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(54) **Vehicle door lock assembly**

(57) A vehicle door lock assembly (1) presenting a lock (5) fitted to the door post (2) and in turn presenting a lock mechanism (9); a striker (7) fitted to the door (4) and which is locked by the lock mechanism (9) in the locked position of the assembly (1); and a manually oper-

ated release device (25) housed in the door (4) and cooperating with the lock mechanism (9) of the lock (5); the release device (25) presenting an activating element (26) fitted through the striker (7).

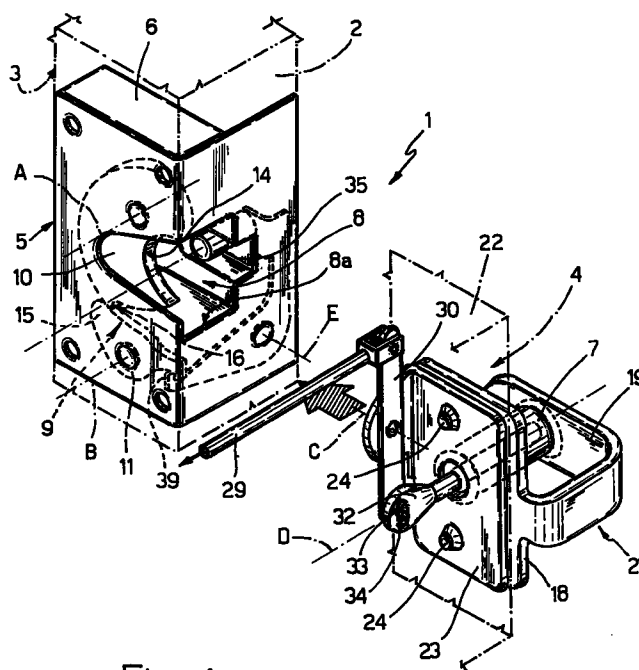


Fig. 1

EP 0 712 985 A1

Description

The present invention relates to a vehicle door lock assembly.

In the following description and claims, the term "door" is used in its widest sense as indicating any assembly consisting of a fixed body element, e.g. door post, defining an opening, and a movable element or wing for closing the opening, and as such applies equally to the side doors, boot lid or rear door.

Vehicle door lock assemblies normally comprise a lock fitted to the movable element or wing of the door, and a striker fitted to a fixed body element defining the door opening, or vice versa.

When the lock is fitted to the fixed element, the problem arises of releasing it using an element, e.g. a handle, fitted to the movable element; whereas, particularly in the case of rear-door locks fitted to the movable element, remote-control releasing of the lock acting from the fixed element can be useful.

Operating devices have therefore been proposed for transmitting a lock release load from one element to the other of the door, and which provide, for example, for releasing a catch and fork mechanism on the lock. Such devices, however, present the drawback of requiring additional work on the door elements, such as the formation of compartments, openings, or specially designed supporting means for housing or supporting the device components. What is more, the assembly tolerances of the fixed and movable elements of the door may result in misalignment of the associated device components.

It is an object of the present invention to provide a vehicle door lock assembly designed to overcome the aforementioned drawbacks typically associated with known devices.

According to the present invention, there is provided a lock assembly for a vehicle door comprising a fixed element defining a door opening, and a movable element for closing said opening; the lock assembly comprising:

- a lock fitted to a first of said door elements, and presenting a lock mechanism;
- striker means fitted to a second of said door elements, and which are locked by said lock mechanism in the locked position of said assembly; and
- a manually operated release device fitted to said second door element, and cooperating with said lock mechanism of said lock;

characterized in that said release device comprises an activating element through said striker means.

A preferred, 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 a view in perspective of a vehicle door lock assembly in accordance with the teach-

ings of the present invention and in the released position;

Figure 2 shows an axial section of the Figure 1 assembly in the locked position.

With reference to the accompanying drawings, number 1 indicates a lock assembly for a vehicle door comprising a fixed element 2, e.g. a post, defining a door opening 3, and a movable element 4, e.g. a door, for closing opening 3.

