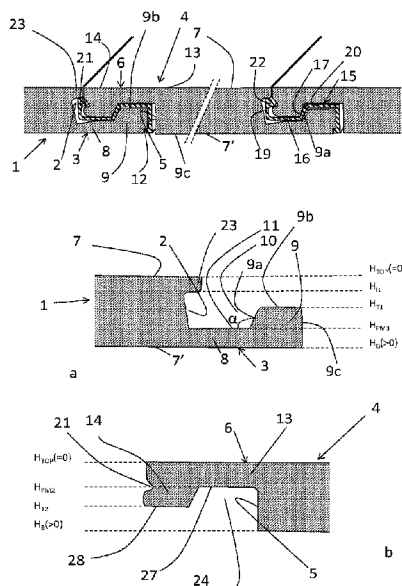




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(54) Titre : ENSEMBLE DE PANNEAUX DE REVETEMENT POUR SOL, MUR OU PLAFOND
(54) Title: SET OF PANELS FOR FLOOR, WALL OR CEILING COVERING



(57) Abrégé/Abstract:

A set of panels comprising:

- a first panel (1) having a side edge (2) on which a first retaining profile (3) is disposed defining a channel (10);
- a second panel (4) having a second retaining profile (6) that can be joined to the first retaining profile (3) and that defines a groove (21);
- a locking profile (15), comprising:
 - a base (16) positioned in said channel (10);
 - an abutment portion (19) along the side edge of the first panel (1) and comprising a rim (22) at its free end extending in a direction facing away from the side edge (2) of the first panel (1), said rim (22) snapping into the groove (21) of the second panel upon joining two panels,
 the channel (10) and locking profile (15) mounted therein configured to establish a first pivot (25) positioned along the base (16) of the locking profile (15).

ABSTRACT

A set of panels comprising:

- 5 • a first panel (1) having a side edge (2) on which a first retaining profile (3) is disposed
defining a channel (10);
 - a second panel (4) having a second retaining profile (6) that can be joined to the first
retaining profile (3) and that defines a groove (21);
 - a locking profile (15), comprising:
 - 10 ○ a base (16) positioned in said channel (10);
 - an abutment portion (19) along the side edge of the first panel (1) and
comprising a rim (22) at its free end extending in a direction facing away from
the side edge (2) of the first panel (1), said rim (22) snapping into the groove
(21) of the second panel upon joining two panels,
- the channel (10) and locking profile (15) mounted therein configured to establish a first pivot
- 15 (25) positioned along the base (16) of the locking profile (15).

SET OF PANELS FOR FLOOR, WALL OR CEILING COVERING

FIELD OF THE INVENTION

5 The invention generally relates to the field of sets of panels for covering floors, ceilings or walls, in particular sets of panels comprising a plurality of panels to be joined at their adjacent edges.

BACKGROUND OF THE INVENTION

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The disclosure aims at a set of panels for covering floors, ceilings or walls with a mechanical locking between adjacent panels.

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Sets of panels for flooring purposes are well known and widely spread in both private homes, business offices and industrial spaces. In general the panels have a rectangular form and are arranged in rows, whereby the adjacent edges (both longitudinal and transversal) of the adjacent panels are coupled to obtain a plain floor (so-called floating flooring systems). In order to improve the coupling between two adjacent panels, it is known to dispose retaining profiles along the edges of the panels, which retaining profiles are configured such as to match in one another and prevent unintentional separation of the panels during use or assembly.

20

25

Numerous systems for coupling adjacent panels are known, either with integrated or with separate locking profiles between both panels to allow easy assembly, to provide a locking between the panels, preventing the panels from been moved apart once assembled.

30

EP 2687650 discloses a set of panels wherein each panel comprises a pair of retaining profiles that can cooperate to join the adjacent edges of two adjacent panels, whereby a separate locking profile is mounted on one of the retaining profiles to obtain both a vertical and horizontal locking.

Despite the numerous existing solutions for joining adjacent panels of a flooring system, there remains a market need for improving speed of assembly of the panels and for improving the durability of the panels, in particular at the edges during assembly of the flooring system and during the entire lifetime of the flooring system.

SUMMARY OF THE INVENTION

In order to address one or more of the above identified market needs the present invention concerns set of panels comprising:

- a first panel (1) having a side edge (2) on which a first retaining profile (3) is disposed;
- a second panel (4) having a side edge (5) on which a second retaining profile (6) is disposed that can be joined to the first retaining profile (3);
- the first retaining profile (3) comprising a first protruding member (8) having a height ($H_B - H_{PM1}$) that is smaller than the height (H_B) of the first panel (1); and
- a first toothed part (9) disposed at a free end of the first protruding member (8) and having a height ($H_B - H_{T1}$) that is larger than ($H_B - H_{PM1}$) and smaller than (H_B) such as to define a first channel (10) between the first toothed part (9), a top surface (11) of the first protruding member (8) extending between the side edge (2) and first toothed part (9) and the side edge (2) of the first panel;
- the first retaining profile (3) comprising a protruding rim (23) that extends from the side edge (2) along the length of that side edge (2) from a level H_{TOP} to a level H_R between H_{TOP} and H_{PM1} , this protruding rim (23) as such partially extending above the first channel (10);
- the second retaining profile (6) comprising a second protruding member (13) having a height (H_{PM2}) that is smaller than the height (H_B) of the second panel (4), and
- a second toothed part (14) disposed at a free end of the second protruding member (13), said second toothed part (14) configured to cooperate with the first channel

(10), said second toothed part (14) comprising a groove (21) in a surface of the second toothed part (14) facing away from the side edge (5) of the second panel (4);

- a locking profile (15) mounted to the first retaining profile (3), said locking profile (15) comprising:

- 5 ○ a base (16) positioned in the first channel (10);
- a first abutment portion (17) extending from a first edge of the base (16) and disposed along the edge of the channel (10) defined by the toothed part (9), said first abutment portion (17) defining an abutment surface (18) facing the first channel (10);
- 10 ○ a second abutment portion (19) extending from a second edge of the base (16) opposite the first edge and positioned in the channel (10) along the side edge of the first panel (1), said second abutment portion (19) comprising a rim (22) at its free end and extending in a direction facing away from the side edge (2) of the first panel (1), such that the rim (22) of the locking profile is
- 15 snapped into the groove (21) of the second retaining profile (6) upon joining two panels,

characterized in that the locking profile (15) is at least partially attached to the first toothed part (9).

