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(54) **ELECTROMOTORICALLY DRIVEN LOCK FOR WINDOW OR DOOR**

ELEKTROMOTORISCH ANGETRIEBENES SCHLOSS FÜR EIN FENSTER ODER EINE TÜR

DISPOSITIF DE VERROUILLAGE À MOTEUR ÉLECTRIQUE POUR FENÊTRE OU PORTE

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Description

[0001] The present invention relates to a window or door such as a door, a window or French window, comprising a frame designed to be attached to the structure of a building and an openable door element slideably supported by said frame so as to be movable from and to a closed position, wherein:

- said openable door element comprises first engagement means movable between an engagement position and a disengagement position and drive means adapted to be actuated to control the movement of said first engagement means from the engagement position to the disengagement position and vice versa,
- said first engagement means are located at a front edge of said openable door element and said second engagement means are located at a counter-edge of said window or door which is integral with the frame of said window or door,
- said window or door comprises second engagement means adapted to be engaged by said first engagement means when the openable door element is in the closed position and said first means are in the engagement position, the engagement between said engagement first means and said second engagement means preventing the openable door element from moving from the closed position to the open position;
- said window or door comprises motor means which are mounted to said openable door element level with the drive devices and are operably associated with said drive devices to control actuation of said first engagement means between said engagement and disengagement positions;
- said window or door comprises electric connection means for electric connection of said motor to a power source;
- said drive devices include a rotary support to be rotated to control the movement of said first engagement means from the engagement position to the disengagement position and vice versa and
- said rotary support defines a through receptacle.

[0002] Windows or doors comprising drive means are known from documents EP 1340 872 A, EP 1 213 425 A and WO 99/64704 A while:

- EP 0537805 discloses a window system for a building with at least one window comprising an outer frame and a vent frame mounted to pivot on the outer frame, having a lock fitting which can be adjusted manually and/or via a motor arrangement, in particular a turn-and-tilt lock fitting releasing the vent frame either about a vertical axis for a turning pivoting movement or about a horizontal axis for a tilting pivoting movement;
- EP 0844356 B1 discloses a device for operating a window, in particular a motorized tilt mechanism having a pane drive unit mounted on the window frame which interacts with a coupling element on the window pane frame to tilt the pane and
- WO 2007/107389 discloses a fitting for a window or a door, in which a leaf can be introduced horizontally or vertically in relation to the fixed frame, the leaf and the frame are connected together by guiding and/or sliding rails and guiding parts and/or carriages engaging therein; a motor drive which engages on the leaf by means of the journal is mounted on the frame and an electric connection in the form of a cable connecting the leafs (2) to the frame (1) is established for transmitting signals and/or energy.

[0003] In the art of building construction, doors and windows are known to be applied to the structure of a building, and the need is further known of powered opening and closing thereof.

[0004] In prior art, power drive of door and windows is not a problem because drive means are widely used which comprise motor means and linkages for guiding the window or door opening and closing movements.

[0005] Greater problems arise in connection with power drive of the lock or any other locking system that can provide removable engagement between the door or door element of the window or door and the window or door support frame, to prevent window or door opening. Particularly problems arise in connection with the power drive of doors or windows having engagement means, such as a latch bolt or a holding pawl, at one of their edges, for engagement of a corresponding complementary portion at the counter-edge of the jamb.

[0006] In the solution as used in the art in almost every window or door; the above engagement devices are reversibly controlled between an engagement position and a disengagement position by means of drive devices that can be manually rotatably driven by a handle. Particularly, these engagement devices include a rotary support whose rotatable actuation causes the engagement devices to be driven from the engagement position to the disengagement position and vice versa. The rotary support of the engagement devices generally supports the rotating shaft of the handle, known in the art as "spindle", and forms a prismatic connection therewith.

[0007] In view of the above, it is apparent that, while on the one hand the need is felt for power driven opening and closing of a window or door, on the other hand problems arise in connection with the power drive of the door and window lock devices, unless specially designed non-standard doors or windows are provided such as the locking device for sliding door according to JP 2002-227488, comprising a plurality of locking devices mounted to the sliding door and having latch functions interlocked. Said locking devices are actuated by a motor-operated device which is mounted in the sliding door vertically spaced apart from said locking devices, the motor-operated de-

vice being interlocked with said locking devices through a connecting rod. Hence the locking device for sliding door according to JP 2002-227488 is a specially designed locking device not allowing power drive of standard doors of windows. As regards it should be stressed that. Nevertheless, the use of doors or windows with non-standard lock devices Is not desirable and not always feasible In the housing field.

