

(19)



(11)

EP 3 508 679 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
10.07.2019 Bulletin 2019/28

(51) Int Cl.:
E06B 3/96 (2006.01) **E06B 3/964 (2006.01)**
E06B 1/70 (2006.01)

(21) Application number: **19150721.9**

(22) Date of filing: **08.01.2019**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(72) Inventors:
• **Kreunen, Jan Gerrit**
7211 AN Eefde (NL)
• **Lemson, Robert**
7609 EA Almelo (NL)

(74) Representative: **Slikker, Wilhelmina Johanna Arnold & Siedsma**
Bezuidenhoutseweg 57
2594 AC The Hague (NL)

(30) Priority: **09.01.2018 NL 2020252**

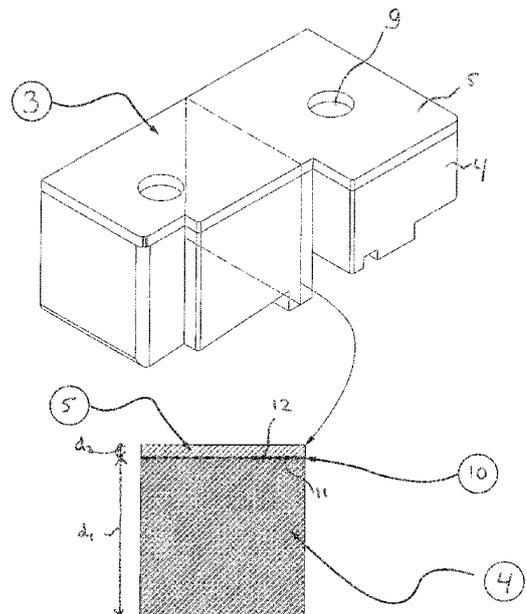
(71) Applicant: **Innodeen B.V.**
7241 CR Lochem (NL)

(54) **CONNECTING ELEMENT FOR A FRAME AND METHOD FOR MANUFACTURE THEREOF**

(57) The invention relates to a connecting element for providing a connection between a sill and a jamb of a frame, which connecting element comprises a first part with first material properties and a second part with second material properties, which second material properties differ from the first material properties, and wherein the second part is connected inseparably to the first part.

The invention also relates to a frame with at least one such connecting element. The invention further relates to a method for manufacturing such a connecting element.

Figuur 2A



Figuur 2B

EP 3 508 679 A1

Description

[0001] The invention relates to a connecting element for providing a connection between a sill and a jamb of a frame.

[0002] A sill is a substantially horizontal beam of a frame for a door or window. A jamb is a substantially vertical post of such a frame. In order to have the sill and the jamb fit together properly and to connect them to each other a connecting element can be provided, which connecting element is arranged between the sill and the jamb and is connected thereto. Such a connecting element is per se known. An example of such a connecting element is a so-called plinth block.

[0003] In order to provide a watertight and/or airtight seal between the connecting element and the jamb it is possible to arrange a sealing element, also referred to as a flashing, therebetween.

[0004] Such a connecting element with seal is for instance known from EP1163416B1 or EP1659253 B1 of the present applicant.

[0005] It is an object of the invention to improve the connecting element of the type stated in the preamble.

[0006] This object is achieved with a connecting element of the type stated in the preamble, which connecting element according to the invention comprises a first part with first material properties and a second part with second material properties, which second material properties differ from the first material properties, and wherein the second part is connected inseparably to the first part.

[0007] An advantage of the connecting element according to the invention is that the first part and the second part are unable to move relative to each other, in particular unable to move in a substantially lateral direction, due to the inseparable connection therebetween. The first part and the second part hereby remain positioned correctly relative to each other during for instance installation of the frame. The inseparable connection can additionally or alternatively provide a substantially watertight and/or airtight connection between the first part and the second part.

[0008] The term inseparable is in this application understood to mean at least that the first part and the second part cannot be separated from each other without damaging the first part and/or the second part.

[0009] It is noted that the inseparable connection can alternatively or additionally be described as the first part and the second part forming one integral whole.

[0010] It is noted that the inseparable connection can alternatively or additionally be described as the second part being integrated with the first part.

[0011] The connecting element according to the invention can particularly be suitable for different types of frame, such as for instance both hollow and solid frames, and frames of different types of material.

[0012] The connecting element can particularly be formed from an inseparable, composite material, which composite material is composed of a first base material

with the first material properties for forming the first part and a second base material with the second material properties for forming the second part.