20 The present invention also concerns the use of a locking profile (15) for locking two adjacent panels of a set of panels comprising:

- a first panel (1) having a side edge (2) on which a first retaining profile (3) is disposed;
- a second panel (4) having a side edge (5) on which a second retaining profile (6) is
- 25 disposed that can be joined to the first retaining profile (3);
- the first retaining profile (3) comprising a first protruding member (8) having a height ($H_B - H_{PM1}$) that is smaller than the height (H_B) of the first panel (1); and
- a first toothed part (9) disposed at a free end of the first protruding member (8) and having a height ($H_B - H_{T1}$) that is larger than ($H_B - H_{PM1}$) and smaller than (H_B) such as to
- 30 define a first channel (10) between the first toothed part (9), a top surface (11) of the

first protruding member (8) extending between the side edge (2) and first toothed part (9) and the side edge (2) of the first panel;

- the first retaining profile (3) comprising a protruding rim (23) that extends from the side edge (2) along the length of that side edge (2) from a level H_{TOP} to a level H_R between H_{TOP} and H_{PM1} , this protruding rim (23) as such partially extending above the first channel (10);

- the second retaining profile (6) comprising a second protruding member (13) having a height (H_{PM2}) that is smaller than the height (H_B) of the second panel (4)), and

- a second toothed part (14) disposed at a free end of the second protruding member (13), said second toothed part (14) configured to cooperate with the first channel (10), said second toothed part comprising a groove (21) in a surface of the second toothed part (14) facing away from the side edge (5) of the second panel; and

said locking profile (15) configured to be mounted on the first retaining profile (3), and comprising:

- a base (16) positioned in the first channel (10);
- a first abutment portion (17) extending from a first edge of the base (16) and disposed along the edge of the channel (10) defined by the toothed part (9), said first abutment portion (17) defining an abutment surface (18) facing the first channel (10);
- a second abutment portion (19) extending from a second edge of the base (16) opposite the first edge and positioned in the channel (10) along the side edge of the first panel, said second abutment portion (19) comprising a rim (22) at its free end and extending in a direction facing away from the side edge (2) of the first panel (1), such that the rim (22) of the locking profile is snapped into the groove (21) of the second retaining profile (6) upon joining two panels.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 schematically represents a cross section of a plurality adjacent panels according to the present invention;

5 Figures 2a and 2b schematically represent a cross section of a part of the panels of the set of panels;

Figures 3a schematically represents a cross section of a locking profile;

Figure 3b & 3c schematically represent alternative embodiments of the locking profile in figure 3a;

10 Figure 4 schematically represents the locking profile of Figure 3a mounted on a panel of the set of panels;

Figures 5&6 represent an alternative embodiment of figure 4 and a schematic representation of the assembly steps of a set of panels according to this embodiment,

Figure 7&8 represent alternative embodiments of figure 4.

15

DETAILED DESCRIPTION

As represented in Figure 1, a set of panels according to the present invention comprises a plurality of panels each having a surface preferably with a decor visible when the panels are
20 installed as a floor, wall or ceiling covering and further referred to herein as 'decor surface' (7), and an opposed surface (7'), further referred to as 'bottom surface') directed to a floor, wall or ceiling covered by the panels when installed.

The panels can have any suitable shape, including rectangular, square or polygonal. Each of
25 the panels comprises at least two pairs of parallel side edges, and in the case of rectangular panels, one pair of long side edges extending in the length direction of the panels and another pair of short side edges or transversal edges extending in a width direction of the panels. The height H_B of the panels is defined as the distance from the level H_{TOP} ($=0$) of the decor surface (7) to the level H_B (>0) of the bottom surface (7') (measured in a direction
30 normal to the top surfaces).

When, and as represented in Figure 1, rectangular panels are installed in rows, the adjacent short edges of two adjacent panels in one row are locked to one another and the adjacent long edges of panels of adjacent rows are locked to one another. Locking is hereby to be understood as connected while preventing movement spacing the locked panels apart in a direction perpendicular to the coupled side edges by a translation (not tilting) in the plane of the bottom surface of the panels (horizontal locking in the event of a horizontal surface such as a floor) and while preventing movement spacing the locked panels apart in a direction perpendicular to the coupled side edges by a translation (not tilting) in a plane perpendicular to the bottom surface of the panels (vertical locking in the event of a horizontal surface such as a floor).

As illustrated in figures 2a and 2b, to allow coupling adjacent panels, retaining profiles are disposed on at least one pair of parallel side edges of each panel (1, 4). As such a first retaining profile (3) is disposed on a first side edge (2) of each panel and a second retaining profile (6) is provided on a second side edge (5) of said each panel opposite to the first side edge (4), whereby the first and second side edges (4,5) extend parallel to one another and can be either short or long side edges of the panel.

The first retaining profile (3), shown in Figure 2a, comprises a first protruding member (8) having a top surface (11), the first protruding member (8) preferably extending at least substantially, and more preferably entirely, along the first side edge (2) and a first toothed part (9) disposed at a free end of the first protruding member (8) and having an upper surface (9b), the first toothed part (9) preferably equally extending along the first side edge (2).

The first protruding member (8) extends in the height direction from the level H_B of the **bottom surface 7'** to a level H_{PM1} of the top surface (11) of the first protruding member (8). The first toothed part (9) extends in the height direction from the level H_B of the **bottom surface 7'** to a level H_{T1} of the upper surface (9b) of the first toothed part (9) between H_{PM1} and H_{TOP} . As illustrated in figure 2a, the first retaining profile (3) defines a first channel (10)

delimited by, on the one hand, the side edge (2) of the first panel and the toothed part (9) and on the other hand a top surface (11) of the first protruding member (8) extending between the side edge (2) and the first toothed part (9).

- 5 The first retaining profile (3) further comprises a protruding rim (23) that extends from the first side edge (2) along the length of that side edge from a level H_{TOP} of the decor surface (7) to a level H_R between H_{TOP} and the top surface (11) of the first protruding member (8) at level H_{PM1} , this protruding rim (23) as such partially extending above the first channel (10). Preferably, the protruding rim (23) extends from the first side edge (2) along the length of
10 that side edge from a level H_{TOP} of the decor surface (7) to a level H_R between H_{TOP} and the upper surface (9b).

