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# (54) ROD HANDLE FOR FIXTURES

(57) Rod handle for fixtures, comprising: - a fixing base (2) that is intended to be rigidly fixed to a fixture and extends in plan in a longitudinal direction (X-X) and in a transverse direction (Y-Y), which is orthogonal to said longitudinal direction (X-X); - a cogwheel (10), which is rotationally connected to the fixing base (2) such that its axis of rotation (Z1-Z1) is orthogonal to said base; - at least one first operating rod (11), a toothed portion (11a) of which meshes with said cogwheel (10) so as to form a rack-pinion system together with said cogwheel, and is movable in a translational manner with respect to said fixing base (2) in parallel with said longitudinal direction (X-X) following rotational movements of the cogwheel (10), said first operating rod (11) being intended to be connected to a fixture closing system in order to operate it by means of its translational movements; and - a gripping handle (20), which is rotationally movable with respect to said fixing base (2) between a first and a second angular position and is kinematically connected to said cogwheel (10) to drag said wheel in rotation as it passes between said two angular positions. Said cogwheel (10) and said first operating rod (11) have overall transverse plan dimensions not exceeding the transverse extension of the fixing base (2). Said gripping handle (20) is kinematically connected to said cogwheel (10) by a bevel gear transmission system (31, 32), wherein: - the driving bevel wheel (31) of said bevel gear is integrally fixed to said gripping handle (20) for conjoint rotation in order to be rotated by the rotational movements of said gripping handle between said first and second angular positions; and - the driven bevel wheel (32) of said bevel gear is integrally fixed to said cogwheel (10) for conjoint rotation. The driving bevel wheel (31) and the associated gripping handle (20) are rotationally supported by a containment structure (40) that is fixed to said fixing base (2). Said bevel gear transmission system (31, 32) has a transmission ratio lower than 1.

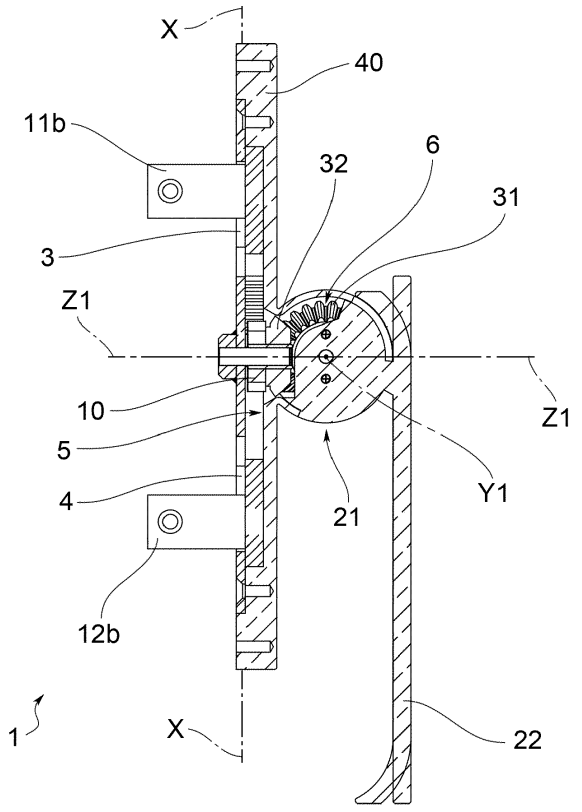


FIG.9

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## Description

FIELD OF APPLICATION

**[0001]** The present invention relates to a rod handle for fixtures, in particular for windows.

STATE OF THE ART

**[0002]** As is known, a rod handle is a device attached to a fixture in order to operate movement rods of a closing system of the fixture. The movement rods can be arranged on the outside of the structure of the fixture or can be housed inside said structure.

**[0003]** In general, a rod handle comprises:

- a fixing base, which is intended to be rigidly fixed to the fixture structure;
- a gripping handle that is rotationally associated with the fixing base; and
- a mechanism that kinematically connects the gripping handle to the movement rods in order to convert a rotational movement of the gripping handle into a translational movement of these rods.

**[0004]** More specifically, the kinematic connection mechanism between the gripping handle and movement rods comprises:

- a cogwheel, in which the axis of rotation is orthogonal to the fixing base of the handle; and
- a pair of operating rods, which mesh with the cogwheel in opposite positions in respective toothed portions and are intended to be connected to the above-mentioned movement rods.

**[0005]** The cogwheel and the two operating rods form a rack-pinion system. A rotational movement of the cogwheel requires the two rods to move in parallel with the fixing base and with one another, in opposite directions.

**[0006]** In turn, the cogwheel is rotationally integral to the gripping handle by means of a prismatic axial coupling. In terms of operation, a rotational movement of the gripping handle corresponds to a rotational movement of the cogwheel of the same angular width and therefore to a predefined translational movement stroke of the two operating rods.

**[0007]** In order to ensure stable meshing between the cogwheel and operating rods and, at the same time, impose the required stroke on the two rods by means of a rotational movement of the gripping handle having an angular width that is operatively permissible for manual operation (between 90° and 180°), the cogwheel has to have a minimum nominal diameter. This imposes minimal dimensions in the transverse direction on the fixing base of the handle so as to be able to house the cogwheel and the two rods.

**[0008]** The "transverse direction" means the plan dimension that is orthogonal to the longitudinal direction, in parallel with which the two rods move. This bond affects the dimensions of the profiles that form the frame of the fixture and those the handle has to be attached to by means of the relative fixing base.

**[0009]** In the field of fixtures, for aesthetic reasons and in order to maximize the window region, there is the tendency to make fixtures comprising profiles having increasingly slim dimensions.

**[0010]** There is therefore the need to provide rod handles that can be made having smaller transverse dimensions than the current dimensions so as to impose less stringent limitations on the dimensions of the profiles that can be used to make the fixtures, without imposing limitations on the longitudinal stroke of the rod and/or the rotational movement of the gripping handle.

PRESENTATION OF THE INVENTION

**[0011]** There is therefore the need to overcome the problems and limitations cited with reference to the prior art.

**[0012]** This need is met by a rod handle for fixtures as per claim 1.

DESCRIPTION OF THE DRAWINGS

**[0013]** Additional features and the advantages of the present invention will become clearer from the description given below of preferred non-limiting embodiments thereof, in which:

- Fig. 1 is a lateral perspective view of a rod handle for fixtures as per one embodiment of the present invention, which is illustrated with the gripping handle in a closed position;
- Fig. 2 is a perspective view of the handle in Fig. 1 illustrated with some parts removed in order to better illustrate others;
- Fig. 3 shows the handle in Fig. 1, which is illustrated with the gripping handle in an open position;
- Fig. 4 shows a perspective view of the handle in Fig. 3, illustrated with some parts removed in order to better illustrate others;
- Fig. 5 shows an exploded view of the handle in Fig. 1;
- Fig. 6 shows an orthogonal lateral view of the handle in Fig. 1 according to the arrow VI shown therein;
- Fig. 7 shows an orthogonal front view of the handle in Fig. 1 according to the arrow VII indicated therein;
- Fig. 8 shows an orthogonal rear view of the handle in Fig. 1 according to the arrow VIII indicated therein;
- Fig. 9 shows an orthogonal sectional view of the handle in Fig. 1 according to the section plane A-A indicated in Fig. 7;
- Fig. 10 shows a partially sectional view of the handle in Fig. 2; and
- Fig. 11 represents a perspective view of the handle in Fig. 1, illustrated with some parts in transparency

in order to better illustrate others.

