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(54) **JOINING SYSTEM FOR BATTEN FLOORS**

(57) The present invention relates to a system for joining battens (3, 3', 3'', 3''') of a batten (2) floor, comprising:

- a joint (1) comprising a longitudinally extending bar (8) comprising:

- a main body (9) with an upper side (25) and a lower side (26),
- a central appendage (11), and a first (15') and second (15'') lateral appendage projecting transversally from the upper (25) side of the main body (9);

- a first (3') and a second (3'') batten with an upper side (23) and a lower side (24), intended to be connected and/or flanked along their respective longitudinal sides

(7', 7''), each batten (3', 3'') comprising:

- on lateral edges along said longitudinal sides (7', 7'') a lateral groove (19) such as to form, when the two battens (3', 3'') are flanked, a central seat (20) capable of accommodating the central appendage (11) of the bar (8), creating, in cross-section, a shape constraint such to prevent the latter from moving out,
- on the lower side (24) close to each of the longitudinal sides (7', 7'') a first (21') and a second (21'') lower grooves shaped in such a way that the first (15') and second (15'') lateral appendages of the bar (8) can slide into them so as to form a constraint preventing the battens (3', 3'') from reciprocally moving away.

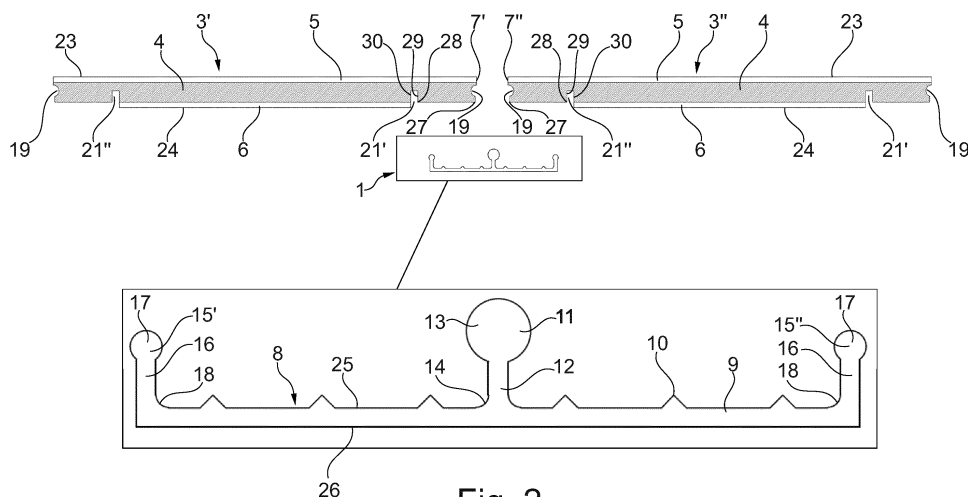


Fig. 2

Description

Technical field of the invention

[0001] The present invention relates to a joining system for batten floors, in particular, as an example but not limited to, floating type floors.

Prior art

[0002] With reference to batten floors, these are made by placing together battens, in wood but not only, shaped laterally to allow their relative interlocking. Typically, adhesives must be used to complete the installation so that the connection of the battens is sufficiently stable. This causes considerable problems if one or more battens have to be replaced or removed. The use of adhesives is not only detrimental to the environment, but also results in higher costs and longer laying times for the floor.

[0003] Systems have therefore been proposed that allow the battens to be laid without the need for adhesives.

[0004] For example, the international application WO 2020/183382 A1 describes a joint for batten floors comprising a plastic linear bar with a central flat body from which protrude laterally a first and a second appendage elastically deformable and that can be inserted in corresponding seats formed inferiorly and longitudinally in two adjacent battens to be connected. The first and second appendages of the linear bar have a substantially S-shaped conformation with the free end facing outwards from the flat body, and the housings in the battens have a conformation that is counter-sagged to the shape of the first and second appendages.

Summary of the invention

[0005] The purpose of the present invention is to make available a joining system for batten floors that does not require the use of adhesives and is an alternative to the systems mentioned with reference to the prior art.

[0006] This and other purposes are achieved by a joining system for batten floors according to claim 1.

[0007] The dependent claims define possible advantageous embodiments of the invention.

[0008] Numbered aspects of the invention follow.

1. System for joining battens (3, 3', 3'', 3''') of a batten floor (2), comprising:

- a joint (1) comprising a longitudinally extending bar (8) comprising:
 - a main body (9) with an upper side (25) and a lower side (26),
 - a central appendage (11), and a first (15') and a second (15'') lateral appendages, transversally protruding from the upper (25)

side of the main body (9);

- a first (3') and a second (3'') battens with an upper side (23') and a lower (24'') side, intended to be connected and/or flanked along their respective longitudinal sides (7', 7''), each batten (3', 3'') comprising:

- on lateral edges along said longitudinal sides (7', 7'') a lateral groove (19) such as to form, when the two battens (3', 3'') are flanked, a central seat (20) apt to house the central appendage (11) of the bar (8), creating, in cross-section, a shape constraint such a to prevent the latter from moving out,
- on the lower side (24) in proximity of each of the longitudinal sides (7', 7'') a first (21') and a second (21'') lower grooves shaped so that the first (15') and second (15'') lateral appendages of the bar (8) can be slidably inserted inside them so as to form a constraint preventing the battens (3', 3'') from reciprocally moving away.

2. Joining system according to aspect 1, in which, in cross-section, said bar (8) has the shape of a substantially lying down E.

3. Joining system according to aspect 1 or 2, wherein the central appendage (11) of the bar (8) is arranged at the centreline of the main body (9), and said first (15') and second (15'') lateral appendages are respectively arranged at opposite lateral ends of the main body (9).

4. Joining system according to any one of the preceding aspects, wherein the central appendage (11) of the bar (8) comprises a first elongated portion (12) orthogonal to the main body (9), and an end portion (13) enlarged with respect to the first elongated portion (12).

5. Joining system according to aspect 4, wherein, in cross-section, the first portion (12) of the central appendage (11) has a substantially rectangular shape and the end portion (13) of the central appendage (11) has a substantially circular shape.

6. Joining system according to any one of the preceding aspects, wherein the lateral appendages (15', 15'') of the bar (8) comprise a first elongated portion (16) orthogonal to the main body, and an end portion (17) enlarged, with respect to the first elongated portion (16), at least inwardly.

7. Joining system according to aspect 6, wherein, in cross-section, the first portion (16) of the lateral appendages (15', 15'') has a substantially rectangular shape and the end portion (17) of the lateral appendages (15', 15'') has a substantially circular or semi-circular shape.

8. Joining system according to any one of the preceding aspects, wherein when the first (15') and sec-

ond (15'') lateral appendages of the bar (8) are housed in the first (21') and second (21'') lower grooves of the first (3') and second (3'') battens, the first portions (16) of the lateral appendages (15', 15', 15'') of the bar (8) elastically outwardly bend and the end portions (17) of the lateral appendages (15', 15'') of the bar (8) abut against internal walls (29) on the internal sides of the lower grooves (21', 21'') of the battens (3', 3'').

9. Joining system according to any one of the preceding aspects, wherein the lateral grooves (19) of the battens (3', 3'') are shaped in such a way that the central seat (20) has a shape at least partly substantially complementary to that of the central appendage (11) of the bar (8).