- As represented in figure 1, a locking profile (15) is mounted to the first retaining profile (3), said locking profile (15) comprises: a base (16) that, in a mounted position, is seated in the
15 first channel (10) along the top surface (11) of the first protruding member (8); a first abutment portion (17) extending along a surface (9a) of the first toothed part (9) defining an edge of the first channel (10); and a second abutment portion (19) located along the side edge (2) of the panel (1) delimiting the first channel (10), said second abutment portion (19) comprising a rim (22) at its free end and extending in a direction facing away from the side
20 edge (2) of the first panel (1). The height of the second abutment portion is such that, in an assembled state of the panels, the free end of the second abutment portion (19) is situated against or substantially against a surface of the rim (23) facing the first channel (10). The first abutment portion (17) defines an abutment surface (18) facing away from the first toothed part (9), and hence facing the first channel (10). In one embodiment, the abutment
25 surface (18) of the first abutment portion (17) facing away from the first toothed part (9) is roughened. This would further increase the resistance of locked panels against moving apart.

- According to the invention, the locking profile (15) is attached to the first toothed part (9).
30 As represented in figures 1 and 3a, 3b & 3c, the locking profile (15) comprises a shielding

portion (20) extending from the first abutment portion (17) along an upper surface (9b) of the first toothed part (9) up to the edge of said upper surface (9b) at the free end of the toothed part (9). Clearly, as shown in figures 3a and 3c the shielding portion can further extend along the free end surface (9c) of the first toothed part (9). The attachment or
5 fixation of the locking profile (15) to the first toothed part (9) can be achieved eg. by an adhesive, applied between the locking profile (15) and one or more of: a portion of a top surface (11) of the protruding member (8), the surface (9a) of the first toothed part (9) defining an edge of the channel (10); the upper surface (9b) of the first toothed part (9) and a surface (9c) of the first toothed part defining a free end of that first toothed part (9). As
10 such the locking profile (15) is fixed to the first toothed part (9) by at least its shielding portion (20), and preferably also by the first abutment portion (17), that is immobilized with respect to the first toothed part (9) and that shields the first toothed part (9) from an accidental impact, thereby decreasing the probability that the first retaining profile (3) is damaged during transport or assembly of the set of panels. Additionally, the shielding of the
15 first toothed part (9) decreases the risk of damaging the first toothed part (9) upon disassembly of the panels and increases the overall strength of the panels in a assembled state.

The locking profile (15) extends along the first channel (10) and can have a length slightly
20 smaller than the length of the concerned side edge (2) of the panel along which it extends or can have a length that is substantially shorter (eg. 2–5 cm) than the side edge (2), in which case it is preferred that several spaced apart locking profiles (15) are provided along the side edge (2). The locking profile(s) (15) mounted to the first retaining profile (3) as such define a slot for receiving part of the second retaining profile (6) of an adjacent panel (4) of the set of
25 panels therein.

In the represented embodiments, the first abutment portion (17), and in particular the abutment surface (18), is oriented such as to define an angle α with the decor surface (7) of the first panel that is larger than 90° and smaller than 135° , preferably smaller than 125° and
30 most preferably smaller than 120° . In case of rectangular panels it is preferred that the angle

α of the retaining profile along at least one edge (short edge) is chosen between 99° and 106° , whilst the angle α of the retaining profile along another edge (long edge) is preferably larger than 106° allowing more easy disassembly of the panels locked along that side edge by angling. Alternatively, the first abutment portion (17) may be partially curved.

5

The locking profile (15) is preferably manufactured in one piece and can be made in a metallic material such as aluminum or spring steel; or in a polymeric material, preferably a fibre reinforced polymeric material.

10 The second retaining profile (6) is disposed at the second side edge (5) of the panel opposed to the first side edge (2) where the first retaining profile (3) is disposed. According to the embodiment exemplified in figures 1&2b, this second retaining profile (6) comprises a second protruding member (13) extending along the second side edge (5) and a second toothed part (14) disposed at a free end of the second protruding member (13) and equally
15 extending along the second side edge (5).

The second protruding member (13) extends in the height direction from a level H_{TOP} corresponding to the level at which the top surface (7) of the panel (2) extends to a level H_{PM2} of the lower surface (27) of the second protruding member (13), between H_{TOP} and H_{T1} .

20 The second toothed part (14) extends in the height direction from the level H_{TOP} to a level H_{T2} of the lower surface (28) of the second toothed part (14), between H_{PM1} and H_{TOP} . As illustrated in figure 2b, the second retaining profile (6) defines a second channel (24) delimited by, on the one hand, the side edge (5) of the second panel (4) and the second toothed part (14) and on the other hand a lower surface (27) of the second protruding
25 member (13) extending between the second side edge (5) and the second toothed part (14). The second toothed part (14) further comprises a groove (21) in a surface of the second toothed part (14) facing away from the side edge (5) of the second panel (4).

In an assembled state, as illustrated in figure 1, the decor surfaces (7) of two adjacent panels
30 extend in a same plane at a level H_{TOP} . The dimensions of the second toothed part (14) are

such that – when two panels are locked – the second toothed part (14) of the second panel (4), on the one hand abuts the first abutment portion (17) of the locking profile (15) on the first panel (1) and, on the other hand abuts the protruding rim (23) of the first panel, thereby effectively preventing (however allowing some play within the standards well known to the Person skilled in the art) a translation of the second panel (4) in view of the first panel (1) in the plane of the bottom surfaces (7') of both panels (1, 4) and in a direction perpendicular to the cooperating side edges (2, 5) of both adjacent panels (1, 4) (horizontal locking). In case the surface (18) of the first abutment portion (17) facing the second toothed part (14) in an assembled state of the set of panels, is roughened, sliding of the second toothed part (14) in an upward direction along the first abutment portion (17) can be made more difficult, thereby increasing the strength of the horizontal locking. Further, the second toothed part (14) of the second panel is dimensioned such that, in the assembled state, it abuts the base (16) on the locking profile (15) of the first panel (1), while the rim (22) of that locking profile (15) snaps into the groove (21) of the second toothed part (14), whereby the locking profile (15) is prevented from moving out of the first channel (10) as the second abutment portion (19) abuts the rim (23) of the first panel (1). As a result both panels (1, 4) are locked from moving in a direction perpendicular to the decor surface (7) (vertical lock).

