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(54) **PROFILE-SECTION-SECURING SYSTEM**

(57) The present invention relates to a system for securing profile sections (2) of the flood, wall or false-ceiling panel type, which uses a base profile section (1) that supports the profile section (2) and has a groove (3) for engagement of the remaining securing elements. The present invention is essentially characterized in that it comprises: a securing element (4) that engages in the

base profile section and secures the profile sections (2); and an end securing element (10). The securing element (4) comprises a rotary component (5) that engages in the groove (3) of the base profile section (1), a securing component (6) proper, which secures the profile section (2), and a body (7) of the securing component that engages the aforesaid two elements.

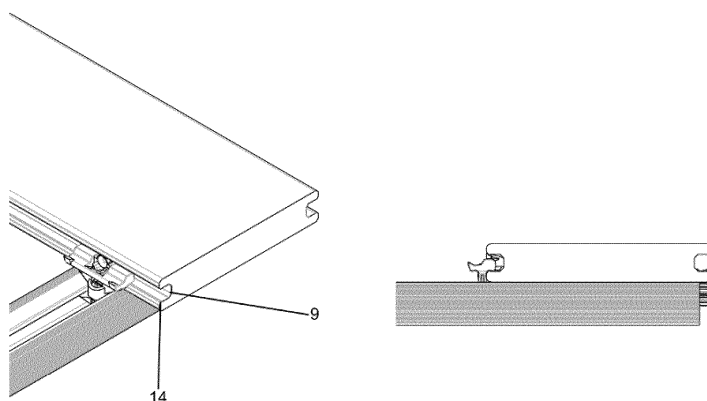


Fig. 17

## Description

### Scope of the invention

[0001] This invention relates to a profile fixing system for use in profiles such as panels intended for floors, façades and fake ceilings. The system includes several components among which are the following: a settlement profile to attach the remaining fastening elements, a fastening element which fits into the settlement profile and attaches the panel-type profiles, and a terminal fixing element.

### Prior art

[0002] Several panel fixing systems are already known in the art. In effect, profiles aimed at covering different types of surfaces are commonly used, with different fixing systems associated thereto.

[0003] Among the prior art's documents, reference is made to the Japanese patents JP 2004218313 and JP 2007218036, as well as to the international patent application WO 2011/149371 which was filed by the herein applicant.

[0004] The patent JP 2004218313 relates to a system for fixing a main profile to a settlement profile using a fixing accessory. It uses a fixing system, such as a screw, in order to unite the fixing accessory of the main profiles to the settlement profile.

[0005] The patent JP 2007218036 also relates to a fixing system which uses screws to attach the fixing support to the base profile.

[0006] The patent application WO 2011/149371 relates to an accessory for fixing profiles intended for use in floors, façades, fake ceilings, etc., as well as a fixing system which uses the said accessory. The main characteristic of this patent application relates to the fact that it does not require other fasteners to be used, such as nails, screws, rivets, in order to attach the main profile or the fixing accessory to the mounting base.

### Summary of the invention

[0007] The main object of this invention is to provide a profile fixing system (the said profiles being also known as rules) into a settlement base, which does not need any other fixing elements such as nails, screws, rivets, to attach the main profile or the fixing accessory to the mounting base, and additionally allowing for:

- Floatability (movement due to external factors such as for instance temperature) of the whole system;
- Eventual disassembly of rules which are contained in the system;
- Eventual reassembly of rules contained in the system.

[0008] Other objectives relate to the simplicity of the

components and to the fast and easy assembling process.

[0009] Other purposes and advantages will become evident throughout the following description.

### Brief description of the drawings

[0010] The following description is based upon the enclosed drawings, wherein an embodiment of the invention is illustrated by means of figures representing the fastening components and the fixing process. Therefore:

Figure 1 shows perspective, plan and raised views, respectively, of a surface with panels;

Figure 2 shows views of the assembling of a rule or main profile;

Figure 3 shows additional views of the assembling of a rule onto the settlement profile;

Figures 4 and 5 are views of the settlement profile;

Figure 6 shows views of the fastening element;

Figures 7 to 11 are exploded views of the fastening element and its constituent parts;

Figure 12 shows views of the main profile;

Figures 13 to 19 show views regarding the process for assembling the several components of the system.

### Detailed description of the invention

[0011] As can be observed in the figures, the object of this invention, i.e. a profile fixing system which, unlike the systems of the prior art, comprises different components which will together ensure an easy assembly in several situations.

[0012] The whole set of profiles comprising the system is supported by a settlement profile (1) to which are attached all the remaining components as hereafter described. Basically, the settlement profile (1) supports the main profile (2) allowing the formation of seamless surfaces based on the repeated application of the said profile (2). The settlement profile (1) is provided with a groove (3) into which are fitted the remaining fixing elements comprising the system, more specifically the fastening element (4) and the terminal fixing element (10).

[0013] As can be observed in Figure 5, the settlement profile has its outer side (13) and lower (14) walls grooved. This will enable a more effective gluing to the settlement surface because of the larger area of glue applied. Also due to the fact that it is grooved, a higher speed of production will be achieved thanks to the larger cooling area. On the other hand, the settlement profile (1) is comprised of several chambers, some of them being closed, so that a greater strength is conferred upon the component. That is the case of the side parts of the said profile (1) which comprise the aforementioned side walls (13) as well as the walls (15) causing these parts to be more resistant. These side parts form, at the centre of the profile and longitudinally, the groove (3) into which

all the remaining components are fitted.

[0014] The profile (2) is attached to the settlement profile (1) by means of the component (4). The said component (4) is fitted into the groove (3) of the settlement profile (1) and through its constituent parts the profile (2) is attached as hereunder described. This component of the system, the fastening element (4), is comprised of a rotor (5) which fits into the groove (3) of the settlement profile (1), the fastener (6) itself which attaches the profile (2) and a body (7) of the fastener into which the two previously referred elements are fitted.

[0015] The rotor (5) is comprised of a head (8) which is attached to the body (7) of the fastener by means of a body being inserted into the groove (3) of the settlement profile (1).

[0016] On its turn, the fastener (6) is connected to the body (7) of the fastening element (4) and the latter attaches the profile (2) to its groove (9) by pressure fitting, having for this purpose a V-shaped fitting area which is formed by flanges provided on the side surfaces. The fastener (6) also presents an opened tronco-conical area (21) for the insertion of a fixing screw to the profile (2) after its fitting.

[0017] The said body (7) of the fastening element (4) is provided in its lower end with a ring (17,) which can be rotated and is intended for fitting the rotor (5), as well as in its upper end with two coupling edges to the groove (9) of the panel (2), a front one (18) provided with a recess (20) for connecting to the fastener itself (4) and a rear one (19) with a coupling area.

[0018] Along the opposed edges of the said profile (2) there is a groove (9) whose lower and upper sections are provided with coupling flanges (14). The fastener (6) will then be fitted into this groove (9) for fixing the profile (2).

[0019] Another component of the system relates to a terminal fixing element (10). The latter is comprised of an elongated body (11) for fitting into the groove's ends (3) of the settlement profile (1) as well as of a nail-type metallic element (12) for fitting into the groove (9) of the profile (2), the said nail being attached to the said elongated body (11) by means of a screw.

