

(86) **Date de dépôt PCT/PCT Filing Date:** 2005/11/09
(87) **Date publication PCT/PCT Publication Date:** 2006/05/18
(45) **Date de délivrance/Issue Date:** 2014/02/04
(85) **Entrée phase nationale/National Entry:** 2007/05/02
(86) **N° demande PCT/PCT Application No.:** EP 2005/011988
(87) **N° publication PCT/PCT Publication No.:** 2006/050928
(30) **Priorité/Priority:** 2004/11/10 (DE10 2004 054 368.2)

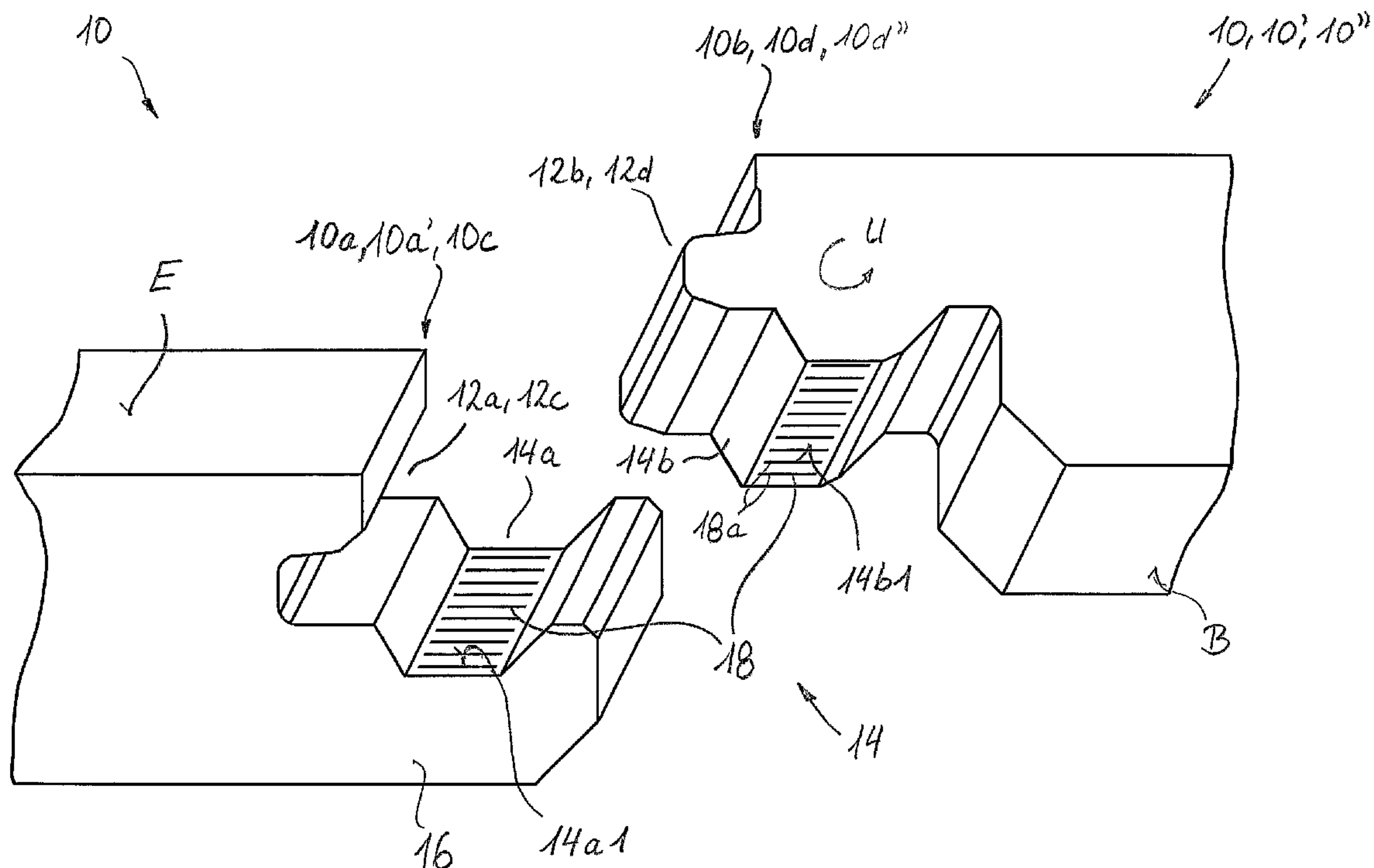
(51) **Cl.Int./Int.Cl.** *E04F 15/02* (2006.01)

(72) **Inventeur/Inventor:**
DURNBERGER, GERHARD, AT

(73) **Propriétaire/Owner:**
KAINDL FLOORING GMBH, AT

(74) **Agent:** NORTON ROSE FULBRIGHT CANADA
LLP/S.E.N.C.R.L., S.R.L.

(54) Titre : PANNEAU DE VETURE
(54) Title: CLADDING PANEL



(57) Abrégé/Abstract:

The invention relates to a cladding panel (10) with two pairs of side edges (10a-10d) lying opposite one another, whereby at least one pair of side edges is provided with coupling means (12) embodied essentially in the form of a groove (12a, 12c) and a tongue (12b, 12d) and extending along the respective side edge. According to the invention, at least one section (14a1) of the boundary surface of the groove (12a, 12c) or/and at least one section (14b1) of the boundary surface of the tongue (12b, 12d) is provided with a roughening (18).

Abstract

The invention relates to a cladding panel (10) with two pairs of side edges (10a-10d) lying opposite one another, whereby at least one pair of side edges is provided with coupling means (12) embodied essentially in the form of a groove (12a, 12c) and a tongue (12b, 12d) and extending along the respective side edge. According to the invention, at least one section (14a1) of the boundary surface of the groove (12a, 12c) or/and at least one section (14b1) of the boundary surface of the tongue (12b, 12d) is provided with a roughening (18).

Cladding panel

Specification

5 The invention relates to a cladding panel with two pairs of side edges lying opposite one another, whereby at least one pair of side edges is provided with coupling means embodied essentially in the form of a groove and a tongue and extending along the respective side edge.

