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

(11) **EP 3 995 656 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
11.05.2022 Bulletin 2022/19

(21) Application number: **21206006.5**

(22) Date of filing: **02.11.2021**

(51) International Patent Classification (IPC):
E05C 9/12 *(2006.01)* ***E05C 9/02*** *(2006.01)*

(52) Cooperative Patent Classification (CPC):
E05C 9/12; E05C 9/021

(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
Designated Validation States:
KH MA MD TN

(30) Priority: **09.11.2020 IT 202000026657**

(71) Applicant: **GIESSE S.P.A.**
40054 Budrio (BO) (IT)

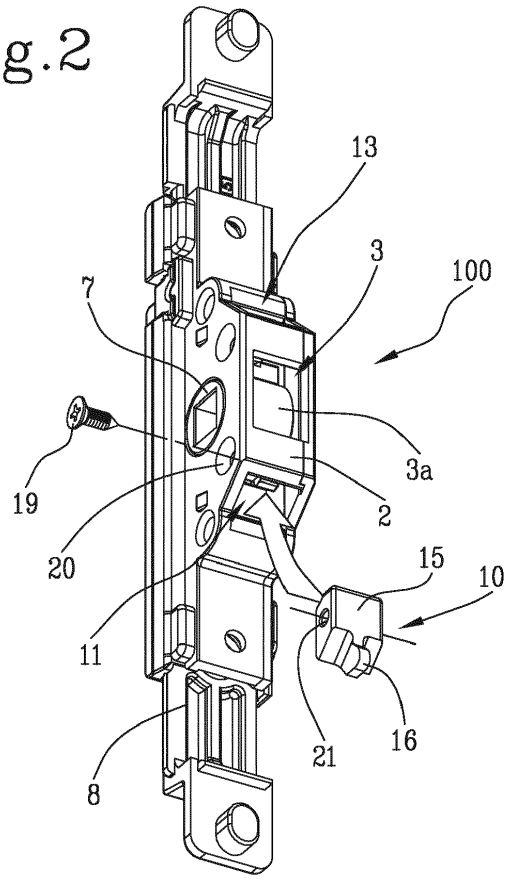
(72) Inventor: **SANTO, Peter Reginald**
STOCKPORT, 56 8AE (GB)

(74) Representative: **Casadei, Barbara**
Bugnion S.p.A.
Via di Corticella, 87
40128 Bologna (IT)

(54) OPERATING DEVICE FOR DOORS AND WINDOWS

(57) Described is an operating device for doors and windows comprising a box-shaped body (2); a wheel (3) having a first circular stretch (3a) having a smooth surface and a second circular stretch (3b) which is toothed and housed in the box-shaped body (2); a rod (8) slidably inserted in the box-shaped body (2) and having the relative ends, outside the box-shaped body (2), configured to be connected, in use, to movable closing/opening devices of a leaf (1) located on the leaf (1); the rod (8) has a relative surface equipped with an operating rack (9) meshing with the second circular toothed stretch (3b) of the wheel (3) in such a way as to allow, by rotating the wheel (3), a sliding of the rod (8) which is able to obtain, in succession, and starting from a closed position of the leaf (1) to a fixed frame, a first position of opening of the leaf (1) from the fixed frame and a second, open position of the leaf (1) relative to the fixed frame different from the previous one; a slider (10) for selecting and locking the wheel (3) which can be inserted stably inside the box-shaped body (2) through a first through seat (11) made in the box-shaped body (2); the slider (10) is positionable radially relative to the wheel (3) and in such a way as to interfere with the rotation of the wheel (3), by abutment with a first tooth (12) of one end of the second toothed circular stretch (3b), and thus limit the rotation of the wheel (3) only between the closed position of the leaf (1) and a single open position of the leaf (1) and vice versa. [Figure 2]

Fig.2



EP 3 995 656 A1

Description

[0001] This invention relates to an operating device for doors and windows, in particular doors and windows made of metal or PVC or the like.

[0002] In particular, the invention is applicable to doors and windows with a traditional leaf-type opening where it is necessary, in some cases, to also have a key-type closing device.