[0008] This invention is based on the technical problem of designing and providing a window or door that has such structural and functional features as to fulfill the above power drive requirements In a simple and cost-effective manner, while obviating the above prior art drawbacks and allowing power drive of standard doors or windows.

[0009] According to the invention, this technical probfem is-achieved by means a window or door as defined in claim 1.

[0010] The features of the window or door of the present invention, and further advantages derived therefrom will be apparent from the following description of a few preferred embodiments thereof, which is given by way of illustration and without limitation with reference to the accompanying figures, In which:

- Figure 1 is a perspective view of a detail of the window or door of the invention;
- Figure 2 is an exploded schematic view of the detail of Figure 1 and
- Figure 3 is a perspective view of a detail of Figure 1 with the covering case removed.

[0011] Referring to the accompanying figures, numeral 1 generally designates a detail of a window or door of the present invention.

[0012] In the example herein described, the window or door is embodied as a one-door sliding French window. Particularly, the window or door of the invention comprises a support frame designed to be attached to the wall structure of a building and adapted to support the sliding door element so that it can be guided along guide rails during its movement from the closed position to an open position.

[0013] It shaft be noted that the fixed frame has been omitted in the figures and that a portion of the sliding door element has been only shown, such components being known to those of ordinary skill in the art.

[0014] The sliding door element has a front edge 9 that abuts, with the door element in the closed position, against a corresponding section of the frame post that defines the counter-edge. As is known in the art, the sliding door element has first engagement means at its front edge, generally at the center thereof, that are movable between a disengagement position and an engagement position In which they engage corresponding second engagement means (not shown) supported by the counter-edge of the window or door frame.

[0015] The engagementbetween the first engagement means and the second engagement means prevents any opeping of the openable door element from the closed position.

[0016] Concerning the above first and second engagement means, no further details thereof will be explained herein, these components being standard components, known per se.

[0017] With reference to the detail of the sliding door element as shown in the figures, the first engagement means include a coupling rod 8 (a central portion whereof is only shown), which can run a preset length of a couple of centimeters, along said front edge 9 of the door to reversibly shift from the engagement configuration to the disengagement position relative to the second abutment means, e.g. beaks, supported by the counter-edge of the frame.

[0018] According to a different embodiment, not shown, the first engagement means may be embodied as a holding pawl, which is adapted to pivot for engaging a corresponding portion of the counter-edge.

[0019] In accordance with a further embodiment, the first engagement means are embodied as a hook adapted to engage a retainer means supported by the counter-edge.

[0020] In the case of a door with pivotal opening, the first engagement means may be embodied as a latch bolt adapted to engage a corresponding recess in the counter-edge.

[0021] The first drive means may also be embodied as a lock.

[0022] The first engagement means are adapted to be driven from the engagement position to the disengagement position and vice versa using drive devices 2 connected thereto and operably associated therewith. The drive devices 2, which are known per se, include a rotary support 3 which is adapted to be rotated to control the movement of the first engagement means from the engagement position to the disengagement position and vice versa.

[0023] It shall be noted that the drive devices comprise pluralities of linkages, gears and/or rack systems, as well as other useful elements allowing the rotary movement of said rotating support 3 to be turned into the movement required for driving the first engagement means 8. In the example of the figures, the rotary drive of the rotary support 3 causes the rod 8 to be moved along the front edge of the sliding door element.

[0024] For simplicity, the figures only show the box-like member that receives the linkages of the drive devices 2. The figures further show the above rotary support 3, which is conformed in such a manner as to define a through receptacle adapted for engagement with the rotating shaft, known in the art as spindle, a handle and the like, thereby providing a form fit therewith.

[0025] The box-like member of the drive devices 2 Is received within the thickness of the sliding door element, at such front edge.

[0026] Advantageously, the window or door of the in-

vention has motor means 4 mounted to the openable sliding door element and operably associated with the drive devices 2 to control actuation of the first engagement means 8 between said engagement and disengagement positions.

[0027] As shown in the figures, the motor means 4 are mounted to the openable door element level with the drive devices 2 and are operably connected thereto.

