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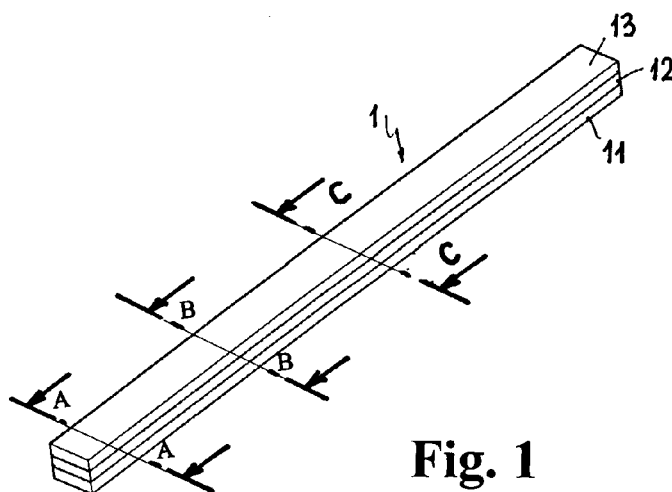
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(54) Title: COMPOSED WOODEN PROFILE FOR MANUFACTURING OF DOOR OR WINDOW WINGS OR FRAMES



**Fig. 1**

(57) Abstract: Proposed is a composed wooden profile, which is intended for manufacturing of window and door wings (2) and frames and which consists of at least three ledges (11, 12, 13), which are assembled and sealed along their complete length, namely of lateral ledges (11, 13) as well of at least one intermediate ledge (12) arranged there-between, wherein at least said intermediate ledge (12) comprises a longitudinal, generally continuous recess (120), which is filled with corresponding insulating filler (125). On both ends of the ledge (12), said recess (120) is ended at certain distance apart from each end portion (121, 122), in which each profile (1) is assembled with each adjacent profile (1) of each window or door wing (2) or frame (3) in each corner area (21, 31) thereof. The wing (2) or the frame (3) of each window or each door as formed by such profiles (1) excel in improved thermal-insulating properties by simultaneously maintaining excellent rigidity, in particular in the corner areas (21, 31).

## **COMPOSED WOODEN PROFILE FOR MANUFACTURING OF DOOR OR WINDOW WINGS AND FRAMES**

The present invention belongs to the field of building construction, namely to wooden door or window frames, which are assembled of several wooden parts and combined with other materials.

The purpose of the invention is to create a profile, which should consist of massive wood and should moreover excel in essentially improved thermal insulating properties, which are required in building-up energetic passive buildings, wherein also a possibility of varying or adjusting said thermal insulating properties is desired regardless to unchanged width or thickness of door or window wing or frame, and which should be regardless to that quickly and easily manufactured, wherein at the same time despite to such improved thermal insulating properties the overall rigidity should be maintained at such level, which normally corresponds to the level of a door or window frame, which consists solely of massive wood.

A window, which is known under a commercial name »Passivhausfenster« and is manufactured by VARIOTEC Sandwich-Elemente GmbH & Co. KG, Neumarkt (DE), has been disclosed on the internet site [www.fenstertechnik-weinfurtnr.de](http://www.fenstertechnik-weinfurtnr.de). A profile, which is foreseen for manufacturing a wing and a frame of such window consists of three massive wooden ledges, which are longitudinally assembled and sealed a sandwich-like manner. Ledges may generally have the same or at least approximately the same thickness. The width of the intermediate ledge is essentially smaller than the width of lateral ledges, so that a centrally located groove is available in such massive wooden profile, which is then filled with a thermal insulating material, for example with polyurethane foam. Due to the presence of said additional thermal insulating filler within said groove, said profile and also a wing or a frame made of such profiles then excels in improved thermal insulating properties. However, such window is essentially weakened regarding the rigidity, which is particularly apparent in medium or large windows with respect to overall dimensions thereof. The ledges, which form such profile, have a constant width along the completely length, and each wing or frame is correspondingly weak in its corner areas. In particular windows having large overall dimensions suffer on bending stiffness of such profiles, so that the width of profiles must be adequately increased, which involves essentially higher consumption of materials and correspondingly higher costs, by which however also effective light permeable surface is correspondingly reduced. Besides, each thermal insulating capability of such window depends on each used thermal insulating material in combination with each disposable width or thickness such insulation layer, respectively. As soon as some higher insulating efficiency is required in a window frame, then by using an economic acceptable material such thermal insulating efficiency can be increased exclusively by increasing of thickness of the whole frame, which in

addition to other deficiencies leads to essential increasing of the price of such frame.

