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(71) Applicant: **GSG INTERNATIONAL S.p.A.**
40054 Budrio (Bologna) (IT)

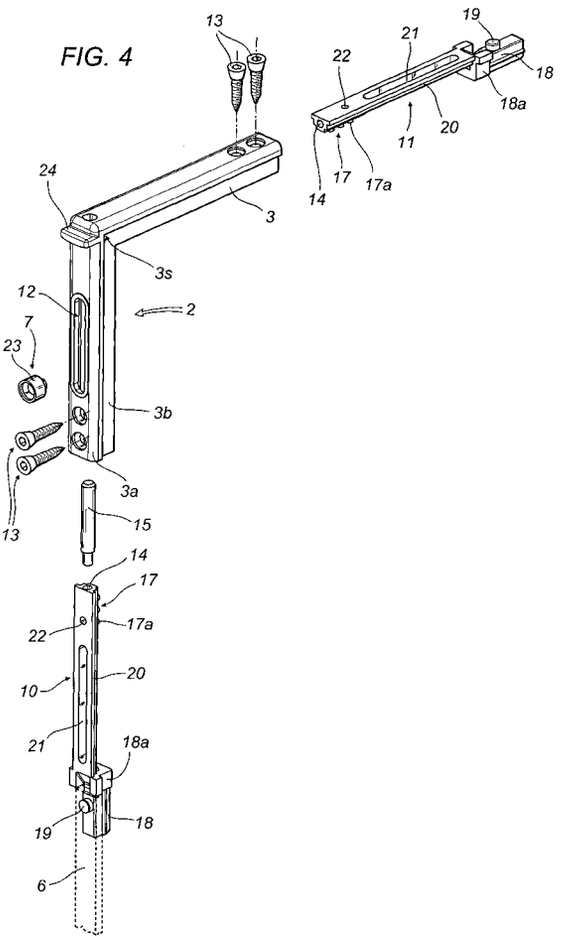
(72) Inventor: **Lambertini, Marco**
40068 San Lazzaro di Savena (Bologna) (IT)

(74) Representative: **Lanzoni, Luciano**
c/o BUGNION S.p.A.
Via Goito, 18
40126 Bologna (IT)

(54) A corner transmission element for doors and windows

(57) Described is a corner transmission element for doors or windows of the type comprising a fixed frame and a mobile frame (1) that can be both turn opened and tilt opened; the transmission element (2) comprising a right-angle shaped body (3) with a cavity (4) within which there slides a flexible control strip (5) for transmitting the movements imparted by operating control means to operating rods (6) of fastening and/or operating means (7) between a vertical frame member (1a) and a horizontal frame member (1b). The body (3) comprises: a portion defining two holes (8, 9) made in each wing of the body (3) for slidably housing respective sliders (10, 11) connecting the flexible strip (5) to the operating rods (6) and to a part of the fastening and/or operating means (7), respectively; a through slot (12) made in a wing of the body (3) and extending for a length that defines the working stroke of a respective slider (10, 11) connected to a part of the fastening and/or operating means (7) which are slidably engaged in the slot (12); and fixing means (13) for securing the body (3) to the corner defined by the vertical frame member (1a) and by the horizontal frame member (1b) which are joined by inserting and frontally positioning the body (3) itself in the channel (C).

FIG. 4



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Description

[0001] The present invention relates to a corner transmission element for doors and windows, in particular doors and windows with frames made of metal, wood or synthetic materials such as PVC.

[0002] At present, the technology relating to door and window hardware, that is to say, parts and accessories for the transmission and control systems for opening and closing the doors and windows, is divided into two different constructional philosophies: one for door and window frames made of metal, and the other for door and window frames made of wood and/or synthetic materials such as PVC.

[0003] At present, the difference in the production of these accessories (which usually comprise rods, contact and transmission elements controlled by operating units with handles) is due to the different door and window frame profile designs.

[0004] In the case of doors and windows with frames made of metal, the profile presents an open channel (usually defined by a pair of L- or T-shaped profiles protruding from the bottom of the body and facing each other. The channel acts as a guide and retains the rods which slide in it under the action of the operating unit to actuate the closing and contact elements (protruding from the channel and usually directly attached to or made as one with the rods) in such manner as to permit opening and closing of the door or window.

[0005] In the case of doors and windows with frames made of wood, synthetic material or aluminium and wood, the profile forming the vertical member of the frame is appropriately slotted (see Figure 1, which shows a prior art solution with a profile made of metal or synthetic material with a wooden covering, represented by the dashed line). The slots are open to the outside and used for fitting a profile P presenting a main chamber C delimited, at the sides, by two parallel wings A1 and, at the top, by two transversal ledges A2 or a narrow portion forming an upper supporting surface.

