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(54) **COUPLING STRUCTURE OF EXTRUDED PANELS**

(57) A coupling structure (1) of extruded panels, comprising a first extruded panel (2) and a second extruded panel (3) adapted to be arranged adjacent to each other and to be coupled by a coupling element (4), the extruded panels (2,3) having, at their respective ends, cavities (5,6) adapted to accommodate the coupling element (4)

for the mutual coupling of the extruded panels (2,3), the coupling element (4) being provided with teeth (7,8) for coupling in complementary cavities (5,6) defined in the ends of the extruded panels (2,3), the teeth (7,8) being made of compact material.

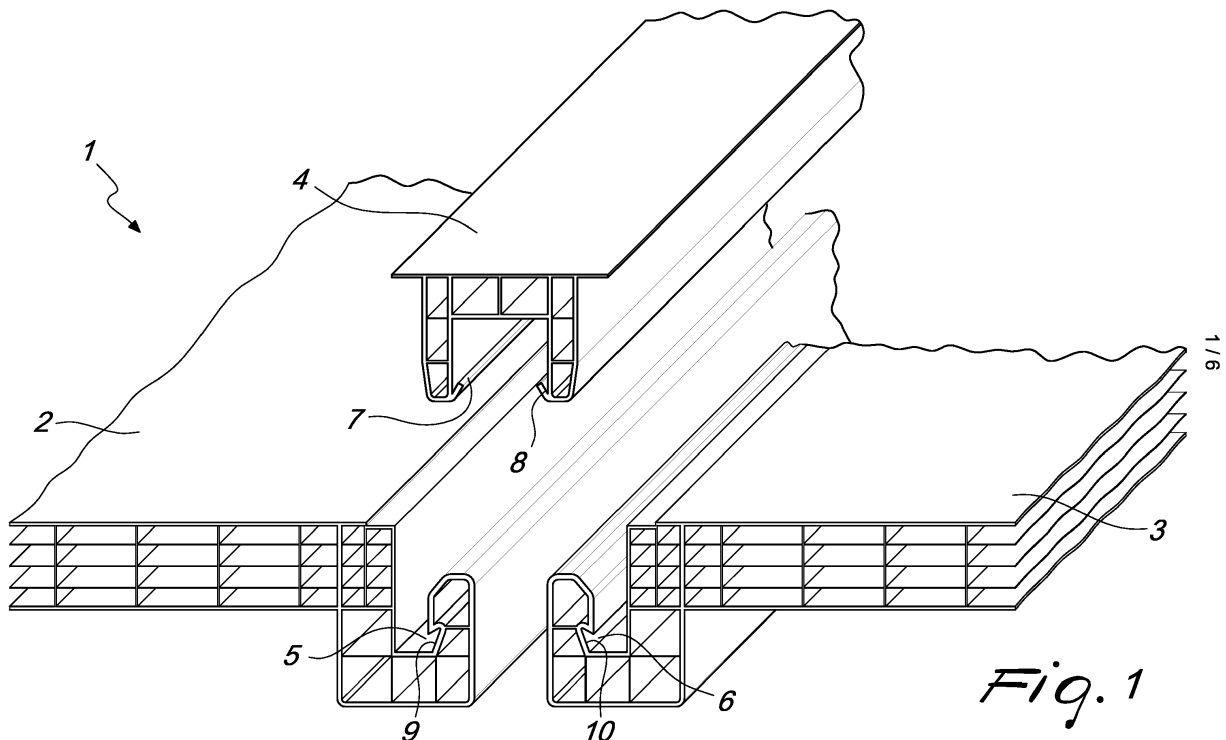


Fig. 1

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Description

[0001] The present invention relates to a coupling structure of extruded panels. More particularly, the invention relates to a coupling structure of extruded panels made of synthetic resin, for example polycarbonate.

[0002] As is known, extruded panels are coupled by using a joining element, which is shaped complementarily to portions of the extruded panels to which such joining element must be coupled in order to allow the assembly of two extruded panels arranged adjacent and parallel.

[0003] In the background art, the joining element also is provided as an extruded element and is shaped with angled teeth, defined by extruded portions, which engage in seats defined complementarily at the end of each extruded panel, so as to perform the coupling.

[0004] CH 690 922 discloses such a coupling solution, in which the joining element is made of extruded material and the teeth are a portion of the extruded material.