**[0014]** The elements or parts of elements that the embodiments described in the following have in common will be indicated by the same reference numerals.

DETAILED DESCRIPTION

**[0015]** With reference to the above-mentioned drawings, 1 indicates, as a whole, a rod handle for fixtures as per the present invention.

**[0016]** The handle 1 according to the invention is in particular intended to be attached to windows (sliding or casement windows), but can generally also be attached to other types of fixtures, for example door fixtures, French doors or front door fixtures.

**[0017]** The rod handle 1 comprises a fixing base 2 that is intended to be rigidly fixed to a fixture (not shown in the attached drawings). In particular, the fixing base 2 is intended to be fixed to a profiled portion that forms the frame of the window.

**[0018]** The fixing base 2 extends in plan in a longitudinal direction X-X and in a transverse direction Y-Y, which is orthogonal to said longitudinal direction X-X.

**[0019]** "Plan extension" means the extension of the portion of the fixing base that is intended to rest against the fixture. The attachment of a handle 1 to a fixture is influenced by the transverse dimensions of the fixing base, which may not be greater than those of the fixture portion intended to receive the handle.

**[0020]** In particular, as illustrated in the attached drawings, the fixing base 2 can be made up of a plate, preferably in metal material. The fixing base 2 can be provided with a plurality of through-holes for inserting anchoring elements into the fixture, for example screws or bolts.

**[0021]** In addition to the fixing base 2, the handle 1 comprises:

- a cogwheel 10, which is rotationally connected to the fixing base 2 so that the axis of rotation Z1-Z1 is orthogonal to said base; and
- at least a first operating rod 11, a toothed portion 11a of which meshes with the cogwheel 10 so as to form a rack-pinion system together with the cogwheel 10.

**[0022]** The first operating rod 11 can move in a translational manner with respect to the fixing base 2 in parallel with said longitudinal direction X-X following rotational movements of the cogwheel 10 about its axis of rotation Z1-Z1. In terms of operation, this first operating rod 11 is intended to be connected to a closing system of a fixture (not shown in the attached drawings) in order to operate it by means of its translational movements.

**[0023]** The handle 1 also comprises a gripping handle 20, which is rotationally moveable with respect to the fixing base 2 between a first angular position and a second angular position and is kinematically connected to the cogwheel 10 in order to drag the cogwheel 10 in rotation as it passes between said two angular positions.

**[0024]** In terms of operation, the rotational movement of the cogwheel causes the translational movement of the first movement rod between two different longitudinal positions, in which the closing system is operated such that it closes and opens, respectively.

**[0025]** In accordance with one embodiment that is not shown in the attached drawings, the handle 1 may comprise just one operating rod. In terms of operation, in this case, the handle 1 can only act on the closing system of the fixture from one point only.

**[0026]** Preferably, as illustrated in the attached drawings, the handle 1 comprises two operating rods 11, 12, both of which mesh with the cogwheel 10. In other words, the handle 1 comprises a second operating rod 12 in addition to said first operating rod 11. In terms of operation, in this case, the handle 1 can act on the closing system of the fixture from two different points.

**[0027]** More specifically, a toothed portion 12a of this second operating rod 12 meshes with the cogwheel 10 in a position that is transversally opposite the first rod 11.

**[0028]** This second operating rod 11 is also:

- movable in a translational manner with respect to the fixing base 2 in parallel with the longitudinal direction X-X at the same time as said first rod 11, but in the opposite direction thereto, following rotational movements of the cogwheel 10; and
- intended to be connected to said fixture closing system - in a position that is longitudinally opposite said first rod 11 - in order to contribute to operating it by means of its translational movements.

**[0029]** Said first and second operating rods 11, 12 form a pinion-double rack system together with said cogwheel 10.

**[0030]** As illustrated in the attached drawings, the cogwheel 1 and the two operating rods 11, 12t have overall transverse plan dimensions not greater than the transverse extension of the fixing base 2. This is also applicable when the handle 1 comprises a single operating rod.

**[0031]** Preferably, as illustrated in the attached drawings, each of said two operating rods 11, 12 comprises an appendage 11b, 12b that extends orthogonally with respect to the fixing base 2 (on the opposite side to the side where said cogwheel 10 is rotationally associated) and passes through the base 2 via a respective through-hole for longitudinal sliding 3, 4. Each operating rod 11, 12 is intended to connect to the closing system of a fixture by means of the respective appendage 11b, 12b. This configuration is also provided when the handle 1 comprises just one operating rod.

**[0032]** The appendage 11b, 12b can be of any shape. For example, it can be made up of a cylindrical body (as illustrated in Fig. 1 to 5) or of a plate (as illustrated in Fig. 6 to 10).

**[0033]** Advantageously, in use these appendages 11b, 12b, protruding from the fixing base 2, can enter the frame of the fixture in which the handle 1 is attached and can therefore reach components of the closing system that are housed inside said frame.

**[0034]** According to the invention, the gripping handle 20 is kinematically connected to the cogwheel 10 by means of a bevel gear transmission system 31, 32, in which:

- the driving bevel wheel 31 of the bevel gear is rotationally integral with said gripping handle 20 in order to be rotated by the rotational movements of the gripping handle between the above-mentioned first and second angular positions; and
- the driven bevel wheel 32 of the bevel gear is rotationally integral with the cogwheel 10.

**[0035]** The expression "rotationally integral" referring to the driving bevel wheel with respect to the gripping handle means that the driving bevel wheel integrally rotates with the gripping handle about the same axis of rotation.

**[0036]** Similarly, the expression "rotationally integral" referring to the driven bevel wheel with respect to the cogwheel means that the driven bevel wheel integrally rotates with the cogwheel about the same axis of rotation.

**[0037]** Preferably, as shown in the attached drawings, the driven bevel wheel 32 is made as one piece together with the cogwheel 10.

**[0038]** The driving bevel wheel 31 and the associated gripping handle 20 are rotationally supported by a containment structure 40, which is in turn fixed to the fixing base 2. The driven bevel wheel 31 is instead rotationally supported by the cogwheel 10 that, as already mentioned, is in turn directly rotationally supported by the fixing base.

**[0039]** According to the invention, the above-mentioned bevel gear system 31, 32 has a transmission ratio lower than 1 (multiplying ratio) such that to an angular rotation of the gripping handle 20 between said first and second angular position it corresponds an angular rotation of the cogwheel 10 having a greater width. In other words, the driving cogwheel 31 has a nominal diameter that is greater than the nominal diameter of the driven wheel 32.

**[0040]** In this way, when dimensioning the handle 1, it is possible to adapt the nominal diameter of the cogwheel 10 to a predefined transverse extension of the fixing base 2 and to a predefined longitudinal stroke of said at least one operating rod 11, without having to adjust the width of the angular stroke of the gripping handle 20 between said first and second angular position.

**[0041]** In other words, due to the use of the bevel gear transmission system described above, it is in particular possible to reduce the nominal diameter of the cogwheel 10 (and therefore to contain the transverse plan extension of the fixing base 2) without having to intervene with the width of the longitudinal stroke of the operating rod and/or with the width of the rotational movement of the gripping handle between the first and the second angular position. In fact, with the width of the angular rotation that can be imposed on the gripping handle 20 by a user being set, the reduction in the nominal diameter of the cogwheel 10 does not influence the extension of the longitudinal stroke of the rod since this reduction is compensated for by an increase in the width of the angular rotation of said cogwheel 10.

