Office de la Propriété Intellectuelle du Canada
Un organisme d'Industrie Canada

Canadian Intellectual Property Office
An agency of Industry Canada

CA 2432891 A1 2002/07/04

(21) 2 432 891

(12) DEMANDE DE BREVET CANADIEN
CANADIAN PATENT APPLICATION

(13) A1

(86) Date de dépôt PCT/PCT Filing Date: 2001/12/20
(87) Date publication PCT/PCT Publication Date: 2002/07/04
(85) Entrée phase nationale/National Entry: 2003/06/23
(86) N° demande PCT/PCT Application No.: EP 2001/015144
(87) N° publication PCT/PCT Publication No.: 2002/052113
(30) Priorité/Priority: 2000/12/22 (100 64 280.2) DE

(51) Cl.Int.^{7}/Int.Cl.^{7} E04F 13/08, E04F 15/04

(71) Demandeur/Applicant:
HULSTA-WERKE HULS GMBH & CO. KG, DE

(72) Inventeurs/Inventors:
SCHWITTE, RICHARD, DE;
TUNTE, UDO, DE

(74) Agent: BERESKIN & PARR

(54) Titre : PANNEAU POUR L'AMENAGEMENT INTERIEUR ET LA CONSTRUCTION A PAROI SECHE, ET PROCEDE POUR REALISER DE NOUVELLES PAROIS D'UNE PIECE OU POUR REVETIR DES SURFACES EXISTANTES D'UNE PIECE

(54) Title: WALL BOARDS OR PANEL BOARDS FOR USE IN INTERIOR CONSTRUCTION AND DRY CONSTRUCTION

(57) Abrégé/Abstract:
The invention relates to a board for use in interior construction, especially for producing new walls in a room or for paneling wall, ceiling or roof surfaces of a room. Said board is provided on at least two opposite ends, a first and a second end, with connecting means, especially having a groove-and-tongue design, for linking the board with other boards of the same kind. The connecting means facilitate a catch, snap-in or click-in connection with an adjoining board of the same kind. Additional fastening means are provided on the board itself or on two boards linked with each other for fastening the board on a support construction. The invention also relates to a method for producing new walls of a room or for paneling already existing wall, ceiling or roof surfaces of a room. According to this method, a first board is mounted, a second board is linked with the first board by establishing a catch, snap-in or click-in connection on the adjoining lateral edges of the two boards, and the second board is secured by additional fastening means.

(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum
Internationales Büro

(43) Internationales Veröffentlichungsdatum
4. Juli 2002 (04.07.2002)

PCT

(10) Internationale Veröffentlichungsnummer
WO 02/052113 A3

(51) Internationale Patentklassifikation[7]: E04F 13/08, 15/04

(21) Internationales Aktenzeichen: PCT/EP01/15144

(22) Internationales Anmeldedatum:
20. Dezember 2001 (20.12.2001)

(25) Einreichungssprache: Deutsch

(26) Veröffentlichungssprache: Deutsch

(30) Angaben zur Priorität:
100 64 280.2 22. Dezember 2000 (22.12.2000) DE

(71) Anmelder *(für alle Bestimmungsstaaten mit Ausnahme von US)*: **HÜLSTA-WERKE HÜLS GMBH & CO. KG** [DE/DE]; Gerhart-Hauptmann-Str. 43-49, 48703 Stadtlohn (DE).

(72) Erfinder; und

(75) Erfinder/Anmelder *(nur für US)*: **SCHWITTE, Richard** [DE/DE]; Ebbingshof 64, 48712 Gescher (DE). **TÜNTE, Udo** [DE/DE]; Dückerstrasse 7, 46348 Raesfeld (DE).

(74) Anwalt: **HOFFMANN EITLE**; Arabellastrasse 4, 81925 München (DE).

(81) Bestimmungsstaaten *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

(84) Bestimmungsstaaten *(regional)*: ARIPO-Patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), eurasisches Patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), europäisches Patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI-Patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Veröffentlicht:
— *mit internationalem Recherchenbericht*

(88) Veröffentlichungsdatum des internationalen Recherchenberichts: 30. Januar 2003

Zur Erklärung der Zweibuchstaben-Codes und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.

(54) **Title:** WALL BOARDS OR PANEL BOARDS FOR USE IN INTERIOR CONSTRUCTION AND DRY CONSTRUCTION

(54) **Bezeichnung:** WAND- ODER VERKLEIDUNGSPLATTE FÜR DEN INNENAUSBAU UND TROCKENBAU

(57) **Abstract:** The invention relates to a board for use in interior construction, especially for producing new walls in a room or for paneling wall, ceiling or roof surfaces of a room. Said board is provided on at least two opposite ends, a first and a second end, with connecting means, especially having a groove-and-tongue design, for linking the board with other boards of the same kind. The connecting means facilitate a catch, snap-in or click-in connection with an adjoining board of the same kind. Additional fastening means are provided on the board itself or on two boards linked with each other for fastening the board on a support construction. The invention also relates to a method for producing new walls of a room or for paneling already existing wall, ceiling or roof surfaces of a room. According to this method, a first board is mounted, a second board is linked with the first board by establishing a catch, snap-in or click-in connection on the adjoining lateral edges of the two boards, and the second board is secured by additional fastening means.

(57) **Zusammenfassung:** Eine Platte für den Innenausbau, insbesondere zum Erstellen von neuen Wänden eines Raumes oder zur Verkleidung von Wand-, Decken- oder Dachflächen eines Raumes weist an zumindest zwei entgegengesetzten Seiten, einer ersten und einer zweiten Seite vorgesehene Verbindungsmittel, insbesondere eine Nut- und Federausgestaltung zur Verbindung mit weiteren, gleichartigen Platten auf, wobei die Verbindungsmittel eine einrastende, einschnappende oder klickende Verbindung mit einer benachbarten, gleichartigen Platte ermöglichen, und zusätzliche Befestigungseinrichtungen sind an der Platte selbst oder an zwei miteinander verbundenen Platten zur Befestigung der Platte an einer Tragkonstruktion vorgesehen. Im Rahmen eines Verfahrens zum Erstellen von neuen Wänden eines Raumes oder zur Verkleidung von vorhandenen Wand-, Decken- oder Dachflächen eines Raumes wird zunächst eine erste Platte montiert, anschliessend wird eine zweite Platte unter Herstellung einer Rast-, Schnapp- oder Klickverbindung an den benachbarten Seitenkanten dieser beiden Platten mit der ersten Platte verbunden, und nachfolgend wird die zweite Platte mittels zusätzlicher Befestigungseinrichtungen gesichert.

WO 02/052113 A3

Art. 34 PCT Amendments:

International Application PCT/EP 01/15144
hülsta-werke Hüls GmbH & Co. KG

Translation of the amended pages 1, 4, 4a and patent claims 1 and 28
as filed November 11, 2002

Technical Field

The invention relates to a board for use in interior construction and dry construction, particularly for producing new walls and facing shells of a room or for panelling wall, ceiling or roof surfaces of a room, **according to the preamble of claim 1,** and to an associated method **according to the preamble of claim 28.**

Prior Art

Large-format boards, e.g. of plasterboard, which are fastened to suitable supports, are known from the domain of interior construction. In dry construction, for example, these boards are fastened to metal profiles to produce new partition walls. Alternatively, for the purpose of forming panellings, the boards can be fastened to a lathing joined to a wall, or they can be fastened to roof slopes such as, for example, the beams of a roof truss. The boards can be more than man-high and have a width of over 1 m. Such boards are known as "one-man boards" and have dimensions of, for example, approximately 1.50 x 1.00 m. In addition, larger standard boards exist

obtained at the abutting edge of two adjacent boards. This flattened region can be filled up with filler. A textile strip is then inserted in the damp filler. By this means the boards are coupled to one another in a tension-resistant manner, for example, to prevent subsequent crack formation in a wallpaper applied over the boards.

Known from DE 297 19 986 U1 is a panelling element which can be coupled to an adjacent panelling element by means of a tongue-and-groove joint. The groove is bounded by so-called groove cheeks. The groove cheek located on the side facing away from the room concerned has recesses for receiving fastening means. The disclosed panel can be joined to a sub-structure by means of the described fastening means.

A combined set comprising a locking member and at least two panels is known from EP 1 120 515 A1, which has not been pre-published. A first panel is fastened to a base by means of a clip. The tongue of a second panel is inserted in the groove of the first panel and is held on the substructure and to the first panel by a projecting portion formed on the clip.

A similar arrangement is known from WO 01/38668 A1, which likewise has not been pre-published. In this case, panels are fixed in position by retaining elements which are fastened to a base. In both of the aforementioned publications, the locking of a panel is effected by means of the separate locking or retaining element, with the result that assembly is comparatively complicated, inflexible and subject to large tolerances.

Known from DE 100 01 076 C1 is a panelling element designed for floor coverings which is provided with a special tongue-and-groove joint rendering possible a locking coupling with adjacent panelling elements. In other words, at the time of coupling, at least one of the portions bounding the groove is at least briefly deflected and a locking coupling is formed

in that this portion is at least substantially moved back and, in an interlocking manner, holds a projection provided on the tongue of the adjacent panel.

DE 200 17 114 U1 describes a panelling element for floors, ceilings or walls, on the lower groove cheek of which there is a recess through which a fastening element, e.g. a screw, can be screwed in for the purpose of joining the panelling element to a sub-structure. A contiguous panelling element can be coupled to a first panelling element fastened in this manner through a form-closure type tongue.

A similar configuration is known from JP 11350706 for a panel which is composed, at least on its surface, of metal.

A board according to the preamble of claim 1 is known from US 4,299,070. This board is formed by extrusion, as a substantially hollow board, and is provided with coupling means in the form of tongue-and-groove. Provided on the tongue are two undercuts in which projections, formed on the two groove cheeks, engage. The projections are of a form which is complementary of the undercuts. A sealing material which is separate from the board material presses the coupling means into engagement with one another.

A method according to the preamble of claim 28 is known from DE 195 03 948 A1. In this case, a first board, which is already fastened to a support structure, is coupled to a second board by a locking coupling. The second board is subsequently fastened to the support structure. The locking coupling is provided with a joint clearance in order to permit modification of a joint between the two boards.

Presentation of the Invention

The object of the invention is to create a board for interior construction and dry construction, which can be coupled to

further boards of the same type with a low resource expenditure and in a time-saving and visually attractive manner for the purpose of forming a new wall or a panelling. Furthermore, a method which is suitable for this is to be created.

This object is achieved by, firstly, the board described in claim 1.

Accordingly, there are provided on at least two opposite sides, a first and a second side, of the board coupling means which, upon coupling to other boards of the same type, render possible a locking coupling to the respectively adjacent board. These coupling means can be provided in the form of, for example, a tongue-and-groove design. In particular, the coupling means on two opposite sides are complementary of one another, so that the lateral edge of a board can be coupled in a locking or interlocking manner to the opposite lateral

Page 4

A similar configuration is known from JP 11350706 for a panel which is composed, at least on its surface, of metal.

A board according to the preamble of claim 1 is known from US 4 299 070. This board is formed by extrusion, as a substantially hollow board, and is provided with coupling means in the form of tongue-and-groove. Provided on the tongue are two undercuts in which projections, formed on the two groove cheeks, engage. The projections are of a form which is complementary of the undercuts. A sealing material which is separate from the board material presses the coupling means into engagement with one another.

A method according to the preamble of claim 28 is known from DE 195 03 948 A1. In this case, a first board, which is already fastened to a support structure, is coupled to a second board by a locking coupling. The second board is subsequently fastened to the support structure. The locking coupling is provided with a joint clearance in order to permit modification of a joint between the two boards.

Presentation of the Invention

The object of the invention is to create a board for interior construction and dry construction, which can be coupled to further boards of the same type with a low resource expenditure and in a time-saving and visually attractive manner for the purpose of forming a new wall or a panelling. Furthermore, a method which is suitable for this is to be created.

This object is achieved by, firstly, the board described in claim 1.

Page 4a

Accordingly, there are provided on at least two opposite sides, a first and a second side, of the board coupling means which, upon coupling to other boards of the same type, render possible a locking coupling to the respectively adjacent board. These coupling means can be provided in the form of, for example, a tongue-and-groove design. In particular, the coupling means on two opposite sides are complementary of one another, so that the lateral edge of a board can be coupled in a locking or interlocking manner to the opposite lateral edge of a board of the same type. The term "locking coupling" in this context means that an at least brief deflection occurs in the region of the coupling, particularly at one of the involved portions, for example, at one of the groove cheeks bounding a groove, so that a (generally termed) locking projection, which is preferably a

edge of a board of the same type. The term "locking coupling" in this context means that an at least brief deflection occurs in the region of the coupling, particularly at one of the involved portions, for example, at one of the groove cheeks bounding a groove, so that a (generally termed) locking projection, which is preferably over-dimensioned, can be accommodated. In other words, in the case of such a locking, snap-in or click-in coupling, a portion is moved in such a way that it passes through a dead centre, whereupon the portion moves back, at least partially, in a resilient manner so that the said locking projection is securely held. In the coupled state, the portion which is moved in this manner can still remain at least slightly deflected, so that a force continues to be exerted which draws the boards to one another. It is also conceivable, however, for there to be no deflection in the coupled state but, at the same time, for mutually coupled boards to be prevented from moving apart. In connection with the coupling means provided on the board which effect the locking coupling, it is to be emphasized that they are integrally provided on the board. In other words, they are produced directly in the board material, so that there is no need for expensive provision of additional coupling means.

Such a locking coupling has the substantial advantage that boards for interior construction finishing work, which are to be fastened to ceilings and/or walls, can be coupled to one another in a hitherto unknown manner without visible joints. The term "without visible joints" means that, although a joint or abutment exists between two adjacent boards, the joint is nevertheless of such a quality and of such small dimensions that it is not noticeable. In particular, the joint corresponds to a very well executed wallpaper butt joint so that the effect of a particularly well applied wallpaper is created or, in the case of other surface types, the joint is not perceptible. This is because the described locking, snap-in or click-in coupling prevents two adjacent

boards from moving apart so that a good appearance is assured without the need for separate working of the abutments between the boards.

In this way, furthermore, a coupling is formed between two boards which couples the two boards perpendicularly to the considered lateral edge in all directions. In other words, the two boards cannot be raised relative to one another in a direction perpendicular to their surface. Furthermore, they cannot easily be separated from one another in a direction parallel to their surface. This is prevented by the interlocking coupling means. This interlocking is effective at least during the period of use, i.e., for as long as the boards form a partition wall or panelling. The coupling means can nevertheless be fashioned in such a way that, through appropriate disengagement of the boards from one another, the boards can be separated from one another in a non-destructive manner without soiling, and can be reused in a different way.

The board according to the invention is particularly suitable for producing new walls or for panelling existing surfaces of a room in that there are additional fastening means, on the board itself or on two mutually coupled boards, which enable the board to be fastened to a support structure. In particular, these fastening means can be provided at the coupling location of two mutually coupled boards so as to enable the board to be fastened at this location to a support structure by appropriate clips or adapters made from metal or plastic. As explained in greater detail in the following, these additional fastening means can be provided in such a way that a respective board is fastened to a support structure by appropriate clips, screws or nails. Fastening to a support structure can also be effected by adhesion or bonding, and by means of hook-and-loop or magnetic tape. It is thereby advantageously ensured that two boards are reliably fastened not only to one another, but also to a

support structure of wood, metal or plastic located beneath them. This support structure can be comprised of, for example, the roof beams, so that the board according to the invention can replace the plasterboards used hitherto. Compared with plasterboards, the board according to the invention offers clear advantages in that, firstly, it is substantially, i.e. approximately 30 %, lighter than a plasterboard. Consequently, it can be transported and fitted with a small expenditure of effort. Furthermore, the board according to the invention can be easily worked, for example, with a compass saw or hand-held circular saw. On the other hand, use of the board according to the invention, unlike the use of plasterboards, does not involve filling of the butt joints and abrading of the filler compound. This also advantageously saves the extensive cleaning work that is normally required with the use of plasterboards. In particular, the board according to the invention is advantageously suitable as a facing for suspended ceilings, light partition walls, facing shells and attic finishing work.