[0005] The solution disclosed above in CH 690 922 suffers a drawback due to the fact that the teeth, being provided by the extruded material of the joining element, break easily, and therefore the coupling between two adjacent extruded panels is not always ensured over time.

[0006] The joining element in the known solution is in fact ensured to hold until a cell of the extruded joining element, which indeed has a cellular structure, fails.

[0007] The aim of the present invention is to provide a coupling structure of extruded panels in which the coupling element is very strong and durable in order to ensure stable coupling of the panels.

[0008] Within this aim, an object of the present invention is to provide a coupling structure of extruded panels in which the coupling element is provided in such a shape as to be complementary to the shape of the end of the mutually adjacent extruded panels to be coupled.

[0009] Another object of the present invention is to provide a coupling structure of extruded panels that can be used with arrangements of panels of a known type, arranged side by side, with the coupling element at the level of the panels, or with the coupling element arranged externally to said panels.

[0010] Another object of the present invention is to provide a coupling structure of extruded panels that is highly reliable, relatively simple to provide and at competitive costs.

[0011] This aim and these and other objects that will become better apparent hereinafter are achieved by a coupling structure of extruded panels, comprising a first extruded panel and a second extruded panel adapted to be arranged adjacent to each other and to be coupled by a coupling element, said extruded panels having, at their respective ends, cavities adapted to accommodate said coupling element for the mutual coupling of said extruded panels, said coupling element being provided with teeth for coupling in complementary cavities defined in said ends of said extruded panels, characterized in that

said teeth are made of compact material.

[0012] Further characteristics and advantages of the invention will become better apparent from the description of preferred but not exclusive embodiments of the coupling according to the present invention, illustrated by way of non-limiting examples in the accompanying drawings, wherein:

Figure 1 is an exploded view of a coupling structure according to the present invention;

Figure 2 is a view of an embodiment of the coupling structure according to the invention in the assembled condition;

Figure 3 is a sectional view of the coupling structure according to the invention with a pair of cellular panels and a corresponding bracket;

Figure 4 is a view of a second embodiment of the bracket used in combination with the coupling structure according to the present invention;

Figure 5 is a view of another embodiment of the coupling structure according to the present invention;

Figure 6 is a view of still another embodiment of the coupling structure according to the present invention.

[0013] With reference to the figures, the coupling structure according to the invention, generally designated by the reference numeral 1, comprises a first extruded panel 2 and a second extruded panel 3, which are adapted to be arranged mutually adjacent and to be coupled by a coupling element 4. The coupling element 4 is shaped like an inverted U and is provided like the extruded panels 2 and 3, except for the fact that it is provided, at its ends adapted to engage cavities 5 and 6, defined respectively in the panels 2 and 3, of teeth 7 and 8 respectively, made of compact material, therefore not with a cellular structure determined by the extrusion of the coupling element 4. This allows to have the teeth 7 and 8 made of very strong material which therefore is not subject to breakages, which might instead occur if the teeth 7 and 8 were provided by extrusion, like the rest of the coupling element 4.

[0014] Advantageously, the teeth 7 and 8, made of compact material, protrude from the cellular chamber that defines the wall of the coupling element 4.

[0015] The teeth 7 and 8, as mentioned, are adapted to engage in cavities 5 and 6 defined in the panels 2 and 3, the cavities 5 and 6 being shaped so as to define a recess in which the teeth 7 and 8 engage.

[0016] The teeth 7 and 8 are angled with respect to the cellular wall of the element 4 and this facilitates assembly, since the teeth 7 and 8 tend to "slip" within respective seats 9 and 10 of the cavities 5 and 6.

[0017] On the other hand, the angle that facilitates coupling also prevents uncoupling. In fact, if one attempted to uncouple the coupling element 4 by performing a traction maneuver, the effect would be to increase the engagement of the teeth 7 and 8 in the cavities 9 and 10, thus making it impossible to provide uncoupling, which

could occur only following the breakage of the teeth 7 and 8.

[0018] Furthermore, the profile of the coupling element 4, comprising the teeth 7 and 8, is provided so as to make the teeth 7 and 8 substantially mate with the internal walls 9 and 10 of the seats 5 and 6 so that the coupling element 4 adheres more to the panels 2 and 3, obtaining therefore a perfect accommodation of the teeth 7 and 8 in the seats 9 and 10.

[0019] Figure 3 shows an embodiment in which the panels 2 and 3 of Figure 1 and Figure 2 are assembled together with a per se known bracket 11 in order to fix such panels to the surface.

