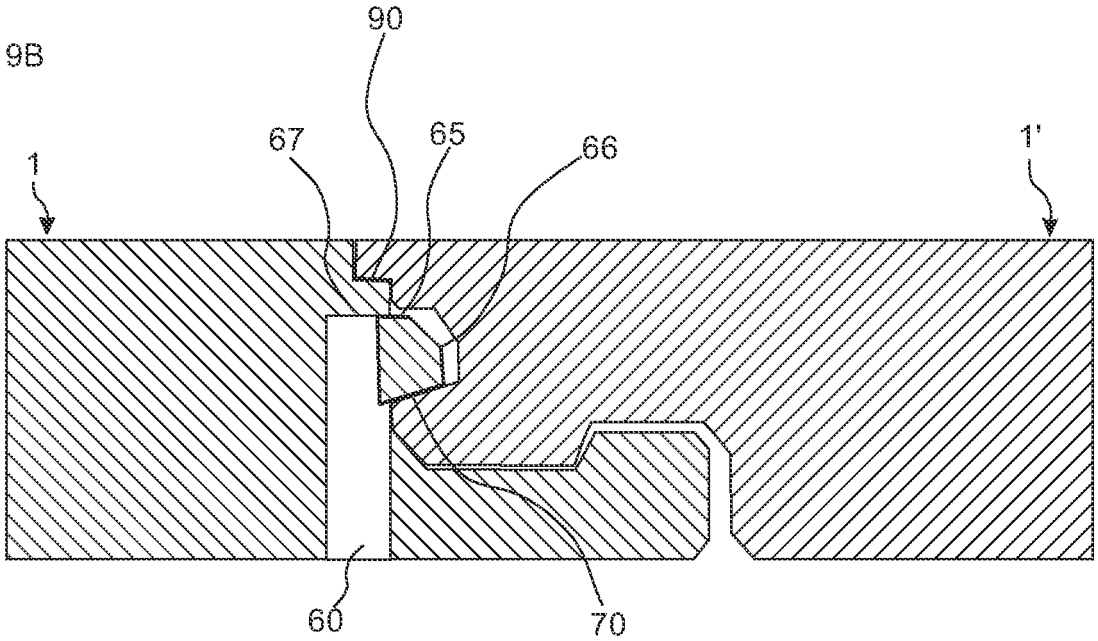


FIG. 10A

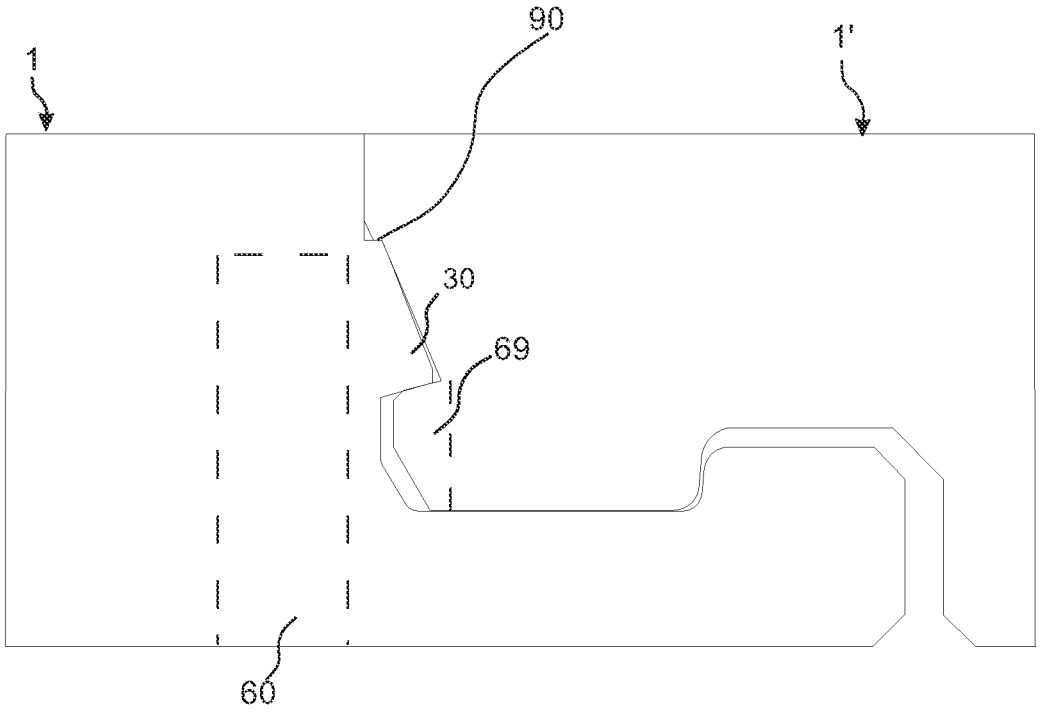


FIG. 10B

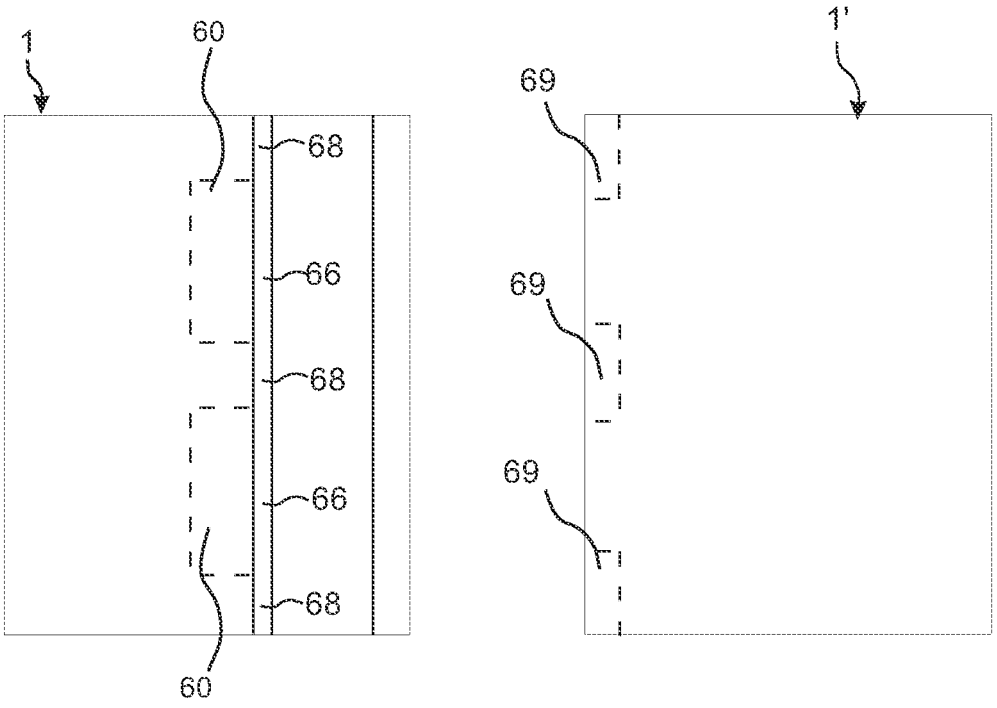


FIG. 11A