[0003] The current operating devices for doors and window are necessary for moving suitable devices for locking the leaf relative to the fixed frame of the window; it all being controlled by an external handle.

[0004] The operating device basically comprises:

- a box-shaped body which can be associated with or housed in an upright of the leaf;
- a kinematic unit (toothed - rack unit which rotates partially), housed in the box-shaped body, for operating the locking devices.

[0005] The kinematic unit, in particular the gear wheel, is connected (by a shaft) to the external handle or grip protruding outside the leaf.

[0006] The locking devices are slidably mounted on the leaf and comprise one or more rods, inserted in suitable channels of the profiles of the leaf. Protruding pins and/or bosses are associated on the rods (protruding from the end of the rod, in the case of the pin, or transversally from the rod, in the case of the boss) designed to interfere, or not, with a respective contact element made or mounted on the fixed frame.

[0007] These slidable rods are connected to the ends of the rack of the operating device (projecting on both sides from the box-shaped body) mentioned above in such a way that the rotation of the partly toothed gear wheel transmits the motion to the rack so as to obtain the linear motion of the rods connected to it so as to obtain the leaf-type, transom-type opening positions and the closing.

[0008] In other words, by acting on the handle or grip (by means of its rotation) it is possible to switch the locking devices from a closed configuration in which the leaf is rigidly fixed to the fixed frame and cannot be moved, to a first open configuration, wherein the leaf is disengaged from the fixed frame and may be opened to a first leaf-type position (90° rotation of the handle), and to a subsequent second transom-type opening position (with a further 90° rotation of the handle). Reversing the rotation of the handle by 180° returns the leaf to the closed configuration.

[0009] In order to obtain these openings, the partly toothed wheel has a toothed circumferential extension of 180° about the surface of the wheel on which they are obtained and in such a way as to generate the movement of the rack, which has an equivalent linear extension of their teeth so as to be able to pull or push the rods in turn.

[0010] This type of operating device, which is now quite well-known, has many advantages, including the reduced dimensions which allow it to be used on various types of profiled sections present on the market and the high level of reliability over time.

[0011] Currently, there are particular needs on the market for doors and windows due to the request for doors and windows with only the traditional leaf-type opening of the movable leaf and also the need to apply a lock with a key for greater safety of the door or window.

[0012] For this need, the operating device as described, would be optimum due to its overall dimensions and reliability, but it cannot be used given its intrinsic technical structure which results in a longer operating stroke of the partially toothed wheel - rack and therefore also of the closing devices in the various positions.

[0013] The operating device structured in this way cannot therefore be used for this particular operating need of the door or window.

[0014] This specific limitation therefore makes it difficult to rationalise the number of components defining the operating device, always maintaining optimum control manoeuvrability and, above all, limiting the number of models and components necessary according to the various operating requirements on the market which would in fact increase the production and storage costs of companies producing accessories of this type.

[0015] In fact, in patent documents EP 2 784 248, GB 2 399 596, EP 1 008 710 and EP 1 445 407, solutions of operating units are known in which a box shaped body for the gear wheel is configured for this purpose, i.e. with a shaping defining a protrusion or a counter-tooth capable of interfering with the rotation of the gear wheel at a particular point.

[0016] The aim of the invention is to provide an operating device for doors and windows which overcomes the above-mentioned drawbacks of the prior art.

[0017] In particular, the aim of the invention is to provide an operating device for doors and windows which is able to be mounted on doors and windows with different opening methods without the need for structural modifications to the device.

[0018] Said aims are fully achieved by an operating device according to the invention as characterised in the appended claims.

[0019] The main features of the invention will become more apparent from the following detailed description of a preferred, non-limiting embodiment, illustrated purely by way of example in the accompanying drawings, in which:

- Figure 1 is a partly exploded perspective view, with some parts cut away in order to better illustrate others, of an operating device according to the invention applied to a mobile frame or leaf;
- Figure 2 shows a perspective view of the operating device of Figure 1;
- Figure 3 is a side view, with some parts cut away in order to better illustrate others, of the operating de-

vice of the preceding drawings;

- Figures 4 and 5 illustrate two different operating configurations of the operating device of Figure 3 in corresponding scaled-up views.

