

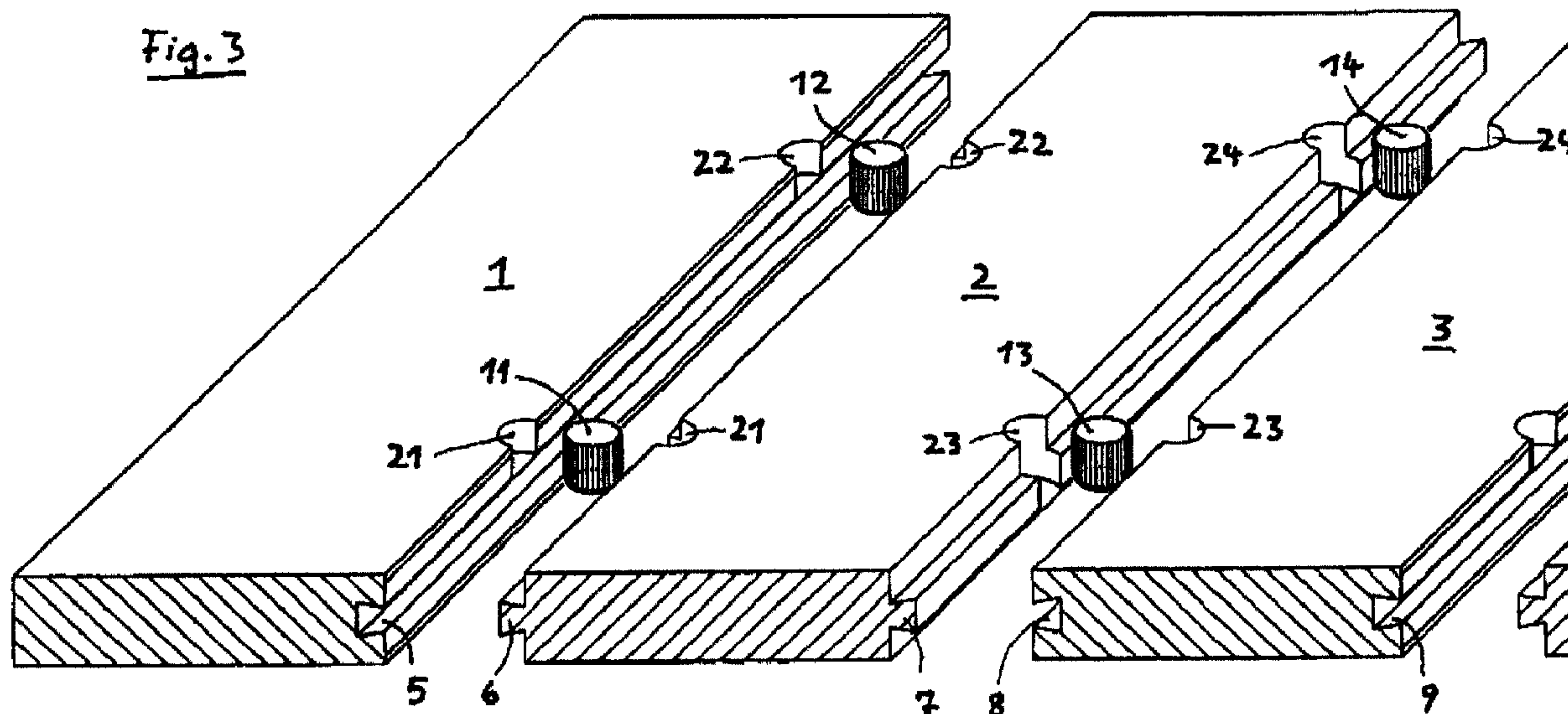


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(54) Titre : PROCÉDE DE FABRICATION D'OBJETS EN BOIS ET ELEMENT FABRIQUE PAR LIAISON DE DECOUPES EN BOIS

