

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
27 August 2020 (27.08.2020)



(10) International Publication Number
WO 2020/170109 A1

(51) International Patent Classification:

E06B 9/34 (2006.01) *E06B 9/15* (2006.01)
E06B 9/165 (2006.01)

(21) International Application Number:

PCT/IB2020/051303

(22) International Filing Date:

17 February 2020 (17.02.2020)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

102019000002347 18 February 2019 (18.02.2019) IT

(71) Applicant: **B.B.C. SPA** [IT/IT]; Zona PIP SNC, 75012 Bernalda (MT) (IT).

(72) Inventor: **MONTANARO, Paolo**; Via Giorgio Vasari, 68, 70010 Casamassima (BA) (IT).

(74) Agent: **AVV. NATALIA GIULIANO- STUDIO RUBINO SRL**; Via L. Della Valle, 84, 88100 Catanzaro (CZ) (IT).

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,

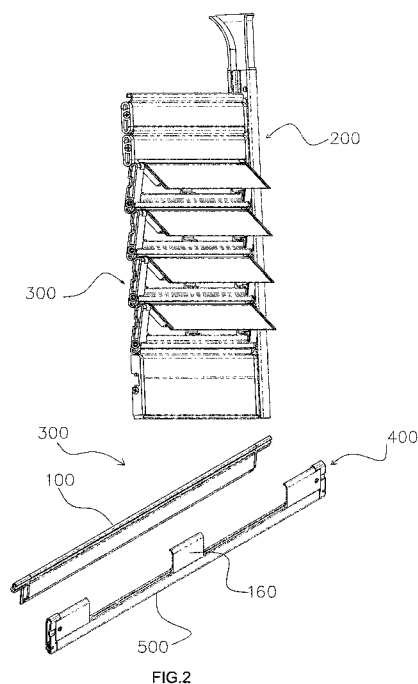
HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: ROLLER-UP SHUTTER WITH OSCILLATING SLATS



(57) Abstract: Roll-up roller shutter with oscillating slats (200) comprising oscillating movable slats (300), each comprising a fixed frame (400) formed by at least two supports (160) and by a fixed lower profile (500) provided with a first hook (520), and a removable oscillating slat (100) superiorly provided with a second hook (140). The removable oscillating slat (100) is coupled with the support (160) inferiorly by means of the first hook (520), and superiorly by means of a recess (150), and configured to receive a folded upper head (161) of the support (160). The support (160) is inferiorly coupled by means of a first recess (162a) of its lower portion engaging a first upper protrusion (501a) of the fixed profile (500) by means of a second recess (162b) engaging a second lower protrusion (501b) of the fixed profile (500).



WO 2020/170109 A1

DESCRIPTION

"Roller-up shutter with oscillating slats"

* * *

5

The present invention relates to a roller-up shutter with oscillating slats.

10

Several roller-up shutters having oscillating slats are known. The larger ones often suffer of the problem of the slats that embark inward with consequent torsion of its elements and in particular of the hook coupling with the lower fixed profiles of the shutter. This problem has been addressed and solved in patent EP2398993 by means of intermediate supports or also in patent application BA2013A000061 stiffening the slats in the oscillation phase.

15

20

Either way, such solutions do not allow to solve the problem due to the continuous stress due to intermediate supports that download the strength of the hooks of the fixed lower profiles resulting in their twist, and this occurs for shutters of considerable weight and size. Although the eventual addition of other intermediate supports improves the resistance to the bending, it does not improve the torsional strength of the hook in the

oscillating phase, since the movable blade, which is divided into many pieces as there are empty spaces between one support and the next, is characterized by a discontinuity which determines a continuous distance of the hook with respect to the lowest fixed profile, thus causing bending towards the inside of the slat at the expense of the strength of the hook and a continuous stress of the intermediate supports with consequent noise.

This problem has been addressed and solved by the patent application WO2017009876 which also allows a reduction of elements with respect to those used in the known solutions. Moreover, the described solution allows to use the same elements for shutters having dumpster and which are positioned both indoor and outdoor, with consequent simplification of the shutter itself and reduction of assembly time. In particular, the patent application WO2017009876 describes a roller, shown in figure 1, comprising a plurality of slats that perform a sliding screen in a pair of slide guides, the slats comprising a fixed frame and at least one movable oscillating slat having locking teeth, in which the fixed frame comprises two or more supports, a fixed lower profile, a series of caps, a gasket, so that the weight of the lower fixed profile of the upper slat, acting as a

lever, rotates the mobile slat which belongs to the subsequent lower slat, without the use of any guiding mechanism, in which the mobile slat, in the orthogonal position with respect to the horizontal plane, in its upper
5 portion is equipped with a first hook which is introduced into a second hook of the fixed lower profile; the movable slat being provided with a recess, outside the walls of the slat itself, suitable for receiving the element of the supports; the movable slat being configured to perform a
10 rotation of 180°.

However, the roller shutter just described suffers of the problem that its slats flex when the dimensions of the roller shutter exceed 1.8 m in width, due to the weight force.