[0006] When the door or window is assembled, this profile is fitted with a preassembled kit comprising an operating unit consisting of a rack and pinion device (to which a handle is then connected) and some rods built into or connected to the operating unit itself. The rods are in turn slidably mounted in a longitudinal cover-like supporting element usually of predetermined length (greater than the length of the vertical member of the frame and adapted on assembly). This cover is positioned on the above mentioned upper supporting surface and screwed directly to the profile chamber.

[0007] Elements for closing and operating the frame (usually contact pins and bolts) are connected to or made as one with the rods and protrude from the cover, the latter having suitable openings or slots made in it to permit the movement of the operating and closing elements under the action of the rods). These differences in profile design have led to two different branches of manufacturing of accessories for different types of door and window frames. This in turn has resulted in the need for manufacturers and "sub-contractors/assemblers" to keep a large number of different items in stock, with all the costs that this involves.

[0008] This is contrary to general requirements in the current market of door and window frames, which calls for adaptability and fast fitting using appropriate tools which can also be used to automatically fasten the operating elements at predetermined positions, thereby eliminating the need to keep large numbers of different accessories in stock (as is already the case in the market of door and window frames made of metal).

[0009] Furthermore, there is increasing demand for nondedicated kits (that is to say, kits that can be used not only in metal profiles but also in profiles for frames made from other materials such as wood and aluminium, wood or synthetic material). This may be accomplished more easily by the use of simplified profile geometry that is the same for all types of door and window frames available on the market.

[0010] In an attempt to follow this philosophy and meet at least part of these demands, the Applicant designed and constructed an operating unit for doors and windows (see patent application BO2003A000312) applicable to a mobile frame having a U-shaped channel for positioning and fitting the operating unit and such that it can be made and used in both types of door and window frame profiles. This specification is intended only to give an example of the problems involved but without thereby being directly affected by the solution concerned.

[0011] Starting from this concept, the Applicant has conducted further research to produce a "universal" accessory, meaning by this an accessory that can be used in door and window frames of both the types stated above: especially accessories for tilt and turn door and window frames.

[0012] One of these is the corner transmission element (an example of which for metal door and window frames is disclosed in patent EP-736.658 to the same Applicant as the present), always fitted in tilt and turn doors and windows. This accessory is fitted to the top corner of the frame, on the side opposite the hinges, and often also to the other two corners (at the bottom on the side opposite the hinges and at the top on the same side as the hinge which is detached when the door or window is tilt opened). Usually, this accessory has an outer body in the shape of a right angle and an internal cavity with a control rod sliding in it. The control rod consists of a flexible steel strip that transmits the movements imparted by the handle to the vertical operating rods running along the outer vertical member of the mobile frame to vary the configuration of the accessories on the horizontal members.

[0013] The present invention therefore has for an aim to provide a corner transmission element whose structural characteristics are such that it can be fitted quickly

and easily to frames made of metal, wood, synthetic material, or wood and aluminium, and to whichever corner of the mobile frame is required.

[0014] In accordance with the invention, the above aim is achieved by a corner transmission element for doors or windows of the type comprising a fixed frame and a mobile frame that can be both turn opened and tilt opened; the transmission element comprising a right-angle shaped body with a cavity within which there slides a flexible control strip for transmitting the movements imparted by control means to operating rods of fastening and and/or operating means between a vertical frame member and a horizontal frame member; the body comprising: a portion defining two holes made in each wing of the body for slidably housing respective sliders connecting the flexible strip to the operating rods and to a part of the fastening and/or operating means, respectively; a through slot made in a wing of the body and extending for a length that defines the working stroke of a respective slider connected to a part of the fastening and/or operating means which are slidably engaged in the slot; and fixing means for securing the body to the corner defined by the vertical frame member and by the horizontal frame member which are joined by inserting and frontally positioning the body itself in the channel.

[0015] The technical characteristics of the invention, with reference to the above aims, are clearly described in the claims below and its advantages are apparent from the detailed description which follows, with reference to the accompanying drawings which illustrate a preferred embodiment of the invention provided merely by way of example without restricting the scope of the inventive concept, and in which:

- Figure 1 is a cross section of a door and window frame profile to which a corner transmission element according to the present invention can be applied;
- Figure 2 is a schematic front view of a tilt/turn window;
- Figure 3 illustrates a detail R from Figure 2, in a perspective view that is rotated with respect to Figure 2, and shows a corner transmission element according to the invention fitted to one of the hinge sides of the mobile frame;
- Figure 4 is an exploded perspective view of the corner transmission element according to the present invention;
- Figure 5 is a longitudinal section of the corner transmission element of Figure 4.