(54) Title: STRUCTURAL PANEL IN THE FORM OF A BOARD MADE OF WOOD



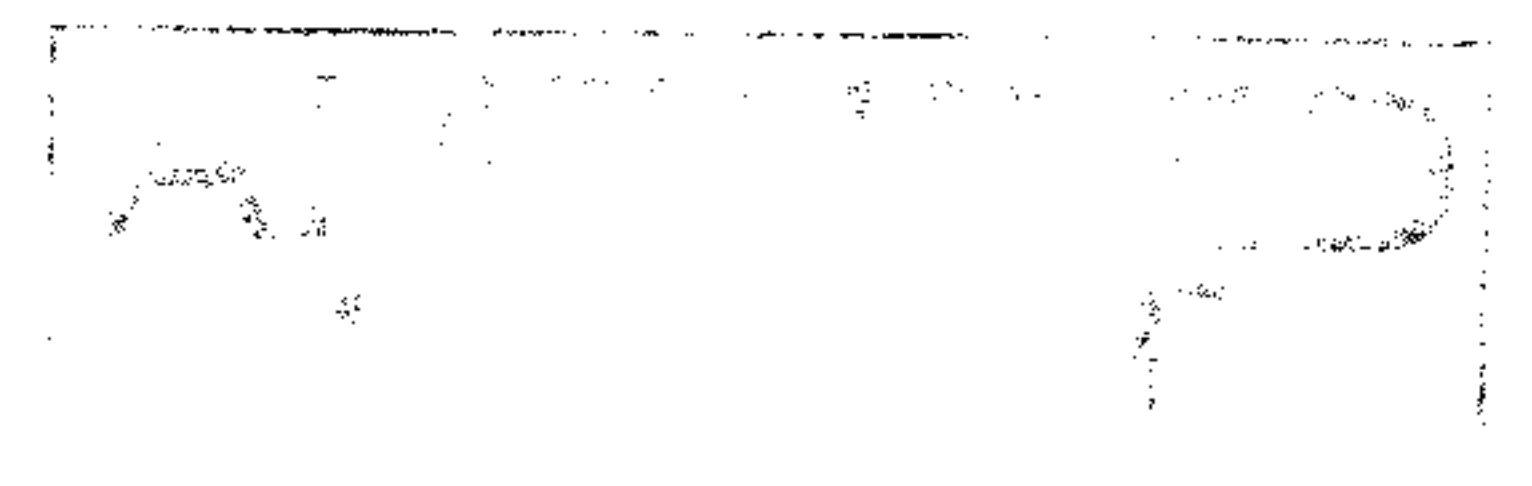
(57) **Abrégé/Abstract:**

The invention relates to a method for producing a component and to a component made of wood, comprising strips (1, 2, 3) arranged next to each other in a row. The strips are connected to each other at the end faces thereof by tongues (6) and by grooves (5) that enclose the tongues, and wherein the tongues and grooves of said strips have a cross-section similar to that of the dovetail form. The invention relates in particular to a further development of the method for producing objects made of wood and of the component produced by connecting parts according to the older German patent application no. 10 2010 008 684.3 from 19 February 2010. According to the invention, positive locking against shearing loads or shear loads between the strips connected to each other, in the direction along the end faces adjacent to each other, is produced. The positive locking comprises locking grooves (21, 22, 23, 24) and locking bolts (11, 12, 13, 14) made of wood, which are inserted into the locking grooves and which extend at at least one point along end faces adjacent to each other from one strip to the other strip of strips connected to each other. The locking bolts are preferably axially symmetric pins made of wood, which are inserted into locking grooves in the form of cylindrical or slightly conical holes.

Abstract

The present invention relates to a structural panel in the form of a board consisting of parts in the form of strips made of wood arranged next to one another in rows, together forming two opposing front sides of the panel, and which are connected to each other at linearly aligned end faces by equally linearly aligned female connectors on the one hand and by grooves that enclose the female connectors on the other.

The structural panel is intended in particular for use in erecting and fitting walls on building structures and in the manufacture of household furniture, and is made primarily of tested natural products without the use of additional connecting means such as glues or other adhesives. The inventive connection between the end faces adjacent to one another of the strips arranged in a row consists mainly in a positive locking fit effective in two directions between female connectors and grooves with a cross-section of the kind similar in form to a dovetail. In the inventive positive locking fit under uniform influences of ambient temperature and moisture, the female connectors are enclosed by the corresponding grooves under constant bias and are free of additional connecting means such as glue or other adhesives. The frictional force between the tongue and groove under bias counteracts a displacement of the connected strips against one another in a direction along their end faces under thrust or shearing loads. To prevent such a displacement under particularly high thrust or shearing loads, a positive locking fit is provided according to the present invention, consisting of preferably rotationally symmetrical locking grooves into which plugs in the form of primarily axially symmetrical formed pins made of wood are inserted, which extend radially at at least one point along end faces adjacent to each other from the one to the other of the connected strips, and which extend from an opening in one of the common front sides of the strips to a depth of the female connector in the structural panel.



Structural Panel in the Form of a Board Made of Wood

The present invention relates to a structural panel in the form of a board consisting of parts in the form of strips made of wood arranged next to one another in rows, together forming two opposing front sides of the panel, and which are connected to each other at linearly aligned end faces by equally linearly aligned female connectors on the one hand and by grooves that enclose the female connectors on the other. The structural panel is intended for use in erecting and fitting walls on building structures and in the manufacture of household furniture.

The object of the present invention is to create an especially durable connection of strips made of wood for producing a structural panel of the aforementioned kind, made primarily of tested natural products without the use of additional connecting means such as glues or other adhesives.

A structural panel of the aforementioned kind consisting primarily of natural products in particular for erecting and fitting walls on building structures is already the subject matter of the older German patent application dated February 19, 2010, disclosed in DE 102010008684A1. Inventive features of this structural panel consist in the female connector and the grooves having a cross-section of the kind similar in form to a dovetail and that under uniform influences of ambient temperature and moisture the female connectors are enclosed by the corresponding grooves under constant bias and are free of additional connecting means such as glue or other adhesives.



The connection of the strips along the end faces thereof via female connectors and grooves with a cross-section of the kind similar in form to dovetail is positive locking in both directions transverse to the end faces and is thus durable under stress load.

