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## (54) Vehicle door handle

(57) A vehicle door handle (1) has a connecting body (2) having a seat (8) extending along an axis (A); a lock assembly (3) insertable inside the seat (8) in a direction (D) parallel to the axis (A), and having at least one tooth (19) extending crosswise to the aforementioned direction (D); and a ring nut (20), which has a stop wall extending inside the seat (8), and rotates about the axis (A) between a first position permitting insertion of the lock assembly (3) and the tooth (19), and a second position wherein the stop wall clamps the tooth (19) in the aforementioned direction (D).

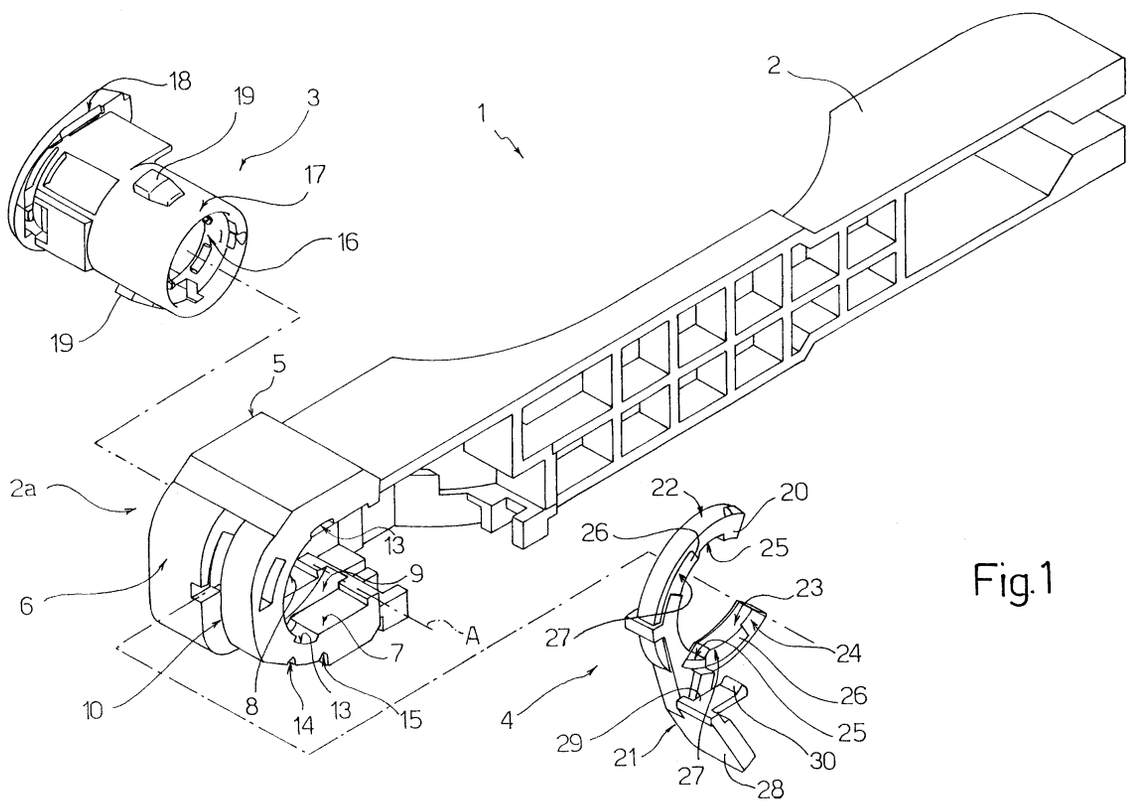


Fig.1

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## Description

**[0001]** The present invention relates to a vehicle door handle.

**[0002]** In particular, the present invention relates to an outside handle of the type comprising a connecting body fitted inside a vehicle door; a lever hinged to the connecting body and operated by a user to release a lock mechanism on the door; and a lock assembly inserted inside a hole in the door and inside the connecting body.

**[0003]** This type of handle is normally fitted to the door by fixing the connecting body to a wall inside the door, and then fitting the connecting body with the lever and the lock assembly, which have respective portions on the outside of the wall. The lock assembly is inserted in a given direction through a hole in the wall and inside a seat formed in the connecting body, where it is clamped by means of a screw, which extends crosswise to said given direction and clamps the lock assembly inside the seat.