10 Cladding panels of this type are generally known. Reference is made by way of example to EP 1 036 244 B1.

The generic panels are usually produced by essentially cuboid-shaped raw panels, i.e., raw panels the side surfaces of which assigned to the side edges run essentially
15 orthogonally to the walking surface, being machined, e.g., by milling to form the coupling means on at least one pair of side edges, namely in the form of a groove in the area of the one side surface and of a tongue in the area of the other side surface. The purpose of this chip removal is thereby always to achieve the smoothest surfaces possible in order to be able to slide two panels that are connected to one another via groove and
20 tongue relative to one another in the longitudinal direction of the respective side edge when laying the cladding panels.

One problem that generic cladding panels always have to deal with in practice are the seasonal variations in the relative humidity. In times of high relative humidity the
25 cladding panels expand because of swelling, whereas they shrink during the heating period in winter because of the low relative humidity. This swelling and shrinking causes the formation of cracks between panels abutting on one another even if, as is customary with many types of cladding panels currently available on the market, the coupling means of the cladding panels are embodied with integrated locking means, which extend in the
30 longitudinal direction of the respective side edge of the cladding panel and try to counteract a relative movement of the two panels in a direction running in the panel plane

and orthogonally to the respective side edge. Further causes for the formation of cracks to be mentioned are the effects of static and mechanical-dynamic stresses, as exerted on the floor, e.g., by heavy pieces of furniture or by walking on it. With rectangular cladding panels this crack formation problem occurs in particular at the short sides of the panels. Furthermore, the crack formation problem occurs to a particular extent if the panels, as is customary today, are laid in a freely floating manner on the subfloor, i.e., are not connected to the subfloor by separate connecting means and are not glued to one another.

- 10 To prevent crack formation, EP 0 843 763 A1, EP 1 024 234 A1 and EP 1 026 341 A1 suggested a cladding panel with which, in the connected state of two panels, the lower lip delimiting the groove of the one panel presses against the tongue of the respective other panel with a prestressing force. This prestressing force is thereby produced by a permanent displacement of the lower lip from its rest position, which the lip assumes in
15 the unconnected state of the two panels. This permanent displacement causes a constant mechanical stress and a gradual fatigue of the panel material.

The object of the present invention is therefore to provide a cladding panel of the type mentioned at the outset, with which the formation of cracks between two panels connected to one another can be counteracted, without providing a prestressing force of
20 this type.

This object is attained according to the invention by a cladding panel of the type mentioned at the outset, with which at least one section of the boundary surface of the groove or/and at least one section of the boundary surface of the tongue is provided with
25 a roughening.

In connection with the present invention, "boundary surface" hereby refers to the surface extending from the side surface of the respective side edge, following the groove with a
30 face normal facing into the groove or following the tongue with a face normal facing

away from the tongue and ending on the other side of the groove or of the tongue once more at the side surface of the side edge.

5 Providing the roughening according to the invention means that the friction between the groove of the one panel and the tongue of the other panel is increased, so that a relative displacement of the two interconnected panels in the longitudinal direction of the groove or tongue is made more difficult. The crack formation on the panel side running orthogonally to this longitudinal direction is thus counteracted as well. This means that if the cladding panel is a rectangular cladding panel with a short side and a long side, the
10 crack formation can be counteracted at the short side of the panel in that, at least on the long side, at least one section of the boundary surface of groove or/and tongue is provided with a roughening. Naturally, providing a roughening in the area of the groove or/and the tongue of the short side of the panel also results in a reduction of the tendency to crack formation on the long side of the panel.

15

With respect to achieving a highest possible friction it is preferred if the at least one section of the boundary surface provided with the roughening extends both over essentially the entire length of the respective side edge and in the circumferential direction of the boundary surface over essentially the entire circumference of the
20 boundary surface. However, it can also be desirable, not least for reasons of manufacturing engineering, for the at least one section of the boundary surface provided with the roughening to extend merely over a part of the length of the respective side edge or/and in the circumferential direction merely over a part of the boundary surface.

25 The friction between the boundary surface of the groove and the corresponding boundary surface of the tongue can be further increased in that, whenever both at least one section of the boundary surface of the groove and at least one section of the boundary surface of the tongue are provided with a roughening, these roughenings are provided at least in part on sections of the boundary surfaces of groove and tongue complementary to one
30 another. Two sections of the boundary surfaces of groove or tongue of one and the same panel are to be considered "complementary" within the meaning of this claim if the

groove section provided with a roughening of the one panel and the tongue section provided with a roughening of the other panel bear against one another in the connected state of these two panels when two identical panels are connected.

5 The roughening can be embodied in different ways:

For example, at least one section provided with a roughening can be formed by a tothing. In order to achieve a highest possible friction between two panels connected to one another, it is thereby suggested that the tooth sequence direction of the tothing runs
10 essentially in the longitudinal direction of the respective side edge, whereas the tooth extension direction runs essentially in the circumferential direction of the groove or the tongue. "Tooth sequence direction" thereby means the direction in which the teeth of the tothing follow one another; with a conventional gear wheel thus the circumferential direction of the gear wheel. By contrast, the "tooth extension direction" thereby means
15 the direction in which the individual tooth extends; with a conventional gear wheel with straight teeth thus the axial direction.

The tothing can be formed, e.g., by an essentially chipless machining, for instance by indenting, serrating or the like. But additionally or alternatively it is also possible to form
20 the tothing by a chip-forming machining, e.g., by piercing, milling or the like. With both alternatives for producing the tothing it is, however, advantageous to use a tool the rotational speed of which is adjusted to the feed rate of the panel such that its circumferential speed essentially corresponds to the feed rate of the panel.

25 In a second embodiment variant, which can be used additionally or alternatively to the formation of the roughened section as a tothing, at least one section provided with a roughening can be formed by a plurality of wood fibers protruding from the surface of the respective section of the boundary surface. In order to cause the fibers to stand up, the surface can be treated with an agent, e.g., with a water-dilutable varnish (such as an
30 unplasticized aqueous copolymer latex) which releases the fibers at least in part from

their material compound, e.g., solid wood, MDF or another wood material, raises and fixes them.

According to a third embodiment variant, which can again be used additionally or alternatively to the two embodiment variants explained above, at least one section provided with a roughening can be formed by a plurality of particles applied to the surface of the respective section of the boundary surface. These particles can be, e.g., particles of micronized polypropylene wax with a size of between approximately 30 μm and 75 μm . Furthermore, these particles can be joined to the surface of the respective section of the boundary surface by means of an adhesion promoter, e.g., a water-dilutable varnish (such as an unplasticized aqueous copolymer latex).

