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(54) **DEVICE FOR GUIDING AND CONTROLLING THE OPENING OF A DOOR, IN PARTICULAR AN AUTOMATIC DOOR**

(57) The present invention relates to a device for guiding and controlling the opening of a door, in particular an automatic door,

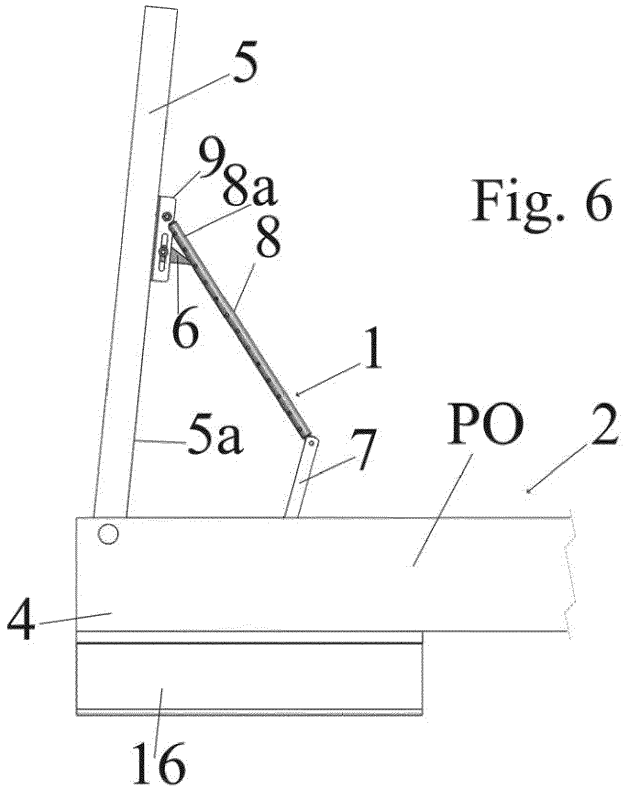

Fig. 6

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Description

TECHNICAL FIELD OF THE INVENTION

[0001] The present invention relates to a device for guiding and controlling the opening of a door, in particular an automatic one, as well as a door provided with such a device.

STATE OF THE PRIOR ART

[0002] As it is known, revolving leaf doors, when closed, stop on the closing ledge, while when open, the stopping point is variable and uncertain.

[0003] In the case of automatically operated doors, a stop point is further required, which is obtained with an electronic control and/or with a mechanical door stop.

[0004] In many cases a mechanical stop is necessary as stopping the movement obtained with electronic control cannot be considered a reliable method.

[0005] The mechanical stop is placed on the floor and the leaf abuts against it in the opening movement.

[0006] However, the solutions proposed up to now, although reliable from a mechanical point of view, do not meet the requirements of ease of assembly, design and resistance.

OBJECTS OF THE INVENTION

[0007] An object of the present invention is to provide a new device for guiding and controlling the opening of a door, in particular an automatic door.

[0008] Another object of the present invention is to provide a device as indicated above which is simple to build.

[0009] Another object of the present invention is to provide a device as above indicated, whose adjustment is easy and intuitive.

[0010] A further object of the present invention is to provide a driving and control device such as to provide good mechanical strength.

[0011] Another object of the present invention is to provide a device as indicated above which can also be installed after the assembly of a respective actuator.

[0012] Another object of the present invention is to provide a device as mentioned above which is capable of ensuring a pleasant aesthetic, which is appreciated both by users and by those employed in the field.

[0013] Another object of the present invention is to provide a new door, for example an automatic door.

[0014] According to one aspect of the invention, a device according to claim 1 is provided.

[0015] According to another aspect of the invention a door according to claim 8 is provided.

[0016] The dependent claims refer to preferred and advantageous embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] Other characteristics and advantages of the invention will be more evident from the description of an embodiment of a device and a door, illustrated by way of example in the attached drawings in which:

- figures 1 and 2 are perspective views from respective sides of a device according to the present invention,
- figure 3 is a plan view of the device figure 1,
- figure 4 is a sectional view along the line IV-IV of figure 3,
- figure 5 is a side view of the device of figure 1,
- figure 6 is a top view of a portion of a door according to the present invention in the open configuration;
- figure 7 is a bottom view of a portion of a door according to the present invention in the closed configuration.

[0018] In the accompanying drawings, identical parts or components are identified by the same reference numbers.

EMDOBIMENTS OF THE INVENTION

[0019] With reference to the enclosed figures, a device for guiding and controlling 1 the opening of a door 2, in particular an automatic door, is shown, which comprises at least one kinematic mechanism 3 arranged to be articulated or pivoted at a first main or terminal end 3a to a frame 4 of a door 2 or to actuation means of the leaf 5 integral with the frame 4 or mounted on the latter and at another or second main or terminal end 3b to the rotating or pivoting leaf 5 of a door 2.

[0020] The kinematic mechanism 3 is displaceable, for example angularly or inclinable between a first rest position (see figure 7) and a second opening position (see figure 6) so as to vary the angle or inclination between components of the kinematic mechanism when passing among these positions.

[0021] The device further includes at least one stop or block component 6 arranged to engage or abut against a respective portion 8a of the kinematic mechanism 3 in the second position so as to prevent, starting from the first position, a displacement or inclination of the same kinematic mechanism 3 beyond the second position.

[0022] Advantageously, the at least one stop or block component 6 is mounted or mountable at the first end 3a and/or the second end 3b.

[0023] The stop or block component 6 can have a base section 6a, for mounting the stop component 6 itself on a component of the device or directly on a portion of a leaf 5, as well as a projecting section 6b defining the abutment portion for a portion 8a of the kinematic mechanism 3.