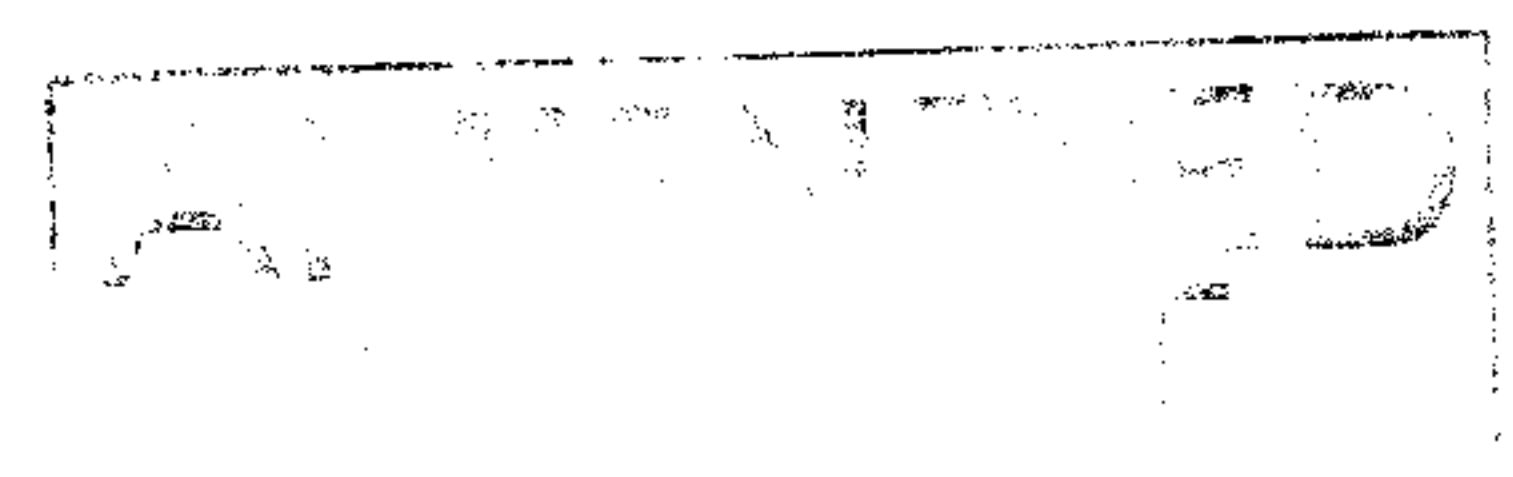
Conversely, shear loads between strips connected to one another in the direction along the end faces adjacent to each other are absorbed by the frictional forces alone between the groove and the female connector enclosed therein.

The object of the present invention is now also to prevent a displacement of the strips connected to each other in the direction along their end faces under particularly high shear loads which can no longer be absorbed solely by the frictional forces between the groove and the female connector enclosed therein.

The inventive solution of the aforementioned objects is specified in the present claim 1 and consists in the case of a structural panel of the kind cited above primarily in that the female connectors and the grooves have a cross-section of the kind similar in form to a dovetail,

in that under uniform influences of ambient temperature and moisture the female connectors are enclosed by the corresponding grooves under constant bias and are free of additional connecting means such as glue or other adhesives,

in that in each case a locking nut made of wood is inserted at at least one point along the adjacent end faces of the strips, which locking groove is open on one of the



common front sides of the strips and extends from one strip to the next strip of strips connected to one another,

in that the locking groove is of a depth that extends from its opening in one of the opposing front sides of the strips into the female connector of the connection of the other strips adjacent to each other,

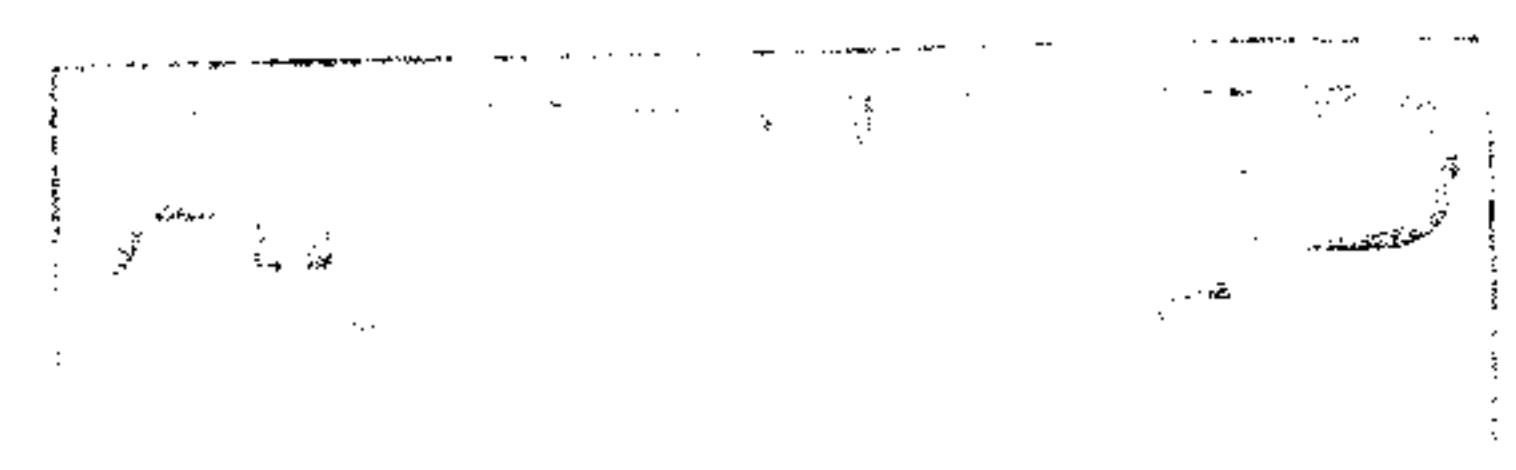
in that the locking groove common to the strips connected to each other is in the form of an approximately rotationally symmetrical hole with an opening in at least one of the common front sides of the strips and in axial alignment approximately perpendicular to the common front side, and

in that the plug consists of an approximately axially asymmetrical pin made of wood similar to the rotationally symmetrical hole, which pin is driven into the hole through the opening in one of the common front sides of the strips.