10. Joining system according to any one of the preceding aspects, wherein the lateral grooves (19) of the battens (3', 3'') are shaped in such a way that the central appendage (11) of the bar (8) is loosely housed in the central seat (20).

11. Joining system according to any one of the preceding aspects, wherein the first (21') and the second (21'') lower grooves of the battens (3', 3'') are shaped in such a way that the lateral appendages (15', 15'') can be slidably inserted inside them from the lower side (24) towards the upper side (23) of the respective batten (3', 3''), without creating shape constraints that prevent the first (15') and second (15'') lateral appendages of the bar (8) from slidably moving out from the upper side (23) towards the lower side (24) of the respective batten (3', 3'').

12. Joining system according to any one of the preceding aspects, wherein the first (21') and second (21'') lower grooves of the battens (3', 3'') and the first (15') and second (15'') lateral appendages of the bar (8) are shaped such that the lateral appendages (15', 15'') of the bar (8) do not snap into the lower grooves (21', 21'') of the battens (3', 3'').

13. Joining system according to any one of the preceding aspects, wherein the first (21') and second (21'') lower grooves of the battens (3', 3''), in cross-section, have a substantially rectangular shape which develops orthogonally to the surface on the lower side (24) of the battens (3', 3'').

14. Joining system according to any one of the preceding aspects, wherein said first (3') and second (3'') battens, when flanked, form on the lower side (24) a cavity (31) suitable for housing the main body (9) of the bar (8), such that, following connection of the battens, the surface on the lower side (26) of the main body (9) of the bar (8) and the surfaces on the lower sides (24) of the battens (3', 3'') are flush.

15. Joining system according to any one of the preceding aspects, wherein said bar (8) of the joint (1) is made of plastic material.

16. Joining system according to any one of the preceding aspects, wherein said bar (8) of joint (1) has a constant cross-section along the whole longitudinal

extension of the bar.

17. Joining system according to any one of the preceding aspects, further comprising at least a third batten (3'') intended to be abutted to at least one between the first and second battens (3', 3'') at respective head portions (71', 71''), the head portions (71', 71'') being transverse or orthogonal to respective longitudinal sides (7', 7'').

18. Joining system according to aspect 17, further comprising at least one constraining element (77) configured to constrain said third batten (3'') and one between said first and second battens (3', 3'') at the respective head portions (71', 71'').

19. Joining system according to aspect 18, wherein said at least one constraining element (77) comprises one or more harpoon portions (77'), for example hooked or uncinated or notched, intended and/or configured to harpoon or hook the head portions (71', 71'') of the third batten (3'') and of one between the first and second battens (3', 3'').

20. Joining system according to aspect 18 or 19, in which:

- each head portion (71', 71'') of the third batten (3'') and one between the first and second battens (3', 3'') includes a cavity, e.g. a groove,
- said at least one constraining element (77) includes a connector configured to be inserted at said cavity,
- preferably, the connector and groove are at least partially countershaped with each other.

21. Joining system according to aspect 18 or 19 or 20, wherein said at least one constraining element (77) is of the adhesive type and/or is configured to be bonded to said head portions (71', 71'') of the third batten (3'') and of one between the first and second battens (3', 3'').

21. Joining system according to any of the preceding aspects, in which each batten (3', 3'', 3''') comprises:

- a finishing or upper covering layer (5),
- a lower covering layer (6),
- a core (4) placed between the finishing or upper covering layer (5) and the lower covering layer (6).

22. Joining system according to aspect 21, wherein the core (4), the finishing or upper covering layer (5) and the lower covering layer (6) are made of different materials, preferably the lower covering layer (6) being made of a more deformable material (e.g. cork) than the finishing or upper covering layer (5, e.g. MDF or HDF).

23. Joining system according to aspect 21 or 22 and aspect 19 or aspect 20 when dependent on 19, wherein the one or more harpoon portions (77') is intended and/or configured to harpoon or hook the

head portions (71', 71'') of the third batten (3''') and one between the first and second battens (3', 3'') at the lower covering layer (6) defined at the head portions (71', 71'').

24. Joining system according to any one of aspects 18 to 23, wherein:

- the head portions (71', 71'') comprise a central part and lateral ends opposed to the central part,
- said at least one constraining element is intended and/or configured to constrain the battens (3', 3'', 3''') at the respective central part of the head portions (71', 71'').

25. Joining system according to any one of aspects 18 to 24, wherein:

- the head portions (71', 71'') comprise a central part and lateral ends opposed to the central part,
- said at least one constraining element is intended and/or configured to constrain the battens (3', 3'', 3''') at at least one respective lateral end of the head portions (71', 71'').

Brief description of the figures

[0009] In order to better understand the invention and appreciate its advantages, some non-limiting exemplary embodiments of the invention will be described below, with reference to the attached figures:

Figure 1 is a schematic plan illustration of a batten floor;

Figure 2 is a cross-sectional view, in disassembled condition, with enlargement of a portion of it, of a joining system for batten floors according to an embodiment of the invention;

Figure 3 is a sectional view, in assembled condition, with enlargement of a portion of it, of the joining system of figure 2;

Figure 4 is a plan view of a joint of the joining system for batten floors according to a possible embodiment of the invention,

Figure 5 illustrates a view from below of two battens, the head portions of which are close together and joined by a constraining element placed in a central part of the head portions of the battens,

Figure 6 illustrates a view from below of two battens, the head portions of which are close together and joined by a constraining element placed at a lateral end of the head portions of the battens,

Figure 7 shows a top view of the two battens of Figure 6, in the configuration prior to their assembly, in which the end portions of the battens are spaced apart and a constraining element is visible (see also the relative detail),

Figure 8 illustrates a view from below of two battens, the head portions of which are close together and

joined by a constraining element (different from that illustrated in Figures 5-7) arranged in a central part of the head portions of the battens.

Detailed description of the invention

[0010] With reference to the attached figures, a portion of floor 2 comprises a plurality of battens 3, in particular a pair of battens 3', 3'', and a joint 1 for their mutual joining.

[0011] By way of example, the battens 3', 3'', may be made of solid wood, or may comprise a core 4 made of MDF ("medium-density fibreboard") or HDF ("high-density fibreboard") with a finishing layer 5 (or upper covering layer) made of wood on at least an upper side 23 (i.e. on the walkable side of the floor) and possibly with a lower covering layer 6 (e.g. cork) on a lower side 24, opposite the walkable upper side 23. The core 4 is arranged between the finishing or upper covering layer 5 and the lower covering layer 6. Preferably, the lower covering layer 6 only partially covers the batten 3', 3'' on the bottom side 24, leaving a free portion thereof, wherein the core 4 is uncovered, for positioning the joint 1, as will be described in detail below. In general, the finishing or upper covering layer 5, the lower covering layer 6 and the core 4 may be of different materials.

[0012] The battens 3', 3'' preferably have a substantially parallelepiped shape with a rectangular or square contour when viewed in plan. This shape seen in plan view is the shape of the batten generally visible when the floor is laid (as shown for example in figure 1).

[0013] The battens 3', 3'' are intended to be flanked at the respective longitudinal sides 7', 7'', which, according to the rectangular-shaped variant, are preferably the longer sides of the rectangle.