Figures 3a & 4 illustrate another preferred embodiment of the present invention, wherein the locking profile (15) is attached to the first toothed part (9) by clamping rather than by an adhesive. In this case, a groove or undercut (12) is provided in a surface (9c) of the first toothed part (9) defining the free end of the first toothed part (9) facing away the first side edge (2) of the corresponding panel (1), whereas the locking profile (15) comprises a shielding/clamping portion (20) extending from the first abutment portion (17) along an upper surface (9b) of the first toothed part (9) and further along the free end surface (9c) of the first toothed part (9) into the groove or undercut (12). In this preferred embodiment, the first toothed part (9) is shielded by the locking profile (15) from an accidental impact, thereby decreasing the probability that the first retaining profile (3) is damaged during transport or assembly or disassembly of the set of panels. Again, the shielding portion (20), and preferably also the the first abutment portion (17), is immobilized in view of the first

toothed part (9), whilst the remainder of the locking profile (15) is allowed to move in view of the first retaining profile (3) allowing interaction with the second toothed part (14) of a second panel (4) to locking two panels (1, 4).

5 According to a third preferred embodiment that is illustrated in figures 5&6, the first channel (10) and the locking profile (15) are configured such as to establish a pivot (25), further referred to as the first pivot, positioned along the base (16) of the locking profile. Such pivot allows broadening the aperture of the slot – ie the distance between the free ends (17', 19')

10 of the first and second abutment portions (17, 19) of the locking profile – upon exerting a pressure on the second abutment portion (19) in a direction normal to the bottom surface (7') of the first panel (1) and in a direction from the decor surface (7) of the panels towards the bottom surface (7') of said panels.

In this case the pivot is obtained by making the surface (11) of the first protruding member (8) facing the base (16) of the locking profile (15) such that it comprises a support section (11a) extending such that upon joining two adjacent profiles, the locking profile (15) is clamped between the support section (11a) and the second toothed part (14); and a second section (11b) positioned such that a void remains present between that section (11b) of the surface (11) and the second locking profile (15) when in a non-tensed position. Further it is

20 preferred that a free space is maintained between the first side edge (2) of the first panel (1) and the second abutment portion (19) of the locking profile (15) such that in case the second abutment portion (19) is pushed towards the bottom surface of the panel, the base (16) partially pivots downward and the free ends of the first and second abutment portions are spaced further apart and favoring a movement of the free end of the second abutment

25 portion (19) towards the side edge (2) of the first panel (1) under protruding rim (23).

In a preferred embodiment and as shown in figure 6, the locking profile (15) comprises a pivot (26) (further referred to as second pivot although it can be provided in addition to or as alternative for the above described pivot (25), positioned at the transition of the base (16)

30 and the second abutment portion (19) or along the second abutment portion (19), which

pivot allows the second abutment portion (19) to partially tilt such that its free end is spaced further apart from the first abutment portion (17) upon exerting a pressure on the free end of the second abutment portion (19).

5 For sake of clarity, figure 6 schematically illustrates the functioning of the pivot, whereby during assembly the second toothed part (14) of the second panel (4) is inserted in the first channel (10), whereby the bottom surface of the second toothed part (14) contacts the rim (22) of the locking profile (15), pressing the rim (22) down- and sideways. As a result of this pressure, the locking profile (15) pivots at first pivot (25) thereby tilting the second
10 abutment portion (19) and rim (22) towards the side edge (2) of the first panel (in a direction under rim (23)) and as such increasing the distance between the free ends of the abutment portions (17, 19) of the locking profile. This distance between the abutment portions (17, 19) is further increased by the tilting of the second abutment portion (19) in view of the base (16) of the locking profile at the second pivot (26). The increasing distance allows the second
15 toothed part (14) to move further in the channel (10) until the bottom surface of the second toothed part (14) contacts the base of the locking profile (15) at least at the position corresponding to the support section (11a) of the base of the channel (10). In this position the downward pressure on the second abutment portion (19) of the locking profile is relieved and the locking profile pivots back towards its rest (unstressed) position, whereby
20 the rim (22) of the locking profile now snaps into groove (21) in the second toothed part, thereby locking the first and second panels towards one another.

Alternatively as illustrated in figure 7, the pivot (25) is obtained by a variation in the thickness of the locking profile along its base (16), such that this base (16) comprises a
25 relatively thick and rigid portion (16a) and a relative thin and more flexible portion (16b). The functioning of this alternative is similar to the functioning of the alternative depicted in figures 5 and 6.

According to a fourth embodiment, as illustrated in figure 8, the rim (22) is compressible or
30 made by bending over the free edge (19') of the second abutment portion (19) of the locking

profile (15), whereby the bending point (22a) or section acts as a pivot between the rim (22) and the remainder of the second abutment portion (19).

In general, for all the above described embodiments, the locking profile (15), the first
5 channel (10) and the second toothed part (14) of two adjacent panels are preferably
configured such as to allow introduction of the second toothed part (14) in the channel (10)
up to a point wherein both panels are locked, by a pure translation of both panels in view of
one another, ie in case the panels form a flooring, a movement of the second panel (4) in
view of the first panel (1), without tilting one of both panels. Such configuration is
10 particularly feasible when the retaining profiles are provided at the short edges of the
panels. In case the retaining profiles are provided at the long edges of the panels, the
locking profile (15), the first channel (10) and the second toothed part (14) of two adjacent
panels are preferably configured such as to allow the introduction of the second toothed
part (14) in the slot up to a point wherein both panels are locked and to allow releasing one
15 panel from another to which it is locked, by a combination of tilting (angling) and translation
of both panels in view of one another.

For all the above described embodiments, the panels can be made from many different
materials or combinations of materials as long as it is feasible to make the retaining profiles
20 as described hereinbefore, on their edges.

The panels may be wood-based (e.g. a fiberboard (MDF, HDF), or a particle board). The
panels may also be made of, or at least comprising a layer of, synthetic material. The term
"synthetic material" as used in the context of the current invention, can be a single polymer
25 or a blend of two or more polymers. The synthetic material can be, for example, a
thermoplastic polymer, a thermosetting polymer, a rubber (elastomer), or any combinations
thereof. In one particular example, the polymeric material is a thermoplastic polymer that
includes vinyl containing thermoplastics such as polyvinyl chloride, polyvinyl acetate,
polyvinyl alcohol, and other vinyl and vinylidene resins and copolymers thereof;
30 polyethylenes such as low density polyethylenes and high density polyethylenes and

copolymers thereof; styrenes such as ABS, SAN, and polystyrenes and copolymers thereof, polypropylene and copolymers thereof; saturated and unsaturated polyesters; acrylics; polyamides such as nylon containing types; engineering plastics such as polycarbonate, polyimide, polysulfone, and polyphenylene oxide and sulfide resins and the like. The
5 synthetic material compound used to form the panel or a layer thereof can be a PVC powder compound that has good impact strength, ease of processing, high extrusion rate, good surface properties, excellent dimensional stability, and indentation resistance.