[0020] Figure 4 is a view of another embodiment, in which the panels are assembled in a bracket 11 of a different type with respect to the bracket 11 of Figure 3.

[0021] Figure 5 shows a constructive variation, in which the coupling between the panels 2 and 3 occurs by means of the coupling elements 3 and 4 not internally to the external profile of the panels but externally thereto, the coupling element 4 being however substantially similar to what has been shown in the preceding figures. The difference of this embodiment resides in that the cavities 5 and 6 defined at the end of the panels 2 and 3 are still present but protrude toward the outside of the panels instead of inside their profile.

[0022] Finally, Figure 6 shows a constructive variation in which the seats 5 and 6 of the panels 2 and 3 are within the thickness of the panels 2 and 3 instead of below such thickness, as shown in Figures 1 and 2.

[0023] In this case also, the coupling element 4 is substantially similar to the coupling element of the panels 2 and 3.

[0024] In practice it has been found that the coupling structure according to the present invention fully achieves the intended aim and objects, since it allows to mutually couple two extruded panels having cellular characteristics by means of a coupling element also provided by extrusion and therefore having cellular characteristics but with teeth or fins for retention that are made of compact material, which therefore is not cellular and accordingly is stronger.

[0025] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0026] All the details may further be replaced with other technically equivalent elements.

[0027] In practice, the materials used, as well as the contingent shapes and dimensions, may be any according to requirements and to the state of the art.

[0028] The disclosures in Italian Patent Application No. MI2014A002110 from which this application claims priority are incorporated herein by reference.

[0029] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the

interpretation of each element identified by way of example by such reference signs.

5 Claims

1. A coupling structure (1) of extruded panels, comprising a first extruded panel (2) and a second extruded panel (3) adapted to be arranged adjacent to each other and to be coupled by a coupling element (4), said extruded panels having, at their respective ends, cavities (5,6) adapted to accommodate said coupling element (4) for the mutual coupling of said extruded panels (1,2), said coupling element (4) being provided with teeth (7,8) for coupling in said cavities (5,6) defined in said ends of said extruded panels, **characterized in that** said teeth (7,8) are made of compact material.
2. The coupling structure according to claim 1, **characterized in that** said teeth (7,8) are contoured so as to be angled, in order to couple in said cavities (5,6) of said ends of said extruded panels (2,3).
3. The coupling structure according to claim 1, **characterized in that** said coupling element (4) is shaped substantially like an inverted U.
4. The coupling structure according to one or more of the preceding claims, **characterized in that** said teeth (7,8) couple within said cavities (5,6), resting against the wall of said cavities.