[0016] With reference to the accompanying drawings, in particular Figures 1 to 3, a corner transmission element is applied to doors and windows of the type comprising a fixed frame and a mobile frame that can be opened, for example, by both turning and tilting.

[0017] The details of the fixed frame and of the mobile frame 1 are well within the knowledge of those familiar with the trade and are illustrated and described herein only insofar as they are relevant to the element that forms the subject matter of this invention.

[0018] Similarly, the material of which the door or window frame is made does not form part of this invention and shall not restrict the scope of the solution disclosed herein, which may be applied to door and window frames made of metal, wood, wood and metal or synthetic material such as PVC.

[0019] The only element shared by all the door and window frames is the type of profile P constituting the "core" of the frame and illustrated by way of non-restricting example in Figure 1, where the profile P presents a sliding channel C defined by an open front and a bottom F.

[0020] More specifically, the profile P may comprise, for example, a channel or main chamber C delimited, at the sides by parallel wings A1 and, at the top, by two transversal ledges A2 protruding from the parallel wings A1, or a narrow portion, forming an upper supporting surface.

[0021] The transmission element 2 comprises (see Figures 2 to 5): a substantially right-angle shaped body 3 with a cavity 4 within which there slides a flexible control strip 5 constituting an element that transmits the movements imparted by control means (for example, a handle M schematically illustrated in Figure 1) to operating rods 6 of fastening and/or operating means 7 between a vertical frame member 1a and a horizontal frame member 1b.

[0022] The rods 6 (schematically illustrated by the dashed lines in Figures 4 and 5) can slide in the channel C of the profile P.

[0023] Looking in more detail at the body 3, the latter comprises at least the following:

- a portion defining at least two respective holes 8, 9 made in each wing of the body 3 for slidably housing respective sliders 10 and 11 connecting the flexible strip 5 to the operating rods 6 and to a part of the fastening and/or operating means 7, respectively;
- a through slot 12 made in a wing of the body 3 and extending for a length that defines the working stroke of a respective slider 10 and 11 connected to a part of the fastening and/or operating means 7 which are slidably engaged in the slot 12; and
- fixing means 13 acting on the body 3 and designed to secure the body 3 to the corner defined by the vertical frame member 1a and by the horizontal frame member 1b which are joined by inserting and frontally positioning the body 3 itself in the channel C.

[0024] The fastening and/or operating means 7 may come in various forms, as described in more detail below, and comprise additional rods A3 for tilt opening (see Figure 3) or fastening elements such as contact bolts or

pins.

[0025] The sliders 10 and 11 in each body 3 are identical, can slide in both directions, as indicated by the arrows F10 and F11, and each of them has, at the end of it, a hole 14 in which a pin 15 stably fits, the latter constituting a fastening element 7 and being slidable within the body 3 and in a respective through hole 16 from a first, idle position where the pin 15 is housed inside the body 3 (see Figure 5) and a second, fastened working position, where the pin 15 protrudes at least partly from the body 3 and is fastened in the fixed frame under the sliding action of the slider 10, 11 to which it is associated (see dashed line in Figure 5).

[0026] The above mentioned through hole 16 is made in only one of the wings of the body 3 and constitutes a partial extension of the respective hole 8, 9 that houses the respective slider 10, 11.

[0027] Each of the sliders 10, 11 comprises a first end having fastening means 17 for the above mentioned control strip 5 and the opposite end defined by a block 18 that is slidable in the channel C and is equipped with at least one protrusion 19 which can be coupled with a respective hole made in the operating rods 6 or in the fastening and/or operating means 7.

[0028] The middle section of each slider 10, 11 is defined by a wall 20 connecting the aforementioned ends and presenting a slot 21 for the passage of at least the means 13 that fix the body 3 to the mobile frame 1.

[0029] Looking in more detail, with reference to Figures 4 and 5, the ends of each slider 10, 11 with the control strip 5 fastening means 17 has a hole 22 for fastening at least one contact bolt 23 defining a part of the fastening and/or operating means 7 that slide within the slot 12 made in the wing of the body 3.

[0030] The fastening means 17 consist of a plurality of circular protuberances 17a protruding from the respective end to which a portion of the strip 5 is coupled to transmit the drive movement between the sliders and, hence, between the rods 6 and the fastening and/or operating means 7.