Still further, doors and windows are disclosed in DE 20 2008 013 830 U1, which are analogously as the previously described ones made of profiles, which consist of sandwich-like assembled massive wooden ledges, which are sealed along the complete length thereof. Each ledge is furnished with a plurality of relatively deep grooves, which are arranged on the side faced towards each neighboring ledges and extend parallel with respect to each other and extend along the complete length of the ledge. Consequently, after assembling said ledges in order to obtain each desired profile a plurality of cavities is obtained, in which the static air is contained, which forms a thermal insulating means for correspondingly improving thermal insulating property of such profile and consequently also of a complete door or window frame. Manufacturing of such profile is relatively simple, although the time consumption is essentially higher than in the previously discussed case. However, at least in the majority of embodiments of such profile, said grooves extend along the complete length of the ledges or profile, so that such profile is weak in its corner areas where the profiles are interconnected, and the rigidity of the frame or the wing obtained in such a manner is then correspondingly reduced. Said rigidity or stiffness of such frame may generally be increased by ending said grooves at certain distance apart from each corner area. However, the thermal insulating capability depends on the number and arrangement of said grooves, and consequently of the volume of the air, which is available therein. The need on increasing of insulating capability may then lead either to enlargement of the volume of said grooves, which then requires either even much more intensive cutting-out and related decreasing of rigidity, or alternatively increasing the width by simultaneously increasing the price of such profile.

The present invention refers to a composed wooden profile for manufacturing of door or window wings and frames, such profile comprising at least three longitudinally assembled and mutually sealed ledges, namely lateral ledges and at least one intermediate ledge arranged there-between, wherein said intermediate ledge comprises a longitudinal recess, which is filled with appropriate thermal insulating filler.

In accordance with the present invention, said recess is ended on both sides of said ledge at certain distance apart from both end portions of the intermediate ledge, where appropriate interconnection of each profile with each neighboring profile is established in order to obtain each desired door or window wing and frame.

Said recess in the intermediate ledge is either continuous in its longitudinal direction, or may also be at least once interrupted in its longitudinal direction and may consist of at least two linearly aligned sections. At least one insert is inserted within said recess of the intermediate ledge in addition to said filler, and is firmly interconnected with the belonging ledge.

In one of possible embodiments, at least two inserts are foreseen within said recess, which are arranged at certain distance apart from each other and also apart from both end portions of the ledge. Each insert may consist of wood or any other sufficiently strong material, optionally of the same material as the thermal insulating filler. Each of disposable inserts is firmly interconnected with the intermediate ledge by means of adhesive.

Said ledges are mutually interconnected by means of adhesive, while said filler preferably consists of polyurethane foam.

Said recess may either be a groove, which extends in the longitudinal direction of the intermediate ledge and is ended apart from both end portions thereof, or may also be a step-like depression or contraction, which extends along the complete length of the ledge except of both end portions thereof.

In one of further possible embodiments, in addition to said intermediate ledge, also at least one lateral ledge is furnished with a longitudinal recess, which is filled with thermal insulating filler. Also in such case said recess may either be continuous in its longitudinal direction, or may also be at least once interrupted in its longitudinal direction in order to consist of at least two linearly aligned sections. Again, at least one insert is inserted within said recess of the intermediate ledge in at least one lateral ledge in addition to said filler, and is firmly interconnected with each belonging ledge. It may also be preferred, if at least two inserts are foreseen within said recess, which are arranged at certain distance apart from each other and also apart from both end portions of the ledge. Each of disposable inserts is firmly interconnected with each belonging lateral ledge by means of adhesive. Also in such case said ledges are mutually interconnected by means of adhesive and said filler preferably consists of polyurethane foam.

Moreover, the invention also refers to a window comprising a wing and/or a frame consisting of profiles accordance with previously described features, or also to a door comprising a wing and/or a frame consisting of profiles accordance with previously described features.