[0013] Because the connecting element is formed from such a composite material, the first part and the second part can be formed simultaneously and/or jointly and/or in one production step, where before, the connecting element and the seal would have to be made separately of each other in multiple steps and/or with multiple operations. Furthermore, no separate processing means need be provided here for the purpose of forming or manufacturing the first part and the second part, whereby costs can be saved.

[0014] Alternatively or additionally, no relative displacements are possible between the first and the second part, whereby the shapes are adapted to each other well.

[0015] Connecting elements are made in many different shapes. The seal is usually die-cut into a correct shape. Due to the large number of different shapes of the connecting elements, it is however expensive to provide a separate cutting die for each shape. It is hereby often the case that the seal, which may or may not have already been die-cut into a basic shape, is cut additionally after being arranged on the connecting element. This is very labour-intensive and/or prone to errors and/or can result in undesired leakage of air, and is no longer necessary in the composite connecting element according to the invention.

[0016] It is noted that the composite material is thus composed prior to the connecting element being manufactured therefrom.

[0017] The composite material can particularly be a solid material.

[0018] In an embodiment of the connecting element according to the invention the second part forms a seal between the first part and the jamb.

[0019] The seal formed by the second part is particularly a moisture-tight and/or airtight seal.

[0020] In another embodiment of the connecting element according to the invention the first part is substantially non-compressible and the second part is compressible to at least some extent.

[0021] The non-compressible first part can form a strong transition or connection between the sill and the jamb. The term non-compressible is here understood to mean that the first part is non-compressible with the exertion of normal forces which are exerted on such a connecting element between a sill and a frame, for instance during installation of the frame or in a situation in which the frame has been installed in a building. The second part is compressible to at least some extent, whereby a moisture-tight and/or airtight seal can be formed.

[0022] The first part can particularly have a hardness chosen between shore D50 and D90.

[0023] The second part can particularly have a hardness chosen between shore A25 and A75.

[0024] The first part can be manufactured from any suitable material, such as for instance from polyvinyl

chloride (PVC), a polyolefin plastic such as for instance so-called Low Density Polyethylene (LDPE), Linear Low Density Polyethylene (LLDPE), High Density Polyethylene (HDPE), High Molecular Weight Polyethylene (HMWPE) or Ultra High Molecular Weight Polyethylene (UHMWPE), polypropylene (PP) or any random combination thereof.

[0025] The second part can be manufactured from any suitable material, such as for instance an olefin-based thermoplastic elastomer (TPE), such as EPDM, or a urethane-based TPE, or a rubber.

[0026] It has been found by applicant that, although the invention is not limited hereto, an HMWPE with a shore D64 hardness and a specific weight of 0.95 g/cm³ can particularly be a suitable material for the first part.

[0027] It has been found by applicant that, although the invention is not limited hereto, a TPE with a shore A57 hardness and a specific weight of 1.16 g/cm³ can particularly be a suitable material for the second part.

[0028] The thickness of the first part and/or the second part can be chosen as desired. A thickness of the second part can particularly be smaller than the thickness of the first part. More particularly, a thickness of the first part can for instance be chosen between 5 mm and 300 mm and/or a thickness of the second part can for instance be chosen between 1 mm and 5 mm.

[0029] The thickness is here defined in a direction from the sill to the jamb in use of the connecting element.

[0030] The invention likewise relates to a frame, comprising a sill and at least one jamb, wherein arranged between the sill and the at least one jamb is at least one connecting element according to one or more of the embodiments or with one or more of the features as described above or below, which at least one connecting element is connected to the sill and the at least one jamb, and wherein the first part of the at least one connecting element is directed toward the sill and the second part of the connecting element is directed toward the at least one jamb.

[0031] In a practical manner such a frame can comprise at least two jambs and at least two connecting elements according to the invention, wherein one connecting element in each case forms the connection between one jamb and the sill.

[0032] In a practical manner such a frame can also comprise a substantially horizontal head element, which mutually connects the at least two jambs on their upper side.

[0033] In a practical manner the at least one connecting element can be connected to the sill and the at least one jamb by means of per se known connecting means, such as for instance screws and/or nails and/or plugs and/or glue.

[0034] The sill and/or the at least one jamb of the frame can take a solid or hollow form, for instance the form of a hollow profile.

[0035] The sill and/or the at least one jamb of the frame can be manufactured from any suitable and/or desired

material.

[0036] The material from which the sill is manufactured can be the same as or different than the material from which the at least one jamb is manufactured.