[0031] The end of each slider 10, 11 defined by the aforementioned block 18 has an enlarged portion 18a whose shape matches the profile of the body 3 so that the slider 10, 11 stops against the body 3 during the sliding movements that take place when the mobile frame 1 changes from one configuration to another.

[0032] The body 3 has a tubular profile divided into two straight sections corresponding to the wings and connected by an opening 4 (constituting the aforementioned cavity) within which the control strip 5 slides round the corner.

[0033] Looking in more detail, the outer profile of the tubular section of the body 3 comprises a first, upper portion 3a that is wider than a second, lower portion 3b, both these portions forming an undercut 3s by which the body 3 rests on the transversal ledges A2 (see dashed line in Figure 1) or on the aforementioned narrow portion.

[0034] In addition to this, the body 3 may have an outer protuberance 24 forming an extension of one of its wings to provide a security feature when the mobile frame 1 is in the tilt opened configuration, constituting an anti burglary system preventing the mobile frame from being lifted from the outside and, at the same time, an internal safety system preventing undesired lifting by a user from the inside.

[0035] The aforementioned fixing means may consist of screws 13 passing through the body 3 (which has appropriate holes made in the respective wings) and through a slot 21 made in each slider 10, 11 in such a way as to be fixed to locking means 25 (shown by the dashed line in Figure 1) in the bottom F of the channel C.

[0036] In a simplified, alternative embodiment, the screws 13 may be fixed directly to the bottom F of the channel C.

[0037] With a structure of this kind, the basic corner element, consisting of body 3 and sliders 10, 11, may be applied to only one corner as a minimum configuration fitted in all tilt/turn doors and windows, but it may also be applied to at least two corners 1c, 1d of the mobile frame 1, or to three corners 1c, 1d, 1e of the mobile frame 1, with suitable additions, such as the pin 16, according to the corner it is applied to, but without further modifications.

[0038] In practice, if the corners 1c, 1d are those on the side opposite the hinges CR of the frame 1, the pin 16 is added to enable the frame 1 to be automatically locked to the fixed frame in the closed configuration, whereas in the case of the upper corner 1e on the same side as the hinges CR, the pin 16 is not applied because it is not necessary.

[0039] Similarly, the contact and operating bolts 23 are applied according to the lock stops present on the fixed frame.

[0040] A corner transmission element made in this way achieves the preset aims thanks to its modular construction whose basic components are always the same and therefore applicable to whichever corner of the frame is necessary.

[0041] The structure of this element also makes it unnecessary to add any additional fastening or operating means on the outside since all that is required is built into the element itself, thus reducing the need for additional assembly operations.

[0042] This modularity permits a considerable reduction in the stock requirements of the manufacturers and frame assemblers since the kit is always the same, irrespective of the number of transmission elements to be fitted and the corners of the door or window frame they are to be fitted to.

[0043] It will be understood that the invention described may be useful in many industrial applications and may be modified and adapted in several ways without thereby departing from the scope of the inventive concept. Moreover, all the details of the invention may be substituted by technically equivalent elements.

Claims

1. A corner transmission element for doors or windows of the type comprising a fixed frame and a mobile frame (1) that can be both turn opened and tilt opened; the transmission element (2) comprising a right-angle shaped body (3) with a cavity (4) within which there slides a flexible control strip (5) for transmitting the movements imparted by operating control means to operating rods (6) of fastening and/or operating means (7) between a vertical frame member (1a) and a horizontal frame member (1b); the rods (6) being slidable in a profile (P) of the mobile frame (1) having a sliding channel (C) that is defined by a front opening and a bottom (F), the corner transmission element being **characterised in that** the body (3) comprises at least:

   - a portion defining at least two respective holes (8, 9) made in each wing of the body (3) for slidably housing respective sliders (10, 11) connecting the flexible strip (5) to the operating rods (6) and to a part of the fastening and/or operating means (7), respectively;
   - a through slot (12) made in a wing of the body (3) and extending for a length that defines the working stroke of a respective slider (10, 11) connected to a part of the fastening and/or operating means (7) which are slidably engaged in the slot (12); and
   - fixing means (13) acting on the body (3) and designed to secure the body (3) to the corner defined by the vertical frame member (1a) and by the horizontal frame member (1b) which are joined by inserting and frontally positioning the body (3) itself in the channel (C).

2. The transmission element according to claim 1, **characterised in that** each slider (10, 11) has, at the end of it, a hole (14) in which a pin (15) stably fits, the latter constituting a fastening element (7) and being slidable within the body 3 and in a respective through hole (16) from a first, idle position where the pin (15) is housed inside the body (3) and a second, fastened working position, where the pin (5) protrudes at least partly from the body (3) and is fastened in the fixed frame under the sliding action of the slider (10, 11) to which it is associated.