[0014] The system may also provide for a further batten 3''', which may be abutted to the first batten 3', or a pair of further battens 3''', each of which may be abutted to a respective batten 3', 3'' (see figure 1). In other words, for the purpose of the present discussion, the first and second battens 3', 3'' are understood to mean battens intended to be abutted to each other and joined by means of the joint 1 (see Figures 1 to 3), while the batten (s) 3''' are understood to mean battens intended to be abutted and/or coupled at end portions of the battens 3', 3'' (see Figures 5 to 8). The one or more further 3''' battens share the characteristics described above with reference to the battens 3', 3''; the numerical references also apply, mutatis mutandis, to the third batten 3''' (see e.g. longitudinal side 7' in Fig. 5 or the lower groove 21''' in Fig. 8).

[0015] Furthermore, each batten 3', 3'', 3''' comprises a first head portion 71' and a second head portion 71'' opposed to each other. The battens 3', 3'', 3''' are intended to be abutted and/or coupled at the head portions 71', 71''. Preferably, the head portions 71', 71'' are end portions of the batten 3', 3'', 3''' opposed to each other with respect to a longitudinal development of the batten 3', 3'', 3'''.

[0016] The head portions 71', 71'' of each batten 3',

3", 3''' are transverse, in particular orthogonal, to the longitudinal sides 7', 7" of the batten 3', 3", 3'''. According to the rectangular-shaped variant illustrated in the attached figures, the head portions 71', 71" are preferably the shorter sides of the rectangle.

[0017] The 71', 71" head portions comprise a central part and a first and second lateral ends opposed laterally to the central part.

[0018] The joint 1 comprises a longitudinally developing rod 8, preferably made in one piece, even more preferably made of plastic material, advantageously presenting in cross-section (i.e. orthogonally to the direction of longitudinal development) a substantially lying E-shape.

[0019] Referring precisely to the cross-section of the bar 8, it comprises a main body 9, preferably substantially rectangular in shape, having an upper side 25 (intended to face the lower side 24 of the battens 3', 3") and a lower side 26 opposite the upper side 25.

[0020] According to an embodiment, at the upper side 25, the main body 9 comprises a plurality of protruding support elements 10 having in cross-section, for example, a substantially triangular shape. On the lower side 26, the main body 9 of the bar 8 is preferably flat.

[0021] The main body 9 comprises, preferably at the centreline, a central appendage 11 projecting transversely, in particular orthogonally, from the upper side 25.

[0022] The central appendage 11 comprises a first elongated portion 12, preferably having a substantially rectangular shape in cross-section, and an end portion 13 enlarged relative to the first portion 12. Preferably, the end portion 13 has a substantially circular shape in cross-section. Preferably, the first end portion 12 connects to the upper side 25 of the main body 9 with two opposing arched connections 14, i.e. not forming sharp edges.

[0023] The main body 9 also comprises, preferably at or near its opposite lateral ends, a first 15' and a second 15" lateral appendage, projecting transversely, in particular orthogonally, from the upper side 25 of the main body 9.

[0024] The lateral appendages 15', 15" comprise a first elongated portion 16, preferably having a substantially rectangular shape in cross-section, and an end portion 17, enlarged with respect to the first portion 16 at least towards the inside of the cross-section of the joint, i.e. towards the central appendage 12 thereof. Preferably, the end portion 17 has a substantially circular or semi-circular shape in cross-section. Preferably, the first portion 16 connects to the upper side of the main body 9 with an arched connection 18, i.e. not forming a sharp edge. Preferably, the first portion 16 is orthogonal to the main body 9.

[0025] According to one embodiment, in cross-section, the extension from the upper side 25 of the main body 9 of the lateral appendages 15', 15" is minor than that of the central appendage 11. The lateral appendages 15', 15" preferably have equal extensions to each other, so that the main body 9, in cross-section, preferably has an axisymmetrical form.

[0026] Advantageously, the lateral appendages 15', 15" and, optionally, the central appendage 11, are elastically deformable.

[0027] Each batten 3', 3" has, along the lateral edges joining the upper side 23 and the lower side 24 along each longitudinal side 7', 7", a lateral groove 19 shaped so as to form, when the two battens 3', 3" are flanked, a central groove 20 open on their lower sides 24, capable of accommodating within it the central appendage 11 of the bar 8, creating a shape constraint for the end portion 13 of the latter, such as to prevent it from slipping out towards the lower side 24.

[0028] Advantageously, the lateral grooves 19 are shaped in such a way that the central seat 20 has a substantially complementary shape to that of the central appendage 11 of the bar 8, in particular in such a way that the central seat 20 has a substantially complementary shape to that of the end portion 13, preferably circular, and at least to that of the final section - connected to the end portion 13 - of the first elongated portion 12, preferably rectangular.

[0029] Preferably, the lateral grooves 19 do not have any arched connections with the surface of the lower side 24 of the battens 3', 3", i.e. sharp edges 27 are provided which, after connection, will be positioned at or near the concavity of the arched connections 14 of the bar 8.

[0030] It should be noted that, preferably, the lateral grooves 19 are shaped in such a way that the central appendage 11 of the bar 8 is positioned in the central groove 20 slightly loosely and such that the battens 3', 3", when connected, maintain a, albeit minimal, distance 32 along the longitudinal sides 7', 7", such that a tolerance in the mutual positioning of the battens exists during installation.

[0031] Each batten 3', 3" further comprises, on the lower side 24 and in the vicinity of each of the longitudinal sides 7', 7", a first 21' and a second 21" lower grooves. The grooves 21', 21" are located at a distance from the lateral groove 19 in the nearest longitudinal side 7', 7" approximately equal to the distance of each lateral appendage 15', 15" from the central appendage 11 of the bar 8, unless there is a small difference in distance sufficient to cause the lateral appendages 15', 15" to bend outwards, as will be described below.

[0032] The lower grooves 21', 21" are shaped in such a way that the lateral appendages 15', 15" can slide into them from the lower side 24 towards the upper side 23 of the respective batten 3', 3", preferably without realizing any shape constraint with the end portions 17 of the lateral appendages 15', 15" such as to prevent them from sliding out, contrary to what happens in the central seat 20 with the end portion 13 of the central appendage 11. Advantageously, the lower grooves 21', 21" and the lateral appendages 15', 15" are not countershaped. Advantageously, the lateral appendages 15', 15" do not snap into the lower grooves 21', 21". According to an embodiment, the grooves 21', 21" have, in cross-section of the batten, a substantially rectangular shape, preferably run-

ning orthogonally to the surface on the lower side 24 of the battens 3', 3".

[0033] Preferably, the lower grooves 21', 21" do not have arched connections with the surface on the lower side 24 of the battens, i.e. sharp edges 28 are provided which, when the battens are connected, will be positioned at or near the concavity of the arched connections 18 of the lateral appendages 15', 15" of the bar 8.

[0034] It should be noted that, preferably, the lower grooves 21', 21" are shaped and positioned in such a way that, following the insertion within them of the lateral appendages 15', 15" of the bar 8, these, in particular their first end portions 16, bend elastically outwards and their respective end portions 17, preferably having a circular cross-section, settle against the internal walls 29 of the lower grooves 21', 21", pushing the battens 3', 3" closer together at the longitudinal sides 7', 7". This also causes the locking of the end portion 13 of the central appendage 11 in the central seat 20, which will not be able to open due to the aforementioned elastic thrust. Preferably, in the assembled condition the end portions 17 of the lateral appendages 15', 15" are instead at a distance, i.e. not in contact, with outer walls 30, opposite the internal walls 29, of the lower grooves 21', 21".