[0028] More in detail, the motor means 4 include a motor whose drive shaft is directly connected to a rotating shaft 5 via a gear-motor. When the motor means 4 are fixed to the openable door element, the rotating shaft 5 is received in the through receptacle of the rotating support 3 while creating a form fit therewith with mating sections. For this purpose, the portion of the rotating shaft 5 that projects out of the motor means 4 defines a tang having a square section complementary to that of the through receptacle of the rotary support 3.

[0029] Preferably, the window or door of the invention includes a covering case 7 for covering the motor means 4, which is conveniently designed to form a pushing extension for a user to manually push the sliding door element.

[0030] The motor of the motor means 4 may be operated by batteries or electric cells, which are received in the window or door or, according to a preferred embodiment, is connected to the mains. Advantageously, the motor of the motor means has a mains power supply system with a backup battery.

[0031] Thus, the window or door of the invention comprises wiring means extending across the openable door element and the frame, for ensuring electric connection of said motor to the mains.

[0032] The electrical connection means includes sliding contacts, such as the two contacts 6 as shown in the figures.

[0033] The window or door 1 is also equipped with electric transducers, for allowing adjustment and control of said motor means and actuation of said drive means according to the position of the first engagement means, in this case the coupling rod 8.

[0034] Advantageously, the covering case 7 supports electric switches for connection/disconnection of said power source to/from said motor, i.e. switches whose operation can start the process of opening/closing the openable door element.

[0035] The window or door of the invention further comprises drive means for driving the movable openable door element from and to the closed position. These drive means are known perse and comprise an additional motor (generally integral with the frame), for actuating articulation means operably associated with the openable door element to control opening and closing thereof. In the example of the openable door element, the articulation means may include a rack-and-pinion device.

[0036] Advantageously, the window or door of the invention includes a controller for managing the operation of all the motor and drive means, thereby coordinating the engagement/disengagement movement of the first engagement means with the opening/closing movement of the openable door element.

[0037] Preferably, the motor means of the window or door of the invention are remotely controlled, e.g. by a radio control, another infrared system or the like, which interacts with the controller to transmit an actuating signal thereto.

[0038] As shown by the above disclosure, the window or door of the invention allows simple and reliable power drive not only of the opening/closing movement of the openable door element but also of the engagement/disengagement movement of the first engagement means, without requiring the window or doorto differ from standard window or door designs.

[0039] Those skilled in the art will obviously appreciate that a number of changes and variants may be made to the window or door as described hereinbefore, without departure from the scope of the invention, as defined in the following claims.

[0040] Thus, for example, in a window or door having multiple door elements, the second engagement means may be supported by a door element instead of the window or doorframe.

Claims

1. A window or door comprising a frame designed to be attached to the structure of a building and an openable door element supported by said frame so as to be movable from and to a closed position, wherein:

   - said openable door element is an openable door element slideably supported by said frame;
   - said openable door element comprises first engagement means (8) movable between an engagement position and a disengagement position and drive means (2) adapted to be actuated to control the movement of said first engagement means (8) from the engagement position to the disengagement position and vice versa,
   - said first engagement means (8) are located at a front edge (9) of said openable door element and said second engagement means are located at a counter-edge of said window or door which is integral with the frame of said window or door and
   - said window or door comprises second engagement means adapted to be engaged by said first engagement means (8) when the openable door element is in the closed position and said first engagement means (8) are in the engagement position, the engagement between said engagement first means and said second engagement means preventing the openable door element from moving from the closed po-

sition to the open position,

wherein:

- said window or door comprises motor means (4) which are mounted to said openable door element level with the drive devices (2) and are operably associated with said drive devices (2) to control actuation of said first engagement means (8) between said engagement and disengagement positions;
- said window or door comprises electric connection means for electric connection of said motor to a power source;
- said drive devices (2) include a rotary support (3) to be rotated to control the movement of said first engagement means (8) from the engagement position to the disengagement position and vice versa;
- said rotary support (3) defines a through receptacle,
- said motor means (4) are fixed to said door element and comprise a motor and a rotating shaft (5) connected to a drive shaft of said motor via a gear-motor;
- said rotating shaft (5) is received in the through receptacle of the rotating support (3) while creating a form fit therewith with mating sections and
- said electric connection means comprise sliding contacts (6).

2. A window or door as claimed in claim 1, wherein said wiring means extend across said openable door element and said frame for electric connection of said motor to the mains.

