



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
22.07.2020 Bulletin 2020/30

(51) Int Cl.:
E04B 2/96 (2006.01) **E06B 7/14 (2006.01)**

(21) Application number: **20150454.5**

(22) Date of filing: **07.01.2020**

(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

(71) Applicant: **L.M. DEI F.LLI MONTICELLI - S.R.L.**
60027 Osimo (AN) (IT)

(72) Inventor: **MONTICELLI, VLADIMIRO**
60024 FILOTTRANO (AN) (IT)

(74) Representative: **Baldi, Claudio**
Ing. Claudio Baldi S.r.l.
Viale Cavallotti, 13
60035 Jesi (Ancona) (IT)

(30) Priority: **16.01.2019 IT 201900000703**

(54) **UPRIGHT-CROSSPIECE ASSEMBLY**

(57) Assembly (100) comprising: an upright (2), a crosspiece (1) comprising a shelf (16) that protrudes frontally from the crosspiece (1) and a connection element (3) disposed between a lateral edge (161) of the shelf and a front side (22) of the upright (2); the connection element (3) is a seal made of soft elastomeric material that is tightly engaged in the crosspiece and in the upright;

and the connection element (3) is suitably configured to act as water conveyor element, in such a way that the water that is deposited on the shelf (16) is laterally drained towards the upright (2), without encountering any obstacles and reaching the front side (22) of the upright in order to be drained along the front side of the upright.

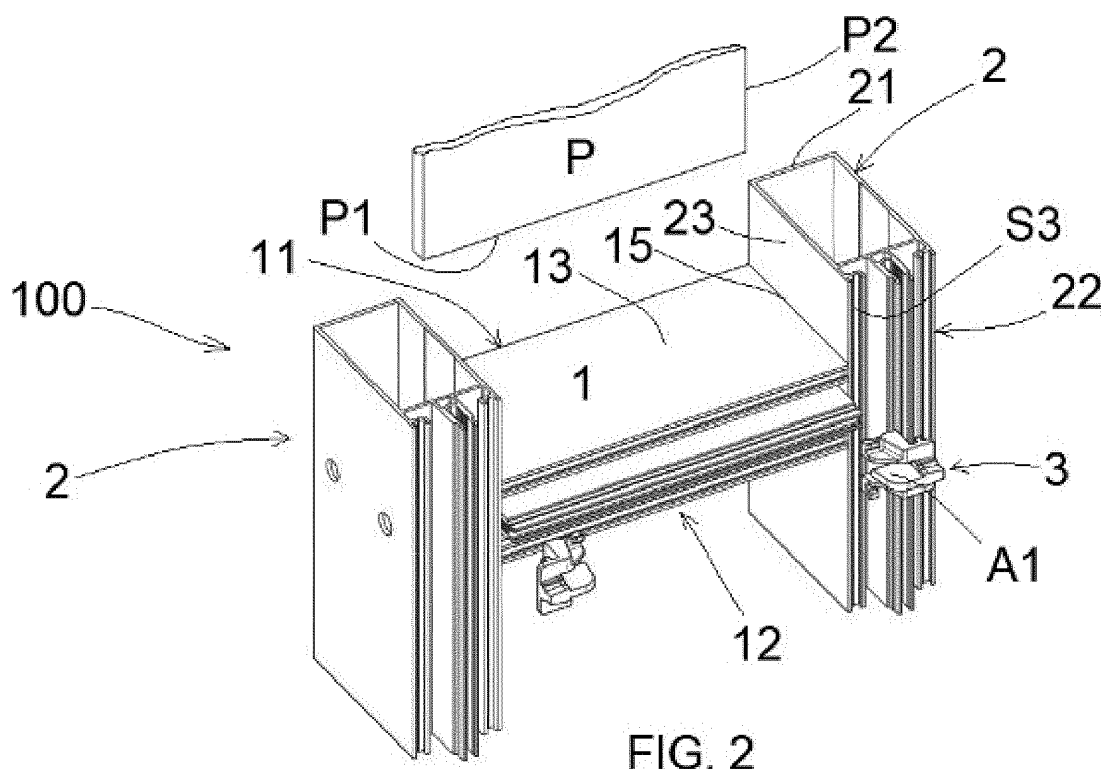


FIG. 2

Description

[0001] The present patent application for industrial invention relates to an upright-crosspiece assembly, in particular for the building sector, for the realization of continuous facades and/or ventilated facades of buildings.