[0020] The invention also relates to a method for fixing profiles (2) such as the ones intended for floors, façades and fake ceilings. This method is basically characterized by the following steps:

- fixing into the settlement profile (1);
- attachment of a terminal fixing element (10) to the settlement profile (1) by pressure or sliding into the groove (3);
- assembling of a first profile (2) into the terminal fixing element (10) by insertion of the lower tongue (13) into the nail-type metallic element (12);
- a fastening element (4) is fixed into a settlement profile (1) by longitudinally fitting its rotor (5) into the groove (3) of the settlement profile (1), after which the said rotor (5) is rotated into a position perpendicular to the groove (3);

- the said fastening element (4) is fixed by means of the fastener itself (6) and of the fastener's body (7) into the groove (9) of the profile (2), the fastener (6) being thus the component which attaches the set of the 3 elements to the profile (2);
- second profiles (2) are then mounted over the previous profiles (2) by means of the fastening element (4);
- the assembling of the profiles (2) is finished by using another terminal fixing element (10) and by pressure fitting the said terminal fixing element into the groove (3) of the settlement profile (1).

[0021] As can be easily understood given the structure of the mentioned elements, the fixing operations of the fastening element (4) into the settlement profile, as well as of the fastening element (4) into the profile (2), are accomplished by pressure fitting.

[0022] However, the attachment of the fastening element (4) to the profile (2) can also be made by screwing it into the profile (2).

[0023] As will become evident to the skilled person, several changes can be made to the embodiment illustrated on the enclosed drawings, which fall within the spirit of the following claims.

## Claims

1. A system for fixing profiles (2) such as panels intended for use in floors, façades, fake ceilings, which uses a settlement profile (1) to support the profile (2) being provided with a groove (3) into which the remaining fastening elements are fitted, **characterized in that** it comprises:
  - a fastening element (4) which fits into the settlement profile and attaches the profiles (2);
  - a terminal fixing element (10).
2. A system for fixing profiles (2) according to claim 1, **characterized in that** the fastening element (4) is comprised of a rotor (5) which fits into the groove (3) of the settlement profile (1), the fastener itself (6) which attaches the profile (2) and the body (7) of the fastener into which the two previously referred elements are fitted.
3. A system for fixing profiles (2) according to claims 1 and 2, **characterized in that** the rotor (5) is comprised of a head (8) which is attached to the fastener (7) by means of a body being inserted into the groove (3) of the settlement profile (1).
4. A system for fixing profiles (2) according to claims 1 and 2, **characterized in that** the fastener (6) is connected to the body (7) of the fastening element (4) and the latter attaches the profile (2) to its groove (9)

by pressure fitting, having for this purpose a V-shaped fitting area which is formed by flanges provided on the side surfaces.

5. A system for fixing profiles (2) according to claims 1 and 2, **characterized in that** the body (7) of the fastening element (4) is provided in its lower end with a ring (17,) which can be rotated and is intended for fitting the rotor (5), as well as in its upper end with two coupling edges to the groove (9) of the panel (2), a front one (18) provided with a recess (20) for connecting to the fastener itself (4) and a rear one (19) with a coupling area. 5 10
6. A system for fixing profiles (2) according to claims 4 and 5, **characterized in that** the fastener (6) also presents an opened tronco-conical area (21) for the insertion of a fixing screw to the profile (2) after its fitting. 15 20
7. A system for fixing profiles (2) according to claims 4 and 5, **characterized in that** the fastener (6) attaches the set of the three parts comprising the fastening element (4) to the profile (2). 25
8. A system for fixing profiles (2) according to claim 1, **characterized in that** the said terminal fixing element (10) is comprised of an elongated body (11) for fitting into the groove's ends (3) of the settlement profile (1) as well as of a nail-type metallic element (12) for fitting into the groove (9) of the profile (2), the said nail being attached by means of a screw. 30
9. A system for fixing profiles (2) according to claims 1 and 2, **characterized in that** the said settlement profile (1) has its outer side (13) and lower (14) walls grooved. 35
10. A system for fixing profiles (2) according to claim 1, **characterized in that** along the opposed edges of the said profile (2) there is a groove (9) whose lower and upper sections are provided with coupling flanges (14). 40
11. A method for fixing profiles (2) such as the ones intended for floors, façades, fake ceilings, and which is **characterized in that**: 45
  - attachment of a terminal fixing element (10) to the settlement profile (1) by pressure or sliding into the groove (3); 50
  - assembling of a first profile (2) into the terminal fixing element (10) by insertion of the lower tongue (13) into the nail-type metallic element (12); 55
  - a fastening element (4) is fixed into a settlement profile (1) by longitudinally fitting its rotor (5) into the groove (3) of the settlement profile (1), after

which the said rotor (5) is rotated into a position perpendicular to the groove (3);

- the said fastening element (4) is fixed by means of the fastener itself (6) and of the fastener's body (7) into the groove (9) of the profile (2);
- second profiles (2) are then mounted over the previous profiles (2) by means of the fastening element (4);
- the assembling of the profiles (2) is finished by using another terminal fixing element (10) and by pressure fitting the said terminal fixing element into the groove (3) of the settlement profile (1).

12. A method for fixing profiles (2) according to claim 10, **characterized in that** the fixing operations of the fastening element (4) into the settlement profile as well as of the fastening element (4) into the profile (2) are accomplished by pressure fitting.

13. A method for fixing profiles (2) according to claim 10 **characterized in that** the attachment of the fastening element (4) to the profile (2) can also be made by screwing it into the profile (2).