It is to be noted that dimensions of, for example, 2.65 m x 41.5 cm or 62.5 cm are currently intended for the board according to the invention. Furthermore, a so-called "short length" of the board could have a length of approximately 1.3 m, preferably 1.285 m. The interlocking design of the coupling means ensures that the abutment between two adjacent boards is largely inconspicuous and, in particular, is no more conspicuous to the viewer than, for example, the joints of abutting wallpaper strips applied with adhesive. In particular, the hitherto necessary filling of joints and the application of a textile strip can be omitted as a result. This means a substantial easing of work, and ensures a satisfactory and visually attractive work result. Furthermore, these coupling means ensure that two adjacent boards are aligned on the same level in respect of their surface. If mounting on a support structure beneath the

board were to be used alone, it would not necessarily be guaranteed that the boards would be on the same level, and obtrusive offsets could be produced on the surface. The coupling means formed on the boards can however be fashioned with such precision that the surfaces of adjacent boards fit to one another in an exactly flush manner.

Furthermore, the board according to the invention can be advantageously provided with physical properties which are favourable in respect of construction. For example, the board has a B1 low flammability classification according to DIN 4102. Furthermore, the F-30B classification required for single-family and two-family houses can be attained. In addition, sound and thermal insulation requirements can be advantageously fulfilled by means of the board according to the invention. Particularly if made from the wood material MDF, the board according to the invention can be classified as a very low-pollutant material which fulfils the requirements of the "Blue Angel" seal. Finally, the board according to the invention can be made airtight or diffusion-tight in order to fulfil various regulations.

Preferred developments of the invention are described in the subsequent claims.

An embodiment which has proved particularly advantageous is that in which the additional fastening means which serve to fasten the board to a support structure are formed by at least one recess which, when two boards are in the coupled state, is present in the coupling region of the two boards, and in which recess a portion of a fastening clip can be received. In other words, a space for receiving a portion of a fastening clip is appropriately provided in the coupling region between two boards according to the invention which are of the same type. A first, installed board can thereby be fastened to the base through the use of one or more fastening clips. Fastening by means of the fastening clips

is effected in this region in such a way that a subsequent coupling of a second board to the already fastened first board is not impeded. As a consequence, it is advantageously possible for a combination of several boards to be both jointlessly coupled to one another and joined to a support structure in a reliable manner. A particular advantage in the use of fastening clips consists in that the board according to the invention can be mounted so as to be movable in all directions relative to the fastening clips. In particular, a larger surface panelled with several boards according to the invention can also move or "work" in a floating manner in a direction perpendicular to the respective abutments with the result that no joints open up upon contraction or swelling of the boards, due to the fact that the combination of all boards is able to move to a certain extent in relation to the clips by means of which the boards are held on the support structure.

For the purpose of fastening the board to a support structure, it has furthermore proved advantageous to fashion at least one groove which serves to receive a portion of a fastening clip. Such a groove extends outwards from the edge of the board into the material of the board, and a corresponding limb of a fastening clip can engage in this groove so that the board is held on the support structure.

Alternatively, or in addition, very satisfactory results have been achieved with at least one recess in the edge region of the board, the recess serving to receive screw heads or nail heads. These recesses can be respectively adapted, as a countersunk hole, to the head of an individual screw or individual nail. However, the recess can also be formed as a groove over a certain length along the edge of the board, so that the number of fastening means used, i.e., screws or nails, can be freely selected. Such a recess, in the widest sense, can also be formed as a free space which, when two

boards are in the coupled state, is present in the coupling region of the boards and is suitable for receiving both the head of a screw or of a nail and a slightly projecting portion of a clip which can be applied by "tacking".

Essentially, any type of locking, snap-in or click-in action is suitable for the locking coupling between two boards of the same type. It is currently preferred, however, to fashion the coupling contours in such a way that a second board which is to be newly installed and joined to a first, already installed, board can be swivelled in. In other words, the second board is swivelled, at least slightly, about the abutting edge between the two boards under consideration and is thereby locked in position.

Both for the previously described embodiment and for an embodiment of a locking coupling which is effected through substantially flat insertion of a tongue into a groove, it is preferred for the board according to the invention that the lower groove cheek, i.e., the groove boundary opposite the visible face of the board, project relative to the groove cheek provided on the visible face. The additional fastening device for receiving a screw head or nail head, or similar fastening means, can be provided in the form of, for example, one or more recesses in the projecting region, without the need for these fastening means to be attached obliquely, slightly past the upper groove cheek. Rather, they can be attached in the region which projects relative to the upper groove cheek, in a direction substantially perpendicular to the board surface.

For the locking coupling between two boards of the same type, it is furthermore preferred that the said locking coupling be fashioned in such a way that the two boards are displaceable in relation to one another in a direction parallel to the mutually interlocked edges. As described in greater detail in the following, this creates the possibility whereby a

third board which is to be newly installed, and which is to be coupled to a first board, in addition to a second board already installed, can, following its coupling to the first board, be coupled, through displacement parallel to the coupling edges, to the second board at the edges perpendicular to the said coupling edges.

In this respect, it is preferred for the board according to the invention that, in addition to the hitherto considered first and second sides which are opposite one another, the third and fourth sides of a rectangular board also have coupling means for a locking, snap-in or click-in coupling. As previously described, it is thereby possible to realize a particularly secure and, advantageously, jointless combination of the boards in all directions. Furthermore, it is rendered possible to panel even relatively large interior surfaces with a multiplicity of the boards according to the invention without the boards themselves being for this purpose excessively large and no longer manageable. In this context, as explained in greater detail in the following, the coupling at the third and fourth sides can be effected through a substantially flat displacement or through a lowering movement in a direction substantially perpendicular to the board surface, in the manner, as it were, of a pushbutton.

For these coupling means on the third and fourth sides of the board according to the invention, it has proved advantageous for these to be of tongue-and-groove design, the tongue projecting, in the coupled state, 6 mm or less, preferably 4 mm or less, into the groove. This means that the newly installed third board under consideration need only be displaced by this comparatively short distance in order to lock the third board, at its third or fourth side, to the already installed second board. This is particularly advantageous for the board according to the invention since, upon attachment of a "topmost" board as a wall panelling,

only a comparatively small gap remains towards the ceiling as a result. Together with a further, comparatively small, gap that may be necessary for the application of a tool in order to move the third board in the appropriate manner, there is produced in the final state a gap of, for example, a maximum of 8 mm, which can be covered with an appropriate profile, e.g. of acrylic, or sealed with a fluid, permanently resilient sealing compound, in a simple and visually attractive manner. It is to be noted in this connection that the described coupling, which requires a comparatively short locking or snap-in distance, is a development which is fundamentally independent of the previously described coupling, according to the invention, of two boards to one another and to a support structure located beneath them. In other words, the particular advantages of such a locking, snap-in or click-in coupling, with a short locking or snap-in distance, are exhibited even without the features described above. Moreover, this applies to all of the embodiments, described in the following, of such a locking coupling on the third and fourth sides of a board according to the invention.

For the groove provided on the third and fourth sides it is particularly, but not exclusively, preferred for a cavity to adjoin the actual groove which serves to receive the tongue. For this cavity, it is preferred that (viewed in cross-section) it be of a lesser width than the groove serving to receive the tongue. In other words, the groove tapers in the direction of the interior of the board to form the said cavity. This serves to provide the two groove cheeks bounding the groove with the flexibility necessary for forming the locking or snap-in coupling. By this means, it is possible to realize both its functioning and, at the same time, the described short locking distance, in consideration of which, per se, a comparatively small groove depth is sufficient. Even in the case of such a comparatively

shallow groove, the described cavity creates the flexibility of the groove cheeks that is advantageous for interlocking.

Moreover, for the interlocking on the third and fourth sides of the board according to the invention, a development is preferred which is essentially also conceivable for the first and second sides. In this context, a groove, in the widest sense, is provided which is open in the direction of the visible face of the board. Accordingly, on the opposite side, a tongue extends in the direction of the rear face of the board. Two adjacent boards can thereby be coupled to one another through a movement which is substantially perpendicular to the board surface, in the manner of a pushbutton. This type of coupling can be effected by a straight-line lowering movement in the said direction on all four sides of a rectangular board. In the case of a board which can be swivelled in on its first or second side, a new board which is to be installed can be interlocked on the third or fourth side in that it is fitted on this side, in the correct position, to an already installed board, and, upon swivelling-in, the tongue projecting in the direction of the rear face goes into the groove open towards the upper face. A jointless surface can thereby be advantageously formed with adjacent boards without the need to displace a newly installed board in parallel to its first and second sides.

The additional fastening means of the board according to the invention for mounting on a support structure can furthermore be formed by a self-adhesive layer which is provided, at least in segments, on the rear face of the board. Such a self-adhesive layer can be protected until the time of mounting by a film or suchlike, so that the adhesive is activated only following removal of the film and thereafter, upon being pressed on to a support structure, fastens the board.

In certain applications an advantage is offered, as an alternative, if the board according to the invention comprises an appropriate adapter for mounting on a portion or an element of the support structure. It is to be noted in this connection that the support structure need not necessarily have separate elements used for mounting of the board according to the invention. Rather, the elements acting together with the fastening means of the board can also be integrally provided on the support structure. For example, a clip, explained in greater detail in the following, can be formed on the support or sub-structure as an integrated component, particularly as an extruded profile. In this respect, fastening means provided on the board and the fastening means of the sub-structure which act together with them need not necessarily be provided separately from the board and sub-structure respectively. In any case, the invention also extends to a combination of the board according to the invention and provided fastening means which are mountable or mounted on a sub- or support structure or are integrated on the latter, since such a combination advantageously creates a particularly simple possibility for producing partition walls or panelling room interior surfaces.

To be cited as a further preferred embodiment of the fastening device provided on the board according to the invention is that of at least one recess, particularly a milled cut, or at least one bore, which acts together with an element or a section provided for this on the sub- or support structure in such a way that the board according to the invention is securely held on this structure. For example, the milling cut could form a locking channel or several locking openings in which an appropriate section on the sub-structure engages and fastens the board according to the invention to the sub-structure in the manner of a pushbutton. Also conceivable is the mounting, e.g. screw-mounting, of an adapter on the rear face of the board according to the

invention. A corresponding mating component would be fastened to the sub-structure and would enable the board according to the invention to be pressed on, slipped on or locked on.

It is furthermore preferred that the board be composed, at least partially, of a wood material, particularly MDF or HDF board, or, alternatively, of plastic. Furthermore, the board according to the invention can be composed, at least partially, of a variant of the said materials modified with additives or with additional layers. In any case, a density of approximately 500 to 800 kg/m^3, preferably approximately 750 kg/m^3, is currently preferred for the MDF board material. In the case of a plastic suitable for the board according to the invention, the density is of a lesser value, in particular, approximately 100 to 150 kg/m^3. The said materials permit the formation, with the necessary precision, of those contours that are necessary for fastening two adjacent boards to one another and for fastening the individual board to a support structure. Furthermore, the surface texture according to the invention can be formed in a particularly attractive manner on the surface of a wood material by pressing on a paper or a film by means of melamine resin. In this way, on the one hand, boards can be produced inexpensively and, on the other hand, it is possible for such boards to be fastened without difficulty. With the use of such wood materials, particularly as laminates with layers applied to them which have been impregnated with melamine resin, the described surfaces can be advantageously realized so as to effect particularly realistic simulation and so that they are abrasion, scratch and impact resistant and easy to clean. Finally, such boards have a high load-bearing capacity, since similar laminate panels are used, for example, as floor-coverings, so that it is possible to use the boards as durable wall or ceiling panelling without further protective after-treatment. In particular, with appropriate fastening, loads of up to 50 kg can be fastened

to the board according to the invention. The preferred material, MDF board, furthermore offers the advantage that it is a thermally comfortable material, the surface of which feels "warm" because the material has a low heat penetration coefficient. Consequently, a wall faced with the board according to the invention feels warmer than a concrete or stone wall or a lime/cement plaster surface.

In respect of the appearance of the board according to the invention, it offers advantages if the additional fastening means are fashioned in such a way that they are covered when two boards are in the coupled state. For example, the board can be provided with a strip of material which projects over the board edge that is visible on the front face, so that the board can be fastened to a support structure at this location by means of nails or screws. This strip of material can be covered by the corresponding edge of an adjacent board.

Although, for a reliable coupling together of two boards, it is important that the coupling be effected in an interlocking or locking manner, it is preferred, according to the invention, that the corresponding coupling means be fashioned so that a forced fit is formed between two mutually coupled boards. Accordingly, two adjacent boards bear on one another under tension, and there is no risk of an unattractive joint forming between the two boards.

A particularly advantageous development of the board according to the invention consists in that the board is formed as a facing shell or partition wall, in that it has respectively one or two surfaces suitable as room interior surfaces. A partition wall for a room can thereby be created in a particularly simple manner. The ceiling or floor, and vertical profiles adapted in any manner, on which the board can be mounted by appropriate coupling means, may be cited as a support or sub-structure within the meaning of the invention on which, in such a case, the board according to

the invention is mounted in addition to the locking coupling between two adjacent boards.

In this case, the board according to the invention can also have a multi-layer structure, and have an intermediate layer. Such an intermediate layer can consist of, for example, a honeycomb or hollow-body board, or of a clamping board, preferably of a thickness of 40 mm, faced on both sides with the board according to the invention instead of with the hitherto known plasterboard. In this way, the coupling means which engage according to the invention enable a partition wall to be formed substantially more easily than is currently possible according to the prior art, whereby partition walls are produced in an elaborate manner by means of vertical members and plasterboards fastened on the latter. It is to be noted that, in this case, the locking coupling means can be formed on both the intermediate layer and the at least one present upper layer. As mentioned, fastening without the use of vertical members can be realized, for example, by the constructor, by means of strips, provided on the upper and lower edges, which are fastened to the floor and ceiling by means of pegs.

The board according to the invention for interior construction advantageously has a surface which is provided with the typical surface texture of a wall facing produced by a craftsman, particularly with the projections and hollows of such a facing. A wallpaper, a plastered surface, particularly a fine, coarse or textured plaster, or a surface produced by a painting technique may be cited as examples of such a craftsman-produced wall facing pre-formed in the factory on the interior finishing board according to the invention. Quite obviously, such surfaces which are to be formed from, e.g. plasterboard, on existing walls or panellings must be produced by means of a multiplicity of individual process steps. The production of such a wall facing is normally associated with six operations, namely,

filling of the butt joint between two boards, smoothing, priming, papering and the application of an undercoat and top coat of paint. Furthermore, this creates a substantial amount of soiling and necessitates the disposal of a large number of different individual materials. All of the six operations described, and the cleaning and disposal work, can be saved through use of the board according to the invention.

This is because such a surface texture is already advantageously provided on a board for construction interior finishing work. In order to create a partition wall or panelling having an appropriate appearance, it is only necessary for several boards to be mounted so that they adjoin one another. There is no need for after-working, particularly filling, plastering or the operations in respect of papering and painting. It is possible to dispense with the six operations cited, resulting in an overall time-saving in interior construction finishing work or dry construction and enabling the rooms to be occupied two to three days sooner.

In addition, it is to be noted that the surface of the board according to the invention can be advantageously made so that it can be painted with an ordinary paint or provided with a wallpaper or tile facing. Thus, if the user so desires, a different colouring or surface finishing can be applied if necessary at a later time, as is usual for craftsman-produced wallpaper coverings. Compared with the conventional method, the use of such a board according to the invention, which is provided with, e.g. an under-film, still dispenses with four operations, namely, filling, smoothing, priming and the application of an undercoat. Alternatively, the board according to the invention can consist of the previously mentioned materials, particularly of MDF board, and be modified or coated with an additive or an additional layer, so that the board can be coated using the previously mentioned operations. Furthermore, the board according to

the invention could also be left bare and, in this state, be provided with a coating or applied layer. All textures that are possible and usual for room interiors are conceivable as surface textures that may be provided on the board according to the invention. For example, an appearance corresponding to that of plastered walls can be formed by an appropriate texture. Furthermore, it is possible to provide the textures known from wallpapers. For example, a coarse fibre appearance can be created. Also known, as wallpapers, are glass-fibre mats which are essentially formed of a comparatively coarse woven fabric. The texture produced in this context can also be provided on the surface of the board according to the invention. This applies likewise to glass-fibre meshes. Irrespective of the physical form of the surface, interior construction finishing work is substantially simplified by the board according to the invention in that the application of the board according to the invention makes it possible to dispense with a large number of hitherto necessary steps for forming the final wall facing. Furthermore, a tiled surface may be cited as a craftsman-produced surface that may be imitated by the board according to the invention.