[0037] The sill can for instance be manufactured from material containing wood, such as solid wood, composite wood, compressed wood fibres, or from plastic, such as thermoplastic or thermosetting plastic, or from metal, such as aluminium, or from a stone-like material, such as natural stone, artificial stone, concrete or composite stone, or from a composite material, or any random combination thereof.

[0038] The at least one jamb can for instance be manufactured from material containing wood, such as solid wood, composite wood, compressed wood fibres, or from plastic, such as thermoplastic or thermosetting plastic, or from metal, such as aluminium, or from a stone-like material, such as natural stone, artificial stone, concrete or composite stone, or from a composite material, or any random combination thereof.

[0039] The invention also relates to a method for manufacturing a connecting element according to one or more of the embodiments or with one or more of the features as described above or below, comprising the following steps, to be performed in any suitable order, of:

- (a) providing a first base material with first material properties;
- (b) providing a second base material with second material properties, which second material properties differ from the first material properties;
- (c) integrally connecting the first base material and the second base material into an inseparable, composite material;
- (d), to be performed after step (c), manufacturing a connecting element from the composite material.

[0040] Step (c) can for instance be performed by pressing the first base material and the second base material together in an optionally heated mould. The pressing can provide a good and/or strong adhesion between the first base material and the second base material, whereby the inseparable connection therebetween is formed. Because of the pressing it may be the case that the second base material is pressed into the first base material to some extent, i.e. is emulsified therein. The first base material can particularly be pressed onto the second base material.

[0041] In order to increase the adhesion between the first base material and the second base material it is possible that one or both connecting surfaces of the first base material and the second base material which are connected to each other are relatively rough and, in particular, not smooth or flat. The connecting surface of the first base material and/or the connecting surface of the second base material can for instance have a surface roughness varying between 20 μm and 3000 μm.

[0042] Step (d) can for instance be performed by cut-

ting and/or sawing and/or machining and/or milling a connecting element with a desired shape from the composite material.

[0043] The invention will be further elucidated with reference to figures shown in a drawing, in which:

figure 1 shows a perspective schematic view of the mounting of a connecting element according to the invention between a sill and a jamb;

figures 2A and 2B show the connecting element of figure 1 in more detail in a perspective schematic view (figure 2A) and a schematic cross-section in the thickness direction (figure 2B);

figures 3A and 3B show schematically a number of connecting elements according to different embodiments mounted on a first type of sill (figure 3A) and on a second type of sill (figure 3B); and

figures 4A and 4B show schematically two types of sill.

[0044] In the figures the same elements are designated with the same reference numerals, increased by hundreds for other exemplary embodiments thereof.

[0045] Figure 1 shows a sill 1 and a jamb 2. As can be seen in figure 1, in this example sill 1 has an upper surface which is not flat and not horizontal, while jamb 2 has a substantially flat and horizontal lower surface. A connecting element 3 is therefore arranged therebetween in order to provide a good fit between jamb 2 and sill 1. The shape of the underside of connecting element 3 is for this purpose adapted to the upper side of sill 1, and the shape of the upper side of the connecting element is adapted to the underside of jamb 2.

[0046] In accordance with the invention, connecting element 3 has a first part 4 and a second part 5. First part 4 is substantially hard and non-compressible so that it can form a good and/or strong connection between sill 1 and jamb 2, while the second part 5 is compressible to some extent in order to form a moisture-tight and/or airtight seal between connecting element 3 and jamb 2. First part 4 and second part 5 are connected inseparably to each other, i.e. formed integrally as one whole.

[0047] In figure 1 continuous holes 8 and 9 are visible in respectively sill 1 and connecting element 3, which are provided in this exemplary embodiment but can be dispensed with if desired. In this exemplary embodiment jamb 2 likewise has holes, which can also be dispensed with if desired, but which are not visible in figure 1. During assembly of the frame the holes of sill 1, connecting element 3 and jamb 2 provided in this example are in register with each other so that plugs 6 and screws 7 can be arranged therein for the purpose of mutually connecting sill 1, connecting element 3 and jamb 2.

[0048] Figures 2A and 2B show connecting element 3 in more detail. The cross-section in thickness direction of figure 2B shows that a boundary layer 10 between connecting surfaces 11, 12 of first part 4 and second part 5 is not flat and/or smooth. This may be caused in that,

when a second base material which will form second part 5 is pressed onto a first base material which will form first part 4, the second base material is pressed into the first base material to some extent. This may alternatively or additionally be caused in that the connecting surface 12 of first part 4 and/or the connecting surface 11 of second part 5 is rough. The cross-section in thickness direction of figure 2B further shows that a thickness d_1 of first part 4 is greater than a thickness d_2 of second part 5.