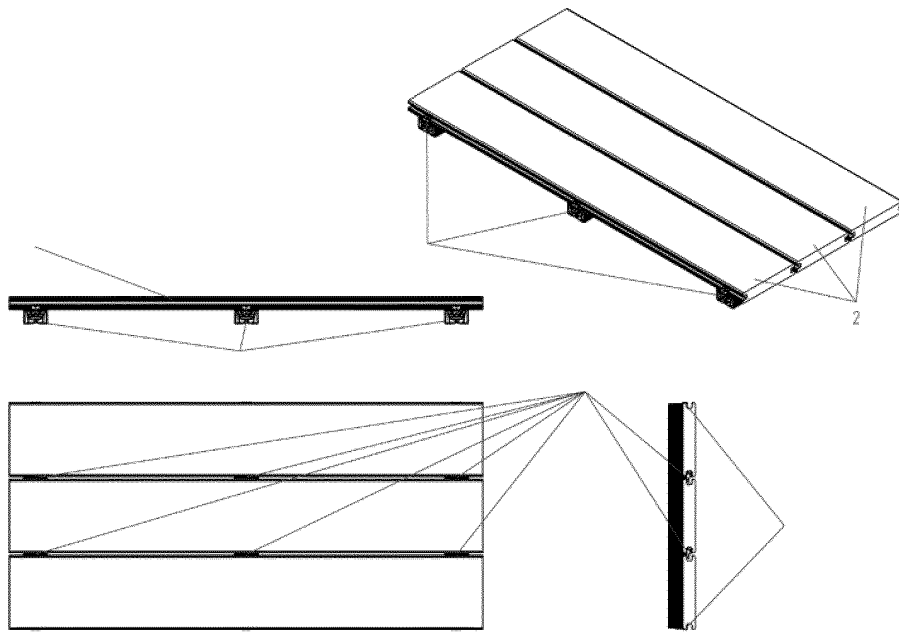


Fig. 1

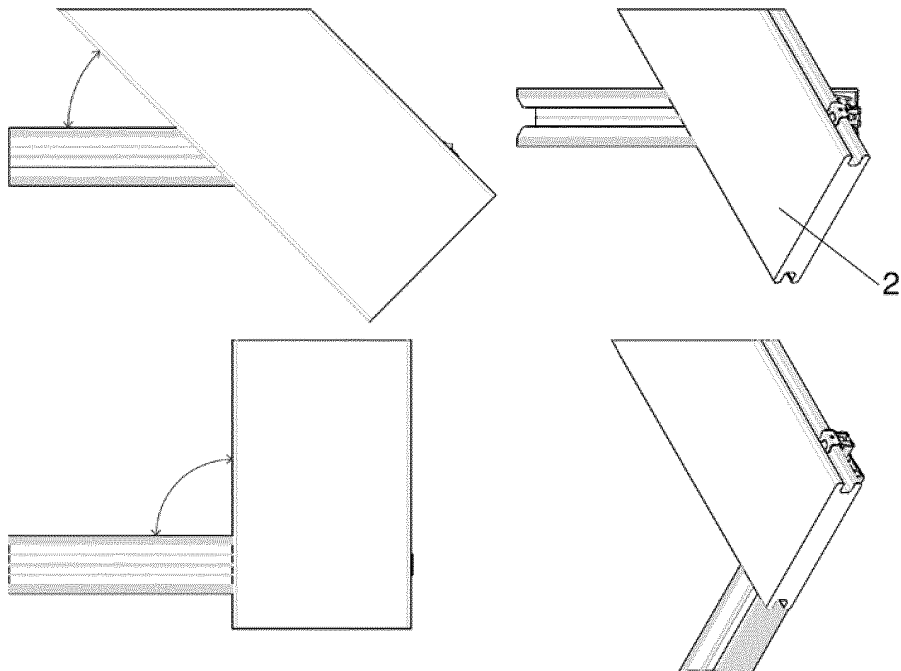


Fig. 2

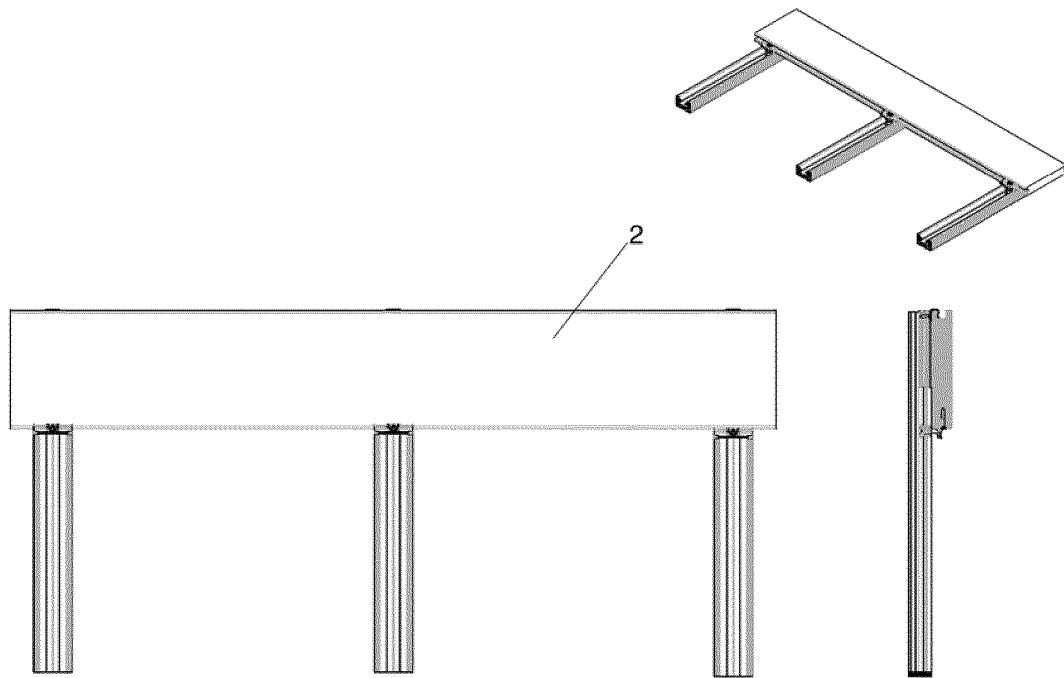


Fig.3