Now the invention will be described in more detail on the basis of embodiments, which are shown in the enclosed drawings, wherein

- Fig. 1 is a perspective view of the schematically shown first embodiment of a profile for manufacturing of a door or window wing or frame;
- Fig. 2 is a schematically shown profile according to Fig. 1 with partially removed one ledge;
- Fig. 3 is a schematically shown further embodiment of a profile according to Fig. 1 with partially removed one ledge;
- Fig. 4 is cross-section in the corner area along the line A – A according to Fig. 1 of a door or window wing consisting of a profile according to Fig. 2;
- Fig. 5 is a cross-section at certain distance apart from the corner area along the line B – B according to Fig. 1 of a door or window wing consisting of a profile according to Fig. 2;
- Fig. 6 is a cross-section in the central region along the line C – C according to Fig. 1 of a door or window wing consisting of a profile according to Fig. 2;
- Fig. 7 is a cross-section in the corner area along the line A – A according to Fig. 1 of a door or window wing consisting of a profile according to Fig. 3;
- Fig. 8 is a cross-section at certain distance apart from the corner area along the line B – B according to Fig. 1 of a door or window wing consisting of a profile according to Fig. 3;
- Fig. 9 is a cross-section in the central region along the line C – C according to Fig. 1 of a door or window wing consisting of a profile according to Fig. 3;
- Fig. 10 is a perspective view of the schematically presented further embodiment of a profile for manufacturing of a door or window wing or frame;
- Fig. 11 is a cross-section in the corner area along the line A – A according to Fig. 10 of a door or window wing consisting of a profile according to Fig. 10;
- Fig. 12 is a cross-section at certain distance apart from the corner area along the line B – B according to Fig. 10 of a door or window wing consisting of a profile according to Fig. 10;

- Fig. 13 is a cross-section in the central region along the line C – C according to Fig. 10 of a door or window wing made of a profile according to Fig. 10;
- Fig. 14 is a cross-section in the corner area along the line A – A according to Fig. 10 of a still further embodiment door or window wing consisting of a profile according to Fig. 10;
- Fig. 15 is a cross-section at certain distance apart from the corner area along the line B – B according to Fig. 14 of a door or window wing consisting of a profile according to Fig. 10;
- Fig. 16 is a cross-section in the central region along the line C – C according to Fig. 14 of a door or window wing consisting of a profile according to Fig. 10; and
- Fig. 17 is a cross-section at certain distance apart from the corner area correspondingly along the line B – B according to Fig. 14 of a door or window frame consisting of a profile according to Fig. 10.

An embodiment of a profile 1 according to Fig. 1, which is intended for manufacturing of a window or door wing 2 or frame 3 consists of three ledges 11, 12, 13, which are longitudinally assembled and mutually interconnected, in particular sealed, wherein the intermediate ledge 12 is furnished with a recess 120, which is either continuous or at least once interrupted, and which ends at a predetermined distance apart from corresponding end portions 121, 122, in which corresponding profiles 1 are interconnected in order to form a corner area of such established wing 2 or frame 3. Said recess 120, which is available in the intermediate portion 123 i.e. apart from both end portions 121, 122, is filled with appropriate thermal insulating filler 125.

In accordance with the present invention, addition to said filler 125 at least one insert 126 is located within said recess 126, which may consist either of wood or any other material, e.g. a thermal insulating material, which is by means of adhesive firmly interconnected with above mentioned ledges 11, 12, 13 of the profile 1. In a preferred embodiment, at least two inserts 126 are foreseen within said recess 120, which are located at a desired distance apart from each other and also apart from both end portions 121, 122 of the ledge 12. Each disposable space between said inserts 126 is filled with a thermal insulating filler 125. The presence of said inserts 126 leads to additional increasing of rigidity of such profile 1 consisting of said ledges 11, 12, 13 and consequently of a window or door wing 2 or frame 3 consisting of such profiles 1.

According to Fig. 1 in correlation with Figs. 4 – 6, the first embodiment of the profile 1, which is intended for manufacturing of a door or window wing 2 or frame 3, provides that said recess 120 is formed as a groove. In such an embodiment, upon assembling and sealing said ledges 11, 12, 13 the thermal insulating filler 125 is surrounded with the material of ledges 11, 12, 13, namely with massive wood, around the complete circumference of the profile 1 of the window or door wing 2 or frame 3, and said thermal insulating filler 125 is completely invisible, when observed from outside. In such case, said filler 125 including each available inserts 126 need to be inserted and integrated into said recess 120 prior to assembling the ledges 11, 12, 13 and forming such assembled profile 1.