A particularly attractive appearance of the board according to the invention is achieved if the latter has a colouring which likewise corresponds to a colouring produced by a craftsman. Considered in particular in this context is an irregular colouring, such as that produced, for example, when a rag, roller or sponge application technique is used. In other words, interior wall colourings expensively produced in this manner by a craftsman can be replaced by a colouring which is correspondingly applied in the factory to the board according to the invention. For the user, the production of a partition wall or the panelling of interior surfaces of a room consequently involves a substantially lesser expenditure, particularly an advantage in respect of installation time and cost, and less soiling. The colouring

of the surface of the board according to the invention which constitutes the visible surface can furthermore correspond to a wood or veneer appearance, and to a stone, tiled or so-called fantasy décor, which may be of any design. Furthermore, the board according to the invention may be provided with a genuine wood veneer on its visible surface. In addition, modifications of the said materials and surface coatings are conceivable. In particular, the board according to the invention can be provided with any coatings which are suitable as a surface. A cork or plastic surface, natural or artificial stone, applied cement, flow-stone, possibly with aggregates or additives, may be cited as examples.

In respect of the appearance of the board according to the invention and, in particular, in respect of the appearance of several adjacent boards, it is advantageous if the surface texture is irregular, at least over the entire surface of one board and preferably over the surface of several boards of the same type. By this, it is to be understood that the surface of the board according to the invention is produced not merely through the repeated adding together of a particular small-format surface texture. This would result in a "repeated pattern" type of appearance which would be identifiable even by an unpractised viewer. As opposed to this, it is preferred for the board according to the invention that the surface texture be irregular at least of the entire surface of a board and thus be repeated, at most, on an adjacent board. Preferably, however, the surface texture is also irregular over several adjacent boards, this being achievable, for example, through the use of appropriately large-format pressing plates in the production of the board according to the invention, as described in greater detail in the following. In this case, the surface texture is repeated after a sufficiently large interval, so that the impression of a repeated pattern cannot be created in any way. Rather, the impression of an irregular, craftsman-produced surface texture is created.

Alternatively, or in addition, the front face of the board can also have a different type of colouration. Thus, for example, in addition to the surface texture, the corresponding coloration can be provided, e.g. that of a tiled pattern, wood décor or suchlike. If necessary, however, only a coloured design of the front face may be provided, without a three-dimensional texturing. In this case, the coloured design can either simulate the light-and-shadow effect of a three-dimensional texturing or it can imitate the coloration of a wall facing which is in any case smooth, for example, the pattern of a décor wallpaper.

In respect of the susceptibility to soiling of the board according to the invention and of its versatility of application, it has proved advantageous to provide the front face of the board with a surface sealant which is capable of resisting moisture. The front face can advantageously have a moisture-repellent surface coating or surface sealant, so as to create a surface which is particularly easy to care for, and can be kept in condition without difficulty using wet cleaning agents.

The boards can be advantageously rectangular in form. A sealing material can be applied to a long edge or to a long and a short edge, thus rendering possible an elastic bearing on the adjacent board, i.e., on the adjacent board adjoining in both the longitudinal direction and the transverse direction. In this way, slight movements, e.g. due to expansion of material, are compensated in that the elastic sealing material deforms or expands so that open, clearly visible joints cannot occur between adjacent boards. It must be mentioned that, alternatively, it is conceivable to allow or even emphasize a joint at this location. For example, it is possible to allow such a joint having an appearance which corresponds to the appearance of a wallpaper abutment, so that this can be accepted and creates the impression of a wallpaper surface produced by a craftsman. Alternatively,

the edges of the board according to the invention can even be of a bevelled form so as to produce in the region of the abutment an emphasized joint, e.g. a V-shaped channel in which, for example, a coloured jointing material can be inserted, so that the joints are emphasized and a correspondingly desired surface appearance is produced.

Instead of the said sealing material, provision can be made whereby the board is provided with adhesive so as to achieve a more secure combination with the adjacent boards and reliably prevent gaping joints. In order that the adhesive can advantageously be handled by the user without difficulty, provision can be made whereby the adhesive is provided with a cover strip which can be removed shortly before the board is mounted, or a two-component adhesive is used, respectively one component of this adhesive being disposed on opposing edges of the board. The two components of the adhesive are only combined, and effect the adhesive bond, upon the coupling of two boards, when they are mounted so that they abut on one another.

Although the tight, jointless coupling between two adjacent boards can be assured through appropriate locking contours, in certain applications it is advantageous if, alternatively or in addition, two adjacent boards are coupled together by means of an adhesive. In this case, it is advantageous if a glue receiving channel which, in the coupled state, is filled with adhesive, is provided in the region of the edges which adjoin one another.

For an attractive appearance, it is furthermore advantageous if a protective strip, particularly a self-adhesive protective strip, is provided on the surface, at least along edges to which the adjacent boards are applied, the protective strip then being removable when two adjacent boards are coupled together. The surfaces of the boards are

thereby protected against soiling, particularly if adhesive is used.

A further simplification for the user can be achieved by the preferred embodiment in which the board according to the invention is provided with an insulating material, preferably on the rear face, so that such a material need not be applied separately. This can be both a thermal insulation and a sound insulation material. For example, an acoustic or sound-insulating mat, having advantageous sound insulating properties and which, for the purpose of reducing structural sound, need normally be only a few millimetres thick, can be applied, preferably to the rear face of the panel. Furthermore, an insulating mat of, for example, Styropor or polyurethane of a thickness of, for example, 60 mm to 80 mm, can be provided for an advantageous reduction of the sound transmission and for thermal insulation. It is thereby possible to influence the thermal and sound insulating properties of the board according to the invention. Furthermore, in general terms, a heating or air-conditioning device, or a heating or air-conditioning component layer, can be provided on, preferably, but not limited thereto, the rear face of the board according to the invention. This can be in the form of, for example, a heating film having a comparatively small thickness and provided with metal films or wires which can be heated by passing through electrical current, so that the board according to the invention can be a heating source for a room. Alternatively, it is conceivable for such a heating film to be provided on the visible face of the board according to the invention, under the normally provided décor paper, or also as a visible surface of the board according to the invention to form, as it were, a visible, "technical base". Such a heating film thereby becomes an integral component of an interior finishing work board, and is not bonded as a separate layer to the board for interior construction finishing work. It is to be emphasized in this connection that the integration of

such a heating film or of any heating device by pressing into the laminate constitutes, in the context of laminate production, an innovation which is independent of the invention described in the preceding paragraphs and of its various embodiments. In other words, a board is thereby for the first time produced from laminate with an integrated heating film or device. In respect of the heating film, it is also to be noted that it can comprise, as a printed material in the manner of, as it were, currently common printed circuit boards or cards, metal which is capable of conducting current and emits heat.

A contraction can occur within the boards or the support structure, for example, due to moisture and/or temperature changes. Provision can therefore be advantageously made whereby the individual boards are movably located on their support structure, i.e., they are installed in a floating manner, so that, for example, the material of the support structure itself or of the boards can expand without resulting in warping or buckling of the boards. By contrast, the boards are advantageously coupled to one another in a fixed manner, for example by means of the above-mentioned locking couplings or adhesion bonds.

If such a fixed and play-free coupling of the boards is not provided, play between the boards can be advantageously compensated by means of the above-mentioned sealing materials. A smooth, closed surface is thereby maintained in such a way that joints cannot open up.

Whereas, from the flooring domain, the individual panel elements have a maximum width of approximately 30 cm, the one-man boards according to the invention can have widths of over 60 cm. For example, they can be dimensioned to match the standard wallpaper strip size so that - as already mentioned - the form of the abutting edges and any irregularities that are present there create the same visual

effect as the visible edges of wallpaper strips applied with a butt joint.

For the boards provided for according to the invention, provision can be made for a comparatively low surface gloss level, for example, 2.5 to 5 gloss level points, measured with a gloss-level meter (Dr. Lange, measuring angle 60°). This can be achieved through appropriate design of the laminate, for example, through the use of appropriate pressing plates. With the use of such pressing plates, the topmost layer of the laminate can be stamped, in a manner known per se, so that the surface design, and particularly the surface roughness, can be influenced by means of such pressing plates. Apart from the design of the pressing plates, the surface roughness of the boards and, consequently, the surface roughness of the laminate layers can be influenced by, for example, the types of paper used, the resin grades or, if applicable, by liquid or solid additives. Thus, for example, a relatively rough paper can be used, or the additives can be contained in or added to the resin.

Such a surface roughness, being greater than that of the floor coverings, not only creates a more matt board surface that is visually desirable but, in particular, also renders possible a better adhesion of varnishes or paints. In this way, the individual boards or the complete produced ceiling or wall panelling can be overpainted, whether to determine the colour immediately upon production of the wall and ceiling panelling or to alter the appearance of the wall or ceiling panelling after a certain period of use.

For the boards, or wall and ceiling panellings, according to the invention, provision can be made, if necessary, to make the boards breathable. To this end, provision can be made, for example, in the production of the laminate layers, for a décor paper having the desired coloration which is coated

with, for example, melamine resin. Depending on the desired pattern, the décor paper can be imprinted with a visible or invisible substance which repels the subsequently applied melamine resin, so that an air-tight seal that is otherwise effected by the melamine resin is broken at these locations. Since the boards in the wall or ceiling area are not normally exposed to such high moisture loads as in the floor area, such a break in the seal can be provided without adversely affecting the durability of the boards or wall and ceiling panelling. In this way, a vapour-permeable wall and ceiling panelling can be achieved.

Gaping joints between adjacent boards are to be avoided in order to achieve an appearance which is as uniform as possible over a large area. Provision can be made, advantageously, to use both adhesive and an edge design which, in turn, renders possible interlocking of adjacent panel elements. This interlocking can be made comparatively weak, so that the boards can be easily coupled to one another without the need to overcome excessively high pressure forces. This because, if additional adhesive is provided, the interlocking need only hold the adjacent boards together until the adhesive is dry and assumes the final coupling of the two boards. The use of tensioning bands, as is known from practice in the adhesion bonding of panel elements on, for example, floors, is thus superfluous, so that working progress is expedited.

If applicable, appropriately profiled rollers can be used as an alternative to pressing plates. If, for example, a laminate is used as a board surface, attainment of the appropriate profile height in the surface of the board material can be facilitated through the use of appropriate paper, for example, by a paper having a weight greater than the standard substance of 70 - 80 grams per square metre that is usual for unresined base paper. Furthermore, additional layers can be used as so-called "underlays", in order to

increase the compressibility of the surface layer of the laminate and thereby to render possible particularly good profile heights.

A board according to the invention can be advantageously produced in a particularly inexpensive manner in that, firstly, the various laminate layers of the laminate surface, known per se, secondly, the core, which can consist of, for example a wood material, and, thirdly, a counteracting material, such as the counteracting paper, known per se, are simultaneously coupled to form a workpiece. This can be achieved in a particularly energy-saving and, accordingly, inexpensive manner with a pressure of approximately 40 kp/cm^2, so that such laminate boards can be produced with substantially less expense than in the case of the production, known per se, of HPL or CPL boards, in which production of the laminate must be completed first and it is then coupled, i.e., in a second operation, to the core and the counteracting material under substantially greater pressure, of approximately 70 kp/cm^2.

The object according to the invention is achieved, secondly, by the method described in claim 28 for producing new walls of a room or for panelling existing surfaces of a room.

Accordingly, firstly, a first board is mounted. A second board is then coupled to the first board, a locking coupling being produced at the adjacent lateral edges of the two boards under consideration, preferably at their longitudinal edges. The second board is then secured by additional fastening means. As previously described, the second board in this case is preferably fastened to a separate support structure. The method according to the invention enables interior construction finishing work boards to be securely fastened, with little expenditure, for the purpose of producing new walls, particularly partition walls, or panelling wall, ceiling or roof surfaces. An attractive

appearance is also achieved as a result of the method according to the invention, since there is no need for after-working in respect of the surface. Furthermore, it is assured that no offsets are formed at the abutments of two adjacent boards, since disposition on the same level is guaranteed by the locking coupling according to the invention.

Preferred developments of the method according to the invention are described in the further claims.

The boards can be advantageously installed by means of a swivelling movement and thereby interlocked. Particularly in an unfavourable working position, e.g. in the case of overhead working, it is thus possible to achieve an easily manipulable and rapid installation of the boards and, at the same time, a secure, fixed coupling of the coupled boards. In this case, firstly, a first board, for example is installed. The tongue of a second board is applied obliquely to the lateral edge of the first board, which is provided with a groove, the tongue being then inserted as far as possible into the groove. The second board is brought into the same plane as the first board by means of a subsequent swivelling movement, it being possible to effect a regular interlocking. Obviously, it is also in principle possible to reverse the installation procedure, in that the groove of the second board is placed on the tongue of the first board and then swivelled. For this swivelling movement, it is to be noted that it can be effected both about a short side and about a long side of the board according to the invention. Coupling to adjacent boards on the other, i.e., long or short side, is then effected, as explained in greater detail in the following, through a substantially flat displacement or through a lowering movement perpendicular to the board surface, in the manner of a pushbutton.

Alternatively, however, provision can be made whereby, prior to their coupling, the two boards are disposed in a common plane and the two boards are coupled to one another by a purely lateral displacement. A locking coupling can be achieved, for example, through appropriate edge profiling of the panel elements, this edge profiling being advantageously designed in favour of a simpler pushing together of the two boards with the lowest possible resisting forces so that, when pushing the boards together over the total length of 260 cm, the user can apply sufficient pressure forces without difficulty.

As previously described in connection with the board according to the invention, fastening clips and grooves provided accordingly on the board, for example, can be used as fastening means. Alternatively, the fastening can be effected by means of self-adhesive layers or screws or nails, which are combined in an appropriate manner with recesses provided on the board.

In the context of the method according to the invention, it is furthermore preferred that, following a first and a second board, a third board is mounted in such a way that it is coupled to both the first and the second board, forming a locking, snap-in or click-in coupling. Consequently, the boards according to the invention can be coupled to one another not merely continuously in a particular direction; rather, relatively large surfaces can be panelled with the boards according to the invention in that rows of several boards, rather than individual boards, are disposed next to one another. The previously described second and third boards form such a row which is located, in its entirety, next to the first board under consideration.

In this context, it is advantageous for certain applications if the third board is coupled to the second board by a swivelling-in movement, in which appropriate coupling

contours at the abutment edge between the second and third boards engage with one another.

Furthermore, it is preferred for other applications that the third board is displaced, at least slightly, in parallel to its coupling edge with the first board, for the purpose of being coupled to the second board. As described above in connection with the actual board according to the invention, this displacement is preferably effected by a comparatively short distance, for example, 6 mm or less, preferably 4 mm or less.

As an alternative to this method of coupling by flat engagement or clicking-in, the coupling between the third and second boards can be effected as it were simultaneously with the coupling of the third board to the first board, in that the third board is lowered, at its abutting edge with the second board, substantially perpendicularly to the board surfaces, so that appropriate interlocking contours engage with one another in this region. This movement has already been referred to above as a "pushbutton" movement.

As a further alternative, provision can be made whereby greater retaining forces and greater locking forces of adjacent panel elements are rendered possible through appropriate edge profilings and whereby, in this case, the panel elements are not slipped simultaneously into one another over their entire length of 260 cm, but these two panel elements are first aligned in a common plane, but set obliquely in relation to one another, so that a V-shaped gap is produced between the two boards. This gap can be closed by a swivelling movement of the second board, so that in each case only an approximately discrete contact point is produced where, due to the interlocking of the two boards, comparatively large forces need to be applied. Due to this merely approximately discrete contact between the two boards, an approximately zipper type joining of the two boards is

produced, so that in each case the closing forces for the two boards need be applied only at the corresponding, approximately discrete region. In this way, mounting of the boards is simplified and the forces to be applied therein are reduced whilst, at the same time, high retaining forces can be assured.

The previously described installation procedures can be performed at two opposite sides of the board, for example, at the two longitudinal sides. If a tongue-and-groove profiling is also provided on the other two sides, i.e., for example, the two ends, this can be advantageously designed to permit a pure sliding movement of two boards, so that the said second board is coupled, firstly, to the first board at the common longitudinal edges and then coupled to a third board at the common end edges by longitudinal displacement.

If a peripheral edge profiling is provided on the boards, this can be produced directly out of the board material itself, for example, milled out. Provision can also be made, however, for the use of special profile strips which are attached to the edges of the actual board. Thus, for example, provision can be made whereby such profile strips are inexpensively used as prefabricated, semifinished products already provided with the final profiling and are coupled to the actual board.