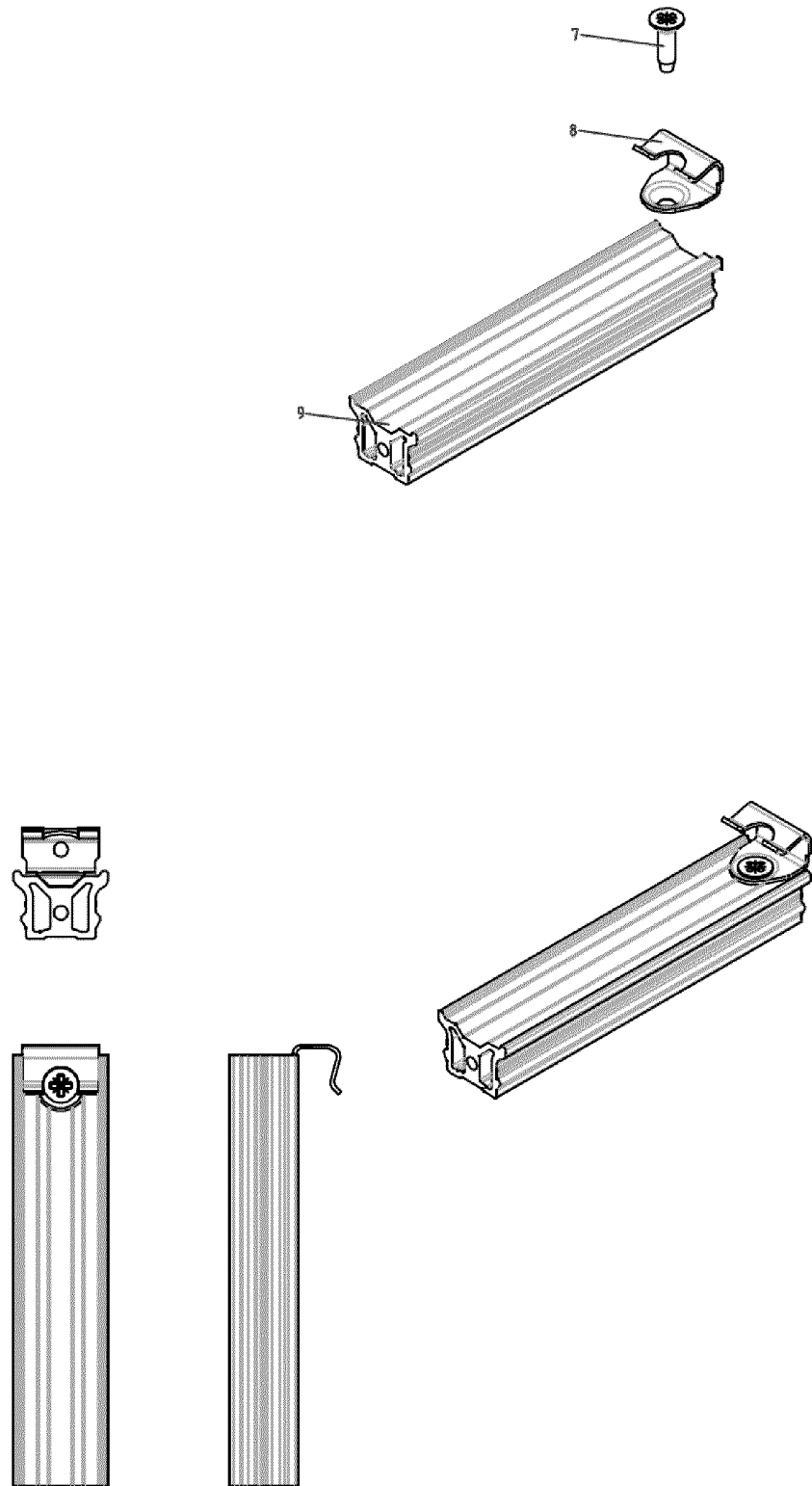


Fig. 4

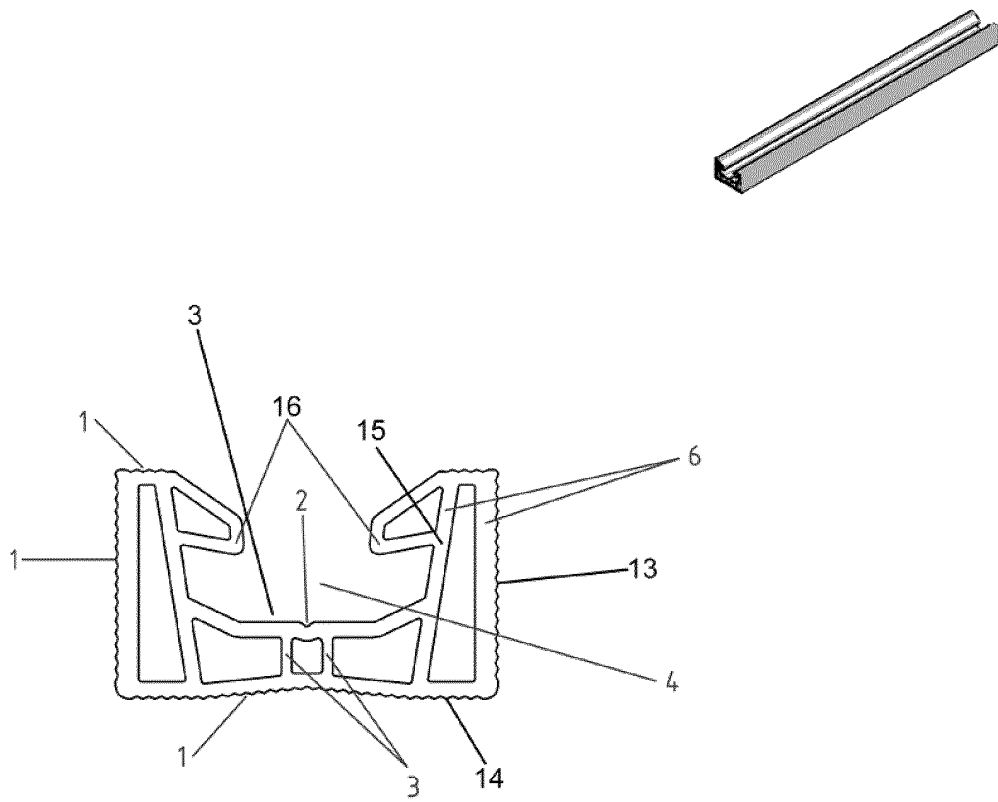


Fig. 5

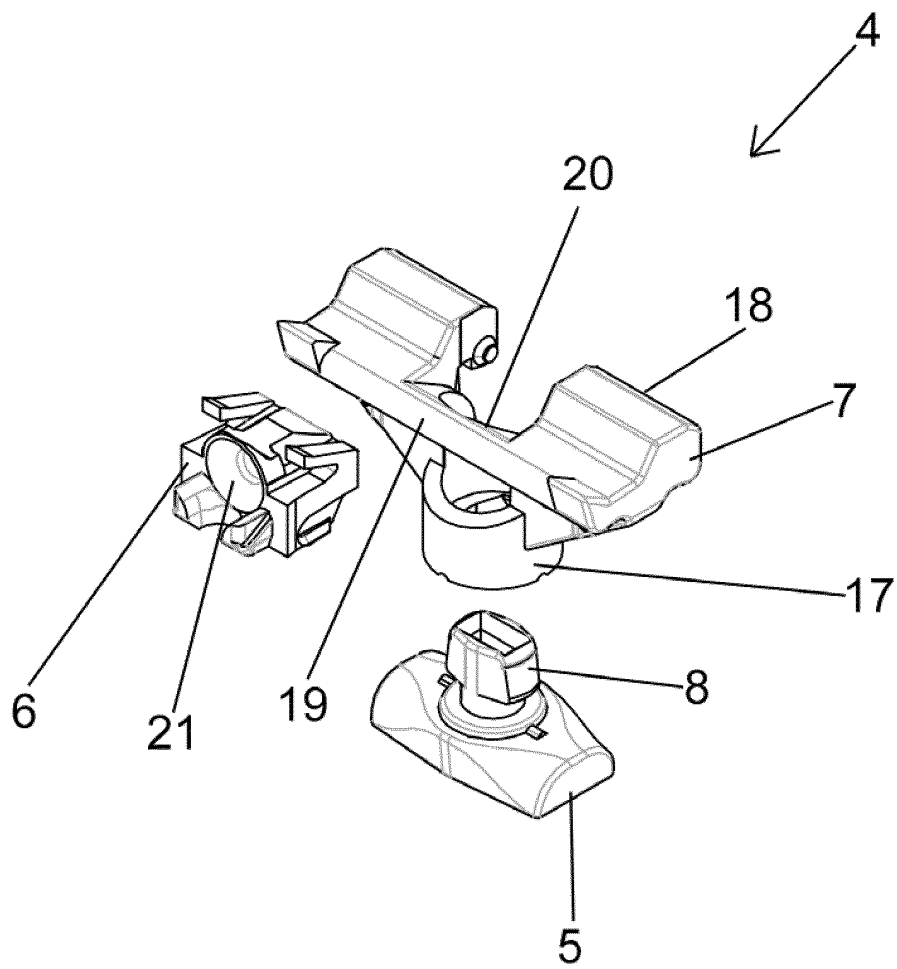


Fig. 6

