(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 469 000 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
27.06.2012 Bulletin 2012/26

(51) Int Cl.:
E05F 11/00 *(2006.01)* ***E05F 11/16*** *(2006.01)*

(21) Application number: **11194446.8**

(22) Date of filing: **20.12.2011**

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

(30) Priority: **23.12.2010 IT MI20102392**

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(54) Device for manually moving shutters, swing doors and the like

(57) The invention refers to a device (100) for moving a shutter (200) of windows and the like, which comprises:
- a main body (10) for actuating the movement;
- a rigid control bar (30) and a controlled bar (31) constrained together at an articulation point (32). The control bar (30) comprises an end (33) opposite the articulation point (32) rotatably constrained to said main body (10). The controlled bar (31) comprises a respective end (34) opposite the articulation point (32) constrained to a portion (35) fixedly connected to the shutter (200).

The device also comprises manual actuation means (40) associated with the main body (10) to make the control bar (30) rotate from a first stationary position in which the shutter takes up the closed position to a second stationary position in which the shutter takes up the open position, and vice-versa.

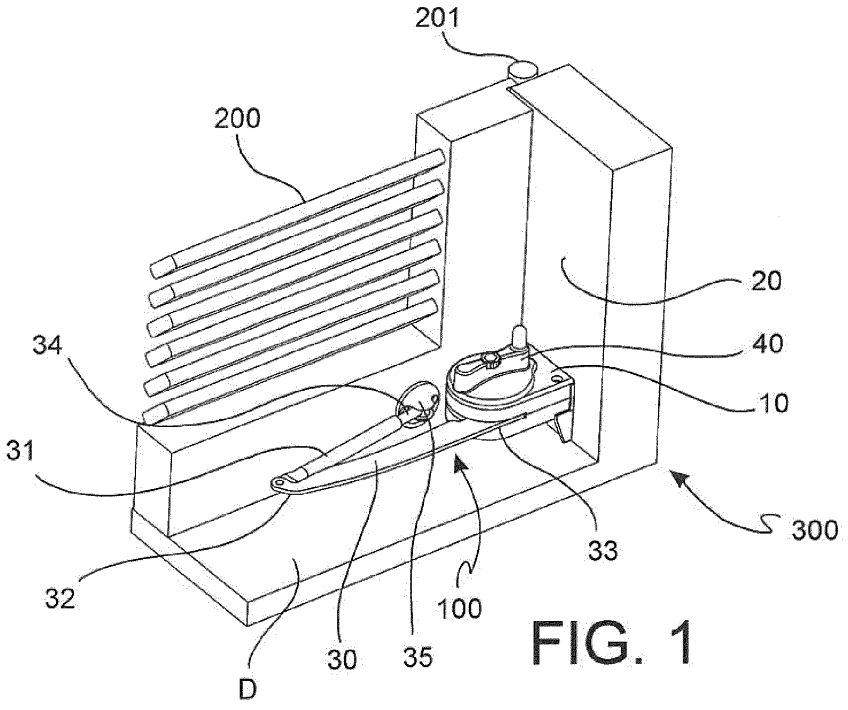

FIG. 1

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Description

[0001] The present invention refers to a manually-actuated device for moving outer shutters for windows, swing doors and the like. In general, the invention refers to doors hinged to a support structure around a vertical axis so as to be able to rotate between an open position and a closed position.

[0002] As known, the manoeuvring of blinds and shutters between the open and closed positions, in particular from inside a window or similar, is awkward, tiring and even dangerous. Indeed, for example in order to carry out the closing manoeuvre starting from the completely open position, it is necessary to stretch out one's arm until an area of the shutter away from the relative hinge is reached, so as to be able to have a sufficient lever arm, and then pull it towards the inside of the window. In order to do this it is necessary to lean to a greater or lesser extent from the window-sill with the risk of losing balance outwards. In any case, the effort required for rotating to close is substantial, in particular for large or bulky shutters. Therefore, such an operation can be rather difficult for a young or old person.

[0003] In order to avoid such drawbacks, manoeuvring systems have already been proposed that do not require the blind or shutter to be directly gripped, and use transmission linkages that can be actuated manually. These systems are generally very complicated, and therefore expensive, as well as difficult to mount.