The panels may also comprise composite materials, or one or more layers thereof, such as wood-plastic composites (WPC), referring to a composite structure comprising a wood-
10 based material and a synthetic material. The panel may comprise multiple layers which can be identical or different with respect to composition and/or physical properties. In one embodiment, the panel may comprise a core, which can be single or multilayered, made from the materials described hereinbefore, and a top layer which may comprise a print layer and a wear layer. Alternatively, the panel may comprise a core, which can be single or
15 multilayered, made from the materials described hereinbefore, onto which a decor is digitally printed, the decor further being covered by a wear layer.

	(1) first panel;		(16) base of locking profile
	(2) side edge of first panel		(17) first abutment portion
	(3) first retaining profile	25	(17') free end of first abutment portion
	(4) second panel		(18) surface of first abutment portion
5	(5) side edge of second panel		facing away the first toothed part (9)
	(6) second retaining profile		(19) second abutment portion
	(7) decor surface		(19') free end of second abutment portion
	(7') bottom surface	30	(20) shielding/clamping portion
	(8) first protruding member		(21) groove in second toothed panel
10	(9) first toothed part		(22) rim of locking profile
	(9a) surface of first toothed part		(22a) bending point of second abutment
	(9b) upper surface of first toothed part		portion
	(9c) free end surface of first toothed part	35	(23) protruding rim on first panel
	(10) first channel		(24) second channel
15	(11) top surface of first protruding member		(25) first pivot
			(26) second pivot
	(11a) support section of top surface (11)		
	(11b) second section of top surface (11)	40	(27) lower surface of the second
	(12) undercut		protruding member (13)
20	(13) second protruding member		
	(14) second toothed part		(28) lower surface of the second toothed
	(15) locking profile		part
45			(14)

CLAIMS

1. A set of panels comprising:

- a first panel (1) having a side edge (2) on which a first retaining profile (3) is disposed;
- a second panel (4) having a side edge (5) on which a second retaining profile (6) is disposed that can be joined to the first retaining profile (3);
- the first retaining profile (3) comprising a first protruding member (8) having a first height – extending in the height direction from a first level (H_B) of a bottom surface (7') of the first panel (1) to a second level (H_{PM1}) of a top surface (11) of the first protruding member (8) – ($H_B - H_{PM1}$) that is smaller than the height (H_B) of the first panel (1), defined as the distance from the level ($H_{TOP} (=0)$) of the decor surface (7) to the level $H_B (>0)$ of the bottom surface (7'); and
- a first toothed part (9) disposed at a free end of the first protruding member (8) and having a second height – extending in the height direction from the first level (H_B) of the bottom surface (7') to a third level (H_{T1}) of the upper surface (9b) of the first toothed part (9) – ($H_B - H_{T1}$) that is larger than the first height ($H_B - H_{PM1}$) and smaller than the height (H_B) of the first panel (1), thereby defining a first channel (10) between the first toothed part (9), a top surface (11) of the first protruding member (8) and the side edge (2) of the first panel;
- the first retaining profile (3) comprising a protruding rim (23) that extends from the side edge (2) along the length of that side edge (2) from the level (H_{TOP}) of the decor surface (7) of the first panel – to a fourth level (H_R), the fourth level (H_R) situated between the level of the decor surface (H_{TOP}) and the top surface (11) of the first protruding member (8) extending at the second level (H_{PM1}), the protruding rim (23) as such partially extending above the first channel (10);
- the second retaining profile (6) comprising a second protruding member (13) having a third height (H_{PM2}) that is smaller than the height (H_B) of the second panel (4), and

- a second toothed part (14) disposed at a free end of the second protruding member (13), said second toothed part (14) configured to cooperate with the first channel (10), said second toothed part (14) comprising a groove (21) in a surface of the second toothed part (14) facing away from the side edge (5) of the second panel (4);
- a locking profile (15) mounted to the first retaining profile (3), said locking profile (15) comprising:
 - a base (16) positioned in the first channel (10);
 - a first abutment portion (17) extending from a first edge of the base (16) and disposed along the edge of the first channel (10) defined by the first toothed part (9), said first abutment portion (17) defining an abutment surface (18) facing the first channel (10);
 - a second abutment portion (19) extending from a second edge of the base (16) opposite the first edge and positioned in the first channel (10) along the side edge of the first panel (1), said second abutment portion (19) comprising a rim (22) at its free end and extending in a direction facing away from the side edge (2) of the first panel (1), such that the rim (22) of the locking profile is snapped into the groove (21) of the second retaining profile (6) upon joining two panels,

wherein the locking profile (15) is at least partially attached to the first toothed part (9), characterized in that said first channel (10) and the locking profile (15) mounted therein are configured to establish a first pivot (25) positioned along the base (16) of the locking profile (15), said first pivot (25) established by a surface (11) of the first protruding member (8) facing the base (16) of the locking profile (15) said surface (11) comprising a support section (11a) extending such that upon joining two adjacent profiles, the locking profile (15) is rigidly clamped between the support section (11a) of the first panel (1) and the second toothed part (14) of a second panel (4) and comprising a second section (11b) positioned such that upon joining two adjacent profiles, a void remains present between the surface (11) of the first panel (1) and the locking profile (15), whereby at insertion of the toothed part (14) of the second panel (4) in the first channel (10) of the first panel (1) the locking profile (17) pivots downwards at the first pivot

(25), thereby tilting the second abutment portion (19) and rim (22) towards the side edge (2) of the first panel and as such increasing the distance between the free ends of the abutment portions (17, 19) of the locking profile (15); and

wherein said first channel (10) and the locking profile (15) mounted therein are configured to establish a second pivot (26) positioned at the transition of the base (16) and the second abutment portion (19) or along the second abutment portion (19).

2. The set of panels according to claim 1, wherein the first toothed part (9) comprises a first groove or undercut (12) in its surface facing away the side edge (2) of the first panel (1); and in that said locking profile (15) comprises a clamping portion (20) extending into the groove or undercut (12) at the free end of the first toothed part.