The plug in the form of an approximately cylindrical or slightly conical pin driven into a locking groove of the kind in the form of an approximately cylindrical hole has proven particularly functional. Especially advantageous embodiments of the invention are specified in the claims appended hereto.

The present invention is described in greater detail by way of an exemplary embodiment of an advantageous design with reference to the drawings. In the drawings:

Figure 1: is a component made of wood in the form of a board, assembled from four strips having female and grooves along the linearly aligned end faces and having a plug

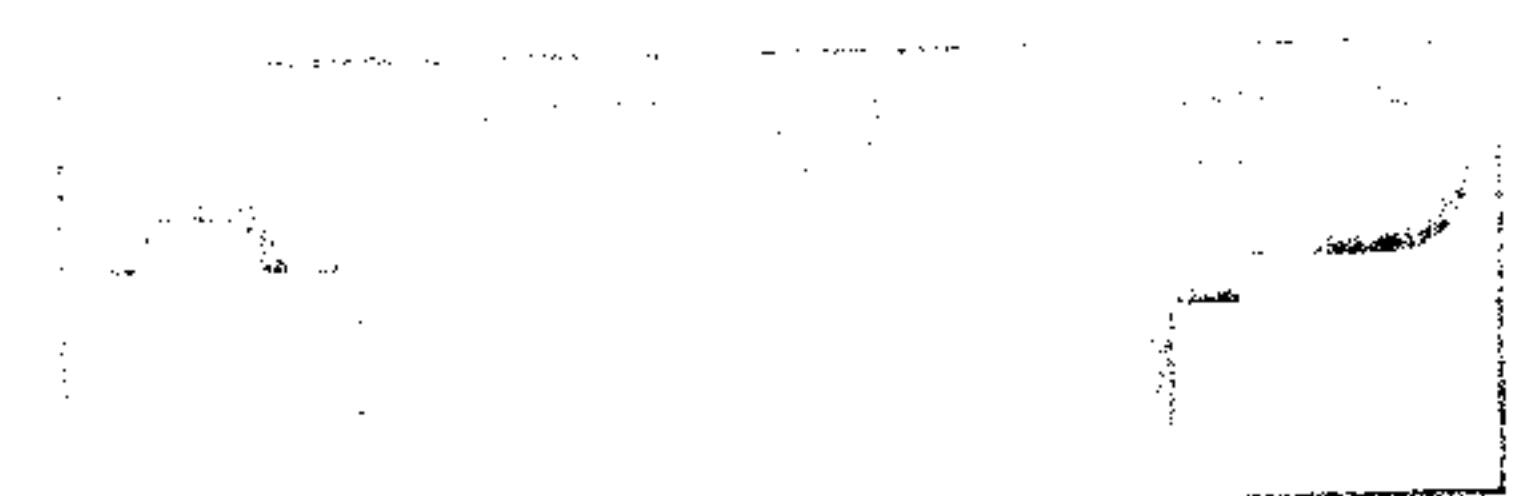


in the form of cylindrical pins that are driven into locking grooves in the form of cylindrical holes at two points, respectively, that are evenly spaced along adjacent end faces of the strips;

Figure 2: is a cross-section through a connection along the adjacent end faces of two strips of the component shown in Figure 1 for representing the female connector of the one strip enclosed in the groove of the other strip, and for representing the locking groove and the plug; and

Figure 3 is the view of the first three strips of the component shown in Figure 1 before being connected, and the parts and features provided for the connection according to the invention.

Figure 1 shows four strips 1 to 4 made of woods of approximately identical internal structures arranged next to each other in a row. The left outermost strip 1 includes a groove 5 on the right of its two linearly aligned end faces which is matched with a corresponding female connector 6 on one of the two linearly aligned end faces of the strip 2. A second female connector 7 is located on the second linearly aligned end face of the strip 2, which is matched with a groove 8 on one of the two linearly aligned end faces of the strip 3. An identical match exists between a groove 9 on the second end face of the strip 3 and a female connector 10 on the left of two linearly arranged end faces of the strip 4, which forms the right side of the finished board. The strips 1 and 3, as parts of the finished board, include only the grooves 5, 8 and 9. Conversely, female

