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(54) **Vehicle door handle**

Türgriff für Kraftfahrzeug

Poignée de véhicule automobile

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## Description

**[0001]** The present invention relates to a vehicle door handle, and in particular to a handle comprising a supporting structure fitted integrally to a door of the vehicle; and a control member in the form of a plate or blade hinged to the supporting structure to rotate, between a rest position and a control position releasing a lock on the door, about a hinge axis normally parallel, in use, to a longitudinal direction of the vehicle.

**[0002]** Some vehicles feature a user recognition device for reading a user-carried identification code. Once the identification code is recognized by a central control unit on the vehicle, the door may be opened by the user rotating the blade. Over a first rotation portion of the blade, the user disconnects the safety device on the door lock by means of a respective mechanical transmission interposed between the blade and the lock, and, over a second rotation portion, releases the lock.

**[0003]** Known handles of the above type are fairly unsatisfactory, in that, to restore the lock to its original position and connect the safety device from outside the vehicle, provision must be made for a remote-control device or for a revolving key-operated lock plug or drum inside the structure of the handle.

**[0004]** Using a revolving key-operated lock plug makes the handle fairly expensive to both produce and assemble, and at least partly determines the geometry and layout of the component parts of the handle itself.

**[0005]** Yet a further drawback is the inconvenience to the user of having to carry a key or a remote-control device after getting out of the vehicle and closing the door.

**[0006]** It is further known from document EP-A-0 831 194 (D1) to have a handle comprising a first actuating portion which actuation release the door and and a second actuating portion, made of a switching button, which is pressed by the user from outside the vehicle when he wants to lock the door.

**[0007]** In D1, the two actuating portions are built independently and the resulting handle presents an important bulk and needs a significant space to integrate the switching button.

**[0008]** It is an object of the present invention to provide a vehicle door handle designed to provide a straightforward, low-cost solution to the aforementioned problems.

**[0009]** It is further object of the invention to provide a vehicle door handle of easy use and presenting ergonomic advantages.

**[0010]** According to the present invention, there is provided a handle for a vehicle door, as claimed in claim 1.

**[0011]** A non-limiting embodiment of the invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a preferred embodiment of the handle according to the present invention fitted to a ve-

hicle door shown only partly;

Figure 2 shows a larger-scale plan view, with parts removed for clarity, of the Figure 1 handle;

Figure 3 shows a section along line III-III in Figure 2 and an enlarged detail for clarity of the Figure 1 handle in a rest position;

Figures 4 and 5 show the same view as in Figure 3 of the Figure 3 handle in a first and second work position respectively;

Figure 6 shows a larger-scale side view, with parts removed for clarity, of the Figure 1 handle.

**[0012]** Number 1 in Figure 1 indicates a handle for a vehicle door 2 comprising an outer panel 3 having an elongated opening 4.

**[0013]** Handle 1 comprises a supporting structure 5, which is elongated in a direction A parallel, in use, to a longitudinal direction of the vehicle, is connected integrally in known manner (not shown) to door 2, and in turn comprises an annular peripheral portion 7 extending along the edge of opening 4 and connected to panel 3.

**[0014]** With reference to Figures 2 to 6, structure 5 also comprises a flared intermediate portion 9, which extends through opening 4 to the inside of door 2, defines outwardly a cavity 11, and has two through openings 12 (only one shown in Figures 3 to 5) perpendicular to direction A and formed in respective positions spaced apart from each other.

**[0015]** For each opening 12, intermediate portion 9 supports a seal 13 on a respective front surface 14 extending about opening 12.

**[0016]** As shown, particularly in Figure 2, intermediate portion 9 supports integrally a supporting fork 15 comprising two arms 16, which project on the opposite sides to cavity 11 and support a hinge pin 18 extending along a respective axis 19 substantially parallel to direction A.

**[0017]** With reference to Figures 2 to 5, handle 1 also comprises a first and a second switch device 21 and 22 connected, as shown schematically, to structure 5 on the inside of door 2, and having respective pushbuttons 23 and 24 facing intermediate portion 9 and movable in respective directions perpendicular to axis 19 to set an electric lock (not shown) of door 2 to a safety-on and safety-off condition respectively.

**[0018]** Push-button 23 of device 21 is activated by a lever 25 hinged to pin 18, and by a rocker arm member 27 interposed between lever 25 and push-button 23. Member 27 comprises an intermediate portion 28 hinged to structure 5 about an axis parallel to axis 19; and two opposite end portions 29 and 30, portion 29 facing push-button 23, and portion 30 being maintained contacting lever 25 by a spring 31 interposed between member 27 and structure 5.