[0020] With reference to the accompanying drawings, and with particular reference to Figure 1, the operating device according to the invention is applicable on doors and windows, such as doors and windows comprising a fixed frame (not illustrated) and a mobile frame or leaf 1.

[0021] The operating device 100 comprises a box-shaped body 2 shaped to match in a housing in a seat of the leaf 1 (see Figure 1, wherein the operating device is housed in a channel of a profile inside an upright of the leaf 1).

[0022] The operating device 100 also comprises a wheel 3 having a first circular stretch 3a with a smooth surface and a second circular stretch 3b which is toothed and housed in the box-shaped body 2.

[0023] The wheel 3 has a coupling seat 4 which, in use, can be engaged by a shaft 5 of a control grip 6 associated with the movable leaf 1. The shaft 5 of the grip 6 couples with the wheel 3 passing through the box-shaped body 2 having a corresponding seat 7.

[0024] The operating device 100 comprises a rod 8 slidably inserted in the box-shaped body 2 and having its ends, outside the box-shaped body 2, configured to connect, in use, with closing/opening devices (not illustrated) of the movable leaf 1 located on the leaf 1.

[0025] The rod 8 has a relative surface equipped with an operating rack 9 meshing with the second toothed circular stretch 3b of the wheel 3 in such a way as to allow, by rotation of the wheel 3 (on the action of the grip 6, a sliding of the rod 8 which is able to obtain, in succession, and starting from a closed position of the leaf 1 to the fixed frame, a first open position of the leaf 1 from the fixed frame (with a first rotation by 90°) and a second open position of the leaf 1 relative to the fixed frame with a further 90° rotation of the grip 6 (for a total of 180°) different from the previous first opening. Depending on the type of mechanisms present on the leaf 1 (and, if necessary, the type of grip 6) the first opening available may be of the traditional leaf-type and the second opening may be of the transom-type. With other types of mechanisms present on the leaf 1 the first opening may be of the transom-type and the second opening may be of the traditional leaf-type.

[0026] These configurations do not limit the scope of protection of the invention.

[0027] In other words (see also Figure 4), the wheel 3 has the second toothed stretch 3b which extends over an arc of 180° along the wheel 3.

[0028] In this way, the rotation of the wheel 3 allows the sliding of the rod 8 (in both directions and thanks to the rack 9) and carries the closing devices (such as, for example, pins and/or bosses) from a closed position of the leaf 1 (wherein the pins and/or bosses are in contact with contact elements present in the fixed frame) to a first open position, for example, traditional leaf-type (or transom-type) and even to a second position for transom-type opening (or leaf-type opening) of the movable leaf.

[0029] In the case of a leaf-type opening, the pins and/or bosses are moved away from the contact elements, whilst in the case of transom-type opening the pins and/or bosses are positioned in such a way as to activate upper operating arms of the movable leaf to obtain this type of opening.

[0030] The rotation of the grip 6 in the opposite direction determines the opposite reaching of the configurations of the movable leaf 1 described above.

[0031] As illustrated (see Figures 2 to 5), the operating device 100 comprises a slider 10 for selecting and locking the wheel 3 which can be inserted stably inside the box-shaped body 2 through a first through seat 11 made in the box-shaped body 2.

[0032] The slider 10 is positionable radially relative to the wheel 3 (see Figures 2 to 4) and in such a way as to interfere with the rotation of the wheel 3, by abutment with a first tooth 12 of one end of the second toothed circular stretch 3b, and thus limit the rotation of the wheel 3 only between the closed position of the leaf (1) and a single open position of the leaf 1 (and vice versa) between the two first and second open positions.

[0033] In that way, if a single opening is chosen for the movable leaf 1 mounted, it is only possible to limit the rotation of the wheel by 90°.

[0034] Preferably, this limitation of the rotation determines only the traditional leaf-type opening of the door or window (blocking, in fact, the possibility of transom-type opening).

[0035] This does not mean that, for other reasons, the selection of the single opening can only be designed for transom-type opening, blocking the traditional leaf-type, without thereby limiting the scope of protection.