[0002] Crosspieces with protruding shelves connected to uprights are generally used in building facades. Rain water or condensation water flows on the shelf of the crosspiece and penetrates an empty space between upright and crosspiece, creating humidity and infiltrations in the facade. Plugs are known to prevent water from being drained from the shelf to the upright. However, in such a case, the water is drained frontally from the crosspiece.

[0003] FR2694953 discloses an assembly comprising an upright, a crosspiece with a shelf that projects from the crosspiece, and a connection element to connect the crosspiece to the upright. The connection element has threaded holes and is made of a rigid material.

[0004] The connection element has a gap wherein a lateral edge of the shelf of the crosspiece is inserted. Therefore, the connection element forms a step on the shelf of the crosspiece. In view of the above, the water that flows on the shelf of the crosspiece is stopped against the step formed by the connection element and is drained from the crosspiece without reaching the upright.

[0005] If the coupling between the shelf and the gap of the connection element is loose, water penetrates into the connection element, and humidity is created.

[0006] WO2004/042159 discloses a system that comprises a mullion, a transom with a shelf that protrudes from the transom, a tight plug disposed in a lateral edge of the transom, and an insert fastened to the mullion by means of screws and fitted into the plug. The plug is made of a rigid material in order to be fitted into the insert. Moreover, the plug is designed to block the water flow on the shelf in order to prevent the water from reaching the mullion. In view of the above, the water is drained frontally from the shelf of the transom.

[0007] The purpose of the present invention is to disclose an upright-crosspiece assembly capable of draining the water from the crosspiece towards the upright, in such a way that the water is drained on the upright, preventing the water from penetrating in an empty space between crosspiece and upright and dripping from the crosspiece.

[0008] Another purpose is to disclose an upright-crosspiece assembly that is reliable, versatile and simple to make and install.

[0009] These purposes are achieved according to the invention with the characteristics of the appended independent claim 1.

[0010] Advantageous embodiments appear from the dependent claims.

[0011] The assembly of the invention is defined by claim 1.

[0012] For the sake of clarity, the description of the assembly according to the invention continues with reference to the attached drawings, which only have an illustrative, not limiting value, wherein:

Fig.1 is an axonometric view of an assembly according to the invention;

Fig.1 A is an enlarged view of a detail of Fig.1;

Fig. 2 is an axonometric view of the assembly of Fig. 1, with an exploded view of two connection elements and one cover panel;

Fig. 2A is an enlarged view of a detail of Fig.2;

Figs. 3, 3A, 3B, 3C, 3D and 3E are a view of a connection element of the assembly of Fig.1, seen from different angles;

Figs. 4, 4A, 4B are respectively a front view, a side view and a plan view of the assembly of Fig.1 ;

Fig. 4C is an enlarged view of Fig.4A;

Fig. 4D is an enlarged view of Fig.4B.

[0013] With reference to Figs. 1, 2 and 4B, an assembly according to the invention is disclosed, which is generally indicated with reference numeral (100).

[0014] The assembly (100) comprises a crosspiece (1), an upright (2) and a connection element (3) disposed between the crosspiece (1) and the upright (2).

[0015] The crosspiece (1) has a rectangular shape and comprises a back side (11) suitable for facing a wall of a building, a front side (12) suitable for facing the exterior of the building, an upper side (13) and a lower side (14). The crosspiece (1) has two rectilinear lateral edges (15) at right angle with the front side and the back side.

[0016] The crosspiece (1) comprises a shelf (16) that projects from the front side (12) of the crosspiece. The shelf (16) has two lateral edges (161) that are aligned with the lateral edges (15) of the crosspiece (1).

[0017] The shelf (16) of the upright (1) is suitable for supporting a cover panel (P) for covering a facade of a building. The cover panel (P) can be internally empty to ensure a good thermal insulation. The panel (P) has a lower edge (P1) and a lateral edge (P2). The lower edge (P1) of the panel is disposed in contact with the shelf (16).

