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(54) **Handle for vehicle doors with improved grip**

(57) Vehicle handle, which comprises a grip (7) provided with an appendix (8) protruding into a frame (1) and inserted in a seat (13) of a counterweight (3) which is pivoted to the frame (1) for rotating around a first axis

(5), wherein a mobile member (15) is mechanically connected to a threaded cursor (19) which can be driven by a screw (20) for moving the mobile member (15) into an opening (16) made in the appendix (8), so as to mechanically connect the grip (7) to the counterweight (3).

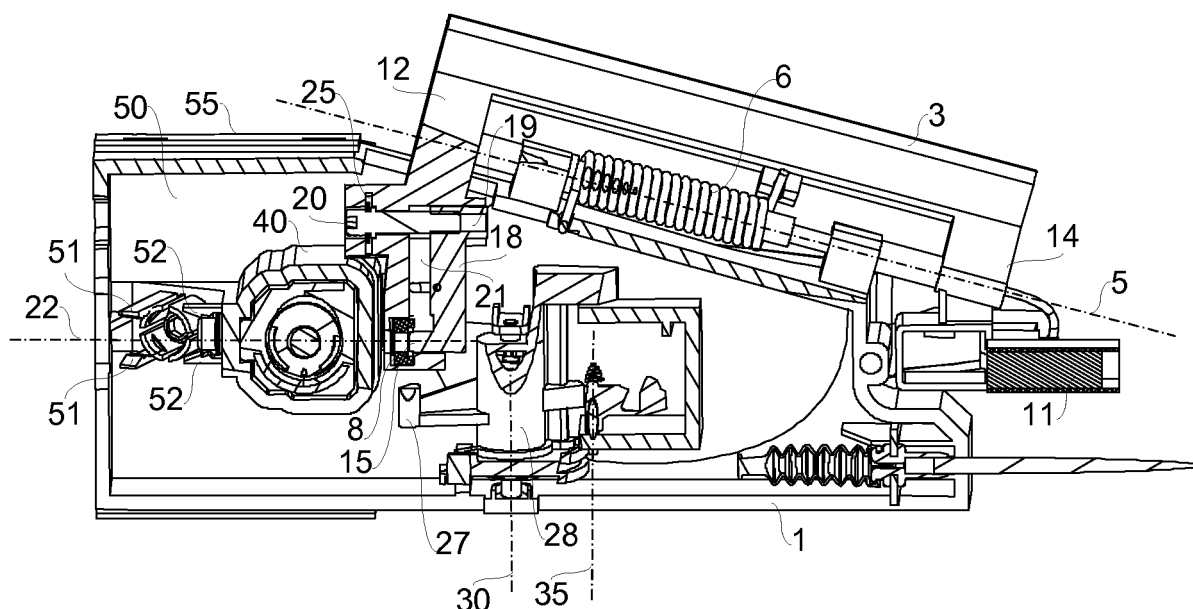


Fig.4

Description

[0001] The present invention relates to a handle for vehicle doors, and in particular a handle with an improved grip which can be pulled for unlocking and simultaneously opening the door of a motor vehicle.

[0002] Known vehicle handles comprise a grip provided with an appendix which protrudes into a frame and is mechanically connected to a counterweight pivoted to the frame. The grip is fixed to the counterweight by means of a screw after the frame has been mounted behind the outer surface of a door. Since the access to the frame is limited by the structure of the door, said screw can be easily rotated only if the door is still free from the lock, which is then mounted last. For this reason, locks are covered by caps separate from the grip, however with an unaesthetic gap.

[0003] It is therefore an object of the present invention to provide a handle, which is free from said disadvantages. Said object is achieved with a handle, whose main features are disclosed in the first claim, while other features are disclosed in the remaining claims.

[0004] Thanks to the particular fixing system of the grip to the counterweight, the grip of the handle according to the present invention can be fixed to the counterweight or removed from the latter in a simple and fast manner by rotating a screw arranged in an easily accessible position, even if the mobile member is covered by the lock. With this arrangement, the lock can be mounted in the handle before fixing the grip, which can then cover the outer portion of the lock, with consequent aesthetic advantages.

[0005] The fixing system is also resistant to forces greater than 2000 N and is provided with arrangements for preventing the handle assembly and/or disassembly in an incorrect manner, for example with a loss of parts.

[0006] The particular arrangement and shape of the handle parts, in particular of the counterweight, makes the handle very safe in case of impacts, since the grip is well balanced by the counterweight.