[0035] The above-mentioned lateral grooves 19' and lower grooves 21', 21" preferably extend along the entire length of the respective battens 3', 3" along the longitudinal direction of the battens.

[0036] Similarly, the bar 8 is preferably shaped as an extrusion solid in the longitudinal direction, in which the cross-section is the same along the entire longitudinal extent. In other words, there are no notches or discontinuities. Therefore, the central appendage 11, the lateral appendages 15', 15", as well as the projecting support elements 10 (where provided) also extend along the entire longitudinal length of the bar 8.

[0037] Preferably, the bar 8 has a longitudinal extension greater than that of the battens 3', 3", 3''' or of the longitudinal sides 7', 7" of the battens 3', 3", 3'''.

[0038] According to an embodiment, the battens 3', 3", 3''' and the bar 8 are shaped in such a way that the surface on the lower side 26 of the main body 9 of the bar 8, when this is connected to the battens 3', 3", 3''', is flush with the surface on the lower side 24 of the battens 3', 3", 3''' . For this purpose, in the space between the side groove 19 and the nearest groove 21', 21'', the batten can be devoid of the lower covering layer 6. In this way, the battens 3', 3", 3''' placed side by side will form a cavity 31 for the main body 9 of the bar 8, which preferably also leaves the lower grooves 21', 21" free at the bottom, which will then be accessible from the lateral appendages 15', 15''.

[0039] The joining system further comprises at least one constraining element 77 configured to constrain the third batten 3''' and one between the first and second battens 3', 3" at respective head portions 71', 71". In particular, where two or N battens 3', 3" are provided, a plurality of constraining elements 77 configured to constrain

each batten 3''' to a respective batten 3', 3" may be provided.

[0040] The provision of constraining elements 77 can be particularly advantageous if a floor covering has to be laid over very large areas, e.g. over an area of more than 200 m².

[0041] Unless otherwise indicated, a constraining element 77 is described below, taking into account the fact that a single constraining element 77 or a plurality of constraining elements 77 may be used to constrain the batten 3''' to a respective batten 3', 3".

[0042] The constraining element may be intended and/or configured to constrain the battens 3', 3", 3''' at a respective central part of the head portions 71', 71" (see Figures 5 and 8). Alternatively or in combination therewith, the constraining element may be intended and/or configured to constrain the battens 3', 3", 3''' at at least one respective side end of the head portions 71', 71" (see Figures 6 and 7).

[0043] In accordance with a possible embodiment illustrated in Figures 5-7, the constraining element 77 comprises one or more hooked or uncinated or notched harpoon portions 77', each of which is intended and/or configured to harpoon or hook the head portions 71', 71" of the third batten 3''' and one between the first and second battens 3', 3". Each harpoon portion 77' may be intended and/or configured to harpoon or hook such head portions 71', 71" at the lower covering layer 6 defined at the head portions 71', 71". As illustrated in the appended Figures 5-7, and in particular in the detail of Figure 7, the constraining element 77 may have a notched profile having a plurality of notches and each harpoon portion 77' may be formed by a respective notch 77c.

[0044] In accordance with a possible embodiment illustrated in figure 8, the constraining element may be of an adhesive type and/or configured to be bonded to said head portions 71', 71" of the third batten 3''' and one between the first and second battens 3', 3". In Figure 8, the constraining element 77 is illustrated in the form of an adhesive strip; clearly, a plurality of strips may be provided. The adhesive and/or glue are configured to operate on the material of the lower covering layer 6, for example cork.

[0045] In accordance with another possible embodiment, each constraining element 77 comprises a connector, each head portion 71', 71" of the third batten 3''' and one between the first and second battens 3', 3" comprises a cavity, for example a groove. The groove may be transverse or orthogonal to the longitudinal sides 7', 7" or may run parallel thereto. In the case where the groove is parallel or transversal to the longitudinal sides 7', 7", it develops from at least one head portion 71', 71"; in particular, it may develop continuously between the head portions 71', 71" of the same batten 3', 3", 3''' or develop, starting from one of said head portions 71', 71", only for a stretch. The connector is configured to be inserted at the cavity to constrain the battens 3', 3", 3''' . Preferably, the connector and the groove are at least

partially countershaped to each other.

Floor laying procedure

[0046] When laying the floor 2, several joints 1' are laid, e.g. on a supporting structure at a distance from the bottom of a floating floor, suitably spaced from each other. The various battens 3', 3", 3''' are then connected to each of them by positioning the first lateral appendage 15' within the first groove 21' of the first batten 3' and the central appendage 11 within the lateral groove 19 of the same. The second adjacent batten 3" is then positioned so that the end portion 13 of the central appendage 11 of the bar 8 is clamped in the central groove 20 formed by the lateral grooves 19 of the two adjacent battens 3', 3", 3'''. It is therefore possible to insert the second lateral appendage 15'' within the second groove 15" of the second batten 3' ' also thanks to the elastic deformability of the first portions 16 of the lateral appendages 15', 15'' of the bar 8, which make possible a lateral mobility between adjacent battens during laying and, as said, push the adjacent battens closer to each other after laying.

[0047] The installation may involve constraining battens 3', 3", 3''' abutted to each other by means of one or more of the above-described constraining elements 77.

[0048] The above procedure can then be repeated for several battens until all the floor battens have been laid 2.

[0049] As will become clear to the skilled person, the laying of the battens can be carried out without machinery, as it is only necessary to apply slight pressure, such as to overcome the elastic force exerted by the lateral appendages 15', 15" (preferably of plastic material), on the battens in order to achieve coupling with a joint 1. Equally simple will be the uncoupling of the battens, which can be done simply by lifting the various battens, e.g. by means of suction cups.

Advantages of the invention and endnotes

[0050] From the above description, the skilled person will be able to appreciate how the batten floor joining system according to the invention makes it possible to lay batten floors quickly and without the use of adhesives. The non-use of adhesives also makes it possible to remove the battens easily, possibly even only in localized portions of the floor.

[0051] To the described embodiments of the floor-board joining system, the skilled person may, in order to meet specific contingent requirements, make numerous additions, modifications, or replace elements with functionally equivalent ones, without, however, going beyond the scope of the attached claims.

Claims

1. System for joining battens (3, 3', 3", 3''') of a batten floor (2), comprising:

- a joint (1) comprising a longitudinally extending bar (8) comprising:

- a main body (9) with an upper side (25) and a lower side (26),
- a central appendage (11), and a first (15') and a second (15'') lateral appendages, transversally protruding from the upper (25) side of the main body (9);

- a first (3') and a second (3'') battens with an upper side (23) and a lower side (24), intended to be connected and flanked along their respective longitudinal sides (7', 7''), each batten (3', 3'') comprising:

- on lateral edges along said longitudinal sides (7', 7'') a lateral groove (19) such to form, when the two battens (3', 3'') are flanked, a central seat (20) apt to house the central appendage (11) of the bar (8), creating, in cross-section, a shape constraint such to prevent the latter from moving out,
- on the lower side (24) in proximity of each of the longitudinal sides (7', 7'') a first (21') and a second (21'') lower grooves shaped so that the first (15') and second (15'') lateral appendages of the bar (8) can be slidably inserted inside them so to form a constraint preventing the battens (3', 3'') from reciprocally moving away.