As already indicated above, at least a core of the panel can be formed of a wood material, e.g., solid wood, a chipboard, an MDF board or the like. But basically it is also possible to apply the principles according to the invention to other materials, e.g., compact laminate, plastic or the like.

As already mentioned above as well, the coupling means can be embodied with integrated locking means extending in the longitudinal direction of the respective side edge. These locking means can thereby be formed from the core material, e.g., in one piece. But it is basically also conceivable to embody the locking means or/and the coupling means in or at a coupling unit connected to the core of the panel. This coupling unit can be connected to the core of the panel in that, e.g., a suitable material, e.g., plastic, a wood extrudate or the like is injected into a prepared indentation in the side surface of the panel and is subsequently machined in a material-removing manner to form the coupling means or/and the locking means. But as an alternative it is also possible to insert a prefabricated part with coupling means or/and locking means prefabricated thereon into the prepared indentation.

In accordance with one aspect of the present invention, there is provided a cladding panel with two pairs of side edges lying opposite one another, whereby at least one pair of side edges is provided with coupling means embodied essentially in the form of a groove and a tongue and extending along the respective side edge, whereby at least one section of the boundary surface of the groove and at least one section of the boundary surface of the tongue is provided with a roughening in the form of a tothing, which roughenings are provided on sections complementary to one another of the boundary surfaces of the groove and tongue, whereby a tooth sequence direction of the tothing runs essentially in the longitudinal direction of the respective side edge, whereas a tooth extension direction runs essentially in a direction orthogonal to the longitudinal direction of the respective panels, and whereby the complementary sections bear against one another and are in engagement with one another in the connected state of the panel with another identical panel.

In accordance with a further aspect of the present invention, there is provided a cladding panel with two pairs of side edges lying opposite one another, whereby at least one pair of side edges is provided with coupling means in the form of a groove and a tongue and extending along the respective side edge, whereby at least one section of the boundary surface of the groove and at least one section of the boundary surface of the tongue is provided with a roughening in the form of a tothing, which roughenings are provided on sections complementary to one another of the boundary surfaces of the groove and tongue, whereby a tooth sequence direction of the tothing runs essentially in the longitudinal direction of the respective side edge, whereas a tooth extension direction runs essentially in a direction orthogonal to the longitudinal direction of the respective panels, and whereby the complementary sections bear against one another and are in engagement with one another in the connected state of the panel with another identical panel, wherein the roughening formed on the at least one section of the boundary surface of the tongue is formed on a protrusion and the roughening formed on the at least one section of the boundary surface of the groove is formed on a corresponding recess, and wherein the roughening increases friction between the groove of a first panel and the tongue of a second panel.

In accordance with a still further aspect of the present invention, there is provided a method for forming a cladding panel, comprising: forming a groove and a tongue at opposite side edges of a panel; and providing a roughening on at least a section of the tongue and at least a section of the groove, wherein the roughening comprises a tothing
5 extending in a tooth sequence running direction that is essentially in the longitudinal direction of the respective side edge and in a tooth extension direction that is essentially in a circumferential direction of the groove and the tongue such that a longitudinal axis of each individual tooth extends essentially in the circumferential direction, whereby the at least one roughening section of the tongue and the at least one roughening section of the
10 groove are arranged to form complementary sections that bear against one another when the cladding panel is connected to at least one other cladding panel, wherein the roughening formed on the at least one section of the tongue is formed on a protrusion, and wherein the roughening formed on the at least one section of the groove is formed on a corresponding recess, wherein the roughening increases friction between the groove of a
15 first panel and the tongue of a second panel.

The invention can be used in a particularly advantageous manner if the cladding panel is a flooring panel, and particularly if the flooring panel is designated to be laid in a floating manner or/and without the use of adhesive to connect adjacent panels.

5 The invention is explained in more detail below by means of exemplary embodiments on the basis of the enclosed drawings. They show:

- Fig. 1 A top view of a cladding panel according to the invention;
- Fig. 2 A partial top view of a covering layer formed by a plurality of cladding
10 panels of this type;
- Fig. 3 A perspective view of the end of the groove and the end of the tongue of a cladding panel provided with a roughening according to the invention;
- Fig. 4 A diagrammatic side view of the panel according to Fig. 3 to explain the method of embodying the roughening; and
- 15 Figs. 5 and 6 Views similar to Figs. 3 and 4 of a further embodiment of a cladding panel according to the invention.

In Fig. 1, a panel according to the invention is designated in general as 10. The panel 10 is embodied as a rectangular panel and has two long sides 10a and 10b and two short
20 sides 10c and 10d arranged respectively in pairs opposite one another. In the exemplary embodiment shown, the panel 10 is provided with coupling means both on the long sides 10a and 10b and on the short sides 10c and 10d, which coupling means serve to connect the panel 10 to adjacent panels 10', 10'', ... in the longitudinal direction L or in the transverse direction Q (see Fig. 2).

25

The coupling means 12 are composed essentially in the form of a groove 12a provided on the long side 10a and a tongue 12b provided on the long side 10b, which together form the coupling means of the long side, and a groove 12c provided on the short side 10c and a tongue 12d provided on the short side 10d, which together form the coupling means of
30 the short side. These coupling means 12 can be embodied in different variants, some of which will be explained below in more detail with reference to Figs. 3 through 6. But all

of these coupling means have the common property that pairs 12a/12b, 12c/12d of grooves and tongues assigned to one another are embodied such that in the connected state of two identical panels 10 the pairs interlock in the manner of jigsaw puzzle pieces, thus without prestressing, i.e., in particular without the lower groove boundary lip being
 5 permanently deflected out of its rest position.

On the one hand, the representation according to Fig. 3 can be interpreted as showing the groove edge 10a or 10c in the bottom left in a first perspective view, and in the top right in a second perspective view the tongue edge 10b or 10d of one and the same panel 10.
 10 But since the panels joined to form a covering layer are embodied to be identical, the representation can, on the other hand, also be interpreted as showing the edges 10b, 10a' or 10c, 10d'' adjoining one another of two panels 10, 10' or 10, 10'' embodied to be identical adjoining one another (see Fig. 2).