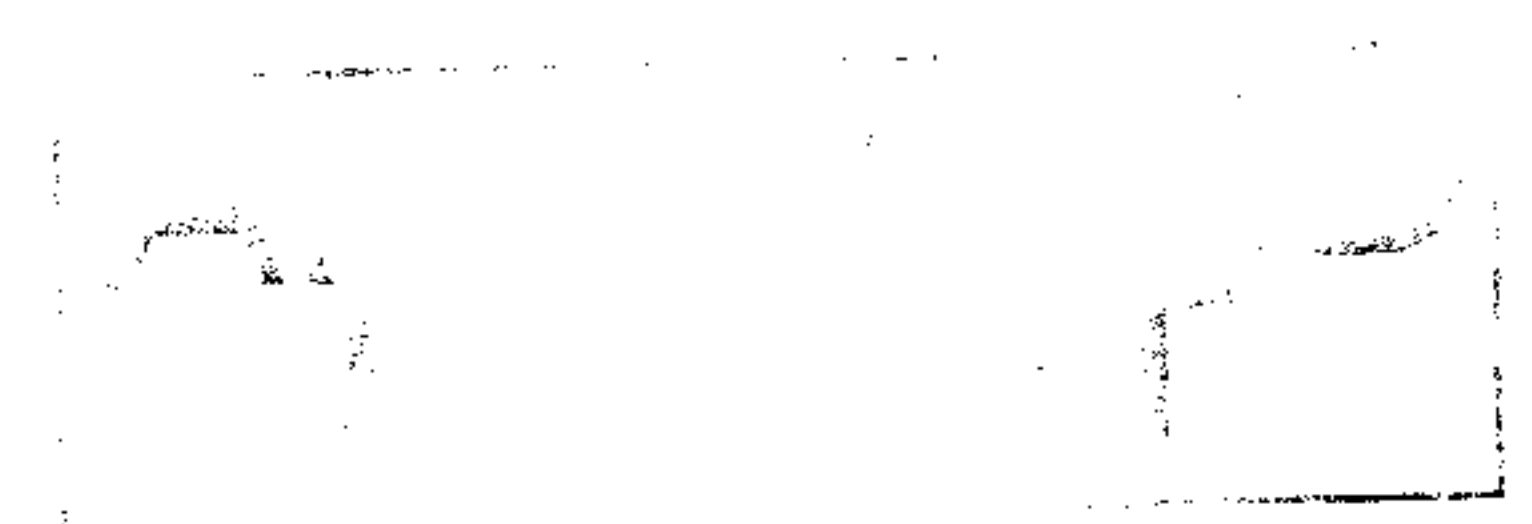


connectors 6, 7 and 10 only are located on the strips 2 and 4 as parts of the finished board. The strips are assembled and connected to one another by a method according to older patent application no. 10 2010 008 684.3.

Located approximately evenly spaced along the connection between the strips 1 and 2 in Figure 1 are two plugs primarily in the form of cylindrical pins 11 and 12 made of wood, which are driven into identically shaped holes. The holes and pins cross the adjacent end faces of the strips and form a positive locking fit against thrust or shear forces between the strips in the direction along the end faces adjacent to one another. The holes are drilled and the pins 11 and 12 are inserted preferably after the female connector 6 of the strip 2 has been inserted into the matching groove 5 of the strip 1, starting at one end of the end faces, such that the strips 1 and 2 are connected to one another in advance.

Identical plugs and locking grooves primarily in the form of cylindrical pins 13 and 14 in cylindrical holes are located between the strips 2 and 3 and form a positive locking fit against shear loads between the strips thus connected to one another. Pins 15 and 16 driven in identically shaped holes connect the strips 3 and 4 to one another.

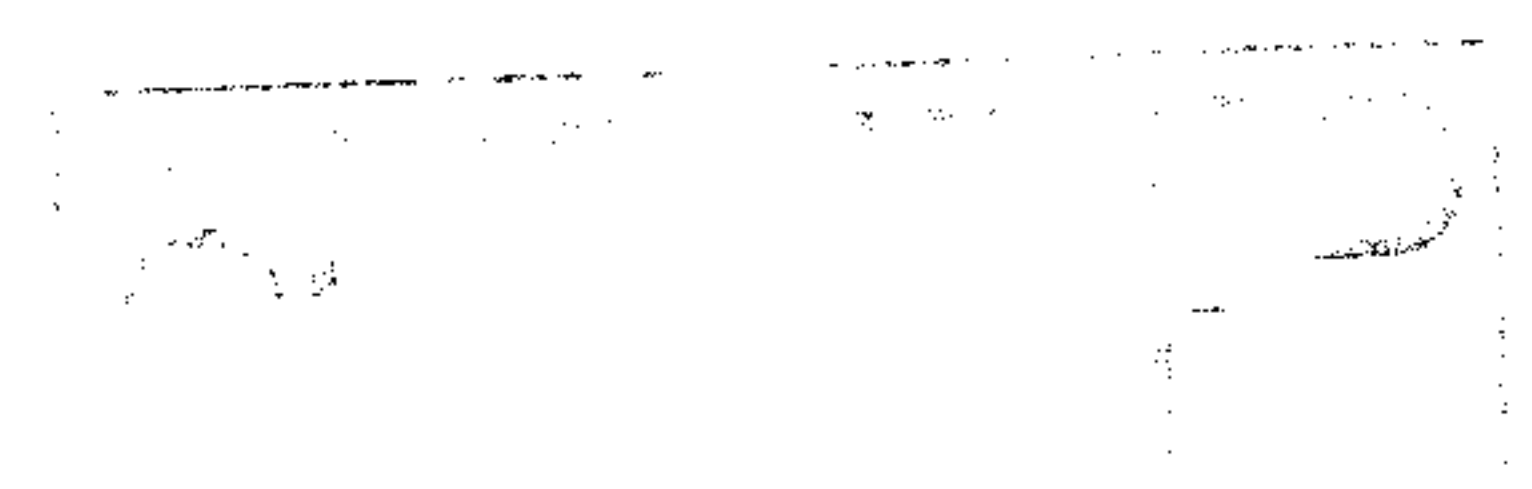
Figure 2 shows an enlarged cross-section through the connection of the strips 2 and 3 and the pin 13 and 14 inserted therein. In the view shown in Figure 2 the locking groove in the form of a cylindrical hole has only one opening on the upper common front side 17 of the strip. The hole and the pin 13 inserted therein extend to a depth below