**[0042]** It should be noted that a reduction in the nominal diameter of the cogwheel corresponds to a reduction in the number of teeth in said wheel and not to a reduction in all the dimensions of said teeth. This means that the reduction in the dimensions of the cogwheel does not jeopardize the meshing stability between the cogwheel and the rod, to the advantage of robustness and reliability of the handle 1.

**[0043]** Due to the invention, it is therefore possible to reduce the nominal diameter of the cogwheel without the handle losing functionality, and simultaneously ensuring stable meshing between the cogwheel and the operating rods.

**[0044]** Advantageously, as shown in the attached drawings, the above-mentioned bevel gear transmission system 31, 32 is arranged between the fixing base 2 and the gripping handle 20 and extends together with the driving bevel wheel 31 that substantially extends in the orthogonal and longitudinal direction with respect to the base 2 so as not to increase the transverse plan dimensions of the handle and therefore of the fixing base.

**[0045]** In accordance with the embodiment illustrated in the attached drawings, the bevel gear transmission system 31, 32 in particular has the following features:

- the nominal diameter of the driven bevel wheel 32 is not greater than the transverse extension of the fixing base 2;
- the angle between the axes of said bevel gear is 90°; and
- the driving bevel wheel 31 is arranged such that its own axis of rotation Y1-Y1 is parallel to said transverse direction Y-Y.

**[0046]** The driving bevel wheel 31 is therefore arranged such that the diametric dimensions thereof do not affect the dimensions in the transverse direction, but only the dimensions in the orthogonal and longitudinal directions. In the transverse direction, the dimensions of the driving wheel 31 correspond to the height of the teeth thereof and therefore remain inside the transverse dimensions of the driven wheel 32.

**[0047]** In this way, the bevel gear transmission system 31, 32 has overall transverse plan dimensions that are not greater than the transverse extension of the fixing base 2 and are not influenced by the nominal diameter of the driving bevel wheel 31.

**[0048]** In particular, the two conical wheels 31 and 32

have teeth that are at a 45° angle.

**[0049]** Preferably, as illustrated in the attached drawings, the gripping handle 20 is made up of a lever having a pivot and rotation axis that coincides with the axis of rotation Y1-Y1 of the driving bevel wheel 31. Therefore, in the preferred case in which the driving bevel wheel 31 is arranged so that its axis of rotation Y1-Y1 is parallel to said transverse direction Y-Y, the axis of rotation of the gripping handle 20 is also parallel to said transverse direction Y-Y.

**[0050]** Even more preferably, the gripping handle 20 with lever has transverse dimensions that are no greater than the transverse extension of the fixing base 2.

**[0051]** Preferably, this configuration of the gripping handle 20 is provided in the preferred embodiment in which the bevel gear transmission system has transverse dimensions that are no greater than the transverse plan dimension of the fixing base 2. In this way, in its entirety, the handle 1, included then also the gripping handle 20, has transverse plan dimensions that are not greater than the transverse plan extension of the fixing base 2.

**[0052]** In accordance with the embodiment illustrated in the attached drawings, the gripping handle 20 comprises a portion 21 of pivoting the containment structure 40 and a gripping portion 22, which is fixed to the pivoting portion. Advantageously, as shown in Fig. 5, the gripping portion 22 is made separately from the pivoting portion 21 and its shape may differ depending on design requirements.

**[0053]** Preferably, as illustrated in the attached drawings, the driving bevel wheel 31 is made in one piece with said pivoting portion 21 of the gripping handle 20. Alternatively, the driving bevel wheel 31 can be made separately and can be made integral with the pivoting portion 21 of the gripping handle 20 by means of one or more pins.

**[0054]** In accordance with one embodiment illustrated in the attached drawings, the containment structure 40 is defined by a box-shaped body having an internal portion that is equivalent to the plan shape of the fixing base 2. The containment structure 40 is fixed to the fixing base 2 by means of shape coupling.

**[0055]** Preferably, as illustrated in the attached drawings, the above-mentioned containment structure 40 is designed to delimit, together with the fixing base 2, a first chamber 5 in which the cogwheel 10 and the two operating rods 11, 12 are housed (or the single rod, if only one rod is provided).

**[0056]** The containment structure 40 is also designed to delimit a second chamber 6, which is orthogonally superposed on the first chamber 5 and in which the bevel gear transmission system 31, 32 is housed.

**[0057]** The first chamber 5 and the second chamber 6 communicate with one another to allow for the kinematic coupling between the cogwheel 10 and the driving bevel wheel 31.

**[0058]** The gripping handle 20, preferably made up of a lever, is rotationally associated with said containment structure 40 in the second chamber 6. More specifically, the pivoting portion 21 of the gripping handle 20 is housed in the second chamber 6, while the gripping portion 22 protrudes from the second chamber 6.

**[0059]** The invention makes it possible to achieve numerous advantages, some of which have already been described.

**[0060]** The rod handle according to the invention can be made having smaller transverse dimensions with respect to those of known rod handles, without, however, losing functionality. In particular, the handle according to the invention can be made having reduced transverse dimensions without this involving an increase in the width of the rotation of the gripping handle, being the longitudinal stroke of the operating rods equal.

**[0061]** The handle according to the invention can also be made having very limited transverse dimensions, thus combining reliability and robustness.

**[0062]** The individual components that form the internal movement mechanism of the handle can in fact be made having reduced dimensions, without, however, losing rigidity.

**[0063]** The invention designed in this way therefore achieves the predetermined objects.

**[0064]** Of course, when practically implemented, said invention may also assume shapes and configurations that differ from that illustrated above, without thereby departing from the present scope of protection.

**[0065]** Furthermore, all the details can be substituted by technically equivalent elements and any dimensions, shapes and materials can be used, according to requirements.

## Claims

1. Rod handle (1) for fixtures, in particular for windows (1), comprising:

   - a fixing base (2) that is intended to be rigidly fixed to a fixture and extends in plan in a longitudinal direction (X-X) and in a transverse direction (Y-Y), orthogonal to said longitudinal direction (X-X);
   - a cogwheel (10), which is rotationally connected to the fixing base (2) with rotation axis (Z1-Z1) orthogonal to said base;
   - at least one first operating rod (11), which is meshed to said cogwheel (10) at its own toothed portion (11a) so as to form with said cogwheel a rack-pinion system and is translatable with respect to said fixing base (2) parallel to said longitudinal direction (X-X) following the rotation of the cogwheel (10), said first operating rod (11) being intended to be connected to a fixture closing system to operate it by its translation movements; and
   - a gripping handle (20), which is rotationally

movable with respect to said fixing base (2) between a first and a second angular position and is kinematically connected to said cogwheel (10) to drag said wheel in rotation passing between said two angular positions, wherein said cogwheel (10) and said first operating rod (11) have a transverse overall plan footprint not exceeding the transverse extension of the fixing base (2),

**characterized in that** said gripping handle (20) is kinematically connected to said cogwheel (10) by a bevel gear transmission system (31, 32), wherein:

- the driving bevel gear (31) of said bevel gear is rotationally integral with said gripping handle (20) in order to be rotated by the rotational movements of said gripping handle between said first and second angular positions and
- the driven bevel gear (32) of said bevel gear is rotationally integral with said cogwheel (10), the driving bevel wheel (31) and the associated gripping handle (20) being rotationally supported by a containment structure (40) fixed to said fixing base (2),

and **in that** said bevel gear transmission system (31, 32) has a transmission ratio lower than 1, such that an angular rotation of the gripping handle (20) between said first and second angular positions corresponds to a greater angular rotation of the cogwheel (10), thereby allowing an adaptation of the nominal diameter of the cogwheel (10) to a predetermined extension in the transverse direction (Y-Y) of the fixing base (2) and to a predetermined longitudinal stroke of said first operating rod (11) without requiring an adjustment of the width of the angular stroke of the gripping handle (20) between said first and second angular positions.