[0024] The stop component 6 can for example be made of a block of any suitable material, such as for example a plastic material, if desired nylon or another material,

for example metal, composite, etc.

[0025] However, this component 6 is advantageously made of a material that is sufficiently elastic to dampen contact noise and absorb shocks and/or occasional violent manoeuvres.

[0026] Thus, as it will be understood, the stop component 6 acts as an obstacle to the rotation or movement of the kinematic mechanism 3 and prevents it from continuing to move by stopping the leaf 5 of the door 2 in a desired angular opening position.

[0027] Advantageously, the kinematic mechanism 3 comprises a first lever or arm 7 arranged to be articulated or pivoted to a frame or framework 4 of a door 2 or to actuation means of the leaf 5 integral with the frame 4 or mounted on the same, at one of its ends corresponding to the first terminal end 3a of the kinematic mechanism and at least one second lever or arm 8 with a first intermediate end 3c pivoted to a second intermediate end 3d of the first lever or arm 7, which second lever 8 has another end corresponding to the second terminal end 3b of the kinematic mechanism which can be articulated or pivoted to the leaf 5 of a door 2.

[0028] If the levers 7, 8 are pivoted to each other and to the frame 4 and to the leaf 5 or to the actuation means and to the leaf 5, then the pivot axes are preferably parallel to each other, if desired vertical, and obtained for example each by means of a respective pin or similar component.

[0029] In this case, the first lever 7 and the second lever 8 are angularly mutually movable between a first rest position and a second opening position so as to vary the angle or inclination between the levers 7, 8 as well as, in use, the angular position of the levers 7, 8 with respect to the frame 4 and to the leaf 5, when passing among these positions. This angle can increase or decrease as a function of the length of the levers 7, 8 as well as of the method of constraint of the same to the components of a door 2.

[0030] In accordance with these variant, at least one stop component 6 can be provided at the first end 3a at the second end 3b of the second lever or arm 8, in which case the stop or block component 6 is arranged to engage or abut against a respective portion 8a of the second lever 8 in the second position so as to prevent a displacement or inclination between such levers 7, 8 and, in use, with respect to the frame 4 or the leaf 5 of a door 2, starting from the first position, beyond the second position.

[0031] With this last expression it is clear that it is understood that it is possible to mutually move the two levers 7, 8 (and, in use, with respect to the frame 4 or to the actuation means and to the leaf 5 so as to angularly move the latter with respect to the frame 4) starting from the first position up to reach the second position, but once the latter is reached, the stop component 6 prevents a further relative movement between levers 7, 8 and with respect to the frame 4 and the leaf 5, so when in the second position the two levers 7, 8 can only be kept stationary or moved backwards towards the first position and the same, in use, applies to the leaf 5 with respect to the frame 4.

[0032] Preferably, the stop component 6 is mounted close to the pivoting or articulation point of the second lever 8 to the leaf 5, for example at a distance between 1 and 20 cm, if desired between 5 and 15 cm.

[0033] It will be understood how the kinematic mechanism 3 could also comprise a single lever or even three or more levers pivoted or articulated to each other.

[0034] In the case of kinematic mechanism 3 with a single lever, a suitable engagement should be provided between it and the frame 4 and the leaf 5 or the actuation means and the leaf 5. In this regard, if desired, the lever could be mounted by means of engagement of a respective end or of a pin carried by the same with a slot delimited by a component of the device integral with the frame or the leaf or in any case another suitable solution.

[0035] In any case, the kinematic mechanism 3 can be moved or tilted between a first rest position and a second open position so as to vary the angle or inclination between components 7, 8 of the kinematic mechanism 3 and/or between the kinematic mechanism 3 (for example also with one lever) and at least one component (if desired, a component delimiting a slot according to the now recalled embodiment) of the device when passing between these positions. This, in use, given that the kinematic mechanism 3 is articulated or pivoted to the frame 4 and to the leaf 5 or to the actuation means and to the leaf 5, determines, in the passage of the device from the first to the second position, an angular or rotating displacement of the leaf 5 with respect to the frame 4.

[0036] The configuration of the lever or levers 7, 8 of the kinematic mechanism 3 can be any suitable.

[0037] Moreover, one or each or some of the levers 7, 8 could be made in one piece or even in two or more pieces. If one of the levers is made in several pieces, the same could be mutually connected in an adjustable manner or not. Naturally, in the case of an adjustable connection, it would be possible to vary the length of the respective lever.

[0038] The lever of the kinematic mechanism or one or more of the levers 7, 8 of the kinematic mechanism 3 could have a substantially rectilinear configuration, thus with a rectilinear main axis of extension, or even curved or with several inclined sections.

[0039] Thus, for example, a lever, for example the first lever or arm 7, could have a plate-like configuration with or without a straight main extension.

[0040] If desired, a lever, for example the second lever or arm 8, could have a tubular configuration.

[0041] To this regard, with reference to the not limiting embodiment shown in the figures, a lever, for example the second lever or arm 8 could include a tubular cylindrical body 8a with one or more its end open.

[0042] In this case, at least one stem 8b, 8c could be provided inserted into the tubular cylindrical body 8a and protruding from one of its open ends for articulation or

pivoting engagement with another lever, with a frame 4 or with a leaf 5. In this case, the stem 8b, 8c would be fixed to the tubular cylindrical body 8a removably or not, i.e. the stem 8b, 8c would not be movable with respect to the tubular cylindrical body 8a unless disassembly or adjustment was performed by an operator.

[0043] Thus, for example, the at least one stem 8b, 8c can have one or more protrusions or buttons, for example elastically loaded or yielding 8d, designed to removably engage one or more through openings 8e delimited in the main body 8a or vice versa, thus with one or more openings (not necessarily through) in the stem 8b, 8c and one or more protrusions or buttons in the cylinder body 8a.