[0007] Further advantages and features of the handle according to the present invention will become clear to those skilled in the art from the following detailed and non-limiting description of an embodiment thereof with reference to the attached drawings, wherein:

- figure 1 shows a front view of the handle;
- figure 2 shows a top view of the handle of figure 1;
- figure 3 shows a bottom view of the handle of figure 1;
- figure 4 shows section IV-IV of figure 3;
- figure 5 shows a first perspective view of the handle of figure 1;
- figure 6 shows section VI-VI of figure 5;
- figure 7 shows a rear view of the handle of figure 1;
- figure 8 shows section VIII-VIII of figure 7;
- figure 9 shows a second perspective view of the handle of figure 1; and
- figure 10 shows an exploded view of the handle of

figure 1.

[0008] Referring to figures 1 to 10, it is seen that the handle according to the present invention comprises in a known way a frame 1 suitable to be fixed behind the outer surface of a door 2 (shown with broken lines in figures 2, 6 and 8) of a motor vehicle. A substantially C-shaped counterweight 3 is pivoted to a side of frame 1 through a shaft 4 for rotating around a first axis 5. Elastic means 6, in particular a helical spring coaxially inserted on shaft 4, urge counterweight 3 toward a rest position. A grip 7 is mechanically connected to counterweight 3 by means of an appendix 8 protruding into frame 1 and a shaped extension 9 inserted in a corresponding seat 10 of counterweight 3. A connector 11 is integral with shaped extension 9 of grip 7 for the connection to electric and/or electronic devices arranged in grip 7.

[0009] Counterweight 3 comprises a first arm 12 provided with a seat 13 for appendix 8 and a second arm 14 provided with seat 10 for shaped extension 9. First axis 5 is arranged between counterweight 3 and seats 10, 13 for shaped extension 9 and appendix 8. Thanks to this mechanical connection between counterweight 3 and grip 7, the latter rotates around first axis 5 together with counterweight 3, which balances the weight of grip 7, so as to move the centre of gravity of the whole toward first axis 5.

[0010] Appendix 8 is locked in its seat 13 by means of a substantially cylindrical-shaped mobile member 15 which acts as a latch for being engaged in a circular opening 16 made in appendix 8 (figures 4 and 8 show mobile pin 15 before penetrating opening 16). Mobile member 15, in its locking position, is engaged also in an opening 17 made in seat 13 for appendix 8. Mobile member 15 is mechanically connected, in particular through a bar 18, to a substantially cylindrical-shaped threaded cursor 19, which can be driven by a screw 20 for moving mobile member 15. Threaded cursor 19 is arranged in a substantially cylindrical seat 21 made in the first arm 12 of counterweight 3. By rotating screw 20, threaded cursor 19 slides in seat 21, so as to move mobile member 15 by means of bar 18 with a translatory movement along a second axis 22 which forms an angle comprised between 0° and 30° with first axis 5. Second axis 22 is also substantially parallel to longitudinal axis of grip 7. In other embodiments of the invention, mobile member 15 can engage opening 16 of appendix 8 with a rotary or rotary-translatory movement, always by means of screw means mechanically connected to mobile member 15.

[0011] The movement of mobile member 15 is limited by a pin 23 which is inserted in a hole made in bar 18 and can transversally slide between two ends of a first slit 24 made in first arm 12 of counterweight 3. The head of screw 20 is instead provided with a groove for a stop ring 25 (Seeger) inserted in a second slit 26 made in first arm 12 of counterweight 3, so as to prevent the longitudinal sliding of screw 20 during its rotation.

[0012] First arm 12 of counterweight 3 is engaged with

a tongue 27 of a rocker 28 which is pivoted to frame 1 or to a member integral therewith by means of a pin 29, so that the rotation of grip 7 around first axis 5 causes the rotation of rocker 28 around a third axis 30 substantially perpendicular to second axis 22 and the simultaneous pulling of a cable 31 connected to the unlocking mechanism of door 2. Elastic means 32, in particular a helical spring coaxially inserted in rocker 28, urge the latter toward a rest position.

[0013] An inertial safety device comprises an inertial mass 33 pivoted to frame 1 by means of a pin 34 for rotating around a fourth axis 35 substantially parallel to third axis 30. Elastic means 36, in particular a helical spring coaxial to pin 34, act on inertial mass 33 for opposing to its rotation in case of accelerations acting on the latter. A stop member 37 protrudes from inertial mass 33 for intercepting a projection 38 which protrudes from rocker 11 on the side opposite to tongue 27, so as to prevent the rotation of rocker 28, and thus the opening of door 2, in case of impact. Inertial mass 33 is covered by a cover 39 (not shown in figure 9) fixed to frame 1.