2. Joining system according to claim 1, wherein the central appendage (11) of the bar (8) is arranged at the centreline of the main body (9), and said first (15') and second (15'') lateral appendages are respectively arranged at opposite lateral ends of the main body (9), optionally in which in cross-section, said bar (8) has the shape of a substantially lying down E.
3. Joining system according to claim 1 or 2, wherein the central appendage (11) of the bar (8) comprises a first elongated portion (12) orthogonal to the main body (9), and an end portion (13) enlarged with respect to the first elongated portion (12), and in which, in cross-section, the first portion (12) of the central appendage (11) has a substantially rectangular shape and the end portion (13) of the central appendage (11) has a substantially circular shape.
4. Joining system according to any one of the preceding claims, wherein the lateral appendages (15', 15'') of the bar (8) comprise a first elongated portion (16) orthogonal to the main body, and an end portion (17) enlarged, with respect to the first elongated portion (16), at least inwardly, and wherein, in cross-section, the first portion (16) of the

lateral appendages (15', 15'') has a substantially rectangular shape and the end portion (17) of the lateral appendages (15', 15'') has a substantially circular or semi-circular shape.

5. Joining system according to any one of the preceding claims, wherein when the first (15') and second (15'') lateral appendages of the bar (8) are housed in the first (21') and second (21'') lower grooves of the first (3') and second (3'') battens, the first portions (16) of the lateral appendages (15', 15'') of the bar (8) elastically outwardly bend and the end portions (17) of the lateral appendages (15', 15'') of the bar (8) abut against internal walls (29) placed on internal sides of the lower grooves (21', 21'') of the battens (3', 3'').
6. Joining system according to any one of the preceding claims, wherein the lateral grooves (19) of the battens (3', 3'') are shaped so that the central seat (20) has a shape at least partly substantially complementary to the one of the central appendage (11) of the bar (8), preferably wherein the lateral grooves (19) of the battens (3', 3'') are shaped so that the central appendage (11) of the bar (8) is loosely housed in the central seat (20).
7. Joining system according to any one of the preceding claims, wherein the first (21') and the second (21'') lower grooves of the battens (3', 3'') are shaped so that the lateral appendages (15', 15'') can be slidably inserted inside them from the lower side (24) towards the upper side (23) of the respective batten (3', 3', 3''), without forming shape constraints that prevent the first (15') and second (15'') lateral appendages of the bar (8) from slidably moving out from the upper side (23) towards the lower side (24) of the respective batten (3', 3'').
8. Joining system according to any one of the preceding claims, wherein the first (21') and second (21'') lower grooves of the battens (3', 3'') and the first (15') and second (15'') lateral appendages of the bar (8) are shaped so that the lateral appendages (15', 15'') of the bar (8) do not snap into the lower grooves (21', 21'') of the battens (3', 3'').
9. Joining system according to any one of the preceding claims, wherein the first (21') and second (21'') lower grooves of the battens (3', 3''), in cross-section, have a substantially rectangular shape which develops orthogonally to the surface on the lower side (24) of the battens (3', 3'').
10. Joining system according to any one of the preceding claims, wherein said first (3') and second (3'') battens, when flanked, form on the lower side (24) a

cavity (31) suitable for housing the main body (9) of the bar (8), so that, following connection of the battens, the surface on the lower side (26) of the main body (9) of the bar (8) and the surfaces on the lower sides (24) of the battens (3', 3'') are flush.

11. Joining system according to any one of the preceding claims, wherein said bar (8) of the joint (1) is made of plastic material and/or wherein said bar (8) of the joint (1) has a constant cross-section along the whole longitudinal extension of the bar.
12. Joining system according to any one of the preceding claims, further comprising at least a third batten (3'') intended to be abutted to at least one between the first and second battens (3', 3'') at respective head portions (71', 71''), the head portions (71', 71'') being transversal or orthogonal to respective longitudinal sides (7', 7''), the system further comprising at least one constraining element (77) configured to constrain said third batten (3'') and one between the first and second battens (3', 3'') at the respective head portions (71', 71'').
13. Joining system according to claim 12, wherein said at least one constraining element (77) comprises one or more harpoon portions (77'), for example hooked or uncinat or notched, intended and/or configured to harpoon or hook the head portions (71', 71'') of the third batten (3'') and of one between the first and second battens (3', 3'').
14. Joining system according to claim 12 or 13, wherein:
 - each head portion (71', 71'') of the third batten (3'') and one between the first and second battens (3', 3'') includes a cavity, e.g. a groove,
 - said at least one constraining element (77) includes a connector configured to be inserted at said cavity,
 - preferably, the connector and groove are at least partially countershaped with each other.
15. Joining system according to claim 12 or 13 or 14, wherein said at least one constraining element (77) is of adhesive type and/or is configured to be bonded to said head portions (71', 71'') of the third batten (3'') and of one between the first and second battens (3', 3'').