[0018] The upright (2) has a back side (21) suitable for facing a wall of the building, a front side (22) suitable for facing the exterior of the building, and two lateral sides (23). In view of the above, the crosspiece (1) is disposed between the lateral sides (3) of two uprights.

[0019] The assembly (100) may comprise closing elements (not shown in the drawings) to close empty spaces between the panel (P), the crosspiece (1) and the upright (2).

[0020] The connection element (3) is disposed between the lateral edge (161) of the shelf (16) and the front side (22) of the upright (2).

[0021] The connection element (3) is a seal made of a soft elastomeric material that is tightly engaged in the crosspiece and in the upright; preventing water from infiltrating between the crosspiece and the upright. The

connection element is made in one piece.

[0022] The connection element (3) is suitably configured to act as conveyor element in such a way that the water that is deposited on the shelf (16) is drained laterally towards the upright (2), without encountering any obstacle and reaching the front side (22) of the upright in order to be drained along the front side of the upright. In this way, the water is prevented from draining frontally from the shelf and from penetrating in an empty space between the lateral edge (166) of the shelf and the lateral side (23) of the upright.

[0023] With reference to Figs. 1A, 2A and 4, the crosspiece (1) comprises fixing seats (S2, S2') for fixing the connection element (3). The upright (2) comprises a fixing seat (S3) for fixing the connection element (3).

[0024] With reference to Figs. 3 to 3E, the connection element (3) comprises:

- first fixing means (A2, A2') that are engaged in the fixing seats (S2, S2') of the crosspiece (1), and
- second fixing means (A3) that are engaged in the fixing seat (S3) of the upright (2).

[0025] The fixing seats (S2, S2') of the crosspiece comprise:

- a first groove (S2) disposed in the front side of the upright under the shelf, and
- a second groove (S2') disposed in the front side of the crosspiece above the shelf.

[0026] The grooves (S2, S2') have a narrowed opening, in such a way to define undercut parts.

[0027] With reference to Figs. 3A, 3B and 3E, the first fixing means (A2, A2') of the connection element (3) comprise a first tooth (A2) and a second tooth (A2'). The first tooth and the second tooth (A2, A2') are respectively inserted in the first and in the second groove (S2, S2') of the crosspiece. More precisely, each tooth (A2, A2') of the first fixing means comprises a hook (33) that protrudes laterally outwards in order to be inserted through the narrowed opening of the grooves (S2, S2') of the crosspiece and be fixed in the undercut parts of the grooves of the crosspiece, in such a way to firmly fix the connection element to the crosspiece.

[0028] The shelf (16) comprises a guide seat (S1) composed of a notch provided on the shelf (16) of the crosspiece (1).

[0029] The connection element (3) comprises guide means (A1) that are engaged in the guide seat (S1) of the shelf.

[0030] The notch (S1) of the guide seat of the shelf has a U-shaped section with concavity directed towards the exterior of the building.

[0031] The guide means (A1) of the connection element comprise a central wing (34) disposed between the two teeth (A1, A2).

[0032] The central wing (34) is inserted in the notch of

the guide means (S1) of the shelf and acts as guide for the correct alignment of the connection element. It must be noted that, when the central wing (34) of the connection element is inserted in the guide seat (S1) of the shelf, the tooth (A2) in upper position is separated from the upper surface of the shelf, in order to not interfere with the water flow from the shelf (16) towards the connection element (3).

[0033] With reference to Figs. 1, 1A and 4, the connection element (3) comprises a central portion (31) connected to the central wing (34). When the connection element (3) is connected to the crosspiece, an upper surface of the central portion (31) of the connection element is disposed at the same height as an upper surface of the shelf (16), in correspondence of the lateral edge (161) of the shelf (16), in such a way that the water on the shelf can flow freely from the shelf to the central portion (31) of the connection element, without encountering any obstacle.

[0034] A step (35) is provided between the central wing (34) and the central portion (31) of the connection element, and is stopped against the lateral edge (161) of the shelf. The thickness of the step (35) is such that an upper surface of the central portion (31) of the connection element is disposed at the same level as an upper surface of the shelf (16), in correspondence of the lateral edge (161) of the shelf (16).