15 Furthermore, the known roller shutters with oscillating slats present the problem of a large diameter of the region dedicated to the roller shutter winding and the winding itself.

20 A further problem of the known roller shutters with oscillating slats is to involve complex production processes due to the shape of the known slats.

Scope of the present invention is to provide a roller-up shutter with oscillating slats in which the slats do not

flex due to the weight force even when the size of the shutter exceeds 1.8 m in width.

A further object of the present invention is to provide a roller-up shutter with oscillating slats that allows a winding diameter reduced and that it is easy to produce, thus having characteristics such as to exceed the limits which still affect the current roller-up shutter with oscillating slats with reference to the prior art.

According to the present invention, a roller-up shutter with oscillating slats is provided, as defined in claim 1.

For a better understanding of the present invention, a preferred embodiment is now described, purely by way of non-limiting example, with reference to the attached drawings, in which:

- figure 1 shows an exploded view of a slat, according to the prior art;

- figure 2 shows an overall view of a roller-up shutter with oscillating slats, according to the invention;

- figure 3 shows an exploded view of a slat of the roller-up shutter with oscillating slats, according to the invention;

- figure 4 shows an assembled view of the main elements of a slat of the roller-up shutter with

oscillating slats: oscillating removable slat, fixed lower profile and single-walled support, according to the invention;

5 - figure 5 shows a second exploded view of the main elements of the slat of the roller-up shutter with oscillating slats: removable swinging slat, fixed lower profile and single-walled support, according to the invention;

10 - figure 6 shows a side section of a first movable slat coupled to a second movable slat during the opening, and a side section of the fixed lower profile, according to the invention;

15 - figures 7.a and 7.b shows a side view and a perspective view of a second embodiment of a removable oscillating slat of a roller-up shutter with oscillating slats, according to the invention.

20 With reference to these figures and, in particular, to figure 2, a roller-up shutter with oscillating slats is showed, according to the invention. In particular, the roller-up shutter with oscillating slats 200 comprises mobile oscillating slats 300, each consisting of a fixed frame 400, and of at least a removable oscillating slat 100.

In particular, the fixed frame 400 consists of two or more supports 160 and a fixed lower profile 500.

To allow the coupling with the lower fixed profile 500, the oscillating removable slat 100, shown in Figure 4, is provided, in the upper part, of a second hook 140 and of a recess 150, for example a trench, which is external compared to the second hook 140.

The removable oscillating slat 100 is provided in a lower part of locking teeth 141 which define a seat for a gasket 170 shown in Figure 6.

In particular the removable oscillating slat 100 includes a pair of locking teeth 141 specular each other.

The removable oscillating slat 100 is inferiorly coupled by means of a first hook 520 of the fixed lower profile 500, thus allowing a 180° rotation of the removable oscillating slat 100 in a winding having a reduced diameter. Such coupling is realized by means of a support 160 of the removable oscillating slat 100. In particular, the recess 150 of the removable oscillating slat 100 receives an upper folded head 161 of the support 160.

According to an aspect of the invention, the removable oscillating slat 100 has a fulcrum element 151 shaped as a wedge, next to the recess 150. This fulcrum element 151 has a beveled vertex with a very small radius. The technical

purpose of this fulcrum element 151 is to reduce, during lifting, the friction due to rotation.

Advantageously according to the invention, the technical effect of the fulcrum element 151 is greater in the lower part of the roller-up shutter, where the weight underneath the removable oscillating slat is reduced to a minimum.

Advantageously according to the invention, the recess 150 and the upper folded head 161 have curvilinear surface and couple each other so that obtain an advantageous position of the center of rotation.

The support 160 is a linear rigid body provided with shaped walls so as to follow the internal profile of the removable oscillating slat 100. The lower portion of the support 160 is provided of a first recess 162a engaged by the first upper protrusion 501a and a second recess 162b engaged by the second lower protrusion 501b of the fixed profile 500 to prevent the lateral support displacement 160 along the recess 501, showed in figure 5.

The support 160 can be obtained by cutting a profile of extruded aluminum, by casting of light alloys or forging. The particular conformation of the recess 150, of the removable oscillating slat or mobile slat, and of the

support 160 facilitates the construction process of the profile extrusion matrix.

The second hook 140 of a removable oscillating slat 100 mate to the fixed lower profile 500, receives the weight of an upper slat of the shutter. The application of this weight force is offset with respect to the fulcrum formed by the recess 150 and the upper folded head 161; as a result of said contrivance a lever is formed causing the rotation of the removable oscillating slat 100 belonging to the next lower slat, without the use of mechanisms (gears, chains or the same).

This coupling is shown in figure 4. The dimensions of the removable oscillating slat 100 and of the support 160 are reduced, compared to the known art, overall at a height, indicated with H in figure 4, between 45 mm and 53 mm and a thickness, indicated with S in figure 4, comprised between 6 mm and 7.5 mm. In this way, advantageously, the weight force exerted by a removable oscillating slat 100 is applied on a point of the lower slat closest to the roller shutter axis with respect to known roller shutters. In this way the torque on the lower fixed profile 500 is reduced, therefore avoiding the warping of the slat (such warping can be imagined as contained in a horizontal plane).

