(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 186 977 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
19.05.2010 Bulletin 2010/20

(21) Application number: **09175105.7**

(22) Date of filing: **05.11.2009**

(51) Int Cl.:
E05C 7/04 *(2006.01)* ***E05B 63/18*** *(2006.01)*
E05B 63/24 *(2006.01)*

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR

(30) Priority: **12.11.2008 FI 20086071**

(71) Applicant: **Abloy Oy**
80100 Joensuu (FI)

(72) Inventor: **Raatikainen, Juha**
FI80160, Joensuu (FI)

(74) Representative: **Gustafsson, Aulis Valdemar**
AWEK Industrial Patents Ltd Oy
P.O. Box 230
00101 Helsinki (FI)

(54) Wedge release device

(57) The lock (5) for the passive door (3) within a double door (1) according to the invention comprises handle control means (9) and a wedge release device (8). The wedge release device comprises a latch (12), a spring (13), a sliding part (14) and a stopper part (15). The stopper part comprises a stem part (16), and the sliding part (14) is arranged together with the stem part (16) to move in the axial direction of the stem part. The sliding part (14) comprises a handle control surface (18) that allows the sliding part (14) to be moved using the handle control means of the lock (5) in the axial direction of the stem part (16) when a handle connected to the lock is turned.

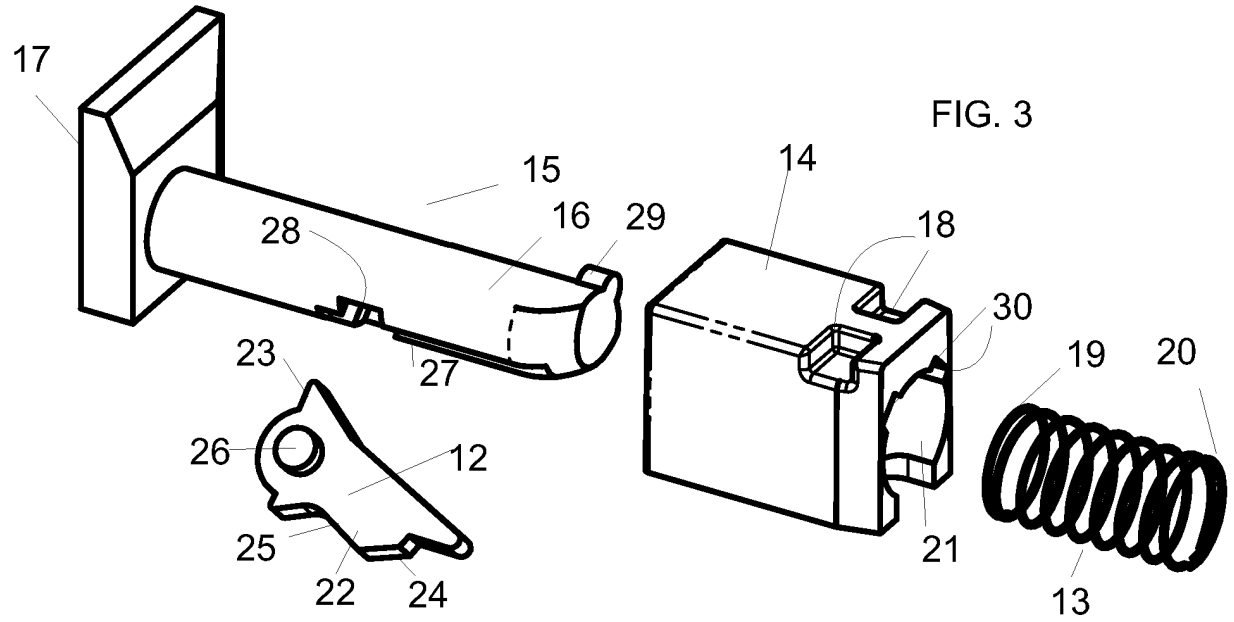


FIG. 3

EP 2 186 977 A2

Description

Field of technology

[0001] This invention relates to a lock of a passive door of a double door.