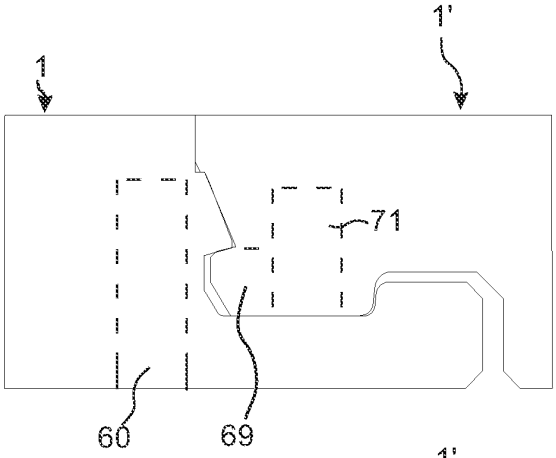


FIG. 11B

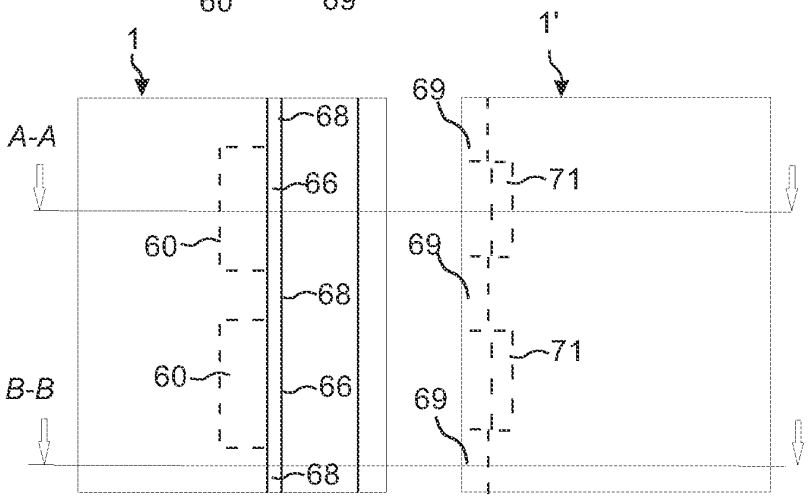


FIG. 11C

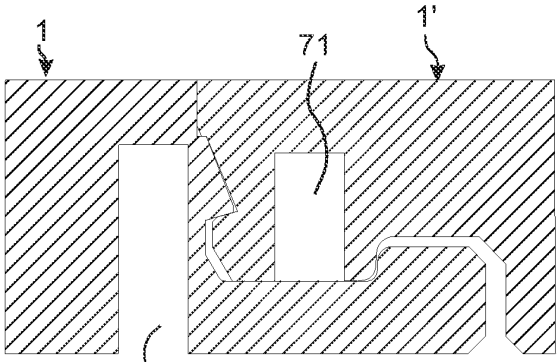


FIG. 11D