3. A window or door as claimed in any one of claims 1 to 2, comprising electric transducers, for adjustment and control of said motor means (4) and actuation of said drive means.

4. A window or door as claimed in any one of claims 1. to 3, comprising a covering case (7) for covering said motor means (4).

5. A window or door as claimed in claims 2 and 4, wherein said covering case supports electric switches for connection/disconnection of said power source to/from said motor.

6. A window or door as claimed in any one of claims 1 to 5, comprising drive means for driving the movable openable door element from and to the closed position.

7. A window or door as claimed in claim 6, comprising a controller for managing the operation of said motor means (4) and said drive means.

8. A window or door as claimed in claim 7, wherein said first engagement means (8) include a lock.

9. A window or door as claimed in claim 1, wherein said first power source comprises at least one cell or battery associated with said window or door.

10. A window or door as claimed in any one of claims 1 to 9, wherein said motor means are remotely controller.

Patentansprüche

1. Fenster oder Tür, umfassend einen Rahmen, der gestaltet ist, um am Mauerwerk eines Gebäudes befestigt zu werden, und ein öffenbares Türelement, das von diesem Rahmen so getragen wird, dass es aus einer und in eine geschlossene Stellung bewegt werden kann, wobei:

- dieses öffenbare Türelement ein offenbares Türelement ist, das von diesem Rahmen verschiebbar getragen wird;
- dieses öffenbare Türelement erste Eingriffsmittel (8), die zwischen einer Eingriffsstellung und einer gelösten Stellung bewegt werden können, und Antriebsmittel (2) umfasst, die betätigt werden können, um die Bewegung dieser ersten Eingriffsmittel (8) aus der Eingriffsstellung in die gelöste Stellung und umgekehrt zu steuern, und
- diese ersten Eingriffsmittel (8) an einer Vorderkante (9) des öffenbaren Türelements angeordnet sind und die zweiten Eingriffsmittel an einer Gegenkante des Fensters oder der Tür angeordnet sind, die einstückig mit dem Rahmen dieses Fensters oder dieser Tür ist, und
- dieses Fenster oder diese Tür zweite Eingriffsmittel umfasst, mit denen die ersten Eingriffsmittel (8) in Eingriff sein können, wenn sich das öffenbare Türelement in der geschlossenen Stellung befindet und sich die ersten Mittel (8) in der Eingriffsstellung befinden, wobei der Eingriff zwischen diesen ersten Eingriffsmitteln und diesen zweiten Eingriffsmitteln verhindert, dass sich das öffenbare Türelement aus der geschlossenen Stellung in die geöffnete Stellung bewegt,

wobei:

- dieses Fenster oder diese Tür Motormittel (4) umfasst, die auf gleichem Niveau mit den Antriebsvorrichtungen (2) auf das öffenbare Türelement montiert und betriebsfähig mit diesen Antriebsvorrichtungen (2) verbunden sind, um

die Betätigung der ersten Eingriffsmittel (8) zwischen der Eingriffsstellung und der gelösten Stellung zu steuern;
- dieses Fenster oder diese Tür elektrische Verbindungsmittel für die elektrische Verbindung des Motors mit einer Stromquelle umfasst;
- diese Antriebsvorrichtungen (2) ein Drehlager (3) umfasst, das zu drehen ist, um die Bewegung der ersten Eingriffsmittel (8) aus der Eingriffsstellung in die gelöste Stellung und umgekehrt zu steuern;
- dieses Drehlager (3) eine durchgehende Aufnahme definiert,

dadurch gekennzeichnet, dass:

- die Motormittel (4) am Türelement befestigt sind und einen Motor und eine Drehwelle (5), die über einen Getriebemotor mit einer Antriebswelle dieses Motors verbunden ist, umfassen;
- diese Drehwelle (5) von der durchgehenden Aufnahme des Drehlagers (3) aufgenommen wird, während sie mit dieser einen Formschluss mit zusammenpassenden Abschnitten bildet, und
- diese elektrische Verbindungsmittel Gleitkontakte (6) umfassen.

2. Fenster oder Tür nach Anspruch 1, wobei sich die Verdrahtungsmittel für die elektrische Verbindung des Motors mit dem Stromnetz durch das öffenbare Türelement und den Rahmen erstrecken.

3. Fenster oder Tür nach einem der Ansprüche 1 bis 2, das bzw. die elektrische Wandler für die Einstellung und Steuerung der Motormittel (4) und die Aktivierung der Antriebsmittel umfasst.

