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(72) Inventors:  
• **Candellone, Ezio**  
**10091 Alpignano (IT)**  
• **Savant, Fiorenzo**  
**10093 Collegno (IT)**

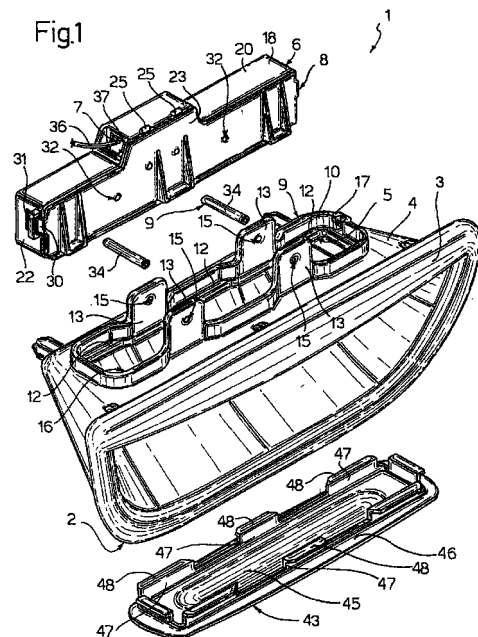
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(74) Representative:  
**Franzolin, Luigi et al**  
**STUDIO TORTA S.r.l.,**  
**Via Viotti, 9**  
**10121 Torino (IT)**

(71) Applicant:  
**Valeo Sicurezza Abitacolo S.p.A.**  
**10026 Santena (IT)**

(54) **Handle for controlling an electric vehicle door lock**

(57) A handle (1) for controlling an electric lock of a vehicle door has a supporting body (2) for fitment to the vehicle door; a control device (7) for manually activating the electric lock; and a casing (8) which fully houses the control device (7), is distinct from the supporting body (2), and is connected releasably to the supporting body (2).



**EP 0 999 323 A2**

## Description

**[0001]** The present invention relates to a handle for controlling an electric vehicle door lock.

**[0002]** More specifically, the present invention relates to a handle, particularly but not exclusively for a vehicle luggage compartment door, of the type comprising a supporting body for connection to the vehicle door, and a device, carried by the supporting body, for controlling an electric lock on the door.

**[0003]** The control device normally comprises a pushbutton switch fitted directly and releasably to the supporting body, and a movable member for activating or switching the pushbutton switch. The movable member is normally defined by an elongated member comprising two or more connecting appendixes which click onto respective appendixes on the supporting body, and which is movable, with respect to the supporting body, to and from a rest position maintained by elastic members interposed between the supporting body and the elongated member and connected directly to the supporting body.

**[0004]** Though widely used, a major drawback of known handles of the type described above lies in the time and cost involved in replacing or simply repairing the control device. In fact, whenever the need arises, the supporting body must first be removed from the vehicle door, and the various component parts of the control device must be removed separately from the supporting body and eventually fitted back onto the supporting body in reverse order before fitting the supporting body itself back onto the door. Disassembling and reassembling the various parts as described above involves a good deal of time and cost, as well as not a few practical difficulties, so much so that, at times, it is preferable to replace the whole handle rather than disassemble and/or replace the control device.

**[0005]** It is an object of the present invention to provide a handle for controlling an electric vehicle door lock, designed to eliminate the aforementioned drawbacks.

**[0006]** According to the present invention, there is provided a handle for controlling an electric lock of a door of a vehicle, the handle comprising first supporting means for connection to a connecting member on the vehicle; control means for manually activating said electric lock; and second supporting means for supporting said control means; characterized in that said second supporting means are distinct from said first supporting means; releasable connecting means being interposed between said first and second supporting means to releasably connect said first and second supporting means.

**[0007]** 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 partly exploded view in perspective

of a preferred embodiment of the handle for controlling an electric vehicle door lock according to the present invention;

Figure 2 shows a larger-scale exploded view in perspective of a detail in Figure 1.

**[0008]** Number 1 in Figure 1 indicates a handle for fitment, in known manner not described in detail, to a vehicle door (neither shown) having an electric lock (not shown). Handle 1 comprises a hollow, flared supporting body 2 made of plastic material, fitted integrally in known manner to the door, and in turn comprising a supporting front wall 3 which rests against an outer front surface of the door, and a lateral wall 4 which extends partly inside the door through an opening in the door, and has an elongated opening 5.