Prior art

[0002] Figure 1 illustrates a double door 1. The double door consists of an active door 2 and a passive door 3. The active door is the door that is normally used. The passive door is the door that is used occasionally, for example in connection with moving when furniture is carried through the doorway. The active door has a lock 4, the bolt 7 of which is inside the passive door's lock 5 when the double door is shut and locked. In that case the wedge 6 of the lock 4 rests against the front shield of the passive door's lock or against a wedge release device.

[0003] The wedge 6 of the lock 4 is a control wedge indicating whether the active door is against the passive door. If the active door is open, the wedge is extruded from the lock body. The lock usually has a spring that imposes an outward force on the wedge. When the wedge is extruded, the lock bolt 7 will not go into the deadbolted position; in other words, it is allowed to move into the lock body and, correspondingly, out of the lock body. Thus the active door can be turned to the closed position against the passive door, and correspondingly to the open position.

[0004] The passive door's lock 5 may also have a wedge release device. The wedge release device is a component pressed by the active door's wedge while the double door is closed. A prior art wedge release device is a metal part bent to a L shape that has a transmission link to a handle turning shaft system of the passive door's lock. When the handle or the knob of the passive door's lock (hereafter, this text will only refer to a handle, but this shall also comprise a knob or similar turnable element) is turned, the wedge release device moves into the passive door's lock body, and the active door's wedge is allowed to extrude. This releases the bolt from the deadbolted position, the active door's bolt is pushed into the lock, and the active door and passive door can be opened. The rate of the wedge release device's movement is directly proportionate to the rate of turning the handle or knob. This causes malfunctions because the slow outward movement of the active door lock's wedge does not necessarily release the bolt from the deadbolted position even though the wedge release device has moved deeper within the passive door's lock.

Short description of invention

[0005] The objective of the invention is to eliminate malfunctions of the passive door lock within a double door, caused by operation of the wedge release device. The objective will be achieved as described in the independent claim. The dependent claims describe various embodiments of the invention.

[0006] The lock 5 of the passive door 3 of a double door 1 according to the invention comprises handle control means 9 and a wedge release device 8. The wedge release device comprises a latch 12, a spring 13, a sliding part 14 and a stopper part 15. The stopper part comprises a stem part 16, and the sliding part 14 is arranged together with the stem part 16 to move in the axial direction of the stem part. The sliding part 14 comprises a handle control surface 18 through which the sliding part 14 can be moved using the handle control means of the lock 5 in a first direction parallel to the axis of the stem part 16 when a handle connected to the lock is turned. The latch 12 is arranged to hold the stopper part 15 stationary in relation to the body of the passive door lock 5 against the pushing force of the wedge of the lock in the active door 2 of the double door, and to turn for releasing said holding action in response to the movement of the sliding part 14 when the handle is turned. The spring 13 is arranged to move the sliding part 14 in a second direction parallel to the axis of the stem part when said handle is released, and the latch 12 is arranged to turn for holding the stopper part stationary when said handle is released.

[0007] The structure according to the invention will eliminate or at least reduce malfunctions of the wedge release device.

List of figures

[0008] In the following, the invention is described in more detail by reference to the enclosed drawings, where

Figure 1 illustrates an example of a double door,

Figure 2 illustrates a double door lock according to the invention,

Figure 3 illustrates an example of a wedge release device according to the invention,

Figure 4 illustrates an example of the wedge release device in the blocking position,

Figure 5 illustrates the example of Figure 4 in the released position.

Description of the invention

[0009] Figure 2 illustrates an example of a passive door lock 5 according to the invention. The lock comprises a wedge release device 8 that is in a force transmission connection with the turning shaft system 10 of the handle through handle control means 9. When the handle is turned, the wedge release device moves deeper into the body 11 of the passive door lock, i.e. to the released state. This allows the wedge of the active door to move

outward from the active door lock body. When the handle is released (handle is no longer turned), the wedge release device moves back to the blocking state, i.e. the state according to Figure 2.

[0010] Figure 3 illustrates an embodiment of the wedge release device of a lock according to the invention. Figure 4 illustrates the same embodiment of the wedge release device in the blocking state, i.e. the wedge of the active door lock is not allowed to extrude. Figure 5 illustrates the wedge release device in the released state, i.e. the wedge of the active door lock is allowed to extrude.