[0004] The purpose of the present invention is to devise and provide a manually-actuated device for moving shutters that makes it possible to at least partially avoid the aforementioned drawbacks and that is particularly simple, functional and cost-effective.

[0005] Such a purpose is accomplished through a device for moving a mobile element, for example a shutter or swing door, constrained to rotate with respect to a fixed element, which is actuated manually in accordance with claim 1.

[0006] Alternative embodiments of such a moving device are described in claims 2-11.

[0007] Another object of the present invention is a system for moving a shutter as defined by claim 12.

[0008] Further characteristics and advantages of the moving device of the invention will become clear from the following description of preferred example embodiments, given for indicating and not limiting purposes, with reference to the attached figures, in which:

- figure 1 schematically illustrates a perspective view of a device for moving a shutter according to the invention constrained to a shutter in closed position;
- figure 2 schematically illustrates a perspective view of the moving device of figure 1 constrained to the shutter in open position;
- figure 3 illustrates an exploded view of the manually-actuated device for moving shutters of the invention;
- figure 4 illustrates an enlarged section view of a main body of the moving device of figures 1-2.

[0009] With reference to the aforementioned figures 1-2 reference numeral 100 indicates a manually-actuated device for moving a mobile element 200, for example a shutter, according to the invention as a whole. In the rest of the description the term shutters is used to indicate, irrespectively, blinds, screens and swing doors in general.

[0010] With reference to the example embodiment of figures 1-2, reference numeral 300 indicates part of a window opening formed by a masonry structure comprising a window-sill D and a fixed support structure 20. The shutter 200, in the example a blind, is hinged to the outside of the masonry structure, in particular to the support structure 20, around a vertical axis.

[0011] It should be observed that although the example illustrated in figures 1-2 refers to the case of a window with a single blind, the invention is equally advantageously applicable to windows provided with two blinds or shutters able to swing closed and, more generally, to any opening provided with one or more wings that can be manoeuvred from the inside.

[0012] In greater detail, the blind 200 of figures 1-2 is articulated through respective hinges 201 (just one hinge is visible in the figures) to the support structure 20 so as to be able to rotate between a completely closed position, illustrated in figure 1, and a completely open position illustrated in figure 2, and vice-versa. It should be observed that the blind 200 can take up any intermediate arrangement between the aforementioned closed and open positions.

[0013] In order to control the rotation of the blind 200 from inside the window without needing to directly grip the blind itself, the invention foresees the use of the moving device 100.

[0014] In particular, such a moving device 100 comprises a main body 10 for actuating the movement irremovably fixed to the support structure 20 of the window. In reference to figures 1 and 3, such a main body 10 is substantially box-shaped and comprises a first 11 and a second 12 half-shell connected together to define a housing 13 of linkages of the device 100. Such first 11 and second 12 half-shells are, for example, manufactured from Zamak alloy or from plastic and are connected together through fastening screws (not shown in the figures).

[0015] The device 100 also comprises a bracket 14 for fixing the main body 10 to the support structure 20 of the window, for example through attachment screws (not shown in the figures). In particular, such a bracket 14 comprises a plate-shaped portion 14a provided with attachment holes 16 suitable for being engaged by the aforementioned attachment screws. Moreover, the bracket 14 comprises a portion 14b projecting perpendicularly from such a plate-shaped portion 14a and integral with it. Such a projecting portion comprises, in particular, pins 15 the protrude in a direction substantially

parallel to the plate-shaped portion 14a suitable for being engaged by a respective fastening portion of the second half-shell 12 to reversibly fasten the main body 10 to the bracket 14 when the latter is fixed to the support structure 20. In greater detail, such pins 15 are configured to receive the fastening screws of the half-shells 11, 12 mentioned above.

[0016] Moreover, the device 100 comprises a rigid control bar 30 and a controlled bar 31 constrained together at an articulation point 32.

[0017] A first end 33 of the control bar 30 opposite a second end corresponding to the articulation point 32 is rotatably constrained to the main element 10. In particular, such a control bar 30 is shaped like a tapered ledge at the second end 32 and at the first end 33 comprises a substantially circular widened portion 36. Such a widened portion 36 comprises a through hole 37 suitable for being engaged by a first shaft 50 of the rotation mechanism of the control bar 30 as will become clearer hereafter.