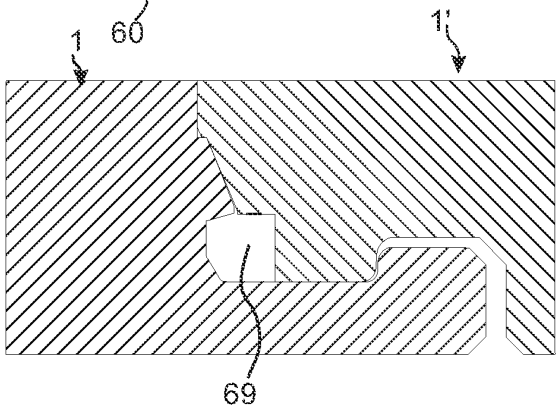


FIG. 12A

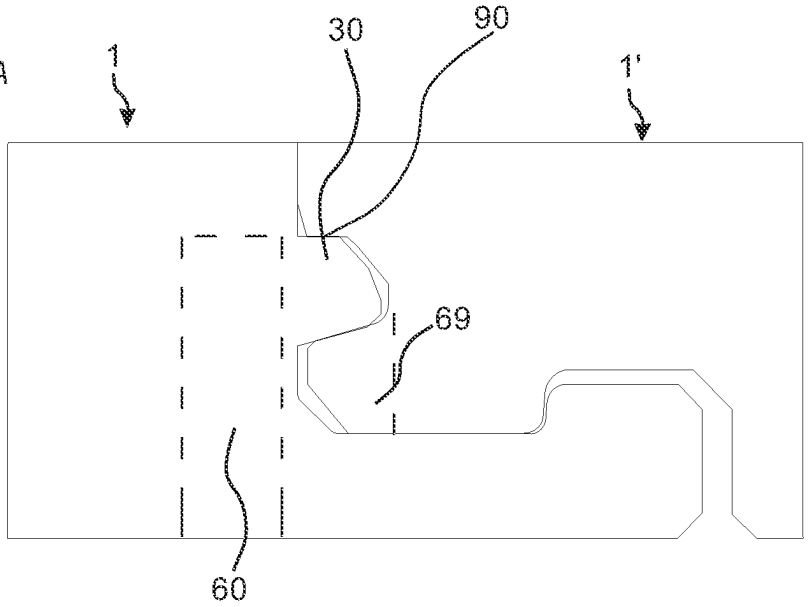


FIG. 12B

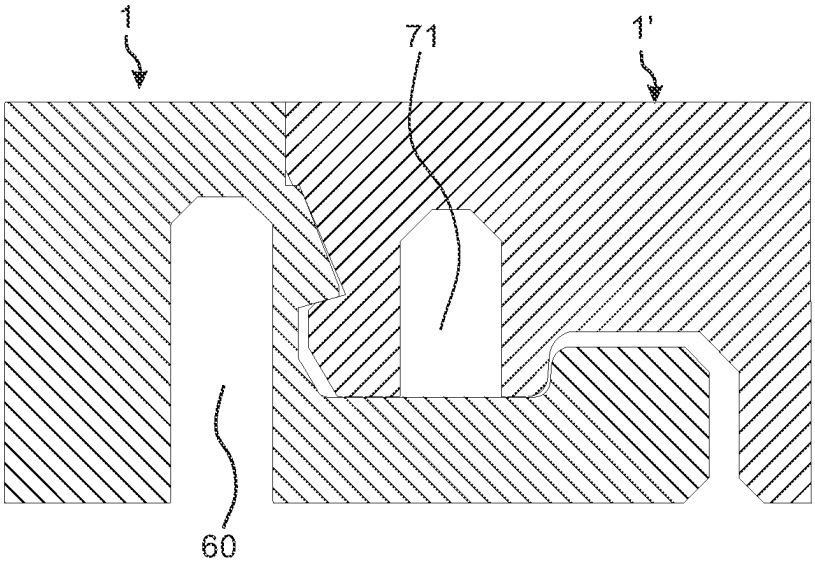