**[0004]** The screw, which is turned by a fitter, normally using a small Allen wrench, to clamp or release the lock assembly, extends through one end of the connecting body located close to said wall and to a further wall on the door supporting the door lock mechanism. The location of the screw therefore leaves very little space in which to tighten and loosen the screw, so that fitting and removing the lock assembly to and from the connecting body is an extremely time-consuming job.

**[0005]** It is an object of the present invention to provide a vehicle door handle designed to eliminate the aforementioned drawback of the known state of the art.

**[0006]** According to the present invention, there is provided a vehicle door handle comprising a connecting body having a seat extending along an axis; a lock assembly having a portion insertable inside said seat in a given direction parallel to the axis; and clamping means for clamping said lock assembly releasably inside said seat; said handle being characterized in that said portion comprises a tooth extending crosswise with respect to said given direction; said clamping means comprising a ring nut which rotates about said axis between a first position permitting insertion of said lock assembly and said tooth, and a second position for clamping said tooth in said direction.

**[0007]** The lock assembly clamping means of known handles fail to provide for clamping the lock assembly to the door, so that water seeps inside the door with all the obvious drawbacks this entails.

**[0008]** In a preferred embodiment of the invention, there is provided a handle as claimed in Claim 1, characterized in that said ring nut is housed inside a further seat in said connecting body, and comprises at least one wedge located on a lateral surface of said ring nut and which engages said tooth so as to push said tooth in said given direction by rotating the ring nut about the axis.

**[0009]** A non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows an exploded view of a preferred embodiment of the handle according to the invention;
Figure 2 shows a section of the Figure 1 handle;
Figure 3 shows a plan view of the Figure 1 handle fitted to a door.

**[0010]** With reference to Figures 1, 2 and 3, number 1 indicates an outside handle of a vehicle. With reference to Figure 3, handle 1 is fitted to a door P comprising a wall P1, and a wall P2 fitted with a known lock mechanism not shown.

**[0011]** Handle 1 comprises a connecting body 2 which is fitted to wall P1; a known lever (not shown) hinged to connecting body 2 and operated, in use, by a user to release the known lock mechanism (not shown); a lock assembly 3 which is inserted inside connecting body 2; and a clamping member 4 designed to assume a clamping position and a release position to clamp and release lock assembly 3 to and from connecting body 2.

**[0012]** Connecting body 2 comprises a shell 5 located at one end 2a of connecting body 2 at the corner formed by walls P1 and P2, and which comprises an outer surface 6, and an inner surface 7 defining a through cavity 8 extending axially along an axis A and for housing lock assembly 3.

**[0013]** Shell 5 also comprises a seat 9, which extends about axis A, enables clamping member 4 to be housed partly inside cavity 8, and in turn comprises an opening 10, and two grooves 11 and 12, which are in the form of sectors of axis A, and are aligned with and extend on opposite sides of opening 10. Opening 10 extends through shell 5, between outer surface 6 and inner surface 7, and permits insertion of clamping member 4 inside cavity 8.

**[0014]** Shell 5 comprises two grooves 13 extending parallel to axis A along inner surface 7 and along the full length of cavity 8; and two cavities 14 and 15 located along outer surface 6 and which are engaged by clamping member 4 to secure clamping member 4 firmly in the clamping and release positions respectively.

**[0015]** Lock assembly 3 comprises a cylinder 16, and is defined by a portion 17 which is housed inside cavity 8, and by a portion 18 which rests against wall P1 in the clamping position. Portion 17 is defined by a substantially cylindrical surface, from which extend radially two teeth 19, each of which slides inside a respective groove 13 when lock assembly 3 is inserted inside or removed from cavity 8.

**[0016]** Clamping member 4 comprises a ring nut 20 and a lever 21 integral with ring nut 20.

**[0017]** Ring nut 20 is in the form of a sector and, in use, is inserted inside seat 9 through opening 10 and extends partly inside cavity 8 to partly surround portion 17.

**[0018]** As shown more clearly in Figure 2, ring nut 20

is fitted prismatically to grooves 11 and 12, and is guided by grooves 11 and 12 so as to rotate about axis A.