[0035] The central portion (31) of the connection element (3) has an upper surface with a first section (36) that is parallel to the central wing (34) and a second section (37) that is inclined relative to the first section (36). When the connection element (3) is connected to the shelf (1), the first section (36) of the central portion of the connection element is coplanar to the upper surface of the shelf, and the second section (37) of the central portion of the connection element is inclined downwards to favor the water drainage towards the front side (22) of the upright (2).

[0036] It must be noted that the central wing (34) of the connection element that is disposed in the notch of the guide means (S1) of the shelf permits the stabilization of the connection element (3) in position, in such a way that the first section (36) of the central portion of the connection element is perfectly coplanar to the upper surface of the shelf (16).

[0037] The fixing seat (S3) of the upright is a longitudinal notch on the front side (22) of the upright, near the lateral side (23) of the upright.

[0038] The second fixing means (A3) of the connection element (3) comprise at least three retention teeth (A3) that are fastened inside the longitudinal notch of the fixing seat (S3) of the upright. The retention teeth (A3) are aligned in such a way to have a central retention tooth and two lateral retention teeth.

[0039] With reference to Fig. 3, each retention tooth (A3) comprises a hooked end (B). The hooked end of the central retention tooth is directed in the opposite direction relative to the hooked ends of the lateral retention teeth.

More precisely, the hooked end of the central retention tooth is directed towards the upright (1), whereas the hooked ends of the lateral retention teeth are directed in the opposite direction.

[0040] Numerous variations and modifications, which are within the reach of an expert of the field, can be made to the present embodiment of the invention, falling in any case within the scope of the invention as disclosed by the appended claims.

Claims

1. Assembly (100) comprising:

- an upright (2) with a back side (21) suitable for facing a wall of a building, and a front side (22) suitable for facing the exterior of the building,
- a crosspiece (1) with a back side (11) suitable for facing a wall of a building, a front side (12) suitable for facing the exterior of the building, and lateral edges (15); said crosspiece (1) comprising a shelf (16) that protrudes from said front side (12) of the crosspiece (1); said shelf (16) having lateral edges (161) aligned with the lateral edges (15) of the crosspiece (1), and
- a connection element (3) disposed between the lateral edge (161) of the shelf and the front side (22) of the upright (2),

characterized in that

said connection element (3) is a seal of soft elastomeric material that is tightly engaged in the crosspiece and in the upright; and
said connection element (3) is suitably configured to act as conveyor element for the water, in such a way that the water that is deposited on the shelf (16) is drained laterally towards the upright (2), without encountering any obstacle and reaching the front side (22) of the upright in order to be drained along the front side of the upright.

2. The assembly (100) of claim 1, wherein said connection element (3) comprises a central portion (31) with an upper surface such that, when the connection element (3) is connected to the upright (1), the upper surface of the central portion (31) of the connection element is disposed at the same height as an upper surface of the shelf (16) in correspondence of the lateral edge (161) of the shelf, so that the water on the shelf can flow freely from the shelf to the central portion (31) of the connection element, without encountering any obstacle.
3. The assembly (100) of claim 2, wherein said upper surface of the central portion (31) of the connection element (3) has a first section (36) that is disposed in horizontal coplanar position relative to the upper

surface of the shelf in correspondence of the lateral edge (161) of the shelf, and a second section (37) that is inclined downwards and continues until the front side of the upright to favor the draining of water towards the front side (22) of the upright (2).

4. The assembly (100) of any one of the preceding claims, wherein said connection element (3) comprises:

- first fixing means (A2, A2') that are engaged in fixing seats (S2, S2') of the crosspiece (1), and
- second fixing means (A3) that are engaged in a fixing seat (S3) of the upright (2).

5. The assembly (100) of claim 4, wherein said fixing seats (S2, S2') of the upright comprise:

- a first groove (S2) disposed in the front side of the upright under the shelf, and
- a second groove (S2') disposed in the front side of the upright above the shelf,

said first fixing means (A2, A2') of the connection element (3) comprise:

- a first tooth (A2) that is engaged in the first groove (S2) of the crosspiece, and
- a second tooth (A2') that is engaged in the second groove (S2') of the crosspiece.

6. The assembly (100) of claim 5, wherein said grooves (S2, S2') of the crosspiece have a narrowed opening in such a way to define undercut parts, and each tooth (A2, A2') of the first fixing means comprises a hook (33) that protrudes laterally outwards in order to be inserted through the narrowed opening of the grooves (S2, S2') of the crosspiece and be fixed in the undercut parts of the grooves of the crosspiece.