4. Fenster oder Tür nach einem der Ansprüche 1 bis 3, das bzw. die ein Abdeckgehäuse (7) zum Abdecken der Motormittel (4) umfasst.

5. Fenster oder Tür nach den Ansprüchen 2 und 4, wobei das Abdeckgehäuse elektrische Schalter zum Verbinden bzw. Trennen der Stromquelle mit bzw. von dem Motor trägt.

6. Fenster oder Tür nach einem der Ansprüche 1 bis 5, das bzw. die Antriebsmittel zum Antreiben des beweglichen öffenbaren Türelements aus der und in die geschlossene Stellung umfasst.

7. Fenster oder Tür nach Anspruch 6, das bzw. die eine Steuerung zum Steuern des Betriebs der Motormittel (4) und der Antriebsmittel umfasst.

8. Fenster oder Tür nach Anspruch 7, wobei die ersten Eingriffsmittel (8) ein Schloss umfassen.

9. Fenster oder Tür nach Anspruch 1, wobei die erste Stromquelle mindestens eine mit dem Fenster oder der Tür verbundene Zelle oder Batterie umfasst.

10. Fenster oder Tür nach einem der Ansprüche 1 bis 9, wobei die Motormittel ferngesteuert sind.

Revendications

1. Fenêtre ou porte comprenant un cadre destiné à être fixé à la structure d' un bâtiment et élément de porte ouvrable supporté par ledit cadre de manière à être mobile à partir de et vers une position fermée, où:

- ledit élément de porte ouvrable est un élément de porte ouvrable supporté par coulissement par ledit cadre;
- ledit élément de porte ouvrable comprend des premiers moyens d'engagement (8) mobiles entre une position d'engagement et une position de désengagement et des moyens d'entraînement (2) adaptés pour être actionnés pour commander le mouvement desdits premiers moyens d'engagement (8) de la position d'engagement à la position de désengagement et vice versa;
- lesdits premiers moyens d'engagement (8) sont situés à un bord avant (9) dudit élément de porte ouvrable et lesdits seconds moyens d'engagement sont situés à un contre-bord de ladite fenêtre ou porte qui est solidaire avec le cadre de ladite fenêtre ou porte et
- ladite fenêtre ou porte comprend des seconds moyens d'engagement adaptés pour être engagés par lesdits premiers moyens d'engagement (8) lorsque l'élément de porte ouvrable est dans la position fermée et lesdits premiers moyens (8) sont dans la position d'engagement, l'engagement entre lesdits premiers moyens d'engagement et lesdits seconds moyens d'engagement empêchant l'élément de porte ouvrable de se déplacer de la position fermée à la position ouverte,

où:

- ladite fenêtre ou porte comprend des moyens moteurs (4) qui sont montés sur ledit élément de porte ouvrable à niveau avec les dispositifs d'entraînement (2) et sont associés opérationnellement auxdits dispositifs d'entraînement (2) pour commander l'actionnement desdits premiers moyens d'engagement (8) entre lesdites positions d'engagement et de désengagement;
- ladite fenêtre ou porte comprend des moyens de connexion électrique pour la connexion électrique dudit moteur à une source d'alimentation;
- lesdits dispositifs d'entraînement (2) incluent

un support rotatif (3) à mettre en rotation pour commander le mouvement desdits premiers moyens d'engagement (8) à partir de la position d'engagement vers la position de désengagement et vice versa;
- ledit support rotatif (3) définit un réceptacle passant,

caractérisée en ce que :

- lesdits moyens moteurs (4) sont fixés audit élément de porte et comprennent un moteur et un arbre rotatif (5) relié à l'arbre d'entraînement dudit moteur via un moteur à engrenages;
- ledit arbre rotatif (5) est reçu dans le réceptacle passant du support rotatif (3) tout en y créant une liaison de forme avec des sections d'accouplement et
- lesdits moyens de connexion électrique comprennent des contacts glissants (6).

2. Fenêtre ou porte telle que revendiquée dans la revendication 1, où lesdits moyens de câblage s'étirent à travers l'élément de porte ouvrable et ledit cadre pour la connexion électrique dudit moteur au secteur.

3. Fenêtre ou porte telle que revendiquée dans une quelconque des revendications 1 à 2, comprenant des transducteurs électriques, pour le réglage et la commande desdits moyens moteurs (4) et l'actionnement desdits moyens d'entraînement.