**[0019]** Ring nut 20 comprises a curved outer surface 22; a curved inner surface 23; two flat lateral surfaces 24; and two slots 25 extending between the two opposite lateral surfaces 24 at inner surface 23. At each slot 25, ring nut 20 also comprises a respective wedge 26 integral with a lateral surface 24 and having a face 27, which extends from an edge of respective slot 25 flush with lateral surface 24, and slopes with respect to lateral surface 24 by an angle of 2 to 20 degrees.

**[0020]** Lever 21 extends from outer surface 22 of ring nut 20, projects from opening 10 in use, and comprises a laminar member 28 which is engaged by the user to move clamping member 4 to or from the clamping or release position; and an elastic retaining member 29 projecting from laminar member 28 and having, on the free end, a tooth 30 for engaging cavity 14 when ring nut 20 is in the clamping position, and cavity 15 when ring nut 20 is in the release position.

**[0021]** In actual use, commencing from an initial condition in which lock assembly 3 and connecting body 2 are separate, ring nut 20 of clamping member 4 is inserted inside seat 9 through opening 10, and opposite portions of ring nut 20 are inserted inside respective grooves 11 and 12. Ring nut 20 is guided by grooves 11 and 12 and rotated about axis A so that tooth 30 of retaining member 29 engages cavity 15 and slots 25 are aligned with respective grooves 13 along axis A. At this point, lock assembly 3 is inserted inside cavity 8 in a direction D parallel to axis A by sliding teeth 19 along grooves 13 and through slots 25 so that ring nut 20 is positioned between teeth 19 and portion 18 of lock assembly 3, which, in this position, substantially rests against wall P1 of door P.

**[0022]** Once lock assembly 3 is inserted as described above, clamping member 4 is rotated about axis A by the user lifting laminar member 28 so as to push teeth 19, by means of respective wedges 26, in direction D and so clamp portion 18 of lock assembly 3 against wall P1, preferably with the interposition of a seal. The clamping position is then secured by tooth 30 of retaining member 29 engaging cavity 14 to prevent any accidental rotation of clamping member 4.

**[0023]** To remove lock assembly 3 from connecting body 2, tooth 30 is simply released from cavity 14 and clamping member 4 rotated in the opposite direction using laminar member 29, so that slots 25 are once more aligned with grooves 13, thus enabling lock assembly 3 to be withdrawn from cavity 8 in direction D.

**[0024]** Lock assembly 3 is therefore assembled and disassembled extremely easily by simply pressing lightly on laminar member 28 of lever 21. Moreover, the action of wedges 26 on teeth 19 of lock assembly 3 ensures portion 18 of lock assembly 3 rests perfectly in fluidtight manner against wall P1 of the vehicle, or against a seal interposed between portion 18 and wall P1.

**[0025]** Clearly, changes may be made to the handle as described herein without, however, departing from the scope of the accompanying Claims.

**[0026]** For example, teeth 19 may be of a different number from that described, and may be carried by a cover layer about portion 17, or by a ring fixed firmly about portion 17.

**[0027]** Moreover, lever 21 may be formed otherwise than as described without, however, affecting the ease with which the clamping member is operated by the user.

## Claims

1. A vehicle door handle (1) comprising a connecting body (2) having a seat (8) extending along an axis (A); a lock assembly (3) having a portion (17) insertable inside said seat (8) in a given direction (D) parallel to the axis (A); and clamping means (4) for clamping said lock assembly (3) releasably inside said seat (8); said handle being characterized in that said portion (17) comprises a tooth (19) extending crosswise with respect to said given direction (D); said clamping means (4) comprising a ring nut (20) which rotates about said axis (A) between a first position permitting insertion of said lock assembly (3) and said tooth (19), and a second position for clamping said tooth (19) in said direction (D).

2. A handle as claimed in Claim 1, characterized in that said ring nut (20) is housed inside a further seat (9) in said connecting body, and comprises at least one wedge (26) located on a lateral surface (24) of said ring nut (20) and which engages said tooth (19) so as to push said tooth (19) in said given direction (D) by rotating the ring nut (20) about the axis (A).

3. A handle as claimed in Claim 2, characterized in that said ring nut (20) comprises a slot (25) permitting passage of said tooth (19); said wedge (26) being located at said slot (25).

4. A handle as claimed in any one of the foregoing Claims, characterized in that said clamping means (4) comprise control means (21) for rotating said ring nut (20) about said axis (A).