3. The transmission element according to claim 2, **characterised in that** the through slot (16) is made in only one of the wings of the body (3) and constitutes a partial extension of the respective hole (8, 9) that houses the respective slider (10, 11) .

4. The transmission element according to claim 1, **characterised in that** each slider (10, 11) comprises a first end having fastening means (17) for the above mentioned control strip (5) and the opposite end defined by a block (18) that is slidable in the channel (C) and is equipped with at least one protrusion (19) which can be coupled with a respective hole made in the operating rods (6) or in the fastening and/or operating means (7).

5. The transmission element according to claim 4, **characterised in that** each slider (10, 11) comprises a middle section defined by a wall (20) connecting said ends and presenting a slot (21) for the passage of at least the means (13) for fixing the body (3).

6. The transmission element according to claim 4, **characterised in that** the end of each slider (10, 11) with the fastening means (17) for the control strip (5) has a hole (22) for fastening at least one contact bolt (23) defining a part of the fastening and/or operating means (7) that slide within the slot (12) made in the wing of the body (3).

7. The transmission element according to claim 1, **characterised in that** the body (3) has a tubular profile divided into two straight sections corresponding to the wings and connected by an opening (4) within which the control strip (5) slides round the corner.

8. The transmission element according to claim 1, **characterised in that** the body (3) an outer protuberance (24) forming an extension of one of its wings to provide a security feature for the mobile frame (1) when the mobile frame (1) is in the tilt opened configuration.

9. The transmission element according to claim 4, **characterised in that** the fastening means (17) located on the end of each slider (10, 11) consist of a plurality of circular protuberances (17a) protruding from the respective end.

10. The transmission element according to claim 4, **characterised in that** the end of each slider (10, 11) defined by the block (18) has an enlarged portion (18a) whose shape matches the profile of the body (3) so that the slider (10, 11) stops against the body (3).

11. The transmission element according to claim 1, **characterised in that** the fixing means consist of screws (13) passing through the body (3) and through a slot (21) made in each slider (10, 11) in such a way as to be fixed to locking means (25) in the bottom (F) of the channel (C).

12. The transmission element according to claim 1, **characterised in that** the fixing means consist of

screws (13) passing through the body (3) and through a slot (21) made in each slider (10, 11) in such a way as to be fixed to the bottom (F) of the channel (C).

13. The transmission element according to claim 1, **characterised in that** at least the body (3) and the sliders (10, 11) are applied to at least two corners (1c, 1d) of the mobile frame (1).

14. The transmission element according to claim 1, **characterised in that** the body (3) and the sliders (10, 11) are applied to three corners (1c, 1d, 1e) of the mobile frame (1).

15. The transmission element according to claim 1, where the channel or main chamber (C) of the profile (P) is delimited, at the sides by parallel wings (A1) and, at the top, by two transversal ledges (A2) or a narrow portion protruding from the parallel wings (A1) to form an upper supporting surface, the transmission element being **characterised in that** the outer profile of the body (3) comprises a first, upper portion (3a) that is wider than a second, lower portion (3b), both these portions forming an undercut (3s) by which the body (3) rests on the transversal ledges (A2) or on the narrow portion.