[0014] Frame 1 is provided with a seat 40 for housing a lock 41. Second axis 22 crosses seat 40 and is substantially perpendicular to lock 41. An outer portion of lock 41 protrudes from frame 1 and is covered by grip 7, in particular by a cavity 42 made in grip 7, which can be provided with an opening for inserting a key into lock 41. Frame 1 is provided with one or more holes 43, 44 for screws 45, 46 to be screwed into threaded holes 47, 48 made in lock 41, so that frame 1 is comprised between the heads of screws 45, 46 and lock 41. In particular, a first hole 43 is made in a wall of a shaped portion 49 of frame 1, which wall is inclined with an angle comprised between 0° and 45° with respect to an outer wall 50 of frame 1 crossed by lock 41 and suitable for being arranged adjacent to the inner surface of door 2. A second hole 44 is made in seat 40 for lock 41. The inner surface of outer wall 50 of frame 1 is provided with one or more stops 51, 52 suitable for retaining screws 45, 46 in holes 43, 44. Holes 43 and/or 44 are provided with metal bushings 53, 54 crossed by screws 45, 46

[0015] A metal cover 55 provided with an opening 56 for lock 41 is fixed on outer wall 50 of frame 1 by means of one or more snap couplings 57, 58 arranged along the sides of metal cover 55 and frame 1. A gasket 59 can be arranged between metal cover 55 and a flange 60 made in the outer portion of lock 41. Screw 45 crossing first hole 43 of frame 1 crosses also a hole 61 made in a shaped portion 62 of metal cover 55 which has substantially the same shape of shaped portion 49 of frame 1. Metal cover 55 can be provided with further holes 63 for being fixed to outer wall 50 of frame 1 by means of self-tapping screws.

[0016] The handle according to the present invention is applied to door 2 without grip 7 and lock 41, after which lock 41 is inserted from the outside into its seat 40 of frame 1 and is fixed to the latter by tightening screws 45, 46. Bushings 53, 54 contact with lock 41, thereby forming

a single metal block. After lock 41 is fixed, shaped extension 9 and appendix 8 of grip 7 are inserted into seats 10 and 13, respectively, of counterweight 3, after which screw 20 is rotated so that mobile member 15 penetrates into opening 16 of appendix 8 and into opening 17 of counterweight 3, so as to carry out the mechanical connection between grip 7 and counterweight 3.

[0017] Possible modifications and/or additions may be made by those skilled in the art to the hereinabove disclosed and illustrated embodiment while remaining within the scope of the following claims.

Claims

1. Vehicle handle, which comprises a grip (7) provided with an appendix (8) protruding into a frame (1) and inserted in a seat (13) of a counterweight (3) which is pivoted to the frame (1) for rotating around a first axis (5), **characterized in that** a mobile member (15) is mechanically connected to a threaded cursor (19) which can be driven by a screw (20) for moving the mobile member (15) into an opening (16) made in the appendix (8), so as to mechanically connect the grip (7) to the counterweight (3).
2. Handle according to the previous claim, **characterized in that** the seat (13) of the appendix (8) is provided with an opening (17) for the mobile member (15).
3. Handle according to one of the previous claims, **characterized in that** the mobile member (15) is connected through a bar (18) to the threaded cursor (19).
4. Handle according to the previous claim, **characterized in that** the movement of the mobile member (15) is limited by a pin (23) which is inserted in a hole made in the bar (18) and can slide transversally between two ends of a slit (24) made in the counterweight (3).
5. Handle according to one of the previous claims, **characterized in that** the threaded cursor (19) is arranged in a seat (21) made in the counterweight (3), so that by rotating the screw (20) the threaded cursor (19) slides in the seat (21).
6. Handle according to one of the previous claims, **characterized in that** the mobile member (15) can move along a second axis (22).
7. Handle according to the previous claim, **characterized in that** the second axis (22) forms an angle comprised between 0° and 30° with the first axis (5).
8. Handle according to claim 6 or 7, **characterized in**

that the second axis (22) is substantially parallel to the longitudinal axis of the grip (7).