**[0009]** As shown in Figure 1, handle 1 also comprises a control assembly 6 for manually activating the electric lock, and which is carried by lateral wall 4 and in turn comprises an electric control device 7, and an outer casing 8 fully housing device 7 and fitted releasably to supporting body 2 by a connecting device 9.

**[0010]** As shown in Figure 1, connecting device 9 comprises an outer annular collar 10, which is integral with and extends perpendicularly to lateral wall 4, and surrounds opening 5 to define a number of connecting portions 12 forming part of lateral wall 4. Collar 10 carries, integrally, two pairs of appendixes 13, and the appendixes 13 in each pair alternate with connecting portions 12, extend coplanar with each other and parallel to and facing appendixes 13 in the other pair, and have respective through holes 15 coaxial with holes 15 in the corresponding facing appendixes 13.

**[0011]** Connecting portions 12, collar 10 and the two pairs of appendixes 13 define a substantially elongated rectangular seat 16 partly engaged by casing 8, the orientation of which inside seat 16 is imposed by a projection (not shown) carried by casing 8 and engaging a reference seat 17 inside collar 10.

**[0012]** As shown in Figures 1 and 2, casing 8 is separate from supporting body 2, is made in one piece from plastic material, and comprises a hollow, substantially parallelepipedal body 18 in turn comprising an end wall 19 parallel to appendixes 13 and located contacting one pair of appendixes 13, and a substantially U-shaped lateral wall 20 having a platelike intermediate portion 21 substantially parallel to lateral wall 4, and two platelike lateral portions 22 substantially perpendicular to lateral wall 4. The casing also comprises a further, movable, end wall 23 having an intermediate portion hinged to intermediate portion 21 by a pair of elastically deformable appendixes 25 integral with body 18 and end wall 23, and defining a virtual hinge enabling rotation of end wall 23 between a closed position (Figure 1) and an open position (Figure 2) permitting access to device 7. In the closed position, movable end wall 23 extends parallel to and facing end wall 19, contacts the other pair of appendixes 13, and defines, together with

body 18, an opening 27 permitting access to casing 8 and located at opening 5. End wall 23 has a pair of locating seats 28 engaged by respective projections 29 carried by lateral portions 22, and is retained in the closed position by a pair of elastic tabs 30 integral with end wall 23 and which click inside respective retaining seats 31 formed on lateral portions 22.

**[0013]** As shown in Figure 1 and particularly in Figure 2, end walls 23 and 19 have respective pairs of holes 32 and 33, which are coaxial with each other and with holes 15, and are each engaged by a respective removable pin 34 forming part of connecting device 9 to connect casing 8 removably to supporting body 2.

**[0014]** As shown particularly in Figure 2, casing 8 houses a known pushbutton switch 35 forming part of control device 7 and connected to the electric lock by a cable 36 extending outwards through an opening 37 in intermediate portion 21. In the particular example described, switch 35 is connected to end wall 19 by a pair of projecting pins 38 integral with end wall 19 and parallel to pins 34.

**[0015]** As shown in Figure 2, device 7 also comprises an elongated platelike member 39 which, in use, is moved manually by a user to switch or activate switch 35. Member 39 is made of plastic material, is located substantially closing opening 27, and is connected to casing 8 so as to move, with respect to casing 8 and in an activating direction substantially perpendicular to intermediate portion 21, between a withdrawn rest position, and a forward activating position to activate switch 35. More specifically, member 39 comprises opposite end portions 39a located contacting respective shoulders 39b formed inside casing 8 and carried by respective lateral portions 22; and two teeth 41 located on either side of switch 35, adjacent to respective end portions 39a, and extending, parallel to each other and to the activating direction, towards intermediate portion 21. Member 39 is maintained in the rest position, in which end portions 39a rest on respective shoulders 39b, by two elastic metal blades 40, which form part of device 7, are also located on either side of switch 35, project inside casing 8 towards switch 35, and each rest on a free end portion of respective tooth 41.

