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(54) **CONNECTION SYSTEM FOR THE REMOVABLE CONNECTION OF AN ACCESSORY FOR WINDOWS OR DOORS**

(57) Connection system (10) for the removable connection of an accessory for windows or doors to a section bar (200) of a window or door, wherein the accessory comprises a base body (101) and wherein the section bar (200) has a portion having a bottom (201) which connects to two side edges (202, 203), which extend in a respective flap (204, 205) substantially parallel to the bottom (201), the flaps (204, 205) delimit an access slit to the channel (206) defined between the bottom (201) and the side edges (202, 203), wherein the system is characterised in that it comprises an anchoring plate (11) which is adapted to be attached to the base body (101) of the accessory and which can be inserted in the channel (206) through the slit, wherein the anchoring plate (11) has a first shaped longitudinal edge (17) which is adapted to lean on the free end of one of the two flaps (204, 205) or one of the two side edges (202, 203) and a second shaped longitudinal edge (18) opposite to the first one, at least one threaded member (12) adapted to attach the anchoring plate (11) to the section bar (200), at least one fitting body (13) that is adapted to be rotatably mounted on the base body (101) of the accessory rotating around an axis of rotation (R) substantially orthogonal to the bottom (201) and having a first fitting projection (24a) and a second fitting projection (24b) substantially opposite to each other with respect to the axis of rotation (R), wherein the at least one fitting body (13) is rotatable between a first position, in which the first fitting projection (24a) thereof and the second fitting projection (24b) thereof can be substantially aligned with the longitudinal axis of the channel (206) without interfering with the anchoring plate (11) and with the section bar (200), and a second position, in which its first fitting projection (24a) can be

fitted against the second shaped longitudinal edge (18) of the anchoring plate (11) and its second fitting projection (24b) can be fitted against the side edge (202, 203) of the section bar facing the second shaped longitudinal edge (18) of the anchoring plate (11).

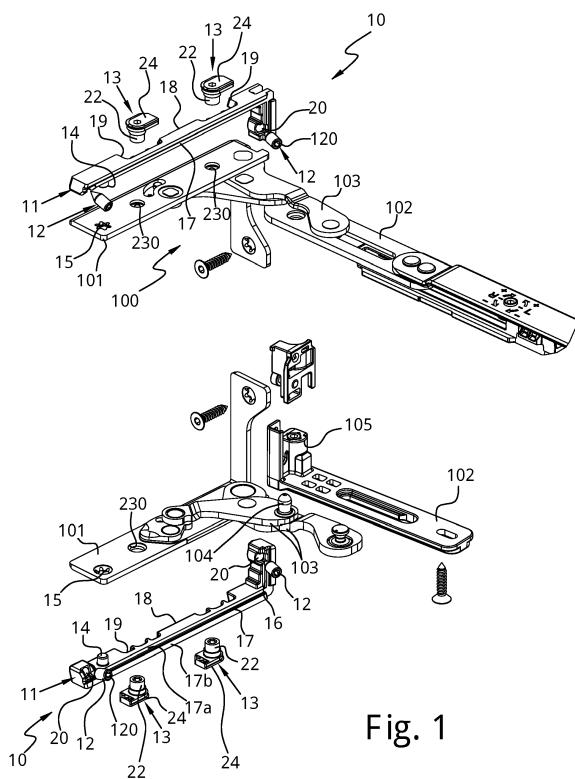


Fig. 1

Description

[0001] The present invention relates to a connection system for the removable connection of an accessory for windows or doors to a window or door section bar.

[0002] In particular, the present invention relates to a connection system for the removable connection of a "concealed hinge" for windows or doors to a window or door section bar.

[0003] Still more in particular, the present invention relates to a connection system for the removable connection of the fixed arm a "concealed hinge" for windows or doors to a section bar of the fixed frame of a window or door.

[0004] In the sector of windows and doors, systems are known for hinging the wings of doors or windows to the fixed frame that consist of so-called "concealed hinges", i.e. hinges that, when the wings are closed, are not visible from outside the window or door. An example of such hinges is described in patent IT1406348.

[0005] In general terms, "concealed hinges" comprise:

- a fixed arm that is attached to the section bar that forms an upper or lower crosspiece of the fixed frame,
- a movable arm that is attached to the section bar that forms an upper or lower crosspiece of the perimetral frame of the wing,
- a group of levers articulating between them the fixed arm and the movable arm, where one of said levers supports an articulating pin on which the wing is hinged.

[0006] In these hinging systems, particularly critical is the connection of the fixed arm of the "concealed hinge" to the section bar that forms the upper or lower crosspiece of the fixed frame.

[0007] As is immediately understandable to the person skilled in the art, when the wing is open, its weight generates a bending stress that tends to deform the articulation levers, hindering the correct opening and closing of the wing, and to compromise the holding of the connection of the fixed arm to the respective section bar (crosspiece) of the fixed frame, with consequent risks of uncouplings and breakdowns.

[0008] Typically, the section bars used to form the fixed frame and, in particular, the crosspieces thereof have a portion with C-shaped cross section and have a bottom whose two opposite sides connect to respective side edges, the free end of which is prolonged in a respective flap that extends substantially parallel to the bottom of the section bar. The flaps delimit an access slit to the channel defined by the bottom and by the side edges.

[0009] According to the prior art, the fixed arm of the "concealed hinges" is shaped so as to be directly inserted in the channel of the section bar to which it is connected through so-called "contrasting grub screws", screws and/or engaging plates.

[0010] In the first case, the fixed arm has one or more threaded through holes, in each of which is engaged a corresponding threaded grub screw (i.e. headless screw) that, following screwing, engages with its free end on the bottom or on the side edge of the section bar opposite the one towards which the fixed arm itself is thrust, "in contrast".

[0011] In the second case, the fixed arm is connected to the section bar with known self-threading screws that engage in the section bar.

[0012] In the third case, the fixed arm is connected to the section bar by means of a plurality of engagement plates that are mounted thereon rotatably around an axis of rotation orthogonal to the bottom of the section bar and that have a width and a length respectively smaller than and greater than the width of the access slit to the channel of the section bar. The engagement plates are rotated between two positions: a first position, in which they are positioned with their width parallel to the width of the slit so as to be able to be inserted in the channel of the section bar, and a second position, in which they are positioned with their width parallel to the longitudinal development of the section bar so as to extend in length below the flaps of the section bar blocking by obstacle the detachment of the fixed arm from the section bar.

[0013] In known systems, the engagement plates generally have symmetrical conformation with respect to the axis of rotation or at least with respect to a plane passing through the axis of rotation.

[0014] In some known solutions, the fixed arm is connected to the respective section bar both with screws and with engagement plates.

[0015] However, these known solutions do not always assure a stable, secure connection able to withstand the bending stresses that are generated when the wing is open, extractions, uncouplings and/or breakdowns being possible.

[0016] In these known solutions, moreover, the fixed arm of the "concealed hinge" is directly connected to the respective section bar; for this purpose, the fixed arm must be appropriately dimensioned and shaped according to the section bar and, when fastening takes place with "contrasting grub screws", it must be machined to create corresponding threaded holes therein. Hence, for every type of "concealed hinge" it is necessary to produce different types of the entire hinging system according to the type (in particular dimensions) of section bar forming the crosspiece of the fixed frame.

[0017] Also known is a system for connecting "concealed hinges" as described in WO2013/020815 in the name of Roto Frank Ag which, however, does not assure a stable and secure locking.

[0018] The purpose of the present invention is to provide a connecting system for the removable connection of an accessory for windows or doors to a window or door section bar that overcomes the drawbacks of the prior art.

[0019] A particular purpose of the present invention is to provide a connecting system for the removable con-

nection of an accessory for windows or doors to a window or door section bar that allows to obtain a stable and secure connection of the accessory to the section bar able to withstand bending stresses, avoiding extractions or breakdowns.

[0020] Another purpose of the present invention is to provide a connecting system for the removable connection of an accessory for windows or doors to a window or door section bar that can be applied to accessories for windows or doors, including existing types, without requiring substantial changes thereto and which allows to standardise the range of these accessories independently of the type and, in particular, of the dimensions of the section bar to which they have to be fastened.

[0021] Another purpose of the present invention is to provide a connecting system for the removable connection of an accessory for windows or doors to a section bar of a window or door that is particularly simple and functional, with low costs.

[0022] These purposes according to the present invention are achieved by providing a connecting system for the removable connection of an accessory for windows or doors to a window or door section bar as set forth in claim 1.

[0023] These purposes according to the present invention are achieved by providing an accessory for windows or doors that can be connected to a window or door section bar as set forth in claim 13.

[0024] Further characteristics are provided in the dependent claims.