15 The embodiment represented in Fig. 3 is a groove/tongue profile which can be connected by angling into one another two adjacent panels 10 and 10' or 10''. To this end, the left groove panel 10 in Fig. 3 can lie flat on the floor, whereas the right tongue panel 10' or 10'' in Fig. 3 is supplied from the side in a position angled with respect to the horizontal, until its tongue 12b, 12d engages with the groove 12a, 12c of the panel 10. Subsequently,
 20 the locking means 14 provided at the coupling means 12a, 12c or 12b, 12d of the two panels 10 and 10' or 10'' can be brought into engagement with one another by pivoting downward the tongue panel 10', 10''. In the exemplary embodiment shown, the locking means 14 are thereby formed on the groove side 12a, 12c of the panels by a recess 14a embodied in the upper surface of the lower lip 16 delimiting the groove 12a, 12c. On the
 25 tongue side of the panel 10, the locking means 14 are formed by a projection 14b provided on the underside of the tongue 12b, 12d.

In the connected state of two panels 10, the engagement of the coupling means 12 prevents a relative movement of the two panels 10 in the upward direction H (see Fig. 1),
 30 i.e., in a direction running orthogonally to the panel plane or walking surface E of the panels 10, whereas the interaction of the locking means 14 prevents a relative movement

of the two panels 10 in a direction running in the panel plane E and orthogonally to the respective side edge 12a through 12d. The panel plane E is thereby spanned by the longitudinal direction L (direction of the long sides 10a and 10b) and the transverse direction Q (direction of the short sides 10c and 10d) of the panels 10.

5

In contrast to the panels of the prior art, the panels 10 according to the invention additionally have a roughening 18 which at least impedes a relative movement of two panels 10 connected to one another in the longitudinal direction of the respective side edge 10a/10b, 10c/10d. To this end, at least one surface section of the surfaces bearing
10 against one another of the coupling means 12 and the locking means 14 are provided with a roughening 18 of this type. In the exemplary embodiment represented in Fig. 3, this is on the one hand the base area 14a1 of the recess 14a on the groove panel shown on the left in Fig. 3, and the top area 14b1 of the projection 14b of the tongue panel shown on the right in Fig. 3. Please note that the two surfaces 14a1 and 14b1 mentioned above bear
15 against one another in the connected state of two adjacent panels, and that their respective roughenings thus interact with one another, which effectively increases the friction in the longitudinal direction of the respective side edges 10a/10b, 10c/10d. Within the meaning of the present application, the surfaces 14a1 and 14b1 of the panel 10 thus form “complementary” surfaces.

20

In the longitudinal direction of the two side edges, the roughenings 18 extend preferably over the entire length of the edges, whereas they are provided merely on a part of the boundary surfaces of the groove or the tongue in the circumferential direction U, as shown in Fig. 3. The latter, however, is mainly due to reasons of production technology.

25

As indicated diagrammatically in Fig. 3, the roughenings 18 are respectively formed by a tothing, the teeth 18a of which follow one another in the longitudinal direction of the respective side edge 10a/10b, 10c/10d (“tooth sequence direction”), whereby each individual tooth extends essentially in the circumferential direction U, i.e., orthogonally
30 to the longitudinal direction of the respective side edge (“tooth extension direction”).

As shown diagrammatically in Fig. 4, the tothing 18 can be embodied, e.g., by pressing the teeth 18a into the base area 14a1 of the recess 14a or into the top area 14b1 of the projection 14b. To this end, a rotating tool 20 or 22 is brought into engagement with the surfaces 14a1 or 14b1, the circumferential surface 20a or 22a of which tool has a counter-
 5 tothing corresponding to the tothing 18 to be embodied. Attention must further be paid to the fact that the tool 20 or 22 rotates synchronously to the movement of the panel 10, i.e., such that, with a rotation about the axis 20b or 22b, its circumferential speed corresponds to the feed rate of the panel 10 in the direction of the respective side edge 10a through 10d.

10

In addition, Fig. 4 shows another tool 24 which corresponds to the tools 20 and 22 in terms of structure and function, but is arranged such that it provides a tothing to an oblique boundary surface 14a2 of the recess 14a. Note must further be taken of the fact that no analogous tothing tool is provided for the oblique surface 14b2 at the tongue
 15 panel shown on the right in Fig. 4. However, even the one-sided provision of a tothing can further increase the friction between the two panels.

Figs. 5 and 6 show a modified embodiment that corresponds essentially to the embodiment according to Figs. 3 and 4. In Figs. 5 and 6, analogous parts are thus
 20 provided with the same reference numbers as in Figs. 3 and 4, but increased by the number 100. Furthermore, Figs. 5 and 6 will be described below only as far as they differ from the embodiment explained previously, to the description of which explicit reference is hereby made otherwise.

25 One the one hand, the panel 110 represented in Figs. 5 and 6 differs from the panel 10 according to Figs. 3 and 4 in that the coupling means 112 embodied at the side edges 110a-110d are not embodied such that two adjacent panels can be connected to one another by angling the tongue panel into the groove panel, but that the panels 110 are connected by being moved towards one another in an essentially planar manner parallel
 30 to the panel plane E. In this case, the locking means 114 are formed by a projection 114a at the free end of the lower lip 116 delimiting the groove 112a, 112c and by a recess 114b

in the area of transition of the tongue 112b, 112d into the panel 110. When the tongue 112b, 112d is inserted into the groove 112a, 112c, the lower lip 116 is thus deflected, i.e., bent downward, until the nose 114a can catch in the recess 114b. As a result of this catching, the lower lip 116 returns again to its rest position shown in Fig. 5, in which it is
5 free of any mechanical deformation.

Also in the exemplary embodiment shown in Figs. 5 and 6, both the groove 112a, 112c and the tongue 112b, 112d are provided with a roughening 118, namely on the one hand at an upper boundary surface 116a of the lower lip 116 and on the other hand at the lower
10 boundary surface 122 of the tongue 112b, 112d. In the present case, the roughenings 118 are formed by particles 118a, which can be applied by means of a spraying tool 128 or 130 (see Fig. 6) to the surfaces 116a and 126, preferably using an adhesion promoter which, after having dried, keeps the particles 118a on the surfaces 116a, 126.

15 It should further be stated that it is basically also conceivable to provide merely one of the two complementary surfaces 116a, 126 with sprayed-on particles of this type, in order to achieve a higher friction between the two panels 110. Furthermore, it is conceivable to apply particles of this type also to the surfaces not visible in Fig. 5 on the lower side of the upper groove boundary lip 132 and on the upper side of the tongue 112b, 112d.