[0036] This solution makes it possible to have a single type of operating device which can be used both for the two types of openings for which it is designed for, but also limited to a single opening (if required) thanks only to the addition of the slider at the time of assembly of the device.

[0037] It should be noted that the box-shaped body 2 has a second seat 13 in which the selecting and locking slider 10 can be selectively housed.

[0038] In this case, the slider 10 may be positioned radially to the wheel 3 and interfere with the rotation of the wheel 3 by contact with a second tooth 14 of the opposite end of the circular toothed sector 3b opposite the previous first end tooth 12.

[0039] This addition is designed to allow the possibility of selecting a single opening (for example of a traditional leaf-type) according to the direction of opening of the movable leaf, that is to say, with a right or left opening direction and thus with the reversing of the direction of rotation of the wheel.

[0040] Preferably, the slider 10 comprises a body 15 for contact with the wheel 3, which can be housed in the

box-shaped body 2, and a gripping portion 16 positioned, in use, outside the box-shaped body 2.

[0041] In light of this, the contact body 15 comprises a surface 17 with a rectilinear extension designed to make contact with a surface of the first or second end tooth 12 or 14 of the wheel 3 and a head end 18 having a curved surface shaped to match which can face a portion of the first circular stretch 3a with a smooth surface of the wheel 3 close to the first or second end tooth 12 or 14.

[0042] It should be noted that the operating device 100 comprises means for fixing the slider 10 to the box-shaped body 2 when the slider 10 is positioned inside the box-shaped body 2.

[0043] In light of this, the fixing means comprise a fixing screw 19 passing through a hole 20 present in the box-shaped body 2 and which can be coupled in a seat 21 made in the slider 10 housed in the box-shaped body 2 in such a way as to lock the position of the housed slider 10.

[0044] In that way, the position and the stabilisation of the slider inside the box-shaped body is ensured.

[0045] It should be noted that the slider 10 is equipped with the seat 21 for fixing in the contact body 15.

[0046] In short, the operating device structured in this way may be mounted without modifications for its operation with two different openings of the leaf, whilst if a single opening is requested (normally, but without limiting the scope of the invention, traditional leaf-type), it is possible to insert the slider to select only a partial rotation of the gear wheel (limited angle) so as to operate a single opening.

[0047] The operating device structured in this way fully achieves the preset aims. Thanks to the possibility of inserting the slider to limit the openings it is possible to maintain a single operating device model without having to vary internal components of the device.

[0048] The mode of selecting the operation of the device is simple, with a reduced cost, and with a high level of reliability.

Claims

1. An operating device for doors and windows comprising a fixed frame and a mobile frame or leaf (1), the operating device (100) comprising:

   - a box-shaped body (2) shaped to match in a housing in a seat of the leaf (1);
   - a wheel (3) having a first circular stretch (3a) having a smooth surface and a second circular stretch (3b) which is toothed and housed in the box-shaped body (2); the wheel (3) having a coupling seat (4) which, in use, can be engaged by a shaft (5) of a control grip (6) associated with the movable leaf (1); the shaft (5) coupling with the wheel (3) passing through a corresponding seat (7) made on the box-shaped body (2);
   - a rod (8) slidably inserted in the box-shaped body (2) and having the relative ends, outside the box-shaped body (2), configured to be connected, in use, to movable closing/opening devices of the leaf (1) located on the leaf (1); the rod (8) having a relative surface equipped with an operating rack (9) meshing with the second circular toothed stretch (3b) of the wheel (3) in such a way as to allow, by rotating the wheel (3), a sliding of the rod (8) which is able to obtain, in succession, and starting from a closed position of the leaf (1) to the fixed frame, a first position of opening of the leaf (1) from the fixed frame and a second position opeining of the leaf (1) relative to the fixed frame different from the previous first opening; **characterised in that** it comprises a slider (10) for selecting and locking the wheel (3) which can be inserted stably inside the box-shaped body (2) through a first through seat (11) made in the box-shaped body (2); the slider (10) being positionable radially relative to the wheel (3) and in such a way as to interfere with the rotation of the wheel (3), by abutment with a first tooth (12) of one end of the second toothed circular stretch (3b), and thus limit the rotation of the wheel (3) only between the closed position of the leaf (1) and a single open position of the leaf (1) between said first and second open positions.