**[0019]** Lever 25 comprises two parallel, substantially C-shaped arms 34 and 35 with the respective concavities facing intermediate portion 9; and arm 34 is interposed between member 27 and pin 18, and is positioned

contacting portion 30.

**[0020]** Each arm 34, 35 extends through an opening 12 and comprises a respective end portion 40 hinged to pin 18, and a respective opposite end portion 41 integral with an outer front plate or blade 42 of lever 25, which is activated manually by the user to release the lock by means of a bracket 38 integral with arm 34.

**[0021]** Blade 42 is positioned partly closing cavity 11, comprises an outer front seat 43 elongated parallel to direction A and defined by a bottom surface 44, and has two through holes 45 (only one shown in the accompanying drawings) formed at openings 12 and defined by respective annular lip seals 48 connected to blade 42.

**[0022]** With reference to Figures 3, 4 and 5, seat 43 houses an elongated blade 49 substantially coplanar with blade 42 and forming part of a switching lever 50 for switching device 22.

**[0023]** Lever 50 also comprises two parallel C-shaped arms 51 and 52, which are interposed between arms 34 and 35, each engage a hole 45 and an opening 12, are connected in sliding manner to respective seals 48, and comprise respective end portions 54 integral with blade 49, and respective opposite end portions 55 hinged to pin 18. More specifically, arm 51 faces arm 34 and is interposed between push-button 24 and pin 18; and arm 52 faces arm 35.

**[0024]** Levers 25 and 50 are connected to each other by a one-way angular connecting device 60 for making lever 50 angular fixed with respect to blade 42 in one rotation direction (clockwise in Figures 3 to 6), and for allowing lever 50 to rotate freely with respect to blade 42 in the opposite direction (anticlockwise in Figures 3 to 6). Device 60 comprises a stop tooth 61 integral with arm 34 and projecting from arm 34 between arm 51 and intermediate portion 9; and a spring 62 (Figures 2 and 6) interposed between arms 35 and 52 and wound about pin 18 to elastically keep arm 51 resting against stop tooth 61.

**[0025]** Lever 25 rotates, with respect to structure 5 and about axis 19, between a rest position (Figures 3 and 5) in which portion 29 is detached from push-button 23, and blade 42 forms an extension of peripheral portion 7 and is held resting against seals 13 by a spring 63 interposed between arm 34 and structure 5 and wound about pin 18; and a control position (Figure 4) controlling the lock of door 2.

**[0026]** Lever 50, on the other hand, rotates, with respect to lever 25 and about axis 19, between a rest position (Figure 3) in which blade 49 is kept detached from bottom surface 44 by device 60; and an actuating position (Figure 5) in which bottom surface 44 defines a stop for blade 49, and arm 51 activates push-button 23.

**[0027]** In actual use, as the user is about to activate blades 42 and 49 to open door 2, a user recognition device (not shown) on the vehicle recognizes a user-carried identification code and enables control of the electric lock. Once the code is recognized, the user moves blade 42 from the rest to the control position, so that

levers 25 and 50 rotate together by means of device 60.

**[0028]** Over a first rotation portion of lever 25, rocker arm member 27, maintained contacting arm 34 by spring 31, rotates until end portion 29 activates push-button 23, thus switching device 21 and setting the lock to the safety-off condition; whereas, over a second rotation portion of lever 25, the lock on door 2 is released. To set the lock to the safety-on condition from outside the vehicle, the user presses blade 49 into the actuating position, so that arm 51 activates push-button 24 to switch device 22.

**[0029]** Handle 1 therefore enables the user to connect and disconnect the safety device of the door 2 lock extremely easily, and with no need for a revolving key-operated lock plug in structure 5, no need for a key or remote-control device carried at all times by the user, and no need for complex mechanical transmissions between levers 25, 50 and the lock.

**[0030]** The safety device in fact is engaged simply and instantly, when lever 25 is set to the rest position, in a manner distinct from activation of lever 25 and using a switch device 22 and a switching lever 50 forming part of handle 1 and requiring no further control members.

**[0031]** Handle 1 is also aesthetically pleasing by blades 42 and 49 being substantially coplanar and rotating together when lever 25 is moved from the rest to the control position, thus defining two portions of a single platelike actuating member similar to the blades of known handles.

**[0032]** Clearly, changes may be made to handle 1 as described and illustrated herein without, however, departing from the scope of the present invention.

**[0033]** In particular, the safety device may be engaged by means of an actuating member other than lever 50 described and illustrated herein, e.g. by means of a member connected to and movable with respect to lever 25, or hinged to structure 5 about an axis other than axis 19.

**[0034]** Connecting device 60 may be other than as shown, and, in particular, spring 62 may be other than or located differently from the one described and illustrated herein.