7. The assembly (100) of any one of the preceding claims, wherein said connection element (3) comprise guide means (A1) that are engaged in a guide seat (S1) obtained in the shelf (16).

8. The assembly (100) of claim 7, wherein said guide seat (S1) of the shelf is a notch with U-shaped section and concavity directed towards the exterior of the building; and said guide means (A1) of the connection element comprise a central wing (34) shaped like a rectangular shape that is engaged in the notch of the guide seat (S1) of the shelf.

9. The assembly (100) of claim 8, when depending on claim 5, wherein said central wing (34) of the guide means is disposed between said teeth (A2, A2') of the first fixing means.

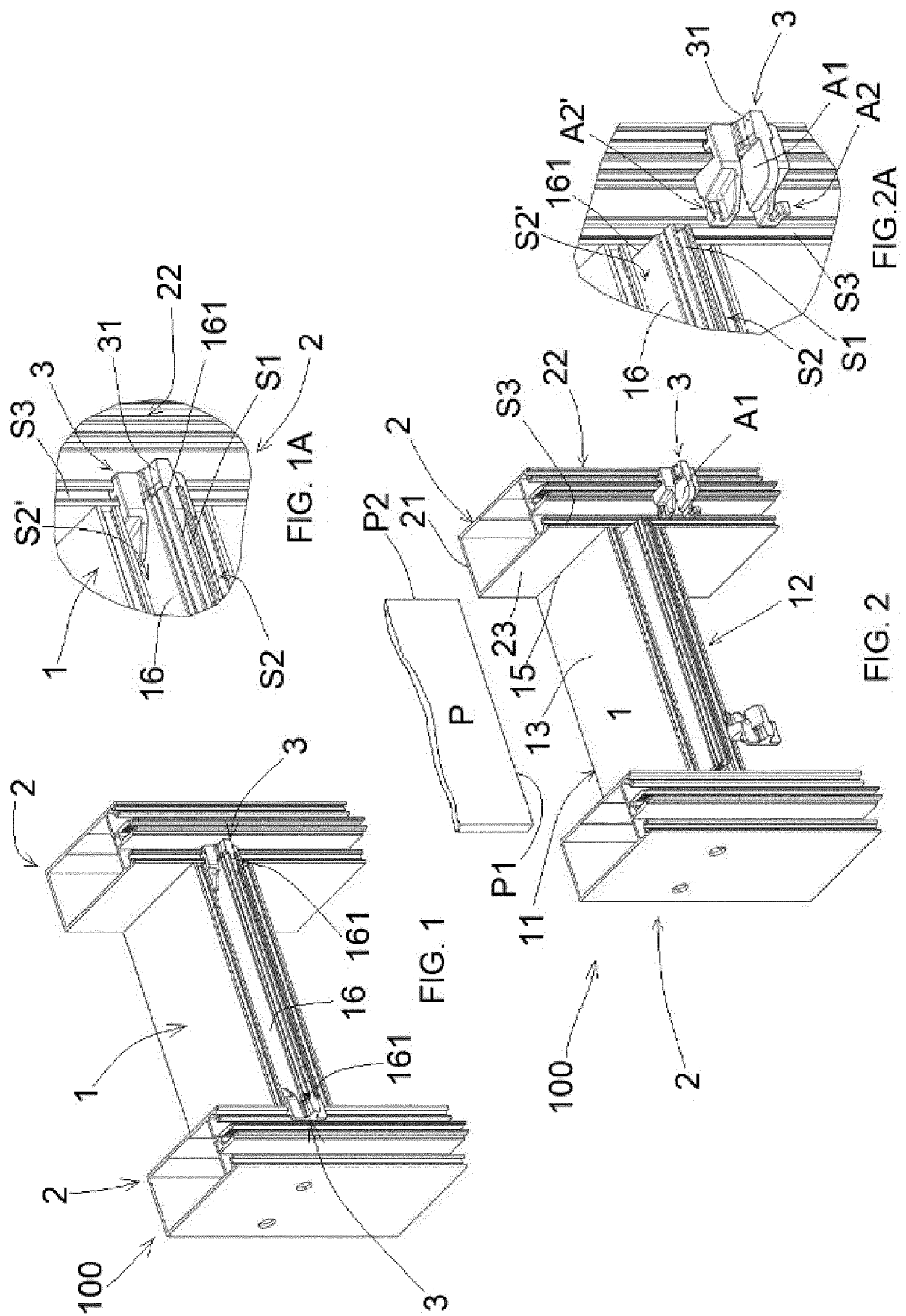
10. The assembly (100) of claim 8 or 9, wherein said central portion (31) of the connection element is connected to said central wing (34) of the guide means.
11. The assembly (100) of any one of claims 8 to 10, wherein a step (35) is provided between the central wing (34) and the central portion (31) of the connection element, and is stopped against the lateral edge (161) of the shelf; the thickness of the step (35) is such that an upper surface of the central portion (31) of the connection element is disposed at the same height as the upper surface (16), in correspondence of the lateral edge (161) of the shelf (16). 5 10
12. The assembly (100) of any one of the preceding claims, wherein said fixing seat (S3) of the upright comprises a longitudinal notch on the front side (22) of the upright, near the lateral side (23) of the upright; and said second fixing means (A3) of the connection element (3) comprise retention teeth (A3) that are fixed in the longitudinal notch of the fixing seat (S3) of the upright. 15 20
13. The assembly (100) of claim 12, wherein each retention tooth (A3) comprises a hooked end (B). 25
14. The assembly (100) of claim 13, wherein said second fixing means of the connection element comprise three retention teeth (A3) disposed in aligned position, in such a way to have a central retention tooth and two lateral retention teeth, wherein the hooked end of the central retention tooth is directed in the opposite direction relative to the hooked ends of the lateral retention teeth. 30 35
15. The assembly (100) of any one of the preceding claims, also comprising a cover panel (O) disposed on said shelf (16) of the crosspiece. 40