FIG. 2

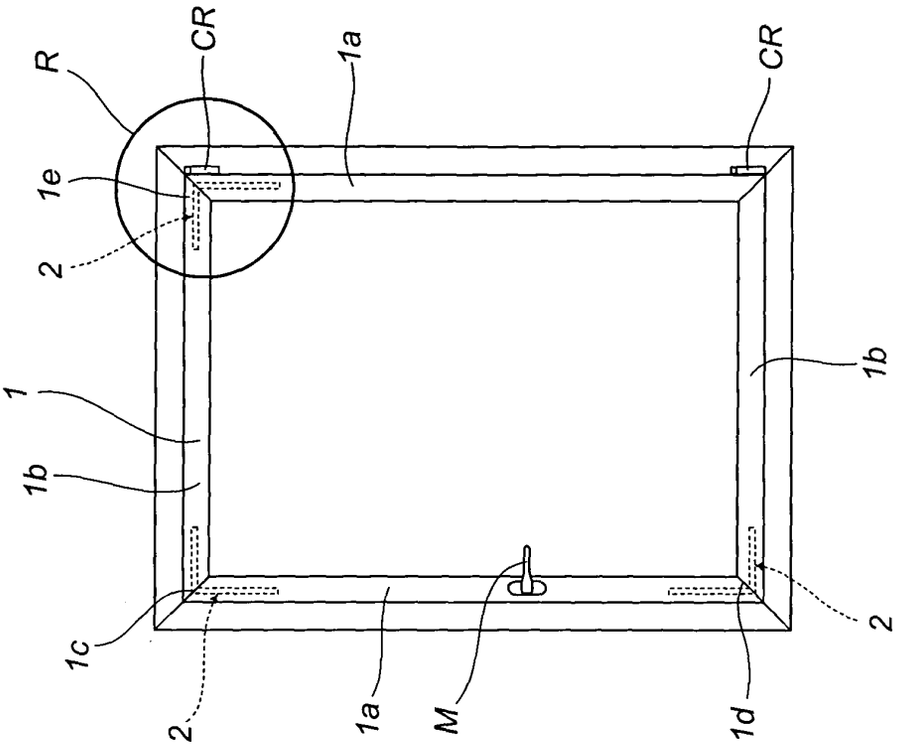

FIG. 1

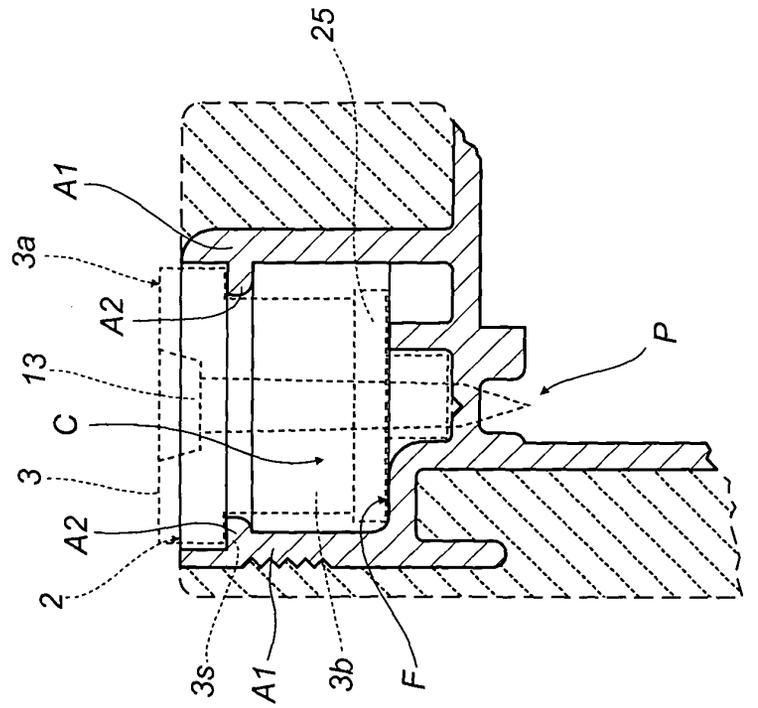

FIG. 3

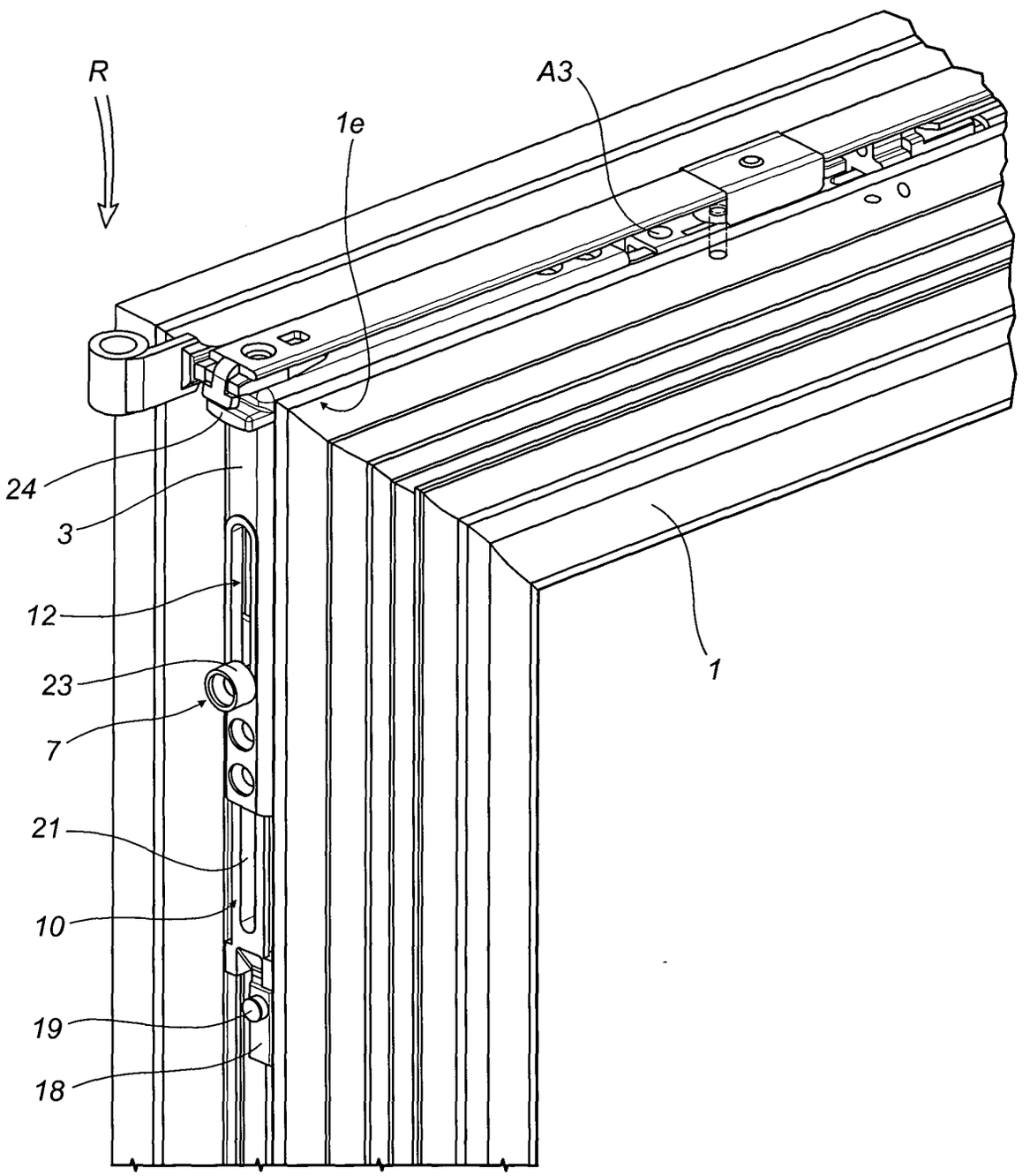

FIG. 4

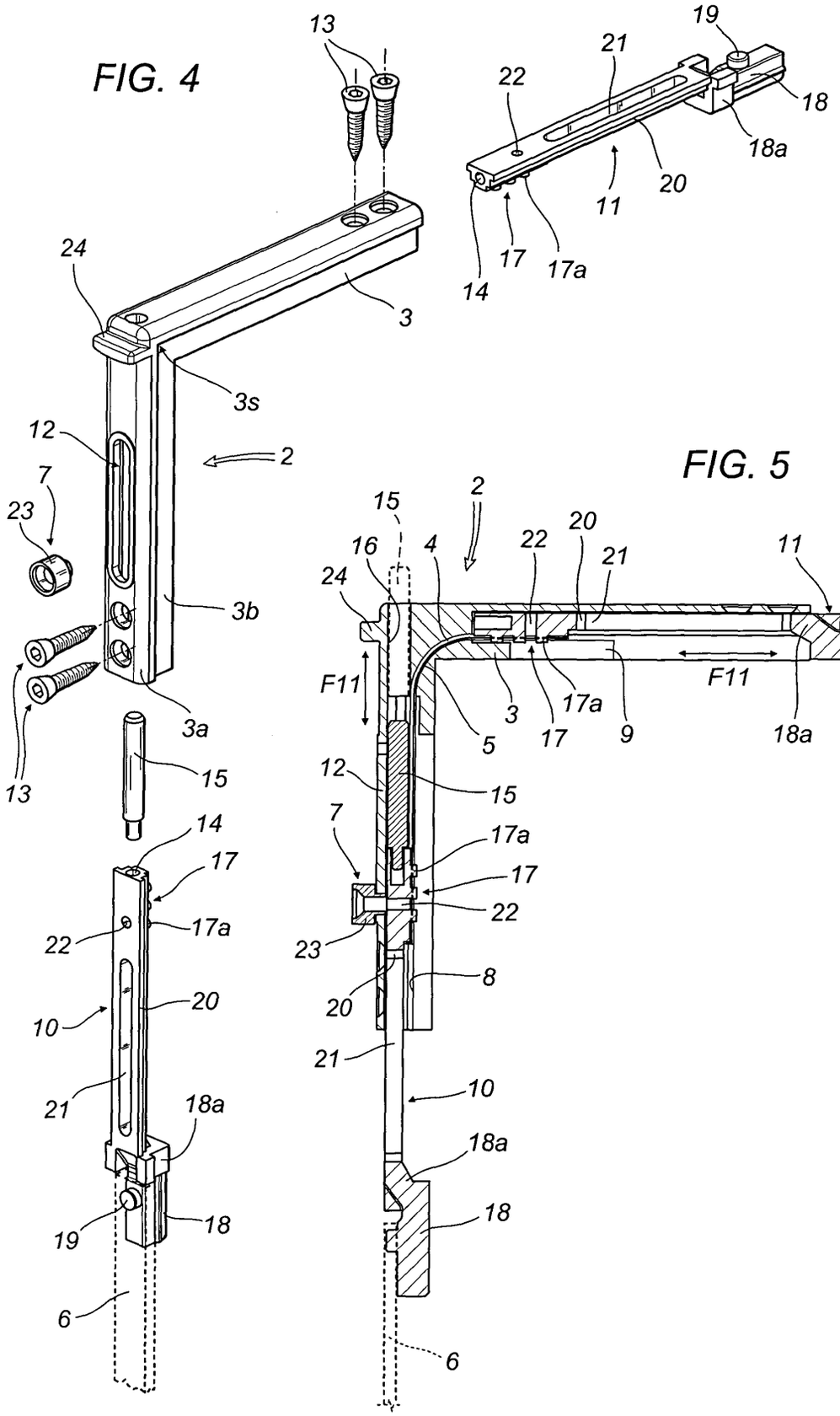