5. A handle as claimed in Claim 4, characterized in that said control means (21) comprise a laminar member (28) engaged by a user and projecting from said connecting body (2); and a retaining member (29) for retaining said clamping means (4) in said first or said second position.

6. A handle as claimed in any one of the foregoing Claims, characterized in that said seat (8) comprises at least one groove (13) engaged in sliding man-

ner by said tooth (19) to guide said lock assembly (3) in said direction (D) and prevent rotation of said lock assembly (3) about the axis (A).

**7.** A handle as claimed in Claims 3 and 6, characterized in that said slot (25) is alignable with said groove (13) along the axis (A) to permit assembly and disassembly of said lock assembly (3).

**8.** A handle as claimed in any one of the foregoing Claims, characterized in that said lock assembly (3) comprises two teeth (19); said seat (8) comprising two grooves (13) parallel to each other and to the axis (A) and which are engaged by said teeth; and said ring nut (20) comprising two slots (25) alignable with the respective grooves (13), and two wedges (26) located on a lateral surface (24) of said ring nut (20) and which engage said teeth (19) so as to push said teeth (19) in said given direction (D).

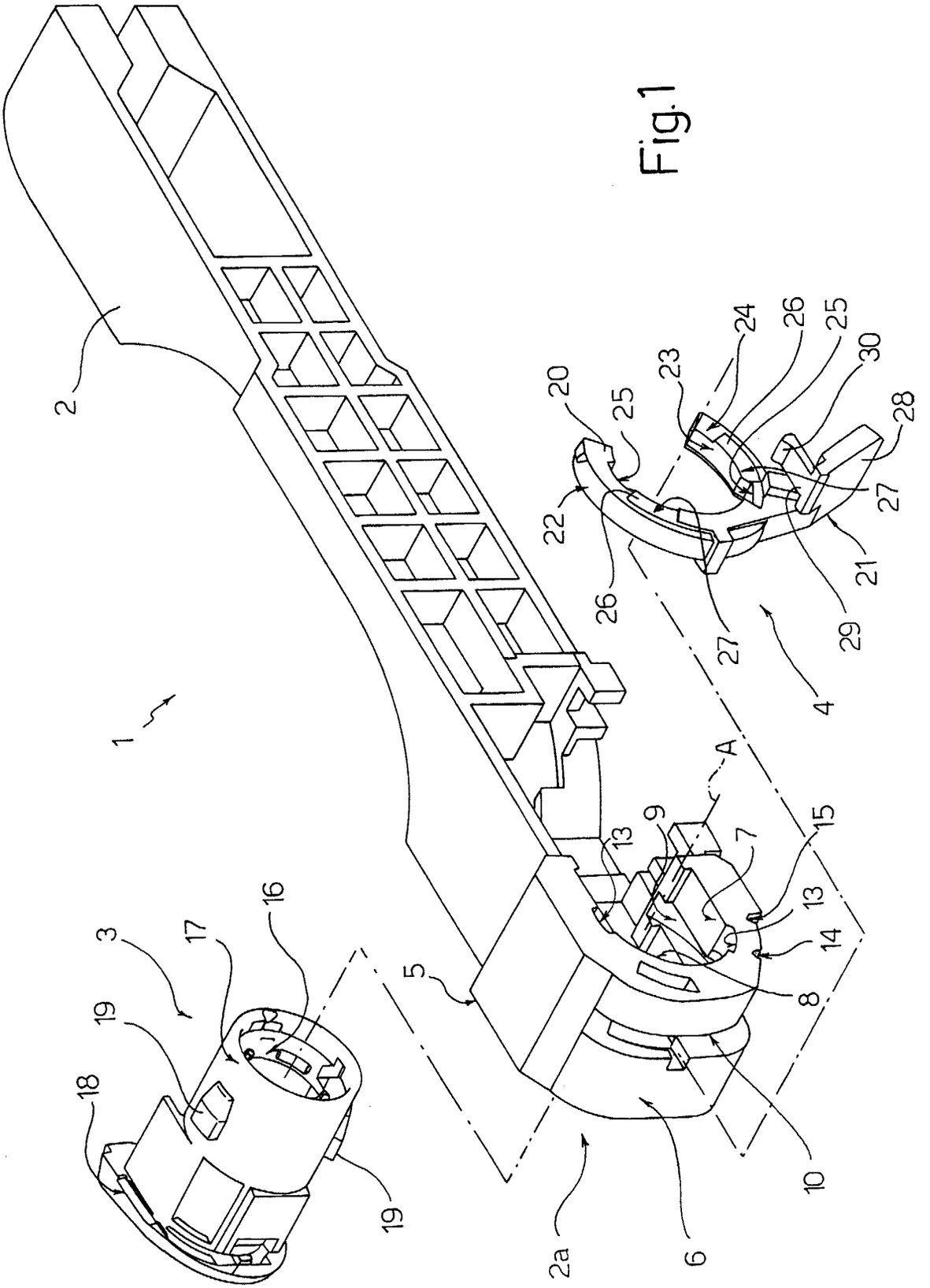
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Fig.1