**[0035]** Finally, handle 1 may comprise a user recognition device; release of the safety device may be controlled by members other than device 21 and member 27; and/or engagement and release of the safety device may be controlled by a single switch device.

## Claims

1. A handle (1) for a vehicle door (2), the handle comprising:

- a supporting structure (5) connectable to said door (2);
- a first platelike control portion (42) rotatably connected to said supporting structure (5) so

as to rotate with respect to the supporting structure (5), about a first hinge axis (19) to actuate control means (21) for setting a lock on said door (2) to a safety-off condition;

- a second platelike control portion (49) to actuate switching means (22) for setting said lock to a safety-on condition;

said first (42) and second (49) platelike control portions being substantially coplanar to each other when the handle is in rest position,

**Characterized in that** said first (42) and second (49) platelike control portions are part of a platelike actuating member and are connected to each other such that they rotate together when said first platelike control portion (42) is actuated for controlling said control means (21) **whereas** said second platelike control portion (49) rotates alone when actuated for controlling said switching means (22).

2. A handle as claimed in claim 1, **characterized in that** said second platelike control portion (49) forms part of a switching member (50) and **in that** said switching member (50) rotates, in use, with respect to said first platelike control portion (42) about a respective second hinge axis (19) parallel to said first hinge axis (19).

3. A handle as claimed in claim 2, **characterized in that** said first and second hinge axis (19) are coincident with each other.

4. A handle as claimed in claim 2 or 3, **characterized by** comprising one way angular connecting means (60) for making said switching member (50) angularly fixed with respect to said first platelike control portion (42) in one rotation direction, and for allowing said switching member (50) to rotate freely with respect to said first platelike control portion (42) in the opposite direction.

5. A handle as claimed in claim 4, **characterized in that** said one-way angular connecting means (60) comprise a first (61) and a second (51) stop integral with said first (42) and second (49) platelike control portion respectively; and elastic means (62) for keeping said stops (51) (61) in contact with each other.

6. A handle as claimed in claim 5, **characterized in that** said first platelike control portion (42) forms apart of a control member (25) for controlling said lock; said elastic means (62) being interposed between said control member (25) and said switching member (50).

7. A handle as claimed in claim 6, **characterized in that** said control means (21) comprise further

switching means (21) switchable by said control member (25).

8. A handle as claimed in claim 7, **characterized by** comprising a rocker arm member (27) interposed between said control member (25) and said further switching means (21).

9. A handle as claimed in claim 8, **characterized by** comprising further elastic means (31) for keeping a portion (30) of said rocker arm member in contact with said control member (25).

10. A handle as claimed in any one of the foregoing claims, **characterized in that** said first platelike control portion (42) defines a housing (43) for said second platelike control portion (49).

11. A handle as claimed in claim 10, **characterized in that** said housing (43) is defined by a bottom surface (44) of said first platelike control portion (42), which bottom surface defines a stop for said second platelike control portion (49).

#### Patentansprüche

1. Handgriff (1) für eine Fahrzeugtür (2), wobei der Handgriff Folgendes umfasst:

- eine Haltevorrichtung (5), die mit der Tür (2) verbunden werden kann;
- einen ersten plattenartigen Betätigungsabschnitt (42), der mit der Haltevorrichtung (5) drehbar verbunden ist, so er sich um eine erste Scharnierachse (19) gegenüber der Haltevorrichtung (5) dreht, um eine Betätigungseinrichtung (21) zu betätigen, um ein Schloss an der Tür (2) in einen Sicherheit-Aus-Zustand zu versetzen;
- einen zweiten plattenartigen Betätigungsabschnitt (49), um eine Schalteinrichtung (22) zu betätigen, um das Schloss in einen Sicherheit-Ein-Zustand zu versetzen;

wobei der erste (42) und der zweite (49) plattenartige Betätigungsabschnitt zueinander im Wesentlichen koplanar sind, wenn sich der Handgriff in der Ruhestellung befindet,

**dadurch gekennzeichnet, dass** der erste (42) und der zweite (49) plattenartige Betätigungsabschnitt Teil eines plattenartigen Betätigungselements sind und so miteinander verbunden sind, dass sie sich zusammen drehen, wenn der erste plattenartige Betätigungsabschnitt (42) betätigt wird, um die Betätigungseinrichtung (21) zu betäti-

gen, während sich der zweite plattenartige Betätigungsabschnitt (49) allein dreht, wenn er betätigt wird, um die Schalteinrichtung (22) zu betätigen.