9. Handle according to one the previous claims, **characterized in that** the screw (20) is provided with a groove for a stop ring (25) inserted in a slit (26) made in the counterweight (3), so as to prevent the longitudinal sliding of the screw (20) during its rotation. 5
10. Handle according to one of the previous claims, **characterized in that** the seat (13) for the appendix (8) is made in an arm (12) protruding from the counterweight (3), wherein the first axis (5) is arranged between the counterweight (3) and this seat (13). 10
11. Handle according to one of the previous claims, **characterized in that** the frame (1) is provided with a seat (40) for housing a lock (41). 15
12. Handle according to the previous claim, **characterized in that** the second axis (22) crosses said seat (40). 20
13. Handle according to claim 11 or 12, **characterized in that** an outer portion of the lock (41) protrudes from the frame (1) and is covered by the grip (7). 25

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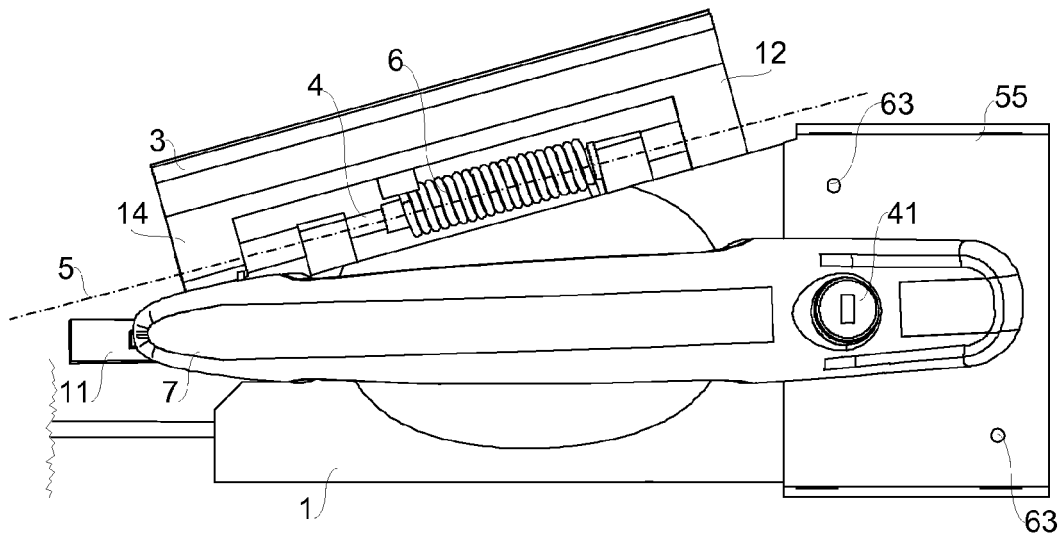