[0018] Moreover, the device 100 comprises a substantially cylinder-shaped controlled bar 31 suitable for cooperating with the control bar 30 for manoeuvring the blind 200.

[0019] A respective first end 34 of the controlled bar 31 opposite a second end corresponding to the articulation point 32, comprises means for rotatably constraining such a first end 34 to a portion of the blind 200. In particular, such means comprise a cylindrical pin 34a rotatably housed in a seat 38 of an articulation element 35 fixed to the blind 200, for example through two screws.

[0020] It should be observed that, advantageously, the controlled bar 31 has a structure with adjustable length including, for example, a first portion 31 a of bar and a second portion 31 b coupled together in a telescopic manner. In greater detail, a preloaded spring (not shown) is housed inside the aforementioned first portion 31a of the controlled bar 31. During an opening step of the blind 200, such a spring is suitable for elastically thrusting the second portion 31 b to take the respective first end 34 of the aforementioned controlled bar 31 away from the first portion 31 a so as to increase the overall length of the controlled bar 31 and ensure that the blind 200 opens completely, i.e. the rotation thereof is about 180°. Vice-versa, during the closing step, such a spring is compressed in response to the telescopic movement of the second portion 31 b with respect to the first portion 31 a to bring the respective first end 34 close to the first portion 31 a reducing the length of the controlled bar 31. Advantageously, the controlled bar 31 provided with a spring makes it possible to compensate for possible differences in rotation angle existing between different types of blinds due, for example, to different thicknesses of the blinds, to the position of the hinges and of the rotation points. Therefore, the device 100 of the invention is adaptable to different types of blinds. Moreover, the spring acts as a bearing to absorb possible stresses on the gears caused, for example, by the action of the wind on the blind 200.

[0021] In reference to figures 1-4, the moving device 100 of the invention comprises manual actuation means 40 of the linkages included in the main body 10 to make the control bar 30 rotate from a first stationary position, in which the blind 200 is in closed configuration, to a second stationary position in which the blind 200 takes up an open configuration, and vice-versa.

[0022] It should be observed that the control bar 30 is able to rotate along an arc of circumference corresponding to a rotation angle of maximum size of about 120°. The device of the invention 100 in any case ensures that the blind 200 rotates by about 180°.

[0023] Such manual actuation means comprise a crank 40 able to rotate axially around a main rotation axis S of the device 100 to impart the rotary motion on the aforementioned first shaft 50 of the mechanism. Such a crank 40 comprises a projecting grip portion 41 to make it easier to actuate it manually.

[0024] In reference to figures 3 and 4, the crank 40 comprises a portion of central core 42 provided with an end 42a facing towards the first half-shell 11 and configured to rotatably engage a respective seat 50' of the first shaft 50. In particular, in reference to figure 4, the rotary motion imparted manually on the crank 40 is transmitted directly to the first shaft 50.

[0025] The aforementioned first shaft 50 comprises a first driving sprocket 51 integral with the first shaft itself and configured to transmit the rotary motion imparted by the crank 40 to a first crown 52. The first driving sprocket 51 and the first crown 52 form a first stage of a speed reducer associated with the moving device 100.

[0026] Such a first crown 52 rotates as a unit with a second shaft 70 suitable for rotating around a secondary axis S1 of the device 100 parallel to the main axis S. Such a second shaft 70, set in rotation by the aforementioned first crown 52, comprises a respective second driving sprocket 71 integral with the second shaft, similar to the first driving sprocket 51 and suitable for transmitting the rotary motion to a second crown 72 having its rotation axis coinciding with the main axis S. The second driving sprocket 71 and the second crown 72 form a second stage of the speed reducer of the device 100.

[0027] It should be observed that that second crown 72 comprises a respective through hole 73 that, although being engaged by the first shaft 50, is configured and sized to keep the second crown 72 unconstrained from the latter. In other words, the rotation of the first shaft 50 imparted by acting manually on the crank 40 does not also pull along the aforementioned second crown 72 that is, instead, only actuated by the rotary movement of the second driving sprocket 71. Such a second crown 72 is constrained to the control bar 30 to transfer the rotary motion imparted by the crank 40 onto it, in a suitably reduced way.