2. Handgriff nach Anspruch 1, **dadurch gekennzeichnet, dass** der zweite plattenartige Betätigungsabschnitt (49) Bestandteil eines Schaltelements (50) ist und dass sich das Schaltelement (50) im Gebrauch gegenüber dem ersten plattenartigen Betätigungsabschnitt (42) um eine jeweilige zweite Scharnierachse (19) dreht, die zu der ersten Scharnierachse (19) parallel ist. 5
3. Handgriff nach Anspruch 2, **dadurch gekennzeichnet, dass** die erste und die zweite Scharnierachse (19) miteinander zusammenfallen. 10
4. Handgriff nach Anspruch 2 oder 3, **dadurch gekennzeichnet, dass** er eine abgewinkelte, in eine Richtung wirkende Verbindungseinrichtung (60) umfasst, damit das Schaltelement (50) in eine Drehrichtung im Winkel gegenüber dem ersten plattenartigen Betätigungsabschnitt (42) fixiert ist und damit sich das Schaltelement (50) gegenüber dem ersten plattenartigen Betätigungsabschnitt (42) in die entgegengesetzte Richtung frei drehen kann. 15
5. Handgriff nach Anspruch 4, **dadurch gekennzeichnet, dass** die abgewinkelte, in eine Richtung wirkende Verbindungseinrichtung (60) einen mit dem ersten (42) bzw. zweiten (49) plattenartigen Betätigungsabschnitt einstückig ausgebildeten ersten (61) und zweiten (51) Anschlag sowie eine elastische Einrichtung (62) umfasst, um die Anschläge (51, 61) miteinander in Kontakt zu halten. 20
6. Handgriff nach Anspruch 5, **dadurch gekennzeichnet, dass** der erste plattenartige Betätigungsabschnitt (42) Bestandteil eines Betätigungselementes (25) zum Betätigen des Schlosses ist, wobei die elastische Einrichtung (62) zwischen dem Betätigungselement (25) und dem Schaltelement (50) angeordnet ist. 25
7. Handgriff nach Anspruch 6, **dadurch gekennzeichnet, dass** die Betätigungseinrichtung (21) ferner eine Schalteinrichtung (21) umfasst, die durch das Betätigungselement (25) umgeschaltet werden kann. 30
8. Handgriff nach Anspruch 7, **dadurch gekennzeichnet, dass** er ein Kipphebeelement (27) umfasst, das zwischen dem Betätigungselement (25) und der weiteren Schalteinrichtung (21) angeordnet ist. 35
9. Handgriff nach Anspruch 8, **dadurch gekennzeichnet, dass** er eine weitere elastische Einrichtung (31) umfasst, um einen Abschnitt (30) des Kipphebelements mit dem Betätigungselement (25) in Kontakt zu halten. 40

tung (31) umfasst, um einen Abschnitt (30) des Kipphebelements mit dem Betätigungselement (25) in Kontakt zu halten.

10. Handgriff nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der erste plattenartige Betätigungsabschnitt (42) ein Gehäuse (43) für den zweiten plattenartigen Betätigungsabschnitt (49) begrenzt. 45
11. Handgriff nach Anspruch 10, **dadurch gekennzeichnet, dass** das Gehäuse (43) durch eine Unterseite (44) des ersten plattenartigen Betätigungsabschnitts (42) begrenzt wird, wobei diese Unterseite einen Anschlag für den zweiten plattenartigen Betätigungsabschnitt (49) bildet. 50

## Revendications

1. Une poignée (1) pour une portière de véhicule (2), la poignée comprenant :

- une structure de support (5) pouvant être raccordée à ladite portière (2) ;
- une première partie de commande en forme de plaque (42) raccordée de manière rotative à ladite structure de support (5), de manière à pouvoir pivoter par rapport à cette structure de support (5) autour d'un premier axe d'articulation (19), afin d'actionner le moyen de commande (21) pour désactiver la position de sécurité d'un verrou sur ladite porte (2) ;
- une seconde partie de commande en forme de plaque (49) servant à actionner le moyen de commutation (22) pour activer la position de sécurité dudit verrou ;

lesdites première (42) et seconde (49) parties de commande en forme de plaque étant principalement coplanaires l'une par rapport à l'autre lorsque la poignée est en position de repos,

**Caractérisée en ce que** lesdites première (42) et seconde (49) parties de commande en forme de plaque font partie d'un élément d'actionnement en forme de plaque et sont reliées de manière à pivoter ensemble lorsque ladite première partie de commande en forme de plaque (42) est actionnée pour commander ledit moyen de commande (21), tandis que ladite seconde partie de commande en forme de plaque (49) pivote seule, lorsqu'elle est actionnée pour commander ledit moyen de commutation (22).

2. Une poignée telle que revendiquée à la revendication 1, **caractérisée en ce que** ladite seconde partie de commande en forme de plaque (49) fait partie d'un élément de commutation (50) et **en ce que** ledit

élément de commutation (50) pivote, en utilisation, par rapport à ladite première partie de commande en forme de plaque (42) autour d'un second axe d'articulation respectif (19) parallèle audit premier axe d'articulation (19).