**[0016]** More specifically, each blade 40 comprises two opposite end portions 40a and 40b; end portion 40a is L-shaped and connected releasably in known manner to respective lateral portion 22; and end portion 40b extends facing respective tooth 41, is substantially S-shaped, and defines a respective seat 42 engaged by the free end portion of respective tooth 41. As such, member 39 is also connected elastically to lateral portions 22 in a direction substantially perpendicular to said activating direction.

**[0017]** As shown in Figure 1, opening 5 is closed in fluidtight manner by an elastically deformable seal 43, which comprises an elongated intermediate portion 45 facing member 39 and resting directly on member 39 when activated by the user; and a peripheral portion 46

resting on an outer surface of supporting body 2. Peripheral portion 46 carries, integrally, a number of elastic connecting appendixes 47 extending inside opening 5, and each terminating with a respective connecting tooth 48 which rests on respective connecting portion 12.

**[0018]** As compared with known solutions, handle 1 described therefore provides for replacing the whole of lock control assembly 6 extremely quickly, with substantially no difficulty and, hence, relatively cheaply, in the event of repair or replacement of device 7.

**[0019]** In fact, in handle 1 described, pushbutton switch 35, member 39 for activating switch 35, and elastic blades 40 are all housed inside the same casing 8, which is separate from supporting body 2 fitted to the door, and may be disconnected easily from supporting body 2 by simply removing a pair of pins 34. In particular, appropriately designed, pins 34 may, in some cases, be removed without removing supporting body 2 from the vehicle door, thus saving even more time.

**[0020]** Providing a control assembly 6 separate from and connected releasably to supporting body 2 enables the manufacture of modular handles, i.e. having different supporting bodies and the same lock control assembly 6 connected to the various supporting bodies by the same connecting device 9.

**[0021]** Finally, using a casing 8 fully housing device 7 provides for fully insulating and so protecting device 7 from external agents.

**[0022]** Clearly, changes may be made to handle 1 as described herein without, however, departing from the scope of the present invention. In particular, casing 8 may be connected to supporting body 2 otherwise than as described by way of example. More specifically, casing 8 may be connected to supporting body 2 by releasable click-on connecting devices or by means of sliding, e.g. guide and slide, connections.

**[0023]** Furthermore, casing 8 and/or supporting body 2 of handle 1 described may be formed otherwise than as described, e.g. to adapt to supporting structures different from the door.

### Claims

1. A handle (1) for controlling an electric lock of a door of a vehicle, the handle (1) comprising first supporting means (2) for connection to a connecting member on the vehicle; control means (7) for manually activating said electric lock; and second supporting means (8) for supporting said control means (7); characterized in that said second supporting (8) means are distinct from said first supporting means (2); releasable connecting means (9) being interposed between said first (2) and second (8) supporting means to releasably connect said first (2) and second (8) supporting means.
2. A handle as claimed in Claim 1, characterized in