[0011] The wedge release device comprises a latch 12, a spring 13, a sliding part 14 and a stopper part 15. The stopper part comprises a stem part 16. The sliding part 14 is arranged together with the stem part 16 to move in the axial direction of the stem part. The stopper part also has a stop face 17 against which the active door's wedge is intended to press.

[0012] The sliding part 14 comprises a handle control surface 18 that through which the sliding part 14 can be moved using the handle control means of the lock 5 in a first direction parallel to the axis of the stem part 16 when a handle connected to the lock is turned. The embodiments in Figures 3 to 5 have two handle control surfaces, but one is enough. The latch 12 is arranged to hold the stopper part 15 stationary in relation to the body of the passive door lock 5 against the pushing force of the wedge of the lock in the active door 2 of the double door, and to turn for releasing said holding action in response to the movement of the sliding part 14 in the first direction.

[0013] The latch 12 comprises a first projection 22 and a second projection 23. The second projection is in a force transmission connection with to the spring 13, which tries to turn the latch 12 to hold the stopper part stationary. In this case the first projection 22 is arranged through the holding surface 24 against the body structure of the passive door lock to hold the stopper part 15 stationary. When the sliding part 14 has moved sufficiently to the first direction, it engages a force transmission connection with the latch release surface 25 (Figure 5). When the sliding part moves further to the first direction, the latch turns to release said holding action in response to the movement of the sliding part 14. Now the holding surface 24 is no longer against the passive door lock body, and the stopper part is also allowed to move in the first direction, deeper into the passive door body. Thus the wedge release device has moved from the blocking state to the released state in which the wedge of the active door lock is allowed to extrude. Because release is no longer dependent on the rate of turning the handle, and release is a clear and rapid action, this ensures that the deadbolting of the active door lock's bolt is released.

[0014] In the illustrated embodiment of the latch, the first projection comprises both the holding surface 24 and the release surface 25, but it is also possible that there are designated projections for both surfaces.

[0015] The spring 13 is arranged to move the sliding part 14 in a second direction parallel to the axis of the stem part when said handle is released, and the latch 12 is arranged to turn for holding the stopper part stationary when said handle is released. In other words, the spring-back force of the spring moves the wedge release device from the released state to the blocking state when the handle is released.

[0016] In the illustrated embodiment, one end 19 of the spring 13 is in a force transmission connecton with the sliding part 14. The other end 20 is against the latch projections 23. If using a different type of structure according to the invention, the other end of the spring may be against the passive door lock body, for example. In that case, the sliding part is not as illustrated in the Figures but can be, for example, a part moving in a groove on the outer surface of the stopper part. The latch 12 may also be attached to the passive door lock body in a pivoting manner.

[0017] In the embodiment illustrated in the Figures, the sliding part 14 is a sleeve, and the stem part 16 is mounted in a sliding manner in the sleeve hole 21. Furthermore, the latch 12 is attached to the stem part 16 in a pivoting manner. The stem part 16 is a rod, and the spring 13 is inside the sleeve around the rod.

[0018] The rod 16 comprises a cutting 27 parallel to the rod's axis in which the latch 12 is located. The latch can be attached to the stem part in a pivoting manner using cotter projections 26, in which case the rod has recesses 28 for the cotter projections. Another method is to use a separate cotter, in which case the rod and latch have holes for the cotter.

[0019] The wedge release device may also have an element 29 for changing the handedness of the installation, with matching elements 30 in the sliding part. Such a wedge release device is suitable for left-handed and right-handed applications.

[0020] As can be noted, an embodiment according to the invention can be achieved through many different solutions. It is thus evident that the invention is not limited to the examples mentioned in this text. Therefore any inventive embodiment can be implemented within the scope of the inventive idea.