3. Une poignée telle que revendiquée à la revendication 2, **caractérisée en ce que** lesdits premier et second axes d'articulation (19) coïncident l'un avec l'autre. 5
4. Une poignée telle que revendiquée à la revendication 2 ou 3, **caractérisée en ce qu'elle** comprend un moyen de raccordement angulaire unidirectionnel (60) pour assurer la fixation angulaire dudit élément de commutation (50) par rapport à ladite première partie de commande en forme de plaque (42) dans une direction de rotation, et pour permettre audit élément de commutation (50) de pivoter librement par rapport à ladite première partie de commande en forme de plaque (42) dans la direction opposée. 10 15 20
5. Une poignée telle que revendiquée à la revendication 4, **caractérisée en ce que** ledit moyen de raccordement angulaire unidirectionnel (60) comprend une première (61) et une seconde (51) butée intégrées respectivement auxdites première (42) et seconde (49) parties de commande en forme de plaque, ainsi qu'un moyen élastique (62) pour maintenir lesdites butées (51) (61) en contact l'une avec l'autre. 25 30
6. Une poignée telle que revendiquée à la revendication 5, **caractérisée en ce que** ladite première partie de commande en forme de plaque (42) fait partie d'un élément de commande (25) servant à commander ledit verrou ; ledit moyen élastique (62) étant interposé entre ledit élément de commande (25) et ledit élément de commutation (50). 35 40
7. Une poignée telle que revendiquée à la revendication 6, **caractérisée en ce que** ledit moyen de commande (21) comprend un autre moyen de commutation (21) commutable par ledit élément de commande (25). 45
8. Une poignée telle que revendiquée à la revendication 7, **caractérisée en ce qu'elle** comprend un élément à balancier (27) interposé entre ledit élément de commande (25) et ledit autre moyen de commutation (21). 50
9. Une poignée telle que revendiquée à la revendication 8, **caractérisée en ce qu'elle** comprend un autre moyen élastique (31) pour maintenir une partie (30) dudit élément à balancier en contact avec ledit élément de commande (25). 55

10. Une poignée telle que revendiquée dans une quelconque des revendications susmentionnées, **caractérisée en ce que** ladite première partie de commande en forme de plaque (42) forme un logement (43) pour ladite seconde partie de commande en forme de plaque (49).

11. Une poignée telle que revendiquée à la revendication 10, **caractérisée en ce que** ledit logement (43) est délimité par une surface inférieure (44) de ladite première partie de commande en forme de plaque (42), ladite surface inférieure formant une butée pour ladite seconde partie de commande en forme de plaque (49).