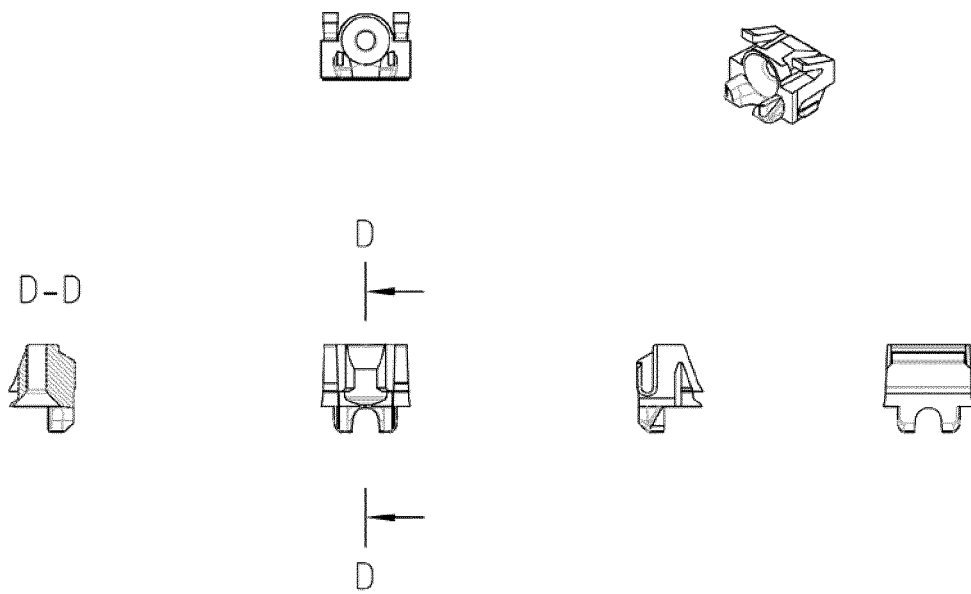


Fig. 7

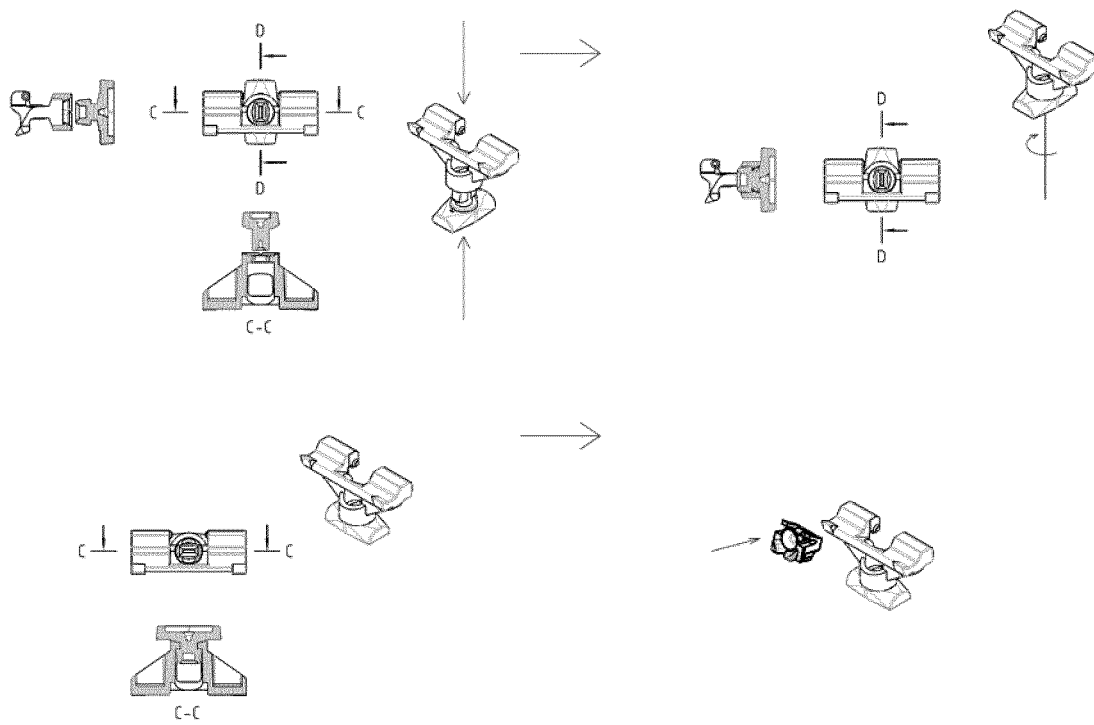


Fig. 8

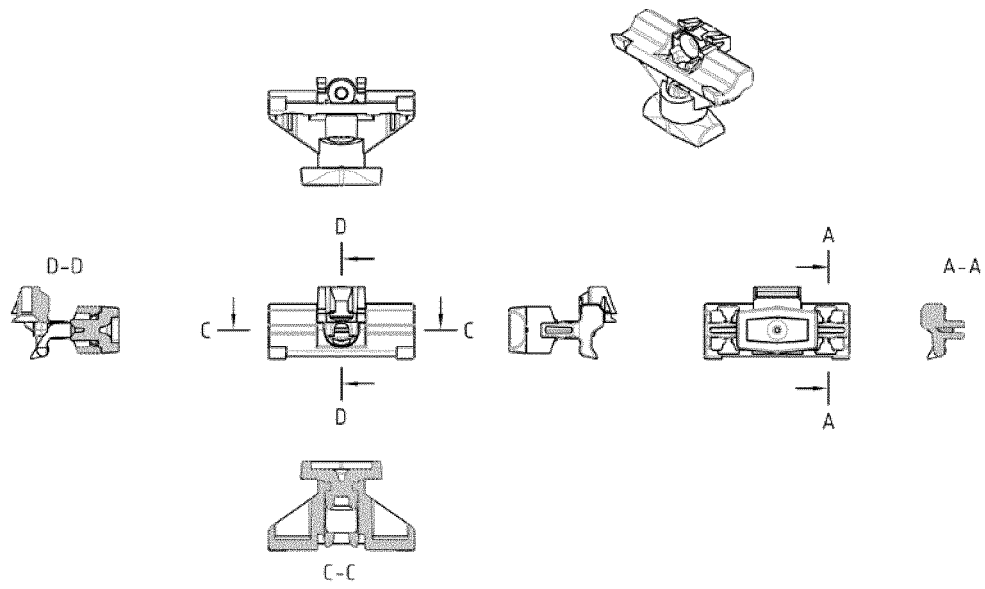


Fig. 9

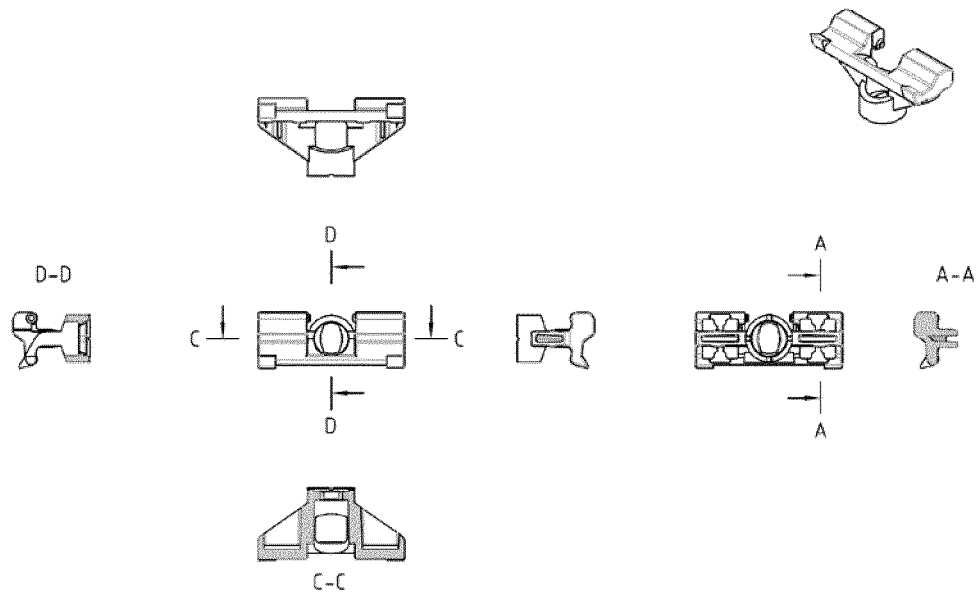