[0028] In reference to figures 3 and 4, it should be observed that the crank 40 and the first shaft 50 are constrained together and to the half-shells 11, 12 of the main

body 10 through a threaded assembly screw 60 inserted perpendicularly in the main body 10 so as to engage through holes 11a, 12a formed in the half-shells 11, 12. Such a screw 60 comprises a head portion 61 and an opposite riveted portion 62.

[0029] The aforementioned screw 60 can be screwed in to partially translate along the main axis S between an extracted position in which the riveted portion 62 is in abutment with a projecting ridge 12' of the second half-shell 12 and a lowered position in which such a riveted portion 62 is spaced from the projecting ridge 12' as shown in figure 4. From the aforementioned lowered position, the screw 60 can be unscrewed to translate up to the extracted position.

[0030] It should be observed that the moving device 100 of the invention comprises means 90 for blocking the rotation of the control bar 30. Such blocking means comprise a substantially frusto-conical shaped brake element 90 arranged between a bottom portion of the crank 40 and an outer wall 19 of the first half-shell 11 of the main body 10. Such a brake element 90 is, for example, manufactured from rubber or plastic and, in reference to figure 4, comprises an annular undercut 92. Moreover, the brake element 90 comprises a through opening 91 suitable for being engaged by the central core 42 of the crank 40.

[0031] Such a brake element is activated/deactivated through an annular knob 80 able to be screwed in/unscrewed arranged on the top of the crank 40 at the head portion 61 of the assembly screw 60. In particular, the annular knob 80 wraps around the aforementioned head portion 61.

[0032] Operatively, through screwing of the annular knob 80, the screw 60 is taken from the extracted position to the lowered position. In this way, the central core 42 of the crank 40 is thrusted into abutment on an upper portion 90' of the brake element 90 compressing the latter against the outer wall 19 of the first half-shell 11. After the pressure has been exerted, the brake element 90 deforms preventing any further rotation of the crank 40 by friction, therefore blocking it.

[0033] In this way, it is possible to obtain the function of fixed positioning of the blind or shutter 200 in the completely open position or in the completely closed position, as well as in any intermediate position in a stable and safe manner, avoiding having to use further retaining mechanisms, such as blocks or hooks inserted in the walls.

[0034] The operation of the moving device 100 can be described in reference to figures 1-2.

[0035] From the completely closed position of the blind 200 of figure 1, by rotating the crank 40 in the clockwise direction there is the rotation in the clockwise direction of the control bar 30 around the main axis S, i.e. the opening rotation of the blind 200. In an initial step of the rotation of the control bar 30, for example by angles of rotation of the blind 200 of between about 0° and 90°, the controlled bar 31 operates essentially to thrust the blind 200 open accompanying the movement of the control bar 30. Thereafter, for rotation angles of between about 90° and 180°, the controlled bar 31 operates as an end stop element to complete the opening of the blind 200 as shown in figure 2. It should be observed that in this position the angle measured towards the outside formed by the control bar 30 and by the controlled bar 31 is obtuse.

[0036] Similarly, from the completely open position of the blind 200 of figure 2, by rotating the crank 40 in the anti-clockwise direction there is a counter-rotation of the control bar 30 around the main axis S and, therefore, the closing rotation of the blind 200. In an initial step of such a counter-rotation, from about 180° to about 90°, the controlled bar 31 operates essentially to pull the blind 200 pulled by the control bar 30. For smaller rotation angles, from about 90° to about 0°, the controlled bar 31 operates as an end stop element to complete the closing of the blind 200 as shown in figure 1.

[0037] Advantageously, the device 100 for moving shutters of the invention makes it possible to open and close blinds or swing doors in general just by manually rotating the crank 40, with a minimal physical effort and without any need to lean out from the window.

[0038] Moreover, with respect to currently known devices, the device 100 of the invention is small in size and is simple to mount, adapting to different types of blinds already being used without requiring adjustments.

[0039] A man skilled in the art can bring modifications, adaptations and replacements of elements with other functionally equivalent ones to the embodiments of the device for moving shutters described above, in order to satisfy contingent requirements, without departing from the scope of the following claims. Each of the characteristics described as belonging to a possible embodiment can be made independently from the other described embodiments.