Provision can also be made, however, to use profile strips made from a material which, for the purpose of better dimensional stability, for example, is better suited to edge profiling than the actual board material. In this case, provision can be made whereby the strips are first attached to the board and the board is then guided through the profiling process, for example, by means of a milling cutter.

Furthermore, provision can be made to produce the profile strip from a freely deformable material, for example, from a

liquid plastic or a plastic foam, and to bond this strip on to the board while it is being formed. In such a case, the board can be guided along a correspondingly contoured hollow form, the hollow form being filled with the plastic or the plastic foam and the foam or the plastic being bonded to the rest of the board. Particularly if an appropriate pressure is applied, for example, by the expansion behaviour of a plastic foam, it is possible to achieve an intimate bonding of this material to the board material if the board material is porous, for example, in the form of a wood material. Provision can also be made, if necessary, whereby such a strip is attached, as a semifinished product, to the actual board and, in a second processing operation, for example by milling, this semifinished product is provided with the desired profile contour.

In the case of a covered fastening of the board to a support structure by appropriate means, for example, by means of fastening clips, screws or nails, it is particularly advantageous if the boards permit a direct abutment of adjacent boards, for example, either by means of board material or by means of an intermediate adhesive or sealant, so that a particularly uniform, continuous design of the wall or ceiling panelling can be achieved, such as that which is achievable and known, for example, in the case of a papered or plastered surface.

Brief Description of the Drawings

Explained more fully in the following, by way of example, are embodiments of the invention represented in the drawings, wherein:

Figs. 1 to 8 each show a cross-sectional view of the coupling region of two mutually coupled boards, in the region of the first and second sides of the boards;

Fig. 9 shows a perspective representation of the embodiment shown in Fig. 8; and

Figs. 10 to 14 each show a cross-sectional view of the coupling region of two mutually coupled boards, in the region of the third and fourth sides.

Detailed description of Preferred Embodiments of the Invention

In the purely schematic Fig. 1, the reference 1 denotes two boards of the same type for interior construction finishing work, the one board 1 having a groove 2 and the other board 1 having a tongue 3 which extends into the groove 2 of the adjacent board 1. The combination of tongue and groove secures the two boards 1 against forces which act transversely relative to the board plane and tend to lift the boards away from a support structure. In the opposite direction, the boards 1 are secured in that they are supported on the support structure, not represented in Fig. 1. It must be mentioned at this point, both for the embodiment shown in Fig. 1 and for all embodiments described in the following, that the surface of the board 1 according to the invention which, in the representation in Fig. 1, is actually the upper surface, is the so-called visible face intended to be directed towards a room interior. This visible face is identifiable in that, at the contact face 7, two adjacent boards do not have a discernible joint on this face. In all further figures, the visible face is accordingly formed by the face represented as the lower surface.

The boards 1 are secured against separating forces, which draw the boards apart and act transversely relative to the longitudinal edges of the boards 1, by a contact face 4.

Along this contact face 4, a rib 5 formed on the underside of the tongue 3 bears on the side wall of a retaining channel 6, effecting an interlocking of the two boards 1.

The forces which act in opposition to these separating forces and which tend to push the two boards 1 towards one another are absorbed by a contact face 7 at which the two boards 1 bear on one another and which extends backwards from the front face, i.e., the surface of the two boards 1 directed towards the room interior, towards the support structure.

In the installed state shown in Fig. 1, in which the two boards form a portion of a wall or ceiling panelling, four contact locations 8a to 8d are produced, the contact location 8c being identical to the contact face 4. These four linear or flat contact locations 8a to 8d fix the two boards 1 in position in respect of separating or bending forces, so that only a parallel displacement of the two boards 1 relative to one another in their longitudinal direction is possible without the necessity of overcoming additional retaining forces - apart from frictional forces. In particular, the profilings of the edges of the boards 1 which are to be interlocked with one another are fashioned so that four defined contact locations 8a to 8d are produced. In this case, two separate contact locations 8c and 8d are formed in the front region of the groove cheek which comprises the retaining channel 6. The contact location 8d provides for an exact positioning of the boards in a direction perpendicular to their surface. In the same way, the contact location 8c provides for an exact positioning in a direction parallel to the surface. In this case, the distance, measured in parallel to the surface of the board, between the abutting edge 7 and the inner (in Fig. 1, the right-hand) flank of the rib 5 can be greater than the distance between the abutting edge 7 and the position of the contact location 8c in the retaining channel 6, so that a forced fit is advantageously produced at this location. In addition, the transition

between the retaining channel 6 and the front periphery of the associated groove cheek is of a rounded form, with a comparatively large radius, so as to produce a smooth but nevertheless perceptible engagement of the rib 5 in the retaining channel 6.

Fig. 1 shows a coupling of the two boards 1 without glue. A recess 9 above the tongue 3 and below the upper contact face 7 can, however, serve as a glue receiving channel for the purpose of receiving excess glue if the two boards 1 are to be permanently coupled to one another in a manner which seals the joint.

The boards 1 can be installed by means of a swivelling movement and thereby interlocked. In this case, the left-hand board 1, for example, of which the groove 2 is shown, is installed first. The tongue 3 of the second board 1 is applied obliquely to the lateral edge of the first board 1, the tongue 3 being inserted as far as possible into the groove 2. This is facilitated in that the groove 2 has an upper edge 10 which rises towards the opening of the groove 2 and in this way forms an insertion channel 11 which is shown particularly in Fig. 1.

Likewise, the tongue 3 has an underside 12 which is bevelled towards the free end of the tongue 3, i.e., has a rising course, so that the right-hand board 1, when in its above-mentioned oblique position, can be inserted as far as possible into the groove 2. This insertion movement is limited on the one hand by the contact of the tongue with the upper and lower bounding edges of the groove 2 and, on the other hand, by a contact of the two boards 1 in the region of their upper contact face 7. The subsequent swivelling of the right-hand board 1 effects, as shown in Fig. 1, the complete insertion of the tongue 3 into the groove 2 and the interlocking at the contact face 4. In other respects, with regard to the embodiment shown in Fig. 1, the disclosure of

WO 01/51733 is made, in its full extent, subject-matter of the present application.

Fig. 2 shows a second embodiment example with a fundamentally similar, namely, interlockable edge geometry of the two boards 1, but in which this geometry effects a less strongly formed interlocking of the two boards 1. In view of the substantially greater dimensions of the boards for interior construction finishing work and the correspondingly greater edge length of the boards compared with standard floor panels, it can be advantageous to create a weaker locking resistance, so as to simplify the installation of the boards. If necessary, provision can also be made to provide different edge geometries on different portions of the peripheral edge of the board, for example, in the case of a board having a rectangular form, an edge geometry on the longitudinal edges which differs from that on the end edges. It is to be noted that the tongue-and-groove formation, with the identifiable retaining rib on the side of the tongue 3 facing towards the support structure 15 and with a recess in the corresponding groove cheek, is formed so that the two adjacent boards can be coupled to one another by a substantially flat displacement. In other words, the board shown on the left in Fig. 2 is mounted first by means of, additionally, the fastening clip 16. It must be mentioned that, although this is not indicated in the drawing, the fastening clip 16 is obviously fastened to the support structure. This can be advantageously realized by, for example, flat-head screws, which do not project over the surfaces of the fastening clip and thus do not impede the fitting of the boards according to the invention. Alternatively, the head of a different type of screw can be received in the hollow space shown between the web 18 and the edge of the board. Following mounting of the first board, shown on the left in Fig. 2, the second board, shown on the right, is applied laterally and placed on the support structure. A displacement parallel to the surfaces of the boards presses the tongue into the groove and

effects a locking coupling through the interaction between the retaining rib and the receiving channel for the retaining rib.

In the case of the embodiment example shown in Fig. 2, a seal is provided between the two boards 1 in the region of the contact face 7. Used for this purpose is an additional strip of a sealing material 14, for example, a silicone strip, which can be already sprayed on to one of the two boards 1 in the factory for the purpose of rapid installation, or which can be applied to one of the boards 1 by the user as required.

The two boards 1 are fastened to a schematically indicated support structure 15 by means of fastening clips 16. The latter consist of a base plate 17 which can be glued, nailed, screwed or similarly joined to the support structure 15. A web 18 extends from the base plate 17 and an angled limb 19 extends from the said web into a groove 20 of the board 1 shown on the left. As shown in Fig. 2, the fastening clip 16 has a comparatively wide base plate 17. This base plate, like the rest of the fastening clip 16, can extend for a certain distance in a direction perpendicular to the plane of projection of Fig. 2, resulting in a substantially strip-type fastening clip 16. In the case shown, the web 18 extends substantially perpendicularly from the base plate 17, and the angled limb 19, in turn, extends substantially perpendicularly relative to the web 18 and, consequently, substantially parallel to the base plate 17. The limb 19, however, can also extend at a certain angle so that, in interaction with a correspondingly aligned groove 20 in the board 1, a certain clamping action is effected. The figure indicates, in a purely schematic manner, that behind the groove 20 the board 1 does not extend to the web 18. The alignment of the two boards 1, e.g. a perpendicular alignment of oblong, rectangular boards 1 is effected in that the

adjacent boards 1 bear on one another in each case in the region of their contact face 7.

Provision can also be made, however, whereby the portion of the board, shown on the right in Fig. 2, which is behind the tongue 3 or the portion of the left-hand board 1 which is behind the groove 20 extends to the web 18 of the fastening clip 16, thereby effecting an abutment of the board 1 and assuring the desired, e.g. perpendicular, alignment of the board 1 and preventing the boards 1 from being able to tilt. In each case, however, there is provision such that both boards 1 do not extend to the web 18 but rather, such that a free space remains which permits an expansion movement of the boards, for example, due to moisture and/or temperature differences. In this way, a floating installation of the boards 1 is rendered possible, so that the latter are able to "work" in a material-specific manner without the production of cracks due to tensile forces or buckling of the wall or ceiling panelling due to pressure forces.

Fig. 3 shows an embodiment example which is similar to that of Fig. 2 but in which there is no strip of sealing material 14, a gluing of the two boards 1 by means of an adhesive 21 being provided instead. In this case, the recess 9, as a glue receiving channel, is filled with the adhesive 21. Adhesive 21 emerging from the surface of the boards 1 can be removed with a schematically indicated tool 22.

The tool 22 can be, for example, a blade, with which the adhesive 21 can preferably be removed after it has partially or very largely set. The tool can be, for example, a spatula with which the adhesive 21 can preferably be removed while it is not yet set, but is soft or swollen.

In order to prevent damage (blade) or soiling (spatula) of the surfaces of the boards 1 in the use of the tool 22, a factory-fitted self-adhesive strip 23, which can be removed

following removal of the excess adhesive, is provided on the surface, along the longitudinal edges.

In the case of the embodiment example represented in Fig. 3, provision is made, purely by way of example, for the creation of a visual emphasis of the seam between the two boards 1. For this purpose, the two edges of the board 1 are bevelled and receive the adhesive 21 in this V-shaped joint. Also possible, however, is an unbevelled edge formation similar to that in Fig. 2, in which case the adhesive 21 would be provided instead of the sealing material 14.

Fig. 4 shows an embodiment example in which the boards 1 are not interlocked, the two boards 1 in this case being instead firmly coupled to one another by adhesive 21. The latter extends far into the edge region of the boards 1 and, for example, can be already applied in the factory:

Thus, for example, a single-component adhesive can be provided which is initially protected against setting by means of a protective strip. Following removal of the protective strip, the two boards 1 can be coupled together, so that the adhesive can then set and the two boards 1 can join together.

Alternatively, provision can be made whereby the two interacting edge portions of both boards are each coated with one component of an adhesive 21 which in total comprises two components, so that when the two boards are coupled the adhesive is caused to react and is activated.

In the case of the embodiment example shown in Fig. 4, a visible groove 24 is provided, purely by way of example, in the region of the contact face 7 for the purpose of deliberately achieving a visual texturing of the wall and ceiling panelling.

Fig. 5 shows an embodiment example which is similar to that in Fig. 2 but in which the boards 1 abut directly on one another in the region of their contact face 7, without an intermediate sealing material. The locking coupling, particularly the position of the contact face 4, effects a forced fit between the two boards 1, assuring that the two boards abut firmly on one another in the region of the contact face 7.

This embodiment example according to Fig. 5 renders possible a particularly inconspicuous seam between the two boards 1 so that a particularly extensive impression of the entire wall or ceiling panelling is achieved, for example, similar to the flat impression of a wallpaper in which the individual wallpaper strips abut on one another.

The embodiment examples shown in Figs. 6 and 7 correspond essentially to the embodiments shown in Figs. 4 and 5, but in these cases the boards 1 are fastened to the support structure 15, not by means of fastening clips 16, but by means of screws 25 which - as in the case of the representations of Figs. 1 to 7 as a whole - are indicated in a purely schematic manner. The respective boards 1 shown on the left each have, behind their groove 2, a groove lip 26 which projects over the board periphery shown at the front, the screws 25 extending through this groove lip 26. In order to prevent an impeding projection of the screw heads and to assure trouble-free insertion of the tongue 3 into the groove 2, the groove lips 26 are provided with respective recesses 27 which are capable of receiving all or, as in the case of the embodiments shown, most of the screw head.

These recesses 27 can be provided as discrete hollows in the groove lips 26 so that, for example, the user can be hereby provided with an indication of the locations at which screws 25 are to be used, and in which quantity, for fastening the boards 1. The recesses 27, however, can also be in the form

of a groove which extends over the entire length of the groove lip 26, so that the user can select the respectively appropriate fastening location according to the design of the support structure 15.

Common to all the embodiment examples shown is the fact that the boards 1 are represented in a purely schematic form. Contrary to this purely schematic representation, they preferably consist of two or more different layers or materials: firstly, of a core material, for example of a wood material, and secondly, of a surface, for example of a laminate, the laminate itself, in turn, being able to consist of layers of different materials. In particular, this surface can have a three-dimensional structure, i.e., have hollows and/or projections.

Likewise, the support structure 15 is shown in a purely schematic form in Figs. 2 to 7. This can be, for example, an aluminium profile, as is customary for the dry construction trade. The support structure 15, however, can also be a wooden lath structure or existing ceiling or wall elements such as, for example, masonry, roof beams or suchlike that are to be panelled with the boards 1.

In the case of the embodiment according to Figs. 8 and 9, the structure is similar to that of the previously described embodiments. In particular, one of the boards 1, being the left-hand board in Fig. 8, has a groove 2 for receiving a tongue 3 which is provided on the board shown on the right. In this case, unlike the previously described embodiments, the tongue and groove are fashioned for a swivelling-in movement of the board, shown on the right in Fig. 8, which is to be fitted to the left-hand board. For this purpose, for example, the groove cheek which faces towards the surface on the room side is provided with a bevel 28. The tongue 3 is rounded on its side which faces away from the room and, on its side which faces away from the room, has an appropriate

surface 30. The latter bears on a correspondingly inclined surface 32 of the groove cheek which is at a greater distance from the room interior. Provided on this groove cheek is a retaining channel 6 which has a rounded transition 34 to the front side of the groove cheek under consideration. The rib 5 which projects on the tongue engages in a locking or click-in manner at this rounded transition. The two boards can thereby be jointlessly coupled to one another. Moreover, a particularly advantageous variant of the contact of the two boards 1 at four defined points, already described in connection with Fig. 1, is realized in the case of the embodiment shown in Figs. 8 and 9. The first two contact locations 8a and 8b are located in the front region of the tongue 3, i.e., respectively, on the side of the tongue facing towards the visible face and on the side of the tongue facing away from the visible face. The third contact location 8c is located at the contact point between the projecting rib 5 and the rounded transition 34 of the retaining channel 6. Unlike the embodiment shown in Fig. 1, however, the fourth contact location 8d is not located between the retaining channel 6 and the front edge 40 of the lower groove cheek. This is because a free space is required in this region for the portion 19 of the fastening clip 16. In order to define the position of the two boards in relation to one another in a direction substantially perpendicular to their surfaces, in the case of the embodiment shown in Figs. 8 and 9, a contact location 8d is provided in the contact region between the inclined surface 30 of the tongue 3 and the inclined surface 32 of the groove cheek which faces away from the visible face. As mentioned, the fixing of position in a direction perpendicular to the board surface is essentially effected by this contact location 8d. The definition of position in a direction parallel to the surfaces of the boards 1, and a jointless coupling between the two boards 1, are achieved by means of the contact location 8c. In particular, in this case, on the board which comprises the tongue 3, the dimension between the contact

location 8c and the visible-face upper edge of the board is slightly greater than the corresponding dimension between, on the one hand, the visible-face upper edge of the board which comprises the groove and, on the other hand, the rounded transition 34 of the retaining channel, so that there is a forced fit at this location. Moreover, the described arrangement of the four contact locations 8a to 8d is a measure which is to be considered as being independent of the use of additional fastening means, for example, in the form of the fastening clip 16, and exhibits its advantages in any boards including, for example, floorboards. For example, there is a substantial advantage in that the front end region of the lower groove cheek can be used for additional fastening measures, for example, by means of the shown clip 16 or, also, a fastening by means of nails, if the fourth contact location 8d, which is used for fixing of position in a direction perpendicular to the board surfaces, is provided on an inclined underside of the tongue 3 or, also, on a contact location, on the underside of the tongue, which is straight but separated from the contact location 8b in a defined manner.