[0025] The characteristics and advantages of a connecting system for the removable connection of an accessory for windows or doors to a window or door section bar and an accessory for windows or doors comprising a connection system according to the present invention will be more readily apparent from the following exemplifying and non-limiting description, referred to the accompanying schematic drawings in which:

Figure 1 is an axonometric exploded view of the components of a connecting system according to the present invention applied to the fixed arms of "concealed hinges", upper and lower, of a wing of a door or window;

Figure 2 is an axonometric view of only the lower concealed hinge of Figure 1, for simplicity lacking the movable arm, and of the components of the connecting system of the respective fixed arm in assembled configuration and with the levers of the hinge in the closed position of the wing;

Figure 3 is a bottom view of Figure 2 with the levers of the hinge in the open position of the wing;

Figures 4A and 4B are axonometric views according to different angles of one of the fitting bodies of the connecting system according to the present invention;

Figure 5 shows the step of approaching the fixed arm of the concealed hinge of Figure 3 to the respec-

tive section bar of the fixed frame to which it has to be connected;

Figure 6 is a section view that shows the fixed arm of the concealed hinge of Figure 3 positioned on the respective section bar, but not yet connected thereto; Figure 7 is an axonometric view that shows the concealed hinge of Figure 3 with the respective fixed arm positioned on the respective section bar before the execution of the connection operations;

Figure 8 is a section view that shows the fixed arm of the hinge of Figure 6 after screwing the threaded members that fix "in contrast" the respective anchoring plate to the section bar, before the fitting of the fitting bodies;

Figure 9 is a bottom plan view of Figure 3 with the threaded members screwed and the engagement bodies rotating between their first position and their second position;

Figure 9A is a view on an enlarged scale of a detail of figure 9;

Figure 10 is a view like the one of Figure 9 with one of the two fitting bodies fully rotated in its second position;

Figure 10A is a view on an enlarged scale of a detail of figure 10;

Figure 11 is a section view that shows the fixed arm of the hinge of Figure 6 after screwing the threaded members that fix "in contrast" the anchoring plate to the section bar and after the rotation of the fitting bodies in their second position.

[0026] It is specified that in some accompanying figures (for example, Figures 6, 8 and 11) some components of the "concealed hinge" are shown only partially, being of a known type, not binding for the purposes of the present invention.

[0027] With reference to the figures, a connection system 10 is shown for the removable connection of an accessory for windows or doors to a window or door section bar.

[0028] Although the connection system 10 is applicable for connecting different types of accessories for windows or doors to a section bar forming the fixed frame or the outer frame of a movable panel of a window or door, in the present description reference will be made to the case in which the accessory consists of a so-called "concealed hinge". The connecting system 10 is in fact particularly suitable for connecting a "concealed hinge" or rather the fixed arm of a "concealed hinge", to a section bar forming a crosspiece of the fixed frame of a window or door.

[0029] The "concealed hinge" is known in itself and it will be described in general terms for the purposes of the present description and with reference to the accompanying figures, which are provided solely by way of non-limiting example.

[0030] For simplicity, reference will be made to the connection of a lower "concealed hinge", i.e. applied to the

lower end of a wing or movable panel, the connection of the upper "concealed hinge" being wholly similar.

[0031] Likewise, the section bars forming the fixed frame of a window or door and the window or door in its entirety are not shown and described in a detailed manner, being of a known type.

[0032] The "concealed hinge" 100 comprises:

- a) a fixed arm 101 to be connected to a section bar 200 that forms a crosspiece of the fixed frame of a window or door;
- b) a movable arm 102 to be connected to the corresponding crosspiece of the outer frame of a wing of a window or door;
- c) a group of levers 103 that articulate the fixed arm 101 to the movable arm 102.

[0033] One of the levers 103 supports a hinge pin 104 around which is articulated a bushing 105 fixed to the movable arm 102.

[0034] The fixed arm 101 constitutes the base body of the accessory ("concealed hinge" 100), where said base body (in the present case, the fixed arm 101) has to be connected in a fixed, complete (i.e. without possibility of any relative translation and rotation motion) and removable manner to the section bar 200. In the description and in the claims, then, the reference numeral "101" is used to indicate, in general, the base body of an accessory and, in particular, the fixed arm of a concealed hinge forming the accessory. Equally, the reference numeral "100" is used to indicate, in general, an accessory that can be connected to a section bar of a window or door and, in particular, a "concealed hinge".

[0035] The section bar 200 is also of a known type and it could also be different from the one shown in the accompanying figures.

[0036] For the purposes of the present invention, in any case the section bar 200 comprises a portion to which the fixed arm 101 has to be connected.

[0037] This portion has a bottom 201 that connects to two side edges 202, 203, which extend in a respective flap 204, 205 substantially parallel to the bottom 201.

[0038] The free ends of the two flaps 204, 205 delimit a longitudinal access slit to the channel 206 defined between the bottom 201 and the two side edges 202, 203.

[0039] In general, then, the section bar 200 has C-shaped or double C-shaped cross section, although different conformations are possible in which, in any case, the elements (bottom, side edges and flaps) described above can be noted.

[0040] The connection systems 10 comprises:

- an anchoring plate 11 that is adapted to be attached to the fixed arm 101 (i.e. to the base body of the accessory consisting of the "concealed hinge") and which can be inserted in the channel 206 through the slit delimited by the flaps 204, 205, wherein the anchoring plate 11 is also adapted to be attached to

the section bar 200 through threaded members 12 acting "in contrast";

- one or more fitting bodies 13 that are adapted to be mounted on the fixed arm 101 (i.e. on the base body of the accessory consisting of the "concealed hinge") rotating around a respective axis of rotation R substantially orthogonal to the bottom 201 and that are shaped and arranged so as to assume at least two positions:

- a) a first position, in which they do not interfere with the anchoring plate 11 and they can be inserted, together with it, in the channel 206 through the slit delimited by the flaps 204, 205, and, following the rotation around the respective axis of rotation R,
- b) a second position, in which they fit between the anchoring plate 11 and the section bar 200.

[0041] In greater detail, the anchoring plate 11 consists of a main body with mainly longitudinal development. The main body of the anchoring plate 11 has, advantageously, a length that is substantially equal to or greater than that of the portion of the fixed arm 101 that has to be anchored to the section bar 200.

[0042] With reference to the accompanying figures, the anchoring plate 11 has L shape: an end of its main body extends in an appendage that forms together with the main body the two arms of an L.

[0043] In this case, the anchoring plate 11 can be inserted in the channel of the two section bars 200, 200a that contribute to form an angle of the fixed frame of the window or door, where the section bar 200 forms the (upper or lower) crosspiece and the section bar 200a forms an upright.

[0044] The anchoring plate 11 is attached in a substantially rigid manner in rotation and in translation to the fixed arm 101. For the person skilled in the art it is immediately evident from the accompanying figures and from the present description that the anchoring plate 11 is fixed with respect to the base body 101 (fixed arm). The anchoring plate 11 thus forms a substantially single body with the base body 101 (fixed arm). The anchoring plate 11 has no possibility to move, either in rotation or in translation, relative to the base body 101 (fixed arm), to which it is attached.

[0045] In the case represented in the accompanying figures, the anchoring plate 11 is fastened to the fixed arm 101 through a pin 14, which is inserted in a corresponding through hole 15 drilled in the fixed arm 101 and riveted therein, and a shape or fit coupling 16 with a corresponding portion of the fixed arm 101.

[0046] The anchoring plate 11 also has a first shaped longitudinal edge 17 and a second shaped longitudinal edge 18 opposite each other and extending along its longitudinal development.

[0047] The first shaped longitudinal edge 17 comprises a resting surface 17a that rests against the free end of

one of the two flaps 204, 205 or to one of the two side edges 202, 203. With reference to the accompanying figures, the first shaped longitudinal edge 17 comprises a resting surface 17a that rests against the free end of the flap 205 that forms the outer side of the section bar 200 considered in mounting configuration, i.e. the one against which the wing abuts.

[0048] The first shaped longitudinal edge 17 then comprises a tapered portion 17b that projects beyond the resting surface 17a to be inserted below the flap 205.

[0049] The resting surface 17a and the tapered portion 17b of the first shaped longitudinal edge 17 form a "step".

[0050] The second shaped longitudinal edge 18 has one or more recesses 19 that receive a respective fitting body 13.

[0051] As will be clearer hereinafter, the second shaped longitudinal edge 18 has, at said recesses 19, an abutment or fitting surface 18b for the respective fitting body 13.

[0052] Said abutment or fitting surface 18b is, preferably, obtained in undercut.

[0053] The anchoring plate 11 further comprises one or more threaded holes 20 in each of which is engaged a corresponding threaded member 12.

[0054] The threaded holes 20 are drilled in the anchoring plate 11 in a through manner between its first shaped longitudinal edge 17 and its second shaped longitudinal edge 18.

[0055] In particular, the threaded holes 20 are drilled at end portions 21 of the anchoring plate 11. Said end portions 21 are enlarged so that they extend with a segment thereof beyond the resting surface 17a of the first shaped longitudinal edge 17 at the opposite side with respect to the tapered portion 17b thereof. When the anchoring plate 11 is inserted in the channel 206, said end portions 21 emerge from the slit delimited by the flaps 204, 205, so that the threaded holes 20, or rather the operating end of the threaded members 12 inserted therein, is accessible from outside.