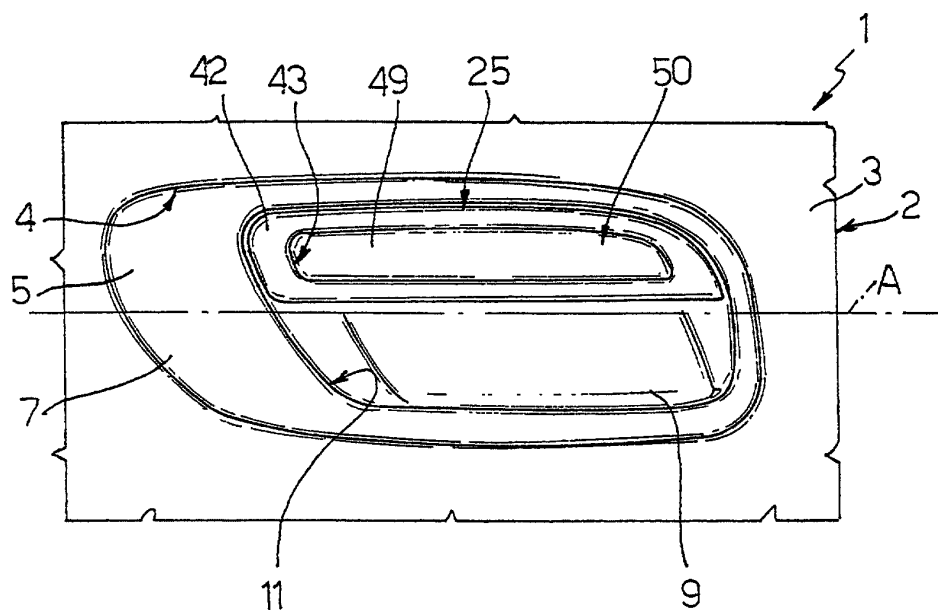


Fig.1

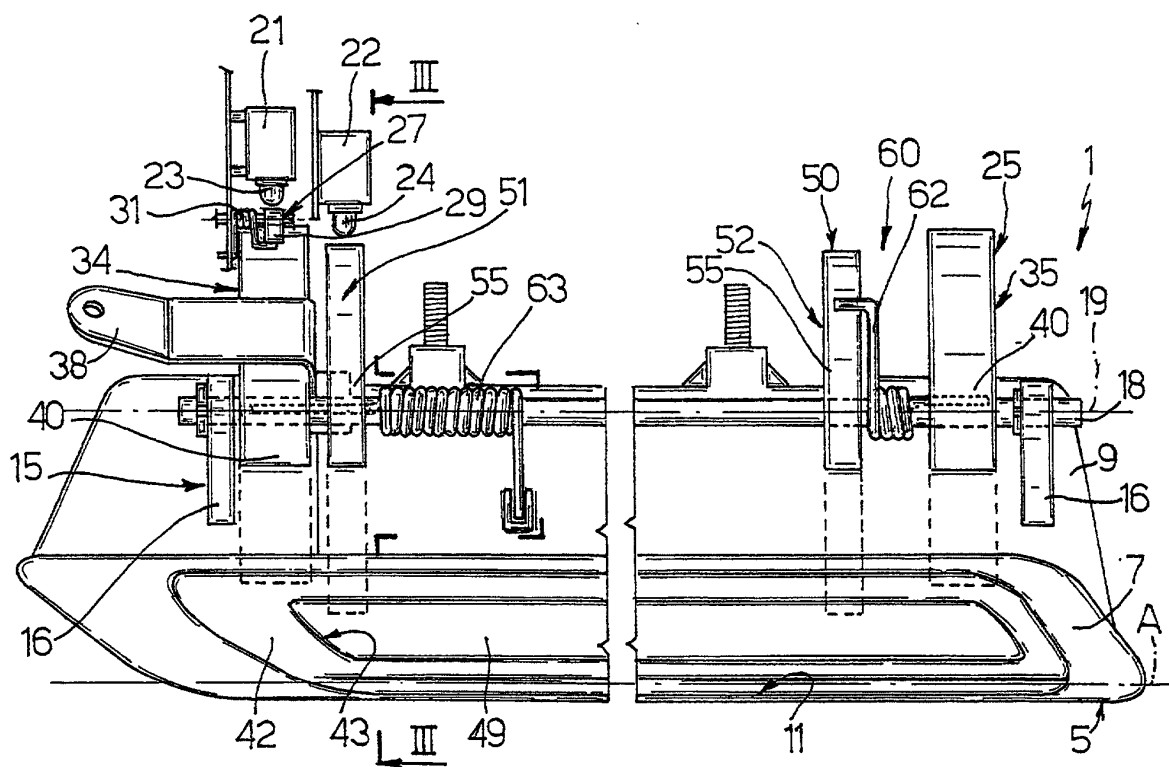


Fig.2