On the other hand, a further embodiment of the profile 1 according to Fig. 10 in correlation with relevant drawings in Figs. 11 – 16 related to door or window wing 2 or frame 3 according to Fig. 17 provides that said recess 120 is available in the

form of a step-like depression or contraction of the ledge 12 in the intermediate area 123 thereof apart from both end portions 121, 122, wherein the thermal insulating filler 125 extends towards the circumference of the profile 1 and is generally visible from outside, although it may then be covered by appropriate layer of any other material. In such a case, said filler 125 and optionally also the inserts 126 may be placed within said recess even after assembling said ledges 11, 12, 13 and forming the profile 1 as such.

As evident in Figs 4 – 9 and 11 – 17, each manufactured profile 1, which consists of massive wooden ledges 11, 12, 13 and the thermal insulating filler 125 placed within appropriate recess 120 located apart from the end portions 121, 122, is used as a semi-product for the purposes of further processing in order to obtain each desired profile of each particular window or door wing (Figs 4 – 9 and 11 – 16) or frame 2 (Fig. 17), which are regarding all required functional aspects adjusted to each other. However, according to the invention each door or window 2 wing or frame 3 consists of profiles 1, which include appropriate thermal insulating filler 125 located within the intermediate ledge 12 apart from the end portions 121, 122 thereof, by which then in the area of said end portions 21, 31 of the door or window wing 2 or frame 3 a common rigidity of massive wooden profile 1 is maintained, by which a required rigidity and strength of the door or window wing 2 or frame 3 is then assured. Said rigidity of the door or window wing 2 or frame 3 may still be improved when at least one insert 126 is present within said recess 120 adapted to receive said filler 125, and is firmly interconnected with said ledges 11, 12, 13. At least two inserts 126, which are located apart from each other and also apart from both end portions 121, 122 of the ledge 12, are preferably inserted within said recess 120 of each profile 1, which is intended to form the door or window wing 2 or frame 3.

As further evident from the enclosed drawings (Figs. 10 – 17), the profile 1 of each corresponding door or window wing 2 or frame 3 can also be designed in such manner that in addition to said intermediate ledge 12 also at least one lateral edge 11, 13 is furnished with appropriate recess 130. Also in such case, quite analogously and logically for those skilled in the art, such recess 130 is then filled with thermal insulating filler 135 and when required combined with appropriate inserts consisting of wood or any other thermal insulating material, wherein such insert is then firmly interconnected with each corresponding ledge 11, 13, in which said recess 130 is available.

Thanks to the above described concept, such profile excels in that despite to excellent rigidity of each door or window wing 2 or frame 3 obtained by means of assembling such profiles and by maintaining the corner areas completely consisting of massive wood and without weakening thereof, each desired thermal insulating properties may be adjusted even when width or thickness of such profile is limited.

## PATENT CLAIMS

1.     Composed wooden profile (1) for manufacturing of door or window wings (2) and frames (3), comprising at least three longitudinally assembled and mutually sealed ledges (11, 12, 13), namely lateral ledges (11, 13) and at least one intermediate ledge (12) arranged there-between, wherein said intermediate ledge (12) comprises a longitudinal recess (120), which is filled with appropriate thermal insulating filler (125), **characterized in that** said recess (120) is ended on both sides of said ledge (12) at certain distance apart from both end portions (121, 122) of the ledge (12), where interconnection of each profile (1) with each neighboring profile (1) is established in order to obtain each desired door or window wing (2) and frame (3).
2.     Profile according to Claim 1, **characterized in that** said recess (120) is continuous in its longitudinal direction.
3.     Profile according to Claim 1, **characterized in that** said recess (120) is at least once interrupted in its longitudinal direction and consists of at least two linearly aligned sections (120', 120'').
4.     Profile according to Claim 2, **characterized in that** at least one insert (126) is inserted within said recess (120) of the intermediate ledge (12) in addition to said filler (125), and is firmly interconnected with the belonging ledge (12).

5. Profile according to Claim 2, **characterized in that** at least two inserts (126) are foreseen within said recess (120), which are arranged at certain distance apart from each other and also apart from both end portions (121, 122) of the ledge (12).
6. Profile according to Claim 4 or 5, **characterized in that** said insert (126) consists of wood.
7. Profile according to Claim 4 or 5, **characterized in that** said insert (126) consists of the same material as the thermal insulating filler (125).
8. Profile according to Claim 4 or 5, **characterized in that** each of disposable inserts (126) is firmly interconnected with the intermediate ledge (12) by means of adhesive.
9. Profile according to anyone of the preceding Claims, **characterized in that** said ledges (11, 12, 13) are mutually interconnected by means of adhesive.
10. Profile according to anyone of the preceding Claims, **characterized in that** said filler (125) consists of polyurethane foam.
11. Profile according to anyone of the preceding Claims, **characterized in that** said recess (120) is a groove, which extends in the longitudinal direction of the intermediate ledge (12) and is ended apart from both end portions (121, 122) thereof.