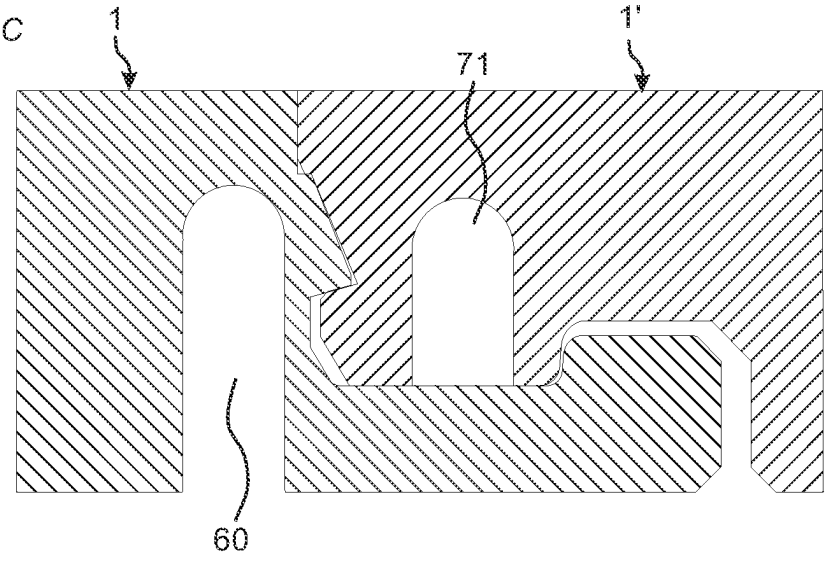


FIG. 12C



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- WO 2009116926 A **[0003]**
- WO 2011001326 A **[0005]**