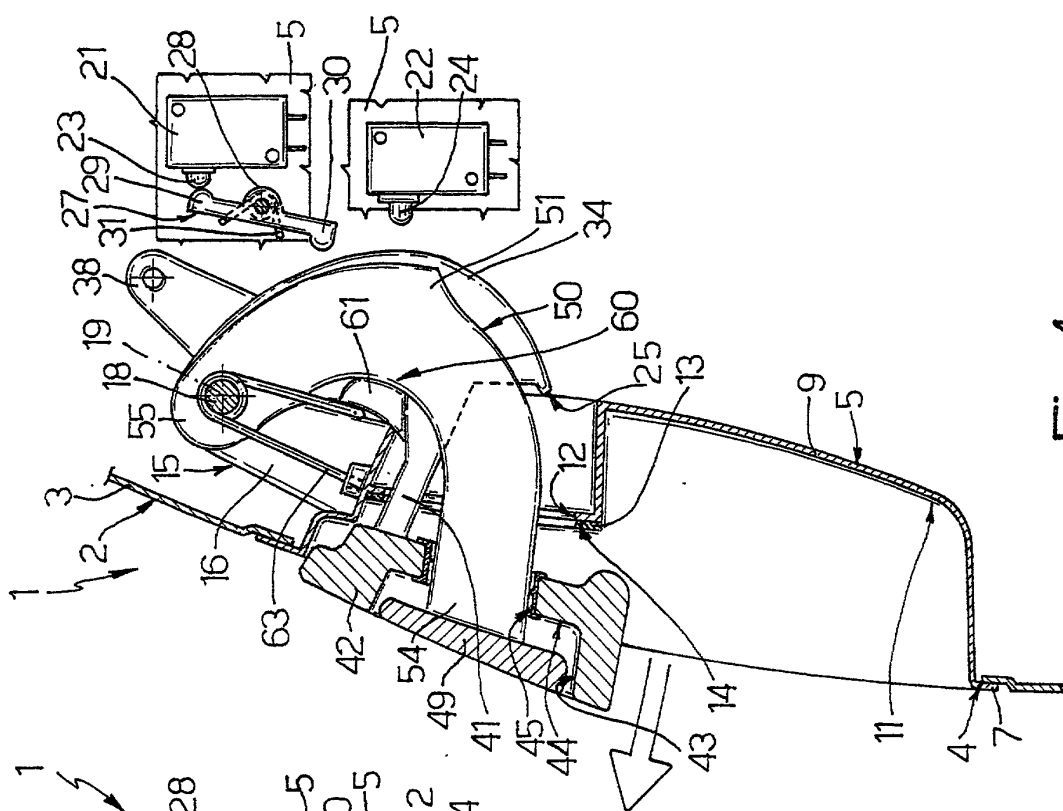


Fig. 4

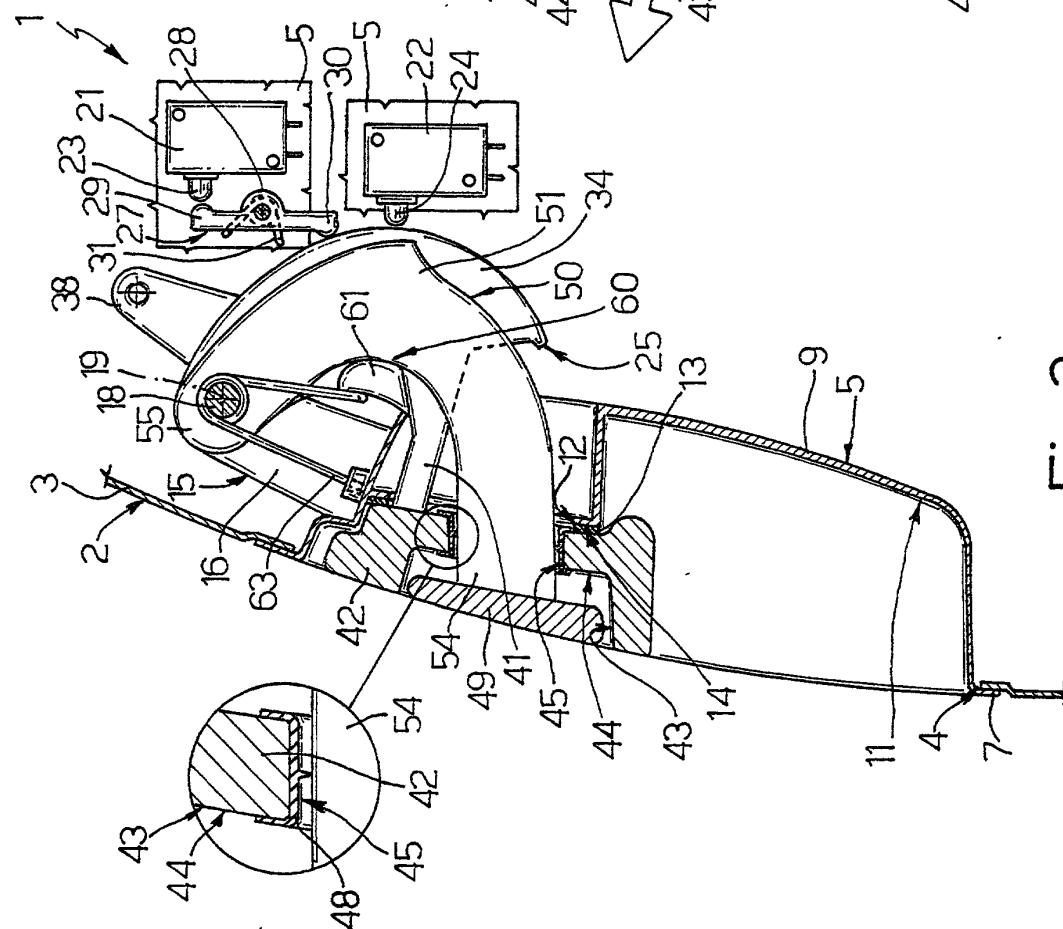


Fig. 3