According to an aspect of the invention, an external portion of the roller shutter slats comprises at least a cap element 150a having a central support 201 placed, in use, adherent inside a cavity of the oscillating slat 100.

5 The central support 201 has a herringbone conformation, having a central linear element to which a plurality of protrusion is laterally connected. The cap element 150a also comprises at least a vent channel 202, 202a able to evacuate hot air in use, neutralizing the thrust force that
10 would cause the cap element to come out of its seat, at one end of the roller shutter slats. The cap element 150a also comprises a protection element 203 able to protect the internal surface of the oscillating slat 100 during the winding phase, and to protect from atmospheric agents
15 (smog, sea air, etc.) which could compromise the surface treatment of an extruded profile.

Therefore, the roller-up shutter with oscillating slats 200 according to the invention allows to avoid the bending of the roller shutter slats when this has a size
20 major than 1.8 m.

In addition, the roller-up shutter with oscillating slats according to the invention enables a winding of a shutter having light-height of 2.5 m in 19 cm of diameter, thanks to the small size of its slats and its supports.

Another advantage of the roller-up shutter with oscillating slats according to the invention is that, thanks to the design of the coupling region of the substrate, the first hook 520 of the lower fixed profile 500 avoids accumulations and consequent release of water, during the rolling phase, inside the house where the shutter is installed.

In addition, the particular design of the oscillating removable slat, and of the support, allows the rolling-up shutter with oscillating slats to reduce the opening angle with a better application of the weight force of the upper slats on the lower ones, a significant reduction in the width of the sliding guides which represents a strength in the installation phase where it is not possible to replace the existing ones. In fact, since the towel needs reduced spaces for scrolling and the oscillation, the appropriate rails may be housed within the preceding compartments.

In the end, the roller-up shutter with oscillating slats according to the invention allows easy construction of the profiles that make up the slats while being of reduced dimensions.

Finally it is clear that the roller-up shutter with oscillating slats here described and illustrated can be subject to modifications and variations without thereby

coming out of the protecting scope of the present invention, as defined in the appended claims.

CLAIMS

1. Roll-up roller shutter with oscillating slats (200) comprising oscillating movable slats (300), each comprising a fixed frame (400) formed by at least two supports (160) and by a fixed lower profile (500) provided with a first hook (520), and a removable oscillating slat (100) superiorly provided with a second hook (140),

characterized in that the removable oscillating slat (100) is coupled with the support (160) inferiorly by means of the first hook (520), and superiorly by means of a recess (150) comprised in its upper part, under the second hook (140), and configured to receive a folded upper head (161) of the support (160) so that the removable oscillating slat (100) is able to rotate of 180°, and in that the support (160) is inferiorly coupled by means of a first recess (162a) of its lower portion engaging a first upper protrusion (501a) of the fixed profile (500) by means of a second recess (162b) engaging a second lower protrusion (501b) of the fixed profile (500).

2. Roll-up roller shutter with oscillating slats (200) according to claim 1, characterized in that the dimensions of the removable oscillating slat (100) and of the support (160) are reduced at a height H comprised

between 45 mm and 53 mm and a thickness S comprised between 6 mm and 7.5 mm.

3. Roll-up roller shutter with oscillating slats (200) according to claim 1, characterized in that the support (160) is a linear rigid body provided with walls shaped so as to follow the internal profile of the removable oscillating slat (100).

4. Roll-up roller shutter with oscillating slats (200) according to claim 1, characterized in that the support (160) is formed by extrusion in aluminum, with diecasting of light alloys or forging sheets.

5. Roll-up roller shutter with oscillating slats (200) according to claim 1, characterized in that said removable oscillating slat (100) comprises a fulcrum element (151) shaped as a wedge, placed next to the recess (150), having a small radius beveled vertex.

6. Roll-up roller shutter with oscillating slats (200) according to claim 1, characterized in comprising at least cap element (150a) housed in an external portion of the roll-up roller shutter, comprising a central support (201) having a central linear element to which a plurality of protrusion is laterally connected, at least a vent channel (202, 202a), and a protection element (203).