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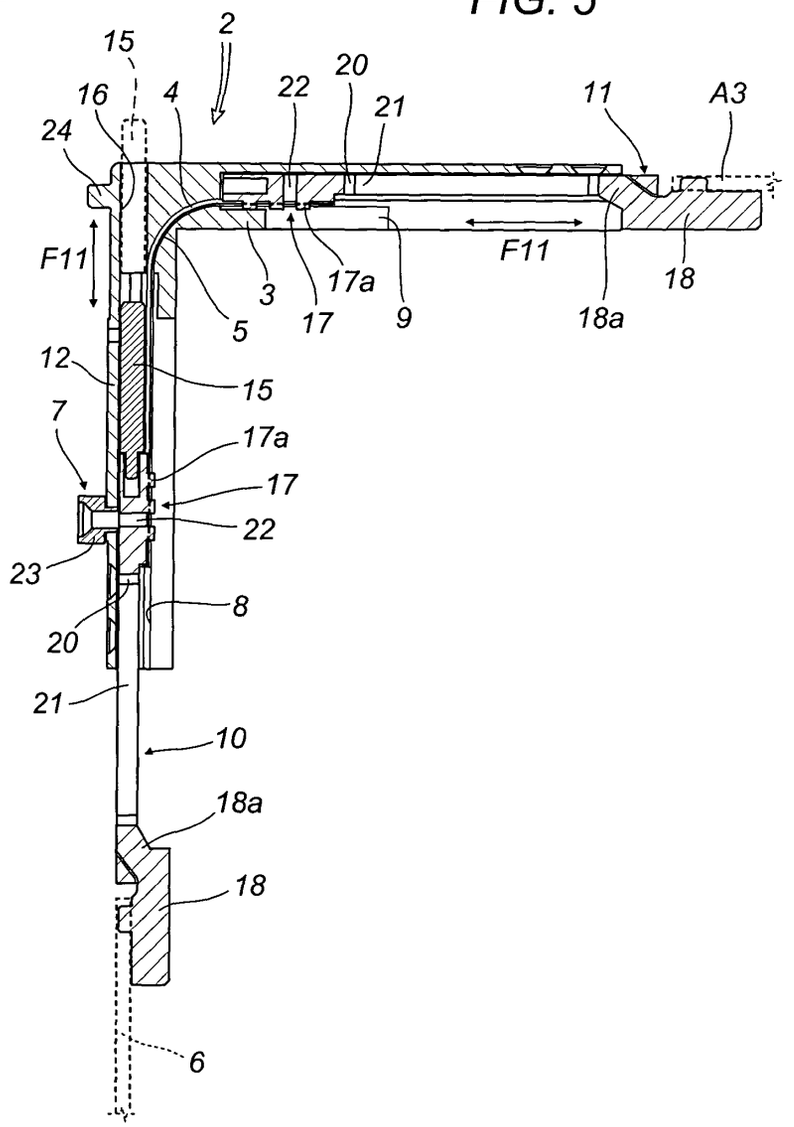
FIG. 5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EUROPEAN SEARCH REPORT

Application Number
EP 04 42 5866

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	25 February 2005	Pieracci, A

CATEGORY OF CITED DOCUMENTS

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