Fig.1

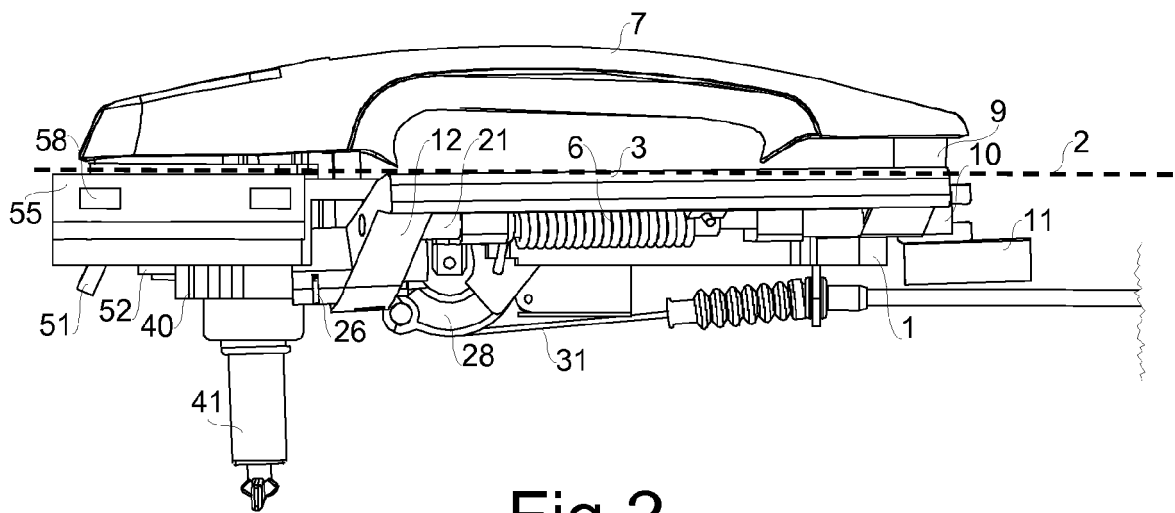


Fig.2

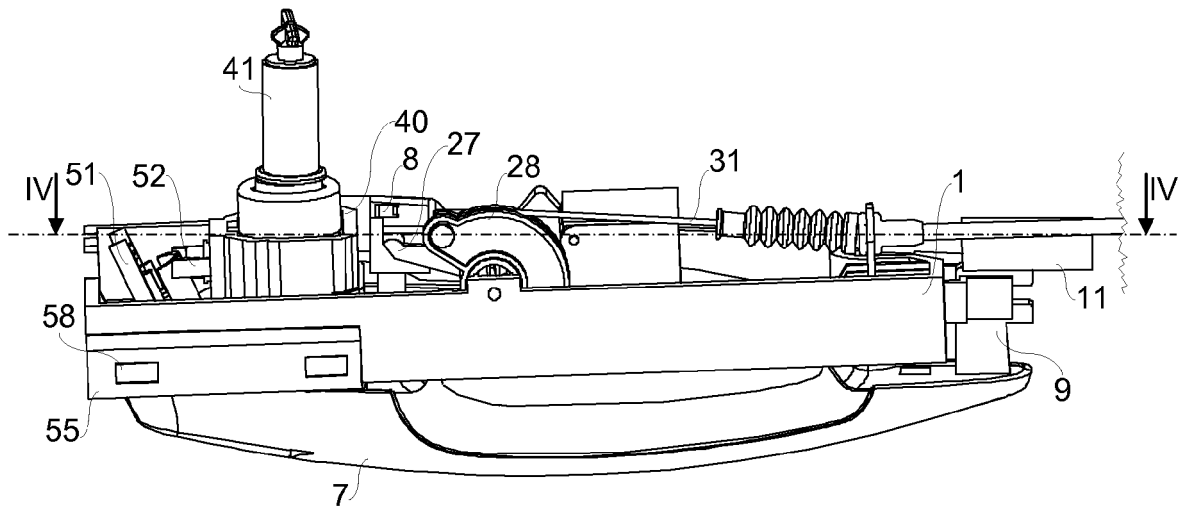


Fig.3

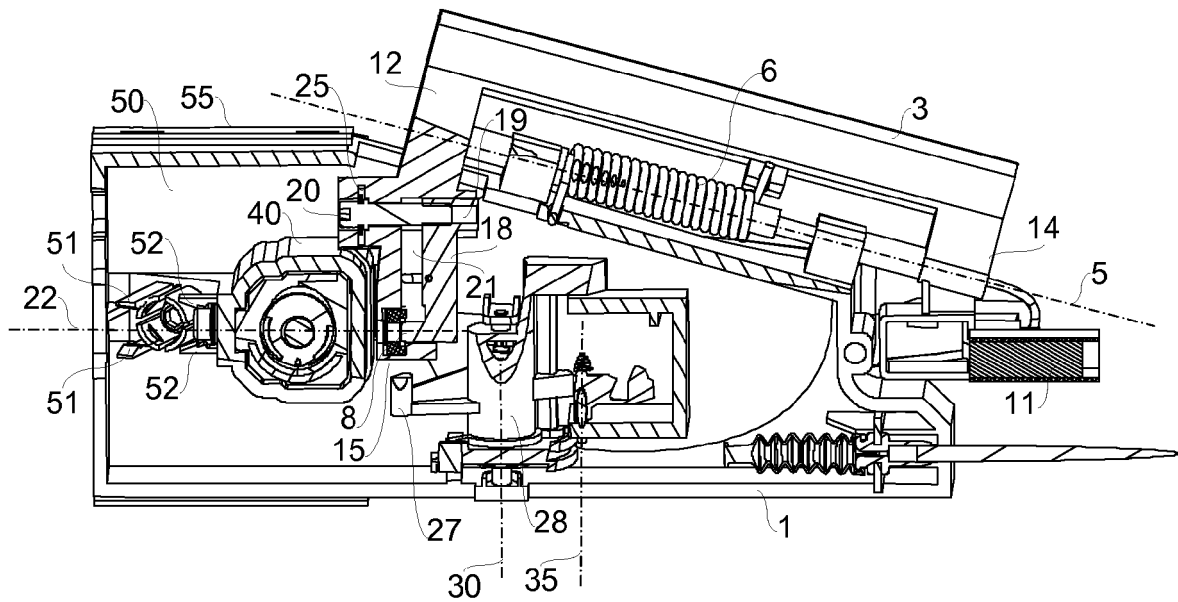


Fig.4

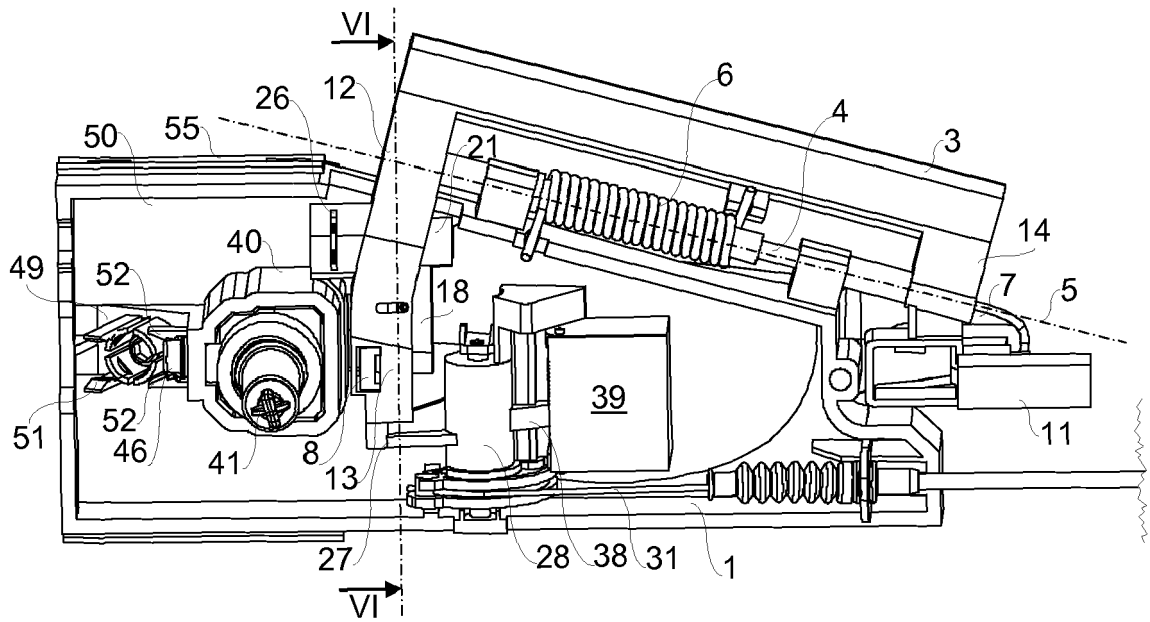


Fig.5

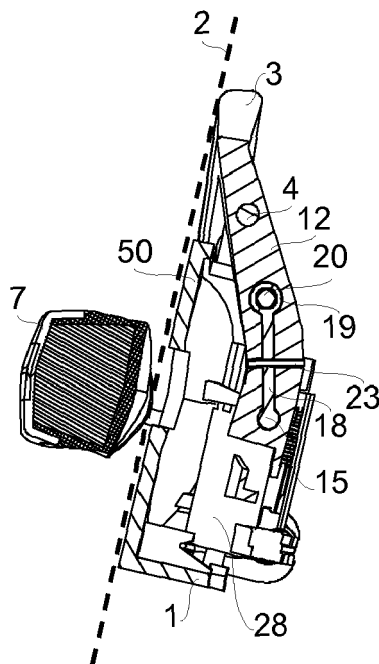


Fig.6

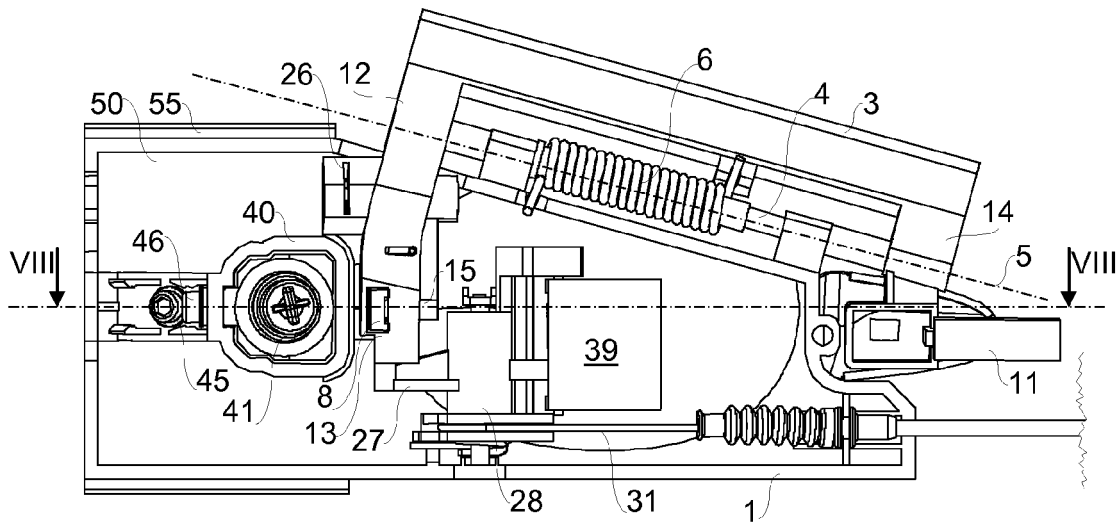


Fig.7