[0044] Thanks to this expedient, by varying the through opening 8e engaged by the lug 8d or the lug engaged by an opening, it is possible to vary the extension of the stem 8b, 8c with respect to the respective open end of the main body 8a and thus the length of the respective lever or arm 8. Clearly, it is possible to provide other expedients to vary the length of a lever or arm 8.

[0045] According to a variant, one or more of the levers could be a gas spring or in any case an electric, hydraulic, oil-hydraulic or pneumatic cylinder and piston system.

[0046] With reference to the non-limiting example in the figures, two stems 8b, 8c are provided, each protruding from a respective end of the tubular cylindrical body 8a and one designed to engage by articulation or pivoting another lever of the kinematic mechanism 7 or a frame 4 and the other designed to engage by articulation or pivoting a further lever of the kinematic mechanism or a leaf 5.

[0047] Basically, the system of levers 7, 8 is capable of producing a high rotation stress on the attachment of the leaf 5, but if necessary it can also be reduced by varying the length of one or more of the levers themselves.

[0048] Advantageously, one or more of the possible stems 8b, 8c has a terminal ring or eyelet 8f delimiting a respective pivot or articulation opening.

[0049] The device includes a bracket 9 which can be fixed or mounted, for example by means of screws, bolts or similar means, on a leaf 5 of a door 2, in which case the first 3a or second 3b end of the kinematic mechanism 3 is articulated or pivoted, by means of a suitable pin to the bracket 9.

[0050] The stop or block component 6 is mounted on the bracket 9.

[0051] Moreover, the stop or block component 6 can be adjustably displaced or mountable in a plurality of operating positions on the bracket 9.

[0052] In this regard, one between the bracket 9 and the stop component or block 6 delimits at least one first slot or several first holes 10, while the other between the stop component or block 6 and bracket 9 can delimit at least one second slot or hole (not visible in the figures) arranged to be aligned, in use, with at least one first slot or several first holes 10, to then provide for the insertion of a fastening means, such as a screw, a bolt or a similar component 11 in the first slot or in a first hole 10 aligned with the second slot or hole. Clearly, by varying the point of the first slot or the first hole aligned with the second slot or hole it is possible to vary the position of the stop or block component 6 on the bracket 9, so as to allow adjustment of the opening in the desired position or rather in the second position of opening.

[0053] Of course, other expedients can also be provided for obtaining an adjustable assembly of the stop component 6 on the bracket 9, if such a component is provided.

[0054] The bracket 9 can be of any suitable configuration, for example U-shaped, L-shaped or other suitable configuration.

[0055] If the bracket 9 is U-shaped, the base section 6a of the stop or block component 6 can be mounted in the seat defined by this U-shaped portion and fixed or mounted therein, for example as described above, with the projecting section 6b protruding from the base section 6a.

[0056] According to the non-limiting embodiment illustrated in the figures, the bracket 9 comprises a straight main wall 9a and one or two straight side walls 9b each rising from an edge of the main wall, in particular at 90°. In this case, at least one first slot or several first holes 10 is delimited in at least one of the two side walls 9b, if desired at least one first slot or several first holes 10 in one of the two side walls 9b and at least one first slot or a plurality of first holes 10 in the other of the two side walls 9b.

[0057] In use, the straight main wall 9a abuts against one side or internal surface 5a of a leaf.

[0058] With specific reference to the non-limiting embodiment of stop component 6, it can have a projecting section 6b tapered when moving away from the base section 6a, if desired with a rectangular, circular, ellipsoidal or another section which gradually decreases until to reach the free end 6c of the stop component 6. Moreover, at the free end 6c, although this is clearly not necessary, a cradle configuration can be provided for the engagement of a portion 8a of the kinematic mechanism, for example a portion of the first 7 or second 8 lever.

[0059] The stop component 6 will preferably be mounted in an intermediate position between the articulation or pivoting point of the respective lever 8 of the kinematic mechanism 3 to be engaged in the second position and the articulation or pivoting point or area of the leaf 5 to the frame. Clearly, the stop component 6 will be much closer to the articulation or pivoting point of the respective lever 8 than to the articulation or pivoting point or zone of the leaf 5 to the frame 4.

[0060] Of course, the stop or block component 6 must be mounted in a point such that it intercepts and prevents further articulation or pivoting of the lever 8, when the latter reaches a respective second position starting from the first position.

[0061] As regards the pin or articulation or pivoting

components of the kinematic mechanism 3, for example of a respective first lever 7 to a frame 4 or to actuation means of the leaf 5 integral with the frame 4 or mounted on the same, this can be made in any suitable manner.

[0062] According to the non-limiting embodiment illustrated in the figures (see in particular figure 4) an outer sleeve 12 is provided to which an end 3a of a lever 7 is fixed, for example by means of screws or similar means 12a, which sleeve 12 is rotatably mounted on an inner sleeve 13, if desired by means of one or more dowels 14 which can be inserted into respective through holes delimited in the outer sleeve 12 and designed to engage the inner sleeve 13 from the outside.

[0063] The inner sleeve 13 then delimits a through opening in which a pin 15 is engaged, if desired by screwing, which pin 15 protrudes from the inner sleeve 13 for the engagement of or fitting in a respective component or part of a frame 4 or to actuation means of the leaf 5 integral with the frame 4 or mounted thereon. Moreover, the head 15a of the pin 15 can protrude and be retained in a zone between the outer sleeve 12 and the end 3a of the lever 7.

[0064] The inner sleeve 13 can also have an engagement surface 13a suitably shaped, for example toothed, designed to be, in use, engaged with or facing a respective component of a frame 4 or of actuation means of the leaf 5 integral with the frame 4 or mounted on the same.