Fig. 10

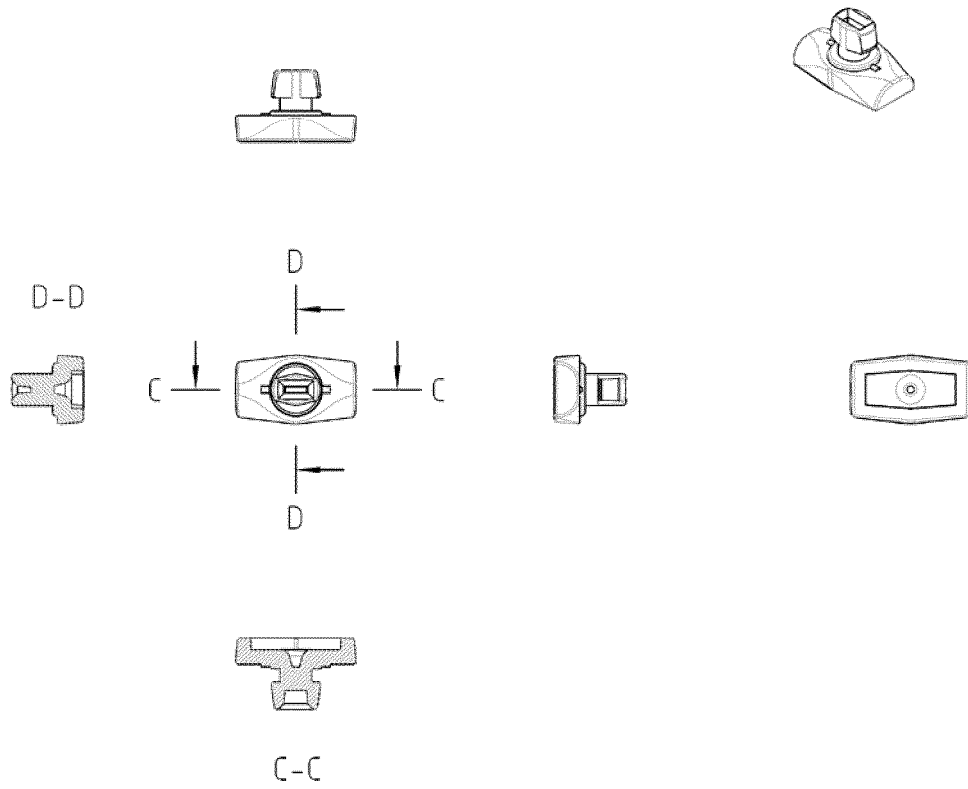


Fig. 11

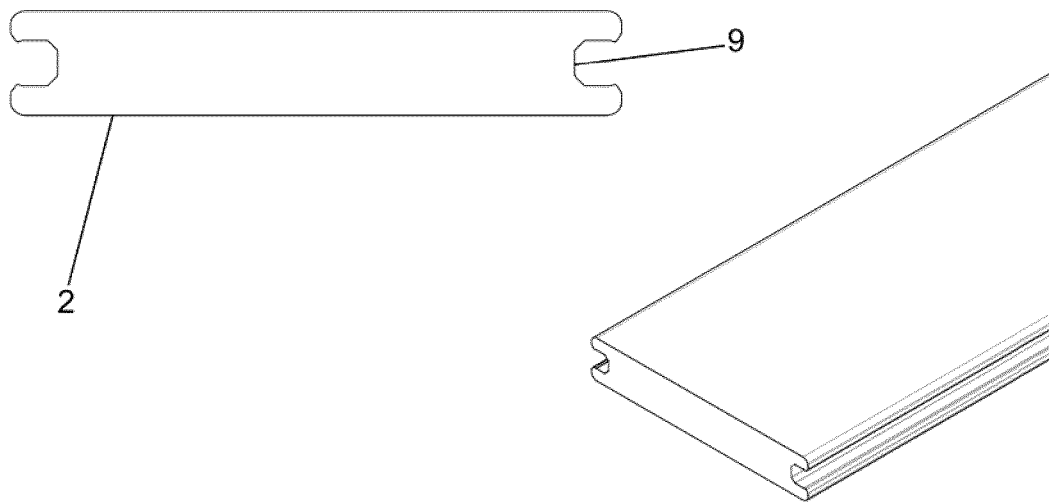
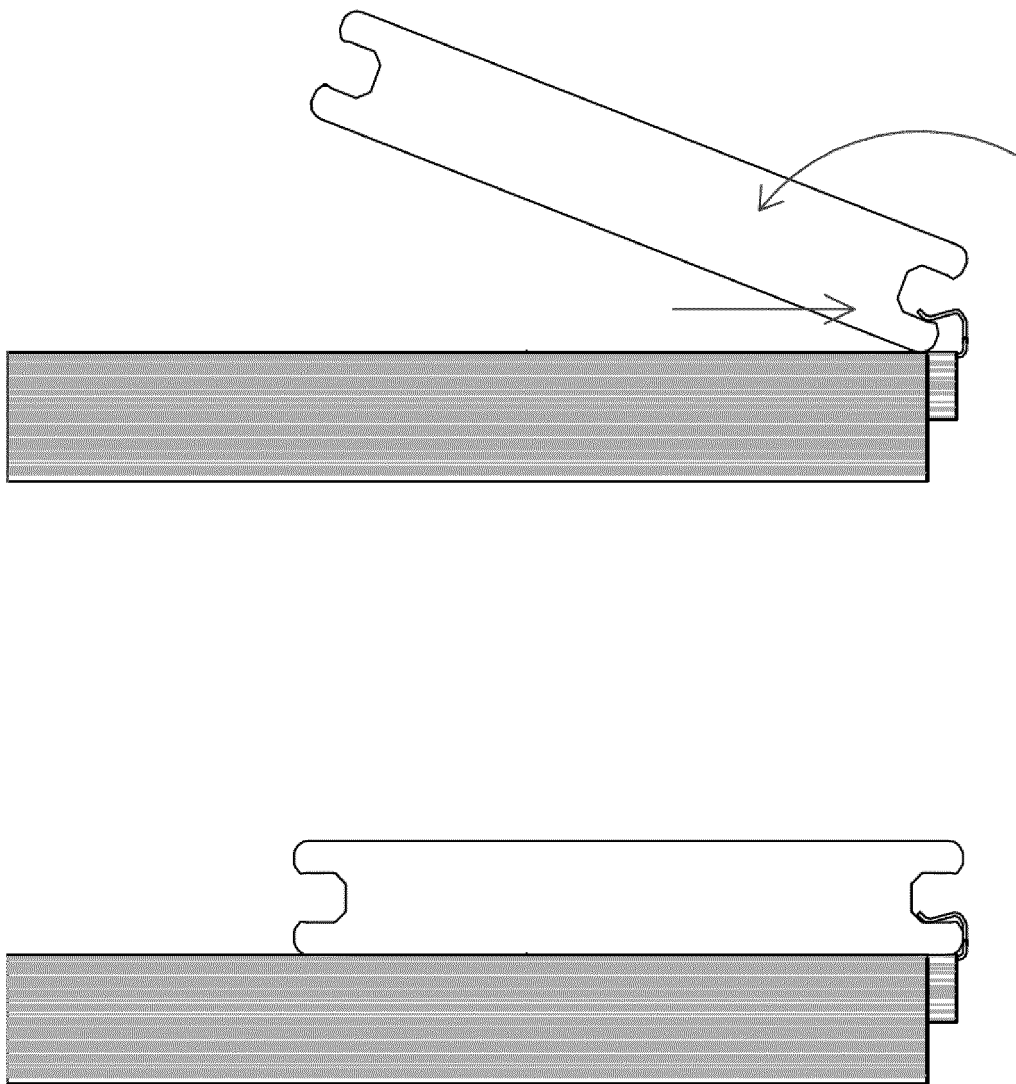