Lock assembly 1 comprises a lock 5 housed in post 2 and presenting a rigidly fixed casing 6; and a striker 7 fixed to door 4, and cooperating with lock 5 and housed inside a seat 8 in casing 6 when the door is closed.

Lock 5 presents a conventional lock mechanism 9 comprising a fork 10 and a catch 11. Fork 10 is hinged to casing 6 about a horizontal axis A, presents a concave seat 14 for striker 7, and is movable between a release position - wherein seat 14 faces the entrance opening 8a to seat 8 formed in casing 6, for receiving striker 7 - and a rotated lock position - wherein fork 10 surrounds and prevents striker 7 from being withdrawn from lock 5. Fork 10 is pushed into the release position (Figure 1) by a spring (not shown), and is held in the lock position by catch 11. More specifically, catch 11 is hinged to casing 6 about an axis B parallel to axis A, and is spring-loaded (not shown) towards fork 10 so that the end portion 15 of catch 11 engages a pawl 16 on the periphery of fork 10, for maintaining it in the lock position.

Striker 7 is substantially cylindrical, and is rigidly connected at opposite ends and by permanent deformation to a plate 18 for securing it to door 4, and to a supporting bracket 19 integral with plate 18 and forming with it a U-shaped supporting structure 21.

Plate 18 is fitted to the panel 22 of door 4 by means of a counterplate 23 on the opposite side of panel 22, and by means of a pair of screws 24 for gripping plate 18 and counterplate 23 on to panel 22. Screws 24 are fitted in radially slack manner through holes 24a in panel 22, to enable striker 7 to be adjusted in relation to lock 5 and so compensate for the manufacturing and assembly tolerances of the door elements.

Assembly 1 also comprises a manually operated device 25 for releasing lock 5, and which provides for transmitting the mechanical release action of a manually operated activating member (not shown) on door 4, e.g. a handle, to lock 5.

According to the present invention, device 25 comprises an activating rod 26 housed in sliding manner inside a cavity 26a through striker 7, and movable axially between a withdrawn idle position (shown by the darker line in Figure 2) and an active position (shown by the fainter line in Figure 2) wherein its end 28 projects axially from striker 7 and, by means of a transmission mechanism 27 described below, provides for releasing catch 11 of lock 5 from fork 10.

Rod 26 is operated by a remote control element, e.g. a tie 29 connected to the door handle (not shown), and via a rocker arm lever 30 hinged centrally to a supporting

bracket 31 integral with and bent 90° in relation to the counterplate, so as to rotate about an axis C perpendicular to the axis of rod 26. Lever 30 is connected at opposite ends to tie 29 and to rod 26 which, for the purpose, presents a head 32 opposite end 28 and presenting a through slot 33 loosely housing a pin 34 on lever 30. As such, when tie 29 is pulled, lever 30 is rotated and pushes rod 26 into the active position.

Transmission mechanism 27 comprises a push rod 35 sliding inside a seat 35a formed in casing 6 and communicating with seat 8 along an axis D parallel to axes A and B and coincident with the axis of striker 7, and hence of rod 26, when door 4 is closed. Mechanism 27 also comprises a square lever 36 hinged to casing 6 about an axis E perpendicular to axes A, B and D, and presenting an arm 37 resting on and operated by push rod 35, and an arm 38 cooperating upwards with a substantially radial projection 39 on catch 11, and which provides for rotating catch 11 in such a direction as to release it from fork 10. Push rod 35 presents an intermediate annular projection 40 which cooperates with casing 6 to define the idle axial position of the push rod.

Assembly 1 operates as follows.

Lock 5 is locked in the normal way by firmly closing door 4, in which position (Figure 2), rod 26 and push rod 35 are coaxial with each other. As already stated, when pull is exerted on tie 29, rod 26 moves from the idle position to the active position (shown by the fainter line in Figure 2); push rod 35 transmits the thrust exerted by rod 26 to arm 37 of lever 36; and lever 36 rotates clockwise (in Figure 2) so that arm 38 cooperates with and releases catch 11 from fork 10 which is thus swung into the release position by its return spring (not shown).