[0065] In this regard, the inner sleeve 13 can protrude from the inner sleeve 12 in a direction moving away from the lever 7 of the kinematic mechanism engaged with the latter and the engagement surface 13a is delimited on the protruding section of the inner sleeve 12.

[0066] Subject-matter of the present invention is even a door comprising a leaf 5 pivoted or articulated to a frame 4, the latter defining a passage opening PO.

[0067] Such door 2 further comprises a device 1 with the first end 3a of the kinematic mechanism 3 mounted, in particular articulated or pivoted to the frame 4 and the second end 3b of the kinematic mechanism 3 mounted, in particular articulated or pivoted to the leaf 5. Moreover, the door 2 could alternatively have a device as indicated above, but without a stop component 6 or rather not integrated in the device itself, but connected directly to the leaf 5 of the door 2.

[0068] The kinematic mechanism 3 is displaceable or inclinable between a first rest position and a second opening position so as to vary the angle or inclination between components 7, 8 of the kinematic mechanism 3 and/or between the kinematic mechanism 3 and at least one component of the device 1 or of the door 2 when passing between these positions and so as to move the leaf 5 between a first configuration of closing the passage opening PO and a second configuration of opening the passage opening PO, respectively, with the stop or block component 6 arranged to engage or abut against a respective portion 8a of the kinematic mechanism 3 in the second position so as to prevent, starting from the first position, a displacement or inclination of the same kinematic mechanism 3 beyond the second position and thus a displacement, in particular an angular displacement, or an opening of the leaf 5 beyond the second opening configuration.

[0069] The device 1 is preferably mounted in a high position of the door 2, for example at the top thereof, or in any case at a distance of at least one meter or better at least one meter eighty or one meter ninety or two meters from the floor.

[0070] Such door is advantageously an automatic door, and thus the same comprises actuation means 16 of the device integral or mounted or fixed to the frame and including a motor 17 for the actuation, for example an electric motor, if desired brushless or a motor of another type, of the device and displacement of the latter between the first and the second position so as to move the leaf 5 between a first configuration of closing the passage opening PO and a second configuration of opening the opening passage PO, respectively.

[0071] The motor 17 is clearly connected, in any suitable way, and such as to actuate or rotate one of the levers of the kinematic mechanism, for example the first lever 7, thereby even determining a rotation of the second lever 8.

[0072] If desired, with reference to the non-limiting embodiment illustrated in the figures, the motor 17 is connected and such as to set the pin 15 in rotation, so as to control the rotation of the first lever 7.

[0073] In this regard, the actuation means are illustrated in the figures in a schematic manner and the figures do not even illustrate the connection of the motor 17 to the pin 15, which in any case can be obtained in any suitable manner.

[0074] The actuation means 16 or rather a casing or containment box thereof can be mounted or fixed, with any suitable method, such as screws, bolts, rivets, by interlocking or hooking, to the frame 4 of a door 2, for example at the top at the same.

[0075] As an alternative or in addition to the motor 17, an elastically yielding component can be provided, such as a spring, for example a gas spring designed to act on the door 2 or on the device 1 so as to oppose the opening force of the door itself imposed by an operator or by the motor and so as to return the door leaf to the closed position once this force ceases to act or is reduced.

[0076] Moreover, the actuation means can, in addition or as an alternative to what is indicated above, also comprise other components, such as for example a device for the emergency opening of the automatic door.

[0077] The hinge axis of the leaf 5 to the frame 4 is preferably vertical.

[0078] The pivot axes of the kinematic mechanism 3 to the frame 4 or to the actuation means 16 and to the leaf 5 are preferably parallel to the pivot axis of the leaf 5 to the frame 4, so they are preferably vertical. Moreover, if the kinematic mechanism 3 comprises several levers 7, 8, then also the relative pivot axis between the same levers is preferably parallel to the pivot axis of the leaf 5

to the frame 4.

[0079] With specific reference to the door 2, the kinematic mechanism 3, for example a respective second lever 8 is clearly articulated on one side or internal surface 5a of the leaf 5, i.e. on a surface of the leaf 5 facing into or towards the opening passage PO defined by the frame 4.

[0080] In this regard, the stop component 6 is also advantageously mounted so as to protrude from this surface 5a of the leaf 5 facing into or towards the opening defined by the frame 4.

[0081] The bracket 9 for the articulation or pivoting of the second lever 8 and for the assembly or support of the stop component 6 is mounted on the surface 5a of the leaf 5.

[0082] The assembly of the stop component 6 in the connection zone of the kinematic mechanism 3 on the leaf 5 entails an impact of the stop component 6 on the kinematic mechanism 3 and in particular on a respective lever 7, advantageous, since in this zone the arm for transferring the motion from the kinematic mechanism 3 or from the lever 7 to the leaf is short, thus ensuring the desired strength for the intervention of the stop component 6.

[0083] Clearly, the door 2 can also comprise an electronic control device as well as one or more possible sensors and/or buttons, so that the control device, in communication with the sensors and/or buttons, can automatically, depending on the detection of the/ of the sensor(s) or following a command from a user, determine the activation of the motor 17.

[0084] The door 2 can then be provided, for powering the motor or other component, with electrical power supply means, such as batteries or a cable or the like for connection to the electrical mains or other suitable electrical power supply means.

[0085] Of course, the door 2 could be of a single or double leaf type. In the case of a double leaf door 2 then the same could be equipped with one or two devices 2.

[0086] In any case, it will be understood that a device 1 according to the present invention can be mounted on doors of any type, in particular on doors with a socalled rotating or pivoted leaf.

[0087] With a device 1 or a door according to the present invention, with the kinematic mechanism articulated or pivoted on one side to the frame 4 (or to the actuation means) and on the other to the leaf 5 and the at least one stop component 6 mounted on a bracket 9 or directly on the leaf 5, when the door 2 has to be opened, manually or even automatically by operating a motor 17, following a detection by a suitable sensor of the presence of a person or object facing or close to the door or following the manual operation by a user, the leaf 5 is angularly displaced with respect to the frame 4, thereby bringing the door 2 from a closed configuration to an open configuration.