3. The set of panels according to claim 1 or 2, wherein the locking profile (15) is attached to the first toothed part (9) with an adhesive.

4. The set of panels according to any one of claims 1 to 3, wherein the locking profile (15) is manufactured in one piece.

5. The set of panels according to any one of claims 1 to 4, wherein the locking profile (15) is manufactured in a metallic material.

6. The set of panels according to any one of claims 1 to 5, wherein the dimensions of the channel (10) and locking profile (15) are such that a free space remains between the second abutment portion (19) of the locking profile and the side edge (2) of the first panel (1) when said locking profile (15) is in a non-tensed position.

7. The set of panels according to claim 1, wherein said rim (22) is compressible in a direction substantially perpendicular to the side edge (2) of the first panel.

8. The set of panels according to claim 7, wherein said rim (22) comprises a pivot allowing compressing the rim (22) in a direction substantially perpendicular to the side edge (2) of the first panel (1).

9. The set of panels according to any one of claims 1 to 8, wherein the first and second retaining profiles (3,6) are provided on a short edge of said panels (1,4).

10. The set of panels according to any one of claims 1 to 9, wherein the first and second retaining profiles (3,6) are provided on a long edge of said panels (1,4).

11. The set of panels according to any one of claims 1 to 10, wherein the first channel (10), the locking profile (15) and the second toothed part (14) are configured to allow locking of the second panel to the first panel by a translation only of the second panel in view of the first panel.

12. Use of a locking profile (15) for locking two adjacent panels of a set of panels comprising:

- a first panel (1) having a side edge (2) on which a first retaining profile (3) is disposed;
- a second panel (4) having a side edge (5) on which a second retaining profile (6) is disposed that can be joined to the first retaining profile (3);
- the first retaining profile (3) comprising a first protruding member (8) having a first height – extending in the height direction from a first level (H_B) of a bottom surface (7') of the first panel (1) to a second level (H_{PM1}) of a top surface (11) of the first protruding member (8) – ($H_B - H_{PM1}$) that is smaller than the height (H_B) of the first panel (1), defined as the distance from the level ($H_{TOP} (=0)$) of the decor surface (7) to the level $H_B (>0)$ of the bottom surface (7'); and
- a first toothed part (9) disposed at a free end of the first protruding member (8) and having a second height – extending in the height direction from the first level (H_B) of the bottom surface (7') to a third level (H_{T1}) of the upper surface (9b) of the first toothed part

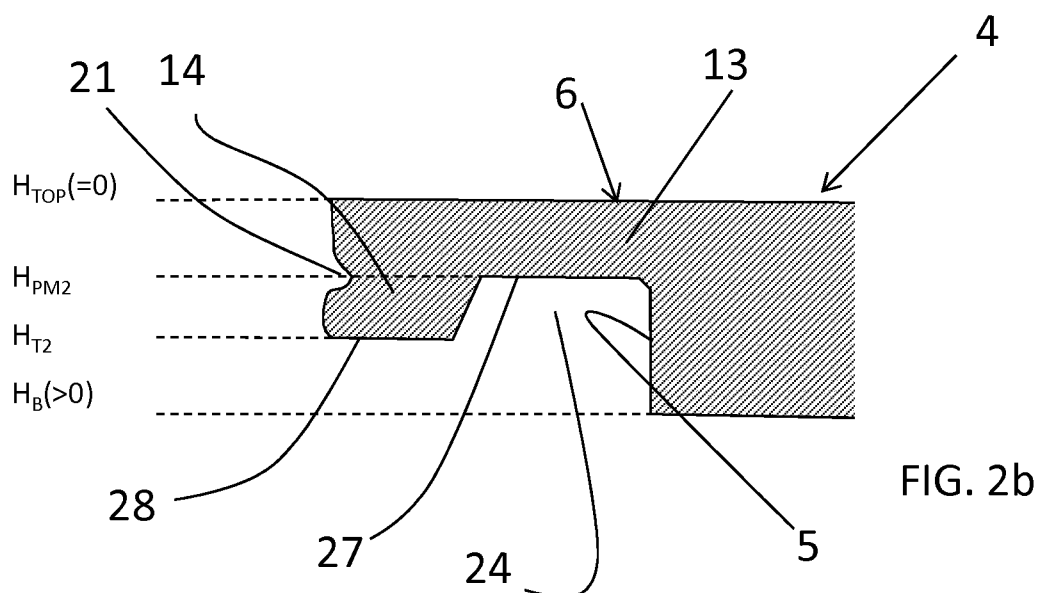
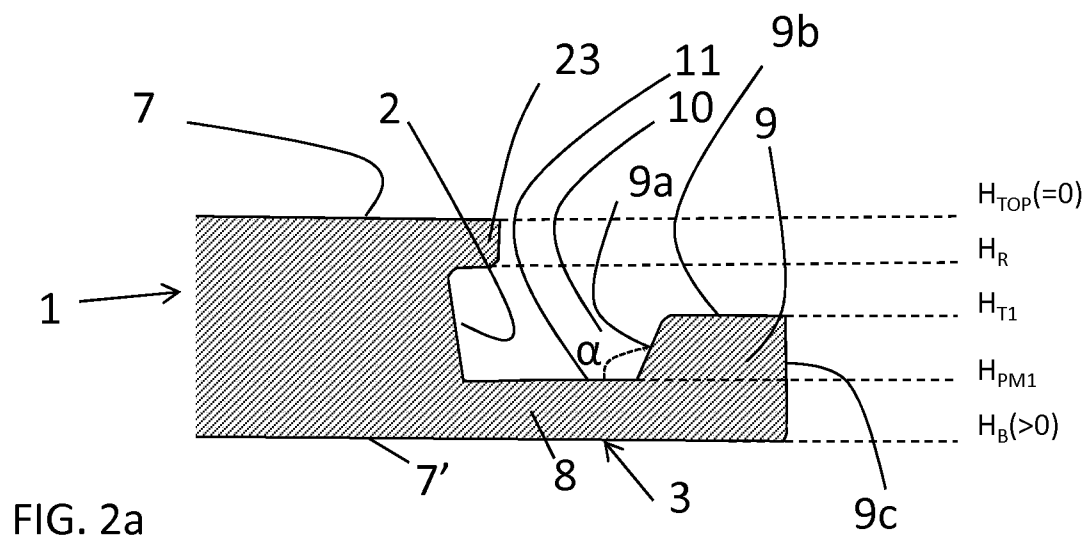
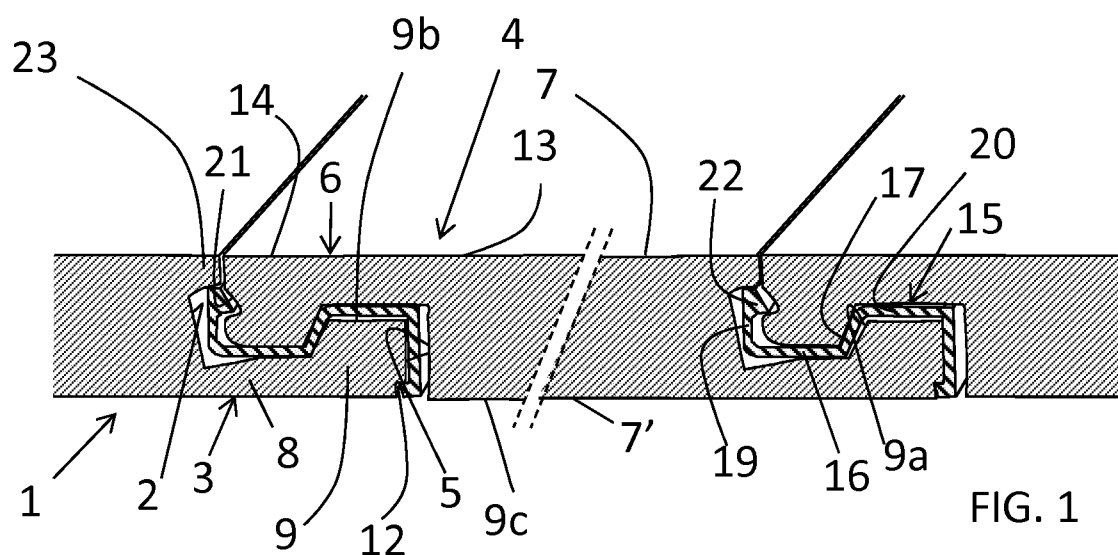
(9) – ($H_B - H_{T1}$) that is larger than the first height ($H_B - H_{PM1}$) and smaller than the height (H_B) of the first panel (1), thereby defining a first channel (10) between the first toothed part (9), a top surface (11) of the first protruding member (8) and the side edge (2) of the first panel;