**2.** Rod handle according to one or more of the preceding claims, wherein the gripping handle (20) consists of a lever with pivot and rotation axis coincident with the rotation axis (Y-Y) of the driving bevel wheel (31).

**3.** Rod handle according to claim 1 or 2, wherein said bevel gear transmission system (31, 32) is arranged between the fixing base (2) and the gripping handle (20) and extends with said driving bevel wheel (31) extending substantially orthogonally and longitudinally with respect to said fixing base (2).

**4.** Rod handle according to claim 1, 2 or 3, wherein the angle between the axes of said bevel gear is 90 °.

**5.** Rod handle according to claim 4, wherein said bevel gear transmission system (31, 32) has a transverse overall plan footprint not exceeding the transverse extension of the fixing base (2).

**6.** Rod handle according to claim 5, wherein the nominal diameter of the driven bevel wheel (32) does not exceed the transverse extension of the fixing base (2).

**7.** Rod handle according to claim 4, 5 or 6, wherein the driving bevel wheel (31) is arranged so as to have its rotation axis (Y-Y) parallel to said transverse direction (Y-Y), so that the rotation axis of the gripping handle (20) is also parallel to said transverse direction (Y-Y).

**8.** Rod handle according to claim 7, wherein the gripping handle (20) has a transverse dimension not exceeding the transverse extension of the fixing base (2) .

**9.** Rod handle according to one or more of the preceding claims, wherein the driven bevel wheel (32) is in one piece with said cogwheel (10).

**10.** Rod handle according to one or more of the preceding claims, wherein the gripping handle (20) comprises a portion (21) of pivoting to the containment structure (40), the driving bevel wheel (31) being made in one piece with said pivoting portion (21) or being made integral with it.

**11.** Rod handle according to one or more of the preceding claims, comprising a second operating rod (12) in addition to said first operating rod (11), wherein said second operating rod (12) is engaged to said cogwheel (10) at its own toothed portion (12a) in a position transversely opposite to said first rod (11), said second operating rod (12) also being:

- translatable with respect to said fixing base (2) parallel to said longitudinal direction (X-X) at the same time as said first rod (11), but in the opposite direction, following rotations of the cogwheel (10); and
- intended to be connected to the same closing system of a fixture - in a position longitudinally opposite said first rod (11) - in order to help actuate it with its own translation movements,

said first and second operating rods (11, 12) forming with said cogwheel (10) a pinion -double rack system.

**12.** Rod handle according to claim 11, wherein said cogwheel (10) and said first and second operating rods (11, 12) have a transverse overall plan footprint not exceeding the transverse extension of the fixing base (2) .

**13.** Rod handle according to one or more of the preceding claims, wherein said first and second rods (11,

12) each comprise an appendage (11b; 12b) that extends orthogonally with respect to said fixing base (2) on the opposite side with respect to that on which said cogwheel (10) is rotationally associated and crosses said fixing base (2) at a respective longitudinal sliding through opening (3, 4), each operating rod (11, 12) being intended to connect with a closing system of a fixture via said appendage (11b; 12b).

**14.** Rod handle according to one or more of the preceding claims, wherein said containment structure (40) is configured to delimit together with said fixing base (2) a first chamber (5) in which said cogwheel (10) and the operating rods (11, 12) are housed and wherein said containment structure (40) is configured to delimit a second chamber (6), which is orthogonally superposed to said first chamber (5) and in which the bevel gear transmission system (31, 32) is housed, said first chamber (5) and said second chamber (6) communicating with each other to allow a kinematic coupling between said cogwheel (10) and the driving bevel wheel (31).

**15.** Rod handle according to claim 14, wherein said gripping handle (20) is rotationally associated with said containment structure (40) at said second chamber (6) and protrudes from said second chamber (6) with a gripping portion (22).

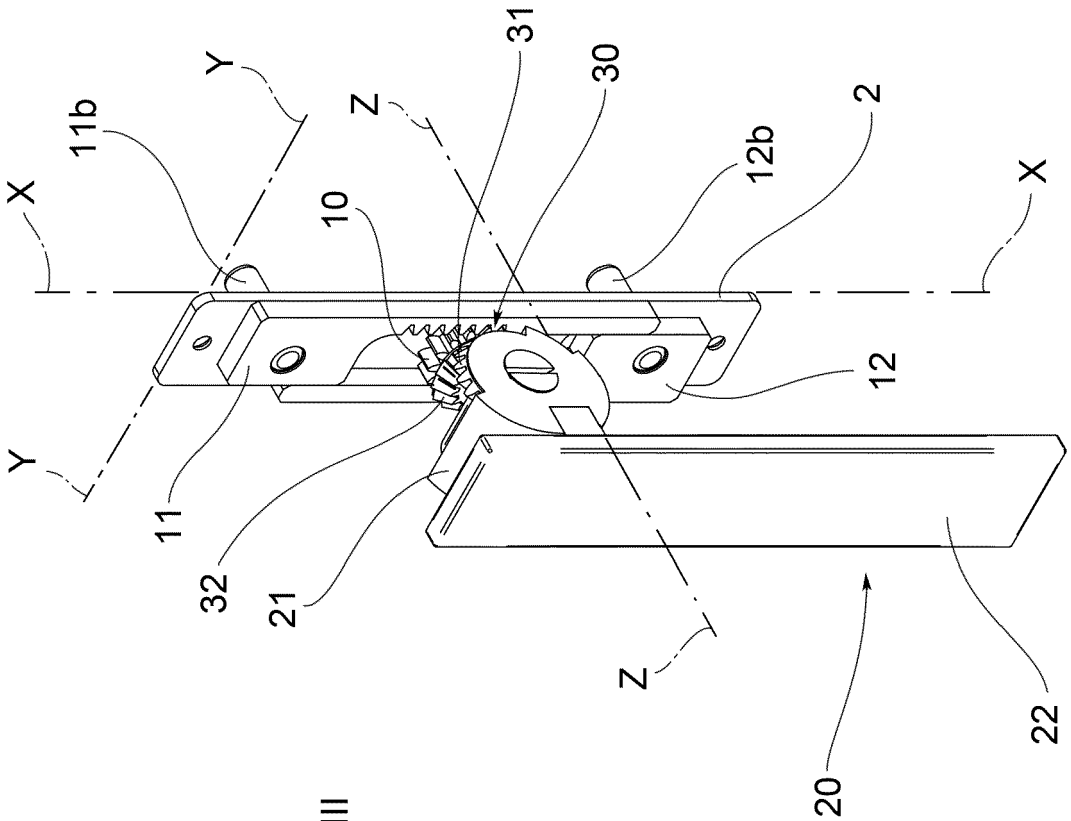
31
30
Y
Z
11b
2
12b
X
X
10
Y
12
11
32
21
Z
20
22