12. Profile according to anyone of the preceding Claims, **characterized in that** said recess (120) is a step-like depression or contraction, which extends along the complete length of the ledge (12) except of both end portions (121, 122) thereof.

13. Profile according to anyone of the preceding Claims, **characterized in that**, in addition to said intermediate ledge (12), also at least one lateral ledge (11, 13) is furnished with a longitudinal recess (130), which is filled with a thermal insulating filler (135).

14. Profile according to Claim 13, **characterized in that** said recess (120) is continuous in its longitudinal direction.

15. Profile according to Claim 13, **characterized in that** said recess (130) in at least one lateral ledge (11, 13) is at least once interrupted in its longitudinal direction and consists of at least two linearly aligned sections.

16. Profile according to Claim 14, **characterized in that** at least one insert (136) is inserted within said recess (130) of the intermediate ledge (12) in at least one lateral ledge (11, 13) in addition to said filler (135), and is firmly interconnected with each belonging ledge (11, 13).

17. Profile according to Claim 14, **characterized in that** at least two inserts are foreseen within said recess (130), which are arranged at certain distance apart from each other and also apart from both end portions (121, 122) of the ledge (12).

18. Profile according to Claim 16 or 17, **characterized in that** each of disposable inserts (136) is firmly interconnected with each belonging lateral ledge (11, 13) by means of adhesive.

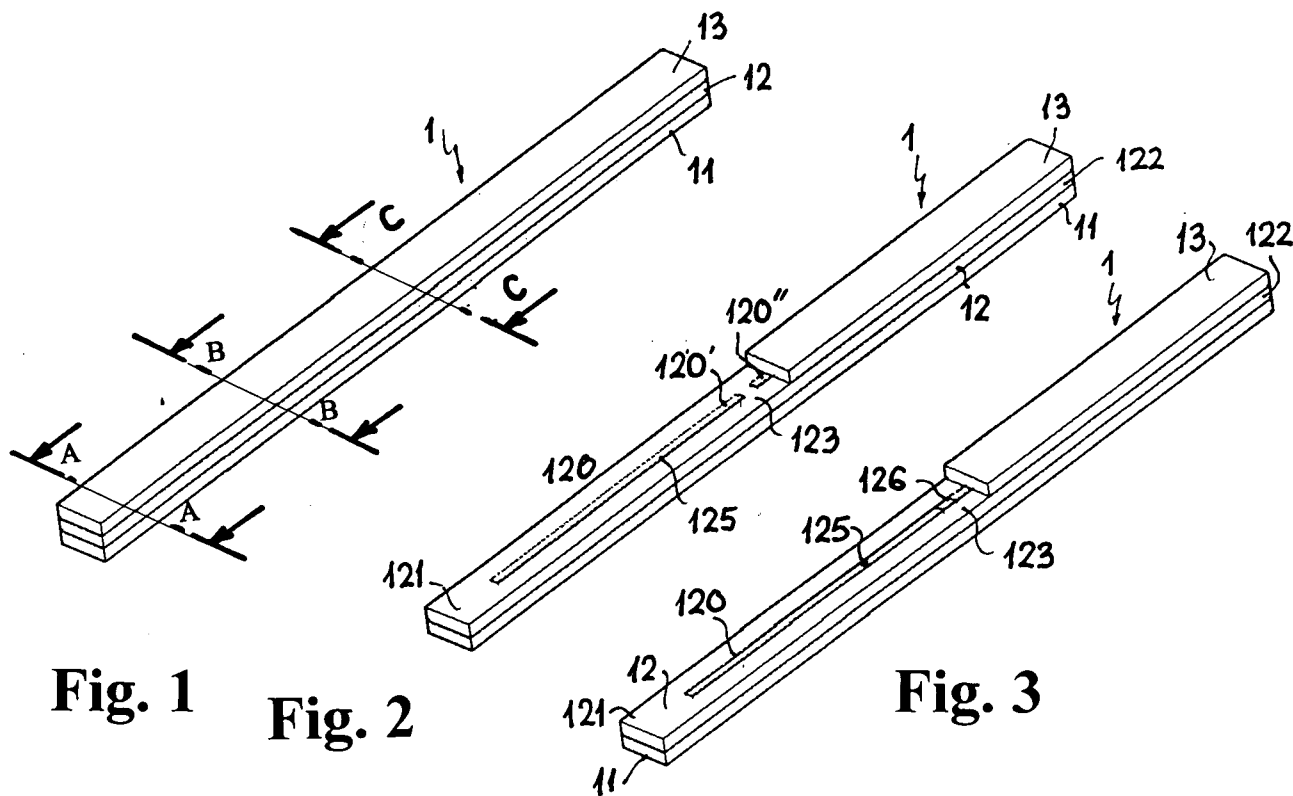
19. Profile according to anyone of Claims 13 to 18, **characterized in that** said ledges (11, 12, 13) are mutually interconnected by means of adhesive.