[0049] Figure 3A shows a solid sill 101. The solid sill 101 can for instance be manufactured from a stone-like material, a composite material or a plastic material. Three connecting elements 103, 203 and 303 according to different embodiments are arranged on sill 101. The three different connecting elements 103, 203 and 303 in particular each have a different shape. Connecting element 303 is thinner than the connecting elements 103 and 203. In accordance with the invention, each connecting element 103, 203 and 303 comprises a respective first part 104, 204, 304 and second part 105, 205, 305.

[0050] Figure 3B shows the same connecting elements 103, 203, 303 as in figure 3A, but arranged on a different type of sill 201. Sill 201 is hollow, in particular manufactured from a hollow profile. Sill 201 can for instance be manufactured from plastic, such as plastic PVC or fibre-reinforced plastic, or from metal, such as aluminium or steel.

[0051] Figures 3A and 3B show that both solid sills as in figure 3A and hollow sills as in figure 3B are suitable for connection to a connecting element according to the invention.

[0052] Figures 3A and 3B further show that connecting elements 103, 203, 303 can further have both a width equal to the width of sill 101, 201, i.e. connecting element 103, and a width smaller than the width of the sill 101, 201, i.e. connecting elements 203, 303. Connecting element 103 extends here over the whole width of sill 101, 201 and connecting elements 203, 303 extend over a part of the width of sill 101, 201.

[0053] Figures 4A and 4B show two different types of jamb 102, 202, which can be connected to a sill via connecting elements according to the invention. This shows that both solid jambs as in figure 4A and hollow jambs as in figure 4B are suitable for connection to a connecting element according to the invention. Jambs 102, 202 can for instance be manufactured from wood, plastic, such as plastic PVC or fibre-reinforced plastic, or from metal, such as aluminium or steel.

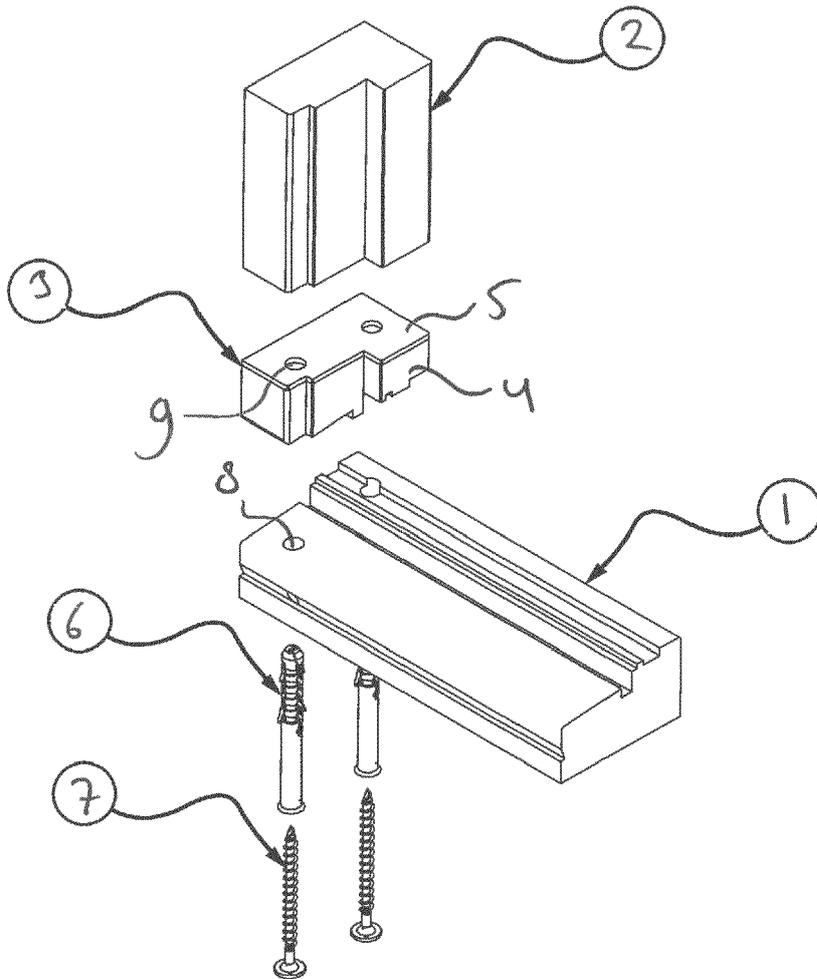
[0054] It is noted that the invention is not limited to the above discussed exemplary embodiments but also extends to other variants within the scope of the appended claims.