2. The device according to claim 1, wherein the box-shaped body (2) has a second seat (13) in which the selecting and locking slider (10) can be selectively housed in such a way as to be positioned radially to the wheel (3) and interfere with the rotation of the wheel (3) by contact with a second tooth (14) of the opposite end of the second toothed circular stretch (3b) opposite the previous first end tooth (12).

3. The device according to claim 1 or 2, wherein the slider (10) comprises a contact body (15) with the wheel (3), which can be housed in the box-shaped body (2), and a gripping portion (16) positioned, in use, outside the box-shaped body (2).

4. The device according to claim 3, wherein the contact body (15) comprises a surface (17) with a rectilinear extension designed to make contact with a surface of the first or second end tooth (12, 14) of the wheel (3) and a head end (18) having a curved surface shaped to match which can face a portion of the first circular stretch (3a) with a smooth surface of the wheel (3) close to the first or second end tooth (12, 14).

5. The device according to any one of the preceding claims, comprising means for fixing the slider (10) to the box-shaped body (2) when the slider (10) is po-

sitioned inside the box-shaped body (2).

6. The device according to claim 5, wherein the fixing means comprise a fixing screw (19) passing through a hole (20) present in the box-shaped body (2) and which can be coupled in a seat (21) made in the slider (10) housed in the box-shaped body (2) in such a way as to lock the position of the housed slider (10).

7. The device according to claim 6, wherein the slider (10) is equipped with the seat (21) for fixing in the contact body (15).

Fig.2

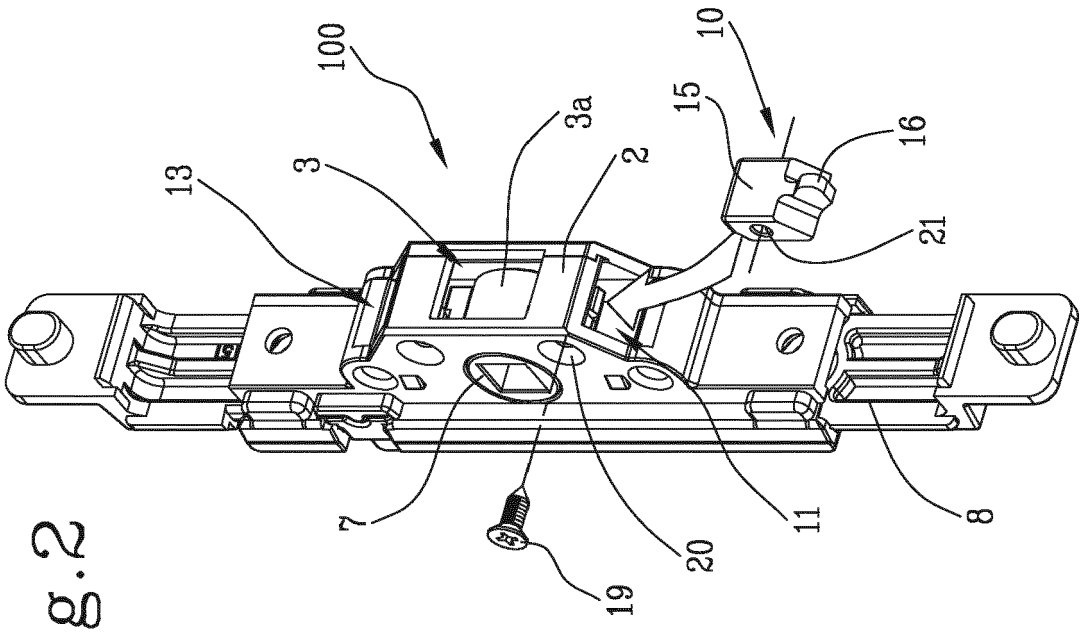
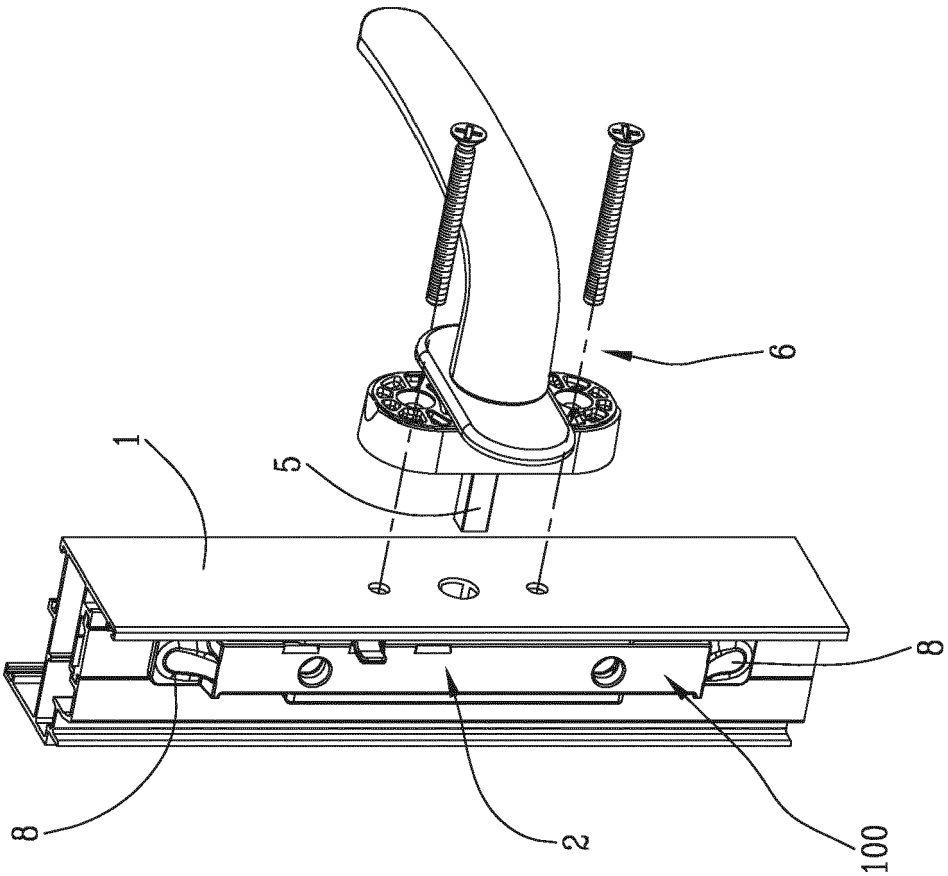