Claims

1. Moving device (100) of a movable element (200) constrained to rotate with respect to a fixed element (20) between an opening position and a closing position,
characterised in that it comprises:

- a main body (10) for actuating the movement irremovably fixed to said fixed element (20);
- a rigid control bar (30) and a controlled bar (31) constrained to each other in an articulation point (32), said control bar (30) comprising an end (33) opposite the articulation point (32) rotatably constrained to said main body (10), said controlled bar (31) comprising a respective end (34) opposite the articulation point (32) suitable for being constrained to a portion (35) fixedly connected to the mobile element (200);

- manual actuation means (40) of the device associated with the main body (10) to rotate said control bar (30) from a first stationary position in which the movable element (200) takes up the closing position to a second stationary position in which the movable element takes up the opening position, and vice-versa.

2. Device (100) according to claim 1, also comprising means (34a) for rotary constraining said respective end (34) of the controlled bar (31) to an articulation element (35) fixed to said movable element (200).

3. Device (100) according to claim 2, wherein said rotary constraining means (34a) comprise a cylindrical pin (34a) housed in a seat (38) of the articulation element (35).

4. Device (100) according to claim 1, wherein said controlled bar (31) has a structure with adjustable length, including a first (31a) and a second (31b) bar portion coupled together in a telescopic manner.

5. Device (100) according to claim 4, wherein said first portion (31a) of the controlled bar comprises, on the inside, a spring suitable for acting elastically on said second portion of bar (31 b).

6. Device (100) according to claim 1, wherein said manual actuation means comprise a crank (40) able to rotate about a main rotation axis (S) of the device to impart the rotary motion to the control bar (30).

7. Device (100) according to claim 6, also comprising means (90) for blocking the rotation of the control bar (30) that comprise a brake element (90) arranged between a bottom portion of the crank (40) and an outer wall (19) of the main body (10).

8. Device (100) according to claim 7, wherein said brake element (90) is frusto-conical shaped and comprises a through opening (91) suitable for being engaged by a central core (42) of the crank (40).

9. Device (100) according to claim 8, wherein said brake element (90) is activated/deactivated by an annular knob (80) able to be screwed in/unscrewed to thrust the central core (42) of the crank (40) into abutment on an upper portion (90') of the brake element (90) compressing it against the outer wall (19) of the main body (10).

10. Device (100) according to claim 9, wherein said annular knob (80) is arranged on the top of the crank (40) to engage a head portion (61) of an assembly screw (60) inserted perpendicularly in the main body (10).

11. Device (100) according to claim 10, wherein, through screwing of said knob (80), the screw (60) is suitable for translating partially along the main axis (S) between an extracted position and a lowered position, and by unscrewing the knob (80) the screw (60) is suitable for translating between the lowered position and the extracted position.

12. System for moving a shutter (200) of windows and the like, comprising:

- a support structure (20) to which the shutter is hinged about a vertical axis to rotate between an opening position and a closing position, and vice-versa;
- a manually-actuated moving device (100) according to claim 1, comprising:

  - a main body (10) irremovably fixed to said support structure (20),
  - a rigid control bar (30) constrained to a controlled bar (31) at an articulation point (32) and rotatably constrained to the main body (10) at an end (33) opposite the articulation point (32),
  - a respective end (34) of the controlled bar (31) opposite the articulation point (32) constrained to a portion (35) fixedly connected to the shutter (200).