55 Claims

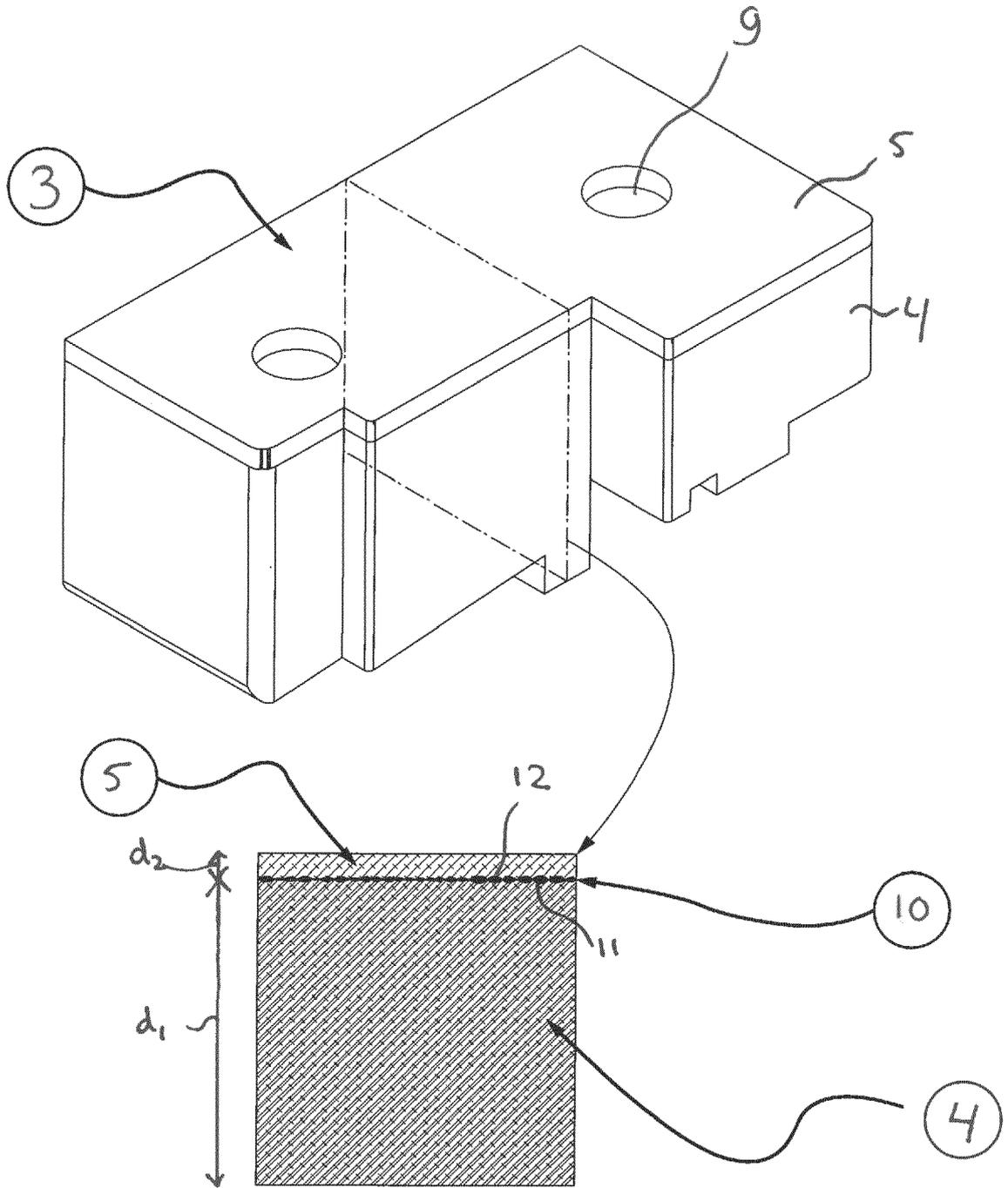
1. Connecting element for providing a connection between a sill and a jamb of a frame, which connecting