- the first retaining profile (3) comprising a protruding rim (23) that extends from the side edge (2) along the length of that side edge (2) from the level (H_{TOP}) of the decor surface (7) of the first panel – to a fourth level (H_R), the fourth level (H_R) situated between the level of the decor surface (H_{TOP}) and the top surface (11) of the first protruding member (8) extending at the second level (H_{PM1}), the protruding rim (23) partially extending above the first channel (10);
- the second retaining profile (6) comprising a second protruding member (13) having a third height (H_{PM2}) that is smaller than the height (H_B) of the second panel (4), and
- a second toothed part (14) disposed at a free end of the second protruding member (13), said second toothed part (14) configured to cooperate with the first channel (10), said second toothed part (14) comprising a groove (21) in a surface of the second toothed part (14) facing away from the side edge (5) of the second panel;

said locking profile (15) configured to be mounted on the first retaining profile (3), and comprising:

- a base (16) positioned in the first channel (10);
- a first abutment portion (17) extending from a first edge of the base (16) and disposed along the edge of the channel (10) defined by the toothed part (9), said first abutment portion (17) defining an abutment surface (18) facing the first channel (10);
- a second abutment portion (19) extending from a second edge of the base (16) opposite the first edge and positioned in the first channel (10) along the side edge of the first panel, said second abutment portion (19) comprising a rim (22) at its free end and extending in a direction facing away from the side edge (2) of the

first panel (1), such that the rim (22) of the locking profile is snapped into the groove (21) of the second retaining profile (6) upon joining two panels, characterized in that said first channel (10) and the locking profile (15) mounted therein are configured to establish a first pivot (25) positioned along the base (16) of the locking profile (15), said first pivot (25) established by a surface (11) of the first protruding member (8) facing the base (16) of the locking profile (15) said surface (11) comprising a support section (11a) extending such that upon joining two adjacent profiles, the locking profile (15) is rigidly clamped between the support section (11a) of the first panel (1) and the second toothed part (14) of a second panel (4) and comprising a second section (11b) positioned such that upon joining two adjacent profiles, a void remains present between the surface (11) of the first panel (1), the second toothed part (14) of the second panel (4) and the locking profile (15), whereby at insertion of the toothed part (14) of the second panel (4) in the first channel (10) of the first panel (1) the locking profile (17) pivots downwards at the first pivot (25), thereby tilting the second abutment portion (19) and rim (22) towards the side edge (2) of the first panel and as such increasing the distance between the free ends of the abutment portions (17, 19) of the locking profile (15); and in that said first channel (10) and the locking profile (15) mounted therein are configured to establish a second pivot (26) positioned at the transition of the base (16) and the second abutment portion (19) or along the second abutment portion (19).