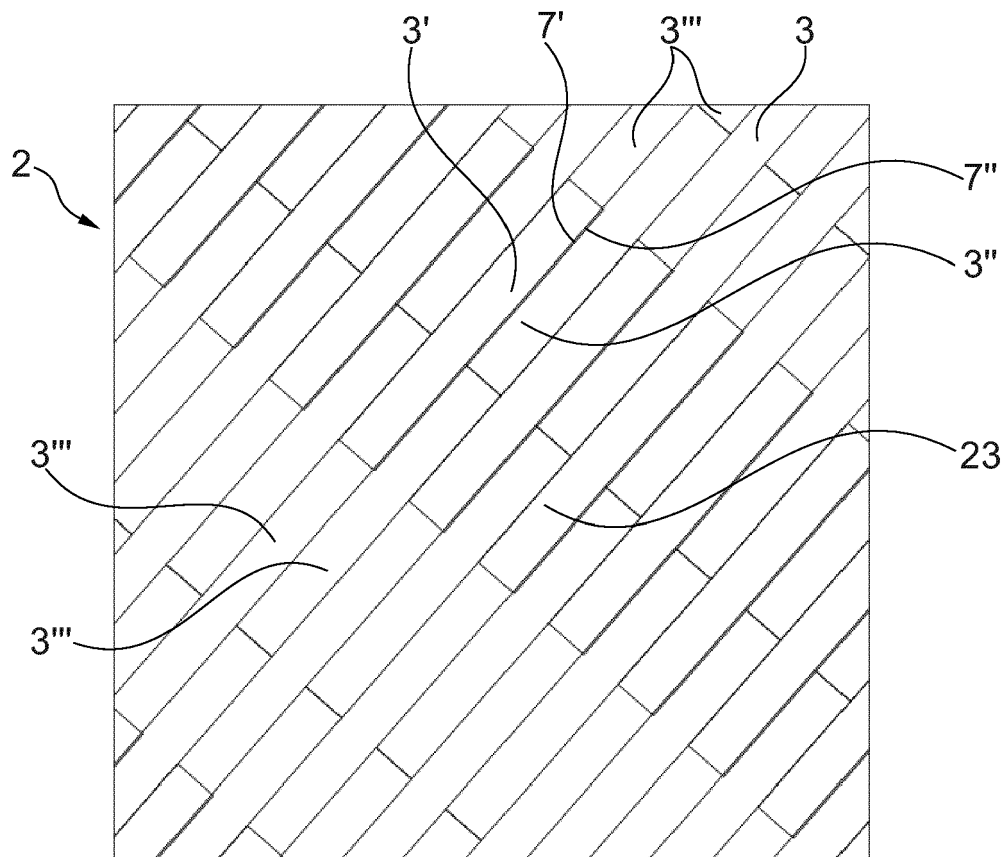


Fig. 1

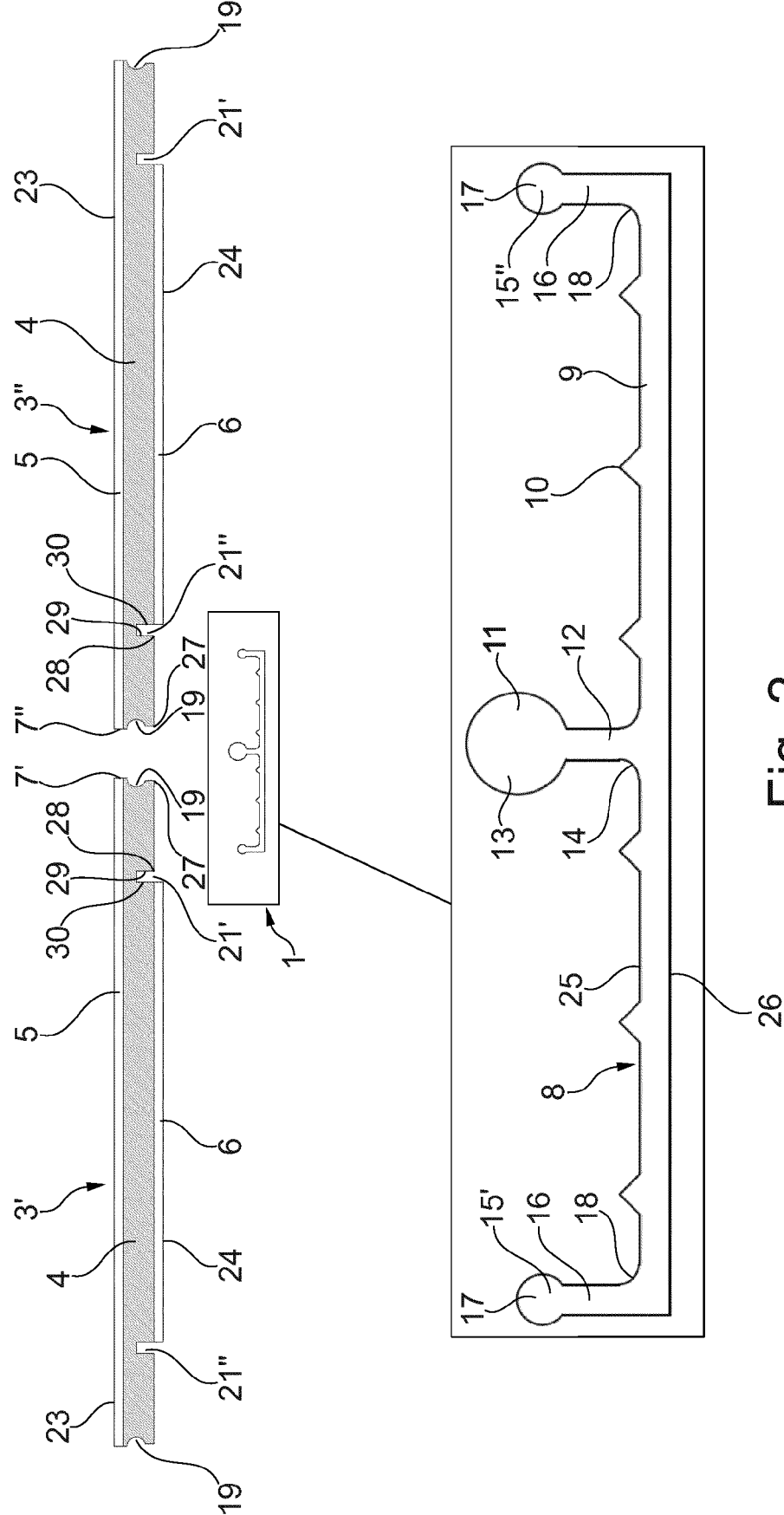


Fig. 2

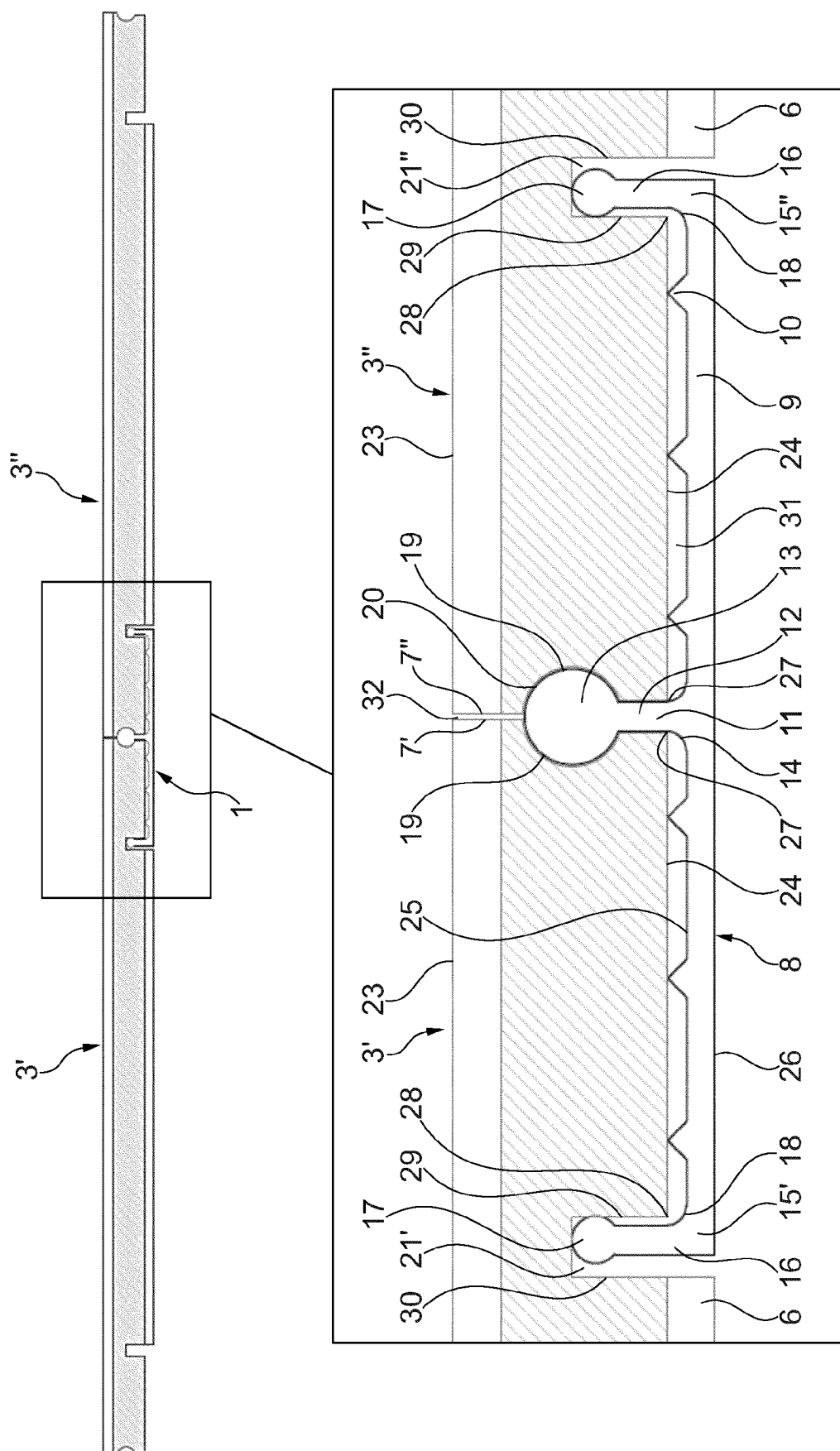


Fig. 3