[0056] The axis of the threaded holes 20 is inclined with respect to the bottom 201 by a non-zero angle, different from a right angle. As is readily apparent from the accompanying figures, the axis of the threaded holes 20 is not parallel or coaxial to any of the axes of rotation R of the fitting bodies 13. The threaded holes 20 have distinct axes, distanced from the axes of rotation R of the fitting bodies 13.

[0057] The threaded members 12 consist of headless screws, i.e. "threaded grub screws", which have an operating axial end, whereat a seat 120 is obtained in which an operating tool 300 is engaged, and the opposite axial and free end generally conical.

[0058] Following screwing in the respective threaded holes 20, the free end of the threaded members 12 projects beyond the second shaped longitudinal edge 18 of the anchoring plate 11 and engages against the flap 204 and/or the side edge 202 opposite to the flap 205 or to the side edge 203 against which the first shaped lon-

gitudinal edge 17 of the anchoring plate 11 itself rests.

[0059] The anchoring plate 11 is then connected to the section bar 200 by "contrasting" action of the threaded members 12. Since the anchoring plate 11 is attached to the fixed arm 101 (base body), the latter is also connected to the section bar 200 by "contrasting" action of the threaded members 12.

[0060] The threaded members 12 are distinct and separate from the fitting bodies 13. As is readily apparent from the accompanying figures, the threaded members 12 do not engage with any of the fitting bodies 13. The threaded members 12 and the fitting bodies 13 can be operated independently of each other.

[0061] Each fitting body 13 is mounted on the fixed arm 101 so as to be able to rotate around a respective axis of rotation R, without possibility of any translation with respect to the fixed arm 101, in particular without any possibility of any sliding along the axis of rotation R. As is readily apparent from the accompanying figures, each fitting body 13 is mounted on the base body 101 (fixed arm) with possibility of relative motion with respect to the base body 101 only in rotation around the respective axis of rotation R.

[0062] With reference to the accompanying figures, each fitting body 13 comprises a tang 22 that defines the axis of rotation R and that is inserted rotatably in a corresponding through hole 230 drilled in the fixed arm 101. As is readily apparent from the accompanying figures, the tang 22 and the through hole 230 are not threaded. The through holes 230 are different and distanced from the threaded holes 20 in which the threaded members 12 are engaged; the through holes 230 are obtained in the base body 101 (fixed arm) and the threaded holes 20 are drilled in the anchoring plate 11 in such a position that, considering the system 10 in mounting condition on the accessory (concealed hinge 100), the ones are not superposed on the others.

[0063] The tang 22 has a first axial end that emerges from the surface of the fixed arm 101 opposite to the one on which the anchoring plate 11 is mounted; in said first axial end of the tang 22 a seat 23 is obtained in which an operating tool 300 is engaged.

[0064] The tang 22 has a second axial end opposite to the first axial end thereof and which is attached or integral to a shaped plate 24. The tang 22 then forms a single rigid body with the respective plate 24; the tang 22 and the respective plate 24 then always rotate together as a single rigid body.

[0065] The plate 24 comprises a first fitting projection 24a and a second fitting projection 24b that are substantially opposite to each other with respect to the axis of rotation R.

[0066] Each fitting body 13 is rotatable around the respective axis of rotation R between at least a first position and a second position.

[0067] In the first position (Figures 2, 3, 5, 6 and 8), each fitting body 13 is positioned so that its first fitting projection 24a and its second fitting projection 24b are

substantially aligned with the longitudinal axis of the channel 206 without interfering with the anchoring plate 11 and with the section bar 200.

[0068] As is immediately understandable for the person skilled in the art, the maximum length of the plate 24, the position of the axis of rotation R with respect to the anchoring plate 11 and the width of the anchoring plate 11 are dimensioned in such a way that, when the fitting bodies 13 are in said first position, they can be inserted together with the anchoring plate 11 in the channel 206 through the slit delimited by the flaps 204, 205 without interfering with them (as shown in Figures 5 and 6).

[0069] In the second position (Figures 10, 10A and 11), each fitting body 13 is positioned in such a way that its first fitting projection 24a is fitted against the second shaped longitudinal edge 18 of the anchoring plate 11 and its second fitting projection 24b is fitted against the side edge 202 of the section bar 200 facing the second shaped longitudinal edge 18 of the anchoring plate 11.

[0070] Advantageously, each fitting body 13 - or rather the respective plate 24 - has a size in length (not necessarily equal to the maximum size in length) substantially equal to the distance between the portion of the second shaped longitudinal edge 18 of the anchoring plate 11 that is facing thereto and the inner wall of the side edge 202 of the section bar 200 facing the second shaped longitudinal edge 18, so as to fill, in length, the space existing between the anchoring plate 11 and the side edge of the section bar opposite the one towards which the anchoring plate 11 is pushed by the threaded members 12.

[0071] The plate 24 is shaped as an eccentric or cam, the first fitting projection 24a and the second fitting projection 24b having asymmetric configuration with respect to at least one plane passing through the axis of rotation R and, considering the fitting body 13 in its second position, parallel to the longitudinal axis of the section bar 200.

[0072] Each fitting body 13 passes from the first position to the second position carrying out a rotation of no more than 90°.

[0073] The second fitting projection 24b can have a bevel 25 that allows fitting in channels of section bars of smaller width.

[0074] The first fitting projection 24a comprises at least one stop tooth 26 adapted to engage with a corresponding portion of the second shaped longitudinal edge 18 of the anchoring plate 11 to stop the rotation of the respective fitting body 13. The stop tooth 26 is provided at the face of the plate 24 opposite the one from which the tang 22 extends and on a portion of the edge of the first projection 24a. The stop tooth 26 is provided in substantially opposite position to the second projection 24b with respect to the axis of rotation R.

[0075] The second fitting projection 24b comprises one or more substantially wedge-shaped reliefs 27 and, when the fitting body 13 is in its second position, they jut under the respective flap 204 or on the bottom 201.

[0076] Preferably, the reliefs 27 are provided at the face of the plate 24 from which the tang 22 extends so as to jut below the respective flap 204 possibly causing a plastic deformation thereof.

[0077] The assembly and mounting operations of the connection system 10 according to the present invention are immediately understandable for the person skilled in the art in light of the above description and of the accompanying figures.

[0078] Briefly, the connection system 10 is first of all assembled on the base body of the accessory that has to be connected to the section bar 200, in the present case the connection system 10 is assembled on the fixed arm 101 of the "concealed hinge" 100.

[0079] For this purpose, the anchoring plate 11 is attached to the fixed arm 101 along the longitudinal development thereof and at the surface thereof intended to lean on the flaps 204, 205. The anchoring plate 11 is mounted on the base body (fixed arm 101) in a fixed manner in translation and rotation with respect thereto.

[0080] Likewise, the fitting bodies 13 are mounted on the fixed arm 101 so that their plates 24 flank the anchoring plate 11 and, in particular, they flank second shaped longitudinal edge 18 thereof at the recesses 19. The fitting bodies 13 are movably mounted on the fixed arm 101 (base body) with only the ability to rotate around the respective axis of rotation R.

[0081] The assembly thus obtained, with the fitting bodies 13 in their first position, is then mounted on the section bar 200: the anchoring plate 11 and the fitting bodies 13 are inserted laterally in the channel 206 as shown schematically in Figure 5.

[0082] Figure 6 shows a section view of the connection system 10 mounted on the fixed arm 101 and inserted in the section bar 200, before the execution of the connecting/fixing operations.

[0083] The fixed arm 101 bears on the flaps 204, 205; the anchoring plate 11 is inserted in the channel 206 with its first shaped longitudinal edge 17 approached to the flap 205 on the inner side of the frame; the fitting bodies 13 are housed in the channel 206 and are placed in their first position.

[0084] Subsequently, before rotating the fitting bodies 13 so as to bring them to their second position, the anchoring plate 11 is attached "in contrast" by means of the threaded members 12.

[0085] As shown in Figures 7 and 8, with the aid of an operating tool 300, the threaded members 12 are screwed in the respective threaded holes 20 until their free end engages/fits below the flap 204 and/or against the side edge 202 pushing "in contrast" the anchoring plate 11 against the flap 205 and/or the opposite side edge 203.

[0086] The anchoring plate 11 is pushed by the threaded members 12 towards the side edge 203 so that the support surface 17a of its first shaped longitudinal edge 17 leans against the free end of the flap 205.

[0087] The tapered portion 17b of the first shaped lon-

gitudinal edge 17 extends below the flap 205.

[0088] After thus fixing the anchoring plate 11 to the section bar 200, the fitting bodies 13 are rotated, with the aid of an operating tool 300, so as to be brought from their first position to their second position (Figures 9, 10 and 11).