4. Fenêtre ou porte telle que revendiquée dans une quelconque des revendications 1 à 3, comprenant un boîtier de couverture (7) pour couvrir lesdits moyens moteurs (4).

5. Fenêtre ou porte telle que revendiquée dans les revendications 2 et 4, où ledit boîtier de couverture supporte des interrupteurs électriques pour la connexion/déconnexion de ladite source d'alimentation audit/dudit moteur.

6. Fenêtre ou porte telle que revendiquée dans une quelconque des revendications 1 à 5, comprenant des moyens d'entraînement pour entraîner l'élément de porte ouvrable mobile à partir de et vers la position fermée.

7. Fenêtre ou porte telle que revendiquée dans la revendication 6, comprenant un contrôleur pour gérer le fonctionnement desdits moyens moteurs (4) et desdits moyens d'entraînement.

8. Fenêtre ou porte telle que revendiquée dans la revendication 7, où lesdits premiers moyens d'engagement (8) comprennent un verrou.

9. Fenêtre ou porte telle que revendiquée dans la revendication 1, où ladite première source d'alimentation comprend au moins une cellule ou batterie associée à ladite fenêtre ou porte.

10. Fenêtre ou porte telle que revendiquée dans une quelconque des revendications 1 à 9, où lesdits moyens moteurs sont commandés à distance.