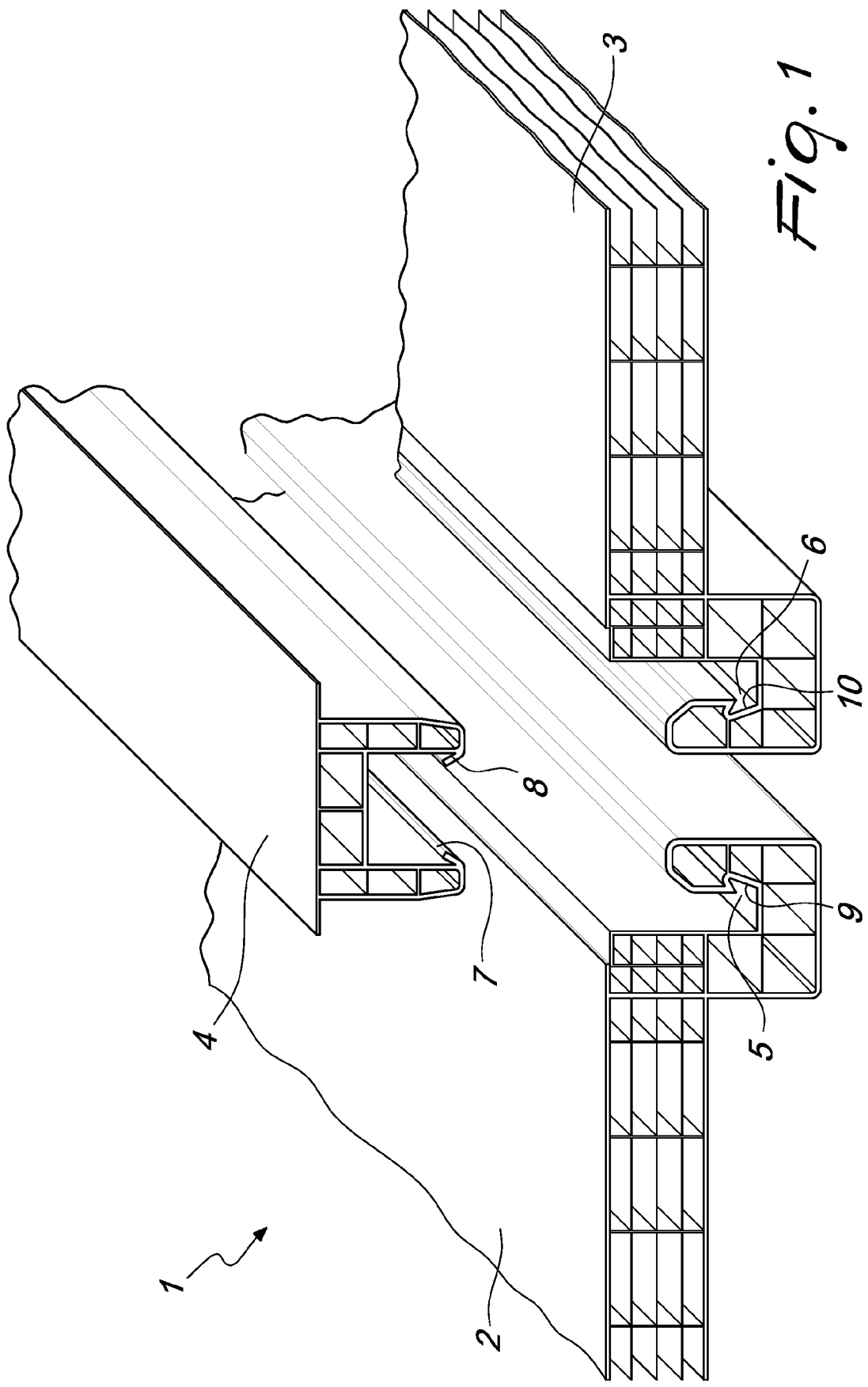


Fig. 1

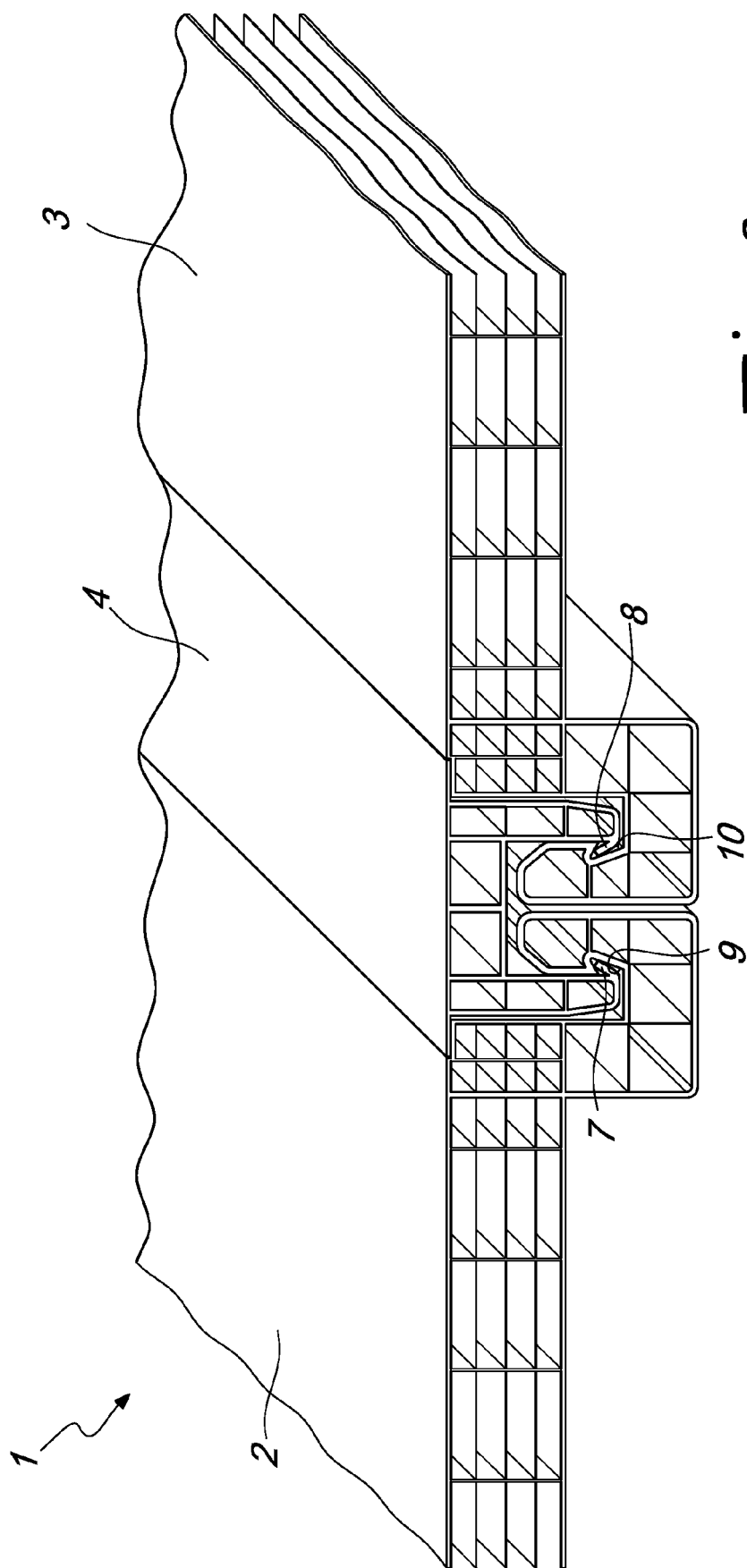


Fig. 2

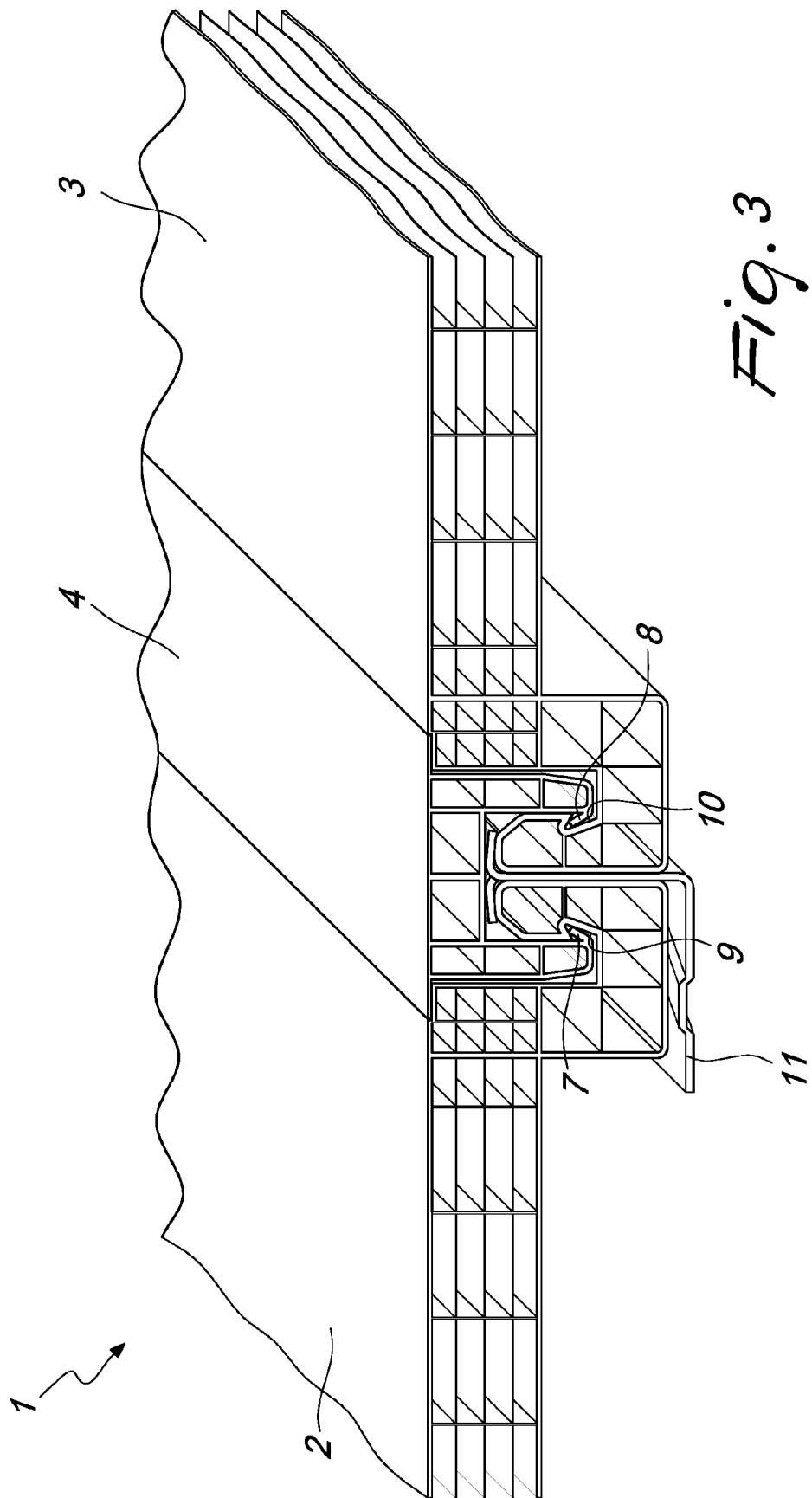