the female connector 17 and above the bottom common front side 18 such that no discontinuities appear in the latter as a result of the pins.

Figure 3 shows the strips 1, 2 and 3 between which are arranged the pins 11, 12, 13 and 14 in the state prior to their assembly. Figure 3 also shows the holes in the form of half shells 21 and 22 matching the pins 11 and 12 and the holes in the form of half shells 23 and 24 matching the pins 13 and 14. The holes extend to a depth above the female connectors 6 and 7, and the pins extend axially to a depth of about the middle of the strips in relation to their thickness. The lateral surface of the pins includes axially symmetrically aligned narrow grooves as shown in Figure 3, which can form a durable connection in the holes with the wood of the strips.

The present invention is not limited to the exemplary embodiment described, but also encompasses any other expedient application and use of the features specified in the claims.



Claims

1. Structural panel in the form of a board consisting of parts in the form of strips made of wood arranged next to one another in rows, which together form two opposing front sides of the panel and which are connected to each other at linearly aligned end faces by equally linearly aligned female connectors on the one hand and by grooves that enclose the female connectors on the other, characterized in that

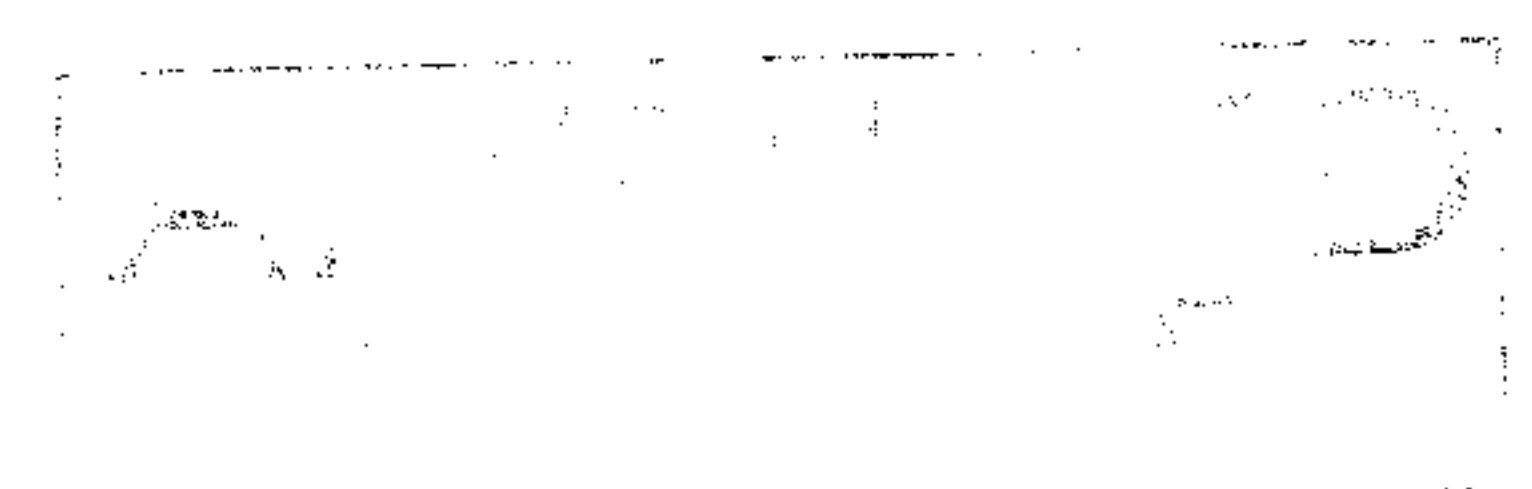
the female connectors and grooves have a cross-section of the kind similar in form to a dovetail.

that under uniform influences of ambient temperature and moisture the female connectors are enclosed by the corresponding grooves under constant bias and are free of additional connecting means such as glue or other adhesives,

in that a plug made of wood is inserted into a locking groove at at least one point along end faces adjacent to each other, which locking groove is open at one of the common front sides of the strips and which extends from one strip to the next strip of the strips connected to each other.

in that the locking groove has a depth that extends from its opening in one of the opposite front sides of the strips into the female connector of the connection of the strips adjacent to each other,

in that the locking groove common to the strips connected to one another is in the form of an approximately rotationally symmetrical hole with an opening in at least one of the common front sides of the strips and in an axial alignment approximately perpendicular to the common front side, and



in that the plug consists of an approximately asymmetrical pin similar to the rotationally symmetrical hole made of wood, which is driven into the hole through the opening in one of the common front sides of the strips.