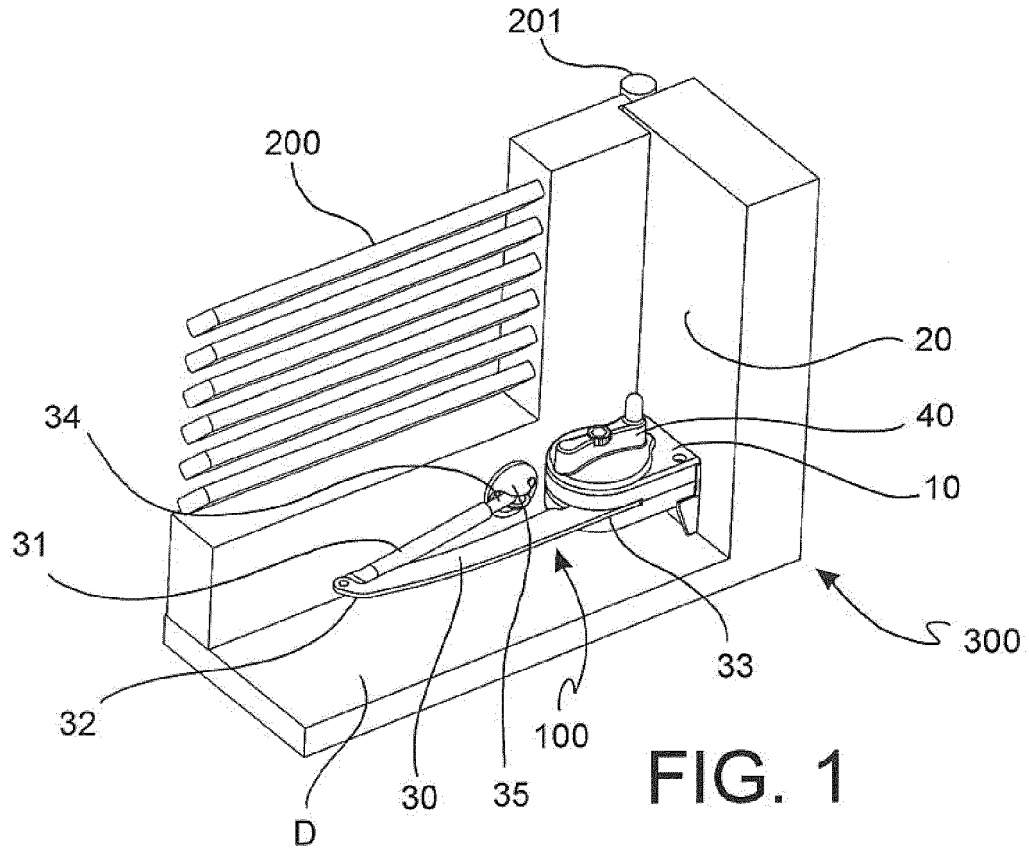
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FIG. 1

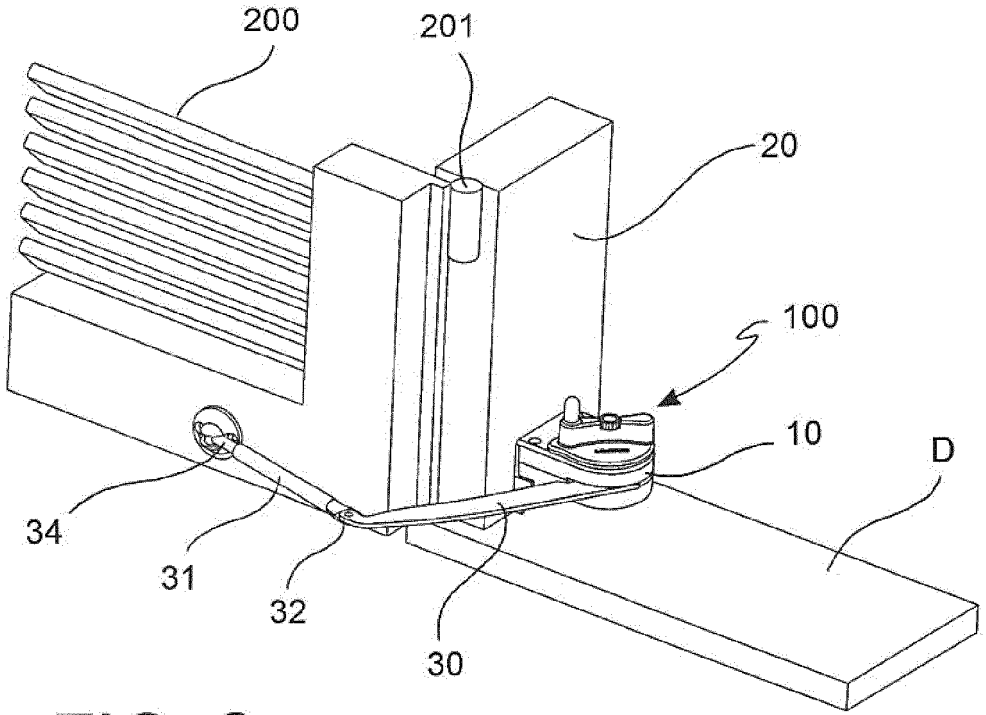
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FIG. 2