Fig. 3

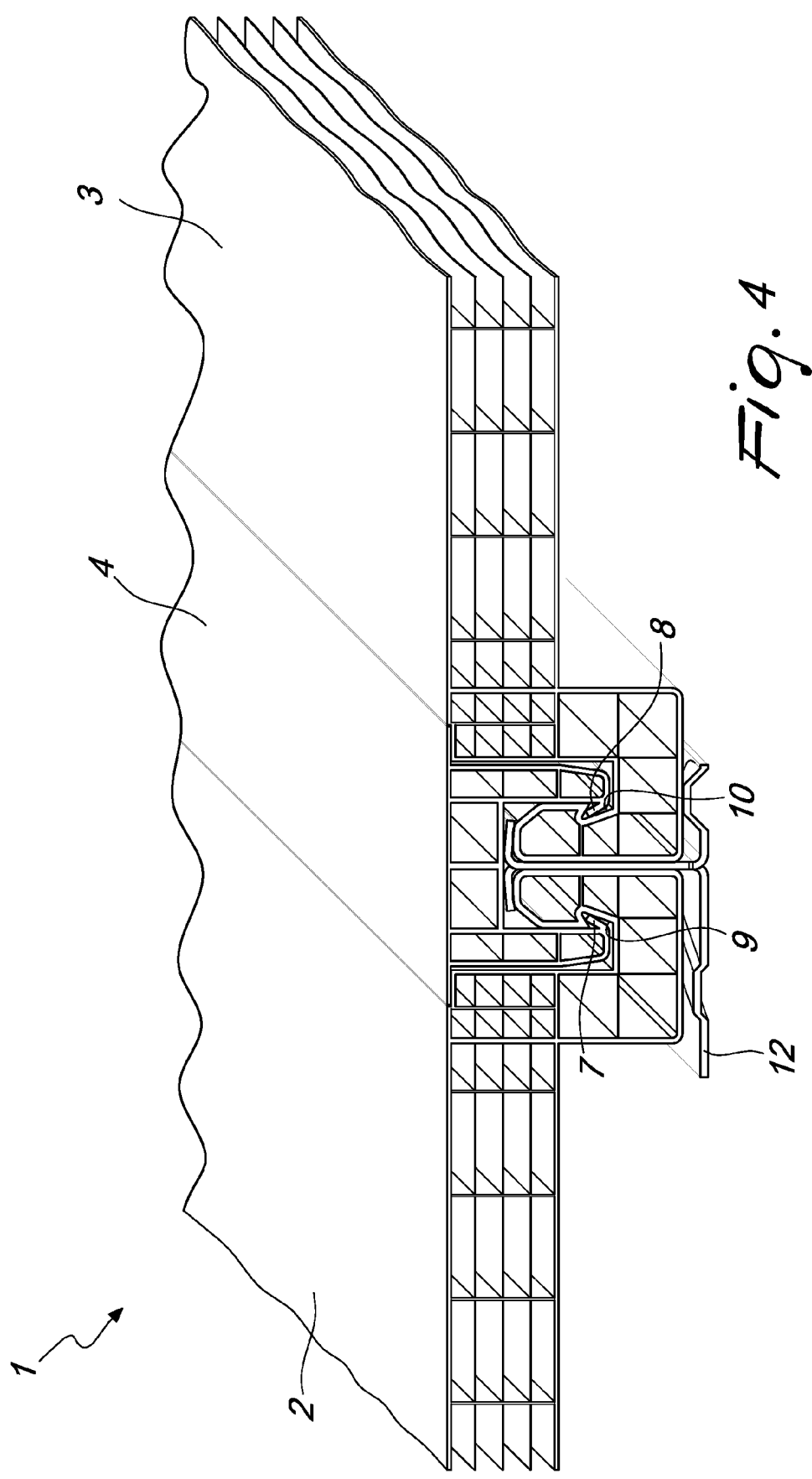


Fig. 4

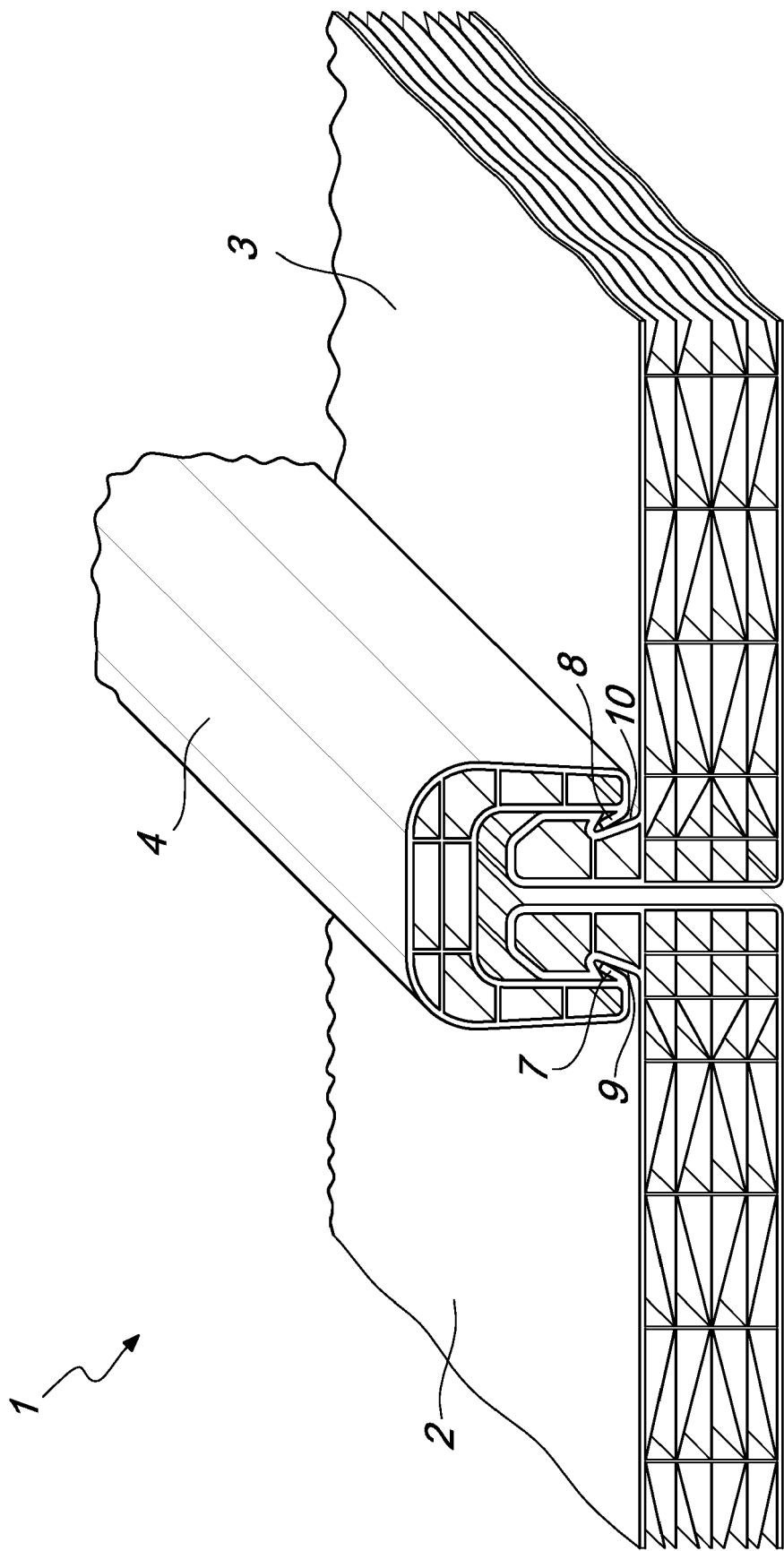


Fig. 5