2. The component according to claim 1, characterized in that
 - the locking groove consists of a hole approximately cylindrical in shape and with an axial depth which extends into the female connector of the connection of the strips adjacent to each other, preferably penetrating said female connector,
 - and in that in the hole, the plug consists of an approximately cylindrical or slightly conically shaped pin, preferably with axially symmetrically aligned narrow grooves formed on the lateral surface thereof.
3. The component according to claim 1 or 2, characterized in that
 - the pin has a length approximately equal to half the thickness of the strips and the hole has an axial depth greater than the axial length of the pin.
4. The component according to claim 3, characterized in that
 - the axial depth of the hole includes the thickness in the cross-section of the corresponding female connector.

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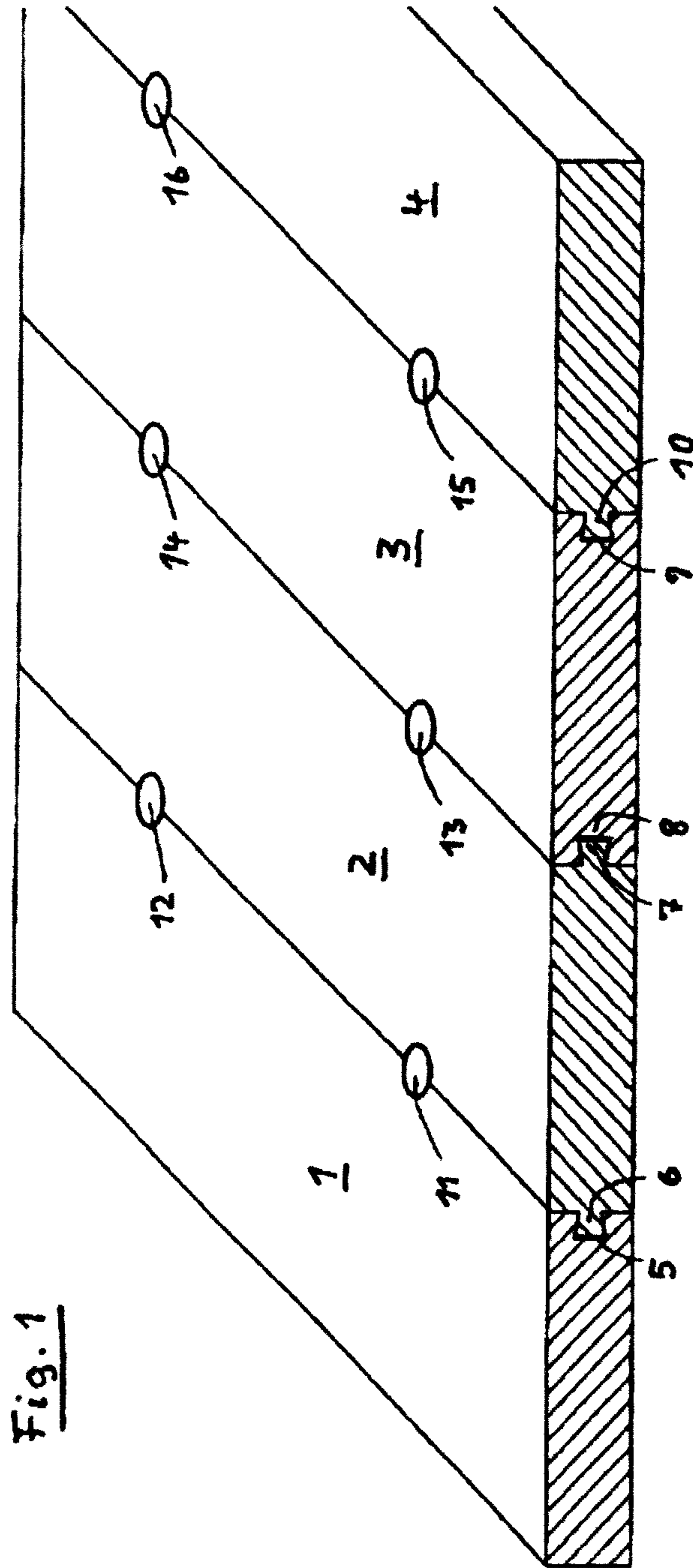