- element comprises a first part with first material properties and a second part with second material properties, which second material properties differ from the first material properties, and wherein the second part is connected inseparably to the first part. 5
2. Connecting element according to claim 1, wherein the connecting element is formed from an inseparable, composite material, which composite material is composed of a first base material with the first material properties for forming the first part and a second base material with the second material properties for forming the second part. 10
 3. Connecting element according to claim 1 or 2, wherein the second part forms a seal between the first part and the jamb. 15
 4. Connecting element according to any one of the foregoing claims, wherein the first part is substantially non-compressible and the second part is compressible to at least some extent. 20
 5. Connecting element according to any one of the foregoing claims, wherein the first part has a hardness chosen between shore D50 and D90. 25
 6. Connecting element according to any one of the foregoing claims, wherein the second part has a hardness chosen between shore A40 and A70. 30
 7. Connecting element according to any one of the foregoing claims, wherein the first part is manufactured from a material chosen from the group comprising polyvinyl chloride (PVC), a polyolefin plastic such as for instance so-called Low Density Polyethylene (LDPE), Linear Low Density Polyethylene (LLDPE), High Density Polyethylene (HDPE), High Molecular Weight Polyethylene (HMWPE) or Ultra High Molecular Weight Polyethylene (UHMWPE), polypropylene (PP) or any random combination thereof. 35 40
 8. Connecting element according to any one of the foregoing claims, wherein the second part is manufactured from an olefin-based thermoplastic elastomer (TPE), such as EPDM, or a urethane-based TPE, or a rubber. 45
 9. Frame, comprising a sill and at least one jamb, wherein arranged between the sill and the at least one jamb is at least one connecting element according to any one of the claims 1-8, which at least one connecting element is connected to the sill and the at least one jamb, and wherein the first part of the at least one connecting element is directed toward the sill and the second part of the connecting element is directed toward the at least one jamb. 50 55
10. Method for manufacturing a connecting element according to any one of the foregoing claims, comprising the following steps, to be performed in any suitable order, of:
 - (a) providing a first base material with first material properties;
 - (b) providing a second base material with second material properties, which second material properties differ from the first material properties;
 - (c) integrally connecting the first base material and the second base material into an inseparable, composite material;
 - (d), to be performed after step (c), manufacturing a connecting element from the composite material.
 11. Method according to claim 10, wherein step (c) is performed by pressing the first base material and the second base material together.
 12. Method according to claim 10 or 11, wherein step (d) is performed by cutting and/or sawing and/or machining and/or milling a connecting element with a desired shape from the composite material.