The advantages of lock assembly 1 according to the present invention will be clear from the forgoing description.

In particular, by virtue of the lock being released by a restrained activating element fitted through the striker, no additional work or alterations to the door elements or specially designed supporting means for the release device are required. Moreover, the possibility of adjusting the position of the striker in relation to the lock ensures correct alignment of the release device components (rod 26 and push rod 35) fitted to the fixed and movable door elements, so that no further adjustment is required to the release device to compensate for the fabrication and assembly tolerances of the door.

Clearly, changes may be made to lock assembly 1 as described and illustrated herein without, however, departing from the scope of the present invention.

For example, the release device may be controlled by means of a Bowden cable or any other suitable rigid or flexible transmission element; the transmission element may be connected directly to rod 26; lever 30 and transmission device 27 may be replaced by any other member or mechanism suitable for the purpose; and lock 5 may be fitted to the movable as opposed to the fixed door element.

Claims

1. A lock assembly (1) for a vehicle door comprising a fixed element (2) defining a door opening (3), and a movable element (4) for closing said opening (3); the lock assembly (1) comprising:

- a lock (5) fitted to a first (2) of said door elements (2, 4), and presenting a lock mechanism (9);
- striker means (7, 21) fitted to a second (4) of said door elements (2, 4), and which are locked by said lock mechanism (9) in the locked position of said assembly (1); and
- a manually operated release device (25) fitted to said second door element (4), and cooperating with said lock mechanism (9) of said lock (5);

characterized in that said release device (25) comprises an activating element (26) through said striker means (7, 21).

2. An assembly as claimed in Claim 1, characterized in that said release device (25) comprises a manually operated transmission member (29); and means (30) for connecting said activating element (26) to said transmission member (29).

3. An assembly as claimed in Claim 1 or 2, characterized in that said striker means comprise a cylindrical striker (7); and said activating element comprises a rod (26) movable axially along an axial cavity (26a) in the striker (7).

4. An assembly as claimed in Claim 3, characterized in that said connecting means comprise a first restrained lever (30) fitted to means (23) for securing the striker (7) to said second door element (4).

5. An assembly as claimed in Claim 3 or 4, characterized in that said lock mechanism (9) of said lock (5) comprises a fork (10) and a catch (11); said assembly (1) comprising a transmission device (27) fitted to said lock (5) and interposed between said activating element (26) and said catch (11) in said locked position of said assembly.

6. An assembly as claimed in Claim 5, characterized in that said transmission device (27) comprises a second lever (36) hinged to the casing (6) of said lock (5), and presenting a first arm (37) operated by said activating element (26), and a second arm (38) cooperating with said catch (11).

7. An assembly as claimed in Claim 6, characterized in that said transmission device (27) comprises a push rod (35) interposed between said activating element (26) and said second lever (36); said push rod (35) being housed in axially sliding manner inside a seat (35a) on said lock (5), and being coaxial

with said striker (7) in said locked position of said assembly.

8. An assembly as claimed in any one of the foregoing Claims, characterized in that said first element (2) is a post, and said second element (4) is a door of said vehicle.