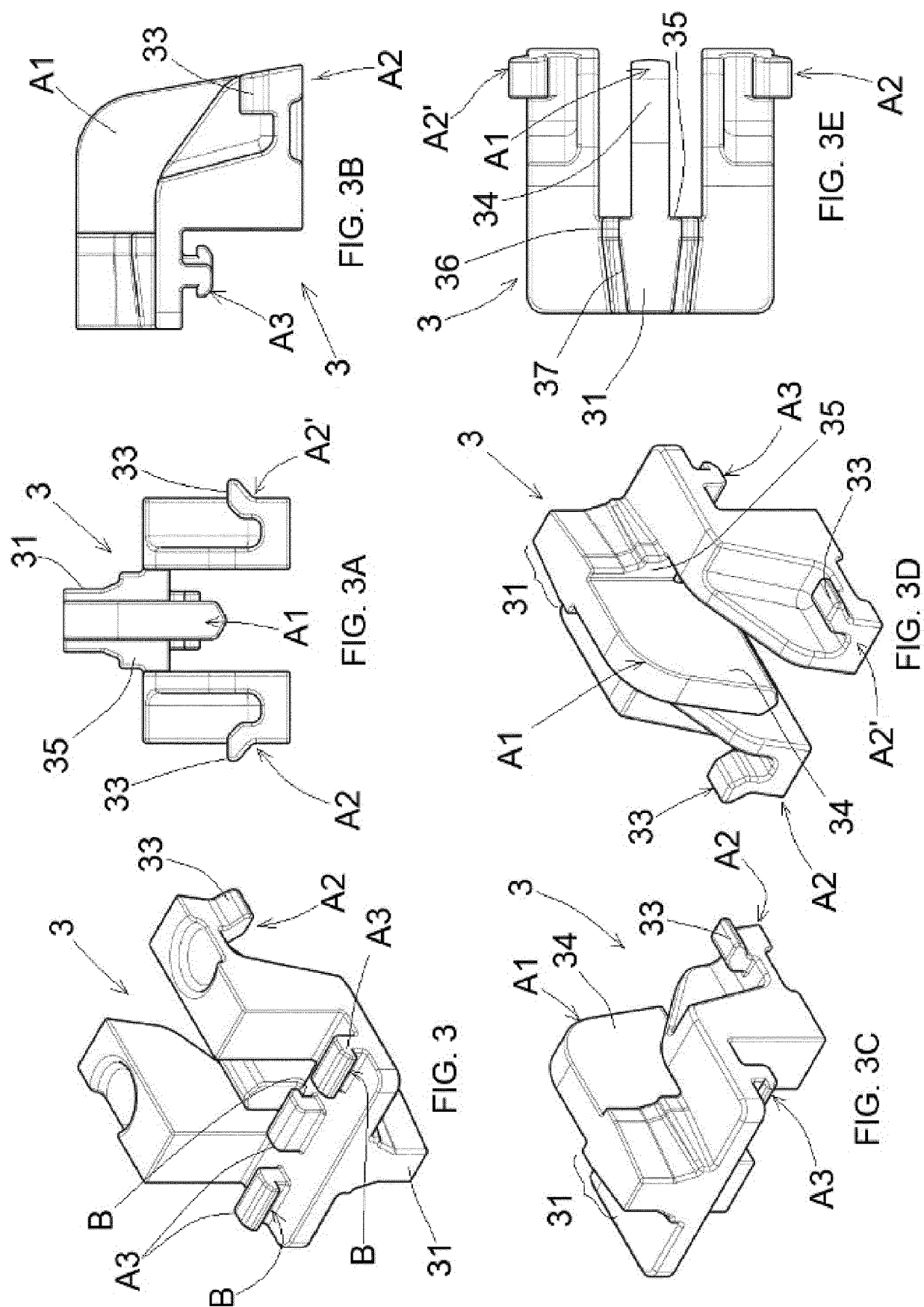
45

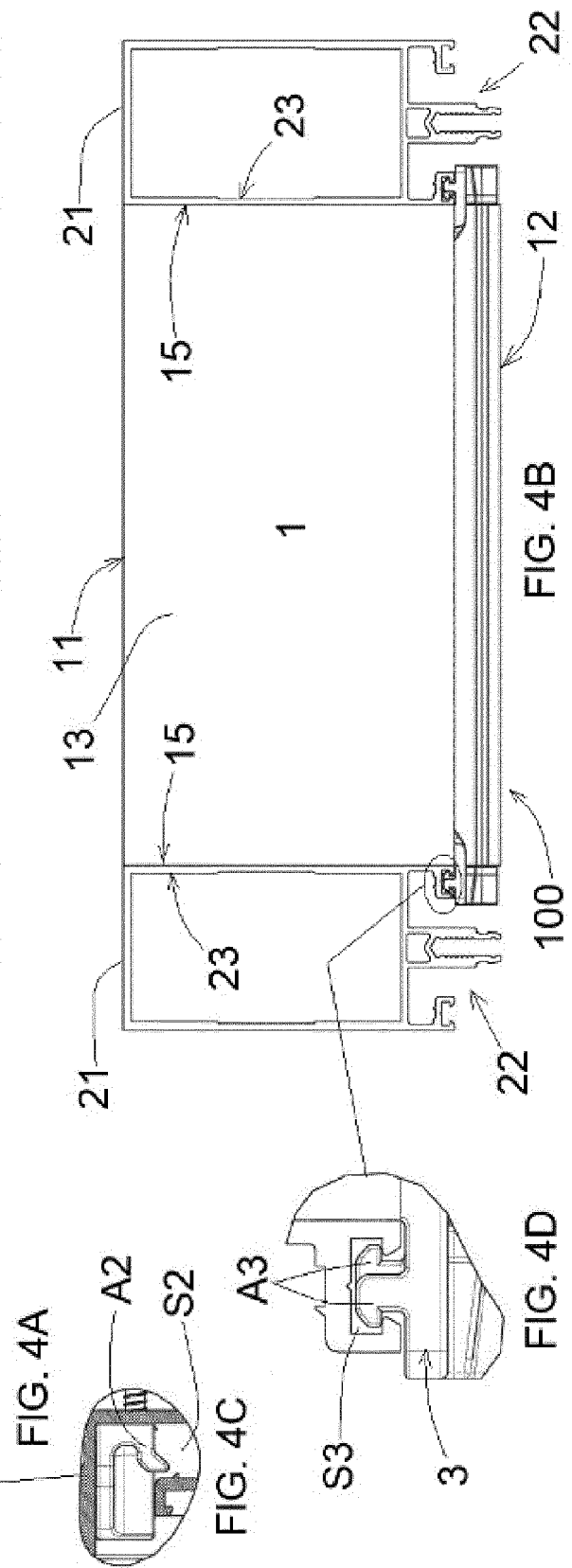
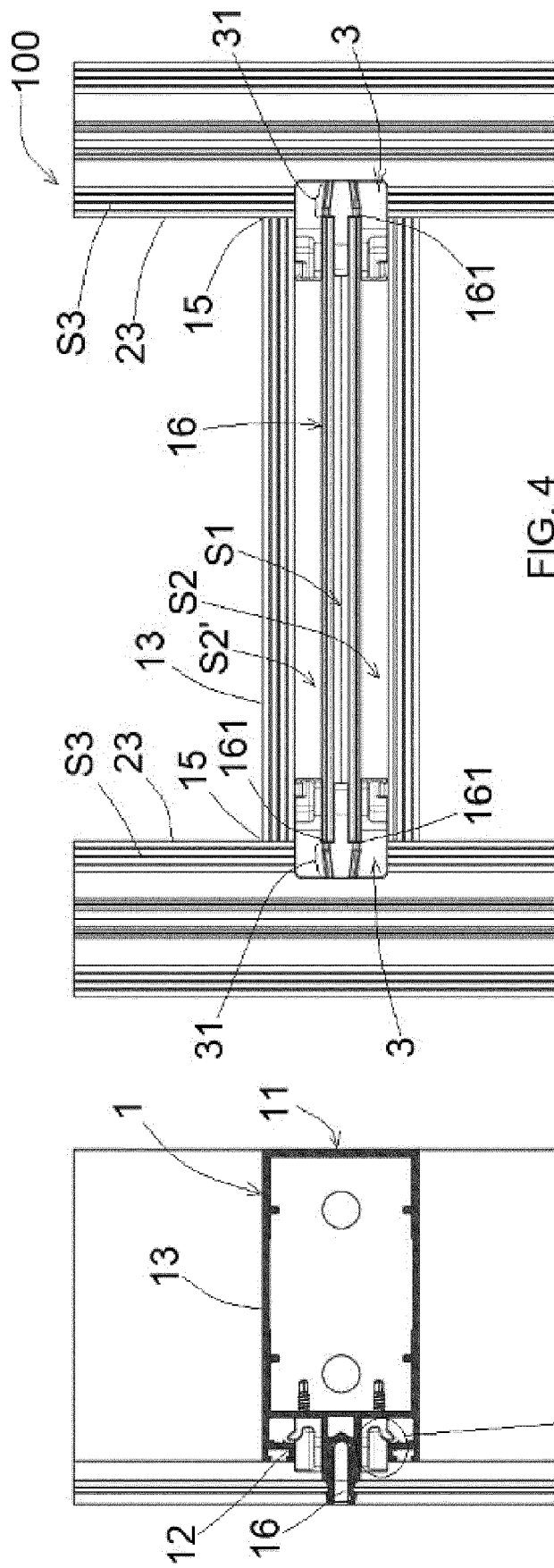
50

55

5









EUROPEAN SEARCH REPORT

Application Number
EP 20 15 0454

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 A	FR 2 694 953 A1 (ALUVAR SA [FR]; COSTA ALAIN) 25 February 1994 (1994-02-25) * page 2, lines 9-12 * * page 5, line 1 - page 9, line 16; figures 1-7 *	1,4-10, 12-15 2,3,11	INV. E04B2/96 ADD. E06B7/14
X A	DE 93 05 394 U1 (KAWNEER ALUMINIUM GMBH [DE]) 11 August 1994 (1994-08-11) * page 7, line 23 - page 12, line 20; figure 1 *	1,4-10, 12-15 2,3,11	
			TECHNICAL FIELDS SEARCHED (IPC)
			E04B E06B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 15 April 2020	Examiner Couprie, Brice
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

EPO FORM 1503 03/82 (P04C01)

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

EP 20 15 0454

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.

15-04-2020

10

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 2694953	A1	25-02-1994	NONE
DE 9305394	U1	11-08-1994	NONE

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

- FR 2694953 [0003]
- WO 2004042159 A [0006]