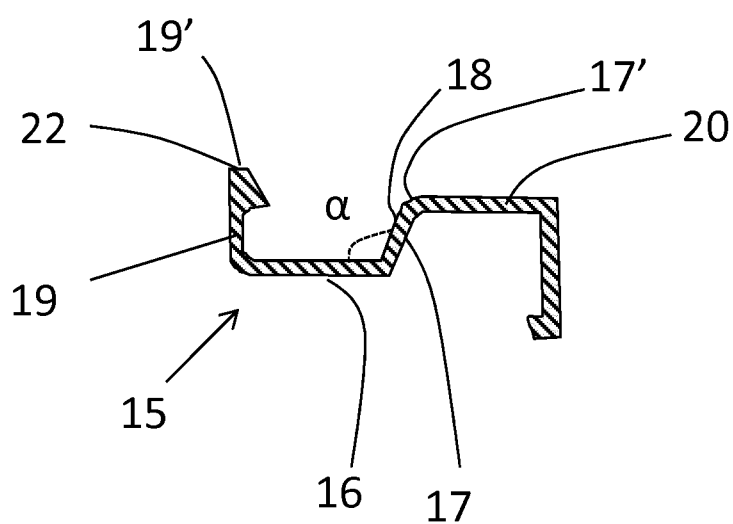


FIG. 3a

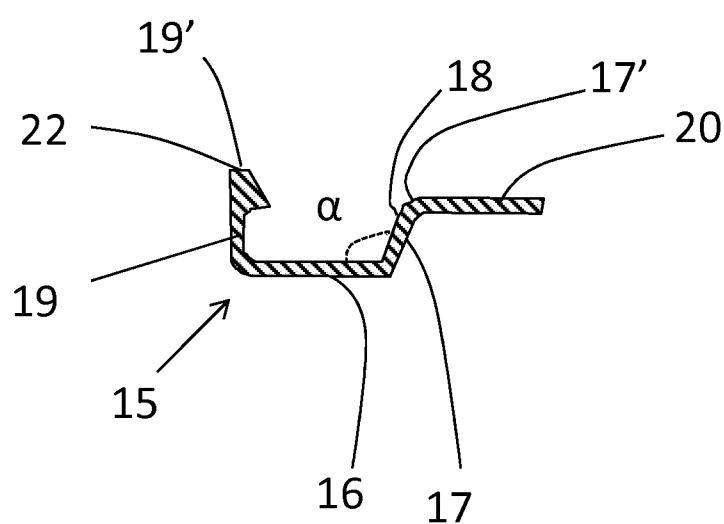


FIG. 3b

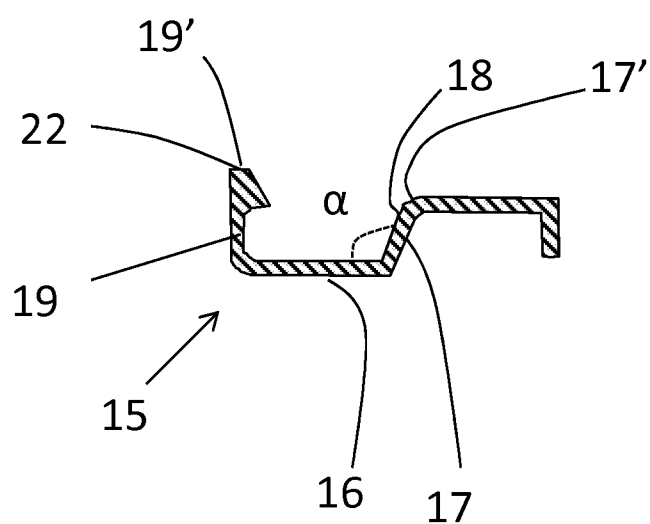


FIG. 3c



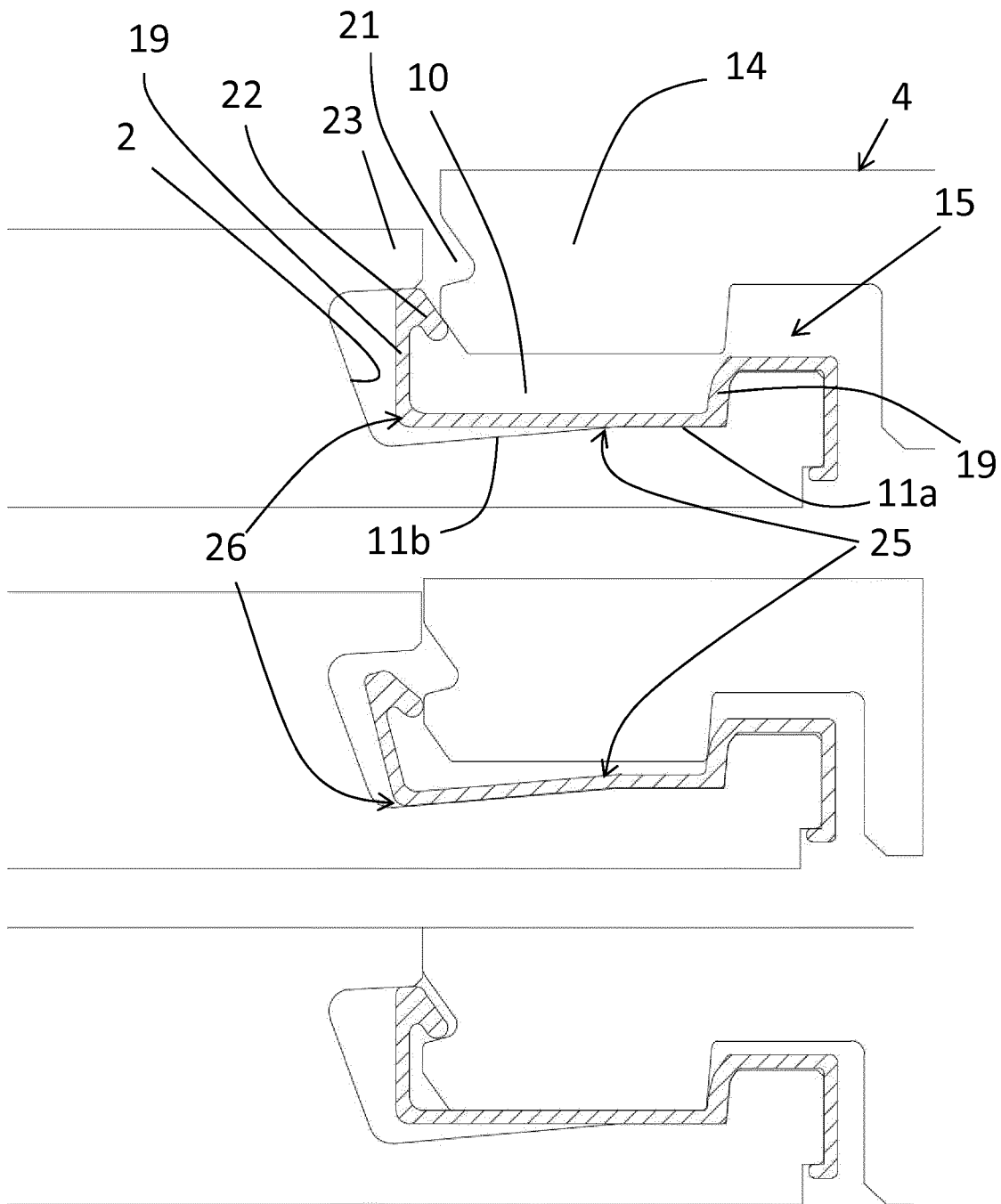


FIG. 6