20

Another embodiment variant for the roughening provided according to the invention is to be explained as well below on the basis of the diagrammatical representations according to Figs. 5 and 6:

25 Also a solvent can be applied to the surfaces 116a and 126 by means of the spraying tools 128 and 130, which solvent starts to dissolve a wood material, e.g., solid wood, MDF or the like used to form the panels 110, at least so much that individual wood fibers disengage at least in part from the material compound and project out of the surface when the treatment agent has dried. In this case, 118a designates the wood fibers projecting
30 from the surfaces 116a and 126a in Fig. 5.

The following has to be added:

The panels 10, 110 can be made of any material, e.g., a wood material such as, e.g., solid-wood boards, MDF boards, chipboards or the like, but also of compact laminate, plastic
5 and suitable panel materials of this type.

If the panels are to be used as flooring panels, they can have a core 10e, 110e, as indicated in Figs. 4 and 6 respectively with the panel 10, 110 shown in the bottom left, which core is embodied, e.g., as an MDF board (medium-density fiberboard), whereby a
10 decorative layer 10f, 110f is glued to this core 10e, 110e on its walking surface E, and a leveling layer 10g, 110g is glued to its underside B resting on the floor, opposite the walking side E. The decorative layer 10f, 110f can comprise, e.g., one or more plies of printed paper, which is or are saturated with synthetic resin. In an analogous manner, the leveling layer 10g, 100g can be formed by a laminate layer comprising several paper
15 plies of this type.

The groove 112a, 112c or the tongue 112b, 112d do not necessarily have to be formed directly of the material of the core 110e. Rather, as indicated by a dashed line in Fig. 6, it is also possible to inject a suitable material, e.g., plastic, a wood extrudate or the like into
20 a recess 150 prepared in the side surface 110a through 110d, and let it cure there, and to embody the groove 112a, 112c or the tongue 112b, 112d subsequently by machining.

CLAIMS:

1. Cladding panel with two pairs of side edges lying opposite one another, whereby at least one pair of side edges is provided with coupling means in the form of a groove and a tongue and extending along the respective side edge, whereby at least one section of the boundary surface of the groove and at least one section of the boundary surface of the tongue is provided with a roughening in the form of a tothing, which roughenings are provided on sections complementary to one another of the boundary surfaces of the groove and tongue, whereby a tooth sequence direction of the tothing runs essentially in the longitudinal direction of the respective side edge, whereas a tooth extension direction runs essentially in a direction orthogonal to the longitudinal direction of the respective panels, and whereby the complementary sections bear against one another and are in engagement with one another in the connected state of the panel with another identical panel, wherein the roughening formed on the at least one section of the boundary surface of the tongue is formed on a protrusion and the roughening formed on the at least one section of the boundary surface of the groove is formed on a corresponding recess, and wherein the roughening increases friction between the groove of a first panel and the tongue of a second panel.

2. Cladding panel according to claim 1, characterized in that the tothing is formed by a substantially chipless machining.

3. Cladding panel according to claim 1, characterized in that the tothing is formed by a chip-forming machining.

4. Cladding panel according to any one of claims 1 to 3, characterized in that, with a rectangular cladding panel with a short side and a long side, at least one section of the boundary surface of groove or/and tongue is provided with a roughening at least on the long side.

5. Cladding panel according to any one of claims 1 to 4, characterized in that the at least one section of the boundary surface provided with the roughening extends over merely a part of the length of the respective side edge.
6. Cladding panel according to any one of claims 1 to 4, characterized in that the at least one section of the boundary surface provided with the roughening extends over essentially the entire length of the respective side edge.
7. Cladding panel according to any one of claims 1 to 6, characterized in that the at least one section of the boundary surface provided with the roughening extends over merely a part of the width of the boundary surface in the direction orthogonal to the longitudinal direction of the respective panels.
8. Cladding panel according to any one of claims 1 to 6, characterized in that the at least one section of the boundary surface provided with the roughening extends over essentially the entire width of the boundary surface in the direction orthogonal to the longitudinal direction of the respective panels.
9. Cladding panel according to any one of claims 1 to 8, characterized in that at least a core of the panel is manufactured from at least one of a wood material, a compact laminate and plastic.
10. Cladding panel according to any one of claims 1 to 9, characterized in that the coupling means are embodied with integrated locking means extending in the longitudinal direction of the respective side edge.
11. Cladding panel according to claim 10, characterized in that the locking means are manufactured in one piece from the material of the core.
12. Cladding panel according to any one of claims 1 to 11, characterized in that the coupling means or/and the locking means are embodied in or at a coupling unit connected to the core of the panel.

