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(54) SWING DOOR OR GATE

(57) Swing door or gate, which comprises at least one first wing (2) movable in rotation between a closed position (C), in which it obstructs a transit passage (P), and an open position (A), in which it frees the transit passage (P), and first movement means (3) mechanically connected to the first wing (2) and arranged for moving the latter between the closed position (C) and open position (A). The swing door or gate (1) also comprises a first motorized stopper device (4), which comprises a box-like body (5), intended to be embedded fixed in the transit passage (P) and a stopper body (6), provided with a stop surface (60) susceptible of receiving, in abutment, the first wing (2) in the closed position (C). The stopper body (6) is movably associated with the box-like body (5) between an operative position (O), in which the stopper body (6) projects with at least the stop surface (60) from the box-like body (5) in order to receive, in abutment, the first wing (2) in closed position (C), and a rest position (R), in which the stopper body (6) is housed within the box-like body (5) with the first wing (2) in the open position (A). The first motorized stopper device (4) also comprises second movement means (7) mechanically connected to the box-like body (5) and to the stopper body (6) and arranged for moving the stopper body (6) between the operative position (O) and the rest position (R).

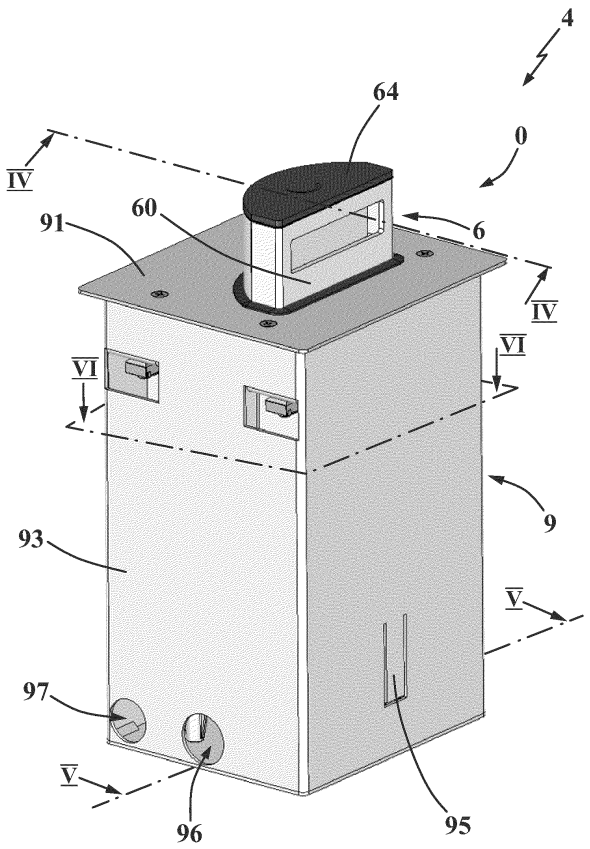


Fig. 2A

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Description

Field of application

[0001] The present invention regards a swing door or gate according to the preamble of the independent claim 1.

[0002] The present swing door or gate is inserted in the field of production of gates intended to be installed at a transit passage, vehicle-accessible or pedestrian-only, which allows accessing a property, public or private, such as for example a parking lot, a condominium, a company, a park and the like.

[0003] The present swing door or gate is intended to be advantageously employed both in the transit passages constituted by a lane with flat access, and in transit passages constituted by access lanes with ramp.

State of the art

[0004] The gates for transit passages, whether they are vehicle-accessible or pedestrian-only, are usually of slidable type or with swing wing.

[0005] The slidable gates provide that a slidable wing slides on a guide placed on the ground orthogonal to the advancement direction on the transit passage, allowing limiting the bulk during the opening of the gate itself.

[0006] Nevertheless, such gates require having a lateral space in which the slidable wing can be placed in order to be opened, so as to not intercept the advancement direction of the transit passage and hence allowing pedestrians and/or vehicles to travel through the aforesaid transit passage.

[0007] In the event in which it is not possible to obtain a lateral space for the containment of the slidable wing of a slidable gate in open position, there are swing gates, such as for example that described in the patent of prior art FR 2589190, which provide for one or two movable wings, each hinged to a corresponding upright by means of hinges, and such upright can for example be integrated in or constituted by the flanks of a passage opening made on a building wall or constituted by a metal column that can be part of a fencing placed to delimit a property.

[0008] Each movable wing is movable around a rotation axis thereof, in particular vertical, defined by the respective hinges, between a closed position, in which they intercept the transit passage in order to prevent the travel by vehicles and/or pedestrians therethrough, and an open position, in which the movable wings are placed to the side of the transit passage (e.g. rotated by about 90° with respect to the corresponding closed position) in order to free the aforesaid transit passage. The movement of the aforesaid movable wings is attained by means of well-known automatic mechanisms, which comprise movement means (comprising for example at least one electric motor) mechanically connected to the movable wings themselves and operatively connected to an electronic control unit which commands the operation thereof.

[0009] Such swing gates of known type usually comprise a stopper, which is fixed to the ground (which can for example be constituted by a floor), and is provided with a stop surface susceptible of receiving, in abutment, the movable wing.

[0010] In particular, the stopper is placed in a position such to allow it to receive, in abutment, at least one movable wing of the gate in closed position.

[0011] In the swing gates provided with two wings, the stopper is usually placed at the center of the transit passage, in order to be able to receive, in abutment, the free side (i.e. the side opposite that where the hinges are situated) of both wings of the gate or in order to receive, in abutment, the free side of only a first of the two wings, with the second wing which is provided, at its free side, with an abutment flange arranged for abutting against the face of the first wing opposite the face arranged for abutting against the stopper.

[0012] The stopper therefore allows stopping the travel of the movable wing (in the event in which the swing gate is provided with only one wing) or of both the movable wings (in the event in which the swing gate is provided with two wings, regardless of whether they are both arranged for abutting against the stopper or whether they are arranged with one that abuts against the stopper and the other that abuts against the first) in a precise manner.

[0013] Therefore, the stopper prevents the wings from being able to follow their path beyond the closed position, carrying out an extra-travel that could damage the hinges and the movement means or cause the blockage of the electronic control unit that commands the movement means, no longer being able to detect and determine the correct position of the wings.

[0014] The swing gates of known type described briefly up to now have in practice shown that they do not lack drawbacks.

[0015] Indeed, the stopper of such gates è constituted by a single body, usually made of metal, fixed to the ground by means of screws or cemented in part directly within the terrain or projecting therefrom for a considerable height, which can even reach up to 8 or 9 cm for example, in a manner such to be able to receive, in abutment, one or both wings in a secure and stable manner.

[0016] The fact that the stopper projects from the ground with one such height can lead to inconvenience and annoyance for the users who travel through the transit passage, whether during their passage on foot, during their transit with vehicles, whether bicycles, scooters, motorcycles or cars.

[0017] Indeed, such stoppers of known type can bring the pedestrian to trip or the user to fall from the bike and from the scooter in the event in which a wheel thereof passes over the stopper itself and, additionally, such stoppers can also damage the bottom of a car, in particular a car having a lower structure, during the travel through the transit passage.

[0018] Such final critical feature is particularly important in the case of a transit passage constituted by a lane with ramp, for example the entrance of a parking lot that is underground with respect to the surface of the street, since there is a greater risk that the cars with lower structure impact the stopper of the swing gate with their bottom, which is generally placed at the top of the ramp. Indeed, when a car starts descending the ramp of the transit passage or is situated at the end of the ascent along the ramp, a pair of wheels of the car is situated at a lower height than that of the height of the other pair of wheels which is at the street level, with the consequence that the bottom of the car passes particularly close to the top of the ramp where the stopper is present.

Presentation of the invention

[0019] In this situation, the problem underlying the present invention is therefore that of overcoming the drawbacks manifested by the solutions of known type, by providing a swing door or gate, which allows reducing the vertical bulk of the stopper with respect to that of the stoppers of the gates of the prior art.

[0020] A further object of the present invention is to provide a swing door or gate, which is safe for a user who travels through the transit passage at which the swing door or gate itself was installed, independent of whether the user travels through the transit passage on foot or on a bicycle.

[0021] A further object of the present invention is to provide a swing door or gate, which does not risk damaging a car, in particular having a lower structure, which follows the transit passage at which the swing door or gate itself was installed, also in the event in which such transit passage is provided with a ramp.

Brief description of the drawings

[0022] The technical characteristics of the invention, according to the aforesaid objects, can be clearly seen in the contents of the below-reported claims and the advantages thereof will be more evident in the following detailed description, made with reference to the enclosed drawings, which represent a merely exemplifying and non-limiting embodiment of the invention, in which:

- figure 1 shows a swing gate, object of the present invention;
- figure 2A shows a first motorized stopper device of the gate of figure 1 in perspective view, with a stopper body in an operative position;
- figure 2B shows the first motorized stopper device of figure 2A with the stopper body in a rest position;
- figure 3 shows a sectional view of the first motorized stopper device of figure 2A according to the trace IV-IV of figure 2A itself;
- figure 4 shows a sectional view of the motorized stopper device of figure 2A according to the trace V-V of figure 2A itself;
- figure 5 shows a sectional view of the motorized stopper device of figure 2A according to the trace VI-VI of figure 2A itself;
- figure 6 shows the section of the motorized stopper device of figure 5 in plan view;
- figure 7 shows a detail of the motorized stopper device of figure 2A relative to movement means, with several parts removed in order to better illustrate other parts;
- figure 8 shows the section of the motorized stopper device of figure 3 with the stopper body itself in a retracted position;
- figure 9A shows a detail of the section of figure 4, relative to a first and a second connection element of snap engagement means that are snap engaged with each other;
- figure 9B shows the snap engagement means of figure 9A with a disengagement mouth of the first connection element in abutment against an enlarged head of the first connection element;
- figure 10 shows a detail of the present swing gate, relative to the stopper body of the motorized stopper device in a release position and to an coupling element of a first wing.

Detailed description of a preferred embodiment

[0023] With reference to the enclosed drawings, reference number 1 overall indicates the swing door or gate, object of the present invention.

[0024] In particular, in the course of the description and in the embodiment illustrated in the enclosed figures, a swing gate 1 will be considered, though a swing door or any other barrier could be intended, without departing from the protective scope of the present invention.

[0025] The swing gate 1 comprises at least one first wing 2 movable in rotation between a closed position C, in which the first wing 2 obstructs a transit passage P, and an open position A, in which the first wing 2 frees the transit passage P.

[0026] In particular, the first wing 2 is susceptible of being moved between the two provided closed C and open A positions in order to carry out the conventional function of controlling the transit passage P, vehicle-accessible or pedestrian-only, to a property, whether private or public, such as for example a residence, a condominium, a business or industrial establishment, a park, a parking lot and the like. More in detail, the transit passage P can be constituted by a street or a lane, it can be provided with a paved surface (e.g. with cement, tiles, bricks and the like) or dirt surface and can be extended, in particular along an advancement direction thereof, on a plane that is substantially horizontal or it is provided with a tilted ramp.

[0027] More in detail, the first wing 2 is rotatable associated, between the open position A and the closed position C, around a hinging axis V thereof (in particular

vertical), with a first support element 21, by means of hinging elements that are per se known to the man skilled in the art and hence not described in detail hereinbelow.

[0028] The support element 21 can be the flank of a passage opening made on a building wall or it can be an upright, in particular having substantially vertical extension, which is for example integrated in a fencing, in which the building wall or the fencing is placed to delimit the private or public property at whose transit passage P the swing gate 1 is installed, according to the invention.

[0029] Advantageously, the gate 1 can comprise a second wing 22, it too movable between the closed position C, in which it cooperates with the first wing 2 in order to obstruct the transit passage P, and an open position A, in which it frees the transit passage P.

[0030] Similar to the first wing 2, also the second wing 22 is advantageously rotatably associated, between the open position A and the closed position C, around a hinging axis V thereof (in particular vertical), with a second support element 210, by means of hinging elements that are per se known.

[0031] More in detail, the first and the second wing 2, 22 in closed position C are substantially aligned with each other in order to obstruct the transit passage P, while in open position A they are rotated, around the corresponding hinging axis V, by an angle for example of about 90°, being arranged substantially parallel to each other at the flanks of the transit passage P itself, in order to allow the passage of motor vehicles, bicycles and/or pedestrians.

[0032] The swing gate 1 also comprises first movement means 3 mechanically connected at least to the first wing 2 and arranged for moving the first wing 2 between the closed position C and the open position A.

[0033] Advantageously, in the event in which the gate 1 is also provided with a second wing 22, the first movement means 3 are mechanically connected also to such second wing 22 and are arranged for moving the first and the second wing 2, 22 between the closed position C and the open position A.

[0034] More in detail, the arrangement of the first movement means 3 ensures that the movement of the first wing 2, and possibly also of the second wing 22 in the event in which this is provided for, is automated and therefore does not require the manual intervention of the user.

[0035] Hereinbelow, for description simplicity, reference will be made to a swing gate 1 provided with only one first wing 2, while a gate 1 can also be intended as provided with a first and a second wing 2, 22 without departing from the protective scope of the present invention.

[0036] In accordance with the idea underlying the present invention, the swing door or gate 1 is provided with a first motorized stopper device 4 comprising a box-like body 5, which is intended to be at least partially embedded fixed in the transit passage P and internally defines at least one containment chamber 50 provided with an access opening 51, and a stopper body 6, which is provided with a stop surface 60 susceptible of receiving, in abutment, at least the first wing 2 in the closed position C.

[0037] Such stopper body 6 is movably associated with the box-like body 5 at least between an operative position O, in which the stopper body 6 projects with at least the stop surface 60 from the access opening 51 in order to receive, in abutment, at least the first wing 2 in closed position C, and a rest position R, in which the stopper body 6 is housed within the containment chamber 50 with the first wing 2 at least in open position A.

[0038] In addition, the aforesaid first motorized stopper device 4 comprises second movement means 7, which are mechanically connected to the box-like body 5 and to the stopper body 6 and are arranged for moving the stopper body 6 between the operative position O and the rest position R.