[0089] In this way the first fitting portions 24a fit with corresponding surfaces of the second shaped longitudinal edge 18 of the anchoring plate 11, while the second fitting portions 24b fit against the inner wall of the opposite side edge 202.

[0090] Any additional rotations of the fitting bodies 13 are prevented by the engagement of the respective stop tooth 26 on the bottom 201 and/or below/against the anchoring plate 11.

[0091] The possible reliefs 27 jut below the flap 204, deforming it.

[0092] The fixed arm 101 is thus connected completely and stably to the section bar 200.

[0093] In particular, thanks to the conformation and the dimensioning of the anchoring plate and of the fitting bodies cooperating therewith, it is possible to fill in a substantially complete manner the channel 206 or rather the distance between the free end of a flap and the opposite side edge.

[0094] In the connection position, the anchoring plate and the fitting bodies form a set that extends with substantial continuity between a flap and the opposite side edge of the channel of the section bar, behaving as a single rigid body together with the fixed arm 101.

[0095] The connection system according to the present invention has the advantage of assuring a connection of an accessory for windows or doors to the channel of a section bar that is complete, stable and secure.

[0096] In particular, the connection system according to the present invention has the advantage of assuring a connection of the fixed arm of a "concealed hinge" to the channel of a section bar that is complete, stable, secure and able to withstand bending stresses that are generated in use, reducing the risks of deformations, extractions and breakdowns.

[0097] The connection system according to the present invention has the advantage of being able to be applied to accessories for windows or doors, including existing ones, without requiring particular modifications to them.

[0098] It also allows to standardise these accessories, in particular independently of the dimensions of the section bars on which they can be mounted, adopting for their connection variously shaped and dimensioned anchoring plates and fitting bodies.

[0099] Thus, for example, in the case of "concealed hinges", the fixed arm thereof can be standardised and, as the dimensions of the section bar vary, it is sufficient to mount thereon an appropriately shaped and dimensioned connection system according to the present invention.

[0100] The connection system for the removable con-

nnection of an accessory for windows or doors to a window or door section bar thus conceived is susceptible to many modifications and variations, all falling within the invention; furthermore, all the details are replaceable by technically equivalent elements. In practice, the materials used, as well as the dimensions, can be of any type according to the technical requirements.

10 Claims

1. Connection system (10) for the removable connection of an accessory for windows or doors to a section bar (200) of a window or door, wherein said accessory comprises a base body (101) and wherein said section bar (200) has a portion having a bottom (201) which connects to two side edges (202, 203), which extend in a respective flap (204, 205) substantially parallel to the bottom (201), said flaps (204, 205) delimiting an access slit to the channel (206) defined between said bottom (201) and said side edges (202, 203), **characterised in that** it comprises:

- an anchoring plate (11) which is suitable to be fixed to the base body (101) of said accessory and which can be inserted in said channel (206) through said slit, wherein said anchoring plate (11) has a first shaped longitudinal edge (17) leaning on the free end of one of said flaps (204, 205) or one of said side edges (202, 203) and a second shaped longitudinal edge (18) opposite to said first shaped longitudinal edge (17),
- at least one threaded member (12) adapted to attach said anchoring plate (11) to said section bar (200),
- at least one fitting body (13) that is adapted to be rotatably mounted on said base body (101) of said accessory rotating around an axis of rotation (R) substantially orthogonal to said bottom (201) and having a first fitting projection (24a) and a second fitting projection (24b) substantially opposite to each other with respect to said axis of rotation (R), wherein said at least one fitting body (13) is rotatable between a first position, in which said first fitting projection (24a) thereof and said second fitting projection (24b) thereof can be substantially aligned with the longitudinal axis of said channel (206) without interfering with said anchoring plate (11) and with said section bar (200), and a second position, in which said first fitting projection (24a) thereof is able to be fitted against said second shaped longitudinal edge (18) of said anchoring plate (11) and said second fitting projection (24b) thereof is able to be fitted against the side edge (202, 203) of said section bar facing said second shaped longitudinal edge (18) of said anchoring plate (11).

2. System (10) according to claim 1, **characterised in that** said at least one threaded member (12) is engaged with a corresponding threaded hole (20) which is obtained in said anchoring plate (11) in a through manner from said first shaped longitudinal edge (17) thereof to said second shaped longitudinal edge (18) thereof, wherein said at least one threaded member (12) is suitable to engage, with the free end thereof, against the flap (204, 205) and/or the side edge (202, 203) opposed to the flap (204, 205) or to the side edge (202, 203) against which said first shaped longitudinal edge (17) of said anchoring plate (11) leans.

3. System (10) according to claim 1 or 2, **characterised in that** said first fitting projection (24a) and said second fitting projection (24b) are asymmetric with respect to at least one plane passing through said axis of rotation (R).

4. System (10) according to one of the preceding claims, **characterised in that** said first fitting projection (24a) comprises at least one stop tooth (26) adapted to engage with a corresponding portion of said second shaped longitudinal edge (18) of said anchoring plate and/or with the bottom (201) of said channel (206).

5. System (10) according to one or more of the preceding claims, **characterised in that** said second fitting projection (24b) comprises, at the surface thereof facing said flap (204, 205) and/or at the surface thereof facing said bottom (201) at least one wedge-shaped relief (27) adapted to jut under said flap (204, 205) and/or on said bottom (201), respectively, when said fitting body (13) is in said second position thereof.

6. System (10) according to one or more of the preceding claims, **characterised in that** said at least one fitting body (13) comprises a plate (24) which defines said first fitting projection (24a) and said second fitting projection (24b) and a tang (22) which extends from the surface of said plate (24) opposed to that adapted to face said bottom (201) and which is rotatably mounted on said base body (101) of said accessory rotating around said axis of rotation (R).

7. System (10) according to claim 6, **characterised in that** said tang (22) is fixed to said plate (24) or is formed integrally therewith.

8. System (10) according to one or more of the preceding claims, **characterised in that** said at least one fitting body (13) has a size in length substantially equal to the distance between the portion of said second shaped longitudinal edge (18) of said anchoring plate (11) that is facing thereto and the side edge (202, 203) of said section bar facing said second shaped longitudinal edge (18) of said anchoring plate.

5 9. System (10) according to one or more of the preceding claims, **characterised in that** said anchoring plate (11) comprises at least one recess (19) wherein said at least one fitting body (13) is received.

10 10. System (10) according to one or more of the preceding claims, **characterised in that** said anchoring plate (11) is L-shaped, the branches whereof are adapted to be inserted into a respective said section bar of a pair of said section bars (200, 200a) mutually concurring in defining an angle.

15 11. System (10) according to one or more of the preceding claims, **characterised in that** said anchoring plate (11) is suitable to be in a substantially complete and removable manner to said base body (101) of said accessory.

20 12. System (10) according to one or more of the preceding claims, **characterised in that** said accessory is a concealed hinge, said base body thereof consisting of the fixed arm of said concealed hinge insertable in the section bar of the fixed frame of a window or door.

25 13. Accessory for windows or doors comprising a base body (101) able to be removably connected to a section bar (200) of a window or door, wherein said section bar (200) has a portion having a bottom (201) which connects to two side edges (202, 203), which extend in a respective flap (204, 205) substantially parallel to the bottom (201), said flaps (204, 205) delimiting an access slit to the channel (206) defined between said bottom (201) and said side edges (202, 203), wherein said accessory comprises a connection system (10) according to one or more of the claims from 1 to 12 that is mounted on said base body (101) for the connection of said base body (101) to said section bar (200).

30 14. Accessory according to claim 13, **characterised in that** it consists of a concealed hinge (100) for windows or doors comprising:

35 a) a fixed arm connectable to a C-shaped section bar (200) of the fixed frame of a window or door;

40 b) a movable arm (102) connectable to a wing of a window or door;

45 c) a group of levers (103) articulating said fixed arm (101) to said movable arm (102), wherein one of said levers (103) supports a hinge pin (104) around which said wing is articulated,

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wherein said base body (101) consists of said fixed arm.

15. Method for connecting an accessory according to claim 13 or 14, comprising the steps of: 5

- arranging said base body (101) to bear on said flaps (204, 205), inserting said anchoring plate (11) into said channel (206) so that said first shaped longitudinal edge (17) thereof is approached to one of said flaps (204, 205) and inserting said fitting bodies (13), placed in said first position thereof, in said channel (206), 10
- fixing said anchoring plate (11) to said section bar (200) through said threaded members (12), 15
- after fixing said anchoring plate (11) to said section bar (200) through said threaded members (12), rotating said fitting bodies (13) so as to bring them from said first position thereof to said second position thereof, wherein said first fitting portions (24a) fit with corresponding surfaces of said second shaped longitudinal edge (18) of said anchoring plate (11) and said second fitting portions (24b) fit against the inner wall of the side edge (202, 203) of said channel (206) 20
which faces the shaped longitudinal edge (18) 25
of said anchoring plate (11).