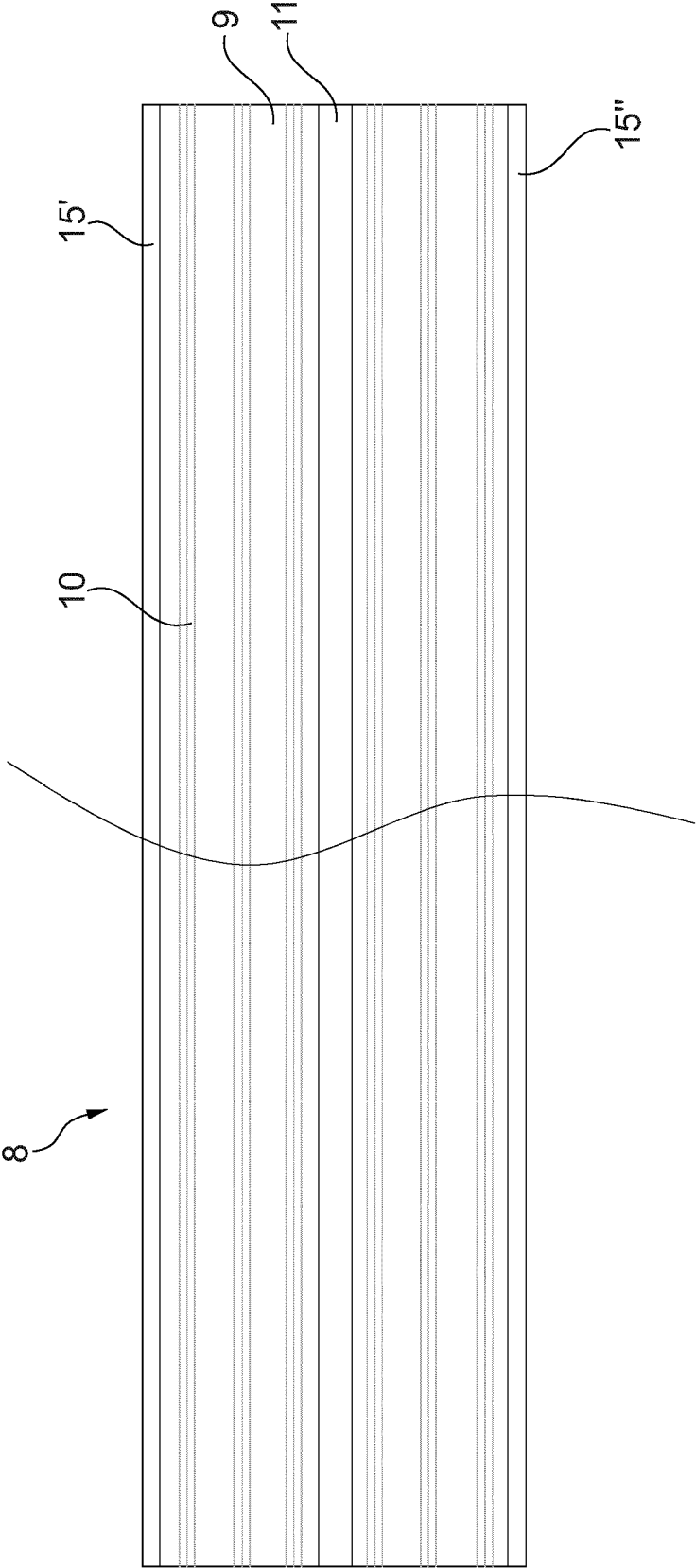


Fig. 4

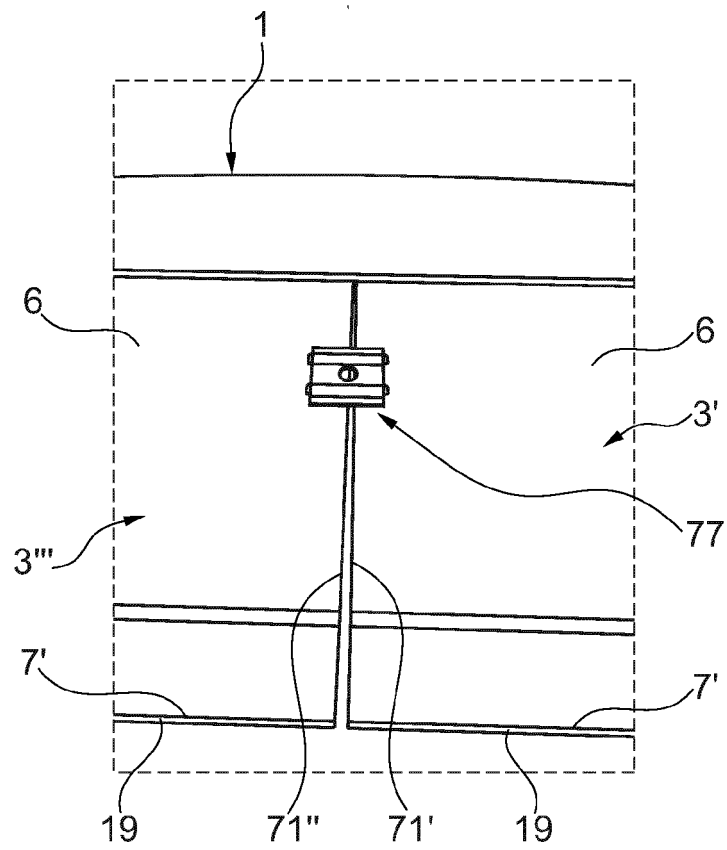


Fig. 5

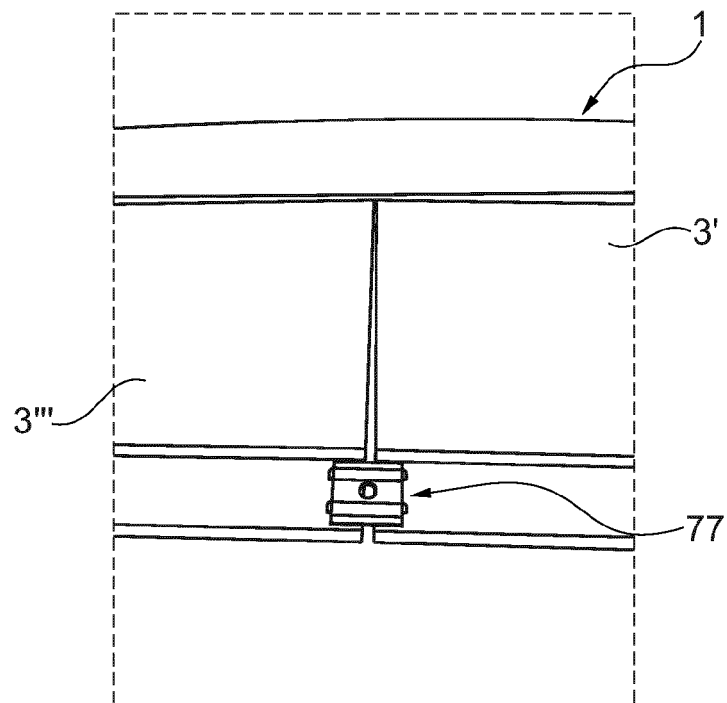


Fig. 6