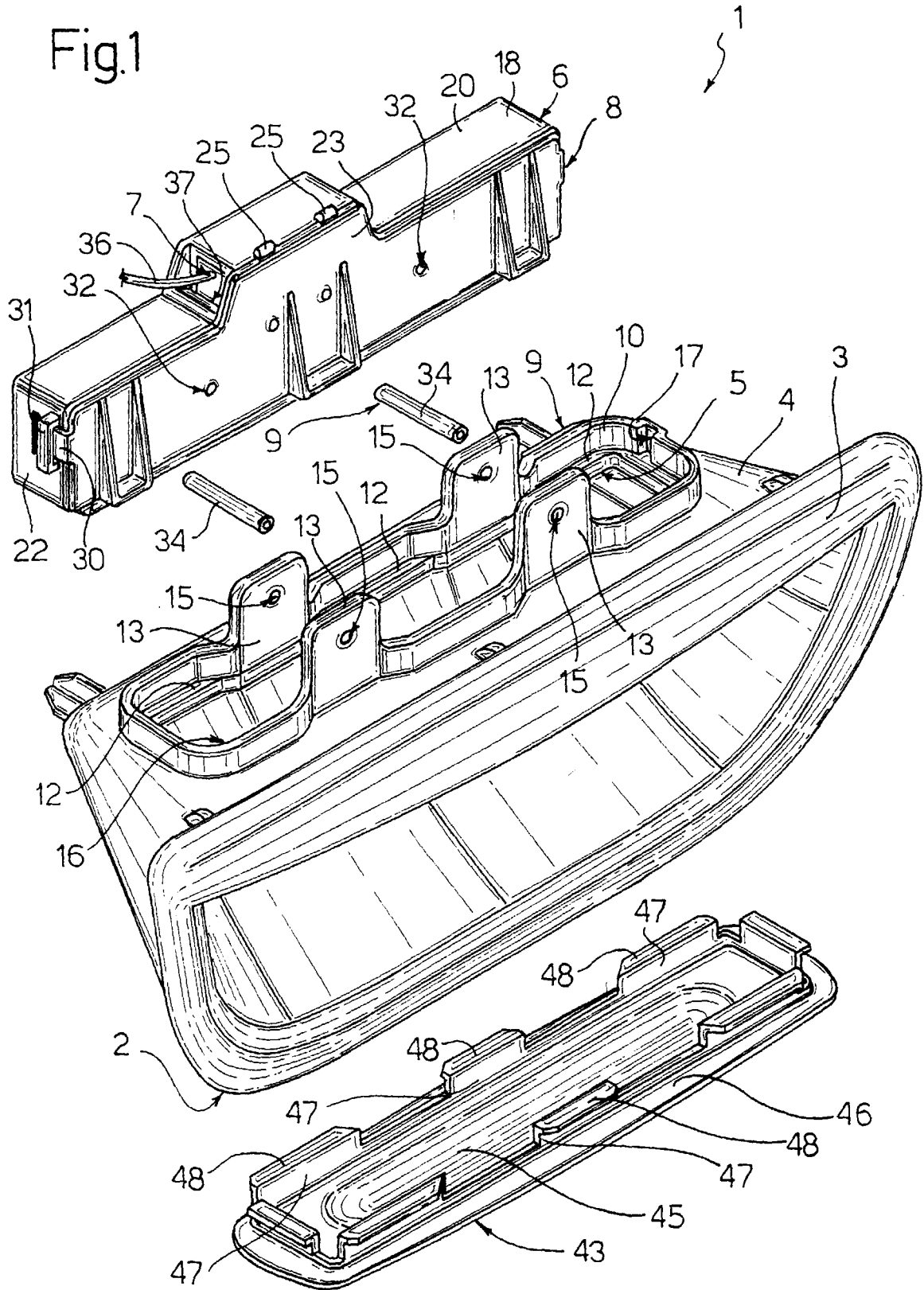
that said second supporting means (8) fully house said control means (7).

3. A handle as claimed in Claim 2, characterized in that said second supporting means (8) comprise a casing (8) having at least one lateral first opening (27); said control means (7) comprising manual activating means (39) extending through said first opening (27). 5
4. A handle as claimed in Claim 3, characterized in that said casing (8) is formed in one piece. 10
5. A handle as claimed in Claim 3 or 4, characterized in that said casing (8) comprises a hollow body (18); and a closing wall (23) connected to the hollow body (18) so as to move between a closed position, and an open position permitting access to said control means (7). 15
6. A handle as claimed in Claim 5, characterized in that said casing (8) comprises hinge means (25) interposed between said hollow body (18) and said closing wall (23) to permit rotation of the closing wall (23) between said open and closed positions. 20
7. A handle as claimed in Claim 6, characterized in that said hinge means (25) define a virtual hinge, and comprise at least one elastically deformable portion (25). 25
8. A handle as claimed in any one of Claims 5 to 7, characterized in that said casing (8) comprises locating means (28, 29) and releasable click-on retaining means (30, 31) interposed between said hollow body (18) and said closing wall (23). 30
9. A handle as claimed in any one of the foregoing Claims, characterized in that said releasable connecting means (9) comprise positioning means (10) for positioning said second supporting means (8) with respect to said first supporting means (2); and releasable locking means (34) for releasably connecting said first (2) and second (8) supporting means. 35
10. A handle as claimed in Claim 9, characterized in that said releasable locking means (34) comprise at least one lock pin (34). 40
11. A handle as claimed in Claim 10, characterized in that said first (2) and second (8) supporting means comprise respective seats (15)(32,33); and said lock pin (34) positively engages both said seats (15)(32,33). 45
12. A handle as claimed in any one of Claims 3 to 11 when dependent on Claim 3, characterized in that 50

said first supporting means (2) comprise at least one lateral second opening (5) formed at said first opening (27) and said manual activating means (39); elastic sealing means (43) being located closing said second opening (5).