[0039] In particular, the arrangement of a box-like body 5 which is movably associated with a stopper body 6 between an operative position O and a rest position R allows considerably reducing the bulk of the first motorized stopper device 4 when it is necessary for a pedestrian, a bicycle or a car to travel through the transit passage P. In this manner, when the first wing 2 (and possibly also the second wing 22 if provided for) is (are) in open position A, there is a reduced risk that, during the travel through the transit passage P, the pedestrians can trip on the same first motorized stopper device 4, the bicycles (bicycles, scooters, motorcycles, and the like) can fall, passing with their wheels over the first motorized stopper device 4 itself and the cars, in particular those with lower structure, can damage the bottom thereof.

[0040] The reduction of the overall bulk of the first motorized stopper device 4 when the first wing 2 is in open position A constitutes a particularly important advantage in the event in which the transit passage P is provided with a ramp, for example for the entrance or exit from an underground parking lot below the street late, and in the event in which the swing gate 1 according to the invention is intended to be installed at the top of such ramp. Indeed, in this case, when a car must travel on the ramp of the transit passage P and is situated at the top of such ramp, the aforesaid car will be tilted with respect to a horizontal plane with a pair of wheels on the ramp at a height lower than that of the street surface and with a pair of wheels placed on the street surface. In this position, therefore, the car will have its own bottom close to the surface of the transit passage P at the top of the ramp, where the first motorized stopper device 4 is present, which, since it has the box-like body 5 at least partially embedded and the stopper body 6 in rest position R when the first wing 2 is in open position A, does not risk damaging the car itself.

[0041] Preferably, in order to reduce, as much as possible, the bulk of the first motorized stopper device 4 on the transit passage P when the first wing 2 is in open position A, the box-like body 5 is intended to be completely embedded fixed, therefore ensuring that, when the

stopper body 6 is in rest position R, the first motorized stopper device 4 substantially does not project with any part thereof with respect to the surface of the transit passage P.

[0042] More in detail, in order to have the box-like body 5 completely embedded, a positioning seat is attained in the ground, extended below the bottom of the transit passage P, in which the box-like body 5 is intended to be inserted, and the box-like body 5 itself is provided with a cover 55 (on which the access opening 51 is in particular made), which is intended to be placed substantially at the same height as the bottom of the transit passage P.

[0043] In addition, in order to obtain that parts of the stopper body 6 do not project vertically with respect to the surface of the transit passage P when the stopper body 6 itself is in rest position R, the access opening 51 of the box-like body 5 is advantageously delimited by a corresponding perimeter edge 53 and, additionally, the stopper body 6 is provided with an upper surface 64 (preferably substantially flat), which is placed substantially at the same height as the perimeter edge 53 of the access opening 51 when the stopper body 6 is in the rest position R.

[0044] Advantageously, the first motorized stopper device 4 comprises a first seal element 530 placed to cover the perimeter edge 53, and such first seal element 530 is for example a gasket made of rubber, so as to prevent or at least limit, as much as possible, the access of external agents, such as rain or dust, into the containment chamber 50.

[0045] In particular, such first seal element 530 is traversed by the stopper body 6 and hits the latter perimetrically, adhering thereto, both in the operative position O and in the rest position R.

[0046] Advantageously, the stop surface 60 of the stopper body 6 is substantially flat, so as to facilitate the abutment of the first wing 2 thereon when the first wing 2 comes to be placed in closed position C.

[0047] In the event in which the present swing gate 1 is provided with the second wing 22, the stop surface 60 of the stopper body 6 is susceptible of receiving, in abutment, both the first wing 2 and advantageously the second wing 22, in closed position C.

[0048] Otherwise, still in the event in which a first wing 2 and a second wing 22 are provided for, the stop surface 60 of the stopper body 6 is susceptible of receiving, in abutment, only the first wing 2, which is preferably provided with a stop step which, when the stopper body 6 is in operative position O and the first wing 2 is in closed position C, laterally projects with respect to the stopper body 6 in order to receive, in abutment, the second wing 22, without such second wing 22 coming to interact directly with the abutment body 6.

[0049] In accordance with another non-illustrated variant which provides both for the first wing 2 and the second wing 22, the stop surface 60 of the stopper body 6 is susceptible of receiving, in abutment, only the first wing 2 and the second wing 22 is provided with a stop step, which, in the closed position C, is susceptible of abutting against the first wing 2 in turn in closed position C and placed in abutment against the stop surface 60 of the stopper body 6.

[0050] Otherwise, once again, in accordance with an embodiment not illustrated in the enclosed figures, the present swing gate 1 comprises two first motorized stopper devices 4, which are placed with their box-like bodies 5 next to each other in the transit passage P and with their stopper bodies 6 susceptible of receiving, in abutment against the stop surface 60 thereof: one body receives the first wing 2 and the other the second wing 22 in closed position C.

[0051] Advantageously, the stopper body 6 is slidably associated with the box-like body 5 along a rectilinear movement direction X, which is preferably substantially transverse to the surface of the transit passage P, still more preferably substantially orthogonal to the latter and, in particular, substantially vertical.

[0052] Advantageously, the first motorized stopper device 4 also comprises guide means 40, which are at least partially housed in the containment chamber 50 of the box-like body 5 and are arranged for guiding the stopper body 6 between at least the operative position O and the rest position R along the movement direction X.

[0053] In this manner, the stopper body 6 correctly remains aligned along the aforesaid movement direction X during its movement between the aforesaid operative O and rest R positions due to the guide means 40.

[0054] In addition, such guide means 40 also have the advantage of increasing the mechanical strength of the first motorized stopper device 4, given that they contribute to preventing that the impact of the first wing 2 (and possibly also of the second wing 22) against the stop surface 60 can misalign the stopper body 6.

[0055] Otherwise, in accordance with an embodiment not illustrated in the enclosed figures, the stopper body 6 is not movable along a movement direction X, even if it is rotatably associated with the box-like body 5 around a revolution axis (preferably intended to be placed substantially horizontal and transverse with respect to the advancement direction introduced above, which is in particular the direction along which the transit passage P is longitudinally extended) between the operative position O, in which the stopper body 6 projects from the access opening 51 with at least its stop surface 60, and the rest position R, in which the aforesaid stopper body 6 closes the access opening 51 with its stop surface 60 (which in particular will be placed substantially horizontal).

[0056] Preferably, with reference to the preferred embodiment illustrated in the enclosed figures, the guide means 40 are placed in the containment chamber 50 to the side of the stopper body 6 in the containment chamber 50.

[0057] More in detail, the guide means 40 comprise at least one guide rod 400, which is extended within the containment chamber 50, and a first slider 401, which is

fixed to the stopper body 6 (e.g. made integrally with a lateral wall of the same stopper body 6 introduced and better explained hereinbelow) and is slidably associated with the aforesaid guide rod 400.

[0058] In particular, the first slider 401 is provided with a sliding opening traversed by the guide rod 400, in a manner such that the first slider 401 can slide on such guide rod 400 without risking that possible impact or mechanical stresses can bring the first slider 401 to be decoupled from the respective guide rod 400.

[0059] Preferably, in order to support, in a balanced manner, the stopper body 6 during its movement, the guide means 40 comprise two guide rods 400 that are parallel to each other, the stopper body 6 is interposed between the aforesaid two guide rods 400 and, additionally, two sliders 401 are provided for that are fixed to the stopper body 6 and slidably each associated with a corresponding guide rod 400.

[0060] Advantageously, the first motorized stopper device 4 comprises elastic means 41, which are mechanically connected (directly or indirectly) to the stopper body 6 and to the box-like body 5 and are susceptible of elastically yielding when the stopper body 6 in the operative position O is subjected to an external stress that tends to push the stopper body 6 from the operative position O towards the rest position R.

[0061] In this manner, in case of malfunction of the present swing gate 1 with the stopper body 6 which remains in operative position O when the first wing 2 is in open position A, the elastic means 41 damp possible impact against the stopper body 6, allowing it to be at least partly retracted in the containment chamber 50 under the external stress due to impact, thus preventing further damage to the first motorized stopper device 4 and to the object that impacted against the stopper body 6 itself.

[0062] Advantageously, the second movement means 7 comprise an actuation motor 70 housed inside the box-like body 5.

[0063] In addition, the second movement means 7 advantageously comprise at least one transmission device 71, which is mechanically connected to the actuation motor 70 and to the stopper body 6 and is arranged for transferring the rotary motion imparted by the actuation motor 70 into a translation motion of the stopper body 6 between the operative position O and the rest position R.

[0064] Preferably, the actuation motor 70 is an electric motor, which, when actuated in rotation, transfers its rotary motion to the transmission device 71 which transforms it into the aforesaid linear motion in order to allow the stopper body 6 to be moved between the operative position O and the rest position R.

[0065] More in detail, such second movement means 7 thus formed with actuation motor 70 and transmission device 71 have particularly simple structure and reliability (with respect for example to linear actuators that are generally pneumatic or hydraulic).

[0066] In particular, in accordance with the embodiment illustrated in the enclosed figures, the transmission device 71 acts on a direction parallel to (and still more preferably coinciding with) the rectilinear movement direction X of the stopper body 6 slidable on the guide means 40.

[0067] In accordance with an embodiment not illustrated in the enclosed figures, the transmission device 71 comprises a pinion movable by means of the actuation motor 70 and a rack engaged by the aforesaid pinion and mechanically connected to the stopper body 6 in order to move it between the operative position O and the rest position R.

[0068] In particular, the box-like body 5 of the first motorized stopper device 4 defines a sealed first housing seat 52 (introduced and better described hereinbelow) and a second housing seat 56 that is sealed, e.g. by means of a seal made for example of EPDM foam.

[0069] Advantageously, the actuation motor 70 is housed in the second housing seat 56, so as to be protected against atmospheric agents.

[0070] Advantageously, the box-like body 5 of the first motorized stopper device 4 is provided with at least one bottom wall 54 placed as a lower delimitation of the containment chamber 50 and opposite the access opening 51, and such bottom wall 54 is therefore, in particular, also opposite the cover 55 on which such access opening 51 is made.

[0071] Preferably, the box-like body 5 has a main longitudinal extension along an extension direction that is substantially parallel to the movement direction X of the stopper body 6, which, once the first motorized stopper device 4 has been installed, is in particular substantially vertical.

[0072] Advantageously, the transmission device 71 of the second movement means 7 comprises at least one actuation screw 72, which is extended along an extension axis Y thereof transverse to the bottom wall 54 and is actuatable in rotation around the extension axis Y (directly or indirectly) by the actuation motor 70.

[0073] Preferably, the extension axis Y of the actuation screw 72 is parallel to the rectilinear movement direction X of the stopper body 6 and, in particular, substantially coinciding with the aforesaid movement direction X.

[0074] In addition, such extension axis Y is preferably substantially parallel to the extension direction of the box-like body 5. Preferably, the bottom wall 54 and the cover 55 are both transverse with respect to the main extension direction of the same box-like body 5.

[0075] Still more preferably, the bottom wall 54 and the cover 55 are substantially parallel to each other and thus the extension axis Y (which is preferably substantially parallel to the main extension direction of the box-like body 5, as reported above) is transverse to both (in particular orthogonal to the bottom wall 54 and to the cover 55).

[0076] Advantageously, the transmission device 71 of the second movement means 7 also comprises a nut screw 73, which is mechanically connected to the stopper

body 6 and engaged with the actuation screw 72. More in detail, such nut screw 73 is movable, by the actuation screw 72 in rotation, along the extension axis Y between a lowered position, in which the nut screw 73 is placed approached to the bottom wall 54 and spaced from the access opening 51 in order to bring the stopper body 6 into the rest position R, and a raised position, in which the nut screw 73 is approached to the access opening 51 and spaced from the bottom wall 54 in order to bring the stopper body 6 into the operative position O.

[0077] The use of an actuation screw 72 and a nut screw 73 advantageously renders the transmission device 71 particularly precise, given that with each turn of the actuation screw 72 around its extension axis Y, an advancement of the nut screw 73 corresponds that is equal to the pitch of the nut screw 73 itself and of the actuation screw 72. Such precision of the transmission device 71 thus advantageously allows being able to precisely adjust how much the stopper body 6 must project from the access opening 51 when it is situated in operative position O.

[0078] Advantageously, the stopper body 6 of the first motorized stopper device 4 is internally provided with at least one slide seat 42, which is delimited by an upper stop element 43 and by a lower stop element 44 and is slidably engaged by the nut screw 73.

[0079] Advantageously, the elastic means 41 comprise at least one damping spring 45, which is interposed and precompressed between the upper stop element 43 and the nut screw 73 and is susceptible to take on am extended configuration and a contracted configuration.

[0080] More in detail, in the extended configuration, the damping spring 45 maintains the lower stop element 44 and the nut screw 73 in abutment against each other.

[0081] In addition, in the contracted configuration, the damping spring 45 is compressed under the action of the external stress in order to allow the lower stop element 44 to be placed distal from the nut screw 73 and exerts an elastic return force that tends to bring the lower stop element 44 and the nut screw 73 back into abutment against each other.

[0082] More in detail, the stopper body 6 is provided with an upper wall 66, with a lower wall 67 opposite the upper wall 66 and with a lateral wall 65 extended between the lower wall 67 and the upper wall 66, in particular with elongated form parallel to the movement direction X.

[0083] Preferably, the slide seat 42 is made within the lateral wall 65 (which is in particular made of extruded tubular form) and, in addition, the slide seat 42 and the nut screw 73 are shaped in a manner such that the nut screw 73 cannot rotate with respect to the slide seat 42 around the extension axis Y.

[0084] For example, the nut screw 73 has planar form, on a plane that is transverse to the extension axis Y, substantially quadrangular and the slide seat 42 is in turn provided with form, on such plane, that is substantially quadrangular. In particular, as illustrated in the enclosed figures, the slide seat 42 is delimited by ribs inside the lateral wall 65 and made integrally therewith.