A further particularity evident in the case of the embodiment shown in Fig. 8 is that, at the transition between, on the one hand, the region which is substantially parallel to the board surface and comprises the contact location 8b and, on the other hand, the inclined surface 30, the surface of the tongue 3 which faces away from the visible face comprises an at least small recess 52 which separates these two contact regions from one another. Consequently, in other words, the bend on the side of the tongue 3 facing away from the visible face need not necessarily be joined to the corresponding bend on the side of the respective groove cheek. Rather, in order to fix the two panels in a defined position in relation to one another, the contact need be effected only at the contact location 8b and between the two inclined surfaces 30, 32.

A further board, being the right-hand board according to Fig. 8, is only fitted after the left-hand board according to Fig. 8 has been fastened to the base by means of one or more fastening clips 16. This fastening clip corresponds essentially to the previously described fastening clips. A particularity in the case of the embodiment shown in Fig. 8, however, is that, on the side which comprises the groove, the board according to the invention does not have an additional groove (20; cf. Fig. 2) for receiving the portion 19 of the fastening clip. Rather, the height of the groove cheek which faces away from the room interior is matched to the free space 36 on the side of the (right-hand) tongue board which faces away from the room in such a way that at this location there is a free space or a recess 38 for the portion 19 of the fastening clip 16. Furthermore, there remains, between the front edge 40 of the groove cheek under consideration and the opposite edge 42 on the tongue board, an appropriate free space 44 in which is received the fastening clip web 18 which joins the portion 19 to the base plate 17 of the fastening clip 16. In this respect, in the case of this embodiment, the additional fastening means, namely, the free spaces 38, 44 are formed in their joined state in the coupling region of two boards.

Fig. 9 shows a perspective representation of the embodiment according to Fig. 8. This additionally shows the dimension of the fastening clip 16 in the direction of the considered coupling edges of two boards 1. This dimension is comparatively short, so that several such clips are normally used along an edge. The openings 46 enable the clip to be fastened to a support structure, for example, by screws, so that a further board, the left-hand board according to Fig. 9, can be subsequently mounted in the previously described manner. In respect of the fastening by means of a clip, it is to be noted that a subsequently installed board, the left-hand board according to Fig. 9, is displaceable in the direction of the coupling edges. In particular, the free

space 38 is selected so that the fastening clips used do not impede such a displacement. This displacement enables a further, third, board to be coupled at the third and fourth sides (the previous embodiments related only to the first and second sides).

In this case, the board 1 on the left in Fig. 8 is fitted by, in addition, the portions 18 and 19 of the clip 16 in such a way that the board 1 can move in the direction of the arrow A relative to the clip. A "floating" fastening to a base or a support structure is thereby formed, as a result of which a combination of several mutually coupled boards can move relative to the clips 16, and effects such as contraction or swelling of the boards can be accommodated without the risk of the boards gaping apart on the visible face. This effect applies likewise to the embodiment according to Figs. 2 to 5. It must be ensured in mounting, particularly in the case of these embodiments, that the web 18 is at a sufficient distance from the front edge 40 of the one groove cheek, so that a movement in the direction of the arrow A is rendered possible in all directions. This advantageously enables movements to be allowed in the order of magnitude of some millimetres. In addition, in the case of the embodiment according to Figs. 8 and 9, the central, larger opening shown is in the form of a longitudinal hole so that, if necessary, the clip itself can also be displaced slightly relative to the support structure on which it is fitted. Alternatively, the said advantages can be achieved in that the support or sub-structure is itself movable. In other words, the coupling between several boards according to the invention and the support or sub-structure would be rigid. The panelled would nevertheless be able to "work" in that the support or sub-structure, particularly the laths or beams of the same, are movably fitted relative to a fixed part of a building.

The described coupling at the third and fourth sides is shown in the further figures. In this case, the embodiment according to Fig. 10 has similarities to the embodiments according to Figs. 2, 3, 5 and 6, since the coupling is essentially effected by a straight-line sliding movement. In particular, a rib 5, formed on the side of the tongue 5 which faces away from the room, engages in a locking or snap-in manner with a retaining channel 6 which is formed on the groove cheek, adjoining the groove 2, which likewise faces away from the room interior. A particularity of the coupling shown in Fig. 10 is that the tongue 3 is comparatively short and only projects to a certain extent into the groove 2. The sliding distance necessary for locking is determined essentially by the distance A between the outer edge of the tongue 3 and the front edge of the groove cheek which faces towards the room since, upon swivelling-in of the previously mentioned third board, it is necessary for the front edge of the tongue 3 to move past the front edge of the groove cheek of an already installed second board. Only when this has been achieved can the third board be displaced, according to Fig. 10, in the left-right direction in order to adopt the mounted state shown in Fig. 10. In the case of the embodiment according to Fig. 10, the length of the tongue 3 is essentially shortened to the dimension that is necessary for reliable supporting of the tongue 3 in the groove 2. This, however, in comparison with known couplings which can be coupled by a flat sliding together, permits the realization of a substantially shorter insertion distance which enables even a final or "topmost" board which is to be fitted on a wall to be coupled to existing boards in such a way that a comparatively small gap remains towards the ceiling. A further particularity to be noted in connection with the embodiment according to Fig. 10 is that the groove base is inclined.

This applies likewise to the embodiment shown in Fig. 11, which differs from the embodiment shown in Fig. 10 in that

the groove cheek which faces away from the room, being the upper groove cheek according to Fig. 11, extends further than the groove cheek on the room side, and in that the retaining channel 6 is provided in this region for the purpose of receiving the rib 5. This is preferred for certain applications and, moreover, achieves the same advantages as those previously described in connection with the embodiment shown in Fig. 10.

The embodiment shown in Fig. 12 differs from that shown in Fig. 11 in that, firstly, both the rib 5 and the boundaries of the retaining channel 6 have a slightly hooked form. A further particularity consists in that the actual groove 2 which serves to receive the tongue 3 is adjoined by a cavity 48 which, in the case shown, is of a lesser width (the dimension from top to bottom according to Fig. 12) than the groove 2. This, however, is not absolutely necessary. Rather, the cavity 48 can have the same width, at least in segments, as the groove 2 and, moreover, be of any form. Due to the cavity 48, the lower groove cheek is extended, as it were, to the base of the cavity 48. Due to this longer formation, the groove cheek can be provided with a greater degree of flexibility and possible tongue course, resulting in particularly good deflection characteristics, which are necessary in order allow the rib 5 to move past the boundaries of the retaining channel 6 to effect the coupling. In particular, in the case of the embodiment shown in Fig. 12, there is a lesser risk of cracks forming on the base of the groove 2 or of the cavity 48.

This advantage also applies to the embodiment shown in Fig. 13. In this case, likewise, the groove 2 is adjoined by a cavity 48 which results in the advantages described. In other respects, the design of the tongue 3 and groove 2 coupling corresponds to rib 5 and the retaining channel 6 of the embodiment shown in Fig. 10.

Fig. 14, finally, shows an embodiment in which a board 1 which is to be newly installed, being the left-hand board according to Fig. 14, engages, as a result of a movement, with an already installed board 1, being the right-hand board according to Fig. 14, the said movement being substantially perpendicular to the board surfaces. In other words, a board which is to be newly installed is applied obliquely, at its first or second side, to the already installed first board and subsequently swivelled downwards, for example, according to the coupling shown in Figs. 8 and 9. The application is effected in such a way that the shown tongue 3, which faces substantially perpendicularly away from the board surface, is in approximate alignment with the groove 2 that is open towards the upper side of the board. Upon lowering, the tongue 3 then passes into the position shown in Fig. 14 and is held in a locking manner. This is effected by a substantially mushroom-shaped formation of the tongue 3, with a widened end on which, in particular, there is formed a locking projection 5 which corresponds to the previously described rib. The said locking projection is received in an appropriate cavity 50 on the groove 2. The coupling shown in Fig. 14 also enables several boards to be jointlessly coupled in a reliable manner at their third and fourth sides. In other respects, with regard to the embodiment shown in Fig. 14, the disclosure of WO 01/51733 is made, in its full extent, subject-matter of the present application.

New claims 1 and 28

1. Board (1) for interior construction, particularly for producing new walls of a room or for panelling wall, ceiling or roof surfaces of a room, **which board can have a multi-layer structure with an intermediate layer and at least one upper layer, and comprises:**

- provided on at least two opposite sides, a first and a second side, coupling means, particularly of a tongue-and-groove (2, 3) design, for coupling to further boards (1) of the same type, the coupling means (2, 3) rendering possible a locking, snap-in or click-in coupling to an adjacent board (1) of the same type, and

- additional fastening means (20, 27, 38, 44), which are provided on the board (1) itself or on two mutually coupled boards (1), for fastening the board (1) to a support structure (15),

characterized in that

the coupling means (2, 3) form a forced fit and are produced directly from the board material and, in the case of a multi-layer structure, are formed in the intermediate layer and/or one of the upper layers.

Claims

1. Board (1) for interior construction, particularly for producing new walls of a room or for panelling wall, ceiling or roof surfaces of a room, which board can have a multi-layer structure with an intermediate layer and at least one upper layer, and comprises:

- provided on at least two opposite sides, a first and a second side, coupling means, particularly of a tongue-and-groove (2, 3) design, for coupling to further boards (1) of the same type, the coupling means (2, 3) rendering possible a locking, snap-in or click-in coupling to an adjacent board (1) of the same type, and

- additional fastening means (20, 27, 38, 44), which are provided on the board (1) itself or on two mutually coupled boards (1), for fastening the board (1) to a support structure (15),

characterized in that

the coupling means (2, 3) form a forced fit and are produced directly from the board material and, in the case of a multi-layer structure, are formed in the intermediate layer and/or one of the upper layers.

2. Board according to claim 1, characterized in that the fastening means are formed by at least one recess (38, 44) which, when two boards are in the coupled state, is present in the coupling region of the two boards (1), and in which recess (38, 44) a portion (19, 18) of a fastening clip (16) can be received.

3. Board according to claim 1 or 2, characterized in that the fastening means comprise at least one groove (20) for receiving a portion (19) of a fastening clip (16).

4. Board according to at least one of the preceding claims, characterized in that the fastening means comprise at least one recess (27) for receiving a screw head or nail head.

5. Board according to at least one of the preceding claims, characterized in that the coupling means are fashioned in such a way that a second board which is to be newly installed can be swivelled into a first, already installed, board.

6. Board according to at least one of the preceding claims, characterized in that a groove cheek which faces towards the support structure (15) and bounds the groove (2) projects relative to a groove cheek adjacent to the visible face of the board.

7. Board according to at least one of the preceding claims, characterized in that the coupling means are fashioned on the first and second sides in such a way that two mutually coupled boards (1) are displaceable relative to one another in the direction of the first and second sides.

8. Board according to at least one of the preceding claims, characterized in that, in addition to the coupling means on the first and second sides, the said board also comprises coupling means on the third and fourth sides for a locking, snap-in or click-in coupling.

9. Board according to claim 8,
characterized in that the coupling means on the third and fourth sides are of a tongue-and-groove design, the tongue projecting, in the coupled state, 6 mm or less, preferably 4 mm or less, into the groove.

10. Board according to at least one of the preceding claims, characterized in that a cavity (48) adjoins a groove which serves as coupling means.

11. Board according to at least one of the preceding claims,

characterized in that, on at least one side there is provided, as coupling means, a groove (2) which opens in the direction of the board surface, and on the opposite side there is accordingly provided a tongue (3) which extends in the direction of the rear face of the board (1). (Fig. 14)

12. Board according to at least one of the preceding claims, characterized in that the said board is provided on a rear face, at least in segments, with a self-adhesive layer.

13. Board according to at least one of the preceding claims, characterized in that the said board comprises, on a rear face, an appropriate adapter for mounting on a support structure.

14. Board according to at least one of the preceding claims, characterized in that the said board comprises at least one recess, for example, a milled cut, or at least one bore, for receiving a portion of the support structure.

15. Board according to at least one of the preceding claims, characterized in that the board is composed, at least partially, of a wood material or plastic, or modifications of the said materials.

16. Board according to at least one of the preceding claims, characterized in that an elastic sealing material is disposed on at least one portion of the edge surrounding the board.

17. Board according to at least one of the preceding claims, characterized in that the said board is fashioned as a facing shell or partition wall in that it comprises one or two surfaces which are suitable as room interior surfaces.

18. Board according to at least one of the preceding claims, characterized in that the said board comprises an intermediate layer, and the locking coupling means (2, 3) are formed on the intermediate layer or one of the upper layers.

19. Board according to at least one of the preceding claims, characterized in that the front face of the board has a surface which has a surface texture typical of a craftsman-produced wall covering, with its projections and hollows, particularly of a wallpaper or a plastered surface or of a surface produced by a painting technique.

20. Board according to at least one of the preceding claims, characterized in that the said board has a colouring which corresponds to a wood or veneer appearance, to a stone, tiled or fantasy décor, or to a craftsman-produced colouring, particularly an irregular colouring and preferably a colouring produced by a rag, sponge or roller technique, or has a layer composed of wood or wood veneer.

21. Board according to at least one of the preceding claims, characterized in that the surface texture and, if applicable, colouring, is irregular at least over the entire surface of the board, preferably over the entire surface of several boards of the same type.

22. Board according to at least one of the preceding claims, characterized in that the front face of the board is provided with a surface sealant which is capable of resisting moisture.

23. Board according to at least one of the preceding claims,

characterized in that an elastic sealing material is disposed on at least one portion of the edge surrounding the board.

24. Board according to at least one of the preceding claims, characterized in that an adhesive is disposed on at least one portion of the edge surrounding the board.

25. Board according to at least one of the preceding claims, characterized in that a glue receiving channel is provided in the region of an edge of the board which, upon attachment of several boards, forms an abutment with adjacent boards.

26. Board according to at least one of the preceding claims, characterized in that a respective removable protective strip is provided at least along two opposite edges.

27. Board according to at least one of the preceding claims, characterized in that the said board comprises, preferably on its rear face, a thermal and/or sound insulating material and/or a heating or air-conditioning device, or a heating or air-conditioning component layer, particularly a heating film.

28. Method for producing new walls of a room or for panelling existing wall, ceiling or roof surfaces of a room, in which, firstly, a first board (1) is mounted, and a second board (1) is then coupled to the first board (1), a locking, snap-in or click-in coupling being produced at adjacent lateral edges of these two boards (1), particularly at their longitudinal sides, and the second board (1) is then secured by additional fastening means,

characterized in that

in connection with the coupling between the first board

28. Method for producing new walls of a room or for panelling existing wall, ceiling or roof surfaces of a room, in which, firstly, a first board (1) is mounted, and a second board (1) is then coupled to the first board (1), a locking, snap-in or click-in coupling being produced at adjacent lateral edges of these two boards (1), particularly at their longitudinal sides, and the second board (1) is then secured by additional fastening means,

characterized in that

in connection with the coupling between the first board and the second board, a forced fit is formed, and the coupling means (2, 3) provided for this are produced directly from the board material.

and the second board, a forced fit is formed, and the coupling means (2, 3) provided for this are produced directly from the board material.

29. Method according to claim 28,
characterized in that, in the formation of a locking coupling, the second board (1) is applied obliquely to

the first board (1) and moved, by a swivelling movement, into the plane in which the first board (1) is located.