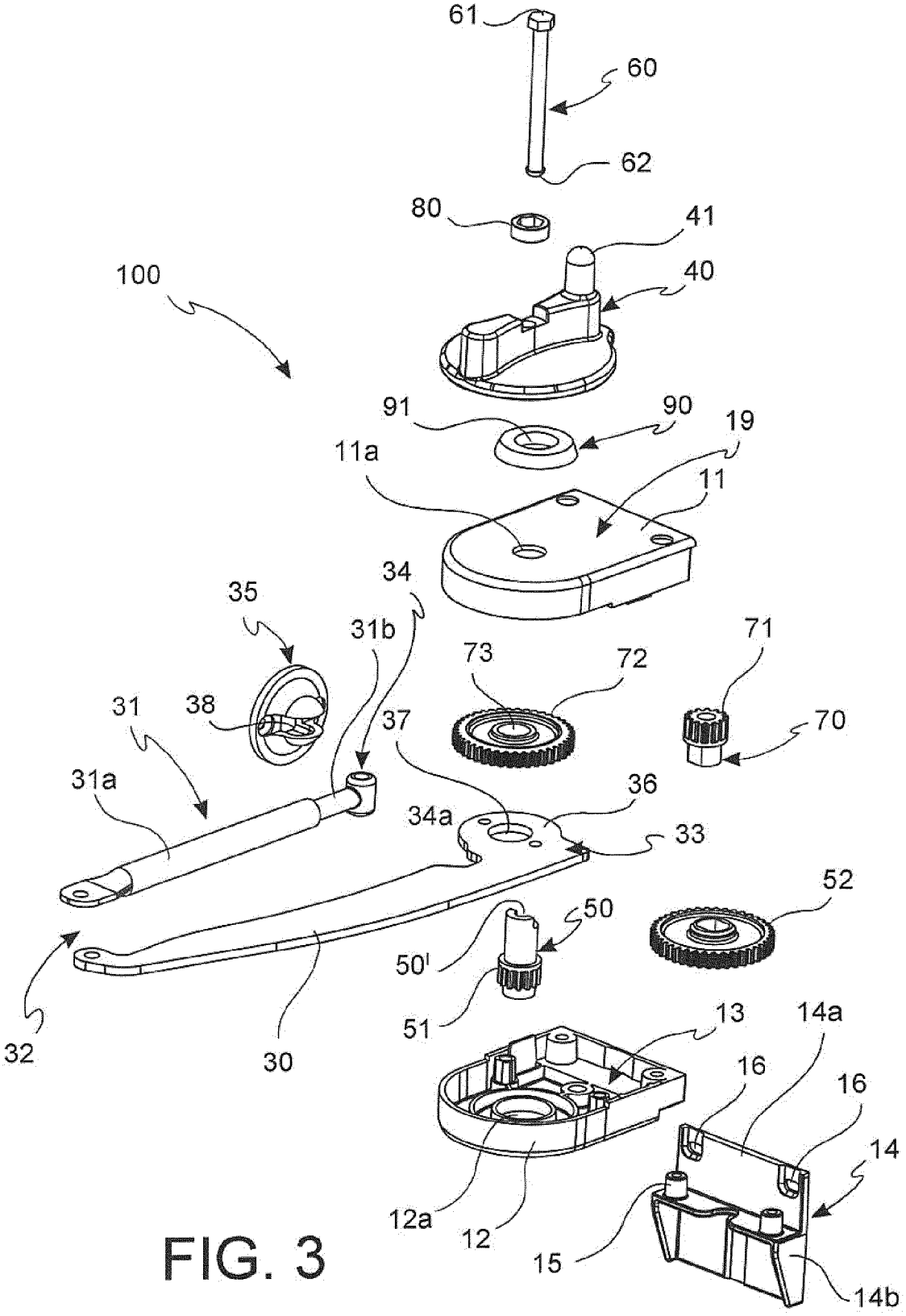
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FIG. 3