16. Method according to claim 15, wherein fastening said anchoring plate (11) to said section bar (200) 30 through said threaded members (12) comprises screwing said threaded members (12) in the respective threaded holes (20), which are obtained in a through manner in said anchoring plate (11) and extend between said first shaped longitudinal edge (17) 35 and said second shaped longitudinal edge (18) thereof, until the free end of said threaded members (12) engages below the flap (204, 205) and/or against the side edge (202, 203) opposite the one against which said anchoring plate (11) is pushed to bear on said first shaped longitudinal edge (17) 40 thereof.

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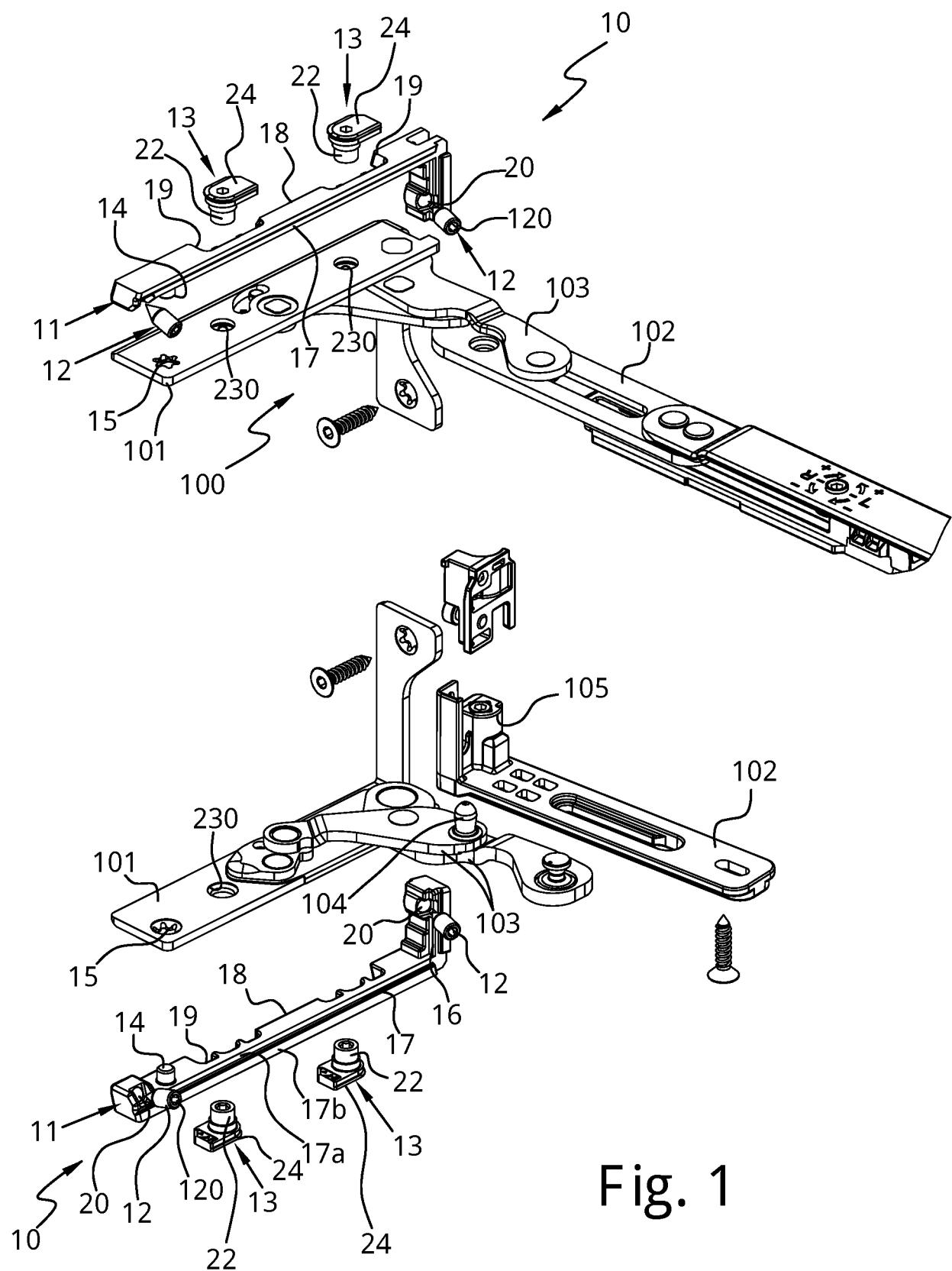