Figure 1



Figur 2A



Figur 2B

Figure 3A

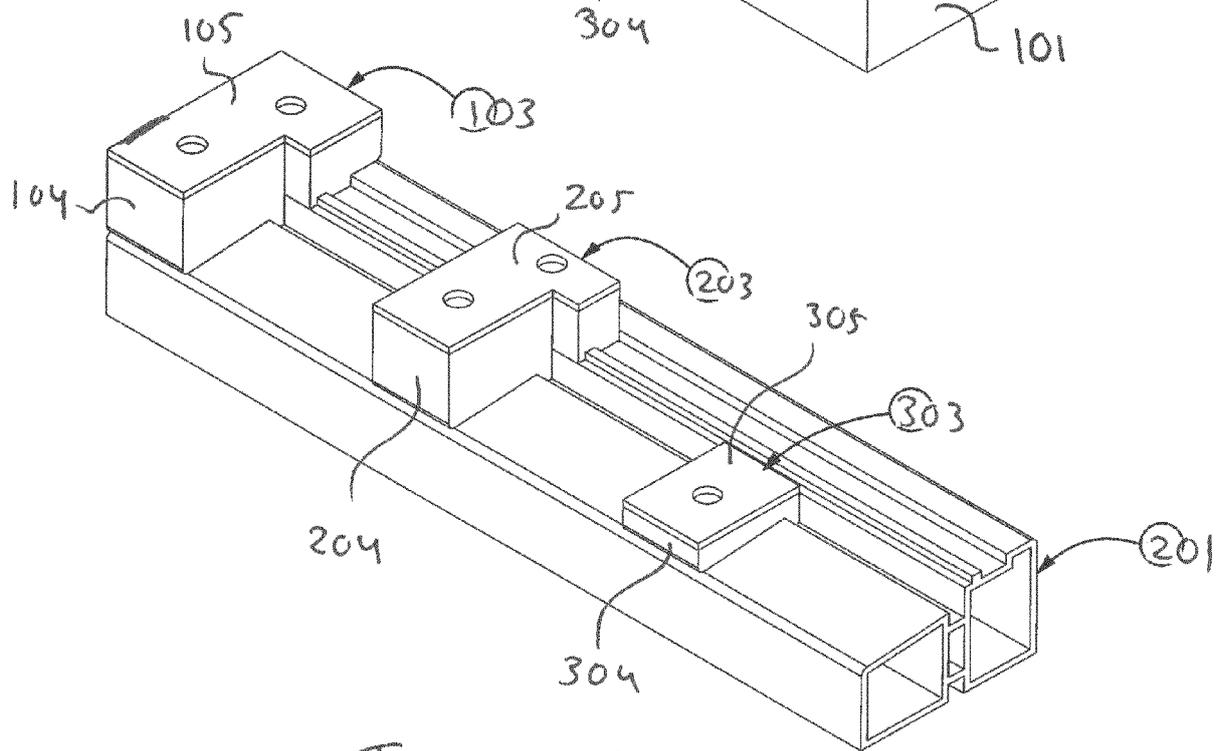
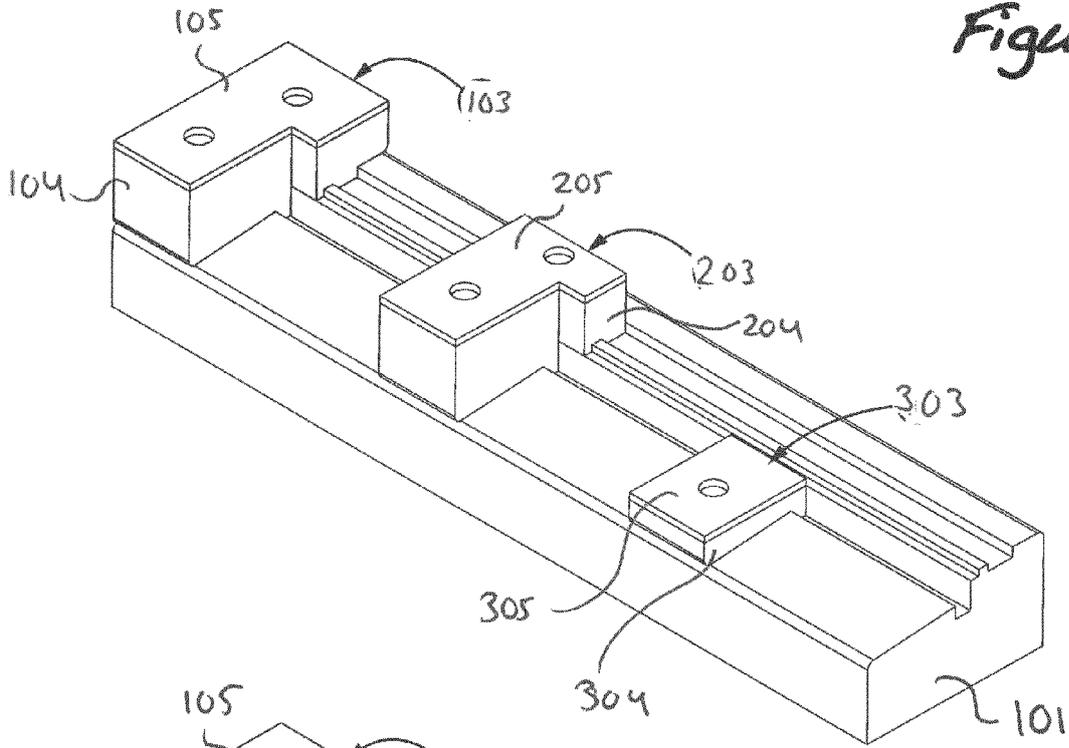