20. Profile according to anyone of the preceding Claims, **characterized in that** said filler (135) consists of polyurethane foam.

21. Window, comprising a wing (2) and/or a frame (3) consisting of profiles (1) according to anyone of Claims 1 to 21, which are firmly interconnected in corner areas (21, 31).

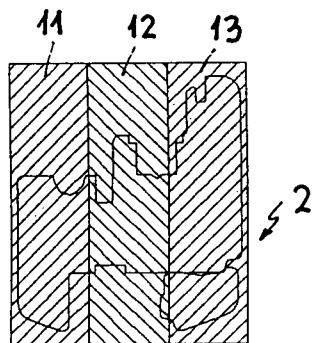
22. Door, comprising a wing (2) and/or a frame (3) consisting of profiles (1) according to anyone of Claims 1 to 21, which are firmly interconnected in corner areas (21, 31).

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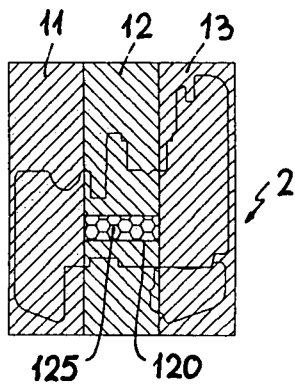


**Fig. 1** **Fig. 2**

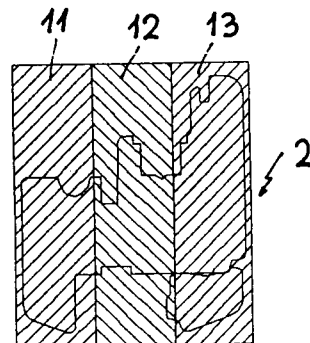
**Fig. 3**



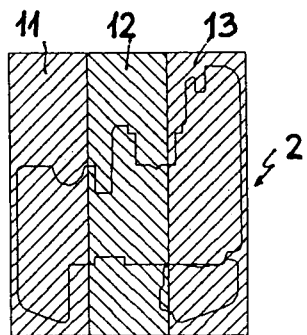
**Fig. 4**



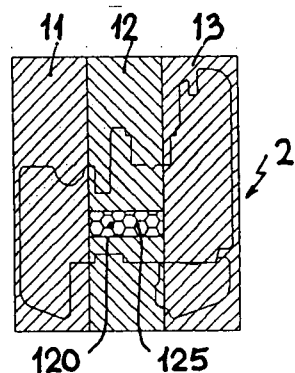
**Fig. 5**



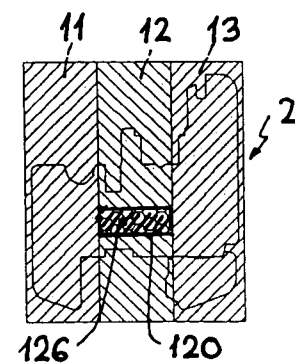
**Fig. 6**



**Fig. 7**

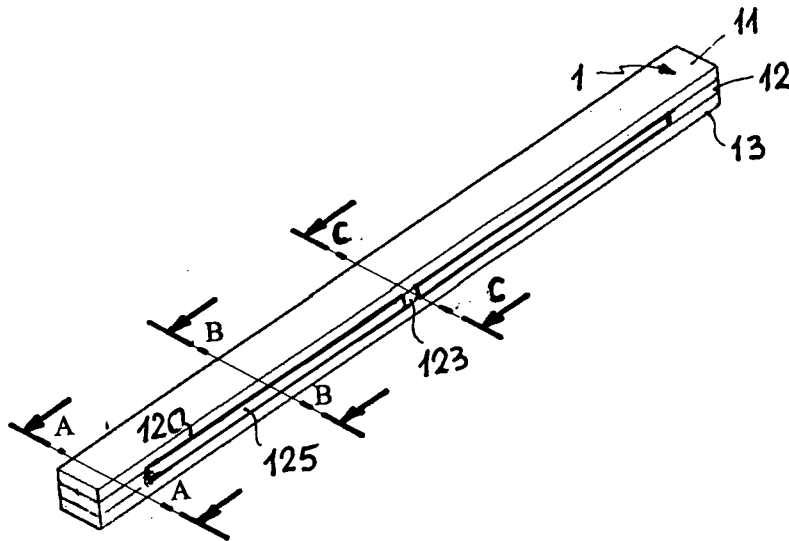


**Fig. 8**

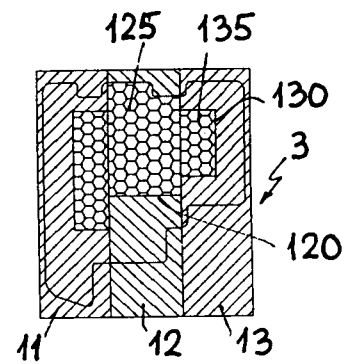


**Fig. 9**

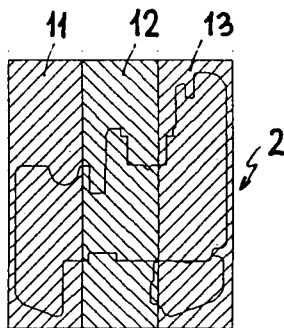
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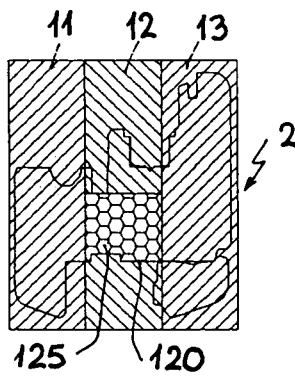
**Fig. 10**



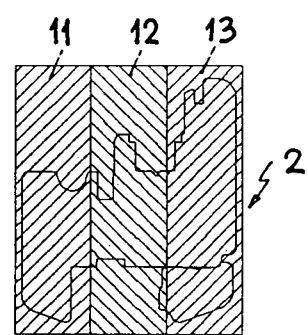