Claims

1. A lock (5) of a passive door (3) of a double door (1), comprising handle control means (9) and a wedge release device (8), **characterised in that** the wedge release device comprises a latch (12), a spring (13), a sliding part (14) and a stopper part (15), said stopper part comprising a stem part (16) and said sliding part (14) being arranged together with the stem part (16) to move in the axial direction of the stem part, said sliding part (14) comprising a handle control surface (18) through which the sliding part (14) is moveable using the handle control means of the lock (5) in a first direction parallel to the axis of the stem part (16) when a handle connected to the lock is turned,

said latch (12) being arranged to hold the stopper part (15) stationary in relation to the body of the passive door lock (5) against the pushing force of the wedge of the lock in an active door (2) of the double door, and to turn for releasing said holding action in response to the movement of the sliding part (14) when said handle is turned,
and said spring (13) is arranged to move the sliding part (14) in a second direction parallel to the axis of the stem part when said handle is released, and said latch (12) is arranged to turn for holding the stopper part stationary when said handle is released.

2. A lock according to Claim 1, **characterised in that** one end (19) of the spring (13) is in a force transmission connection with the sliding part (14).

3. A lock according to Claim 2, **characterised in that** the sliding part (14) is a sleeve, and the stem part (16) is mounted in a sliding manner in the sleeve hole.

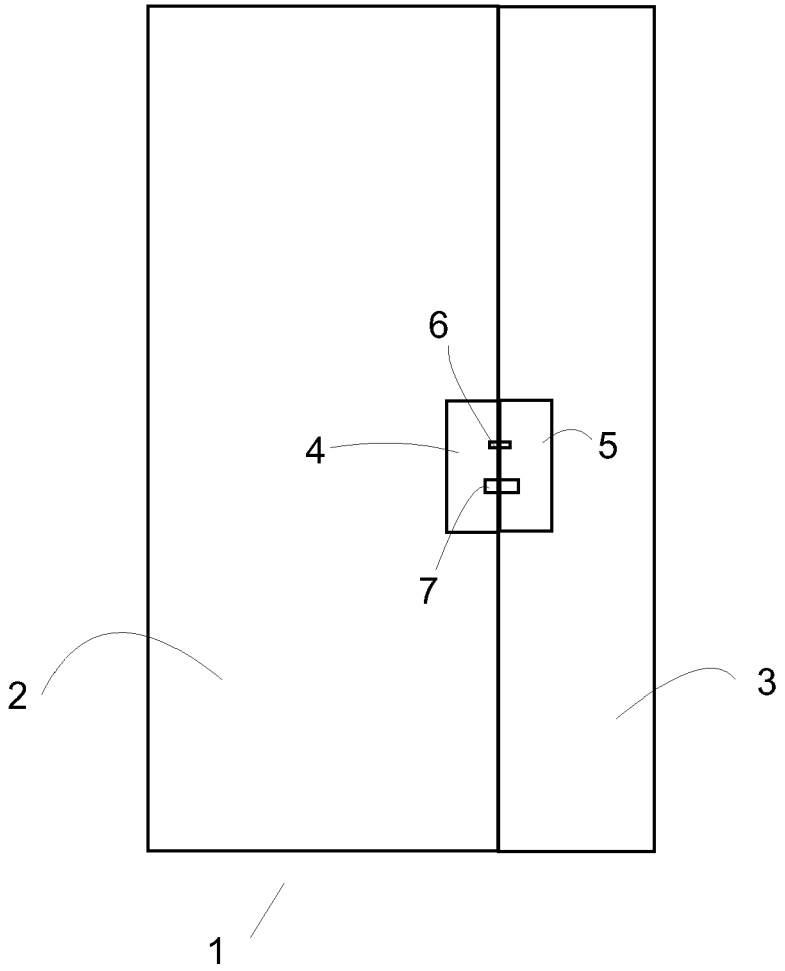
4. A lock according to Claim 2 or 3, **characterised in that** the latch (12) is attached to the stem part (16) in a pivoting manner.

5. A lock according to Claims 3 and 4, **characterised in that** the stem part (16) is a rod, and the spring (13) is inside the sleeve around the rod.