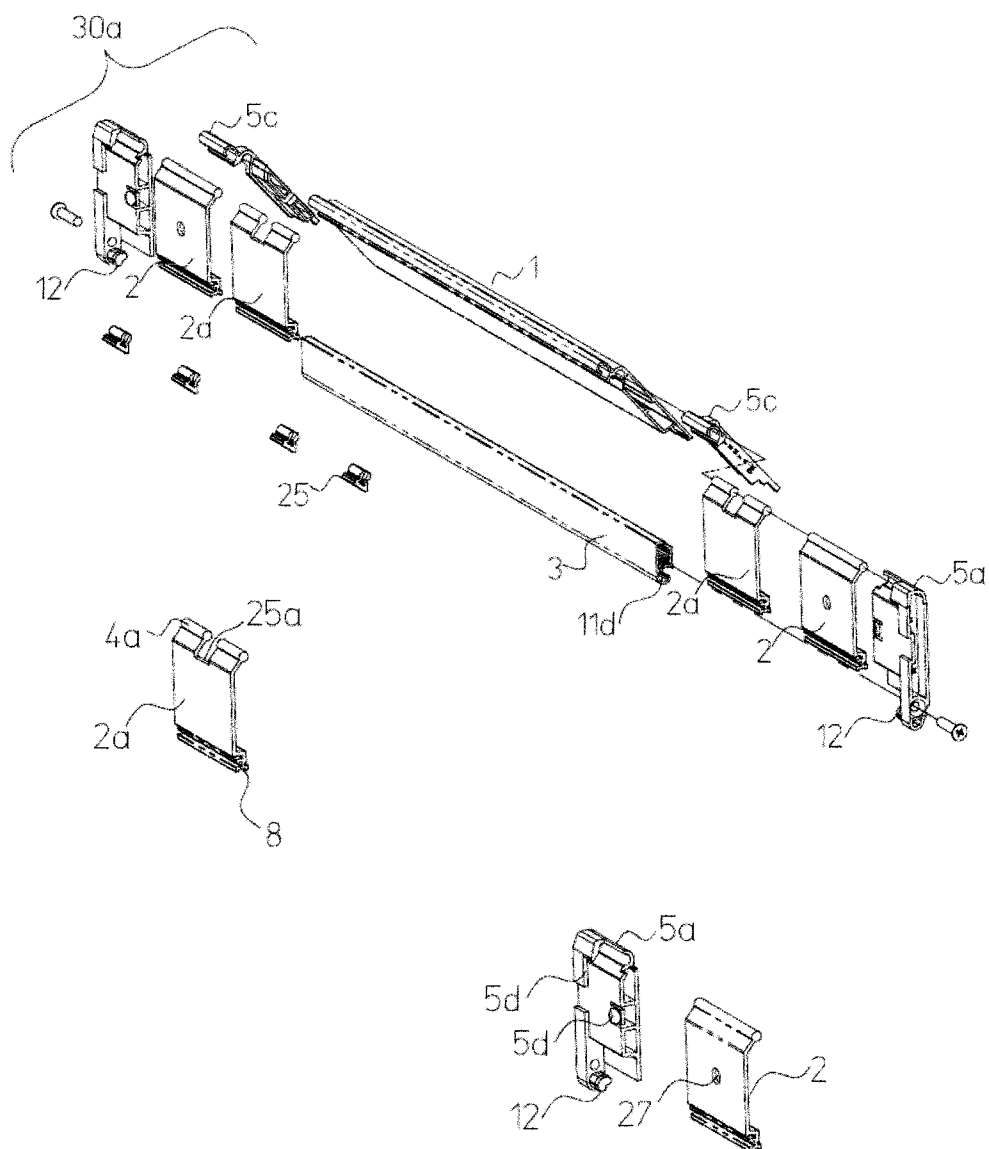


FIG.1
(PRIOR ART)