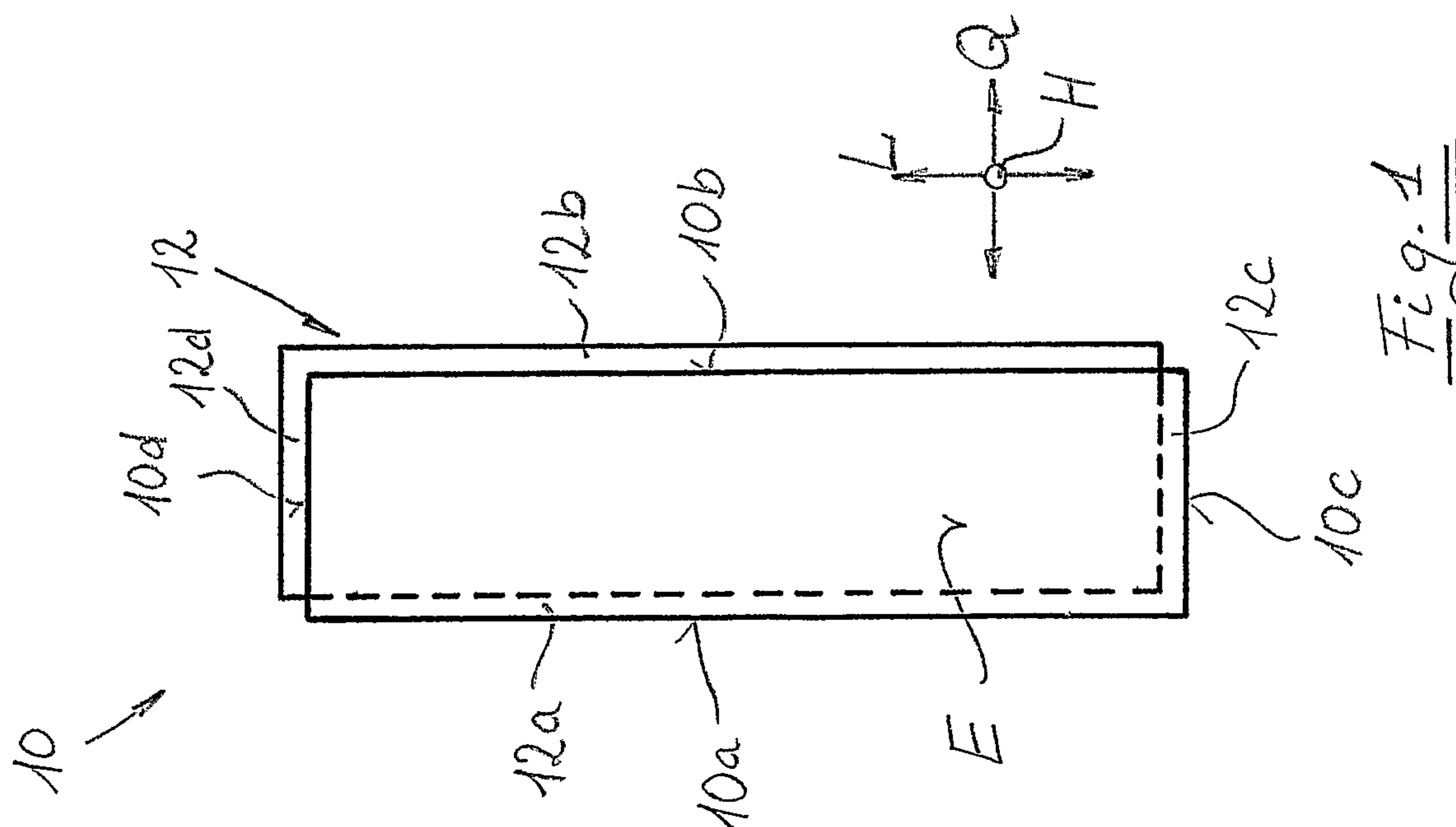
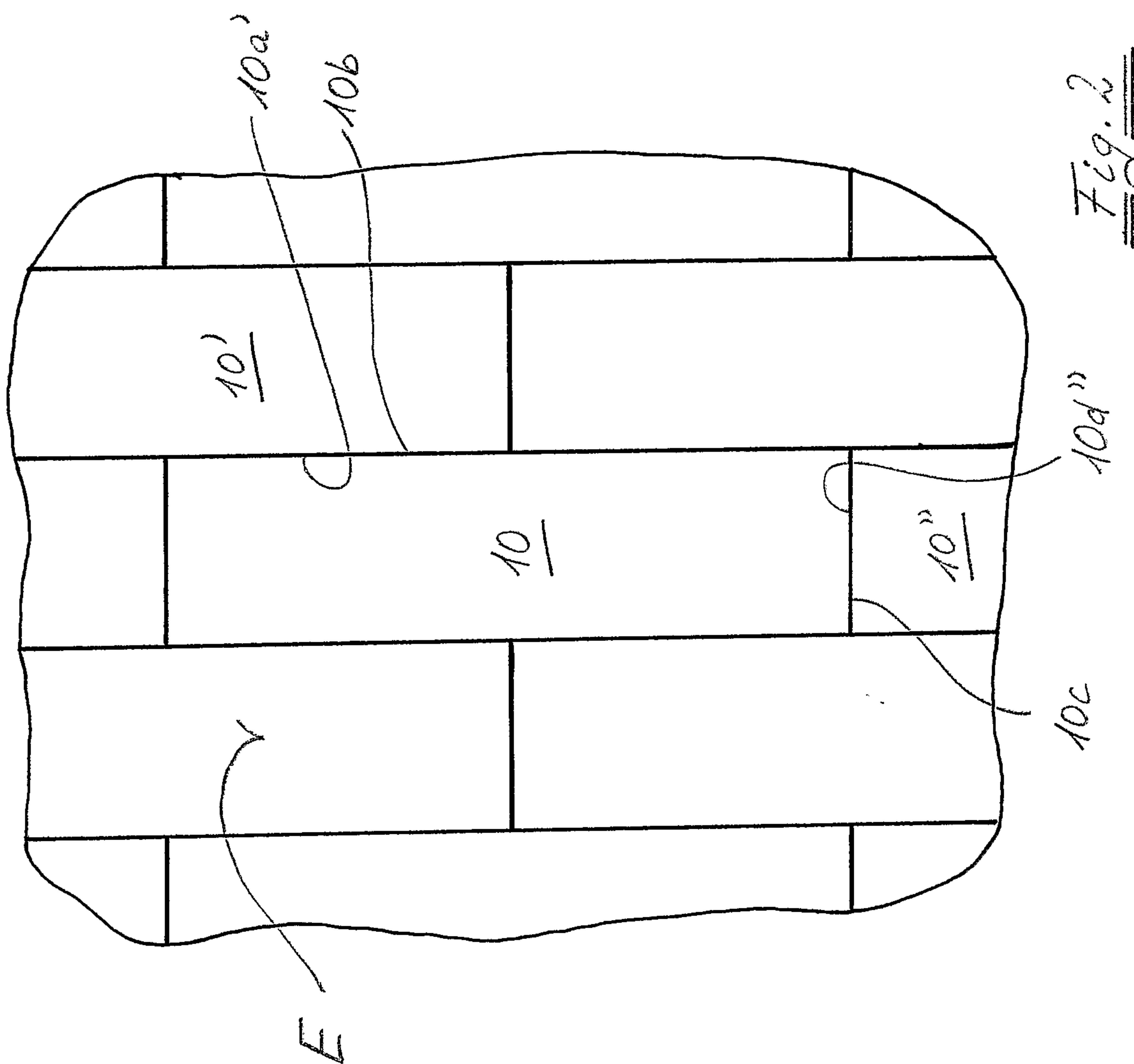
13. Cladding panel according to any one of claims 1 to 12, characterized in that it is a flooring panel.

14. Cladding panel according to claim 2, wherein the substantially chipless machining includes at least one of indenting and serrating.

15. Cladding panel according to claim 3, wherein the chip-forming machining includes at least one of piercing and milling.