Fig. 1

Fig. 3

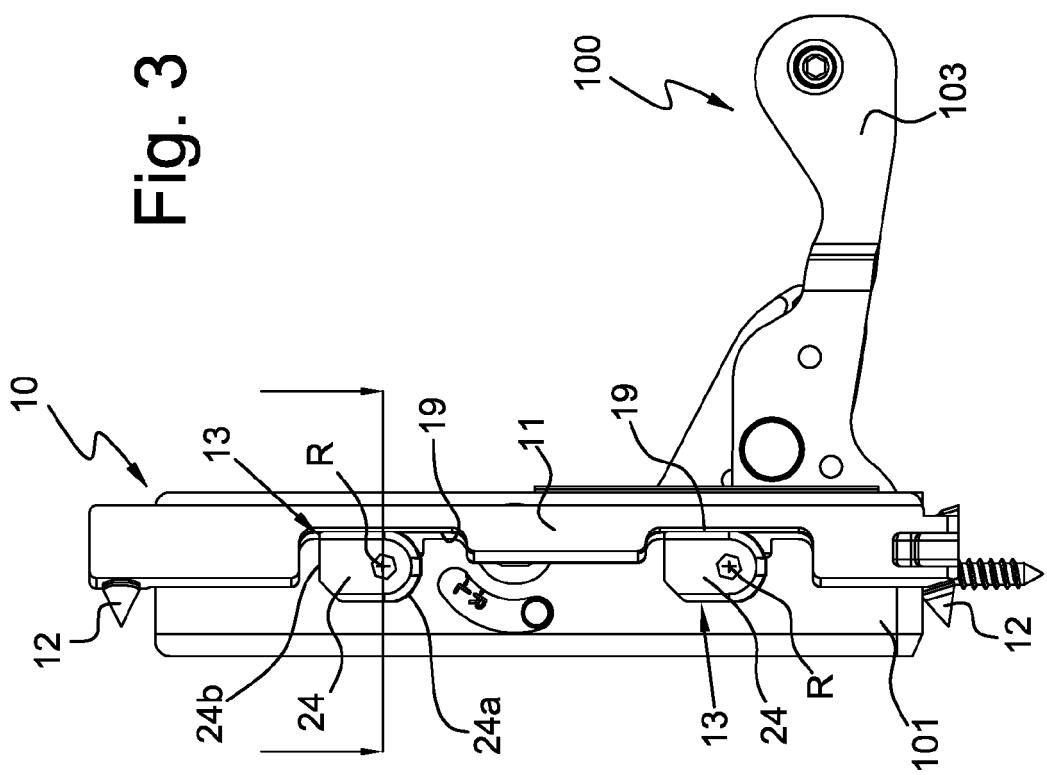


Fig. 2

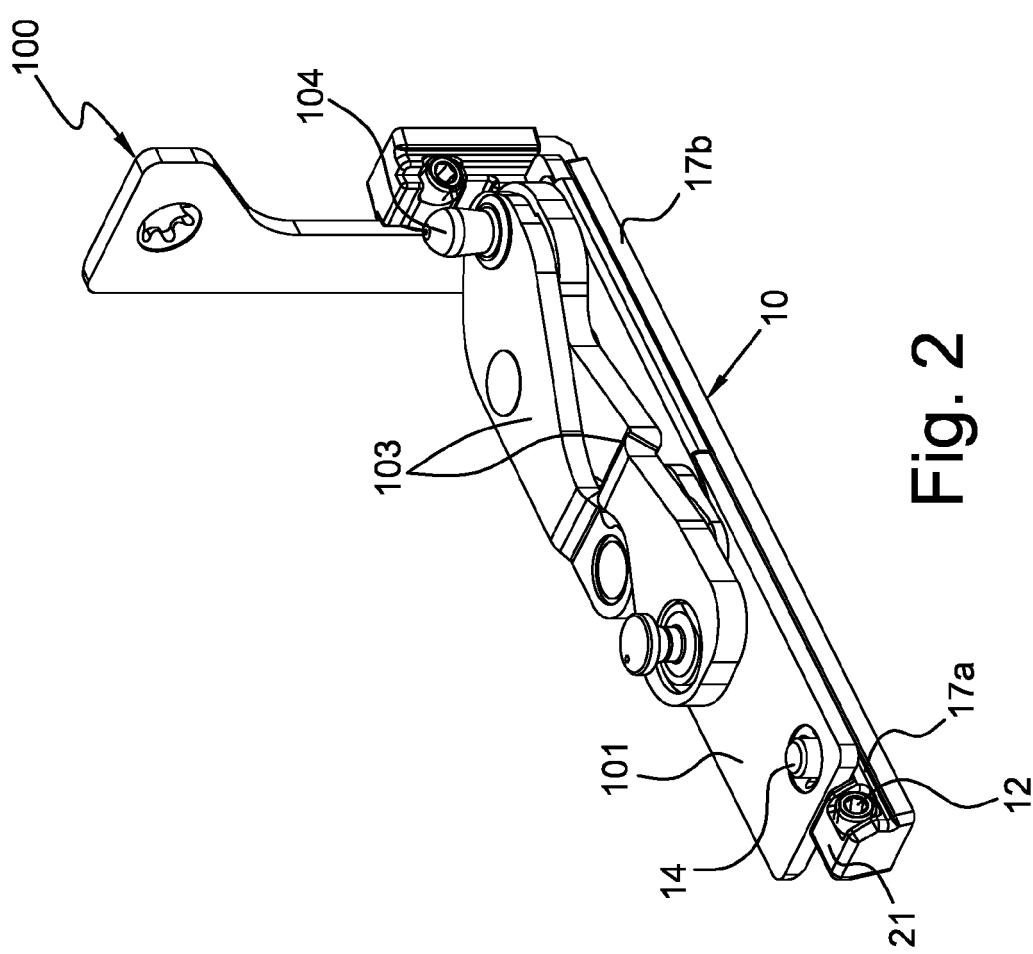


Fig. 4A

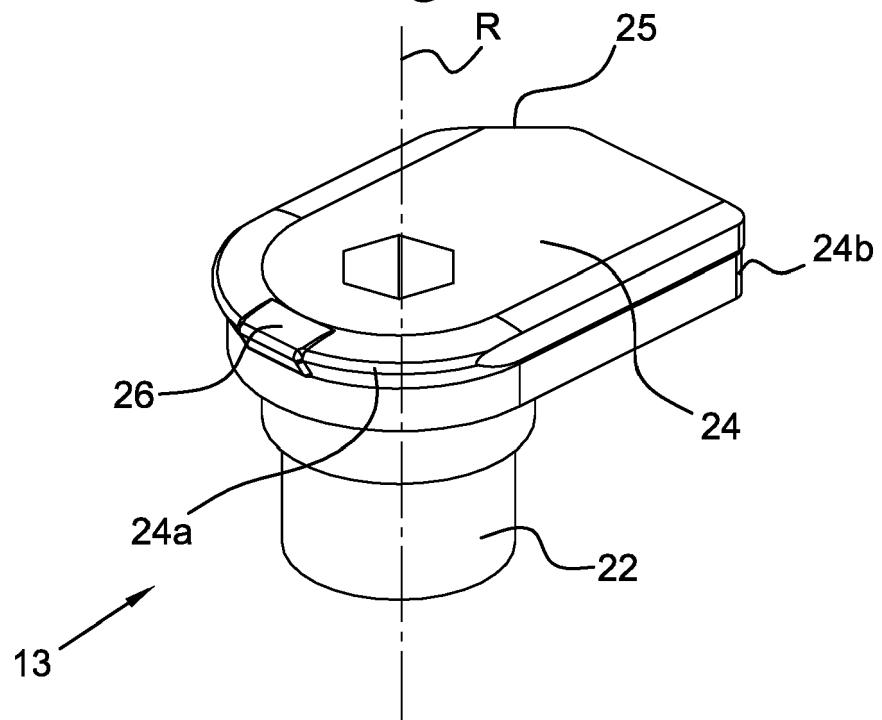


Fig. 4B

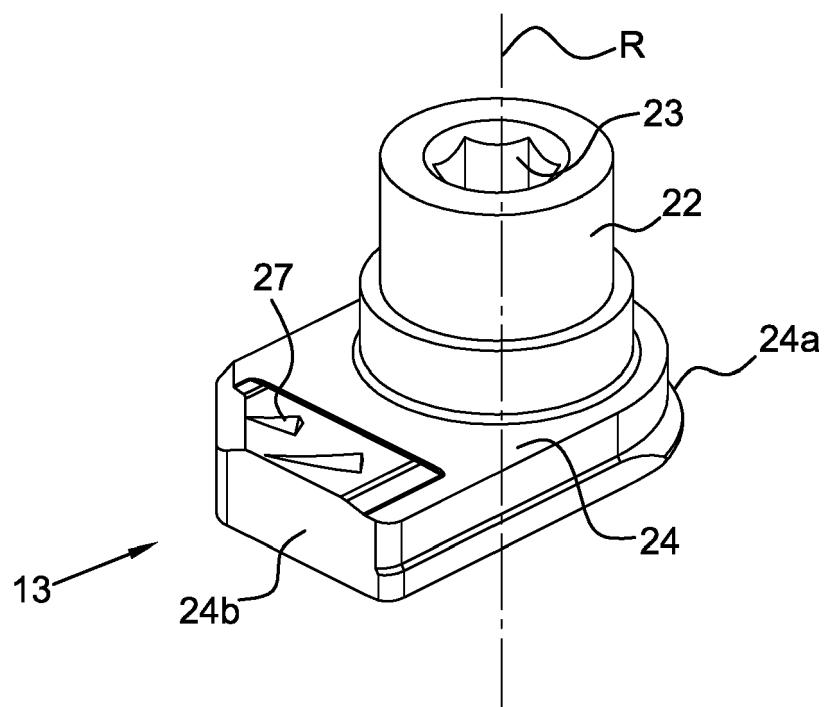


Fig. 5

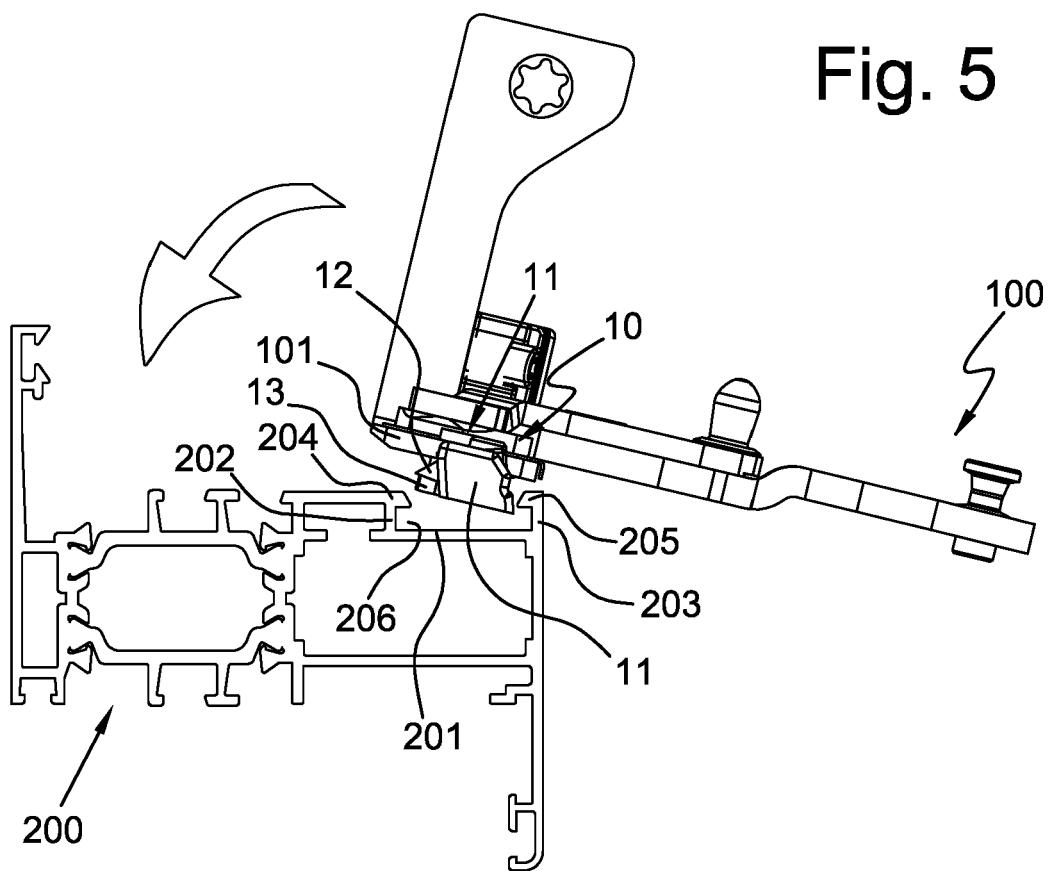