[0085] In addition, in order to render the stopper body 6 structurally simple, reducing the number of its components as much as possible, the upper stop element 43 is preferably constituted by the same upper wall 66 and the lower stop element 44 is preferably constituted by the same lower wall 67.

[0086] In particular, given that the upper stop element 43 is advantageously constituted by the upper wall 66 of the stopper body 6, the damping spring 45 is preferably interposed and precompressed between the aforesaid upper wall 66 and the nut screw 73. In addition, given that the lower stop element 44 is advantageously constituted by the lower wall 67 of the stopper body 6, the damping spring 45, in the extended configuration, preferably maintains the aforesaid lower wall 67 and the nut screw 73 in abutment against each other and, in addition, in the contracted configuration, preferably allows the aforesaid lower wall 67 to be placed distal from the nut screw 73.

[0087] In addition, the lower wall 67 is advantageously provided with a traversing opening, which is traversed by the actuation screw 72 and, in addition, the slide seat 42 is susceptible of being nearly completely longitudinally occupied by the actuation screw 72 when the stopper body 6 is situated in rest position R.

[0088] Preferably, in addition, the damping spring 45 is a helical spring, in a manner such that, when the nut screw 73 is in lowered position with the stopper body 6 in rest position R, the same damping spring 45 is placed to enclose the actuation screw 72 contained in the slide seat 42.

[0089] More in detail, the damping spring 45 is extended between an upper end, which is placed in abutment against the upper stop element 43 (in particular the upper wall 66 of the stopper body 6), and with an opposite lower end, which is placed in abutment against the nut screw 73.

[0090] In addition, in order to maintain the damping spring 45 precisely aligned with the extension axis Y, the nut screw 73 is advantageously provided with at least one positioning groove directed towards the upper stop element 43 and carrying, at least partially inserted therein, the lower end of the damping spring 45.

[0091] More in detail, the arrangement of the damping spring 45 interposed and precompressed between the upper stop element 43 and the nut screw 73 has the considerable advantage of maintaining, coupled in movement, the nut screw 73 and the stopper body 6 in normal operating conditions while it allows a decoupling in the movement between nut screw 73 and stopper body 6 in the case of malfunction of the first motorized stopper device 4.

[0092] Indeed, in particular, during the normal operation of the first motorized stopper device 4, a rotation of the actuation screw 72 corresponds with a translation of the nut screw 73 together with the stopper body 6 (which has its lower stop element 44 maintained in abutment against the same nut screw 73).

[0093] In this manner, therefore, the lowered position of the nut screw 73 corresponds with the rest position R of the stopper body 6, the raised position of the nut screw 73 corresponds with the operative position O of the stopper body 6.

[0094] Instead, in particular, in the event in which the stopper body 6 remains in operative position O due to a malfunction when the first wing 2 is in open position A, the damping spring 45 allows a decoupling in the movement between nut screw 73 and stopper body 6, thus ensuring that the stopper body 6 can translate from the operative position O along the movement direction X, being retracted into the containment chamber 50 under the action of possible external stresses (due for example to accidental impact of pedestrians and vehicles against the stopper body 6) while the nut screw 73 remains in the raised position without being damaged by the same possible external stresses (given that such stresses are damped by the damping spring 45 while it is compressed, passing from the extended configuration to the contracted configuration). In addition, in operation, after the external stresses of the possible impacts have stopped, the elastic return force of the damping spring 45 tends to bring the stopper body 6 itself back towards the operative position O while the damping spring 45 itself passes from the contracted configuration to the extended configuration.

[0095] Advantageously, the stopper body 6 is movable, compressing the damping spring 45 of the elastic means 41 from the extended configuration to the contracted configuration, in a retracted position R' opposite the operative position O with respect to the rest position R.

[0096] In particular, the retracted position R' of the stopper body 6 is situated below the rest position R along the movement direction X.

[0097] In other words, the rest position R is interposed between the operative position O and the aforesaid retracted position R'. Therefore, in operation, the stopper body 6 of the first motorized stopper device 4 reaches the retracted position R' by carrying out an extra-travel downward along the movement direction X.

[0098] Advantageously, the first motorized stopper device 4 comprises snap engagement means 46 provided with a first connection element 460, which is mechanically connected to the box-like body 5 inside the containment chamber 50, and with a second connection element 461, which is mechanically connected to the stopper body 6 and is arranged for being snap engaged with the first connection element 460 with the stopper body 6 placed in the retracted position R'.

[0099] In this manner, in case of possible malfunction of the first motorized stopper device 4 in which the stopper body 6 remains in operative position O, even if the first wing 2 is in open position A, a user can push, with his/her own foot or with his/her own hand, the stopper body 6 towards the retracted position R', with the nut screw 73 which remains in raised position, with the damping spring 45 that passes from the extended configuration to the contracted configuration and with the snap engagement means 46 that block the stopper body 6 in retracted position R', preventing it from returning into the operative position O under the elastic return force of the damping spring 45 after the user has removed his/her own foot. Therefore, in this manner, the stopper body 6 remains blocked inside the containment chamber 50 without risking to interfere with pedestrians and vehicles which travel through the transit passage P even when the first motorized stopper device 4 is deactivated, for example due to the lack of electrical power supply.

[0100] For example, one such case of malfunction can be due to a black-out that interrupts the electrical power supply to the present swing gate 1. In such case, in order to be able to free the transit passage P, it is necessary for a user to mechanically disconnect the first movement means 3 from the first wing 2, manually rotating the first wing 2 from the closed position C to the open position A with the stopper body 6 which in the meantime remains in operative position O and, then, coming to push the stopper body 6 from the operative position O to the retracted position R' as just set forth above.

[0101] Therefore, the arrangement of the damping spring 45 and of the snap engagement means 46 involve the further advantage of allowing a user to bring the stopper body 6 to the retracted position R' without having to mechanically disconnect the second movement means 7 from the stopper body 6 itself.

[0102] In accordance with the embodiment illustrated in the enclosed figures, the first connection element 460 is fixed to the bottom wall 54 of the box-like body 5.

[0103] In addition, the second connection element 461 is, preferably, mechanically connected to the lower wall 67 of the stopper body 6, which advantageously constitutes the lower stop element 44, as previously described.

[0104] More in detail, the first connection element 460 is provided with a stem 462 fixed to the bottom wall 54 and with an enlarged head 463 and, in addition, the second connection element 461 is provided with a coupling seat 465 directed towards the first connection element 460 and susceptible of snappingly receiving, at its interior, the enlarged head 463 of the first connection element 461 when the stopper body 6 is in retracted position R'.

[0105] In particular, the second connection element 461 is provided with a load-bearing structure 464 fixed to the stopper body 6, on which the coupling seat 465 is attained, with at least one second slider 466, which is slidably associated with the load-bearing structure 464 along a direction transverse to the movement direction X between an interference position, in which it partly projects into the coupling seat 465, and a non-interference position, in which it frees such coupling seat 465, and with at least one elastic element 467, which is arranged for maintaining the second slider 466 in interference position in a manner such that this retains the enlarged head 463 of the first connection element 461 in the coupling seat 465 and for elastically transferring so as to allow the entrance or the exit of the aforesaid enlarged head 463

in the coupling seat 465.

[0106] In this manner, when the stopper body 6 is thrust by an external stress or by a user in the rest position R', the enlarged head 463 of the first coupling element 460 enters into the coupling seat 465, pushing the second slider 466 into non-interference position against the action of the elastic element 467 and, immediately after, the elastic element 467 brings the second slider 466 back into interference position in order to couple the aforesaid enlarged head 463 and retain it (preferably abutting against the latter), consequently retaining the stopper body 6 in rest position R'.

[0107] In order to facilitate the access to the coupling seat 465, the enlarged head 463 of the first connection element 461 and/or the second slider 466 are advantageously provided with introduction surfaces that are tilted with respect to the movement direction X.

[0108] In addition, in order to render as secure as possible the engagement of the enlarged head 463 in the coupling seat 465, the second coupling element 461 is preferably provided with two second sliders 466, which face each other, in a manner such that, when the enlarged head 463 is placed in the coupling seat 465, the stem 462 of the first coupling element 461 is interposed between the two second sliders 466. Of course, in the event in which two second sliders 466 are provided for, also two corresponding elastic elements 467 are provided for.

[0109] Advantageously, the first connection element 460 also comprises a disengagement mouth 468, which is slidably engaged with the stem 462 and is preferably provided with an introduction surface that is tapered downward (i.e. towards the bottom wall 54 of the box-like body 5).

[0110] In particular, when the second slider 466 of the second connection element 461 is in interference position in order to couple the enlarged head 463 of the first engagement element 460, the disengagement mouth 468 is situated in an intermediate position between the aforesaid second slider 466 and the bottom wall 54.

[0111] In operation, when the stopper body 6 is situated in the retracted position R' with the second slider 466 of the second connection element 461 in interference position, in order to bring the stopper body 6 itself back into the operative position O (thus disengaging the snap means 46), the user must further push the stopper body 6 beyond the retracted position R', up to a disengagement position that is situated beyond the aforesaid retracted position R'.

[0112] In this manner, the second slider 466, descending towards the aforesaid disengagement position, is thrust by the disengagement mouth 468 into a non-interference position against the action of the elastic element 467.

[0113] Once the second slider 466 meets the introduction surface of the disengagement mouth 468 (which, as stated above, is tapered downward), the latter is pushed towards the enlarged head 463 of the second connection element 461 and, immediately after, the elastic element 467 brings the second slider 466 back into interference position.

[0114] Advantageously, the disengagement mouth 468 abuts against the enlarged head 463 of the first connection element 460. Consequently, the tapering of the disengagement mouth 468 provides a slide for the second slider 466, on which the latter slides up to disengaging the second connection element 461 from the first connection element 460 of the snap engagement means 46.

[0115] In this manner, with the stopper body 6 which is no longer retained in the retracted position R' by the aforesaid snap engagement means 46, the damping spring 45 of the elastic means 41 tends to return from the contracted configuration to the extended configuration, in which the lower stop element 44 and the nut screw 73 are maintained in abutment against each other, with the stopper body 6 which then returns into the operative position O.

[0116] Advantageously, the actuation motor 70 comprises a drive shaft 701, which is rotatable around a rotation axis W substantially parallel to the extension axis Y of the actuation screw 72.

[0117] In particular, the drive shaft 701 is provided with a toothed pinion 702, with preferably spiral thread.

[0118] Advantageously, the second movement means 7 comprise a transmission shaft 74, which is extended transverse to the rotation axis W and to the extension axis Y and is connected to the drive shaft 701 and to the actuation screw 72 by means of toothed coupling.

[0119] For example, in accordance with the preferred embodiment illustrated in the enclosed figures, the transmission shaft 74 is provided on both ends with a toothed crown.

[0120] Advantageously, the first motorized stopper device 4 is provided with a base body 57, which is placed below the box-like body 5 and with the latter delimits a third housing seat 58.

[0121] In particular, the third housing seat 58 is placed below the first and the second housing seat 52, 56.

[0122] More in detail, on the bottom wall 54, at the second housing seat 56, a through hole is made in order to allow the drive shaft 701 to pass from the second to the third housing seat 56, 58.

[0123] Therefore, the drive shaft 701 is advantageously at least partially housed in the third housing seat 58, in particular with the toothed pinion 702.

[0124] Preferably, the transmission shaft 74 is housed in the aforesaid third housing seat 58.

[0125] Otherwise, in accordance with a non-illustrated embodiment, the first motorized stopper device 4 might not be provided with the aforesaid base body 57. In this case, the transmission shaft 74 is at least partially contained in the containment chamber 50 of the box-like body 5, and the stopper body 6 slides within such containment chamber 50.

[0126] Advantageously, the spiral thread of the toothed

pinion 702 of the drive shaft 701 is engaged with a toothed end of the transmission shaft 74, transforming the rotary motion of the actuation motor 70 around the rotation axis W (preferably substantially vertical) in a rotary motion around an axis transverse to the rotation axis W itself, and preferably orthogonal to the latter.

[0127] Preferably, on the bottom wall 54 of the containment chamber 50, a traversing hole 540 is made that is susceptible of being traversed by the actuation screw 72.

[0128] More in detail, the third housing seat 58 communicates with the containment chamber 50 at least by means of aforesaid traversing hole 540.

[0129] Preferably, the actuation screw 72 is at least partially housed in the third housing seat 58.

[0130] Preferably, the second movement means 7 comprise a coupling body 75, which is advantageously fixed to the actuation screw 72, and is in particular provided with a toothed crown arranged for being coupled with the toothed crown of the transmission shaft 74.

[0131] Advantageously, the toothing of the coupling body 75 is engaged with the other toothed end of the rotation shaft 74 (opposite the toothed end of the latter which is engaged with the toothed pinion 702), generating a conical torque that transforms the rotary motion of the rotation shaft 74 (around an axis transverse to the rotation axis W) into a rotary motion around the extension axis Y of the actuation screw 72.

[0132] In other words, the second movement means 7 according to the preferred embodiment are arranged for transforming the rotary motion around the rotation axis W of the actuation motor 70 into a rotary motion of the actuation screw 72 around its extension axis Y.

[0133] Otherwise, additionally, without departing from the protective scope of the present invention, the actuation motor 70 can be aligned with the actuation screw 72, such that the rotary motion of the actuation motor 70 and of the actuation screw 72 occurs around one same rotation axis.

[0134] Otherwise, additionally, the actuation motor 70 can be placed with rotation axis of the drive shaft 701 orthogonal to the extension axis Y of the actuation screw 72, such that the second movement means 7 provide for only one transmission mechanism.

[0135] Advantageously, the toothing arranged on the drive shaft 701 (in particular on the toothed pinion 702), on the transmission shaft 74 and on the coupling body 75 operate a reduction of the rotation speed transmitted by the actuation motor 70 to the actuation screw 72.