FIG.2

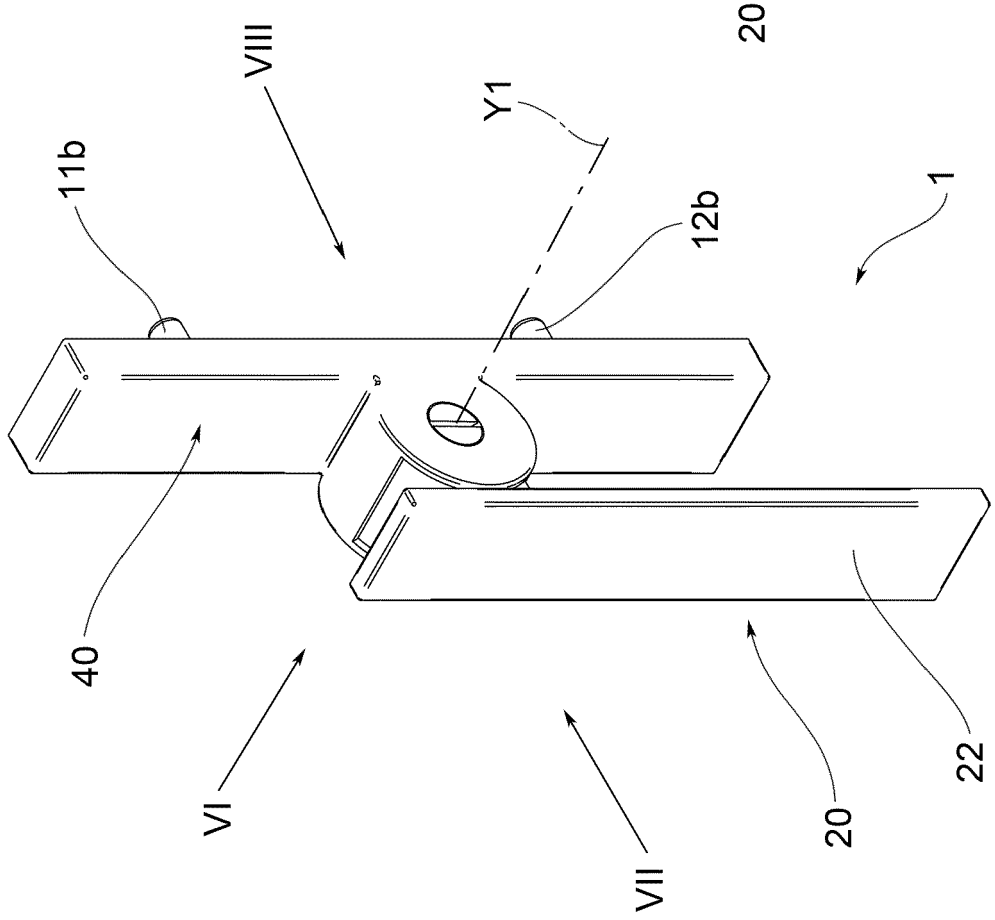
VIII
Y1
11b
12b
1
40
VI
VII
20
22

FIG.1

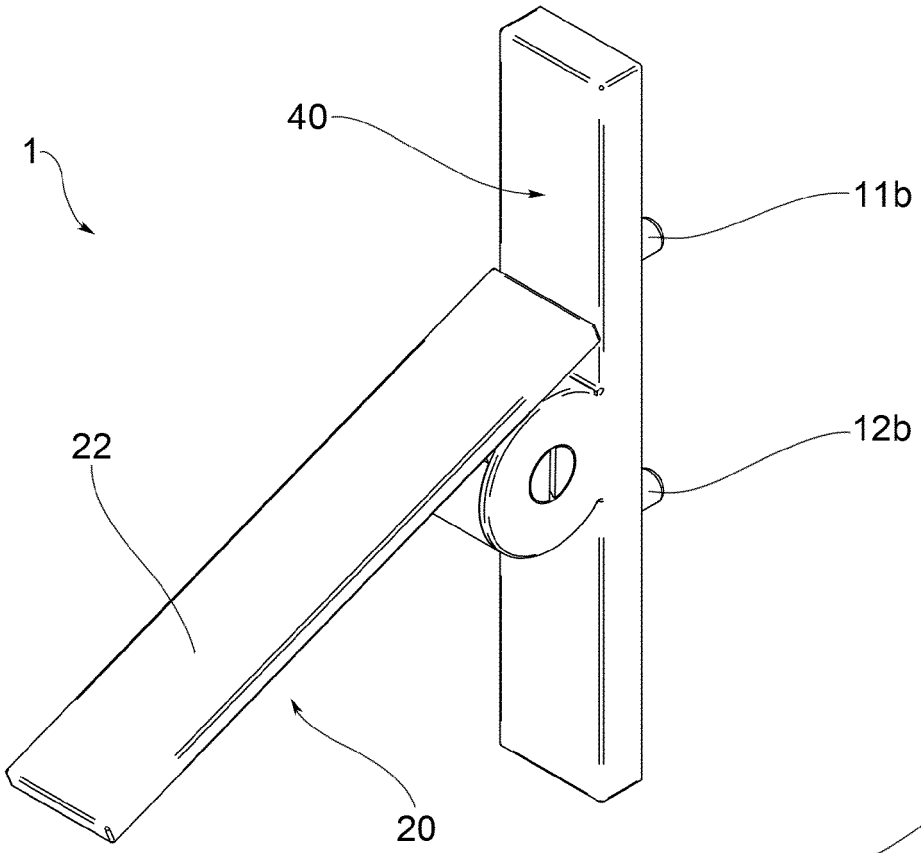


FIG.3