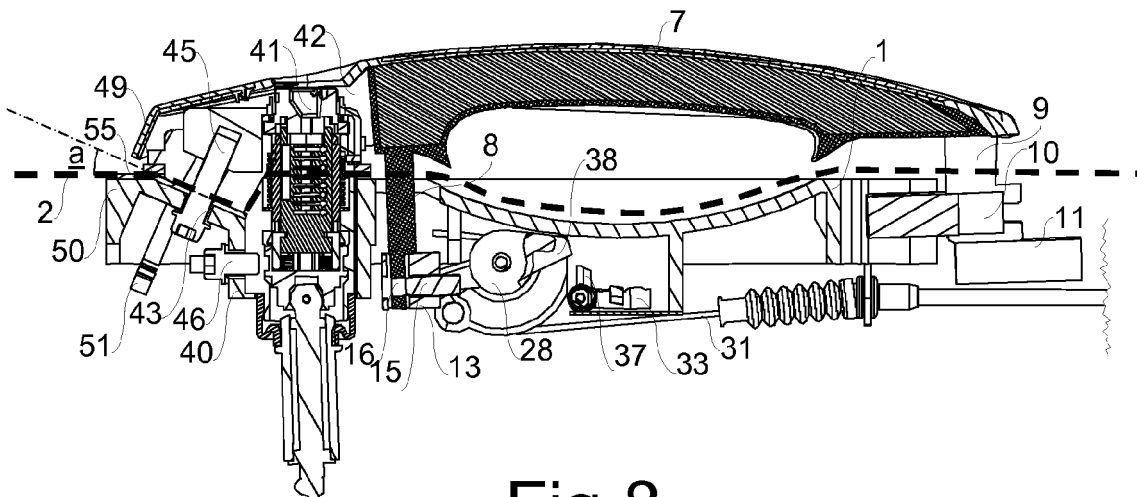


Fig.8

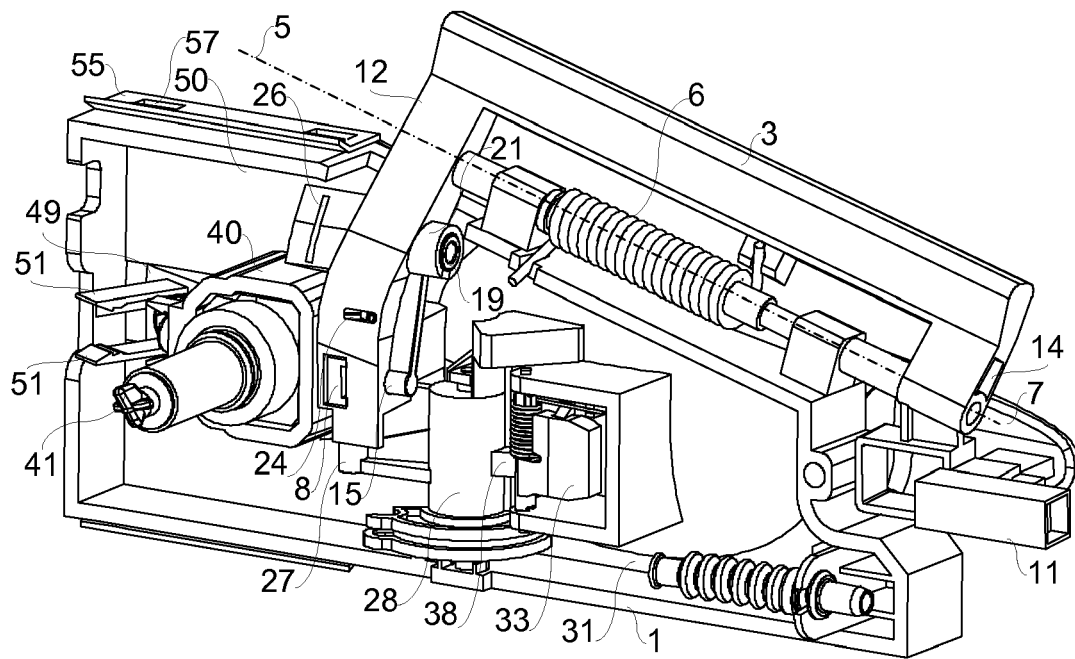


Fig.9

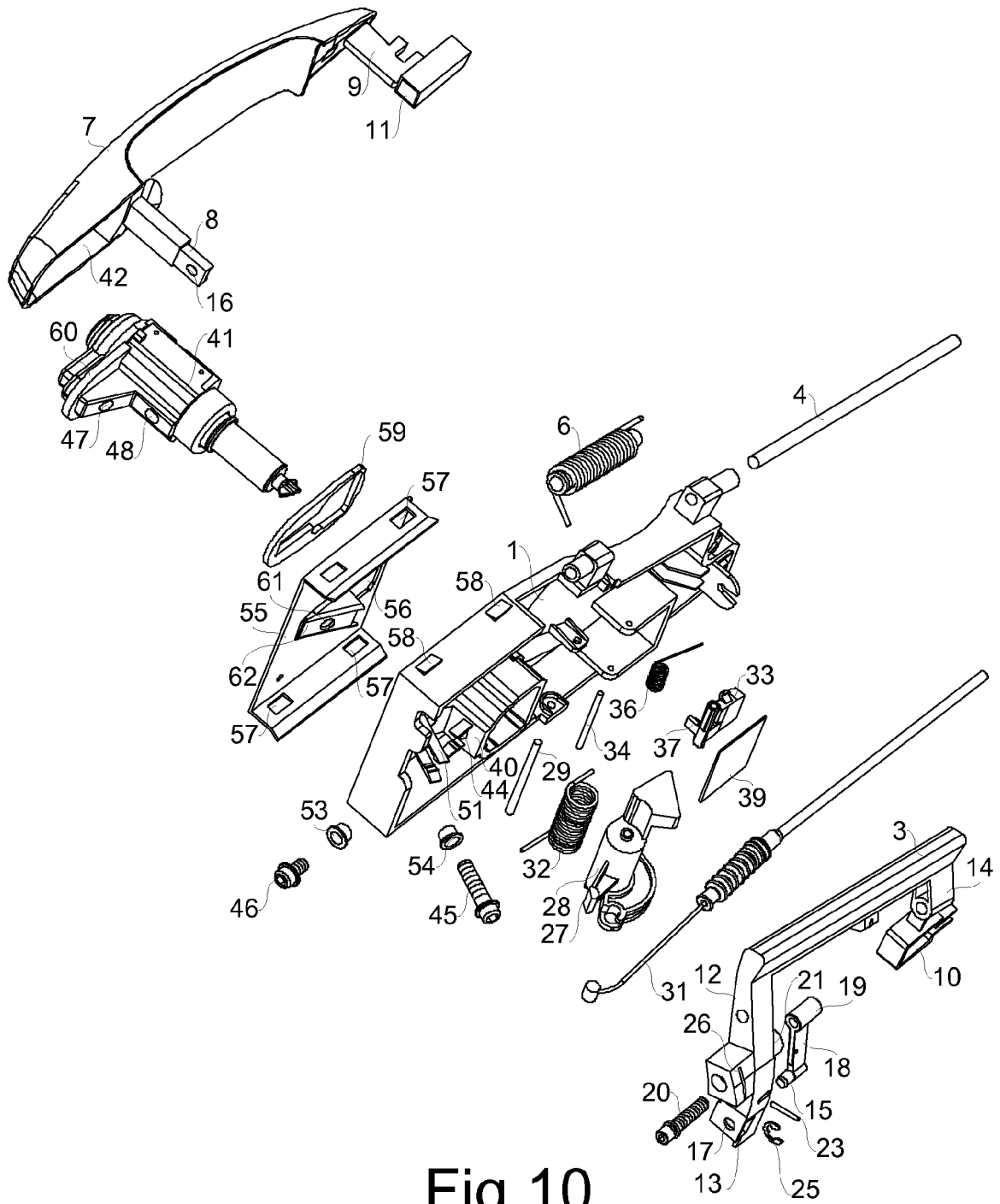


Fig.10



EUROPEAN SEARCH REPORT

Application Number
EP 09 17 0036

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	US 2001/035656 A1 (STUART DAVID R [US] ET AL STUART DAVID R [US] ET AL) 1 November 2001 (2001-11-01) * the whole document *	1-13	INV. E05B65/12 E05B65/20
A	DE 44 05 383 A1 (YMOS AG IND PRODUKTE [DE]) 6 April 1995 (1995-04-06) * the whole document *	1-13	
			TECHNICAL FIELDS SEARCHED (IPC)
			E05B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 16 November 2009	Examiner Wagner, A
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			

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EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 09 17 0036

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16-11-2009

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