[0136] Preferably, between the traversing hole 540 and the actuation screw 72, a second seal element is advantageously interposed, which prevents the possible external agents penetrated within the containment chamber 50 can continue towards the third housing seat 58, therefore risking to damage the actuation motor 70 housed in the second housing seat 56.

[0137] Advantageously, on the bottom wall 54, preferably below the aforesaid second seal element, a seat is made for housing a bearing, which is advantageously interposed between the aforesaid bottom wall 54 and the actuation screw 72. Preferably, the base body 57 is provided with a lower wall 59, which is provided with a containment face directed towards the bottom wall 54 of the box-like body 5, and with an opposite support face, directed towards the positioning seat outside the third housing seat 58.

[0138] In particular, on the support face, a plurality of support feet 590 are fixed that are arranged for creating an interspace between the lower base of the positioning seat and the lower wall 59 of the third housing seat 58.

[0139] Advantageously, the first motorized stopper device 4 comprises a foundation case 9 intended to be embedded fixed in the transit passage P and internally defining at least one housing volume 90, in which the box-like body 5 is placed.

[0140] In particular, the foundation case 9 is fixed in the positioning seat made below the surface of the transit passage P.

[0141] Advantageously, the housing volume 90 is provided with dimensions greater than the box-like body 5 along at least one adjustment direction Z that is transverse with respect to the stop surface 60 of the stopper body 6, and preferably orthogonal to the latter.

[0142] In particular, the adjustment direction Z is transverse, and preferably orthogonal, to the movement direction X of the stopper body 6.

[0143] Advantageously, the first motorized stopper device 4 comprises adjustment means 47 mechanically connected to the foundation case 9 and to the box-like body 5 and switchable between a release configuration, in which they free the box-like body 5 to translate within the housing volume 90 of the foundation case 9 along the adjustment direction Z, and a tightening configuration, in which they block the box-like body 5 in position along the adjustment direction Z.

[0144] Preferably, the foundation case 9 of the first motorized stopper device 4 comprises a cover element 91, which is mechanically connected to the box-like body 5, laterally projects therefrom in order to close the housing volume 90 and is advantageously provided with a passage opening 92 placed at the access opening 51 of the containment chamber 50 of the box-like body 5 in order to allow the stopper body 6 to pass between the operative position O and said rest position R.

[0145] In particular, the cover element 91 is provided with an internal edge 92', delimiting the aforesaid passage opening 92.

[0146] More in detail, the cover element 91 is placed above the box-like body 5 (i.e. more in proximity to the surface of the transit passage P), with the passage opening 92 placed at the access opening 51.

[0147] Advantageously, the first seal element 530 traverses the passage opening 92 of the cover element 91, extended at least partially above the latter.

[0148] Preferably, the first seal element 530 is provided with a groove, which is made at the internal edge 92' of the cover element 91, and in which the internal edge 92'

itself is advantageously inserted, so as to improve the seal of the aforesaid first seal element 530 against the external agents.

[0149] In this manner, the first seal element 530 is easily extractible in order to carry out the maintenance thereof, or to substitute it, being subjected to wear, for example due to its exposure to inclement weather and to rubbing with the stopper body 6 due to its movement between the operative position O and the rest position R.

[0150] More in detail, the first seal element 530 can be extracted by forcing the stopper body 6 towards the retracted position R' or the disengagement position (in other words, beyond the rest position R), such that it can be easily disconnected from the internal edge 92' and removed from the box-like body 5.

[0151] Preferably, the first motorized stopper device 4 comprises a third seal element, which is advantageously at least partially interposed between the cover element 91 and the cover 55.

[0152] In particular, the fourth seal element is maintained in abutment against the cover 55 by means of screws inserted by penetrating the cover element 91.

[0153] Preferably, the foundation case 9 comprises a containment wall 93, which defines, with the cover element 91, the housing volume 90.

[0154] In particular, the containment wall 93 has substantially quadrangular, e.g. rectangular, section.

[0155] Otherwise, without departing from the protective scope of the present invention, the containment wall 93 has polygonal or circular section.

[0156] In accordance with the preferred illustrated embodiment, the adjustment means 47 comprise at least two adjustment tabs 94, and more precisely four adjustment tabs 94, which are arranged on two sides (preferably opposite each other) of the containment wall 93 of the foundation case 9.

[0157] More in detail, the adjustment tabs 94 are extended starting from a bend on the aforesaid sides and are directed inside the containment volume 90.

[0158] In operation, the adjustment tabs 94 are made by means of a notch with substantial U shape on the containment wall 93 and are subsequently bent towards the containment volume 90 in order to be substantially transverse (and preferably orthogonal) to the main extension direction of the box-like body 5, and in particular also to the movement direction X.

[0159] Advantageously, such adjustment tabs 94 are provided with an annular slot whose main extension is parallel to the adjustment direction Z.

[0160] More in detail, the adjustment means 47 comprise at least two tightening screws, engaged with the annular slot of the adjustment tabs 94 and with the box-like body 5, and more particularly at least with its cover 55, and two corresponding cage nuts slidably associated with the adjustment tabs 94.

[0161] In particular, the tightening screws and the corresponding cage nuts are arranged for translating along the adjustment direction Z when the adjustment means 47 are in the release configuration, and for fixing the box-like body 5 to the foundation case 9 when the adjustment means 47 are in the tightening configuration.

[0162] More in detail, when the tightening screws are loosened from the respective cage nuts, the adjustment means 47 are in the aforesaid release configuration, while when the tightening screws are screwed to the respective cage nuts, the adjustment means 47 are in the aforesaid tightening configuration.

[0163] In this manner, the position of the first motorized stopper device 4 can be adjusted along the adjustment direction Z by an installer in order to allow the first wing 2 of the gate 1 to abut against the stop surface 60 of the stopper body 6 in the closed position C with an angle close to 0°.

[0164] Indeed, an incorrect positioning of the first motorized stopper device 4 would involve the risk of damaging the hinging elements or, otherwise, an incorrect closed position C with the transit passage P which could remain partially open.

[0165] Preferably, the adjustment means 47 in the release configuration allows translating the box-like body 5 along the direction Z up to a maximum of 35 millimeters and more preferably up to a maximum of 25 millimeters and in particular up to a maximum of 20 millimeters.

[0166] Advantageously, the foundation case 9 comprises at least one installation tongue 95, which is made on the containment wall 93.

[0167] In particular, such installation tongue 95 is extended starting from a bend made on the containment wall 93.

[0168] More in detail, the installation tongue 95 is directed towards the positioning seat, outside the containment volume.

[0169] Advantageously, the installation tongue 95 is made by means of a notch with substantial U shape on the containment wall 93 and is subsequently bent outside the containment volume 90 in order to be substantially transverse to the main extension direction of the box-like body 5.

[0170] In operation, the installer inserts the foundation case 9 in the positioning seat, and, once placed at its interior, opens the installation tongue 95 outside the containment volume 90, in a manner so as to ensure the foundation case 9 itself in a position fixed within the positioning seat itself.

[0171] In accordance with the preferred embodiment, the first motorized stopper device 4 comprises two installation tabs 95, made on opposite sides of the containment wall 93.

[0172] Advantageously, the foundation case 9 is provided with at least one first access hole 96 intended for the passage of groove channels arranged for draining the water that enters into the containment volume 90 towards a dry well, preferably positioned outside the positioning seat of the first motorized stopper device 4.

[0173] In addition, the foundation case 9 is provided with at least one second access hole 97 for the passage

of electrical cables, in particular at least for the power supply of the second movement means 7 of the first stopper device 4, and hence in particular of the actuation motor 70.

[0174] Preferably, the aforesaid electrical cables are contained in a tube (for example a corrugated tube) that enters into the containment volume 90 by means of the second access hole 97.

[0175] In particular, the aforesaid electrical cables are at least partially housed within the containment volume 90 in the interspace made between the lower base of the positioning seat and the lower wall 59 of the third housing seat 58 due to the support feet 590, then entering into the second housing seat 57 of the box-like body 5 in which the actuation motor 70 is housed.

[0176] In this manner, when an operator wishes to extract the first motorized stopper device 4 from the positioning seat, the portion of electric cables housed in the aforesaid interspace allows easily extracting it without excessively stretching the electrical cables themselves.

[0177] Advantageously, the swing gate 1 is provided with a battery arranged for power supplying at least the actuation motor 70 in case of black-out, which is preferably placed in proximity to the logic control unit, e.g. in a same containment body within which the latter is contained.

[0178] Advantageously, the gate 1 comprises a logic control unit, which is susceptible of receiving at least one open command signal (e.g. by means of a radio control) and is operatively connected to the first movement means 3 and to the second movement means 7.

[0179] In particular, the logic control unit is configured for, following the reception of an aforesaid open command signal, commanding the first movement means 3 to move the first wing 2 from the closed position C to the open position A and commanding the second movement means 7 to move the stopper body 6 from the operative position O to the rest position R.

[0180] Advantageously, the logic control unit is arranged for commanding the first movement means 3 to move the first wing 2 from the open position A to the closed position C and for commanding the second movement means 7 to move the stopper body 6 from the rest position R to the operative position O.

[0181] In particular, the logic control unit is arranged for commanding the first movement means 3 to move the first wing 2 from the open position A to the closed position C (and advantageously simultaneously moving the stopper body 6 into the operative position O) after a predetermined time interval from the opening of the first wing 2.

[0182] More in detail, the logic control unit comprises a timer module, which is arranged for measuring a time interval starting from the reception of the aforesaid open command signal (or from the attainment of the open position A by the first wing 2), at the end of which the logic control unit is configured for commanding the first movement means 3 to move the first wing 2 from the open position A to the closed position C.

[0183] Optionally, the logic control unit can command the aforesaid movement of the first wing 2 from the open position A to the closed position C following a closure command signal, received for example by the same radio control from which it can receive the open command signal.

[0184] In this manner, the stop surface 60 can receive, in abutment, the first wing 2 in the closed position C, being able to block the travel of the first wing 2 itself in the correct closed position C.

[0185] Advantageously, the first motorized stopper device 4 comprises at least one first encoder, which is operatively connected to the logic control unit and is coupled to the second movement means 7 in order to detect the position of the stopper body 6.

[0186] In particular, the first encoder is arranged for detecting the angular position of the drive shaft 701 of the actuation motor 70. In this manner, by knowing the transmission ratios of the second movement means 7, the logic control unit is advantageously able to detect the position of the stopper body 6 along the movement direction X.

[0187] In this manner, the logic control unit commands the second movement means 7 to stop the movement of the stopper body 6 when this reaches the rest position R or the operative position O.

[0188] Advantageously, the logic control unit can adjust the height of the operative position O of the stopper body 6 depending on the requirements and on the installation of the gate 1.

[0189] Preferably, the stopper body in the operative position O projects from 3 to 15 centimeters, and more preferably from 5 and 10 centimeters.

[0190] For example, in the case of a sloped transit passage P, the first wing 2 of the gate 1 has a high distance with respect to the ground when it is situated in the closed position C and, therefore, the operative position O of the stopper body 6 is suitably adjusted by the logic control unit.

[0191] In other words, the logic control unit is arranged for setting the height of the operative position O of the stopper body 6 along the movement direction X depending on the different height from the ground of the first wing 2, so as to allow the latter to abut with full safety against the stop surface 60 in order to be stopped in the closed position C. Advantageously, the gate 1 comprises a second encoder, which is operatively connected to the logic control unit and is coupled to the first movement means 3 in order to detect the position of the first wing 2.

[0192] In this manner, the logic unit can command the actuation motor of the first movement means 3 to stop the movement of the first wing 2 when this reaches the predetermined open A or closed C position.

[0193] Otherwise, without departing from the protective scope of the present invention, in order to detect the position of the stopper body 6 and/or of the first wing 2, the gate 1 can comprise a different type of sensor adapted to

detect the position of the stopper body 6 and/or of the first wing 2, e.g. a photocell or a contact sensor adapted to detect the position of the first wing 2 with respect to the stopper body 6.

[0194] Advantageously, the box-like body 5 of the first motorized stopper device 4 defines a sealed first housing seat 52.

[0195] For example, the first housing seat 52 is sealed by means of a seal for example made of EPDM foam. Advantageously, the logic control unit comprises a master control board and at least one slave control board. Preferably, the master control board is placed in proximity to the first movement means 3, for example at the first support element 21.

[0196] In particular, the master control board is susceptible of receiving at least one aforesaid open command signal.

[0197] Advantageously, the slave control board is placed in the first housing seat 52 of the box-like body 5 and is placed in data communication with the master control board, by means of cables or by means of wireless communication modules, and with the second movement means 7, in order to allow the master control board to command the actuation of the second movement means 7.

[0198] Preferably, the logic control unit comprises a second slave control board, which is placed in data communication at least with the master control board and with the first movement means 3, and advantageously also with the slave control board, and is arranged in order to receive, from the master control board, at least one aforesaid open command signal in order to move the first wing 2 from the closed position C to the open position A.

[0199] Otherwise, without departing from the protective scope of the present invention, the first movement means 3 are commanded by the master control board.

[0200] Advantageously, the stopper body 6 of the first motorized stopper device 4 is provided with a retention seat 61, which is opened on the stop surface 60 with an insertion opening 62 delimited by a retention edge 63.

[0201] In other words, the retention seat 61 of the stopper body 6 is directed towards the first wing 2.

[0202] Advantageously, the first wing 2 carries, mounted thereon, a coupling element 20 susceptible of being at least partially inserted in the retention seat 61 and of being engaged with the retention edge 63 of the insertion opening 62, with the stopper body 6 in the operative position O and the first wing 2 in the closed position C, so as to retain the first wing 2 in the closed position C.

[0203] Preferably, the coupling element 20 is provided with a plate 23, substantially vertical, intended to be fixed to the first wing 2 and with an engagement portion 24 at least partially projecting from the plate 23 and intended to be at least partially inserted in the retention seat 61.

[0204] Preferably, the engagement portion 24 at least partially defines a concavity directed downward (or, otherwise, upward), which is susceptible of being engaged with the retention edge 63 of the retention seat 61.