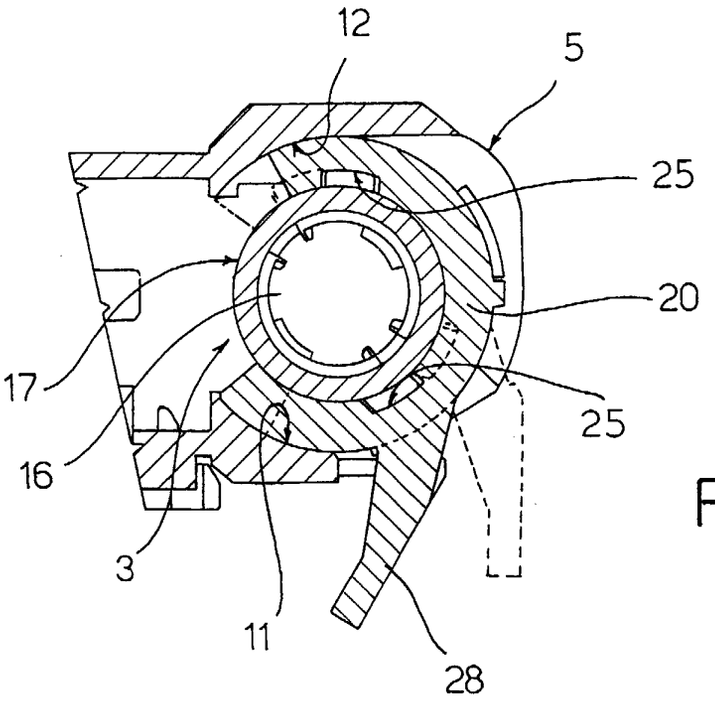
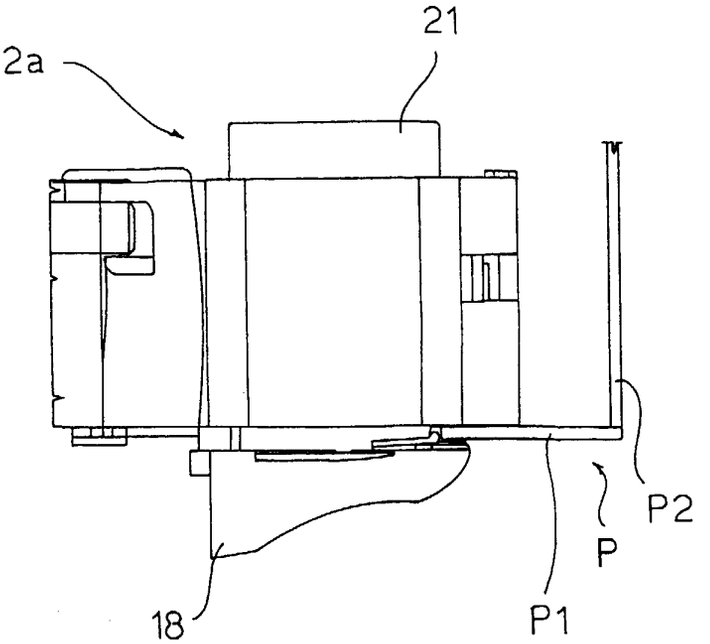



Fig.2

Fig.3



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# EUROPEAN SEARCH REPORT

Application Number
EP 00 12 4657

## DOCUMENTS CONSIDERED TO BE RELEVANT

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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 | 2 March 2001 | Vacca, R |

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