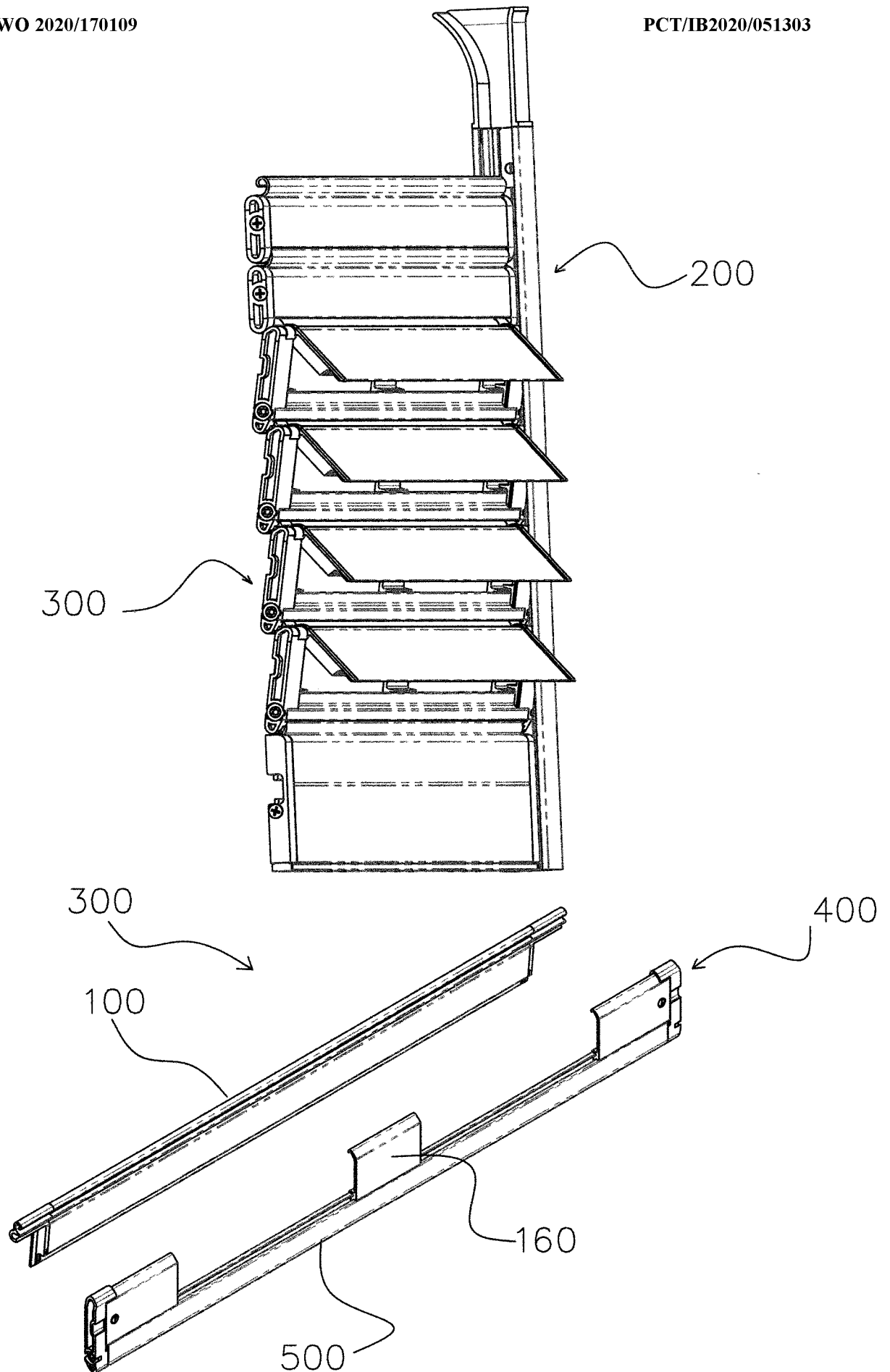


FIG.2

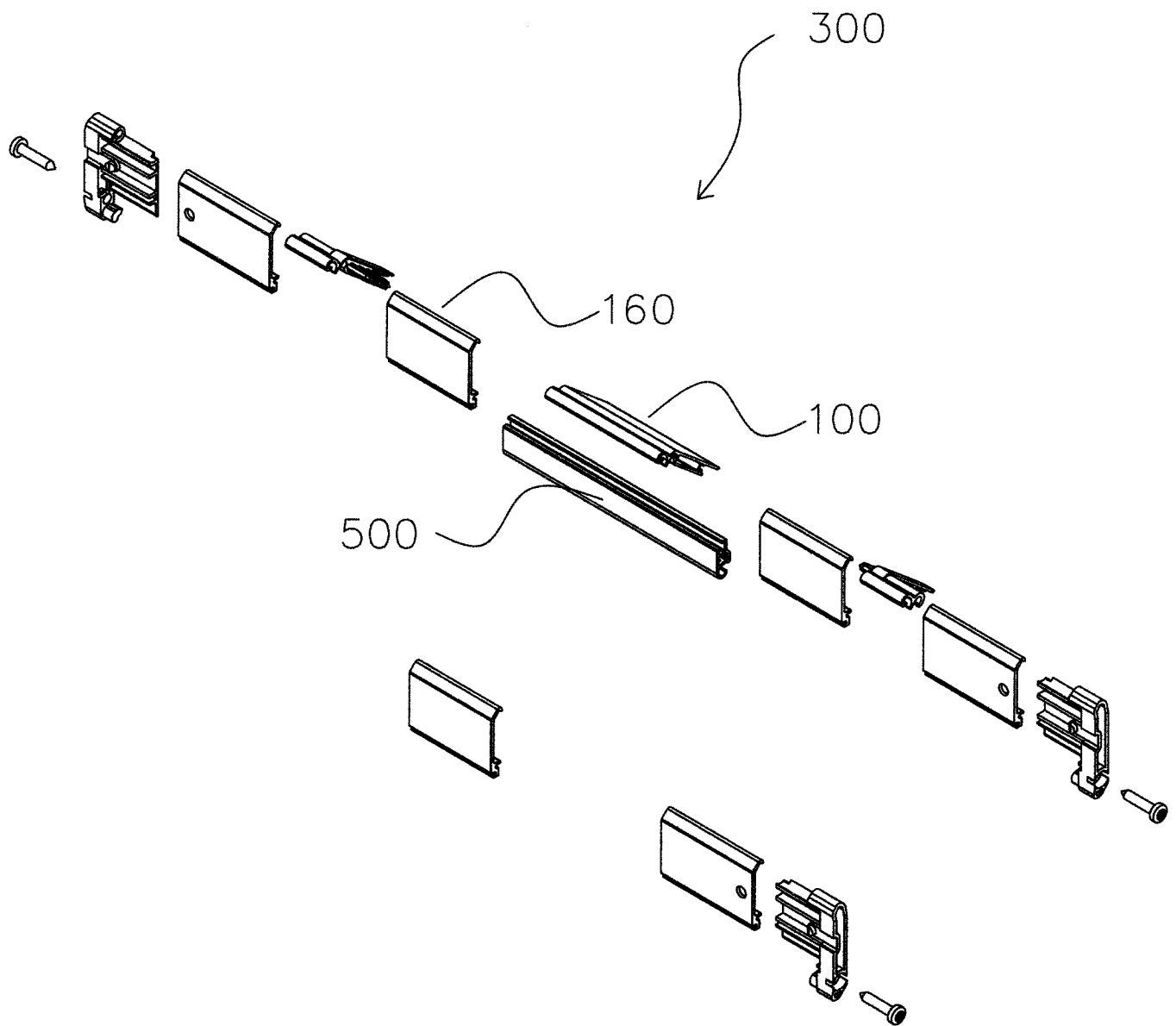


FIG.3

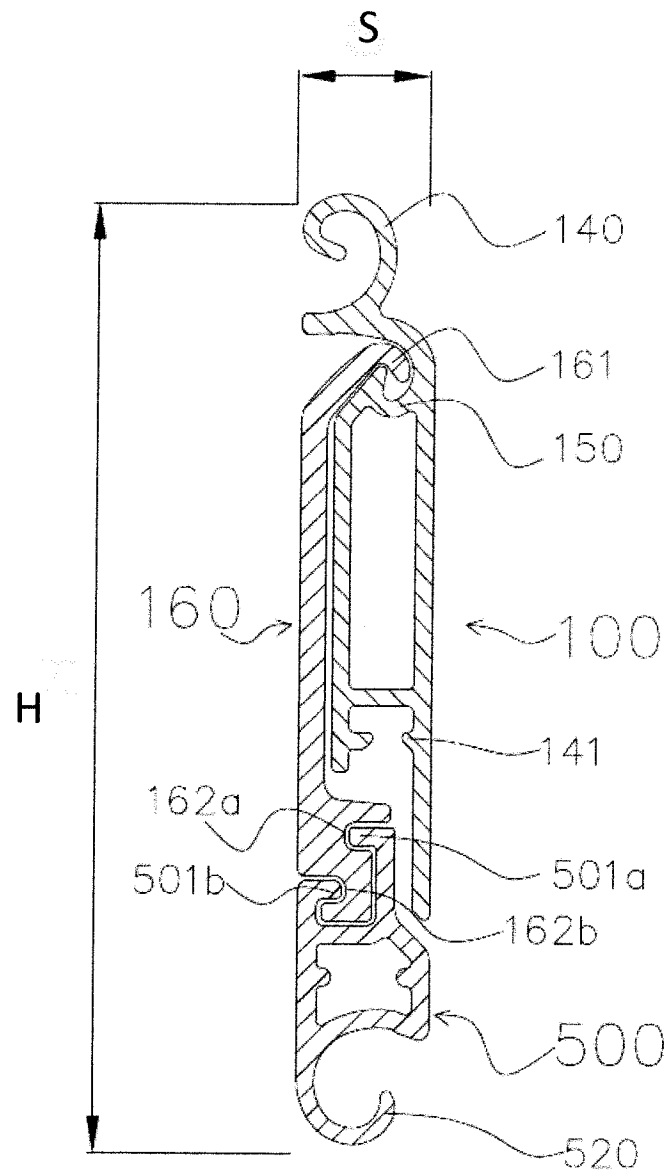


FIG.4

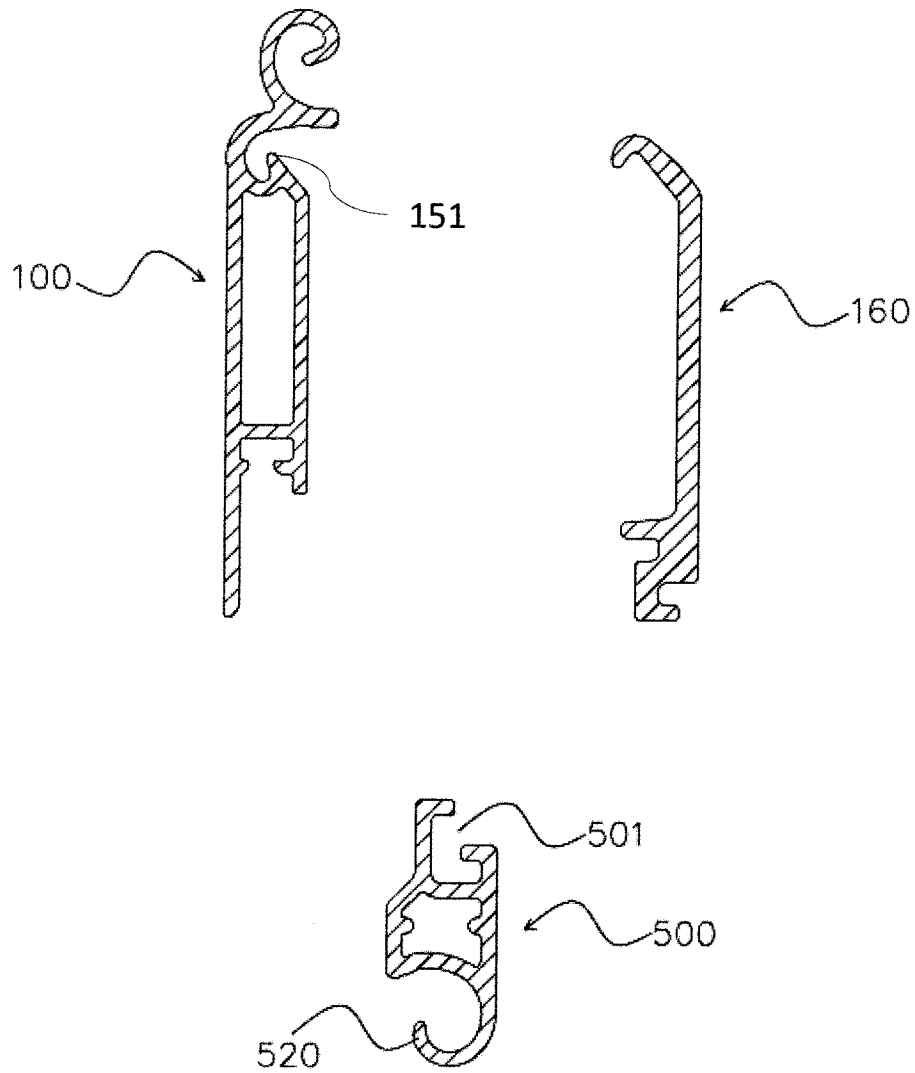


Fig. 5

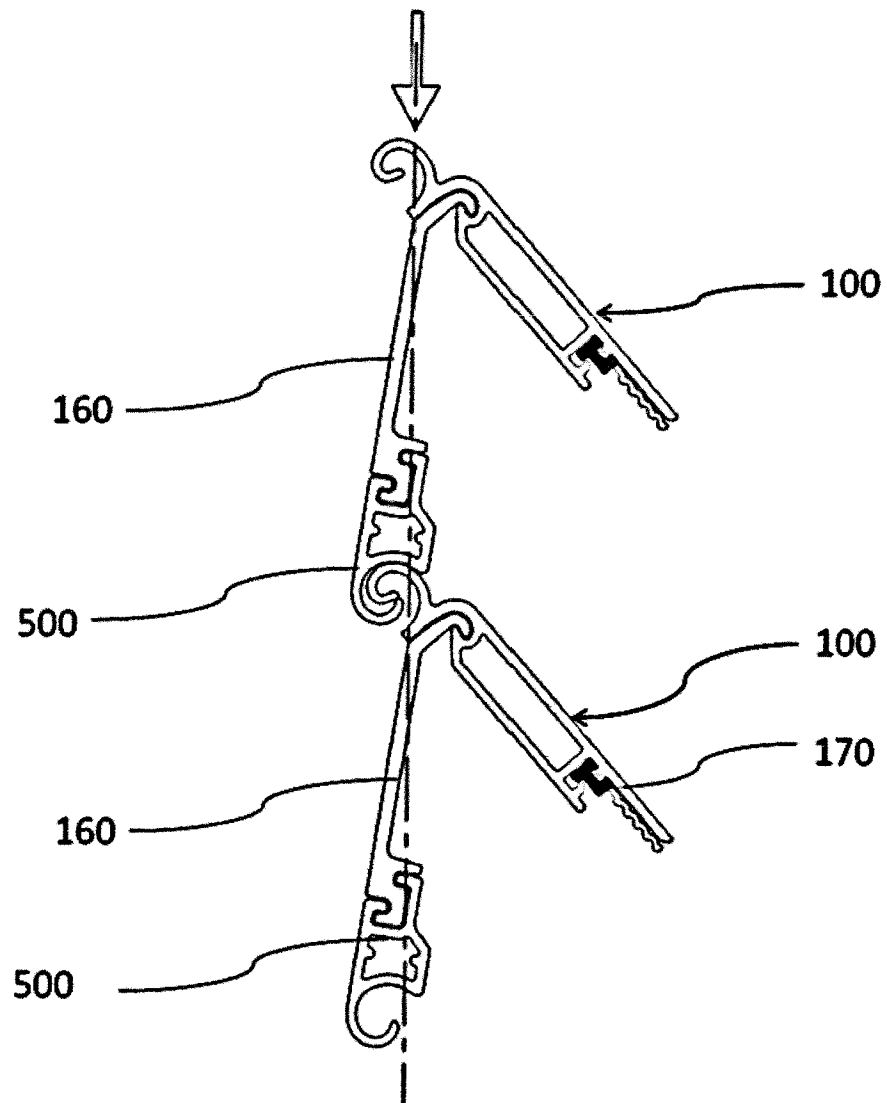


Fig. 6

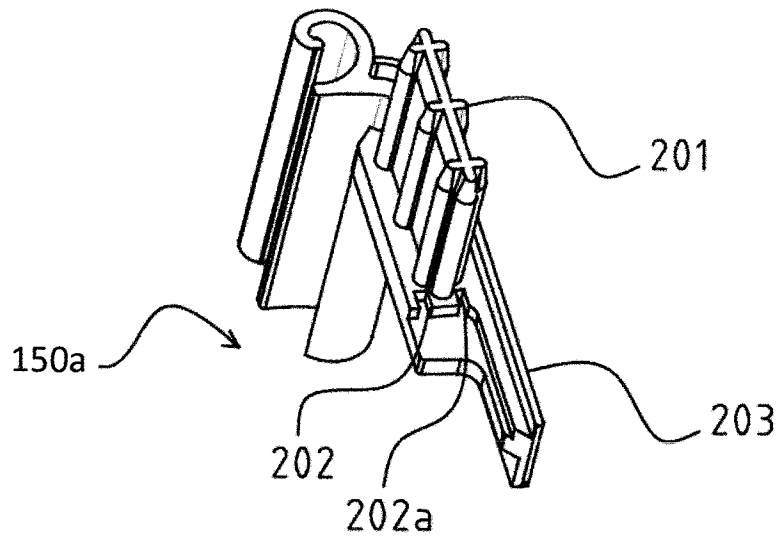


Fig. 7a

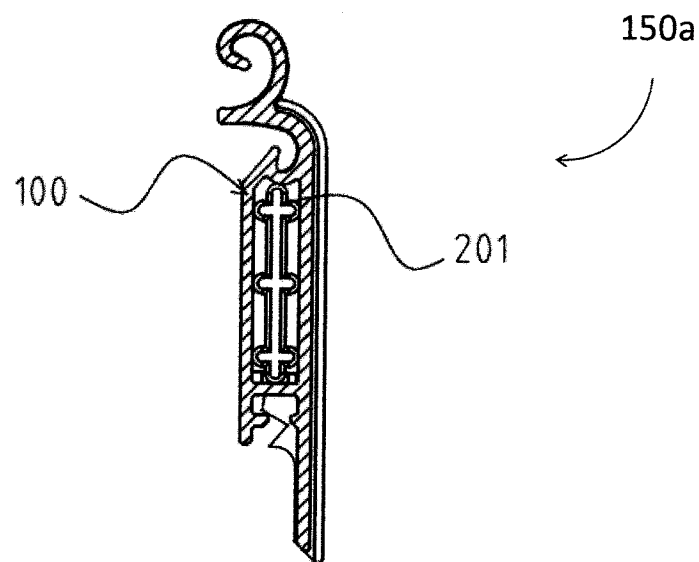


Fig. 7b

Fig. 7

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2020/051303

A. CLASSIFICATION OF SUBJECT MATTER INV. E06B9/34 E06B9/165 E06B9/15 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 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.