16. Cladding panel according to claim 9, wherein the wood material includes at least one of solid wood, chipboard and MDF board.

17. A method for forming a cladding panel, comprising: forming a groove and a tongue at opposite side edges of a panel; and providing a roughening on at least a section of the tongue and at least a section of the groove, wherein the roughening comprises a toothing extending in a tooth sequence running direction that is essentially in the longitudinal direction of the respective side edge and in a tooth extension direction that is essentially in a circumferential direction of the groove and the tongue such that a longitudinal axis of each individual tooth extends essentially in the circumferential direction, whereby the at least one roughening section of the tongue and the at least one roughening section of the groove are arranged to form complementary sections that bear against one another when the cladding panel is connected to at least one other cladding panel, wherein the roughening formed on the at least one section of the tongue is formed on a protrusion, and wherein the roughening formed on the at least one section of the groove is formed on a corresponding recess, wherein the roughening increases friction between the groove of a first panel and the tongue of a second panel.



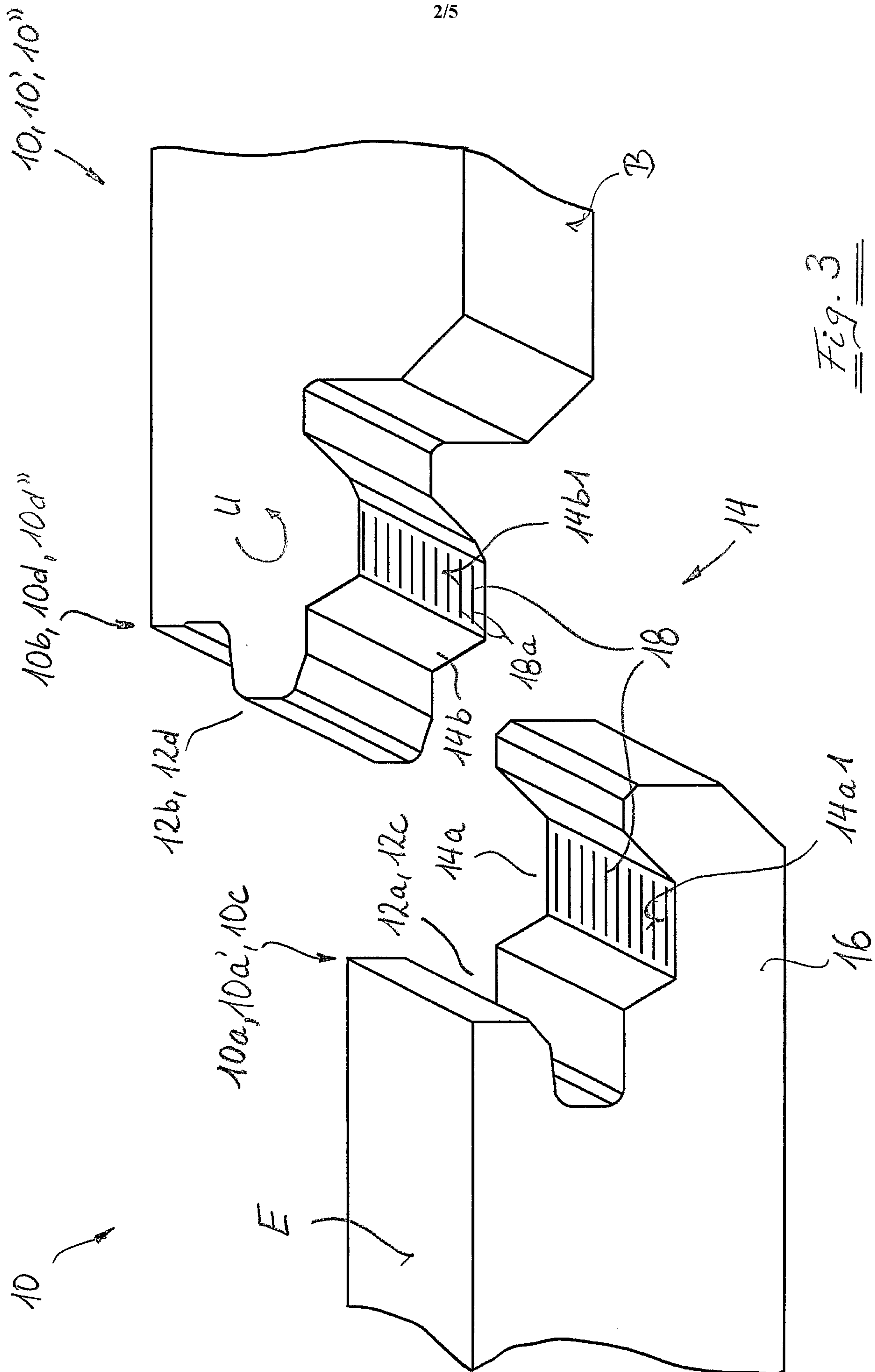


Fig. 3.