[0205] Otherwise, the engagement portion 24 is substantially horizontal and is retained in the retention seat 61 by engagement means, e.g. snap engagement means.

[0206] Advantageously, following the reception of a aforesaid open command signal, the logic control unit is configured for commanding the second movement means 7 to move the stopper body 6 from the operative position O, in which the coupling element 20 is at least partially inserted in the retention seat 61 and engaged with the retention edge 63 of the insertion opening 62, to a release position S, in which the coupling element 20 is at least partially inserted in the retention seat 61 and disengaged from the retention edge 63 of the insertion opening 62, in order to allow the extraction of the coupling element 20 from the retention seat 61 without the retention edge 63 interfering with the coupling element 20.

[0207] Subsequently, the logic control unit is advantageously configured for commanding the first movement means 3 to move the first wing 2 from the closed position C to the open position A in order to disengage the coupling element 20 from the retention seat 61.

[0208] Subsequently, the logic control unit is advantageously configured for commanding the second movement means 7 to move the stopper body 6 from the release position S to the rest position R, preferably before the first wing 2 reaches the open position A, such that a user can cross the transit passage P without having to wait for the complete opening of the first wing A.

[0209] In particular, in the event in which the concavity of the engagement portion 24 of the coupling element 20 is directed downward, the release position S of the stopper body 6 is placed between the operative position O and the rest position R, and more particularly more in proximity to the operative position O than the rest position R.

[0210] Otherwise, in the event in which the engagement portion 24 is directed upward, the release position S is opposite the rest position R with respect to the operative position O (in other words, the stopper body 6 reaches the release position S, carrying out an extra-travel upward along the movement direction X).

[0211] Otherwise, additionally, in the event in which the engagement portion 24 is substantially horizontal, the release position S can advantageously coincide with the operative position O of the stopper body 6.

[0212] More in detail, once the coupling element 20 is disconnected from the retention seat 61, the first wing 2 is moved (preferably in a continuous manner) by the first movement means 3 up to reaching the open position A.

[0213] Advantageously, during the operations of closing the gate 1, as described above, the first wing 2 is moved from the open position A towards the closed position C.

[0214] In particular, the logic control unit commands the second movement means 7 (more precisely by

means of the slave control board) to move the stopper body 6 from the rest position R to the release position S.

[0215] In this manner, when the first wing 2 abuts against the stop surface 60, the retention element 20 is inserted at least with its engagement portion 24 in the retention seat 61.

[0216] Subsequently, the logic control unit commands the second movement means 7 to move the stopper body 6 from the release position S to the operative position O, with the retention element 20 retained in the insertion seat 61.

[0217] In particular, when the first wing 2 is in closed position C, the engagement portion 24 of the coupling element 20 is retained within the retention seat 61 of the stopper body 6, and therefore the first wing 2 is maintained in the closed position C.

[0218] In this manner, in case of adverse weather (e.g. in the presence of wind), the first wing 2 is advantageously maintained in abutment against the stop surface 60 of the stopper body 6, preventing shakes that can bring it to repeatedly hit against the first motorized stopper device 4 and that could damage the latter and annoying clangor.

[0219] Preferably, the aforesaid timer module of the logic control unit (or, otherwise, a second timer module of the latter) is arranged for measuring a time interval starting from when the stopper body 6 has reached the aforesaid release position S, at the end of which the logic control unit is configured for commanding the second movement means 7 to move the stopper body from the release position S to the operative position O.

[0220] Advantageously, such time interval is calculated in order to allow the retention element 20 of the first wing 2 to be inserted in the insertion seat 61 with the stopper body 6 in the release position S.

[0221] Advantageously, in the case of black-out, in order to be able to open the first wing 2, a user can decouple the first movement means 3 from the first wing 2.

[0222] Subsequently, by applying an external force on the upper surface 64 (for example through a manual pressure or with a foot) of the stopper body 6 of the first stopper device 4, the user can bring the stopper body 6 itself from the operative position O to the release position S, thus pushing (e.g. manually) the first wing 2 towards the open position A in order to disengage the coupling element 20 from the retention seat 61.

[0223] Then, the user can bring the stopper body 6 into the retracted position R' with a further pressure, as described above.

[0224] In this manner, the user can freely opening the gate 1 in order to travel through the transit passage P also in the case of lack of electrical power supply to the first and/or second movement means 3, 7, or in the event in which the battery (if provided for) has worn out its charge, or still in cased of malfunction of the logic control unit.

[0225] Advantageously, the swing gate 1 comprises a second motorized stopper device 4', which comprises a second box-like body, which is intended to be at least partially embedded fixed to the side of the transit passage P and internally defines at least one second containment chamber provided with at least one second access opening.

[0226] Advantageously, the second motorized stopper device 4' also comprises a second stopper body, which is provided with a second stop surface susceptible of receiving, in abutment, the first wing 2 in the open position A.

[0227] In particular, the second stopper body is movably associated with the second box-like body at least between a second operative position, in which the second stopper body projects with at least the second stop surface from the second access opening in order to receive, in abutment, the first wing 2 in the open position A, and a second rest position, in which the second stopper body is housed within the second containment chamber with the first wing 2 at least in the closed position C.

[0228] Advantageously, the second motorized stopper device 4' also comprises third movement means mechanically connected to the second box-like body and to the second stopper body and arranged for moving the second stopper body between the second operative position and the second rest position.

[0229] Preferably, the second motorized stopper device 4' is structurally analogous to the first motorized stopper device 4.

[0230] More in detail, the logic control unit comprises a second slave board placed in the second motorized stopper device 4' and placed in data communication with the master control board, by means of cables or by means of wireless communication modules, and with the third movement means, in order to allow the master control board to command the actuation of the third movement means 7.

[0231] Optionally, for example in the event in which the gate 1 is provided with a second wing 22, this can comprise two second motorized stopper devices 4' (both advantageously structurally analogous to the first motorized stopper device 4), which are positioned at opposite sides of the transit passage P and are arranged in order to receive, in abutment: one device receives the first wing 2 and one receives the second wing 22 in the open position A.

[0232] The invention thus conceived therefore attains the pre-established objects.

Claims

1. Swing door or swing gate, comprising:

- at least one first wing (2) movable in rotation between a closed position (C), in which said first wing (2) obstructs a transit passage (P), and an open position (A), in which said first wing (2)

frees said transit passage (P);
- first movement means (3) mechanically connected at least to said first wing (2) and arranged for moving said first wing (2) between said closed position (C) and said open position (A);

said swing door or gate (1) being **characterized in that** it comprises a first motorized stopper device (4), which comprises:

- a box-like body (5), which is intended to be at least partially embedded fixed in said transit passage (P) and internally defines at least one containment chamber (50) provided with at least one access opening (51);
- a stopper body (6), which is provided with a stop surface (60) susceptible of receiving, in abutment, at least said first wing (2) in said closed position (C);
said stopper body (6) being movably associated with said box-like body (5) at least between an operative position (O), in which said stopper body (6) projects, with at least said stop surface (60), from said access opening (51) in order to receive said first wing (2) in abutment in said closed position (C), and a rest position (R), in which said stopper body (6) is housed within said containment chamber (50) with said first wing (2) at least in said open position (A);
- second movement means (7) mechanically connected to said box-like body (5) and to said stopper body (6) and arranged for moving said stopper body (6) between said operative position (O) and said rest position (R).

2. Swing door or swing gate according to claim 1, **characterized in that** it comprises a logic control unit, which is susceptible of receiving at least one open command signal, is operatively connected to said first movement means (3) and to said second movement means (7) and is configured for, following the reception of one said open command signal, commanding said first movement means (3) to move said first wing (2) from said closed position (C) to said open position (A) and commanding said second movement means (7) to move said stopper body (6) from said operative position (O) to said rest position (R).

3. Swing door or swing gate according to claim 2, **characterized in that** the box-like body (5) of said first motorized stopper device (4) defines a sealed first housing seat (52);
said logic control unit comprising a master control board and at least one slave control board, which is placed in the first housing seat (52) of said box-like body (5) and is placed in data communication with said master control board, by means of cables or by means of wireless communication modules, and with said second movement means (7), in order to allow said master control board to command the actuation of said second movement means (7).

4. Swing door or swing gate according to any one of the preceding claims, **characterized in that** the stopper body (6) of said first motorized stopper device (4) is provided with a retention seat (61), which is opened on said stop surface (60) with an insertion opening (62) delimited by a retention edge (63);
said first wing (2) carrying, mounted thereon, a coupling element (20) susceptible of being at least partially inserted in said retention seat (61) and of being engaged with the retention edge (63) of said insertion opening (62), with said stopper body (6) in said operative position (O) and said first wing (2) in said closed position (C), so as to retain said first wing (2) in said closed position (C).

5. Swing door or swing gate according to claim 2 and 5, **characterized in that** following the reception of one said open command signal, said logic control unit is configured for, in sequence:

- commanding said second movement means (7) to move said stopper body (6) from:

  - said operative position (O), in which said coupling element (20) is at least partially inserted in said retention seat (61) and engaged with the retention edge (63) of said insertion opening (62), to
  - a release position (S), in which said coupling element (20) is at least partially inserted in said retention seat (61) and disengaged from the retention edge (63) of said insertion opening (62), in order to allow the extraction of said coupling element (20) from said retention seat (61) without said retention edge (63) interfering with said coupling element (20);

- commanding said first movement means (3) to move said first wing (2) from said closed position (C) to said open position (A) in order to disengage said coupling element (20) from said retention seat (61);
- commanding said second movement means (7) to move said stopper body (6) from said release position (S) to said rest position (R).

6. Swing door or swing gate according to any one of the preceding claims, **characterized in that** the access opening (51) of said box-like body (5) is delimited by a corresponding perimeter edge (53);
said stopper body (6) being provided with an upper surface (64), which is placed substantially at the

same height as the perimeter edge (53) of said access opening (51) when said stopper body (6) is in said rest position (R).

7. Swing door or swing gate according to any one of the preceding claims, **characterized in that** said stopper body (6) is slidably associated with said box-like body (5) along a rectilinear movement direction (X); said first motorized stopper device (4) comprising guide means (40), which are at least partially housed in the containment chamber (50) of said box-like body (5) and are arranged for guiding said stopper body (6) between at least said operative position (O) and said rest position (R) along said movement direction (X).

8. Swing door or swing gate according to any one of the preceding claims, **characterized in that** said first motorized stopper device (4) comprises elastic means (41), which are mechanically connected to said stopper body (6) and to said box-like body (5) and susceptible of elastically yielding when said stopper body (6) in said operative position (O) is subjected to an external stress that tends to push said stopper body (6) from said operative position (O) towards said rest position (R).

9. Swing door or swing gate according to any one of the preceding claims, **characterized in that** said second movement means (7) comprise:

- an actuation motor (70) housed inside said box-like body (5);
- at least one transmission device (71), which is mechanically connected to said actuation motor (70) and to said stopper body (6) and is arranged for transferring the rotary motion impressed by said actuation motor (70) into a translation motion of said stopper body (6) between said operative position (O) and said rest position (R).

10. Swing door or swing gate according to claim 9, **characterized in that** the box-like body (5) of said first motorized stopper device (4) is provided with at least one bottom wall (54) placed as a lower delimitation of said containment chamber (50) and opposite said access opening (51);
the transmission device (71) of said second movement means (7) comprising at least:

- an actuation screw (72), which is extended along an extension axis (Y) thereof transverse to said bottom wall (54) and is actuatable in rotation around said extension axis (Y) by said actuation motor (70), and
- a nut screw (73), which is mechanically connected to said stopper body (6), is engaged by said actuation screw (72) and is movable, by said actuation screw (72) in rotation, along said extension axis (Y) between a lowered position, in which said nut screw (73) is placed approached to said bottom wall (54) and spaced from said access opening (51) in order to bring said stopper body (6) into said rest position (R), and a raised position, in which said nut screw (73) is approached to said access opening (51) and spaced from said bottom wall (54) in order to bring said stopper body (6) into said operative position (O).

11. Swing door or swing gate according to claims 8 and 10, **characterized in that** the stopper body (6) of said first motorized stopper device (4) is internally provided with at least one slide seat (42), which is delimited by an upper stop element (43) and by a lower stop element (44) and is slidably engaged by said nut screw (73);
said elastic means (41) comprising at least one damping spring (45), which is interposed and precompressed between said upper stop element (43) and said nut screw (73) and is susceptible to take on at least:

- one extended configuration, in which said damping spring (45) maintains said lower stop element (44) and said nut screw (73) in abutment against each other; and
- one contracted configuration, in which said damping spring (45) is compressed under the action of said external stress in order to allow said lower stop element (44) to be placed distal from said nut screw (73) and exerts an elastic return force that tends to bring said lower stop element (44) and said nut screw (73) back into abutment against each other.

12. Swing door or swing gate according to claim 11, **characterized in that** said stopper body (6) is movable, compressing the damping spring (45) of said elastic means (41) from said extended configuration to said contracted configuration, in a retracted position (R') opposite said operative position (O) with respect to said rest position (R); said first motorized stopper device (4) comprising snap engagement means (46) provided with a first connection element (460), which is mechanically connected to said box-like body (5) inside said containment chamber (50), and with a second connection element (461), which is mechanically connected to said stopper body (6) and is arranged for being snap engaged with said first connection element (460) with said stopper body (6) placed in said retracted position (R').

13. Swing door or swing gate according to any one of the claims from 10 to 12, **characterized in that** said actuation motor (70) comprises a drive shaft (701),

which is rotatable around a rotation axis (W) substantially parallel to the extension axis (Y) of said actuation screw (72);
said second movement means (7) comprising a transmission shaft (74), which is extended transverse to said rotation axis (W) and to said extension axis (Y) and is connected to said drive shaft (701) and to said actuation screw (72) by means of toothed coupling.