6. A lock according to Claim 5, **characterised in that** the rod (16) comprises a cutting (27) parallel to the rod's axis in which the latch (12) is located, said latch comprising a first projection (22) and a second projection (23), said second projection being in a force transmission connection with the spring (13), said spring trying to turn the latch (12) for holding the stopper part stationary, and said first projection (22) comprising a holding surface (24) to hold the stopper part stationary and a release surface (25) to turn the latch for releasing said holding action in response to the movement of the sliding part (14).

7. A lock according to Claim 6, **characterised in that** the latch (12) is attached to the stem part using cotter projections (26).

FIG. 1



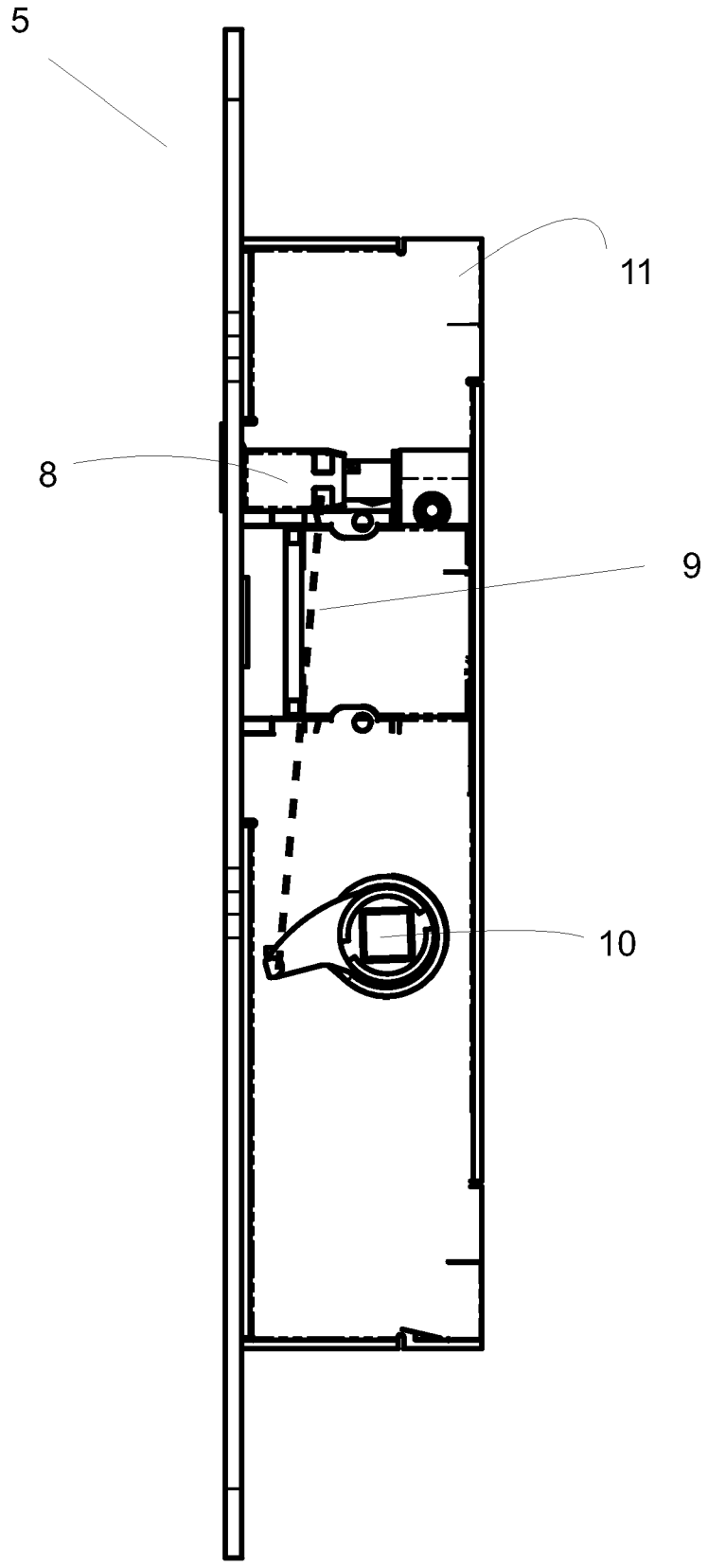


FIG. 2

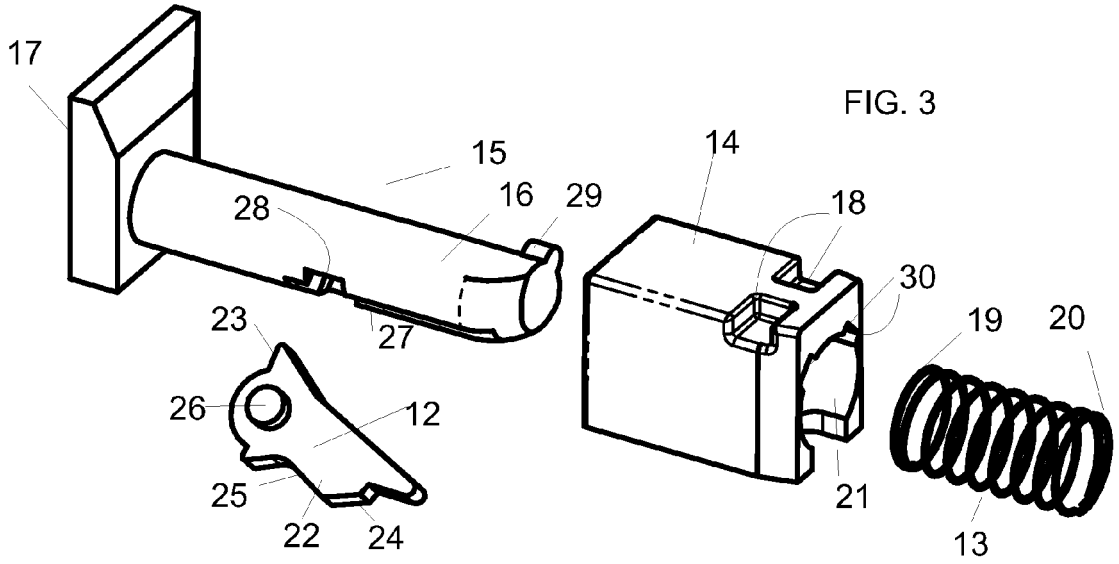


FIG. 3

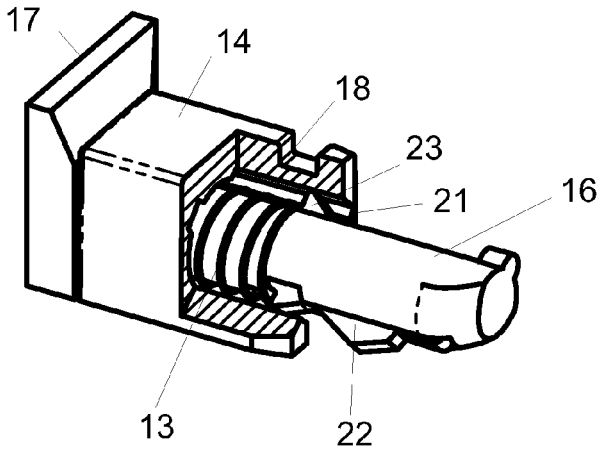


FIG. 4

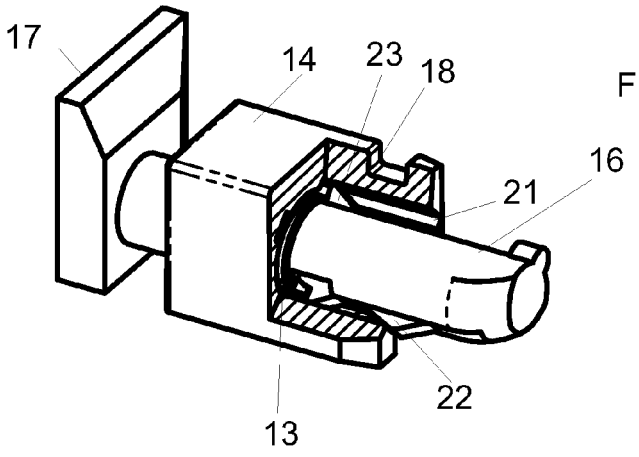


FIG. 5