**Fig. 17**



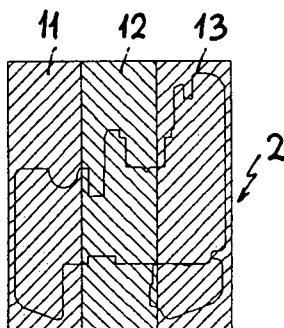
**Fig. 11**



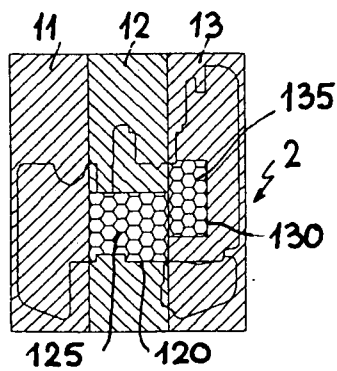
**Fig. 12**



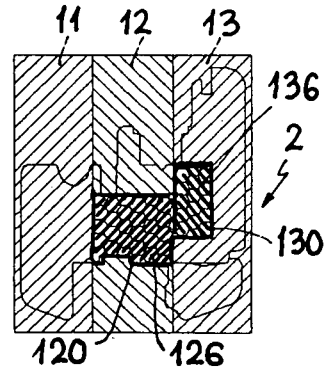
**Fig. 13**



**Fig. 14**



**Fig. 15**



**Fig. 16**

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/SI2010/000003

## A. CLASSIFICATION OF SUBJECT MATTER

INV. E06B3/263

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)  
E06B

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 practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                           | Relevant to claim No. |
|-----------|--------------------------------------------------------------------------------------------------------------|-----------------------|
| A         | DE 20 2008 000994 U1 (HOLZ SCHILLER GMBH [DE]) 15 May 2008 (2008-05-15)<br>cited in the application<br>----- | 1                     |

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

☒ See patent family annex.

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### Information on patent family members

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Form PCT/ISA/210 (patent family annex) (April 2005)