Fig. 6

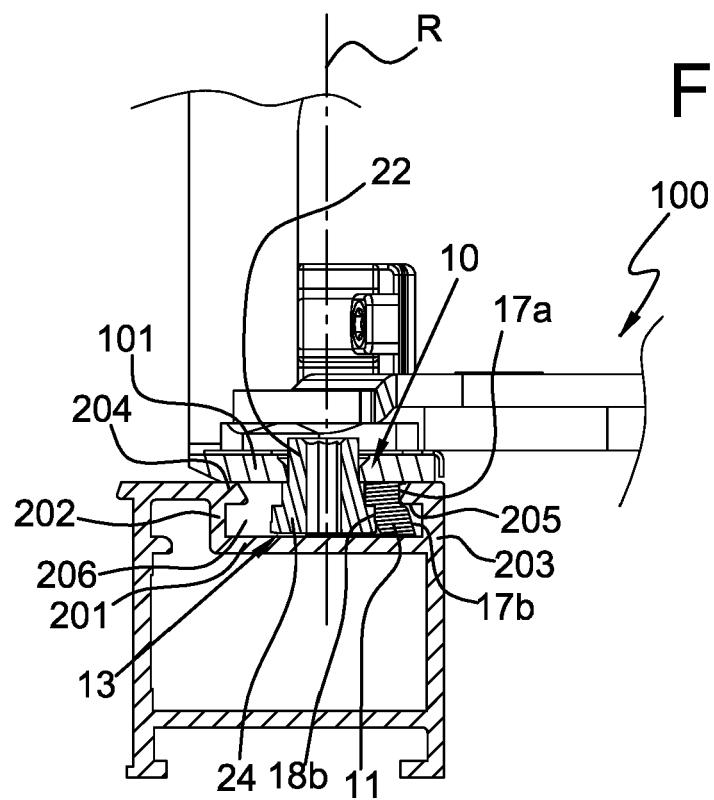


Fig. 7

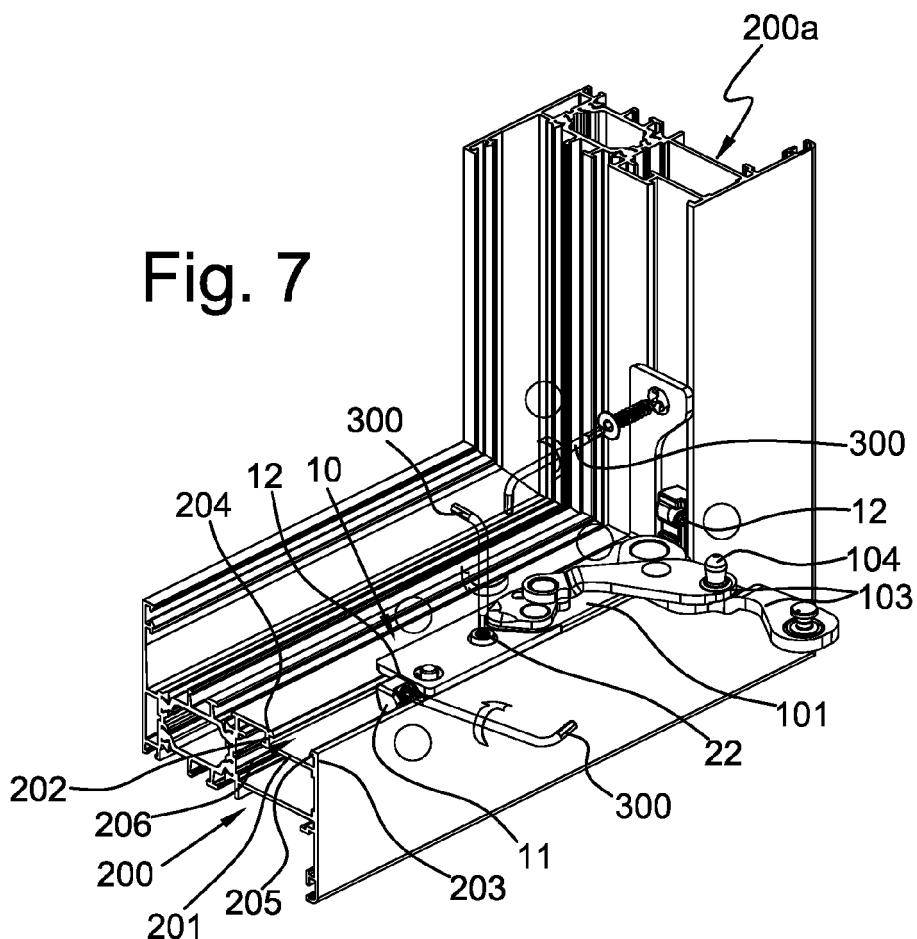


Fig. 8

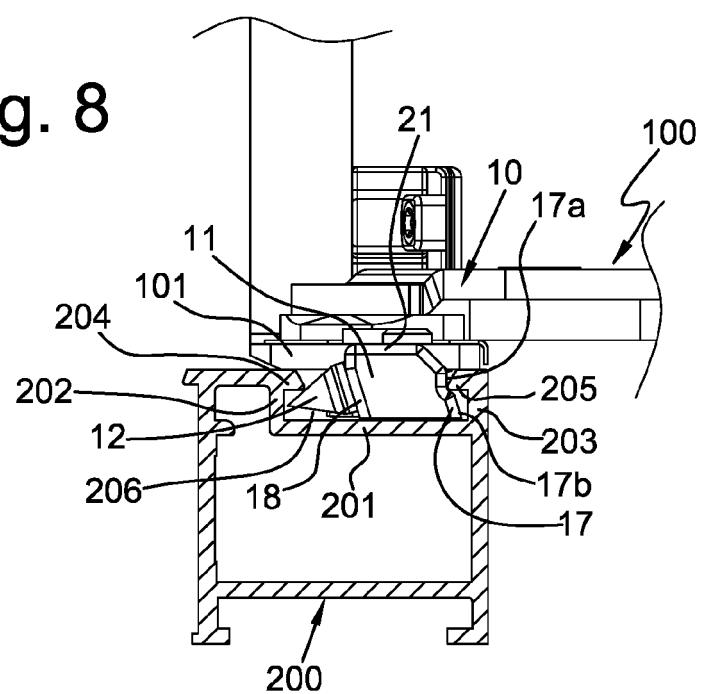


Fig. 9

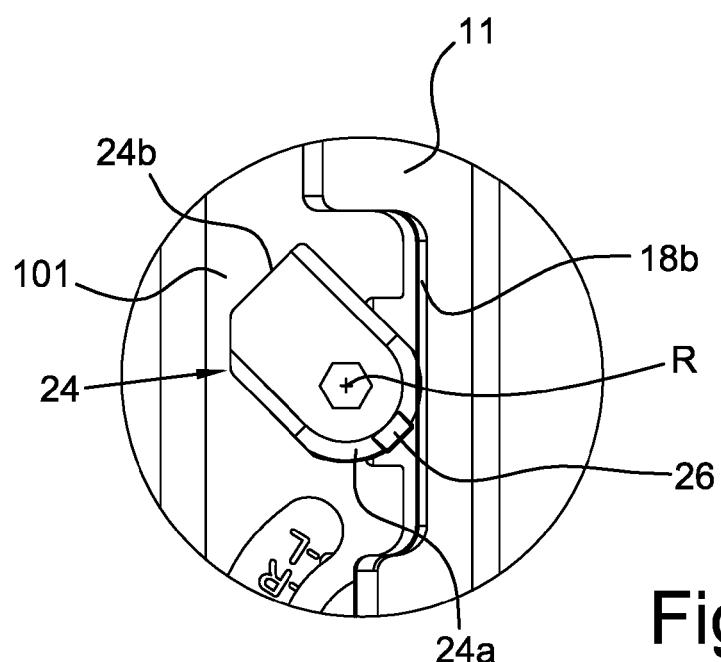
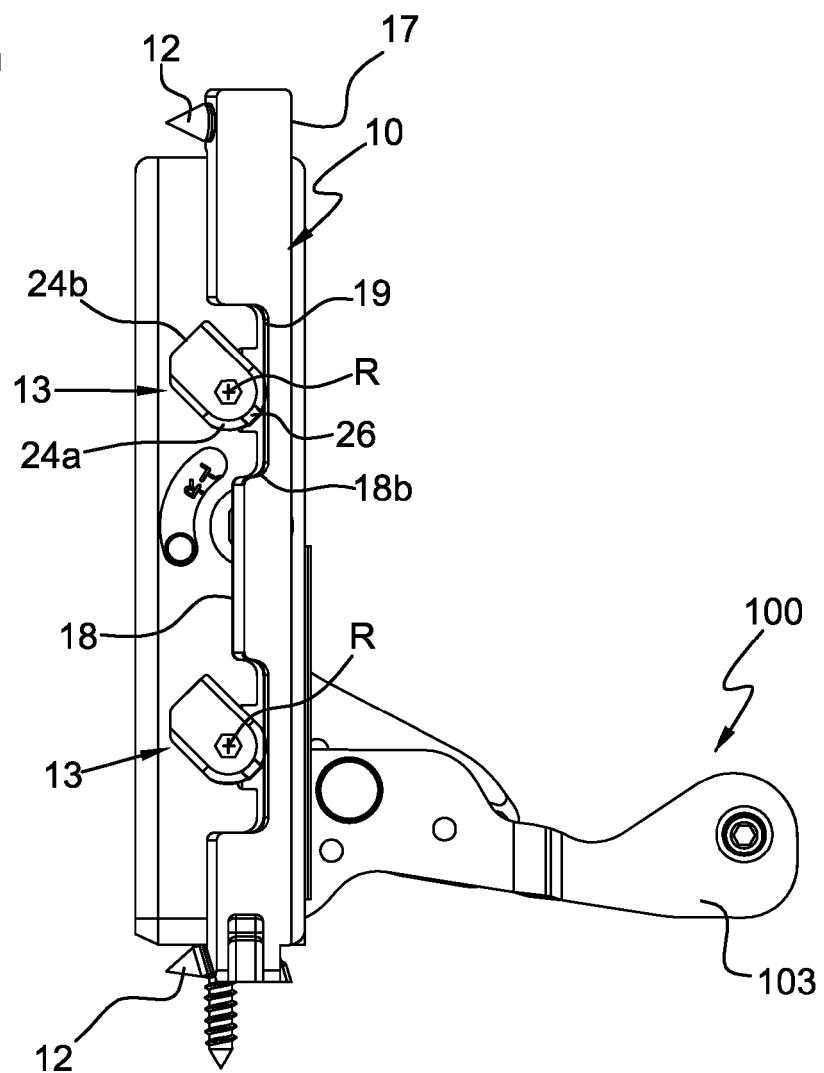