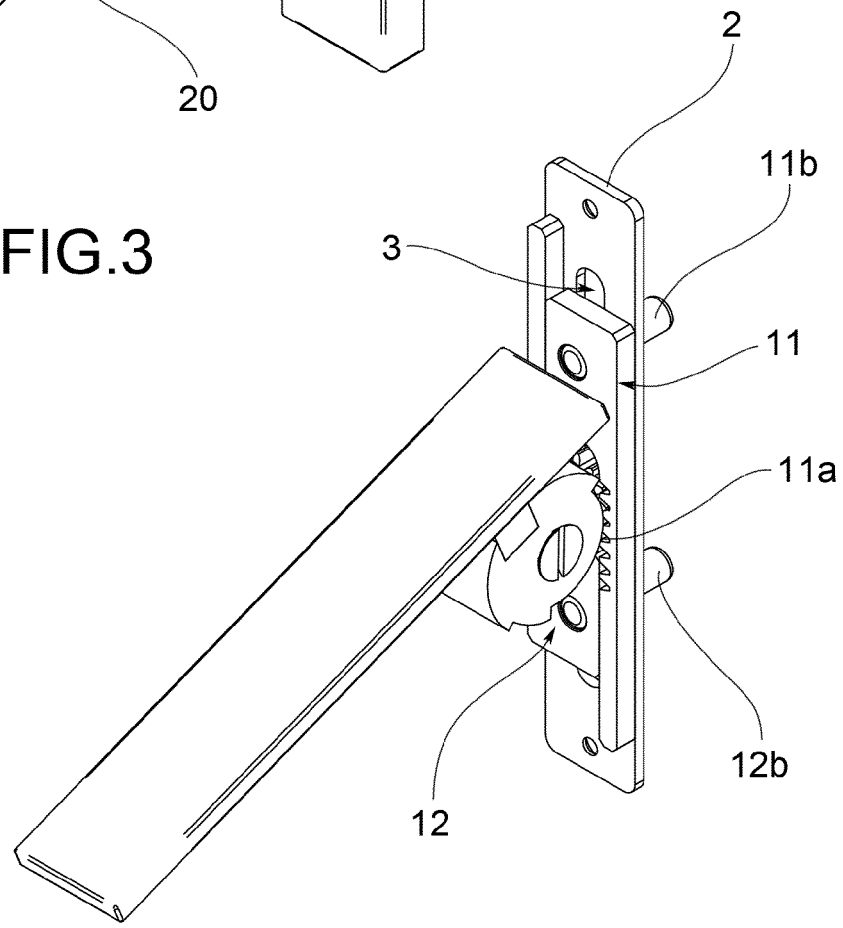


FIG.4

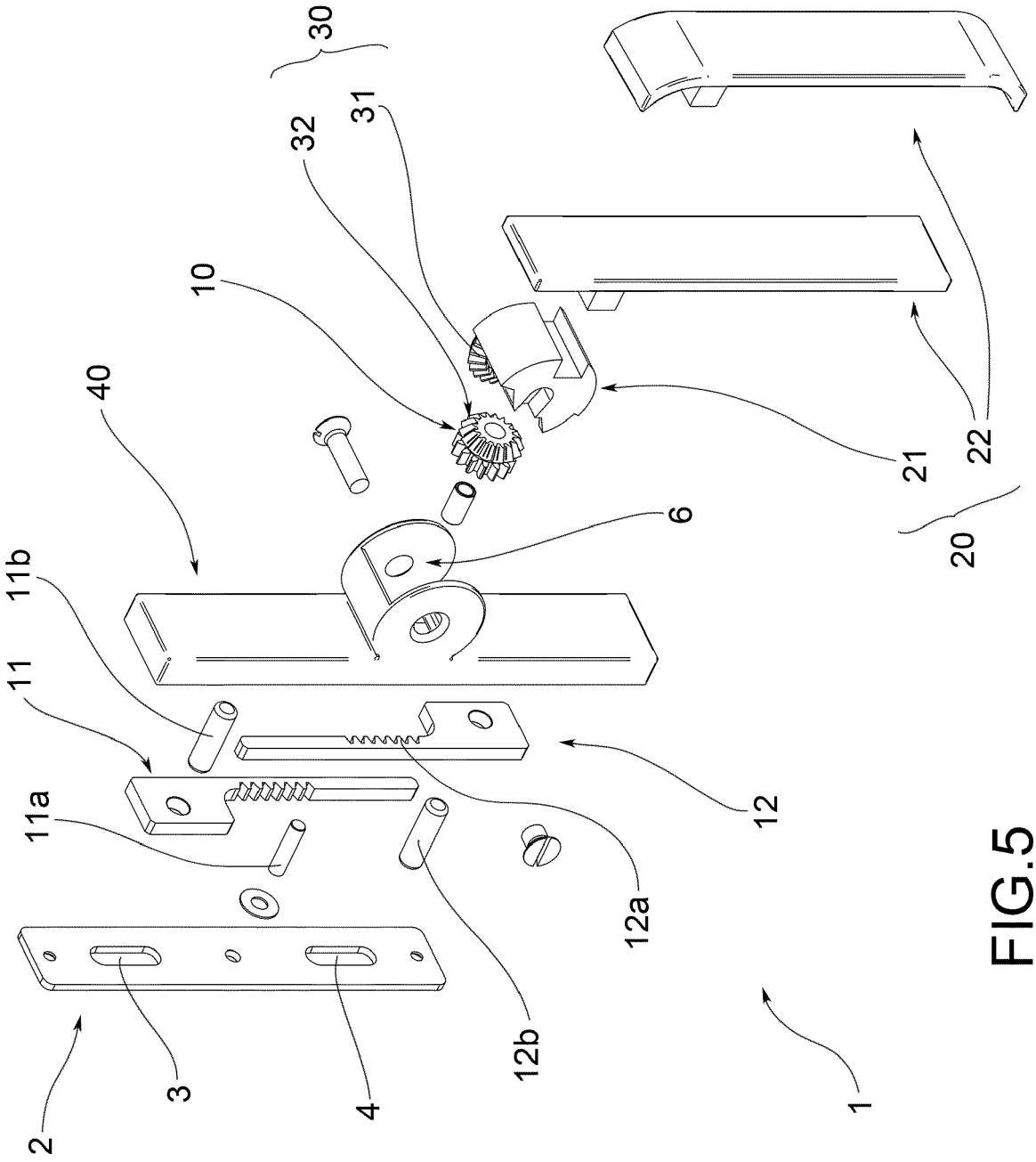


FIG.5

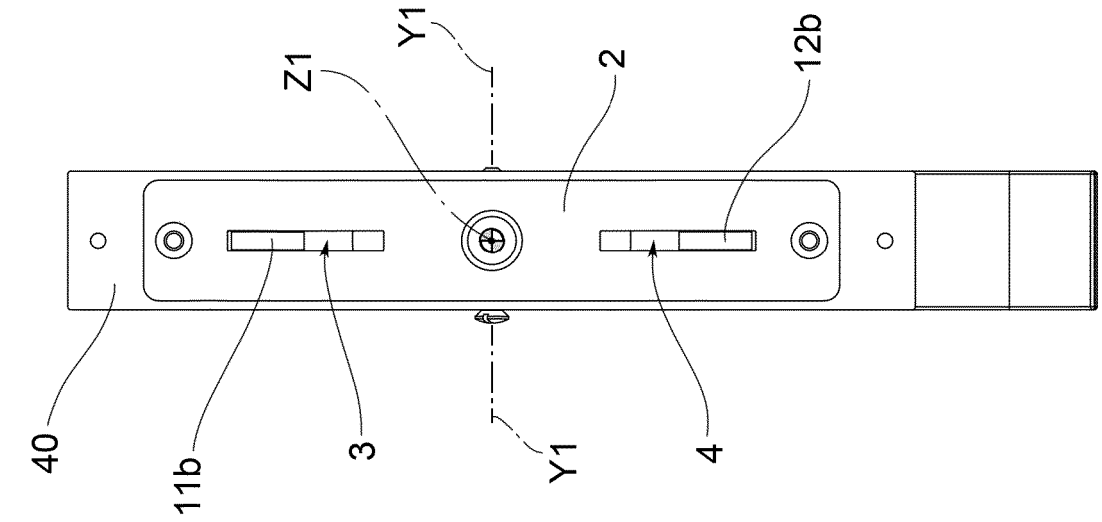


FIG.8

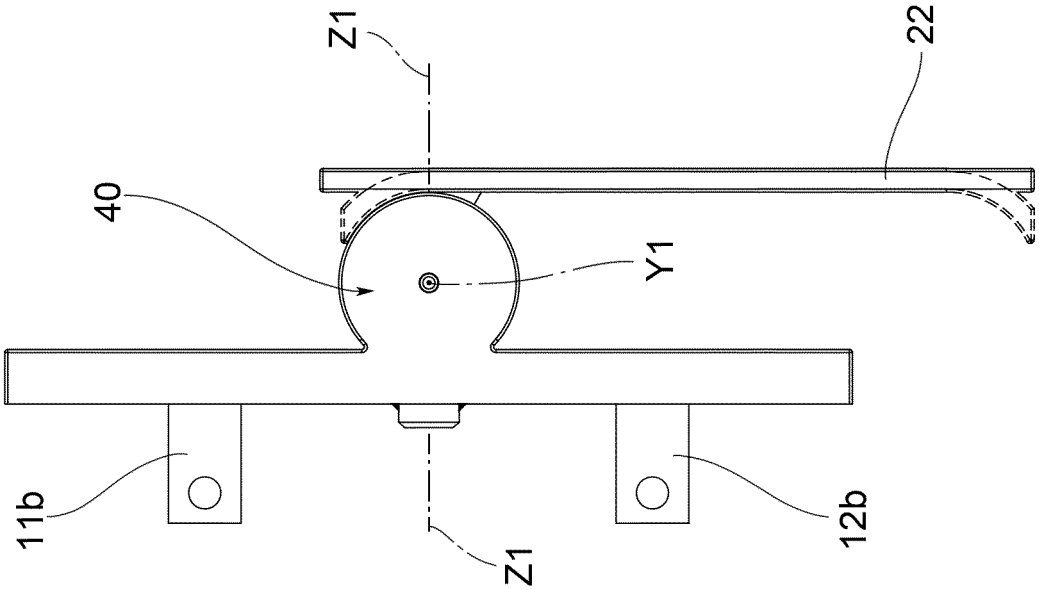