[0088] Following this, the device 1 is moved from the first position, corresponding to the closing of the leaf 5 close to the frame 4, towards or approaching the second position, corresponding to the opening of the door 2 or of the respective leaf 5.

[0089] When, following the opening of the leaf 5, the device reaches the second position, the kinematic mechanism 3 or, for example a respective second lever 8, abuts the stop component 6, which prevents a further angular movement of the kinematic mechanism 3, thereby blocking a further opening of the door 2, regardless of the thrust imparted to the leaf 5 by a user or of the force/torque applied by the motor 17 to the device 1.

[0090] Therefore, it is not possible, even if the force applied by the user or by the motor is excessive or incorrectly calibrated, to open the door 1 beyond what was established in the design or installation phase or even subsequently, as at least one stop component 6 is provided to prevent this from happening.

[0091] As it will be understood, a device 1 according to the present invention is simple to be built and is also very easy to adjust as well as remarkably resistant.

[0092] Moreover, the device 1 can be installed at any time even after the respective actuator or other components in general of the door.

[0093] Moreover, thanks to this device it is not necessary to provide stops on the floor and in fact it remains confined to a usually upper zone of the door, thereby making the door pleasant from an aesthetic point of view.

[0094] Modifications and variations of the invention are possible within the scope defined by the claims.

Claims

1. Device for guiding and controlling the opening of a door, in particular an automatic door, comprising at least one kinematic mechanism (3) arranged to be articulated or pivoted at a first main or terminal end (3a) to a frame (4) of a door (2) or to actuation means (16) of the leaf (5) of a door integral with the frame (4) or mounted on the latter and arranged to be articulated or pivoted at another or second main or terminal end (3b) to the leaf (5) of a door, said kinematic mechanism (3) being displaceable or inclinable between a first rest position and a second opening position so as to vary the angle or inclination between components (7, 8) of said kinematic mechanism (3) and/or between said kinematic mechanism (3) and at least one component of said device when passing among these positions, said device comprising at least one stop or block component (6) arranged to engage or abut against a respective portion (8a) of said kinematic mechanism (3) in said second position so as to prevent, starting from said first position, a displacement or inclination of the same kinematic mechanism (3) beyond said second position,

   said device comprising a fastening means and

at least one bracket (9) that can be fixed or mountable on a leaf (5) of a door, the second (3b) terminal end of said kinematic mechanism (3) being articulated or pivoted to said bracket (9),
said stop or block component (6) being mountable in a plurality of operating positions on said at least one bracket (9),
wherein one between the bracket (9) and the stop or block component (6) delimits at least one first slot or several first holes (10), whereas the other between the stop or block component (6) and the bracket (9) delimits at least one second slot or hole designed to be aligned, in use, with at least one first slot or several first holes (10), to then insert said fastening means in the first slot or in a first hole (10) aligned with the second slot or hole, so that by varying the point of the first slot or the first hole (10) aligned with the second slot or hole it is possible to vary the position of the stop or block component (6) on the bracket (9), thereby making it possible to adjust the second opening position.

2. Device according to claim 1, wherein said kinematic mechanism (3) comprises a first lever or arm (7) arranged to be articulated or pivoted to a frame (4) of a door (2) or to actuation means (16) of the leaf (5) of a door integral with the frame (4) or mounted on the same at one of its ends corresponding to said first main or terminal end (3a) and at least one second lever or arm (8) with a first intermediate end (3c) pivoted to a second intermediate end (3d) of said at least one first lever or arm (7), said at least one second lever or arm (8) then having another end corresponding to said second main or terminal end (3b) which can be articulated or pivoted to the leaf (5) of a door (2), said first lever (7) and said second lever (8) being angularly mutually movable between a first rest position and a second opening position so as to vary the angle or inclination between said levers (7, 8) when passing among these positions, wherein said device at said first terminal end (3a) of said first lever or arm (7) and/or said second terminal end (3b) of said second lever or arm (8) comprises said at least one stop or block component (6) arranged to engage or abut against a respective portion (8a) of said first lever (7) and/or of said second lever (8) in said second position so as to prevent a displacement or inclination between said levers (7, 8), starting from said first position, beyond said second position.

3. Device according to claim 1 or 2, wherein said stop or block component (6) has a base section (6a), for mounting the stop component (6) itself on said bracket (9), as well as a projecting section (6b) defining the abutment portion for a portion (8a) of the kinematic mechanism (3).

4. Device according to claim 3, wherein said projecting section (6b) is tapered away from the base portion (6a), with a rectangular, circular, ellipsoidal or other type of section which gradually decreases until it reaches the free end (6c) of the stop component (6).

5. Device according to claim 4, wherein at said free end (6c) of said stop or block component (6) a cradle configuration is provided for engaging a portion (8a) of the kinematic mechanism.

6. Device according to claim 3, 4 or 5, wherein said bracket (9) is U- or L-shaped and wherein said base section (6a) of the stop or block component (6) is mounted inside the seat defined by this U or L-shaped portion, with the projecting section (6b) protruding from the base section (6a).

7. Device according to any one of the preceding claims, wherein said bracket (9) comprises a straight main wall (9a) and at least one straight side wall (9b) rising from an edge of the main wall (9a), said at least one first slot or several first holes (10) being delimited in said at least one side wall (9b).

8. Device according to any one of the preceding claims, wherein said at least one stop or block component (6) has a base section (6a), for mounting said at least one stop component (6) as well as a projecting section (6b) defining the abutment portion for a portion (8a) of the kinematic mechanism (3), and wherein said projecting portion (6b) is tapered away from the base section (6a).