Fig. 1

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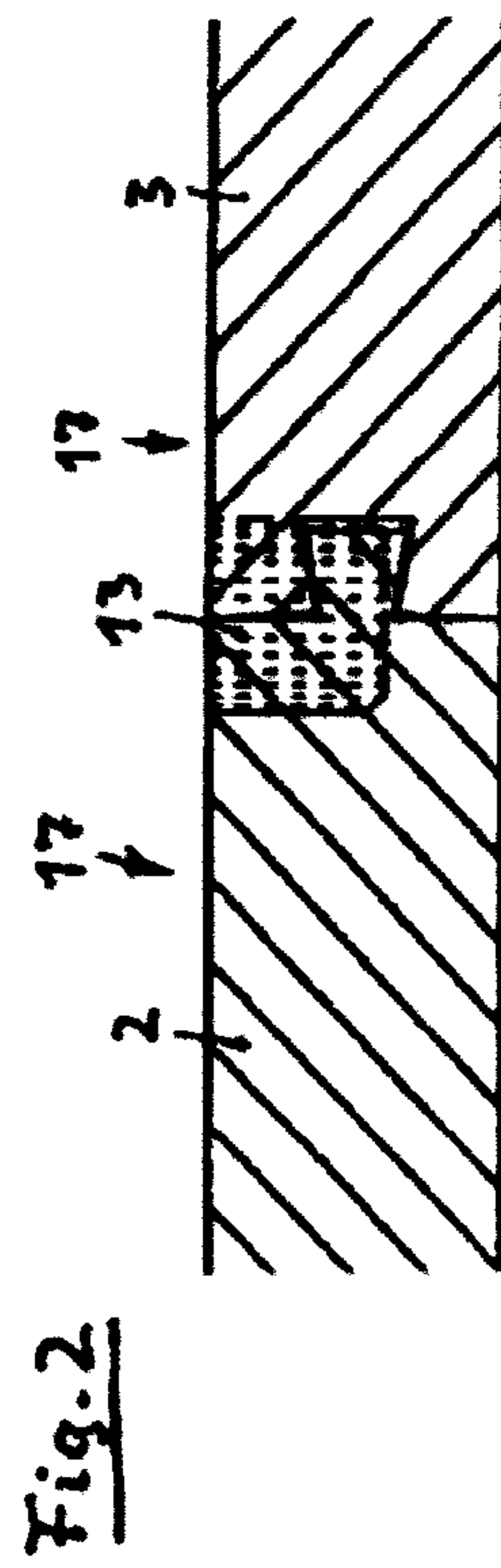


Fig. 2

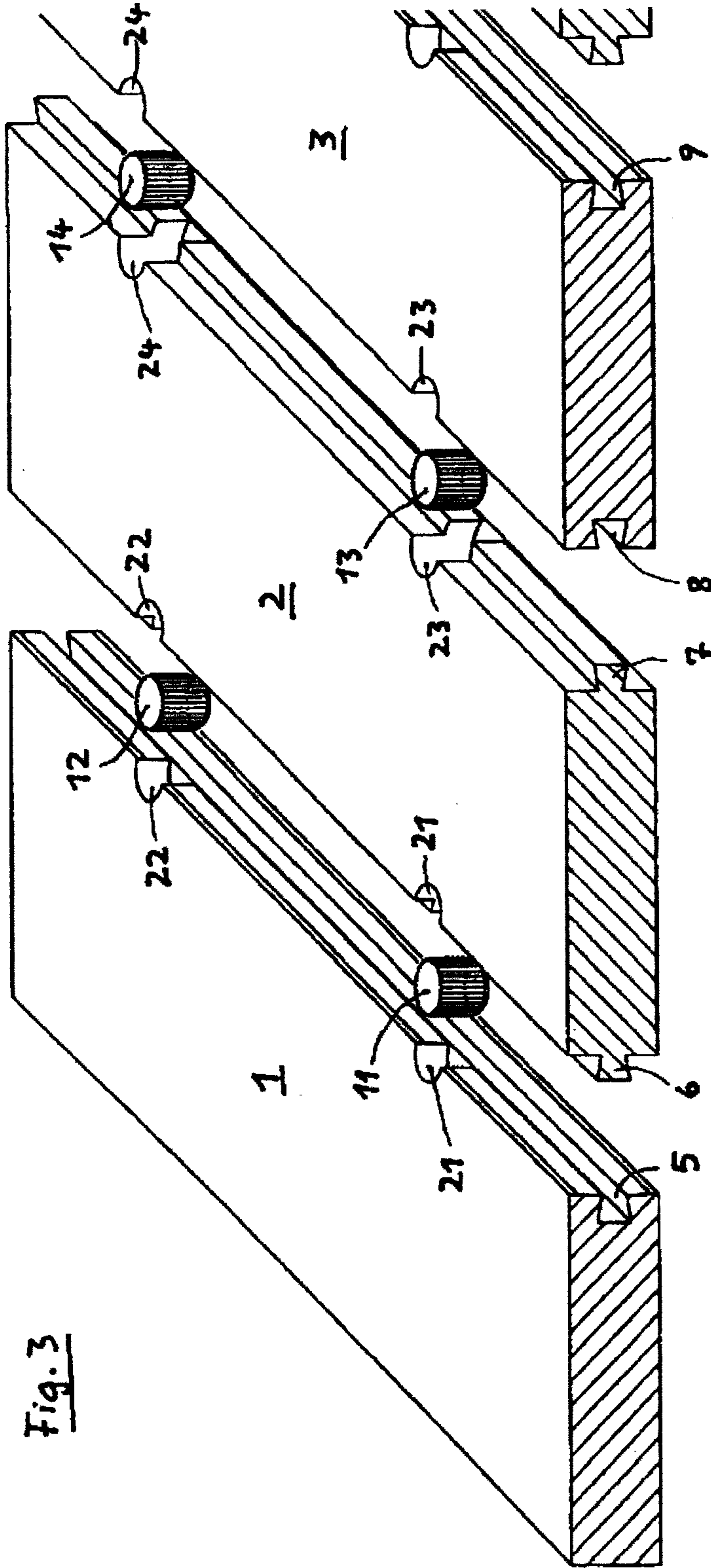


Fig. 3

Fig. 3