Figure 3B

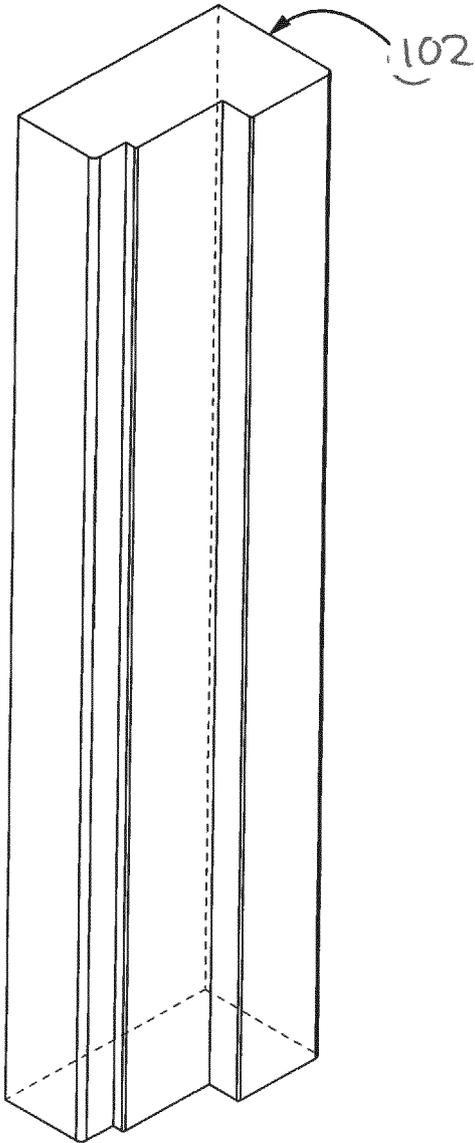


Figure 4A

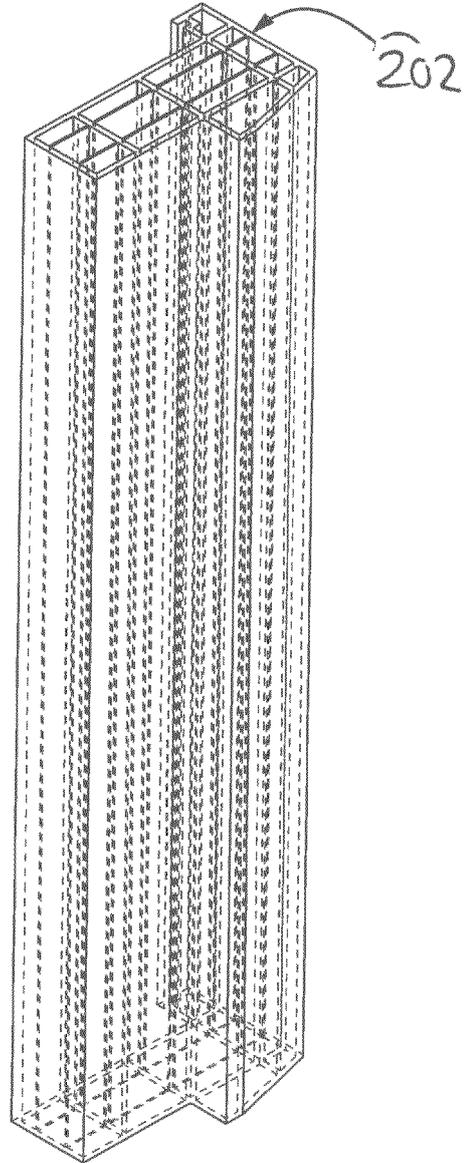


Figure 4B



EUROPEAN SEARCH REPORT

Application Number
EP 19 15 0721

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	NL 6 906 307 A (N.V. BOUWFONDS NEDERLANDSE GEMEENTEN [NL]) 27 October 1970 (1970-10-27) * page 3, line 9 - page 5, line 25; figures 1,3,4,5 *	1-12	INV. E06B3/96 E06B3/964 E06B1/70
X	----- WO 00/58589 A2 (KREUNEN KUNSTSTOFFEN B V [NL]; KREUNEN JOHAN BERNARD [NL]) 5 October 2000 (2000-10-05) * page 7, line 17 - page 10, line 2; figures 1,2 * & EP 1 163 416 A2 (KREUNEN KUNSTSTOFFEN B V [NL]) 19 December 2001 (2001-12-19) -----	1-12	
			TECHNICAL FIELDS SEARCHED (IPC)
			E06B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 19 March 2019	Examiner Hellberg, Jan
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			

EPO FORM 1503 03/82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 19 15 0721

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

19-03-2019

10

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
NL 6906307	A	27-10-1970	NONE

WO 0058589	A2	05-10-2000	AT 324506 T 15-05-2006
			AT 468465 T 15-06-2010
			AU 3576800 A 16-10-2000
			DE 60027555 T2 26-04-2007
			DK 1163416 T3 14-08-2006
			DK 1659253 T3 28-06-2010
			EP 1163416 A2 19-12-2001
			EP 1659253 A2 24-05-2006
			WO 0058589 A2 05-10-2000

15

20

25

30

35

40

45

50

55

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 1163416 B1 [0004]
- EP 1659253 B1 [0004]