Fig.12



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Fig. 13

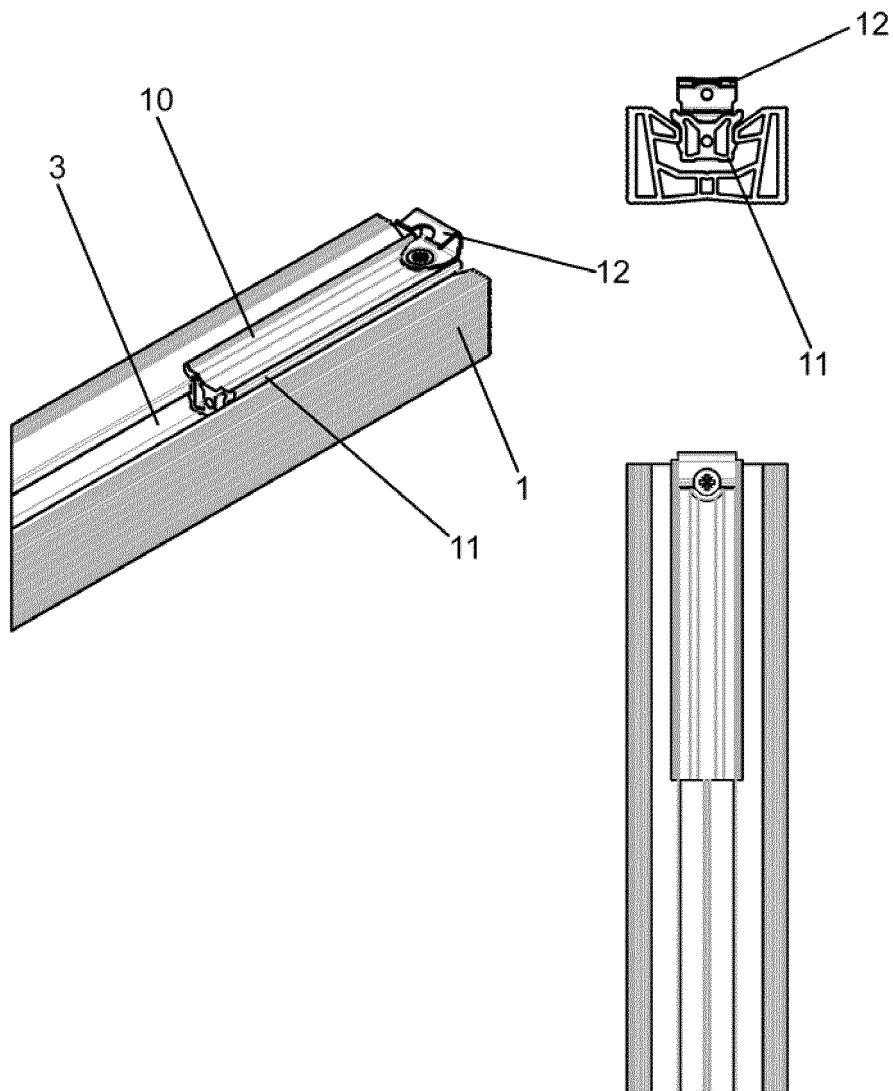


Fig. 14

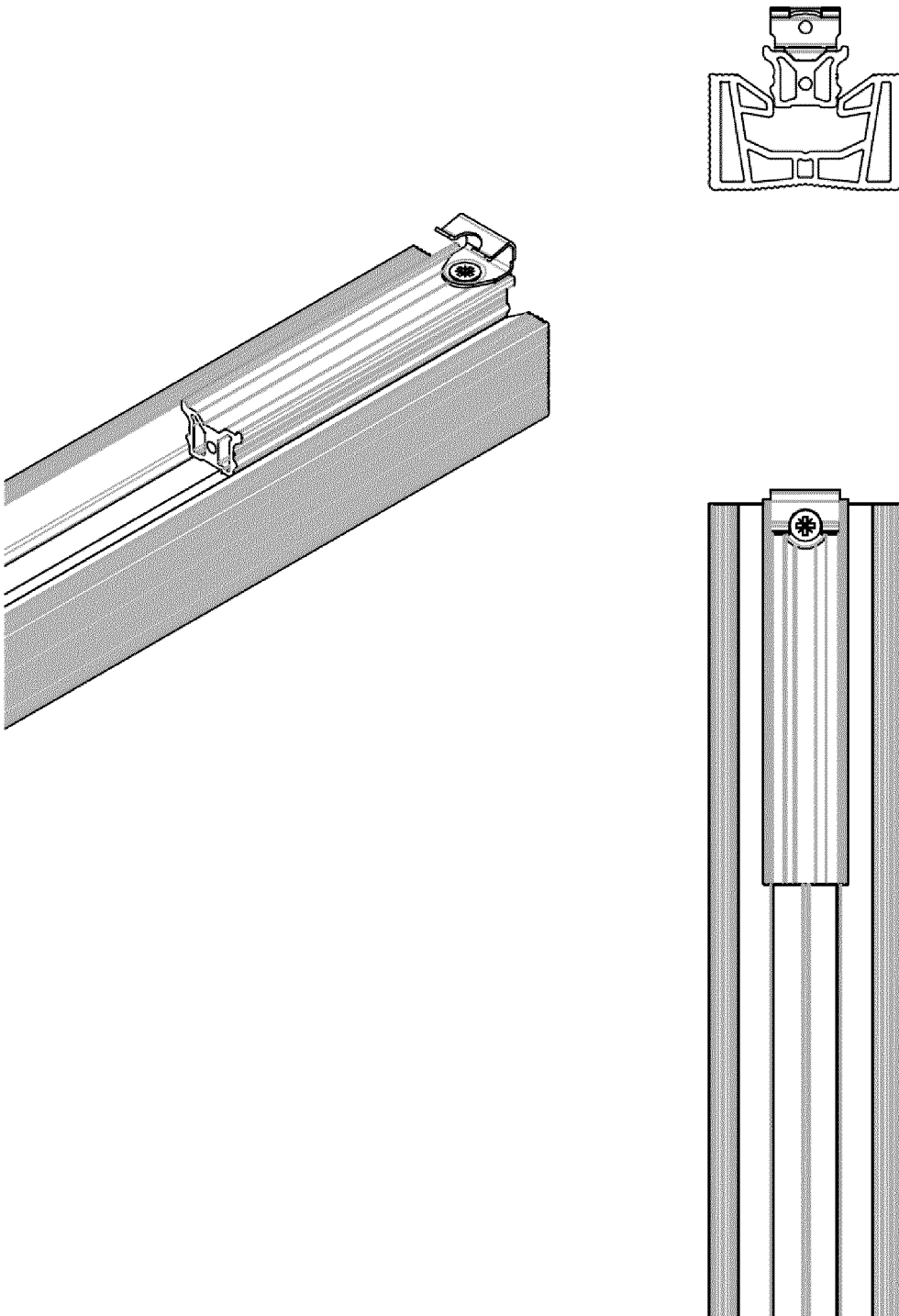


Fig. 15

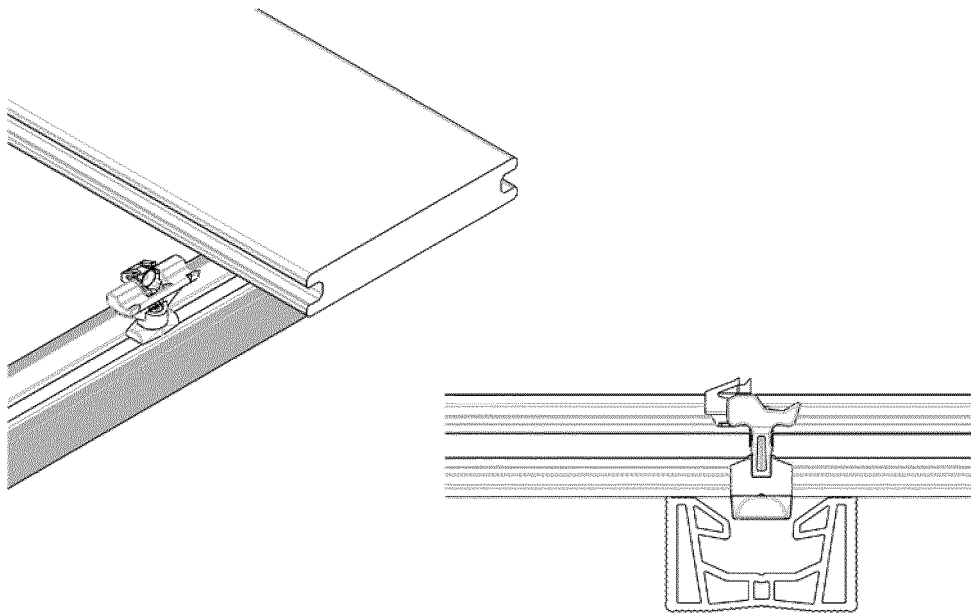


Fig. 16

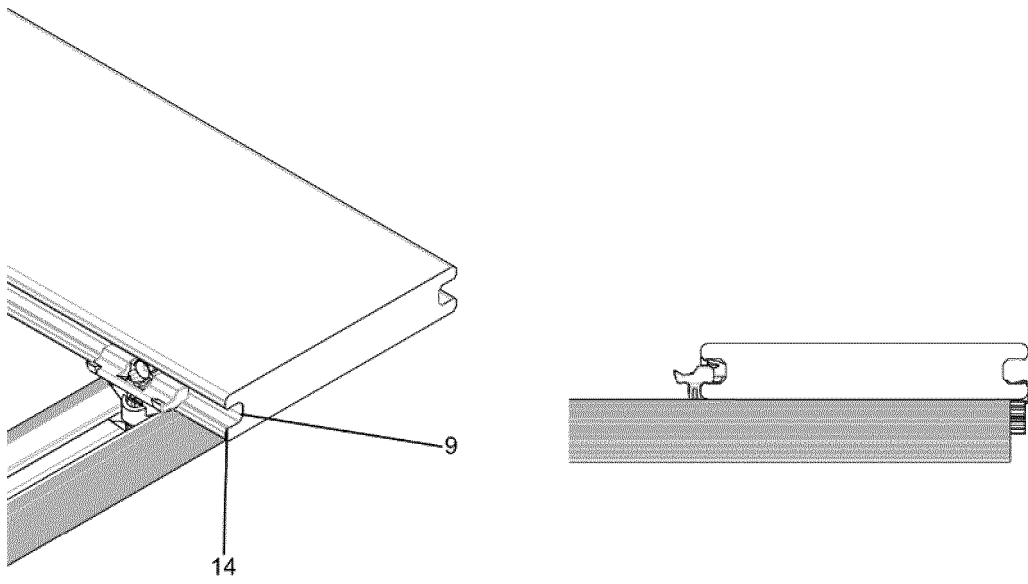


Fig. 17

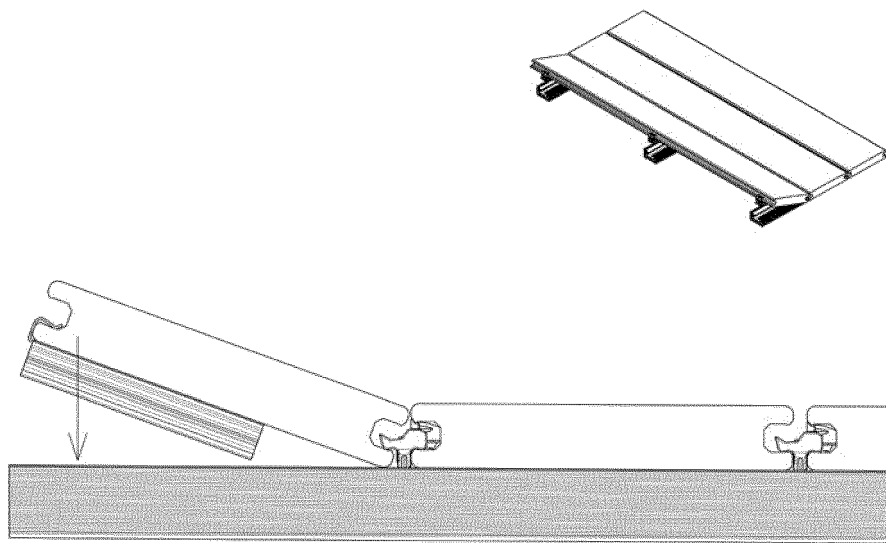


Fig. 18

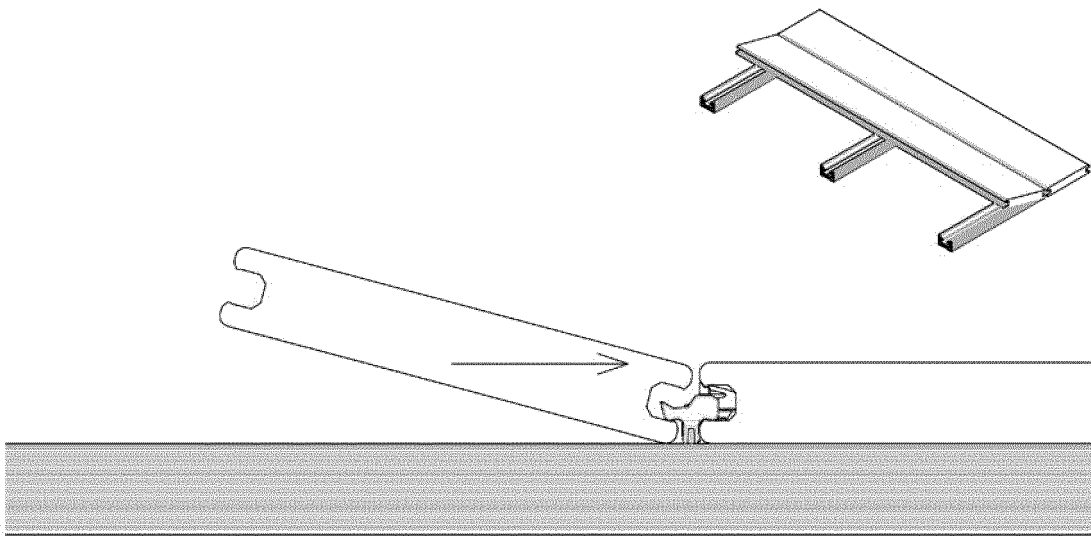


Fig. 19

## INTERNATIONAL SEARCH REPORT

International application No

PCT/PT2013/000027

## A. CLASSIFICATION OF SUBJECT MATTER

INV. E04F13/08 E04F13/26 E04F15/04  
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
E04F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|------------------------------------------------------------------------------------|-----------------------|
| X         | DE 197 07 564 A1 (FUCHS DIETRICH ANTON [AT]) 4 September 1997 (1997-09-04)         | 1                     |
| Y         | column 4, line 67 - column 18, line 44;                                            | 2-12                  |
| A         | figures 1-13                                                                       | 13                    |
|           | -----                                                                              |                       |
| X         | GB 2 352 255 A (JOHNSON BRIAN [GB])                                                | 1,8                   |
| Y         | 24 January 2001 (2001-01-24)                                                       | 13                    |
| A         | page 4, line 12 - page 8, line 6; figures 1-10                                     | 9-11                  |
|           | -----                                                                              |                       |
| Y         | WO 2011/149371 A1 (IHT LDA [PT]; DUARTE MARCO RENATO MARQUES [PT])                 | 2-12                  |
| A         | 1 December 2011 (2011-12-01)                                                       |                       |
|           | page 4, line 9 - page 8, line 25; figures 1-9                                      | 1,13                  |
|           | -----                                                                              |                       |
| Y         | JP 2005 264663 A (MISAWA HOMES CO)                                                 | 13                    |
| A         | 29 September 2005 (2005-09-29)                                                     |                       |
|           | abstract; figures 1-8                                                              | 1-3,5-11              |
|           | -----                                                                              |                       |

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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Date of the actual completion of the international search

16 October 2013

Date of mailing of the international search report

23/10/2013

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/PT2013/000027

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| GB 2352255 A                              | 24-01-2001          | NONE                             |                          |
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**REFERENCES CITED IN THE DESCRIPTION**

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- JP 2007218036 B [0003] [0005]
- WO 2011149371 A [0003] [0006]