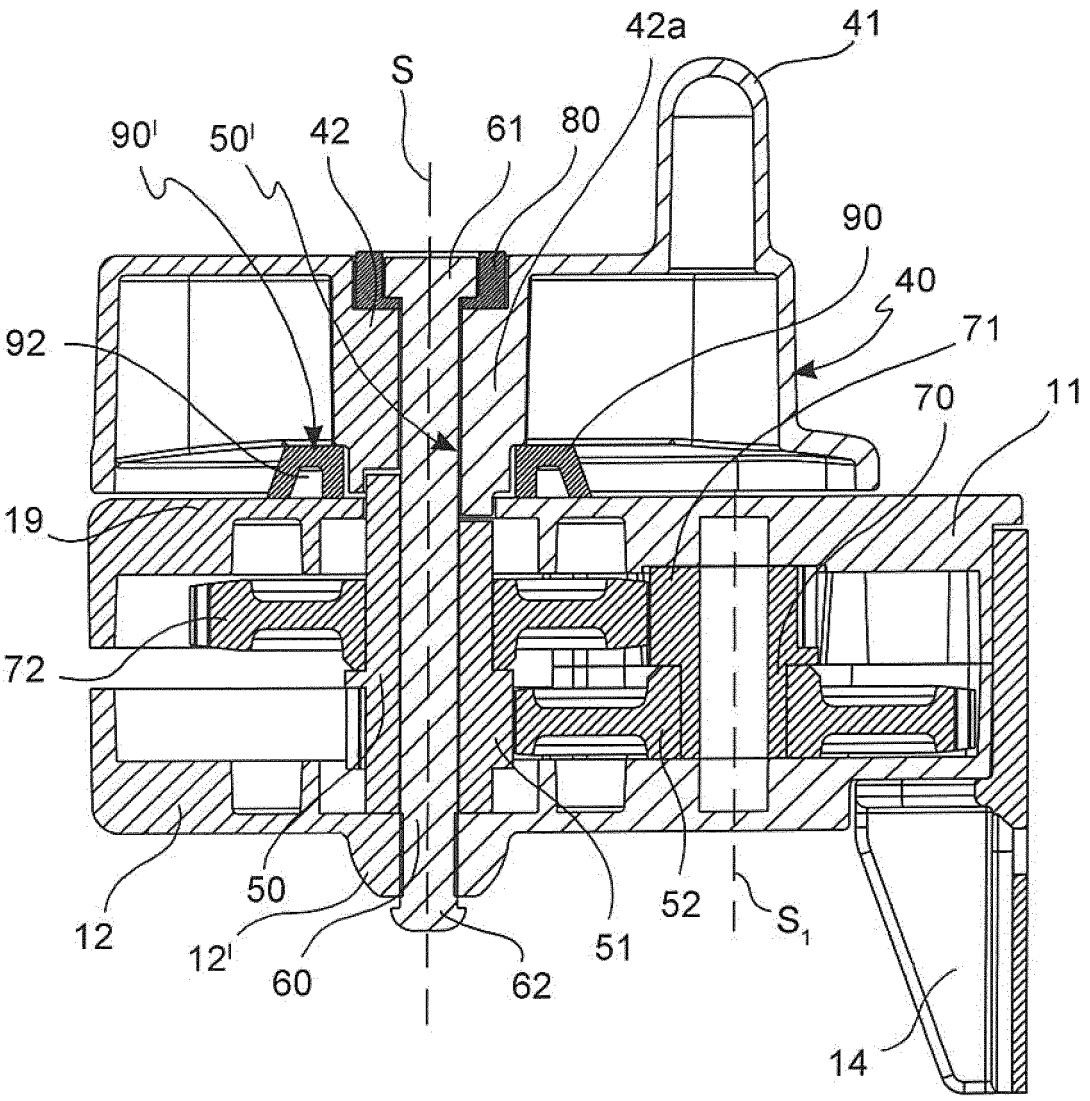
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FIG. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 11 19 4446

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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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
The Hague	24 February 2012	Mund, André

CATEGORY OF CITED DOCUMENTS

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24-02-2012

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