9. Device according to any one of the preceding claims, wherein at least one lever (8) of said kinematic mechanism (3) comprises a tubular cylindrical body (8a) having one or both of its ends open, said device further comprising at least one stem (8b, 8c) inserted into the tubular cylindrical body (8a) and rising from one of its open ends for articulation or pivoting engagement with another lever (7) of said kinematic mechanism, with a frame (4) or with a leaf (5), said at least one stem (8b, 8c) being removably or not fixed to the tubular cylindrical body (8a).

10. Door comprising a frame (4) and at least one leaf (5) pivoted or articulated to said frame (4) defining a passage opening (PO), said door further comprising a device for guiding and controlling the opening of the door, said device comprising at least one kinematic mechanism (3) arranged to be articulated or pivoted at a first main or terminal end (3a) to said frame (4) or to actuation means (16) of the leaf (5) integral with the frame (4) or mounted on it and at another or second main or terminal end (3b) to said leaf (5), said kinematic mechanism (3) being displaceable or inclinable between a first rest position

and a second opening position so as to vary the angle or inclination between components (7, 8) of said kinematic mechanism (3) and/or between said kinematic mechanism (3) and at least one component of said device or of said door when passing between these positions and so as to move said leaf (5) between a first configuration of closing said passage opening (PO) and a second configuration of opening said passage opening (PO), respectively, wherein said door or the respective device comprises at least one stop or block component (6) arranged to engage or abut against a respective portion of said kinematic mechanism (3) in said second position so as to prevent, starting from said first position, a displacement or inclination of the same kinematic mechanism (3) beyond said second position and thus a displacement of the leaf (5) beyond said second opening configuration,

said device comprising a fastening means and at least one bracket (9) fixed or mounted on said leaf (5), the second (3b) terminal end of said kinematic mechanism (3) being articulated or pivoted to said bracket (9),
said stop or block component (6) being mountable in a plurality of operating positions on said at least one bracket (9),
wherein one between the bracket (9) and the stop or block component (6) delimits at least one first slot or several first holes (10), whereas the other between the stop or block component (6) and the bracket (9) delimits at least one second slot or hole designed to be aligned, in use, with at least one first slot or several first holes (10), to then insert said fastening means in the first slot or in a first hole (10) aligned with the second slot or hole, so that by varying the point of the first slot or the first hole (10) aligned with the second slot or hole it is possible to vary the position of the stop or block component (6) on the bracket (9), thereby making it possible to adjust the second opening position.

11. Door according to claim 10, wherein said door is an automatic door which comprises actuation means (16) of the leaf (5) integral with the frame (4) or mounted thereon and including a motor (17) for the actuation of said device and displacement of the latter between said first and said second position so as to move said leaf (5) between a first configuration of closing said passage opening (PO) and a second configuration of opening said opening passage (PO), respectively.

12. Door according to claim 10 or 11, wherein the pivot axes of the kinematic mechanism (3) to the frame (4) and to the leaf (5) are parallel to the pivot axis of the leaf (5) to the frame (4).

13. Door according to claim 10, 11 or 12, wherein said kinematic mechanism (3) is articulated on an internal side or surface (5a) of the leaf (5), i.e. on a surface of the leaf (5) facing into or towards the passage opening (PO) defined by the frame (4) and wherein even said at least one stop component (6) is mounted so as to protrude starting from this internal surface (5a) of the leaf (5).

14. Door according to any one of claims 10 to 13, wherein said stop component (6) is mounted in a position intermediate between the articulation or pivoting point of the respective lever (8) of the kinematic mechanism (3) to be engaged in the second position and the point or zone of articulation or pivoting of the leaf (5) to the frame.