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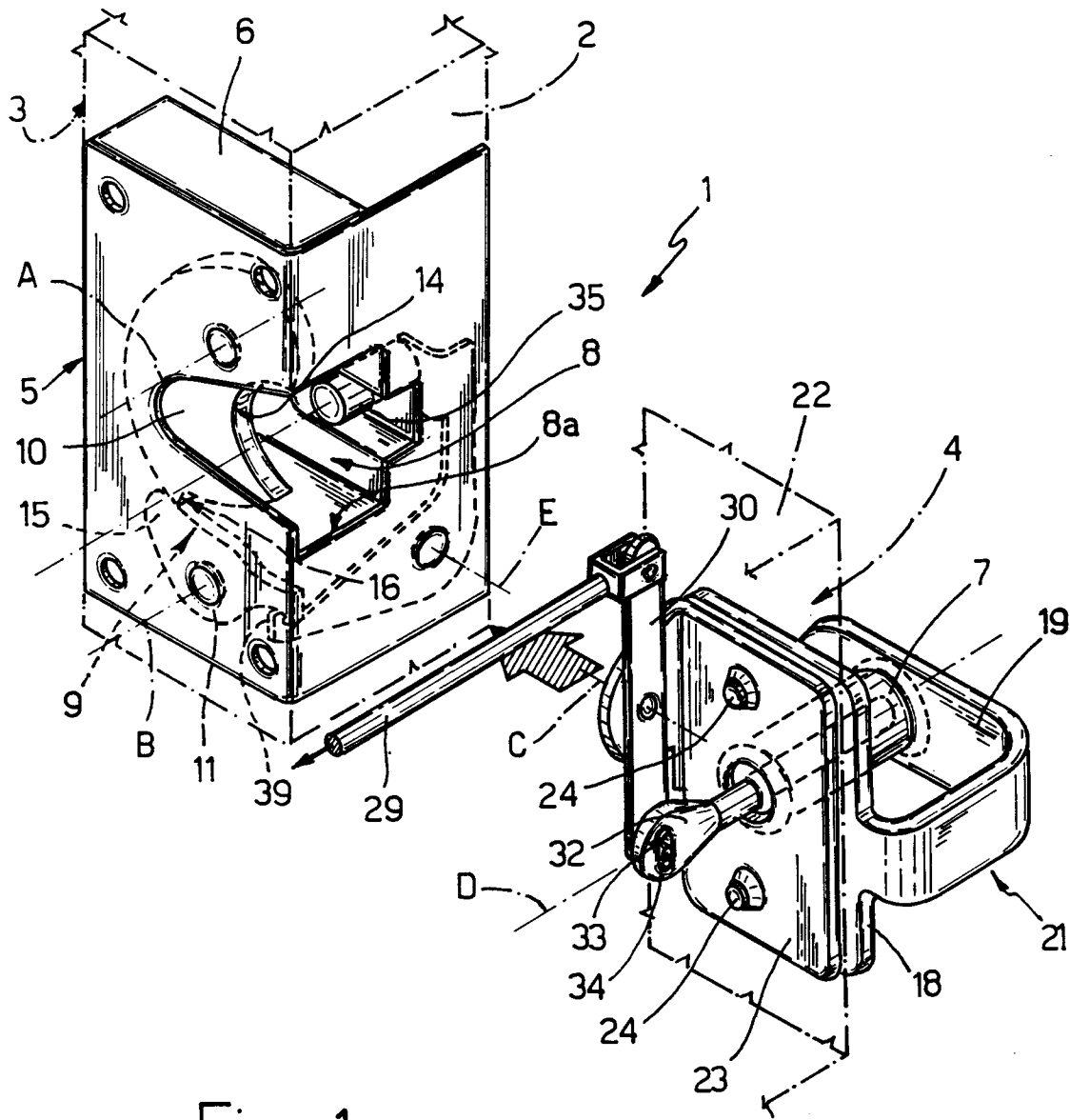