FIG.6

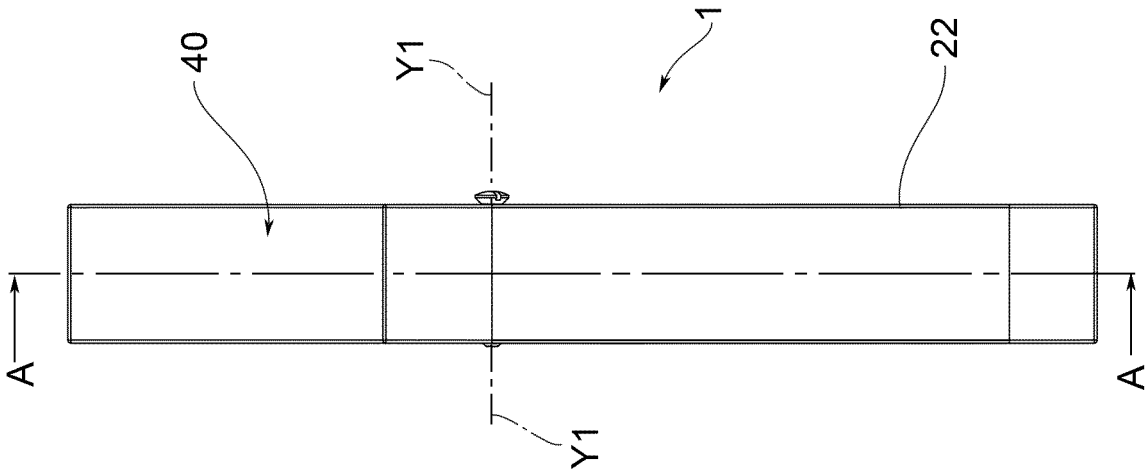


FIG.7

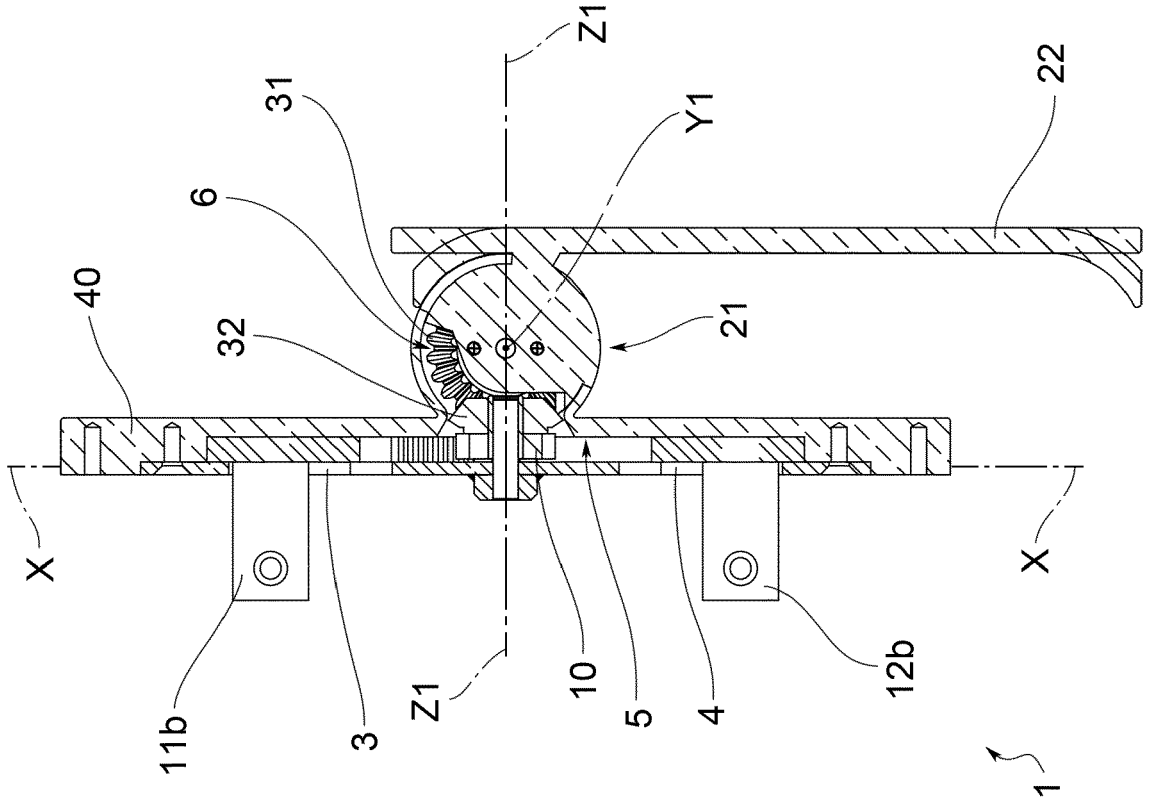
Z1
31
Y1
22
6
40
32
21
X
X
11b
3
Z1
10
5
4
12b
1