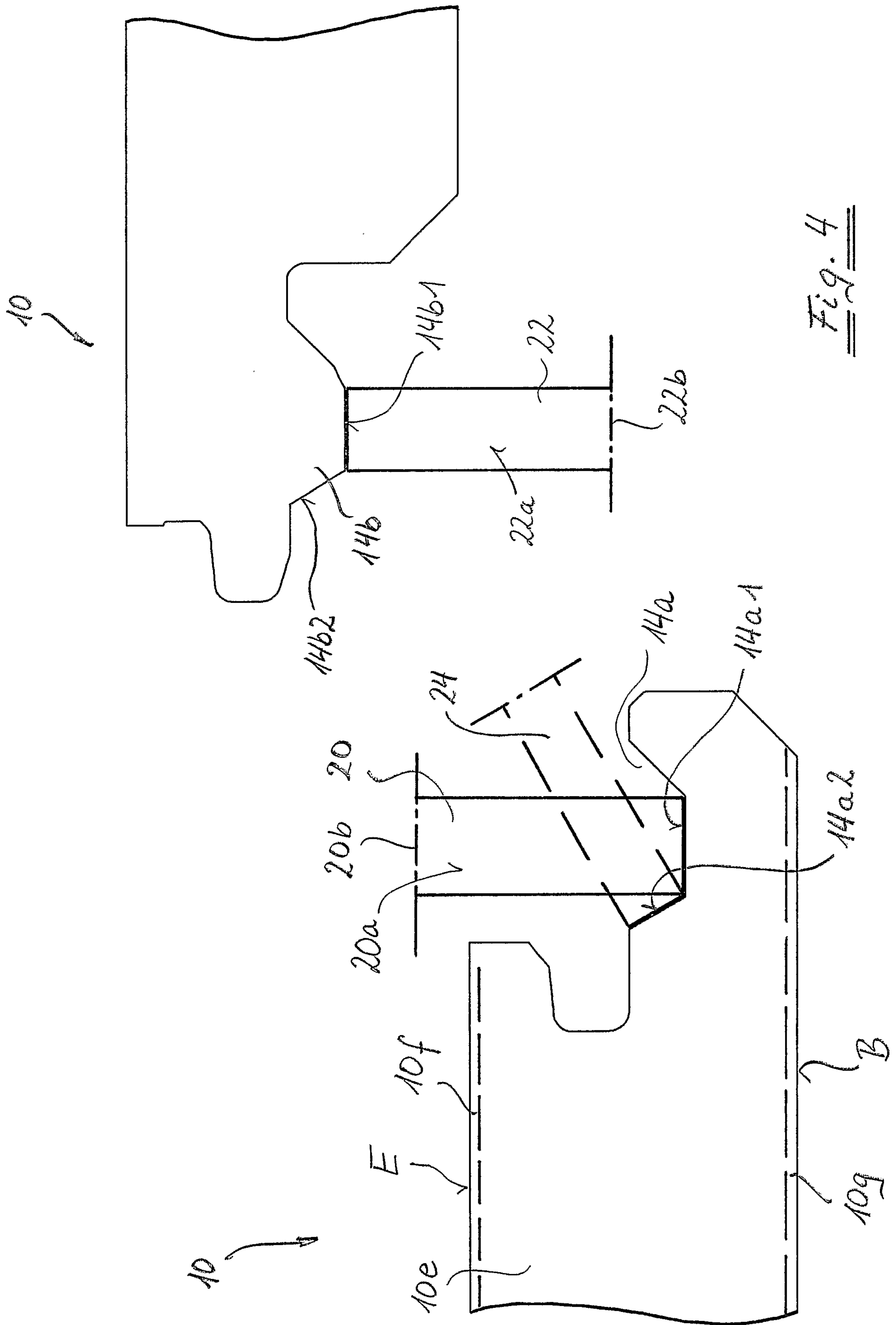


Fig. 4

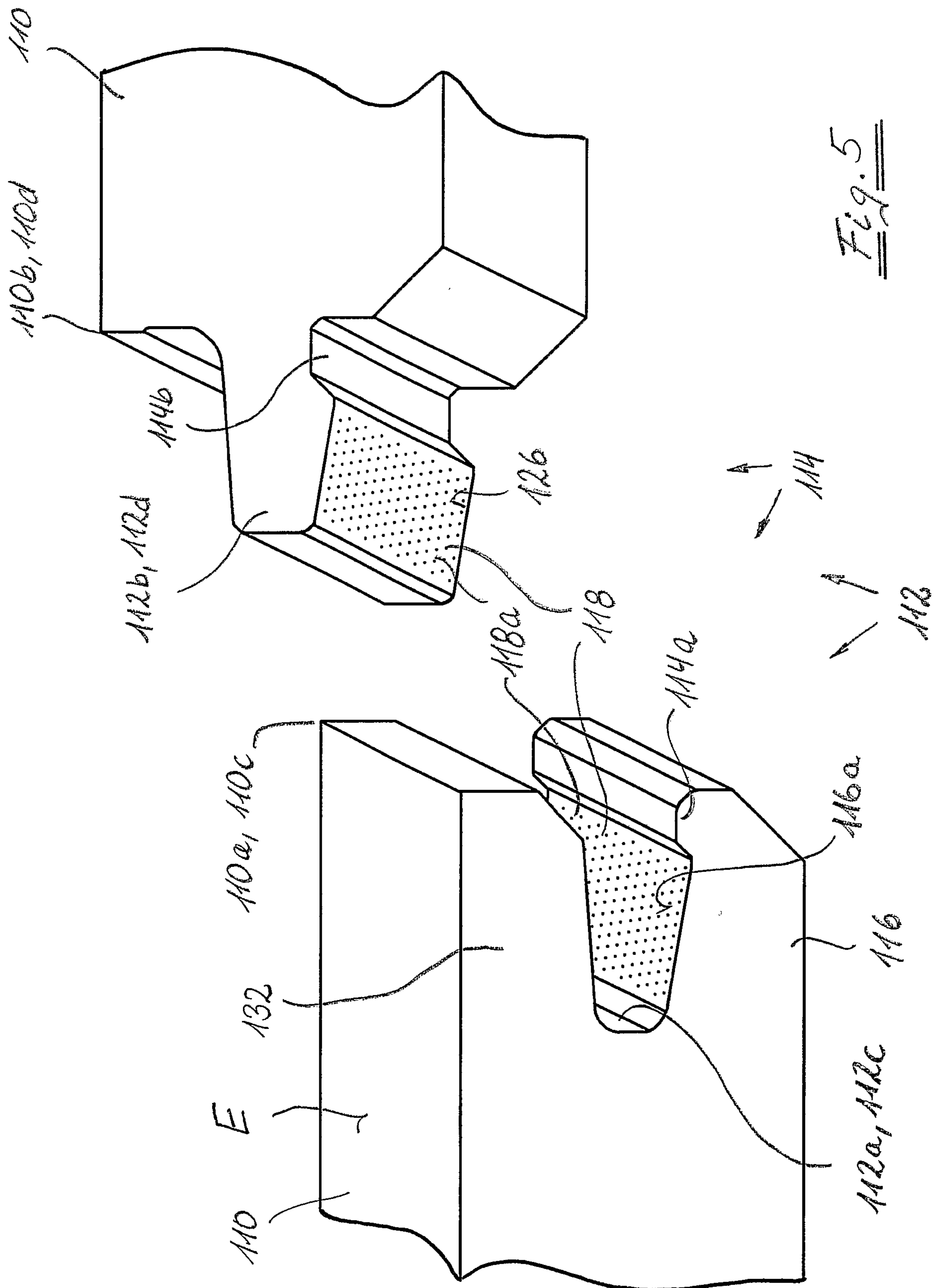


Fig. 5