13. A handle as claimed in Claim 12, characterized in that said control means (7) also comprise switch means (35) activated by said manual activating means (39); releasable connecting means (38) being provided to connect said switch means (35) to said second supporting means (8). 55

Fig.1



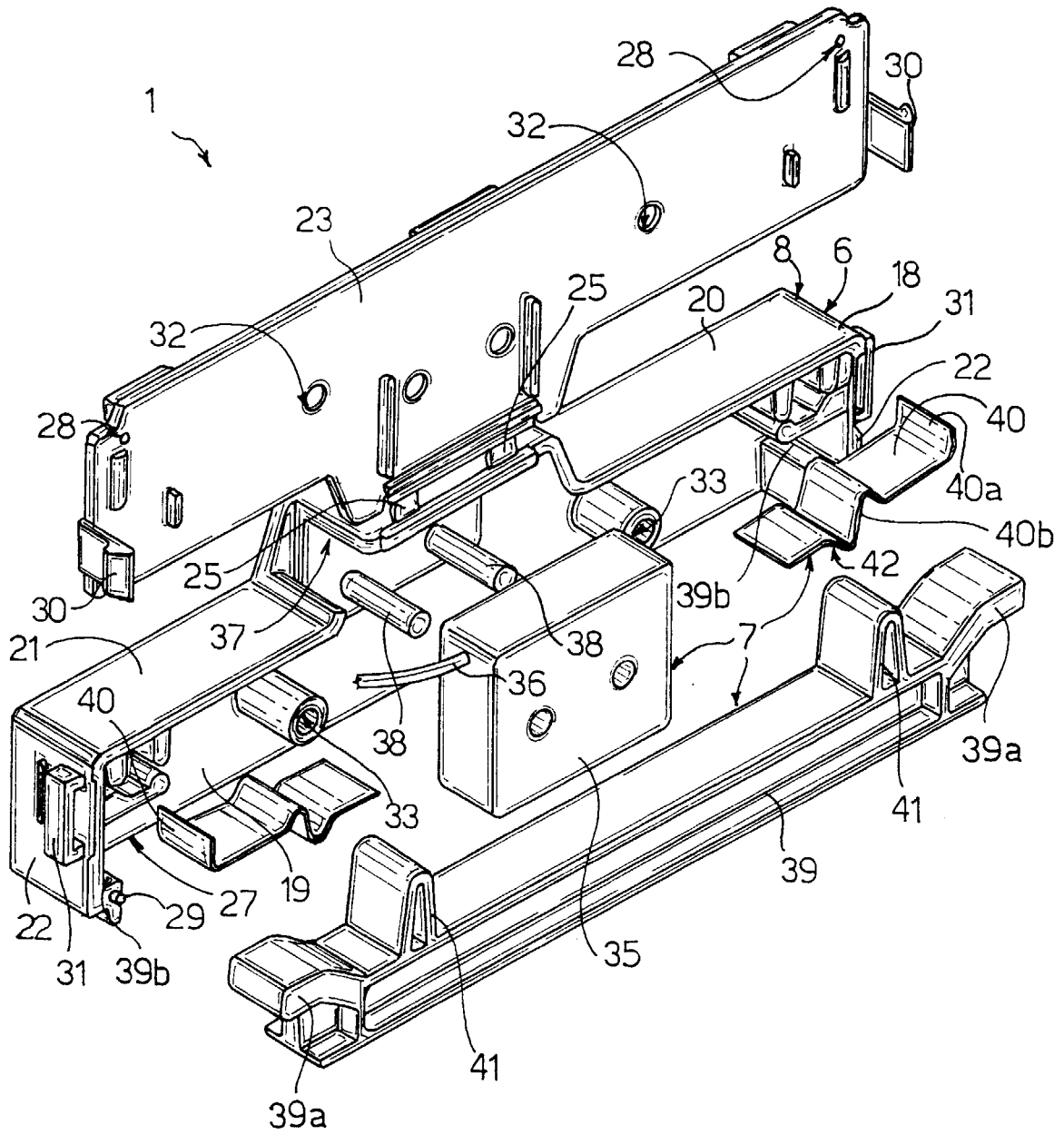


Fig.2