Fig.1



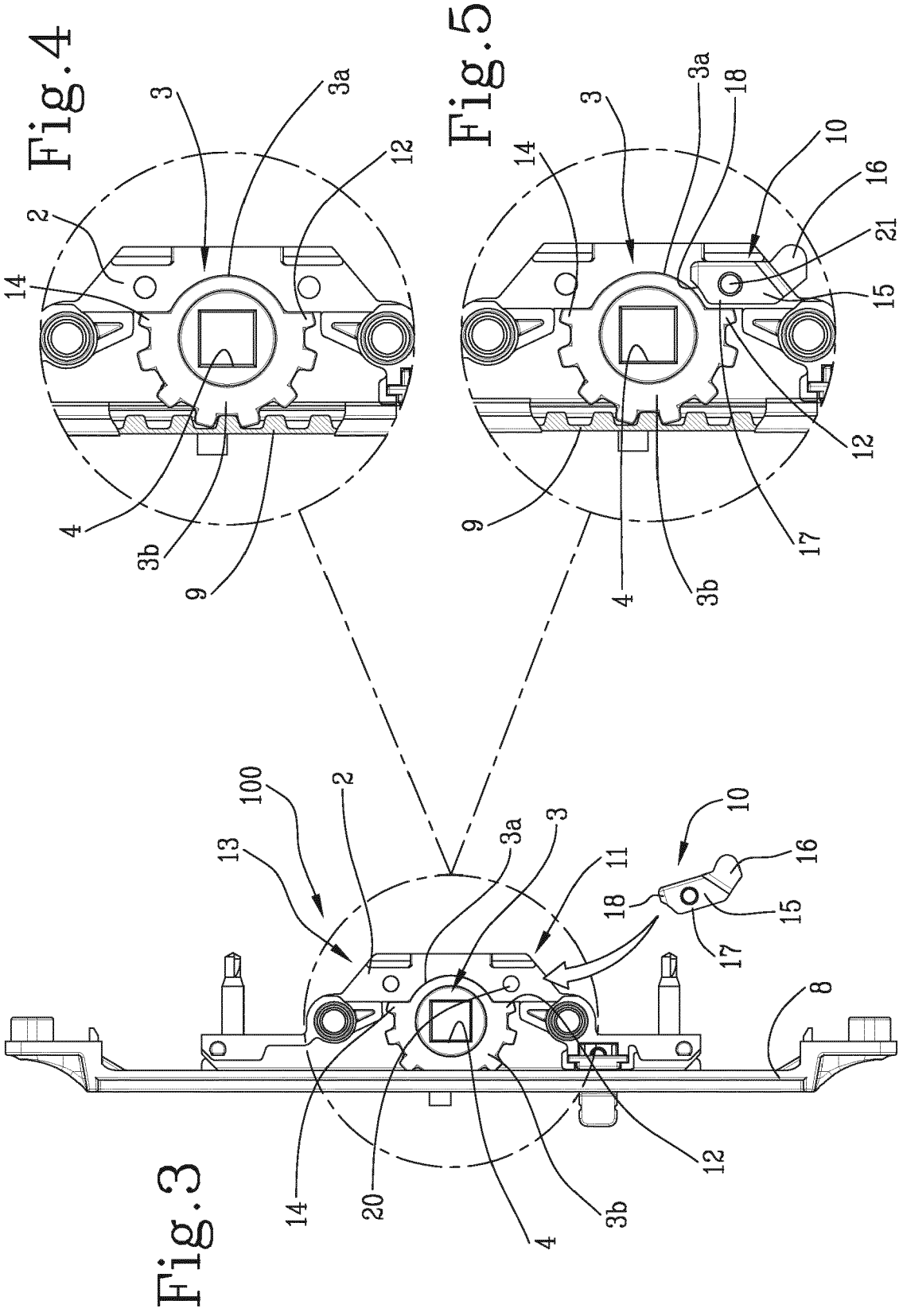


Fig.4
3
3a
12
2
14
4
3b
9
Fig.5
3
3a
18
10
14
16
21
15
12
9
4
3b
17
Fig.3
100
2
13
3a
3
10
11
16
18
15
17
8
14
20
4
3b
12

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 21 20 6006

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	EP 2 784 248 A1 (ROTO FRANK AG [DE]) 1 October 2014 (2014-10-01) * the whole document *	1-7	INV. E05C9/12 E05C9/02
A,D	GB 2 399 596 A (TROJAN HARDWARE & DESIGNS LTD [GB]) 22 September 2004 (2004-09-22) * the whole document *	1-7	
A,D	EP 1 008 710 A1 (FERCO INT USINE FERRURES [FR]) 14 June 2000 (2000-06-14) * the whole document *	1-7	
A,D	EP 1 445 407 A1 (NICO MFG LTD [GB]) 11 August 2004 (2004-08-11) * the whole document *	1-7	
			TECHNICAL FIELDS SEARCHED (IPC)
			E05C

1 The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	4 March 2022	Westin, Kenneth

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 21 20 6006

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

04-03-2022

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2784248 A1	01-10-2014	EP 2784248 A1	01-10-2014
		EP 2808466 A2	03-12-2014
		PL 2784248 T3	31-03-2016
		PL 2808466 T3	28-02-2017
		RU 2014111452 A	27-09-2015
GB 2399596 A	22-09-2004	NONE	
EP 1008710 A1	14-06-2000	DE 69931585 T2	22-02-2007
		EP 1008710 A1	14-06-2000
		FR 2786803 A1	09-06-2000
EP 1445407 A1	11-08-2004	NONE	

EPO FORM P0459

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

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 2784248 A **[0015]**
- GB 2399596 A **[0015]**
- EP 1008710 A **[0015]**
- EP 1445407 A **[0015]**