Fig. 1

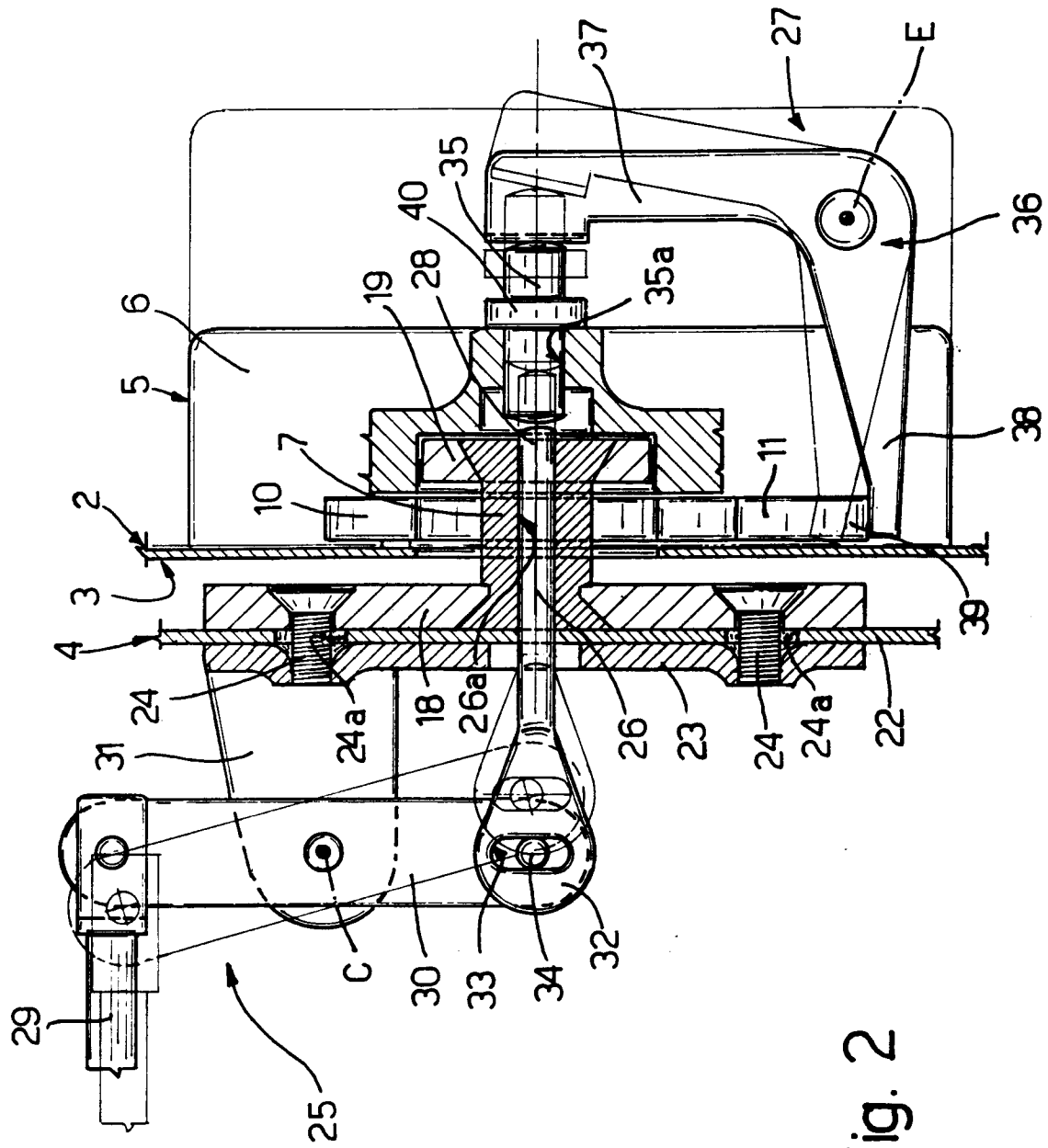


Fig. 2



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EUROPEAN SEARCH REPORT

Application Number
EP 95 11 7544

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	US-A-4 007 955 (KOBAYASHI FUMIO) 15 February 1977 * the whole document * ---	1,2,8,9	E05B65/19 E05B63/24
A	DE-A-35 11 070 (SCHWARZ VERBINDUNGS SYSTEME) 3 October 1985 * the whole document * ---	1,3	
A	GB-A-2 268 966 (FORD MOTOR CO) 26 January 1994 * the whole document * ---	1	
A	FR-A-2 448 610 (CITROEN SA) 5 September 1980 * the whole document * -----	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			E05B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 26 February 1996	Examiner Verelst, P
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