30. Method according to claim 28, characterized in that, in the formation of the locking coupling, the second board (1) is applied to the first board (1) in the plane in which the first board (1) is located and a coupling is subsequently formed at the adjacent lateral edges of these two boards (1) by means of a substantially flat sliding movement.

31. Method according to one of claims 28 to 30, characterized in that there are used as fastening means at least one fastening clip (16) and at least one groove (20) for receiving a portion (19) of the fastening clip (16), and/or several screws or nails and at least one recess (27) for receiving the screw heads or nail heads.

32. Method according to one of claims 28 to 31, characterized in that, following a first and a second board, a third board is mounted in such a way that it is coupled to both the first and second boards, a locking, snap-in or click-in coupling being formed.

33. Method according to claim 32, characterized in that the third board is coupled to the first board by swivelling-in.

34. Method according to claim 32 or 33, characterized in that the third board is displaced at least slightly in parallel to its coupling edge with the first board, in order to be coupled to the second board.

35. Method according to claim 32 or 33, characterized in that the third board is coupled to the second board by a lowering movement effected substantially perpendicularly to its surface.

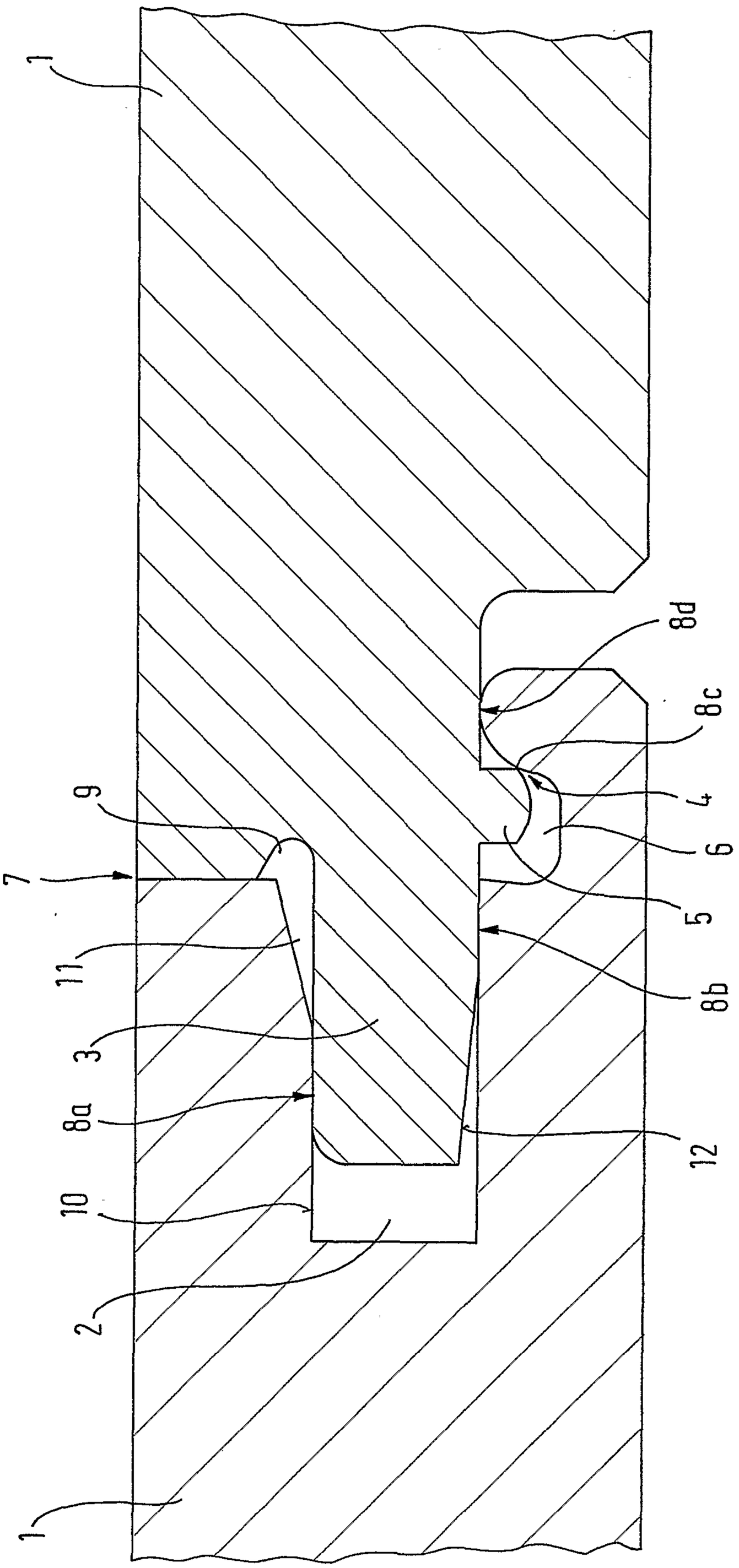


Fig. 1

Fig. 2

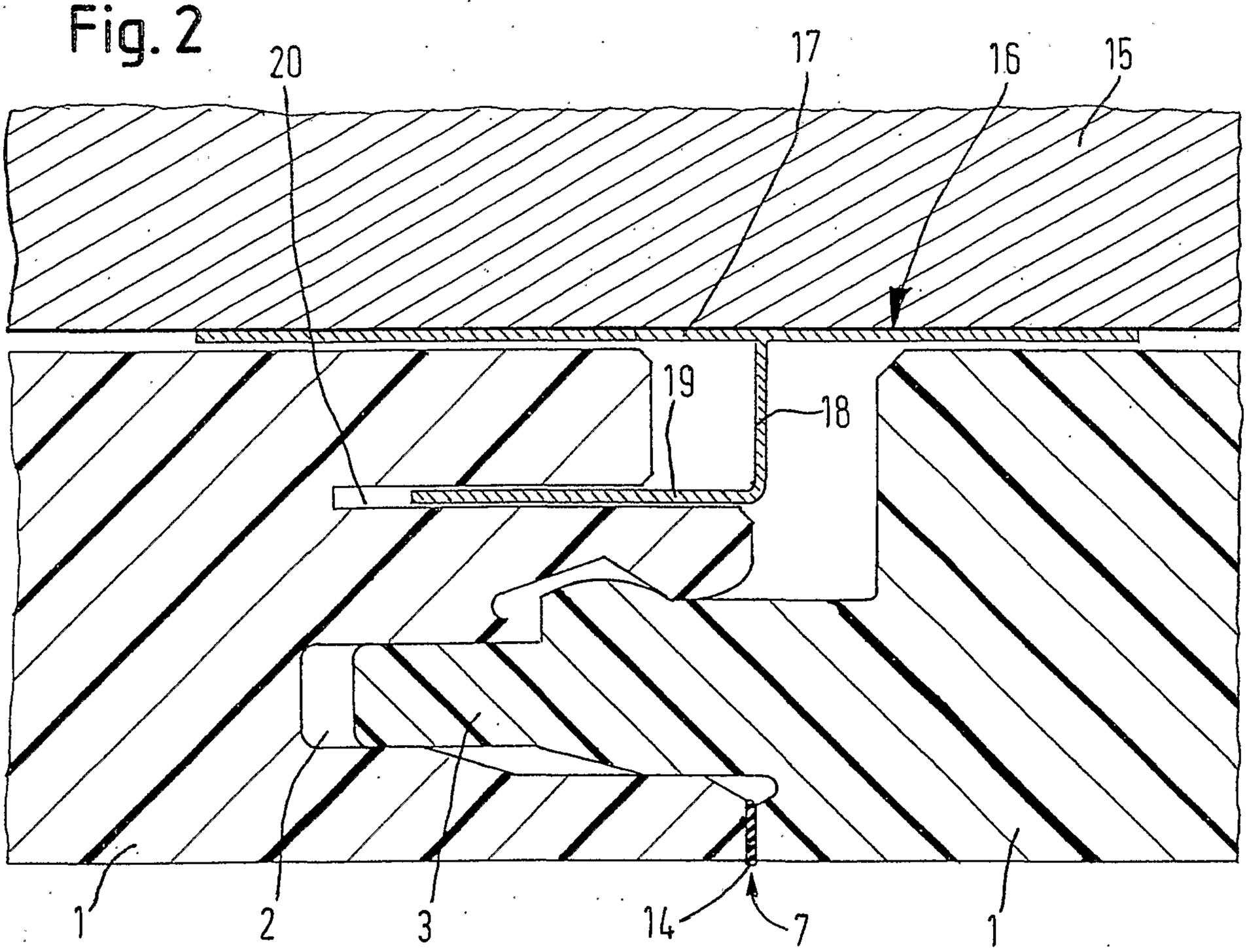


Fig. 3

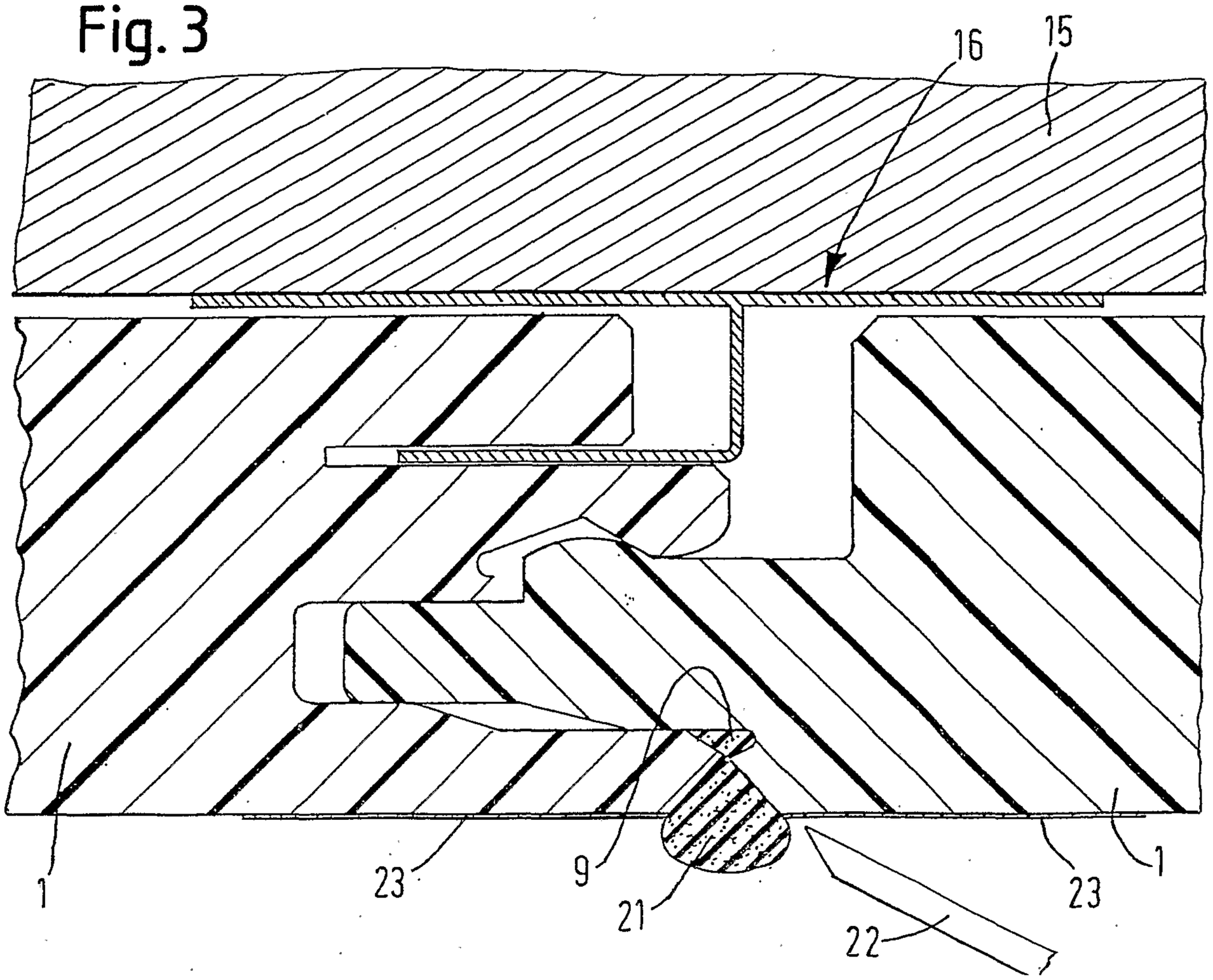


Fig. 4

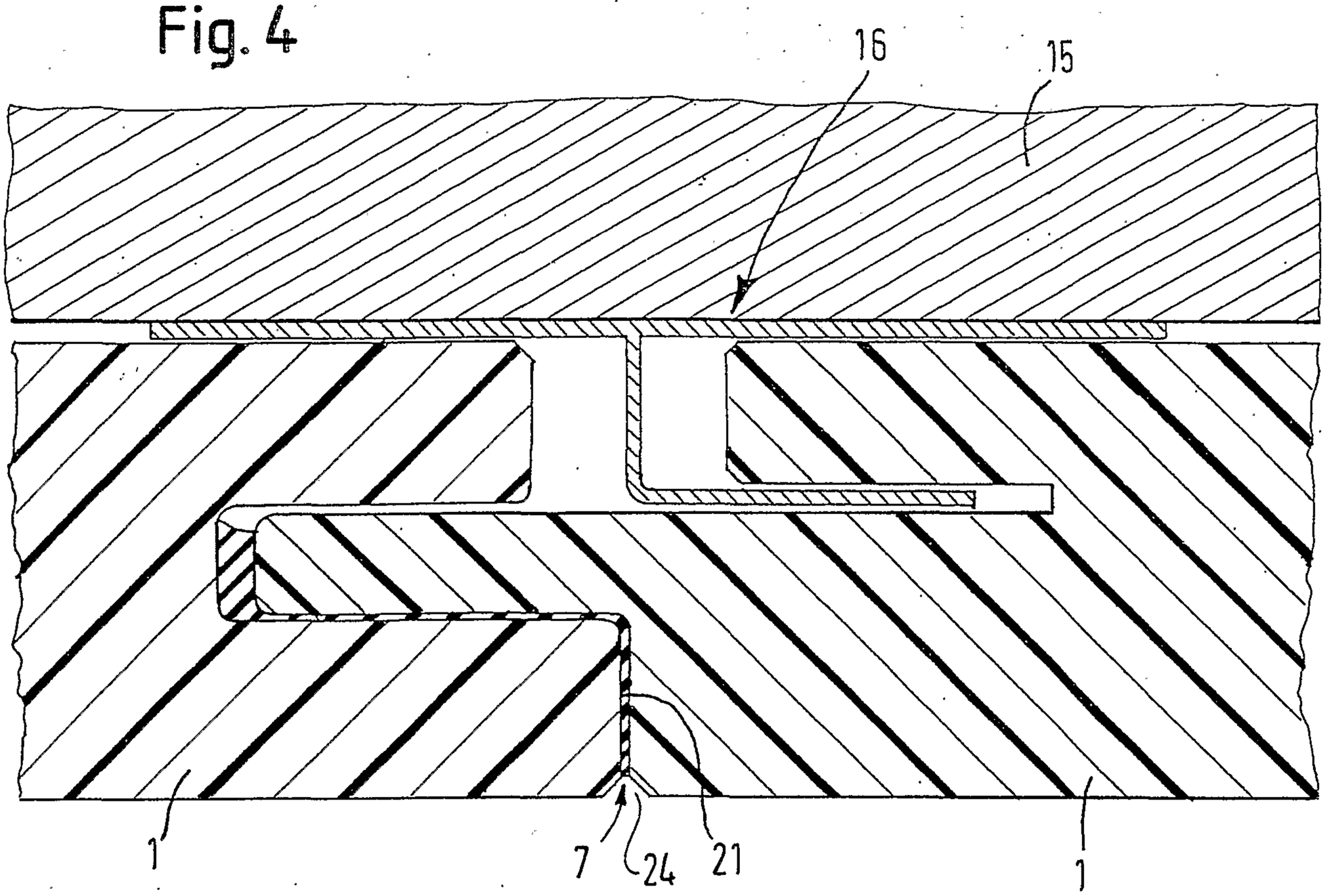


Fig. 5

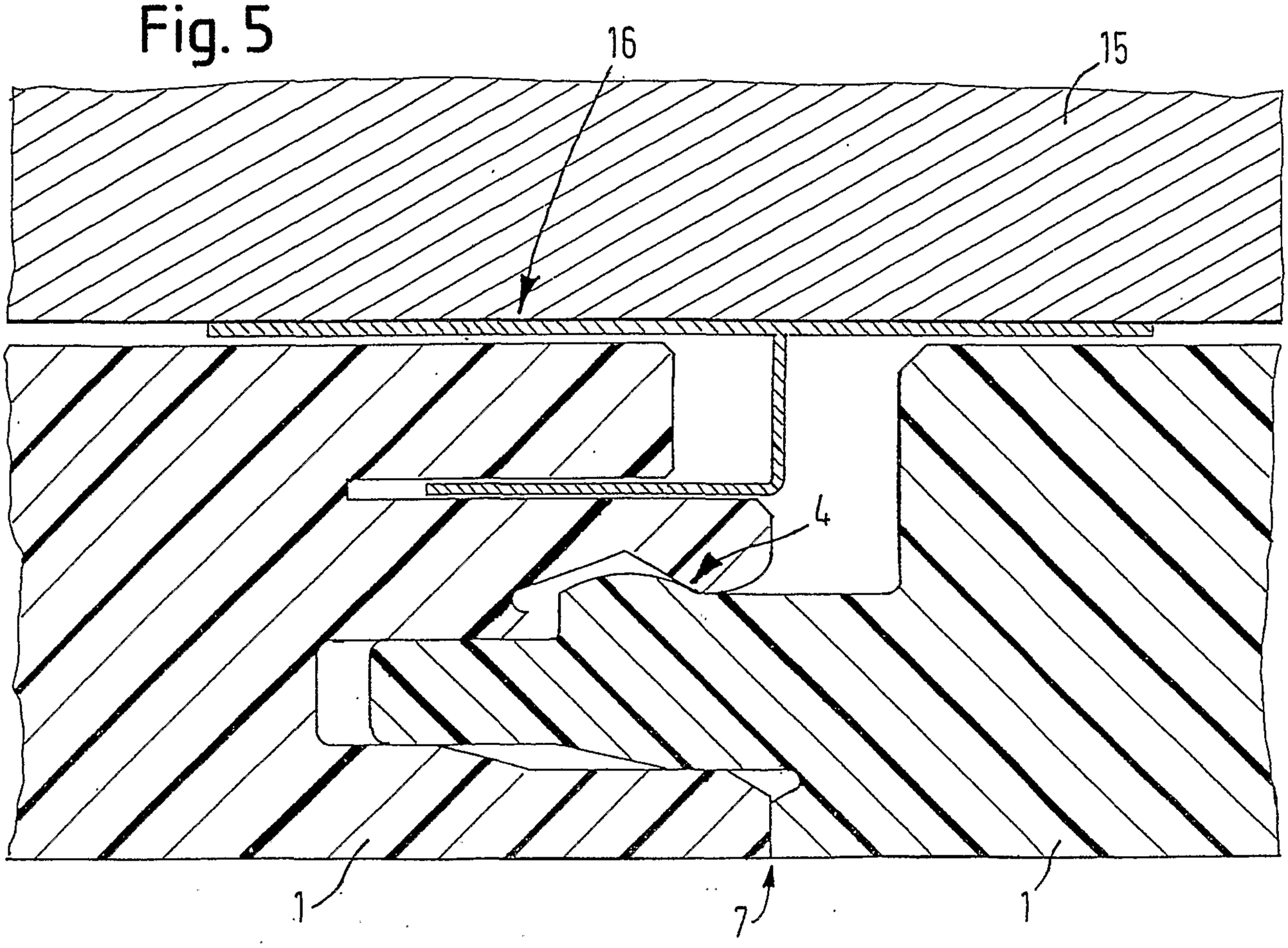


Fig. 6

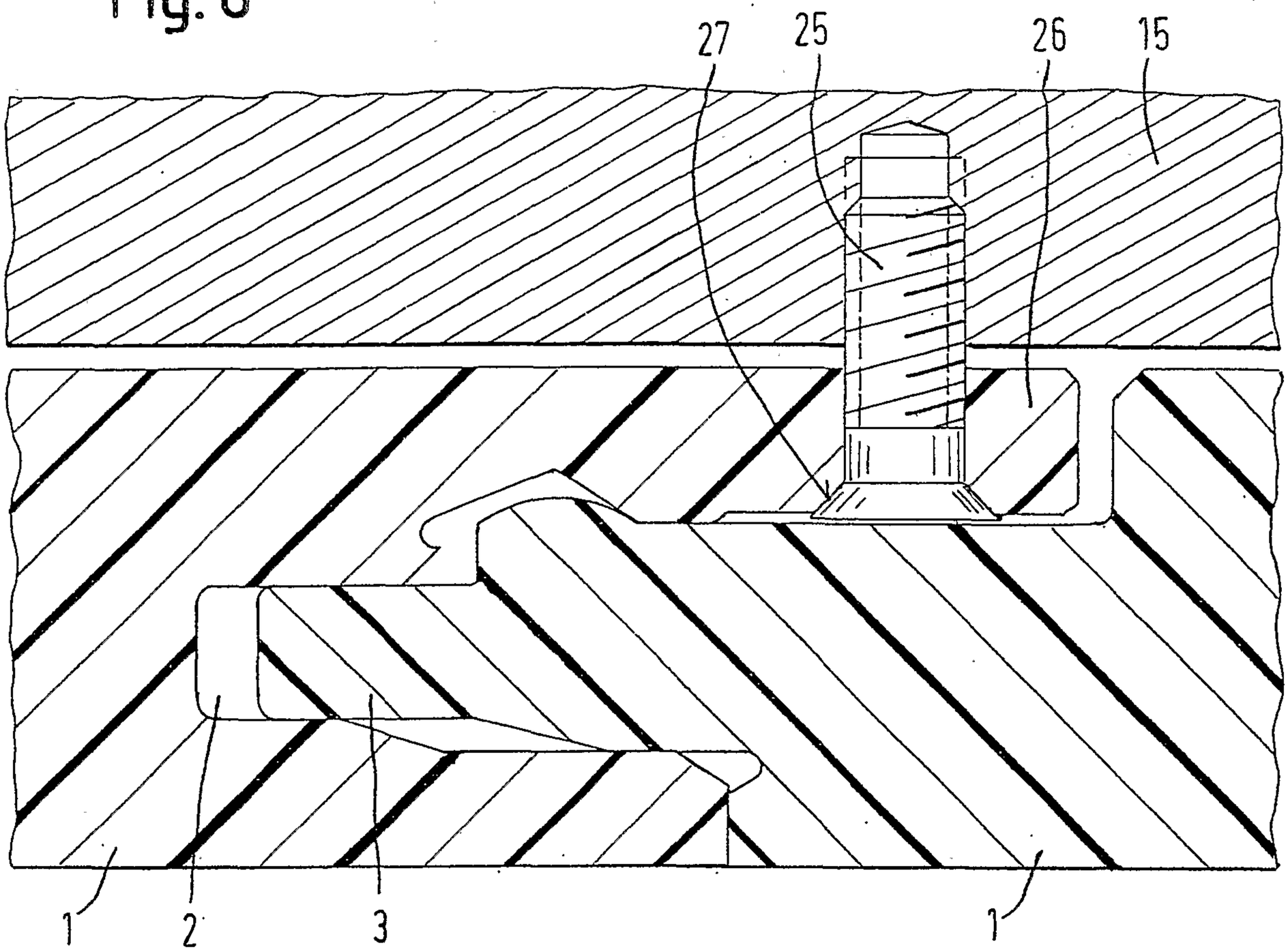
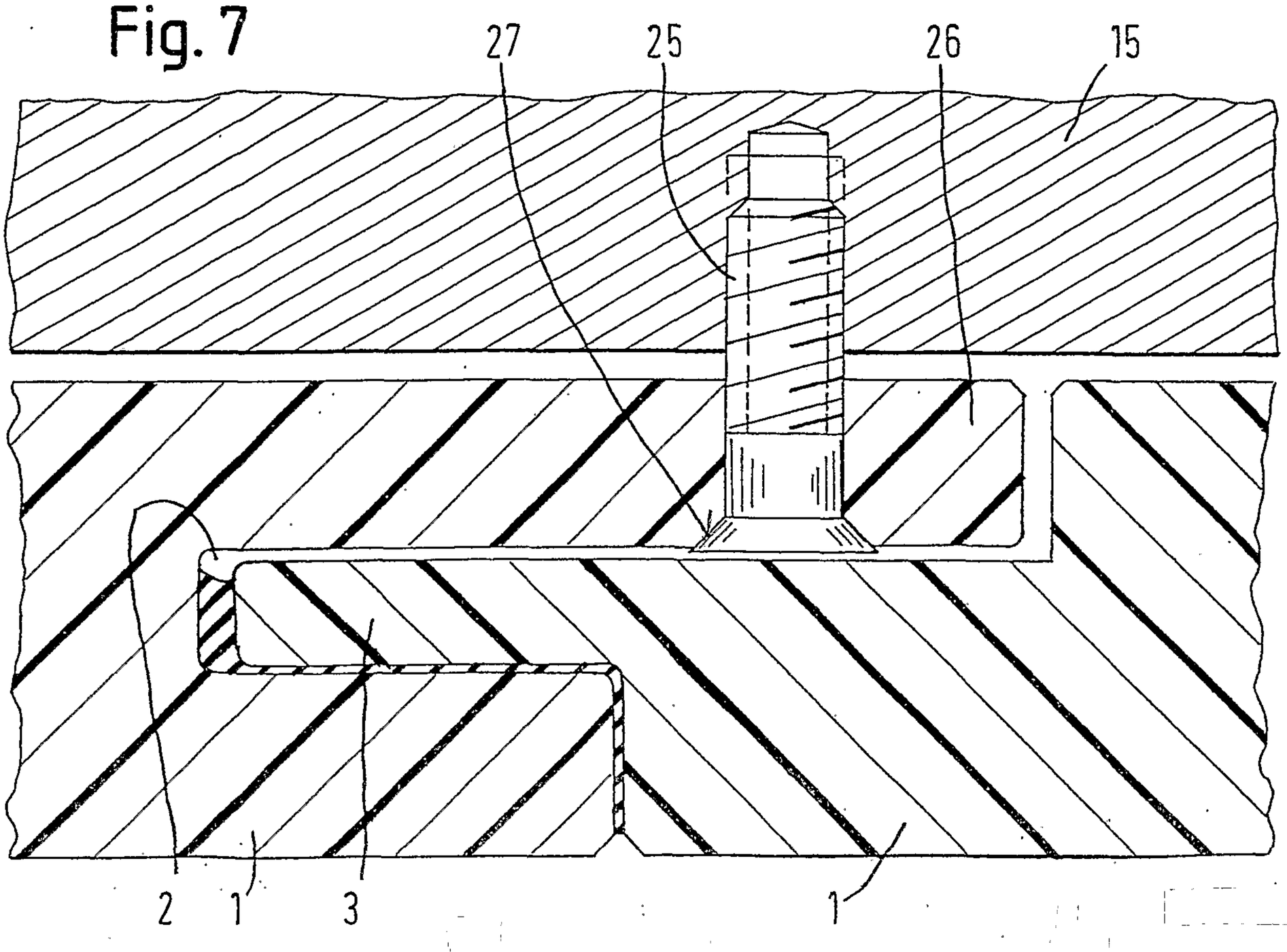