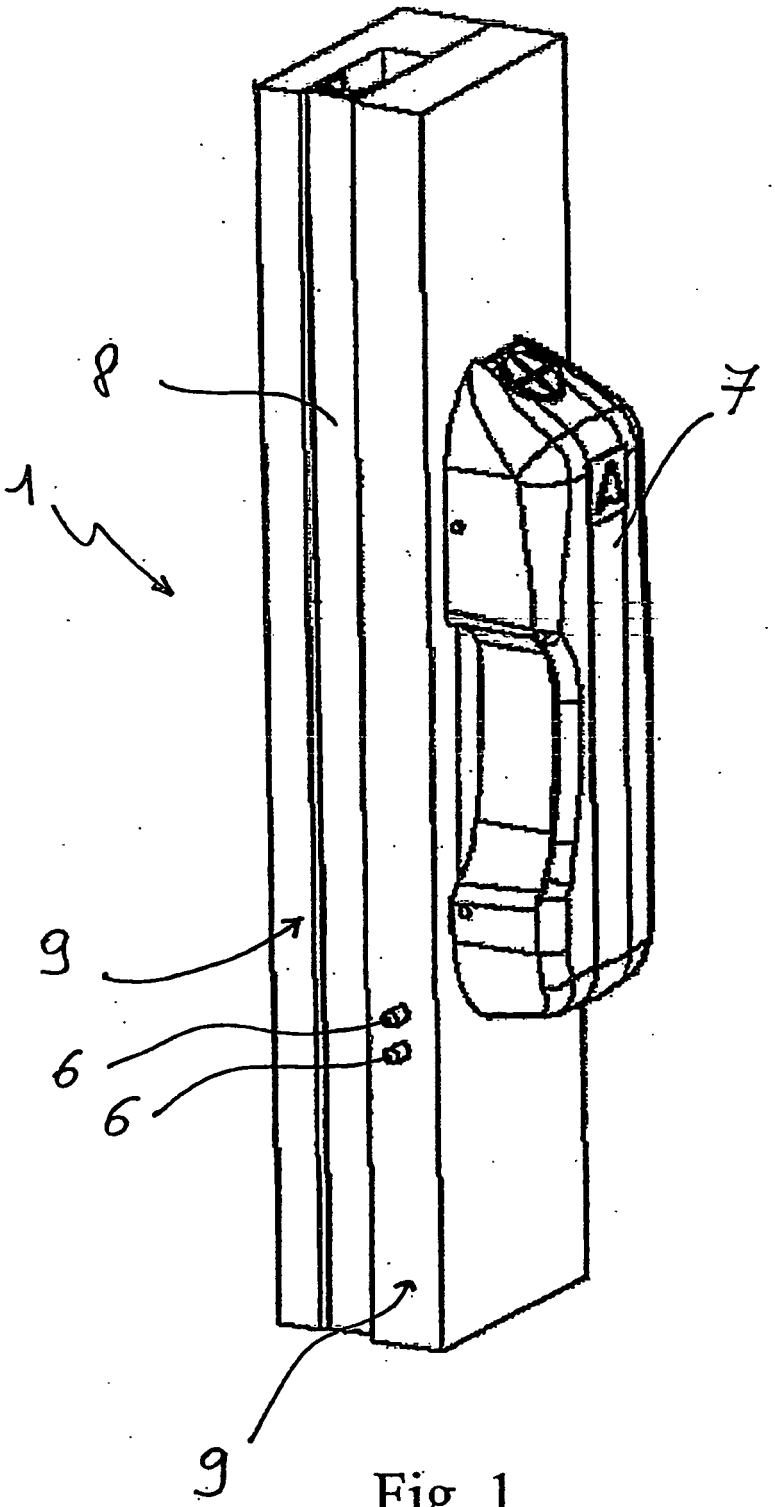

Fig. 1

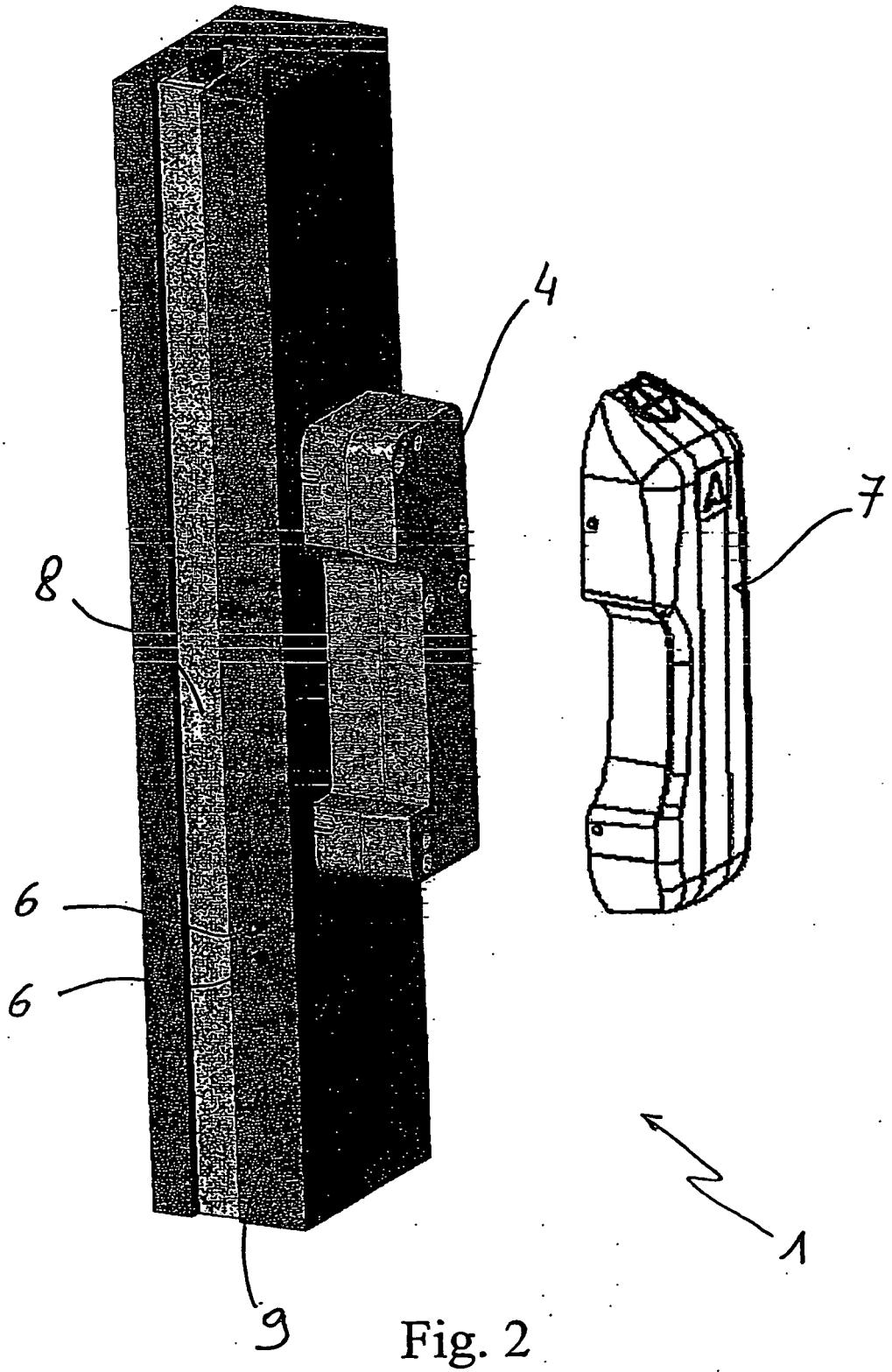

Fig. 2