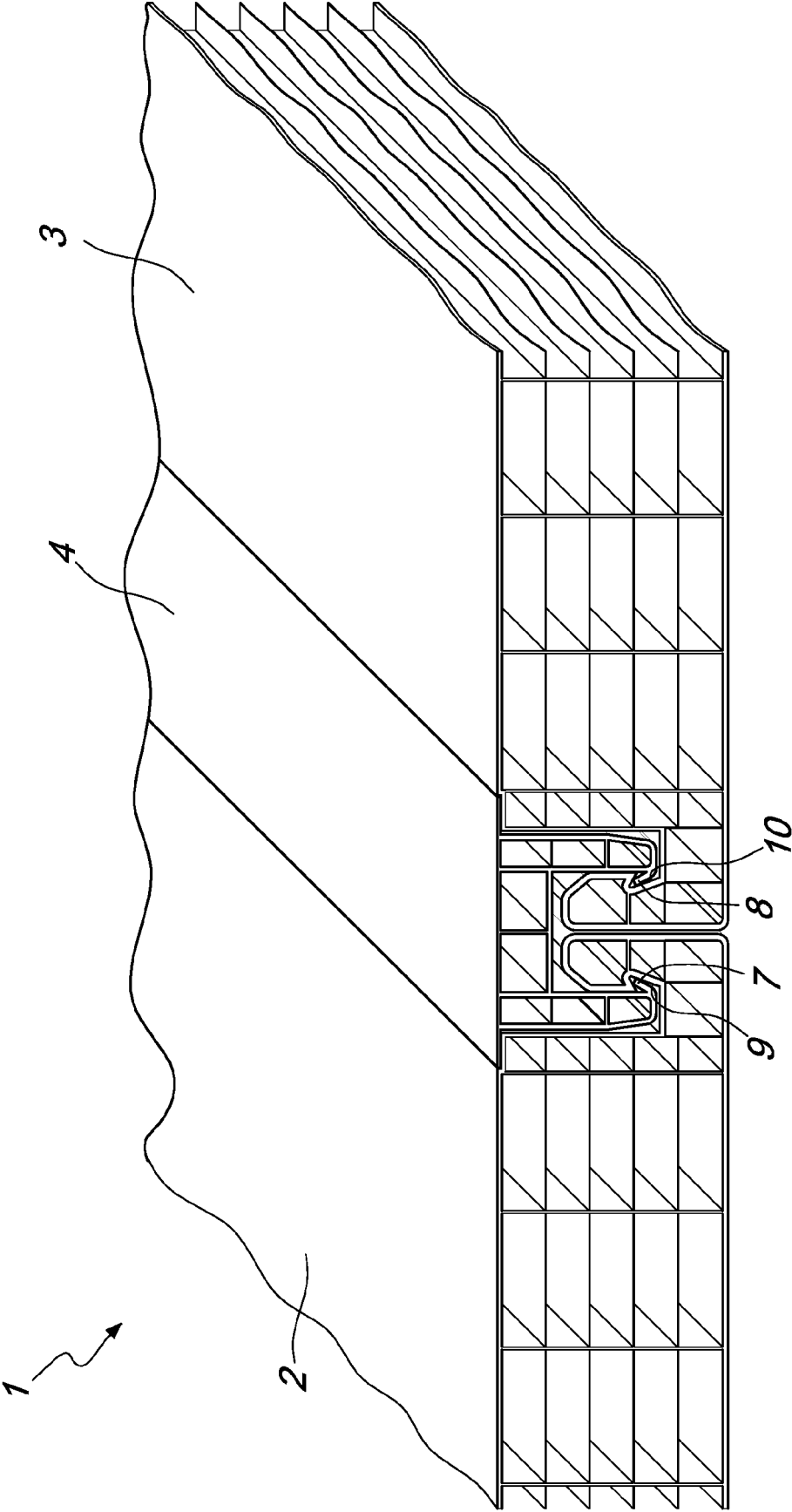


Fig. 6



EUROPEAN SEARCH REPORT

Application Number
EP 15 19 7688

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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			E04D
Place of search		Date of completion of the search	Examiner
The Hague		8 January 2016	Leroux, Corentine
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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