15. Door according to any one of claims 10 to 14, wherein said device is a device according to any one of claims 1 to 9.

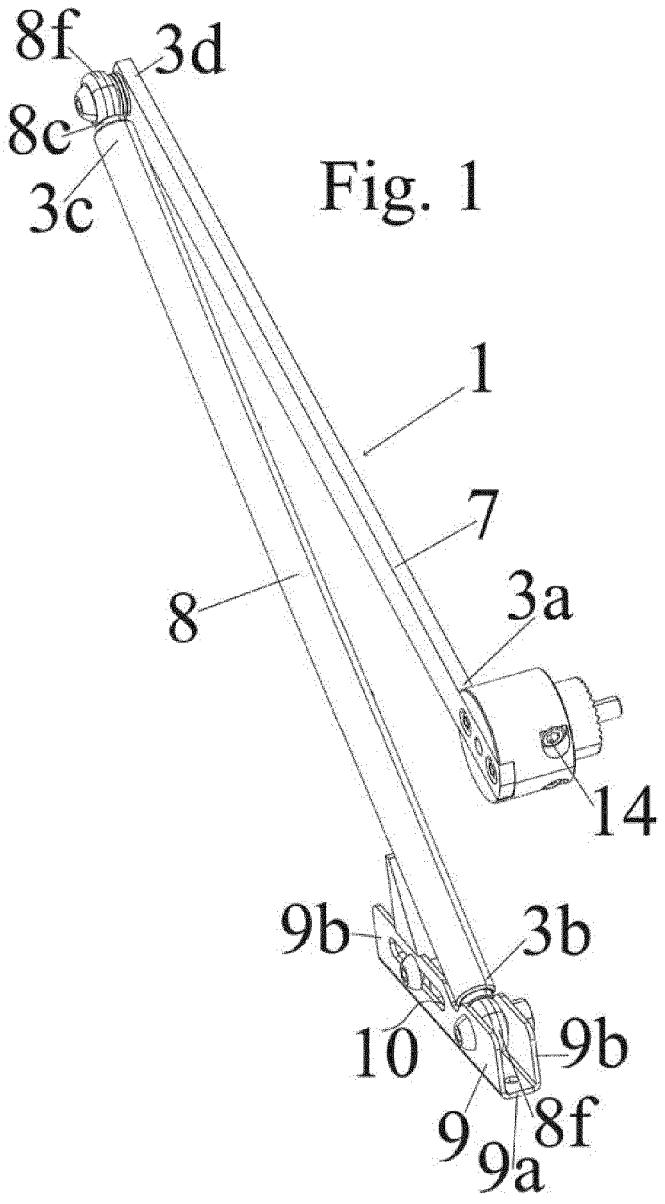
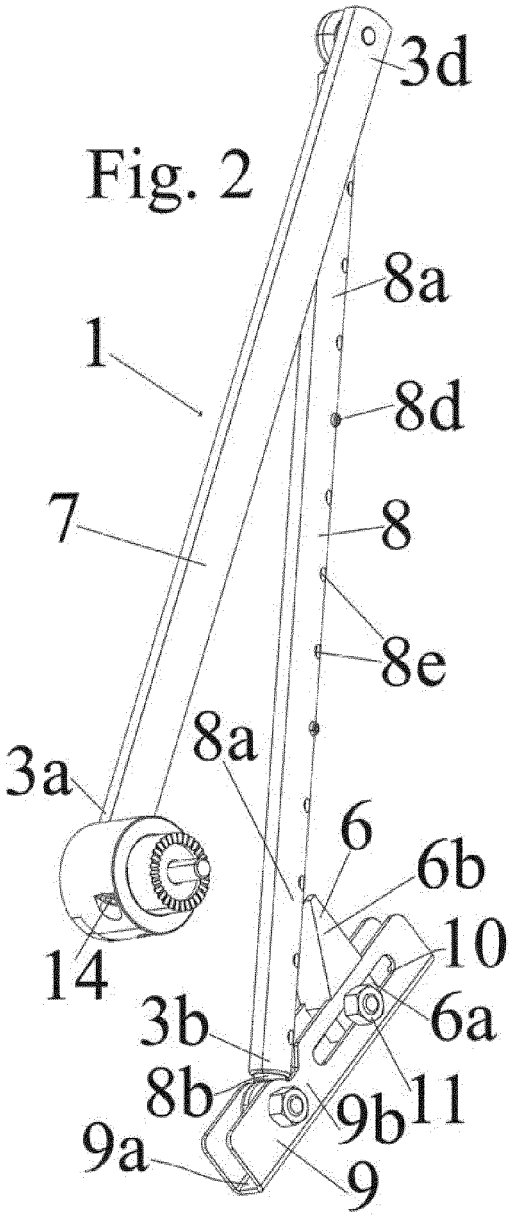

8f
3d
8c
3c
1
7
8
3a
14
9b
3b
10
9b
9
9a
8f

Fig. 1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8a
1
8d
7
8
8e
8a
3a
6
6b
14
10
3b
6a
8b
9b
11
9a
9