14. Swing door or swing gate according to any one of the preceding claims, **characterized in that** said first motorized stopper device (4) comprises a foundation case (9) intended to be embedded fixed in said transit passage (P) and internally defining at least one housing volume (90), in which said box-like body (5) is placed;

said housing volume (90) being provided with dimensions greater than said box-like body (5) along at least one adjustment direction (Z) that is transverse with respect to the stop surface (60) of said stopper body (6);
said first motorized stopper device (4) comprising adjustment means (47) mechanically connected to said foundation case (9) and to said box-like body (5) and switchable between a release configuration, in which they free said box-like body (5) to translate within the housing volume (90) of said foundation case (9) along said adjustment direction (Z), and a tightening configuration, in which they block said box-like body (5) in position along said adjustment direction (Z).

15. Swing door or swing gate according to any one of the preceding claims, **characterized in that** it comprises a second motorized stopper device (4'), which comprises:

- a second box-like body, which is intended to be at least partially embedded fixed on the side of said transit passage (P) and internally defines at least one second containment chamber provided with at least one second access opening;
- a second stopper body, which is provided with a second stop surface susceptible of receiving, in abutment, said first wing (2) in said open position (A);
said second stopper body being movably associated with said second box-like body at least between a second operative position, in which said second stopper body projects with at least said second stop surface from said second access opening in order to receive, in abutment, said first wing (2) in said open position (A), and a second rest position, in which said second stopper body is housed within said second containment chamber with said first wing (2) at least in said closed position (C);
- third movement means mechanically connected to said second box-like body and to said second stopper body and arranged for moving said second stopper body between said second operative position and said second rest position.