Fig. 7



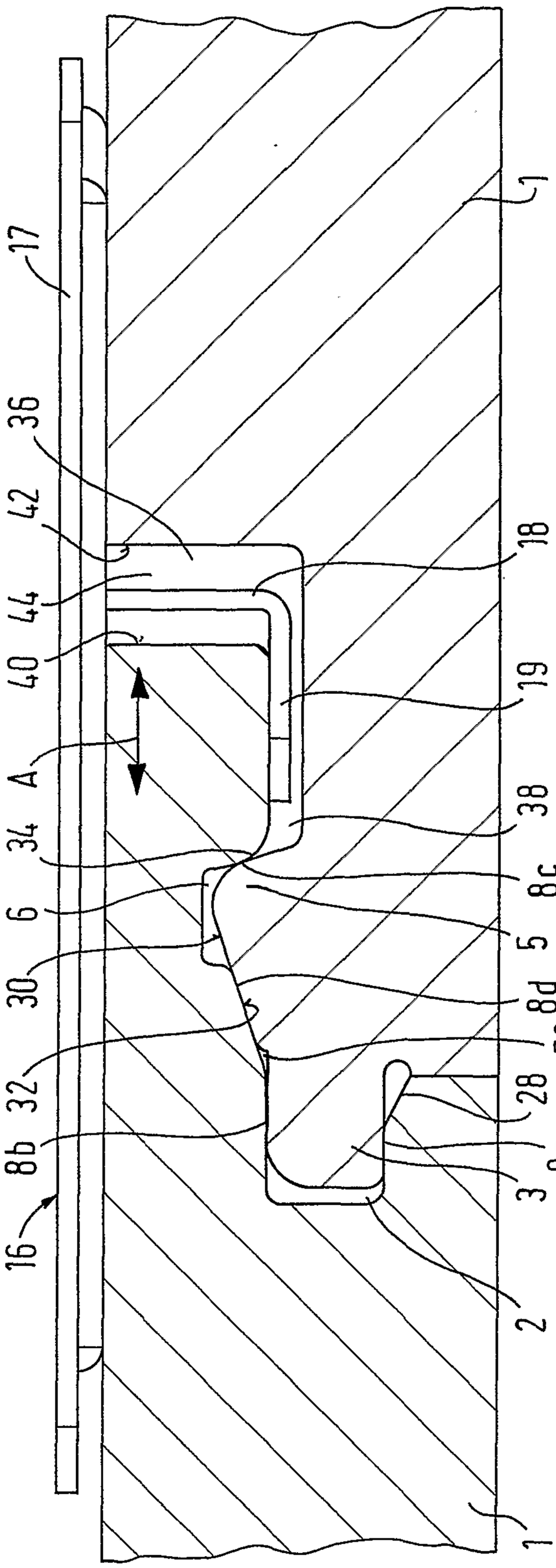

17
36
42
44
40
A
34
6
30
32
8b
16
1
18
19
38
8c
5
8d
52
28
8a
3
2

Fig. 8

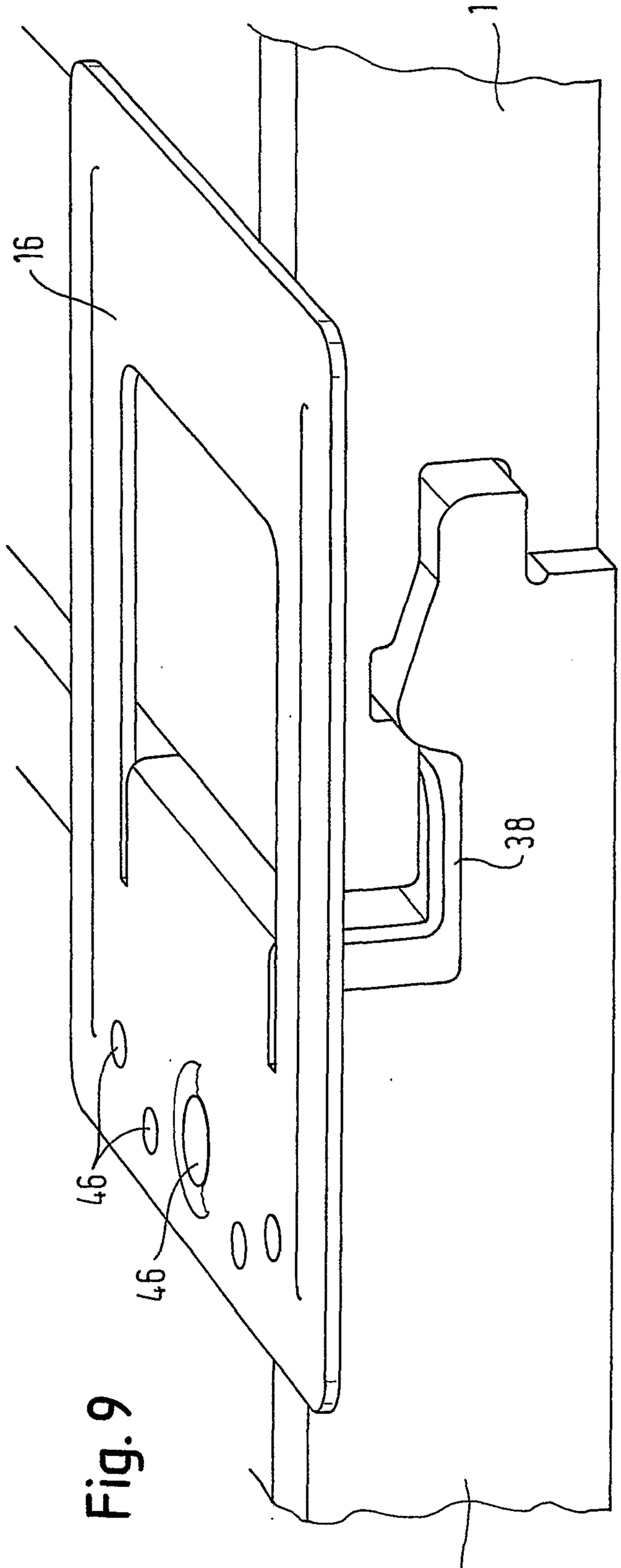

1
16
38
46
46

Fig. 9

Fig. 10

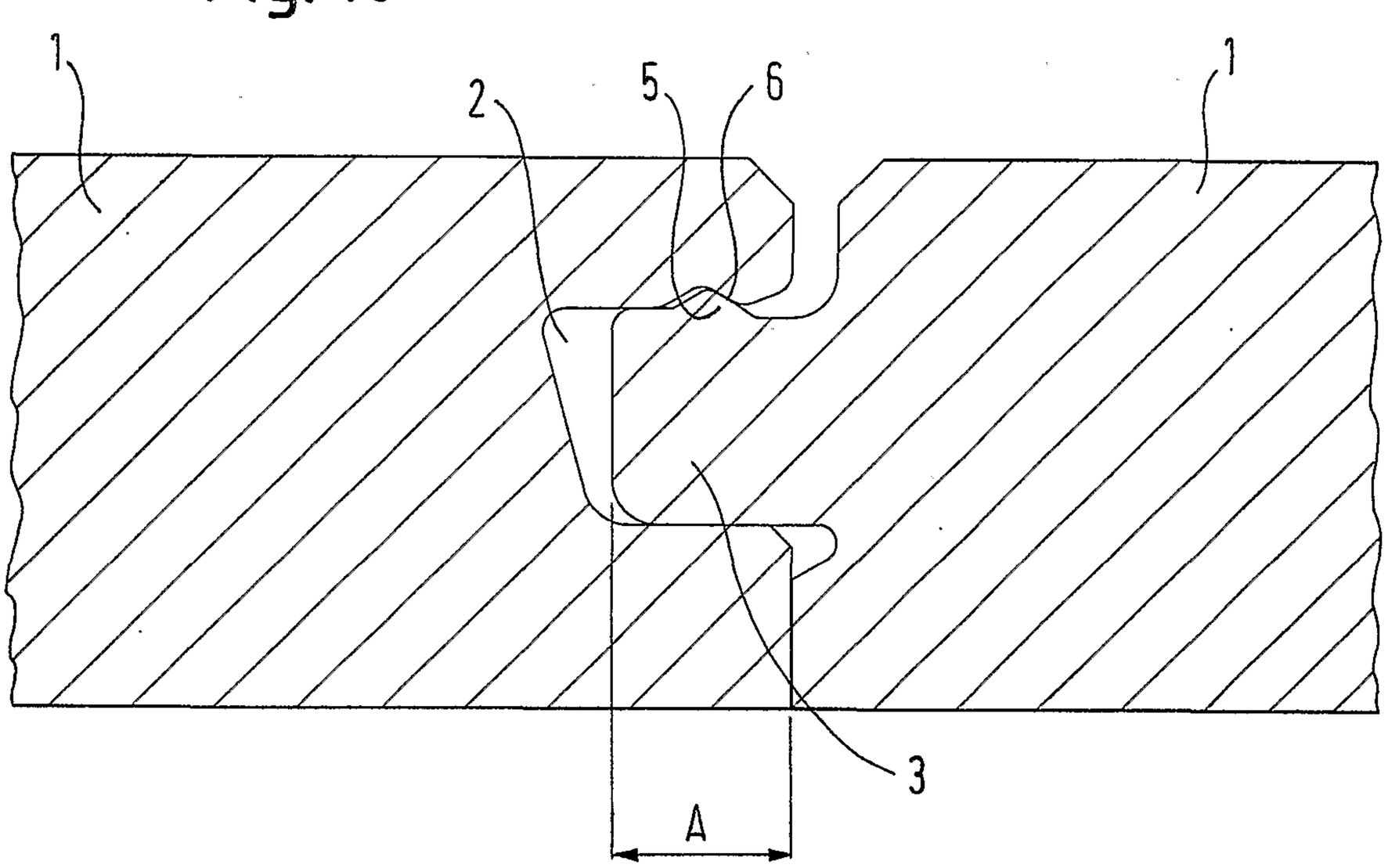


Fig. 11

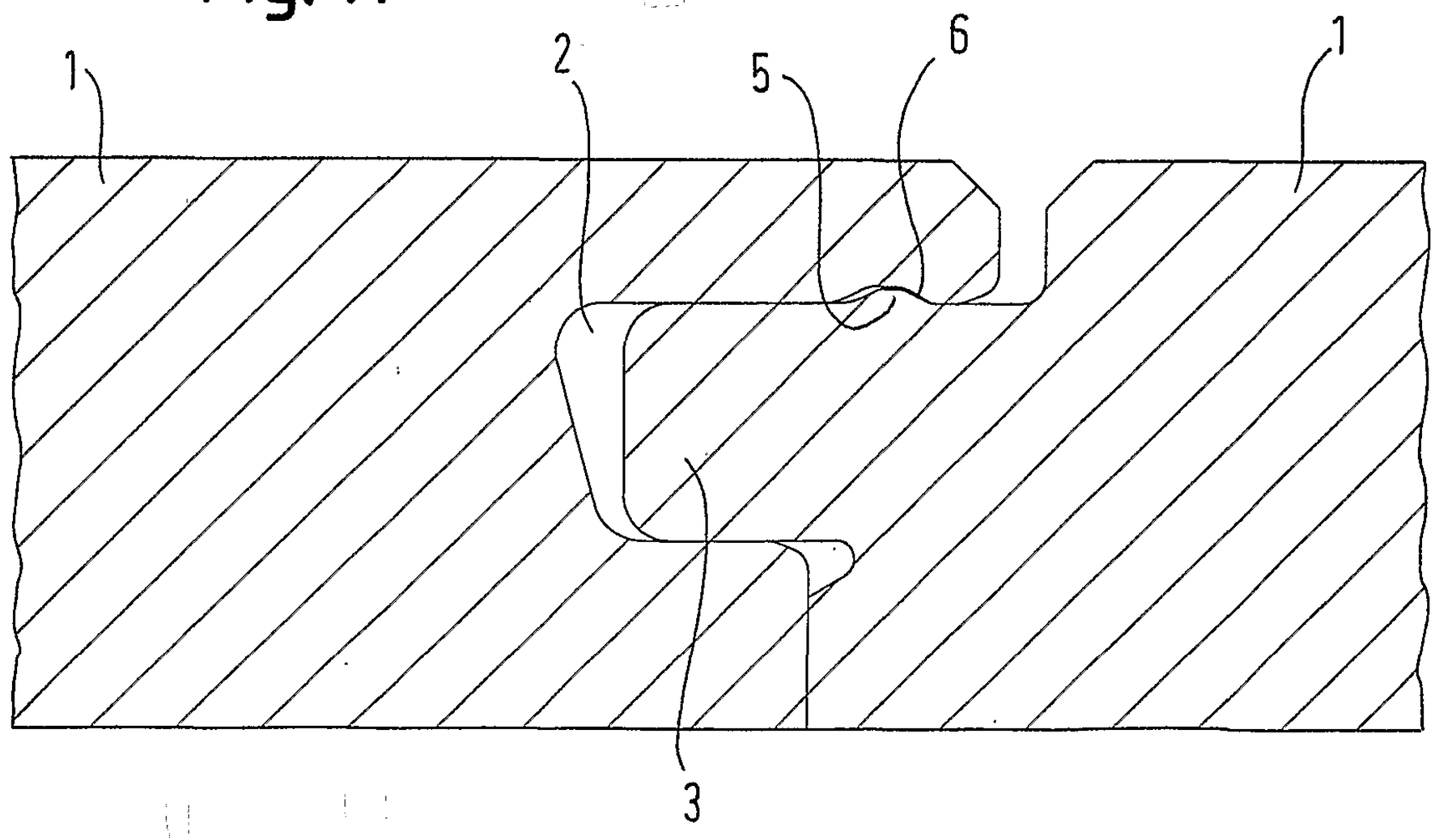


Fig. 12

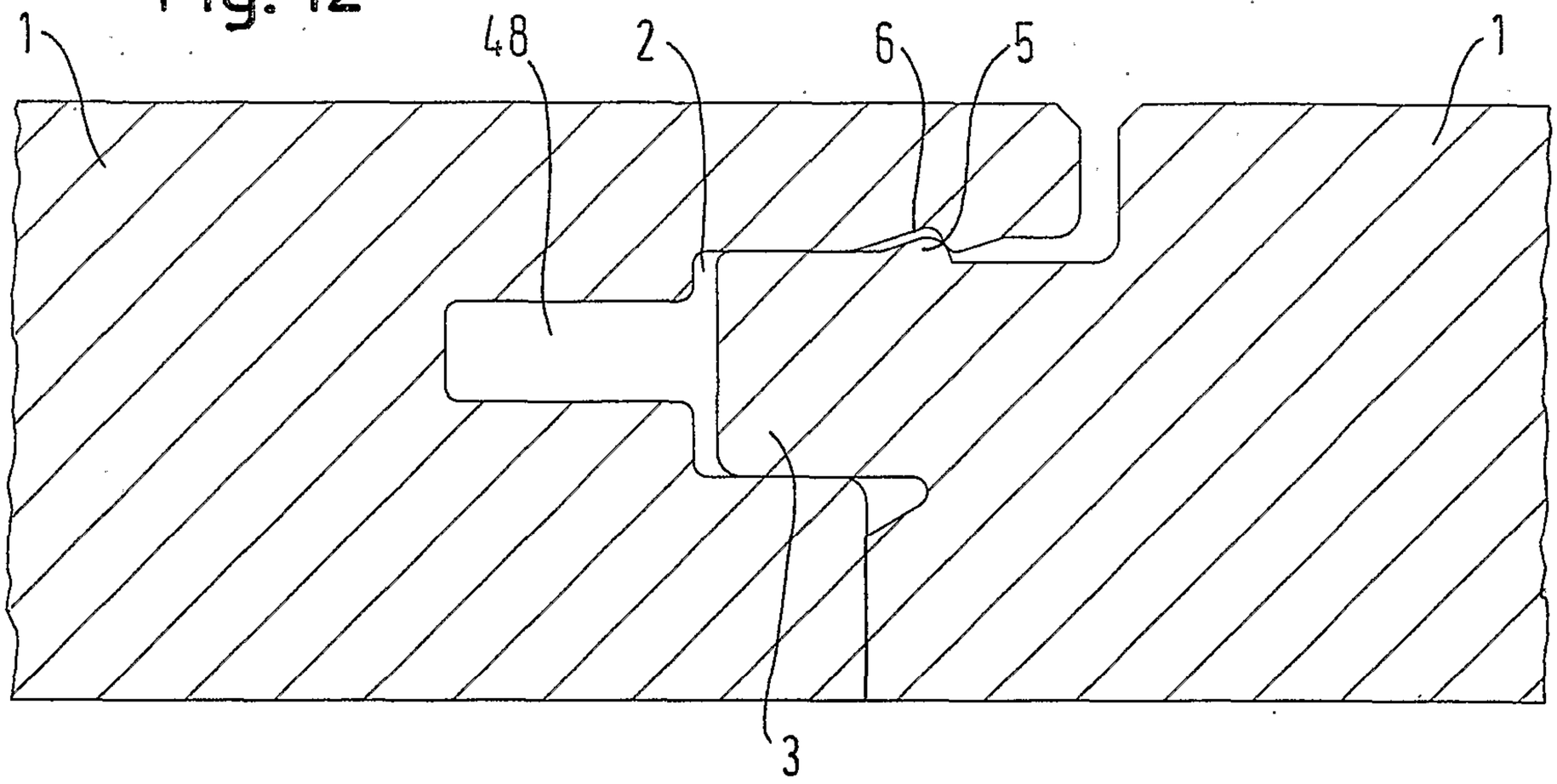


Fig. 13

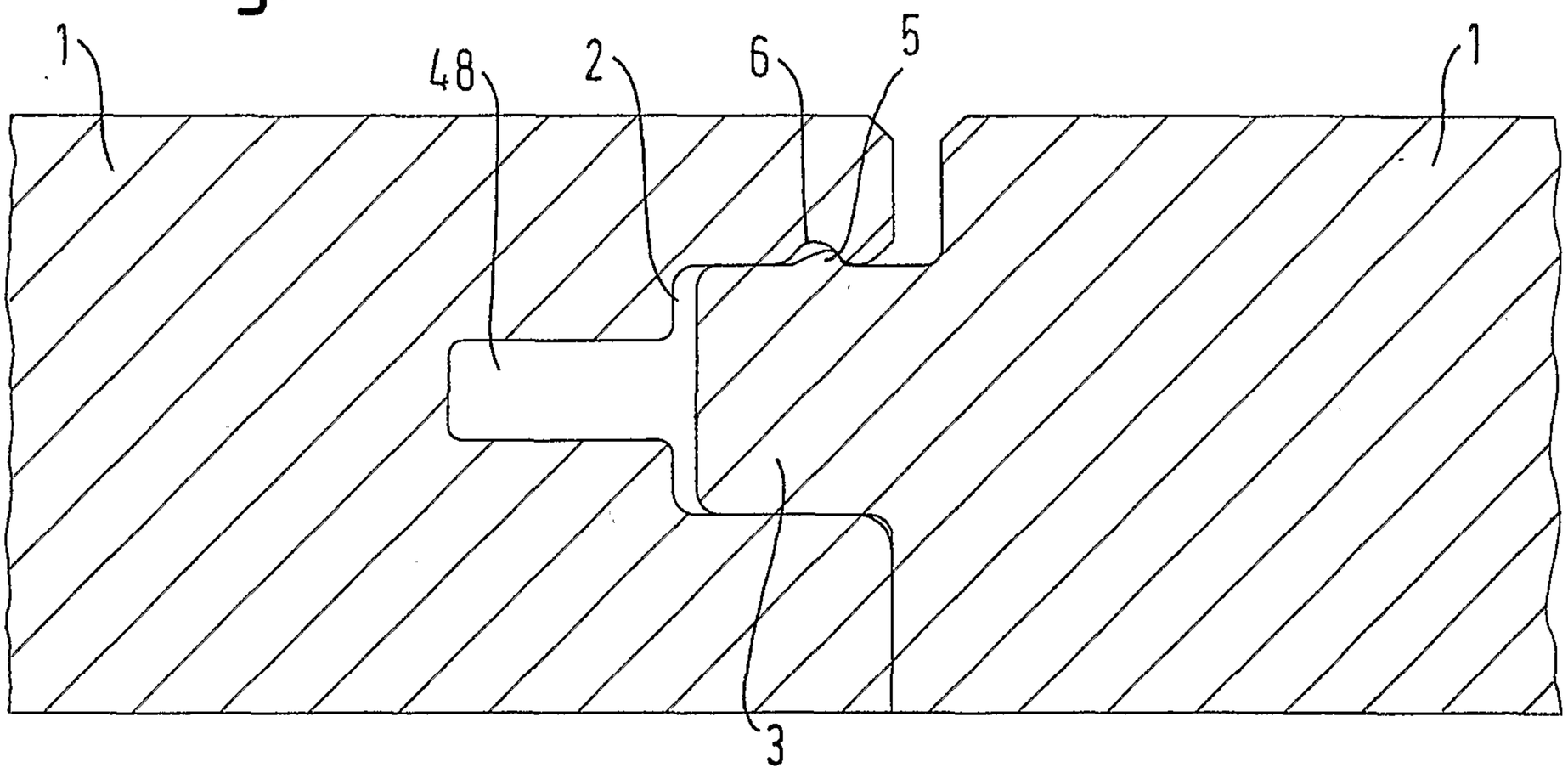


Fig. 14