FIG.9

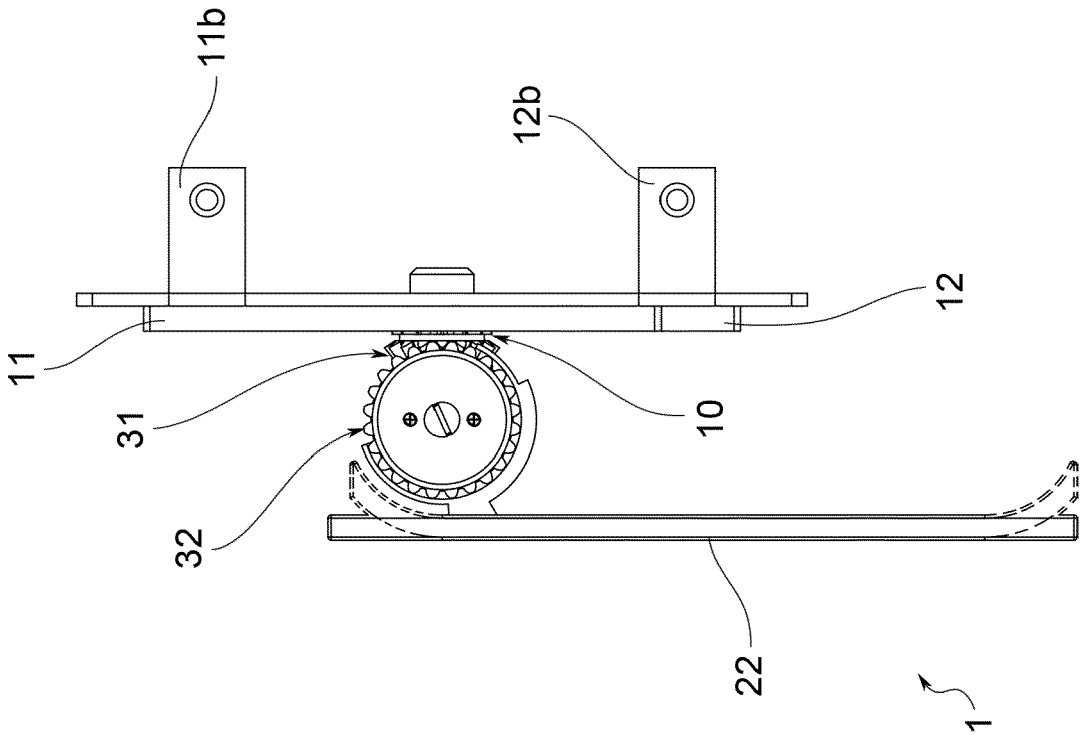
11b
12b
12
11
31
10
32
22
1

FIG.10

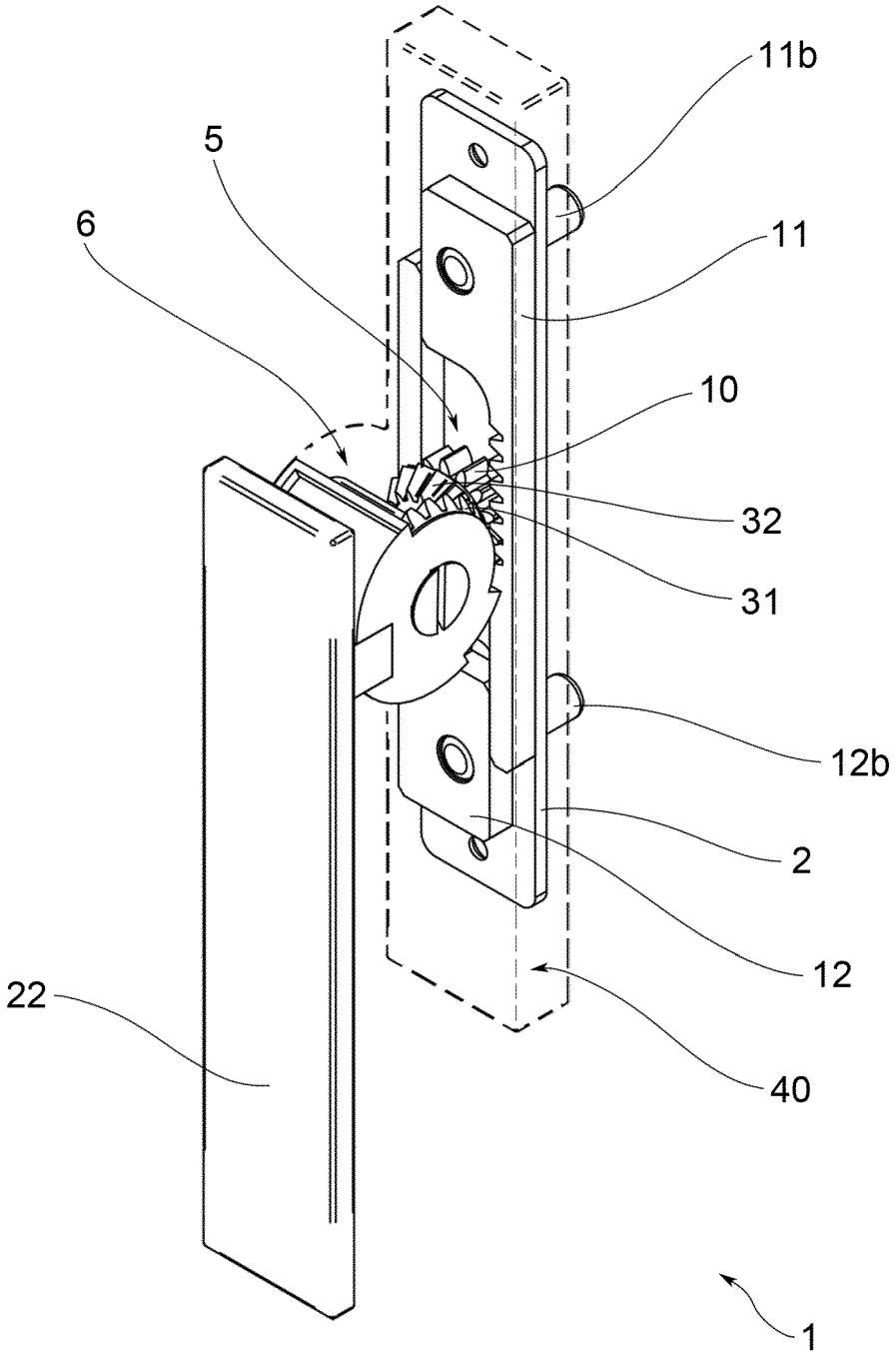


FIG.11

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# EUROPEAN SEARCH REPORT

Application Number
EP 20 16 1416

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
|---|---|---|---|
| X<br><br><br>A | DE 10 2004 019256 A1 (DIRAK DIETER RAMSAUER KONSTRUK [DE])<br>3 November 2005 (2005-11-03)<br>* paragraph [0047]; figure 9 * | 1-13<br><br><br>14,15 | INV.<br>E05C9/04<br>E05B65/00<br>E05B7/00 |
| X | WO 03/031754 A1 (PALAMARA GIOVANNI [IT]; PALAMARA ROCCO [IT])<br>17 April 2003 (2003-04-17)<br>* page 7 - page 8; figure 5 * | 1 | |
| X | GB 921 594 A (EVERED & CO LTD)<br>20 March 1963 (1963-03-20)<br>* the whole document * | 1 | |
| A | EP 2 267 253 A2 (MILGARD MFG INC [US])<br>29 December 2010 (2010-12-29)<br>* the whole document * | 1 | |
| A | KR 200 426 484 Y1 (-)<br>19 September 2006 (2006-09-19)<br>* figures 2-3 * | 1 | |

TECHNICAL FIELDS SEARCHED (IPC)

E05C
E05B

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| The Hague | 15 July 2020 | Ansel, Yannick |

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## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 20 16 1416

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15-07-2020

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---|---|---|
| DE 102004019256 A1 | 03-11-2005 | NONE | |
| WO 03031754 A1 | 17-04-2003 | EP 1438474 A1 | 21-07-2004 |
| | | IT RM20010607 A1 | 11-04-2003 |
| | | WO 03031754 A1 | 17-04-2003 |
| GB 921594 A | 20-03-1963 | NONE | |
| EP 2267253 A2 | 29-12-2010 | CA 2711876 A1 | 25-12-2010 |
| | | CA 2839223 A1 | 25-12-2010 |
| | | CN 101929271 A | 29-12-2010 |
| | | EP 2267253 A2 | 29-12-2010 |
| | | US 2010327612 A1 | 30-12-2010 |
| | | US 2013285394 A1 | 31-10-2013 |
| KR 200426484 Y1 | 19-09-2006 | NONE | |

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82