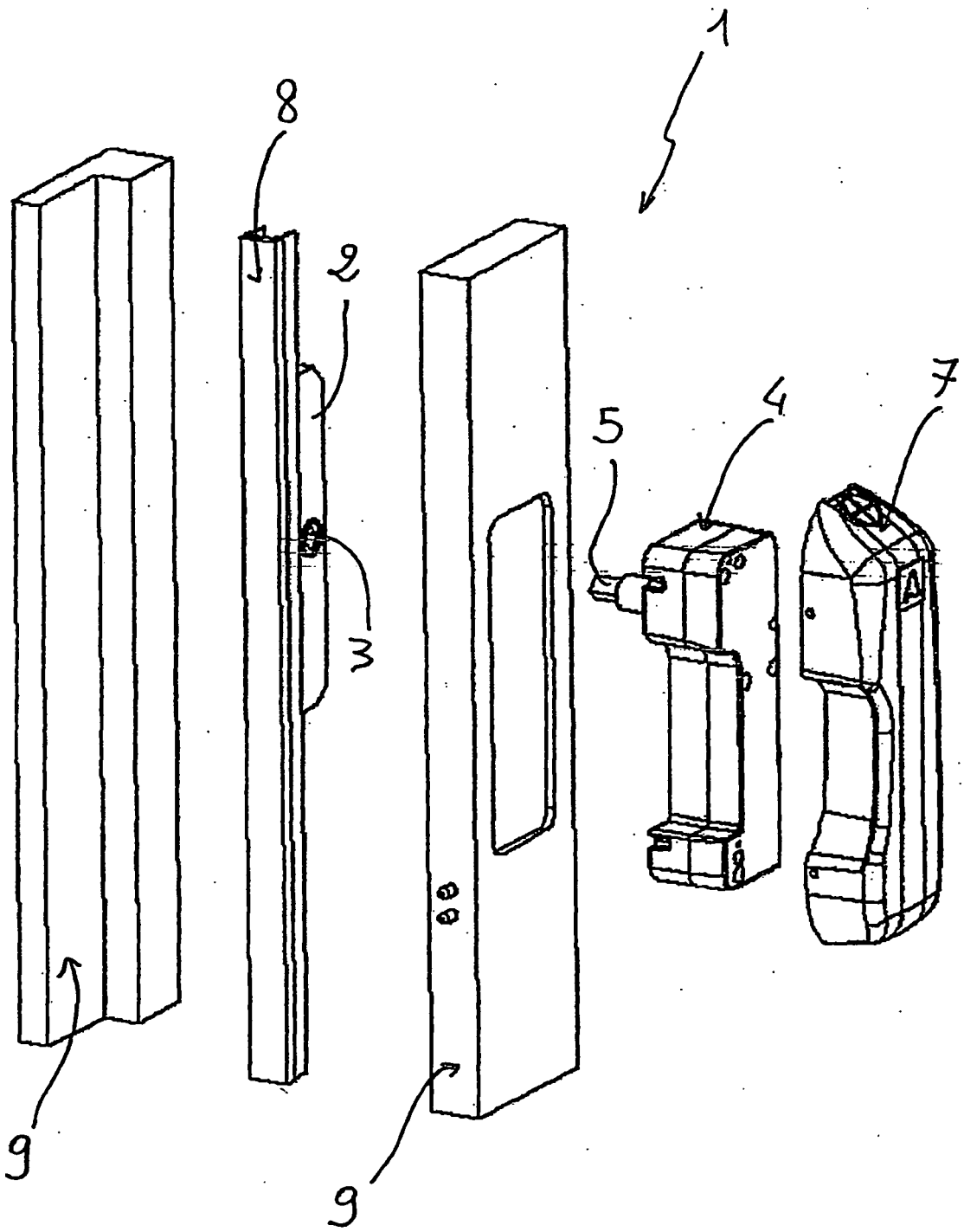

Fig. 3

REFERENCES CITED IN THE DESCRIPTION

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