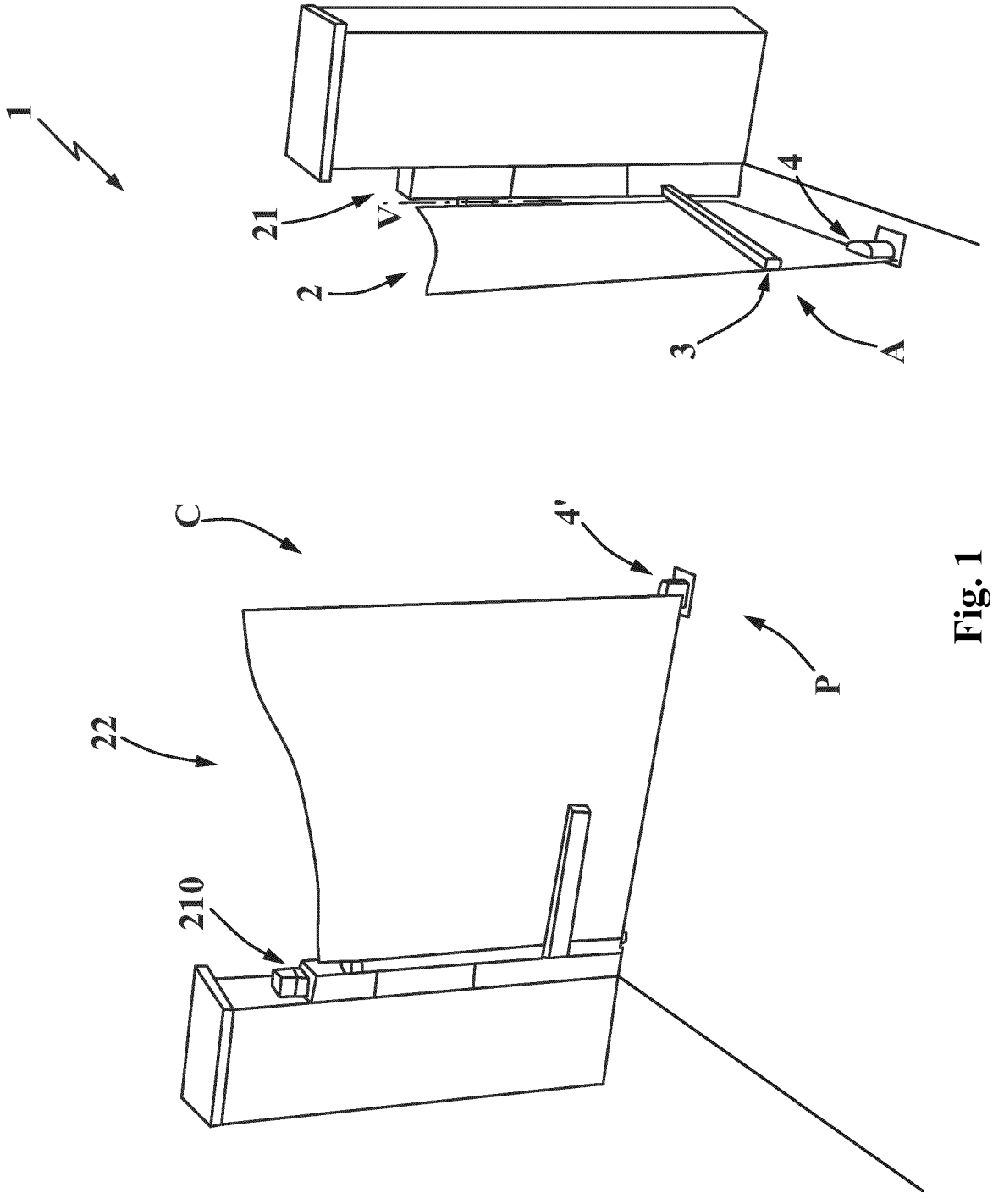


Fig. 1

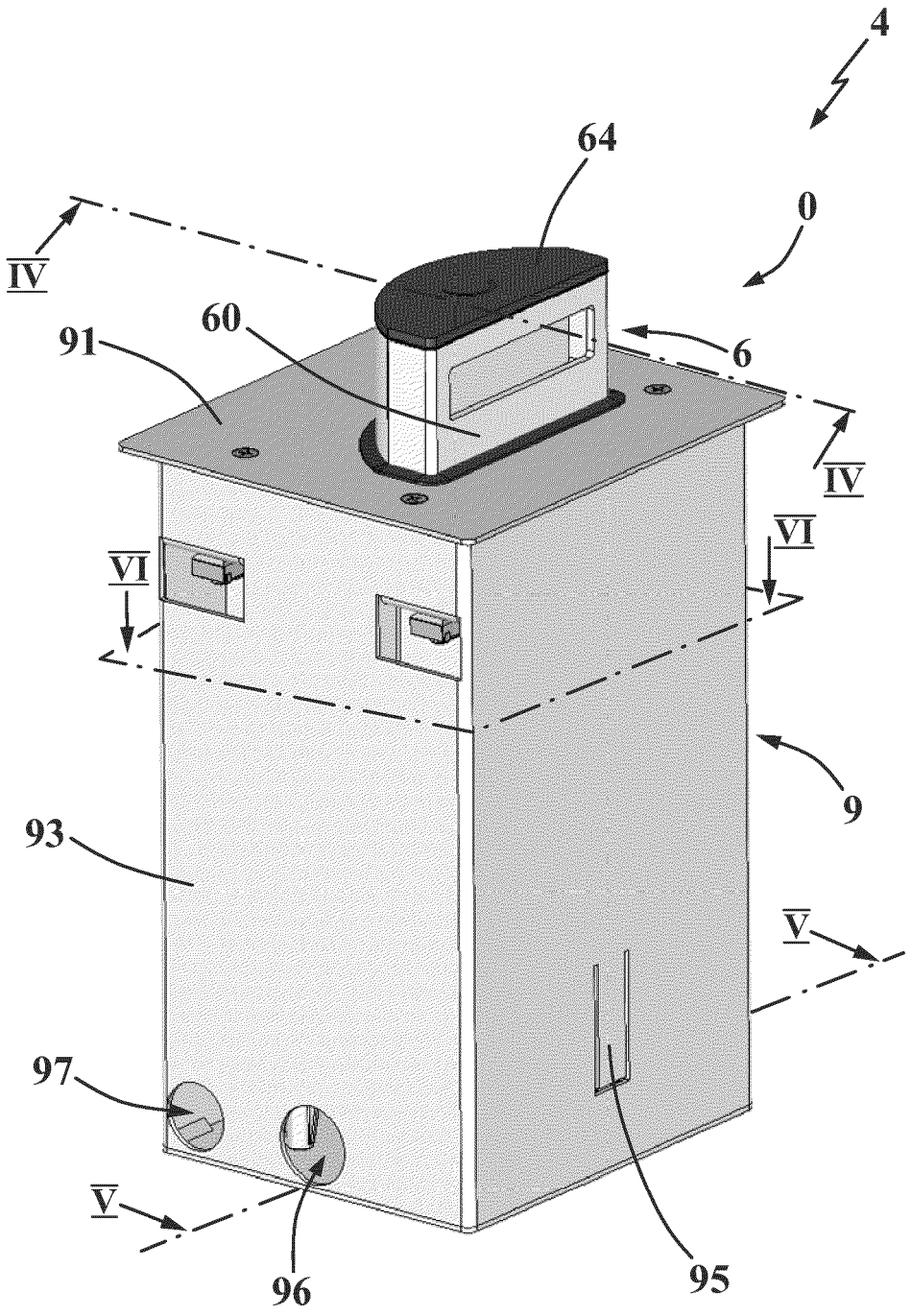


Fig. 2A

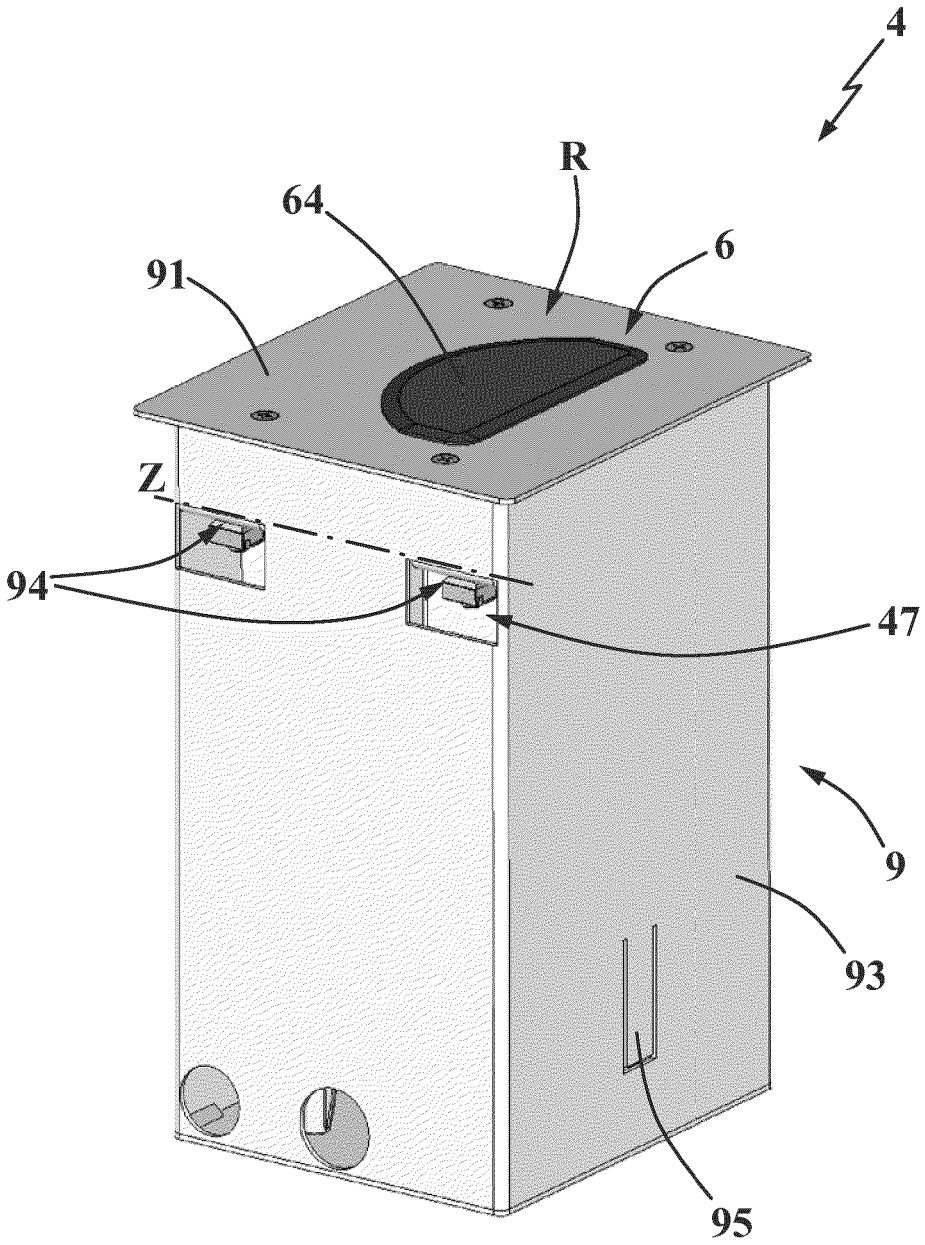


Fig. 2B

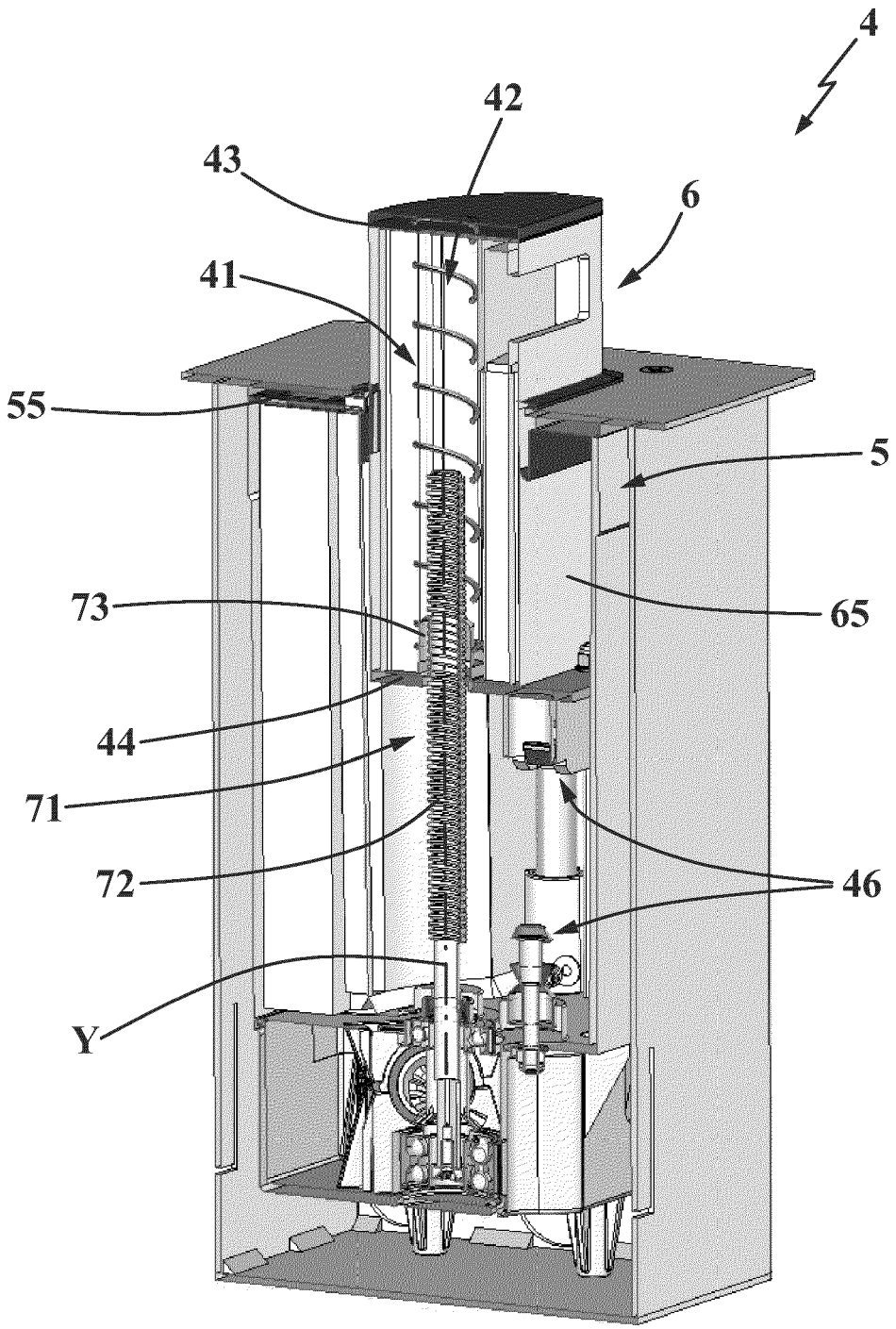


Fig. 3

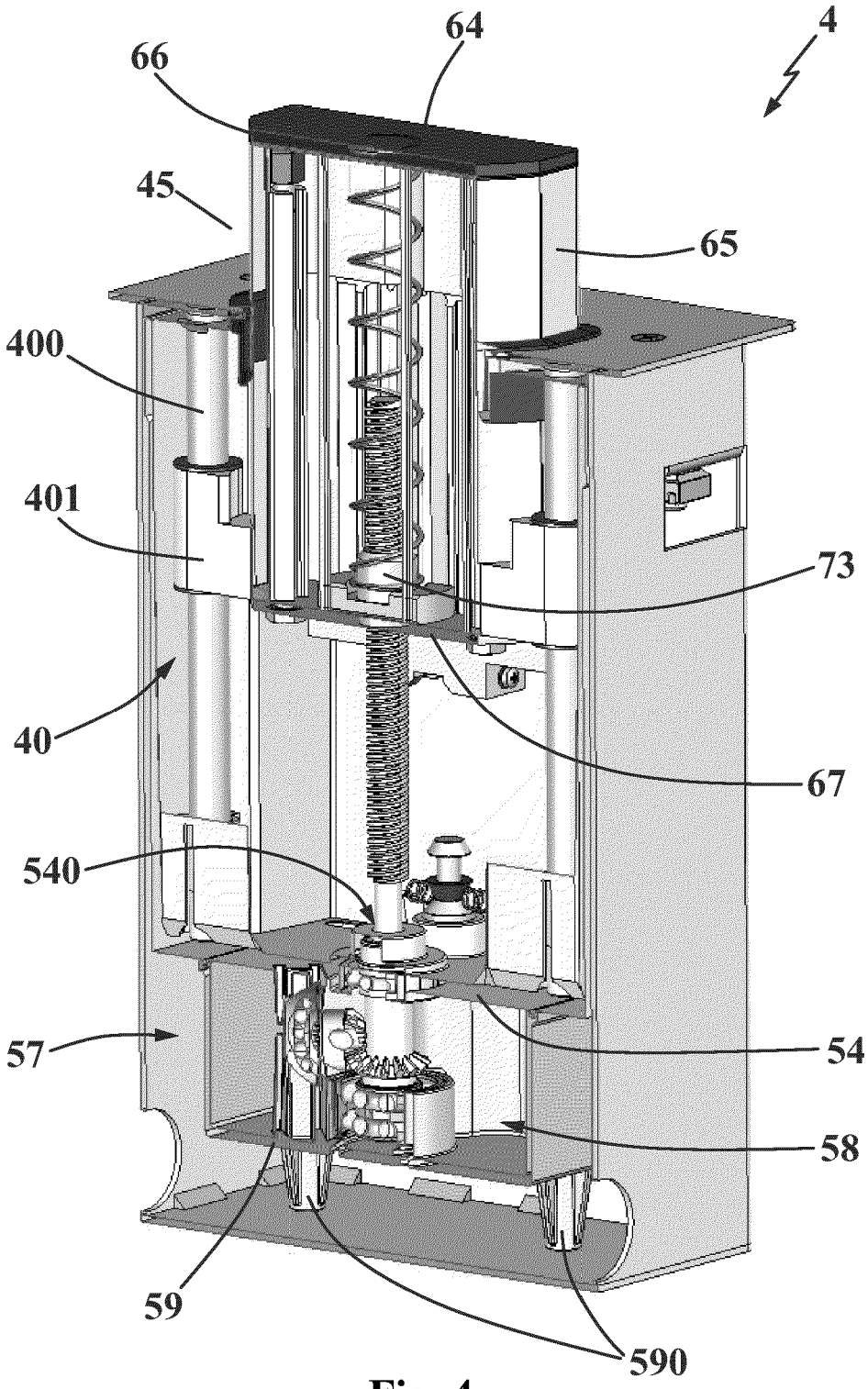


Fig. 4

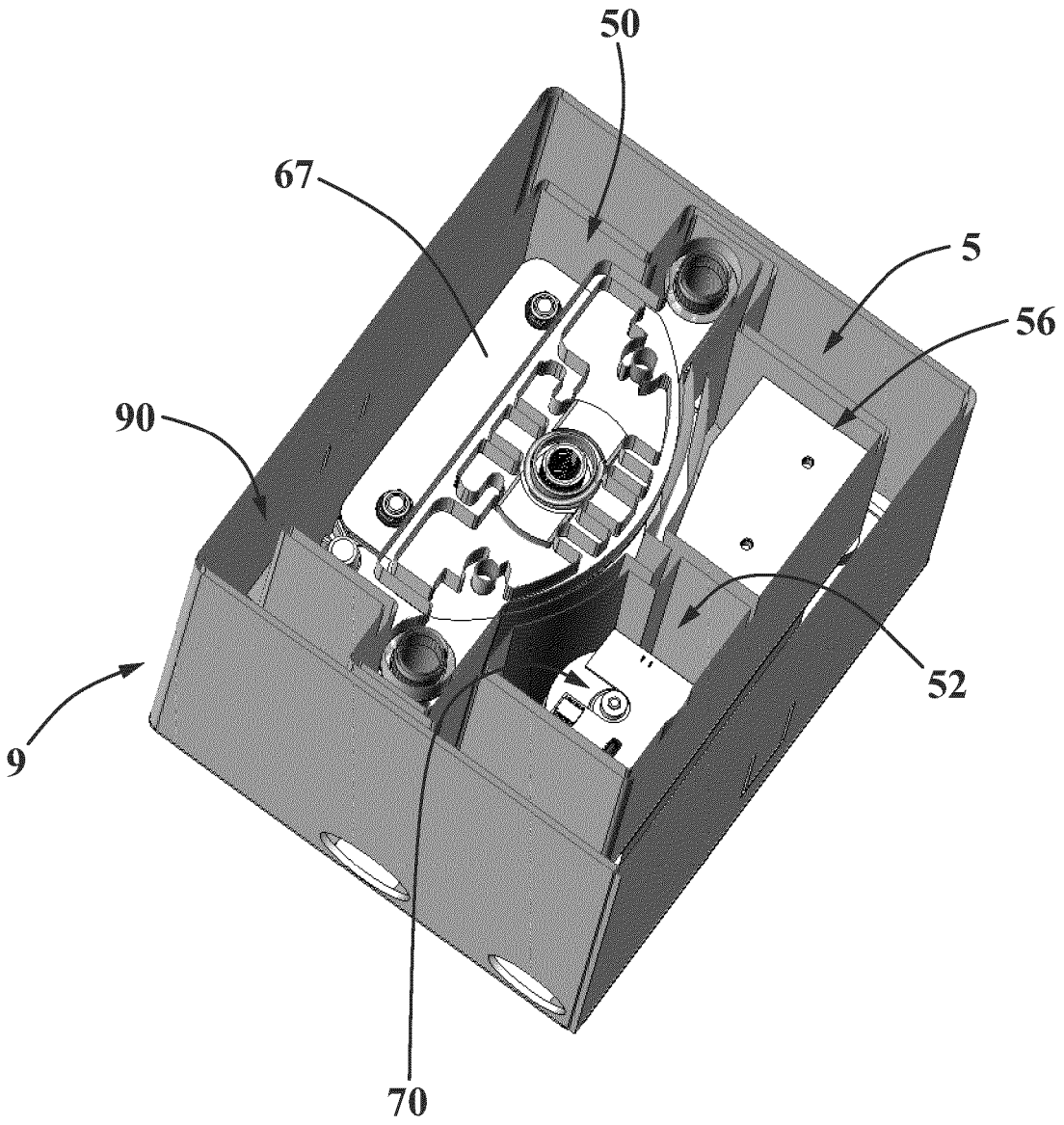


Fig. 5

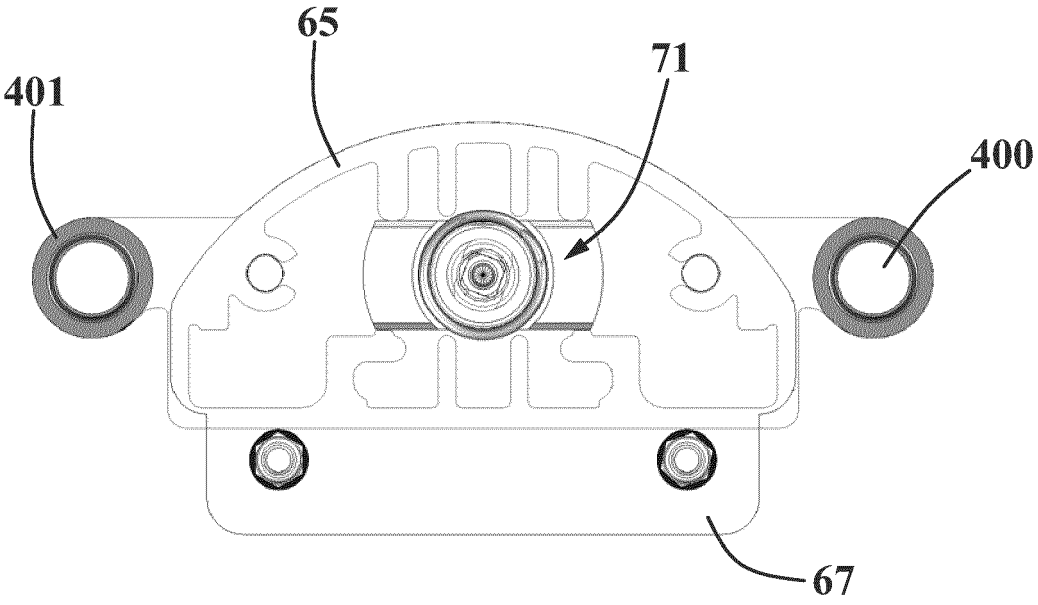


Fig. 6

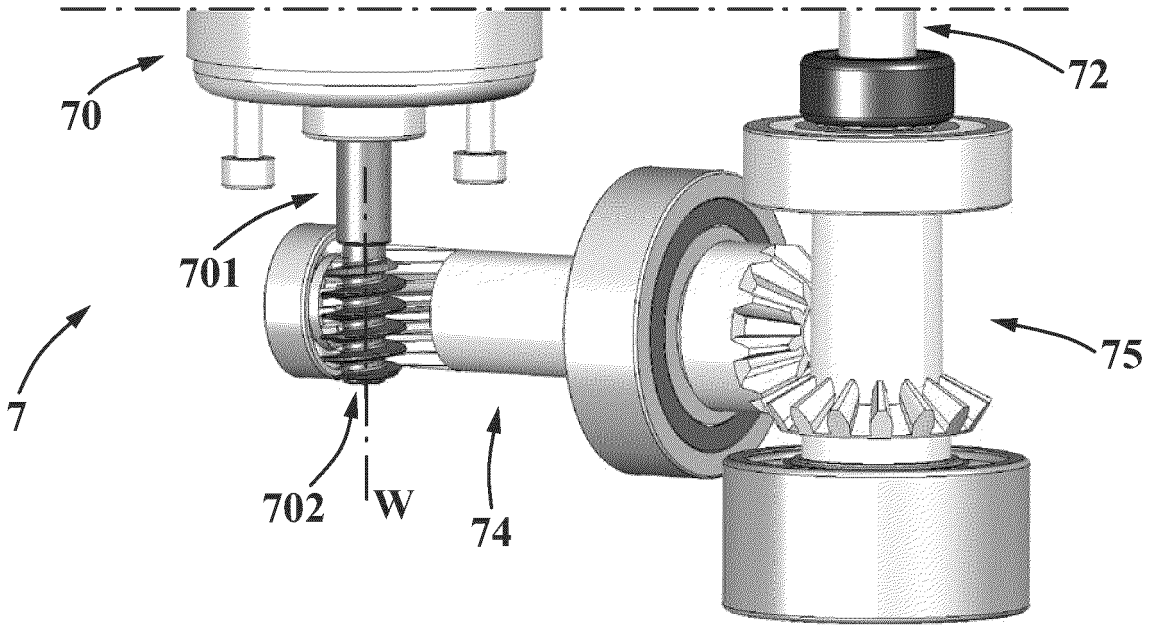


Fig. 7

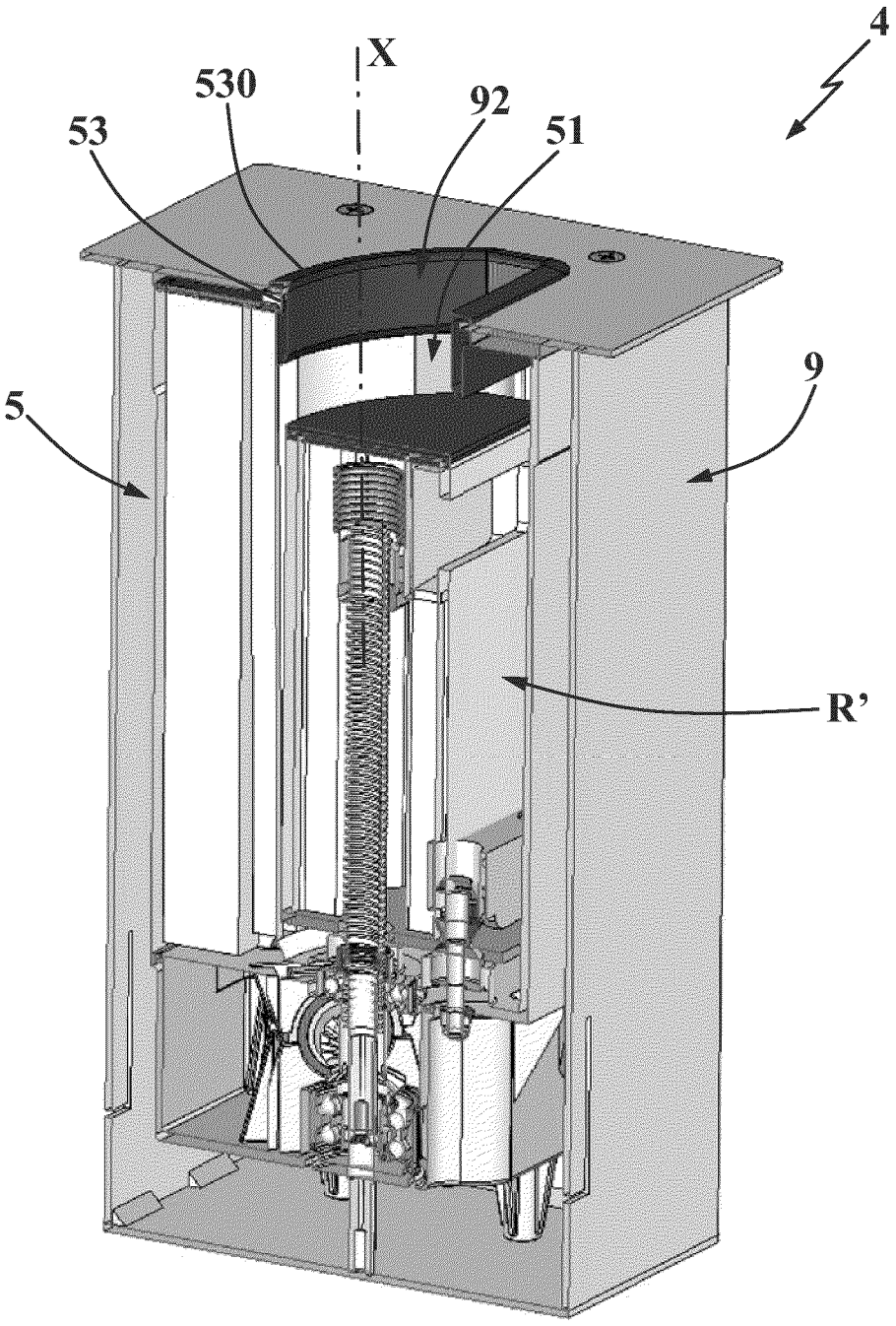


Fig. 8

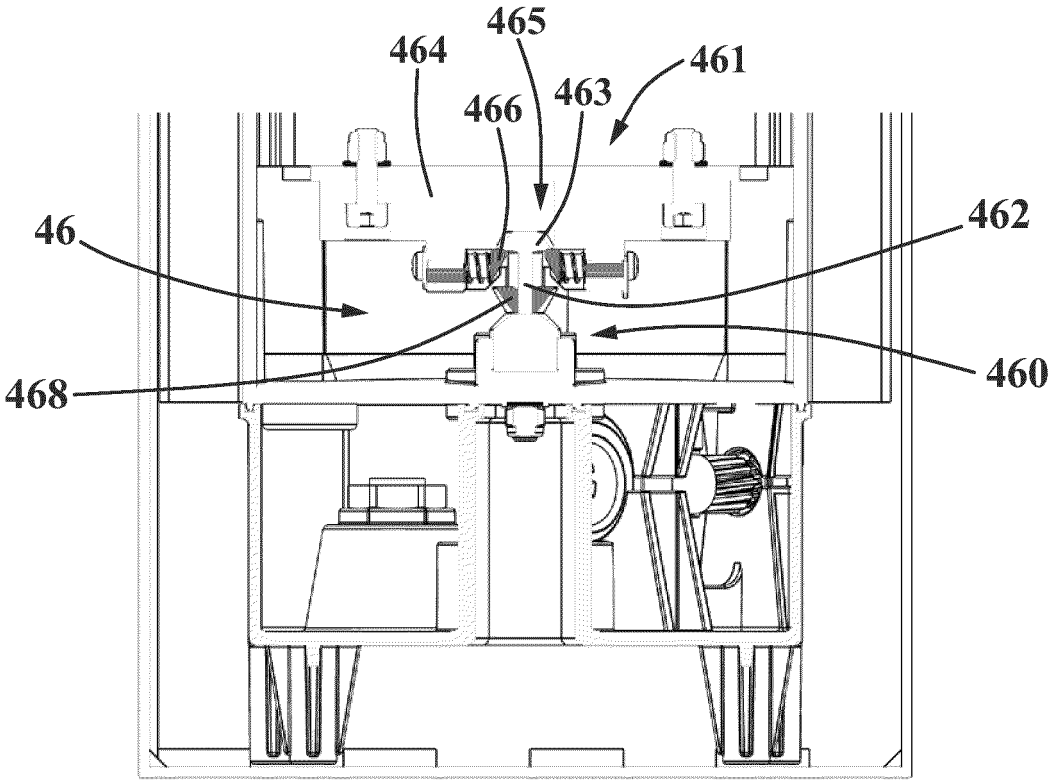

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Fig. 9A

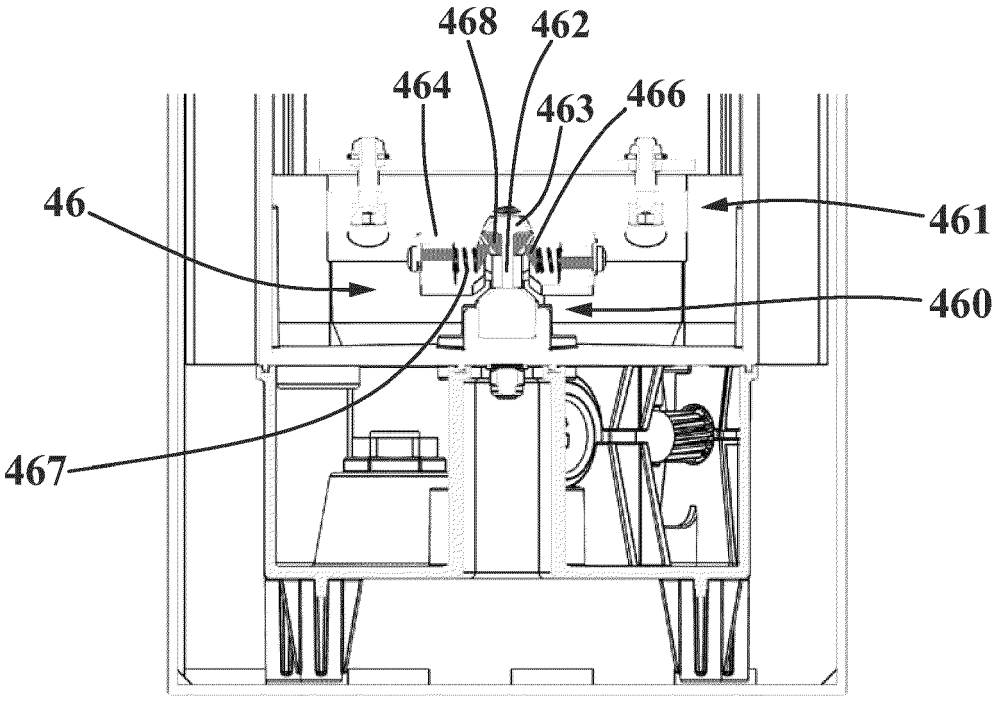

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Fig. 9B

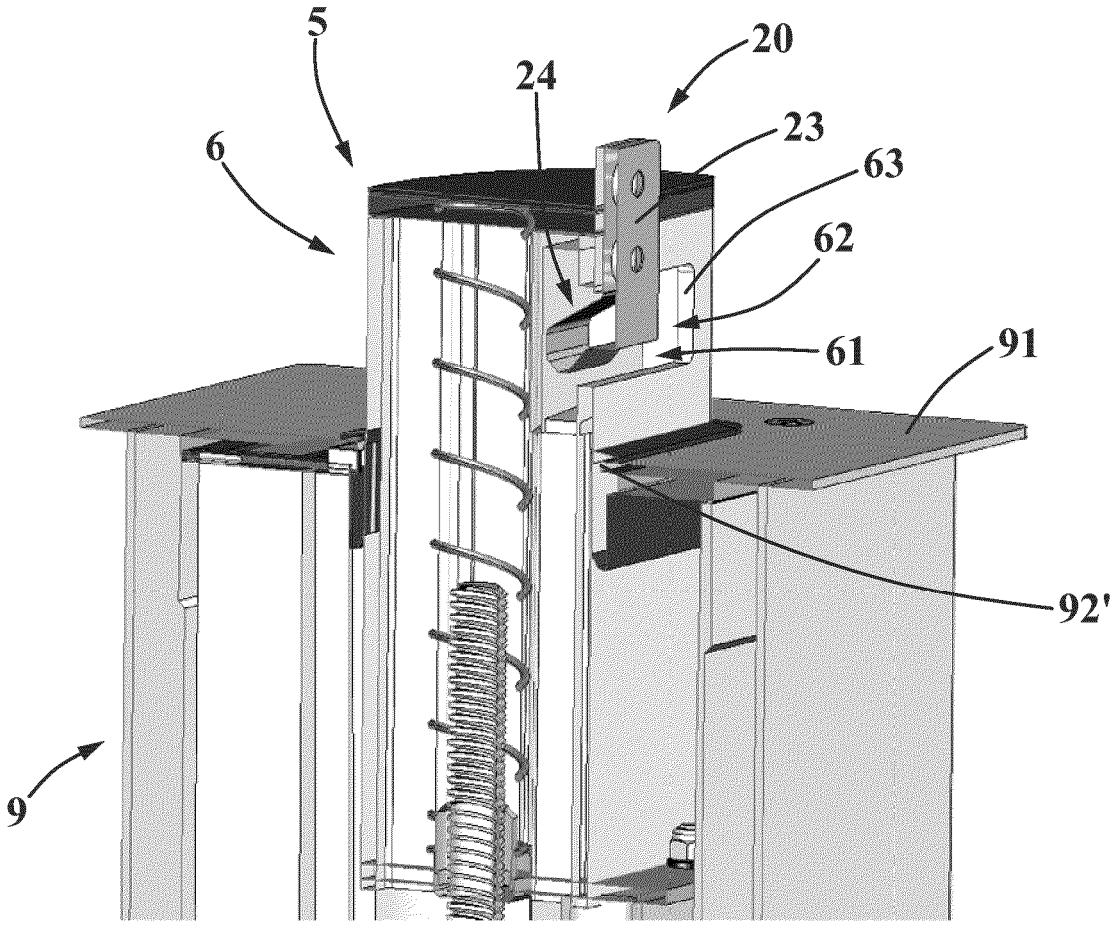


Fig. 10

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EUROPEAN SEARCH REPORT

Application Number
EP 24 20 8715

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 10 2011 000892 B4 (PANAGIOTOPOULOS HARALAMBOS [DE]) 10 January 2013 (2013-01-10) * figures 1-8 *	1-15	INV. E05F5/06 E05F15/40 E06B11/02 E06B1/04
A	DE 83 19 330 U1 (KARL CZENCZ) 13 December 1984 (1984-12-13) * figures 1-3 *	1,15	
A	FR 2 589 190 A1 (LAUZIER SA [FR]) 30 April 1987 (1987-04-30) * claim 1; figures 1-7 *	1	

TECHNICAL FIELDS SEARCHED (IPC)

E05F
E06B
E05G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	17 March 2025	Boyer, Olivier

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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17-03-2025

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 102011000892 B4	10-01-2013	NONE	
DE 8319330 U1	13-12-1984	NONE	
FR 2589190 A1	30-04-1987	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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