Fig. 9A

Fig. 10

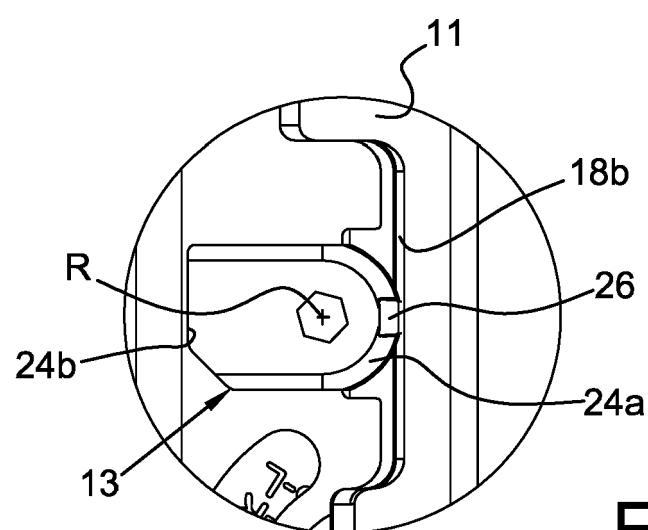
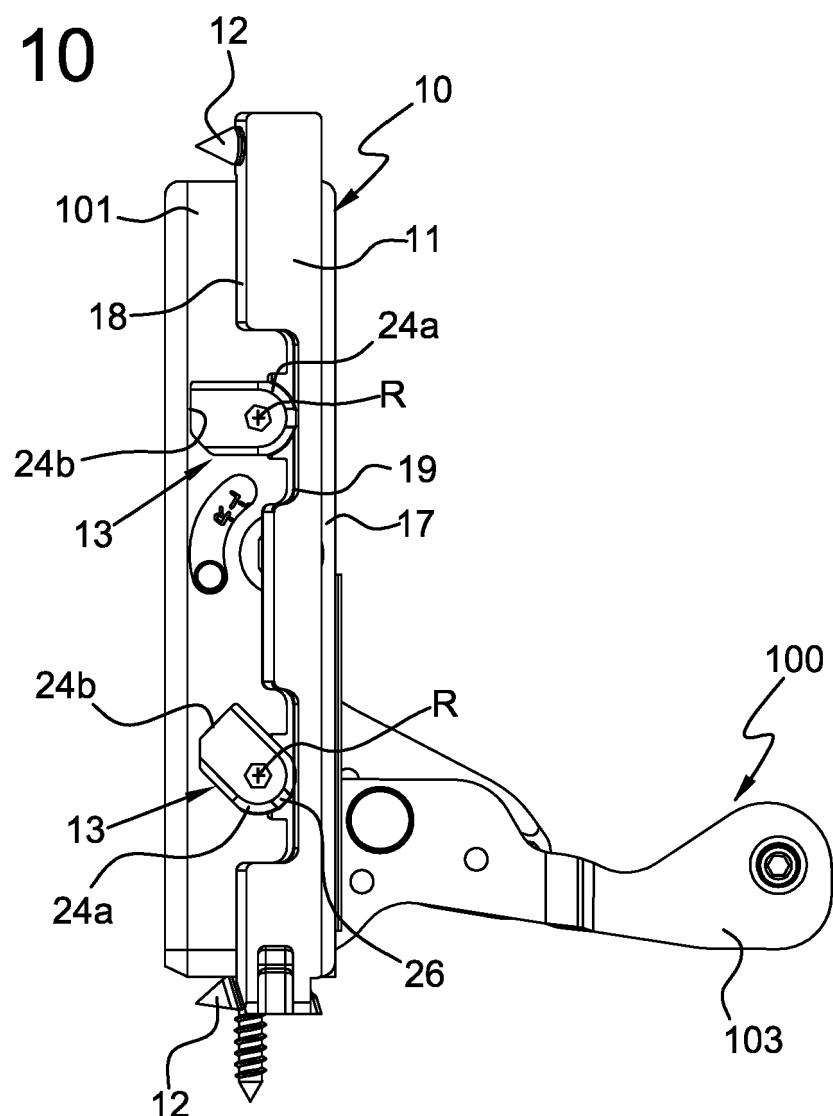


Fig. 10A

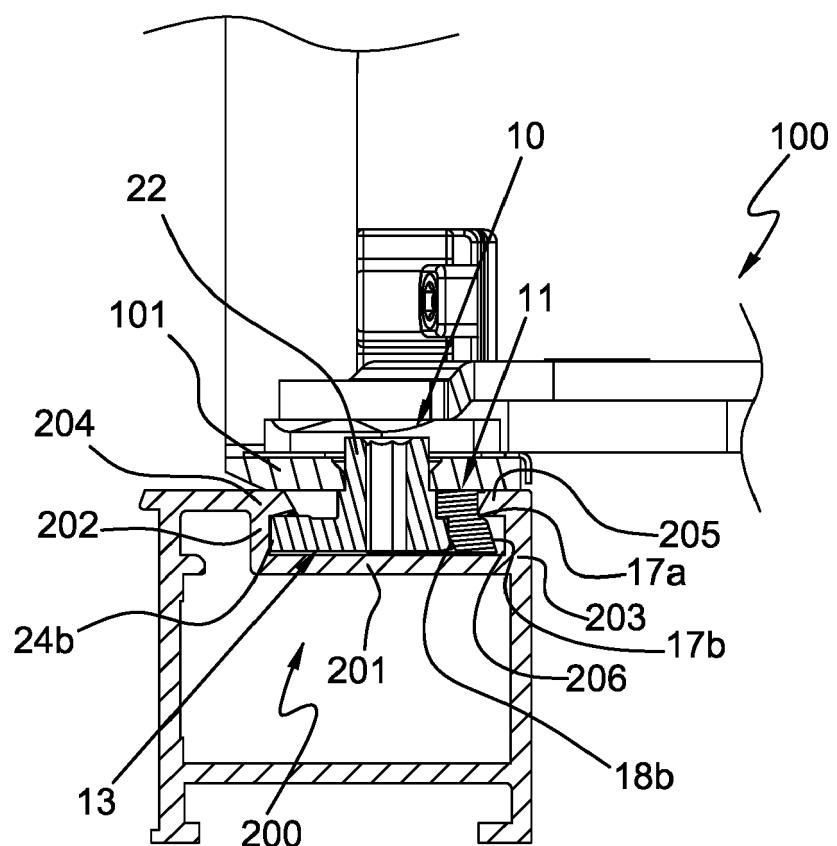


Fig. 11



EUROPEAN SEARCH REPORT

Application Number

EP 18 20 4042

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
10 X,D	WO 2013/020815 A1 (ROTO FRANK AG [DE]; SIEGLER MARTIN [DE]; GONSER MANUEL [DE]) 14 February 2013 (2013-02-14) * page 8, line 16 - page 11, line 20; figures 1-3, 4a-4d *	1,3,6-9, 11-16	INV. E05D5/02 E05D15/30
15 Y	----- WO 2016/135579 A1 (GSG INT S P A [IT]) 1 September 2016 (2016-09-01) * page 6, line 25 - page 9, line 7; figures 10-12 *	2,4,5,10 4,5	
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30			TECHNICAL FIELDS SEARCHED (IPC)
35			E05D
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45			
50 3	The present search report has been drawn up for all claims		
55	Place of search The Hague	Date of completion of the search 11 March 2019	Examiner Klemke, Beate
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