Y	WO 2017/009876 A1 (BENEDETTO NICOLA [IT]) 19 January 2017 (2017-01-19) cited in the application abstract; figures 1,4,6,12,13 page 7, line 22 - line 25 -----	1-6
Y	EP 2 039 871 A1 (BICHLER PETER [DE]) 25 March 2009 (2009-03-25) paragraph [0057]; figure 20 abstract -----	1-6
A	EP 3 263 826 A1 (AXIOM [FR]) 3 January 2018 (2018-01-03) the whole document ----- -/--	1-6
☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 5 May 2020		Date of mailing of the international search report 13/05/2020
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Cornu, Olivier

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2020/051303

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 2 811 103 A1 (CARLO NICOLA DE [IT]; CARLO VINCENZO DOMENICO DE [IT] ET AL.) 10 December 2014 (2014-12-10) figure 4 -----	6
A	NL 7 605 795 A (STAMIC SPRITZGUSSTECHNIK G M B) 2 December 1976 (1976-12-02) figures 4,6 -----	6

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2020/051303

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2017009876 A1	19-01-2017	EP 3322876 A1 WO 2017009876 A1	23-05-2018 19-01-2017
EP 2039871 A1	25-03-2009	AT 505619 T EP 2039871 A1 ES 2365048 T3 PL 2039871 T3	15-04-2011 25-03-2009 21-09-2011 30-11-2011
EP 3263826 A1	03-01-2018	EP 3263826 A1 ES 2722650 T3 FR 3053379 A1	03-01-2018 14-08-2019 05-01-2018
EP 2811103 A1	10-12-2014	EP 2811103 A1 ES 2647296 T3	10-12-2014 20-12-2017
NL 7605795 A	02-12-1976	BE 842149 A CH 603986 A5 DE 2524205 A1 FR 2313541 A1 IT 1070508 B NL 7605795 A YU 127476 A	16-09-1976 31-08-1978 02-12-1976 31-12-1976 29-03-1985 02-12-1976 28-02-1982