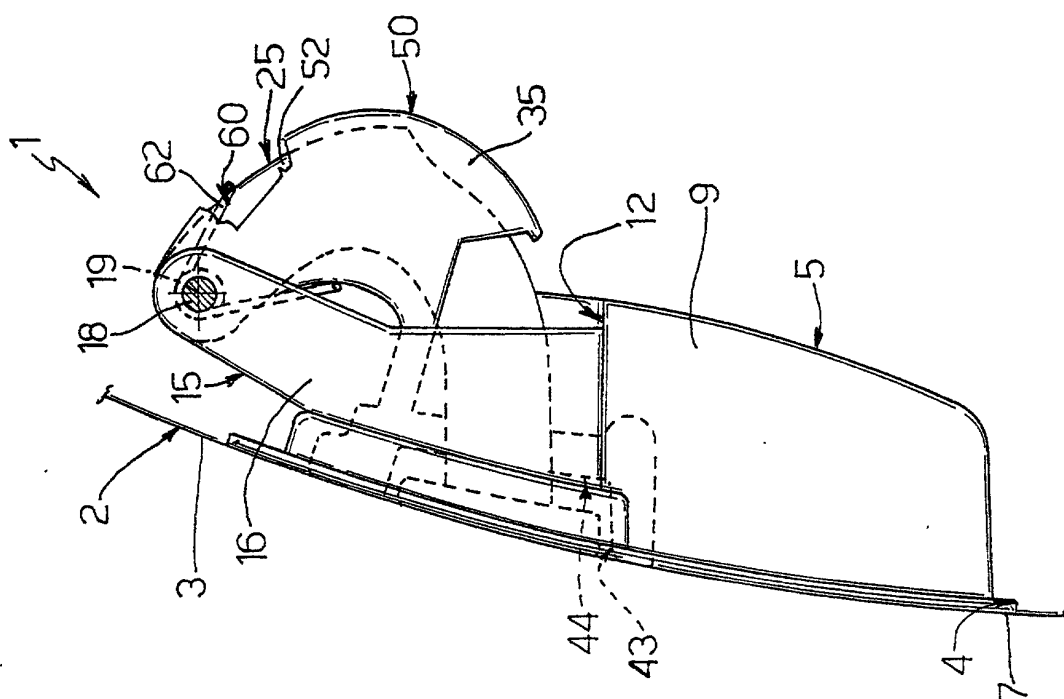


Fig. 6

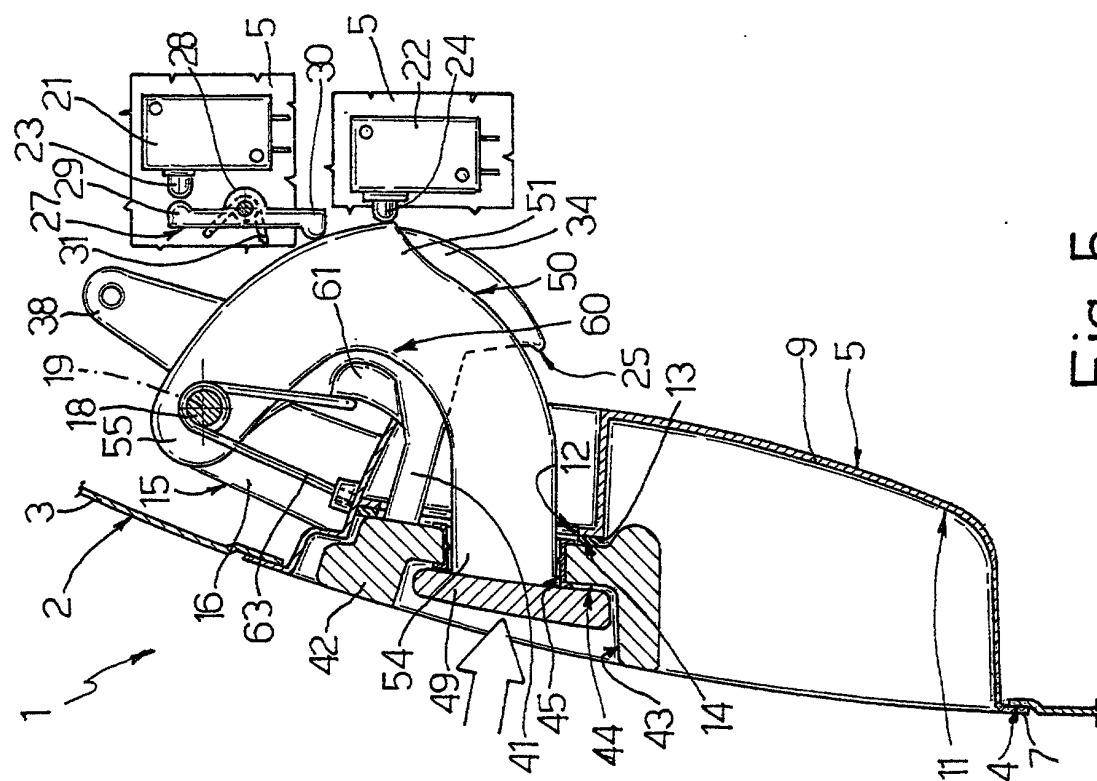


Fig. 5