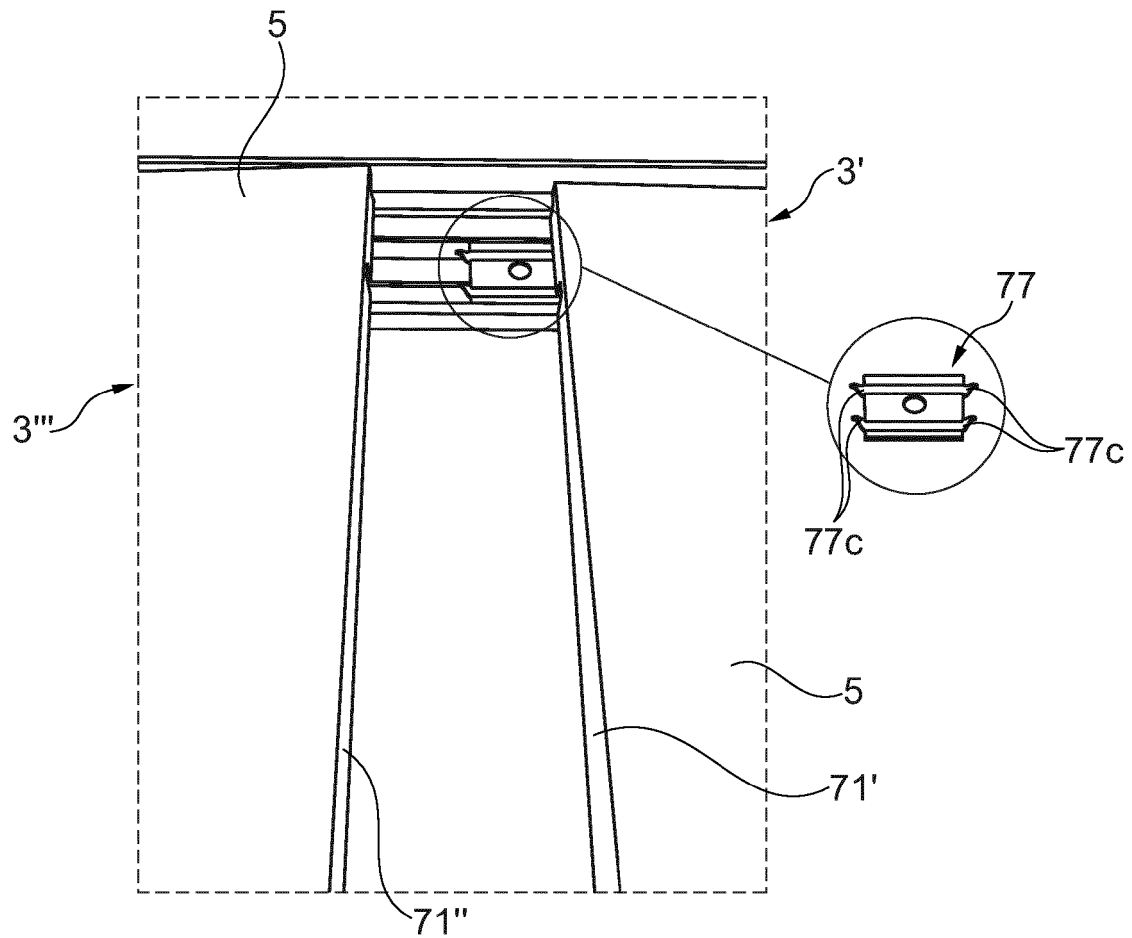


Fig. 7

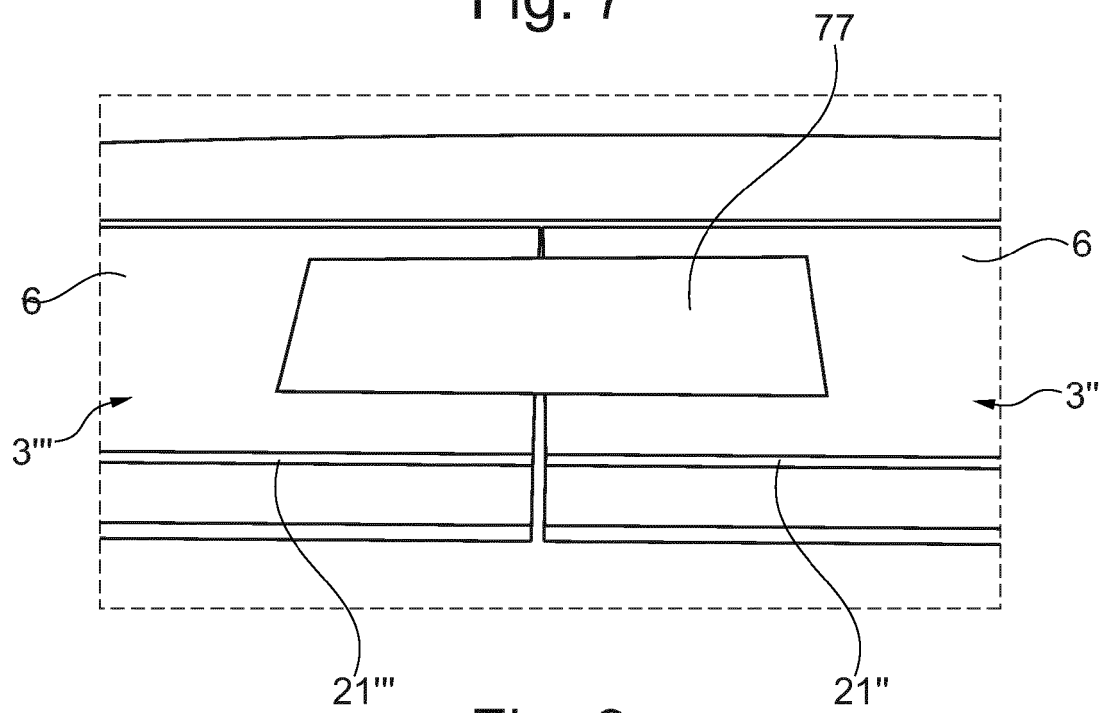


Fig. 8

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2020183382 A1 [0004]