Fig. 2

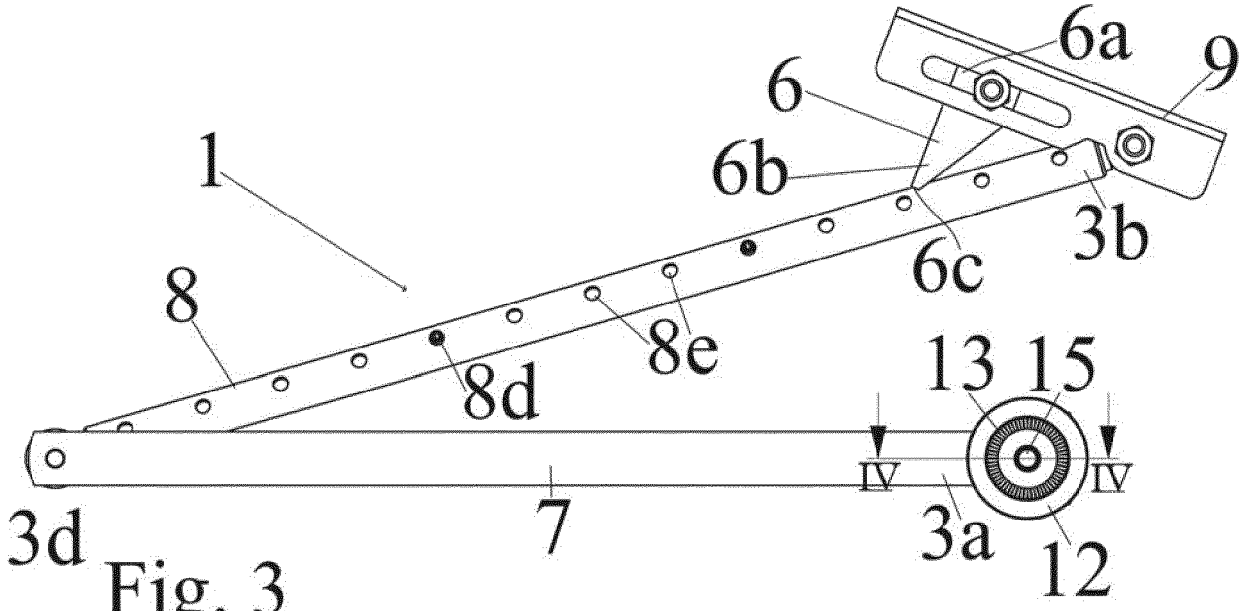

Fig. 3

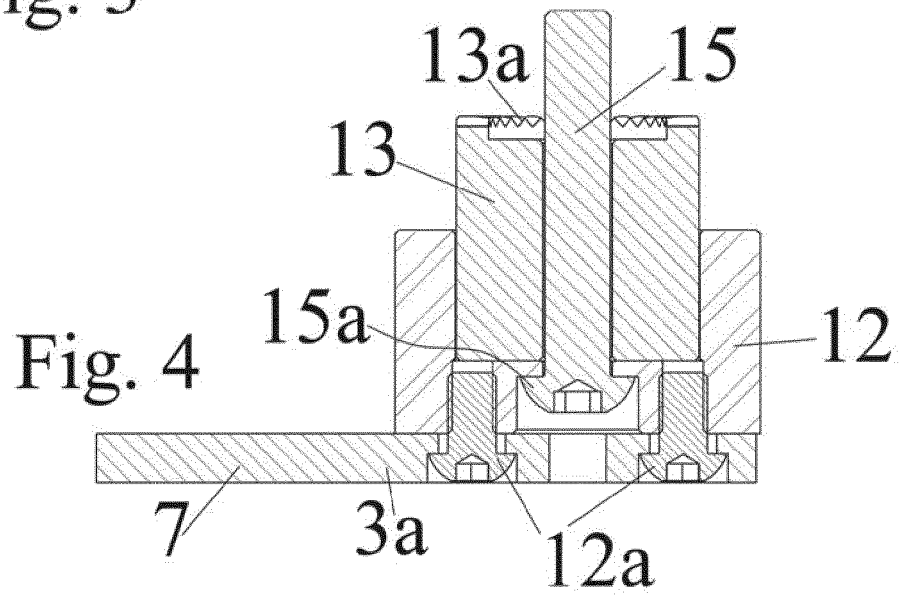

Fig. 4

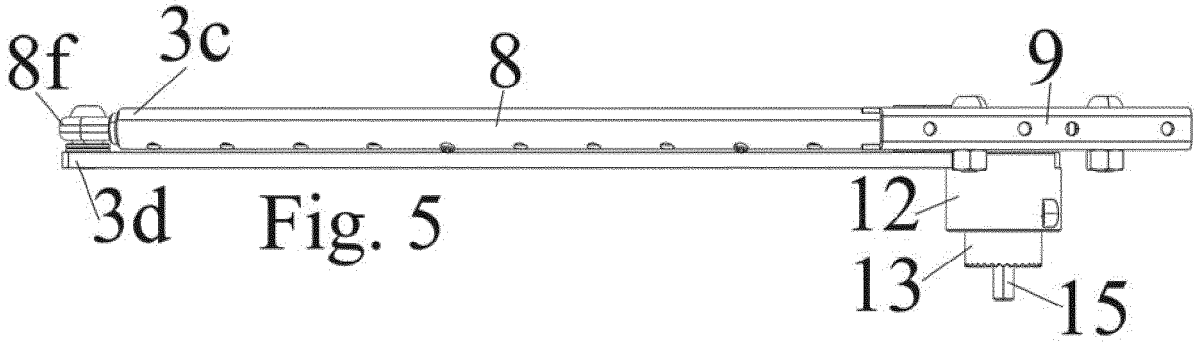

Fig. 5

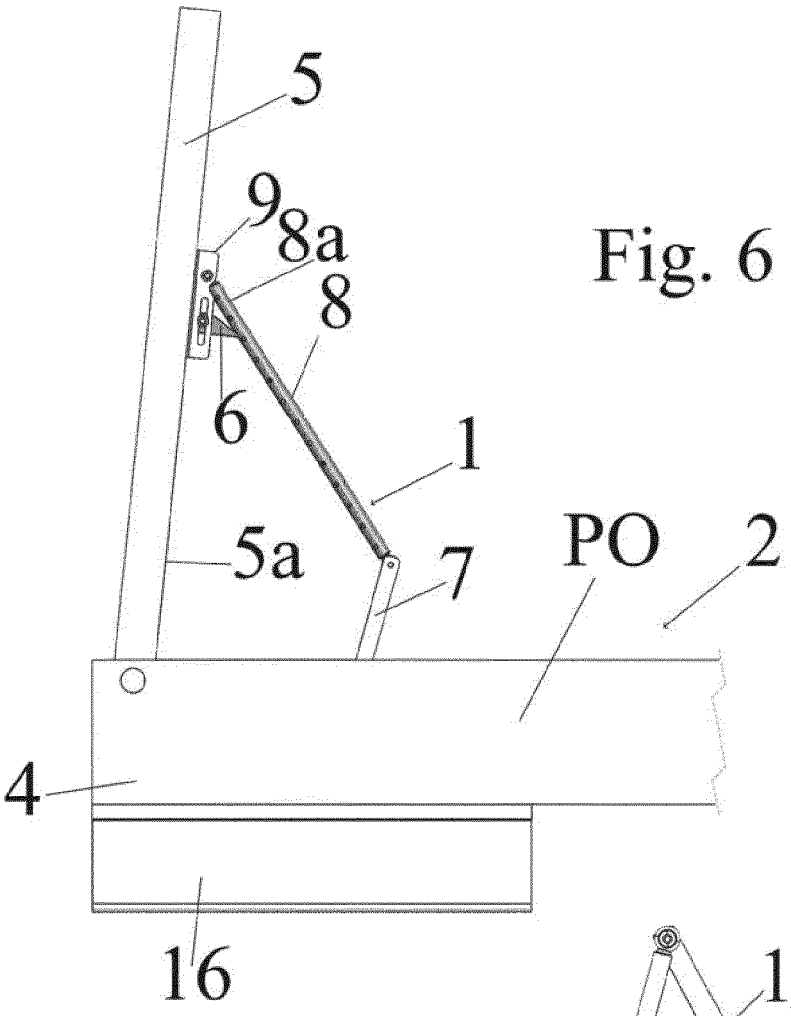

Fig. 6

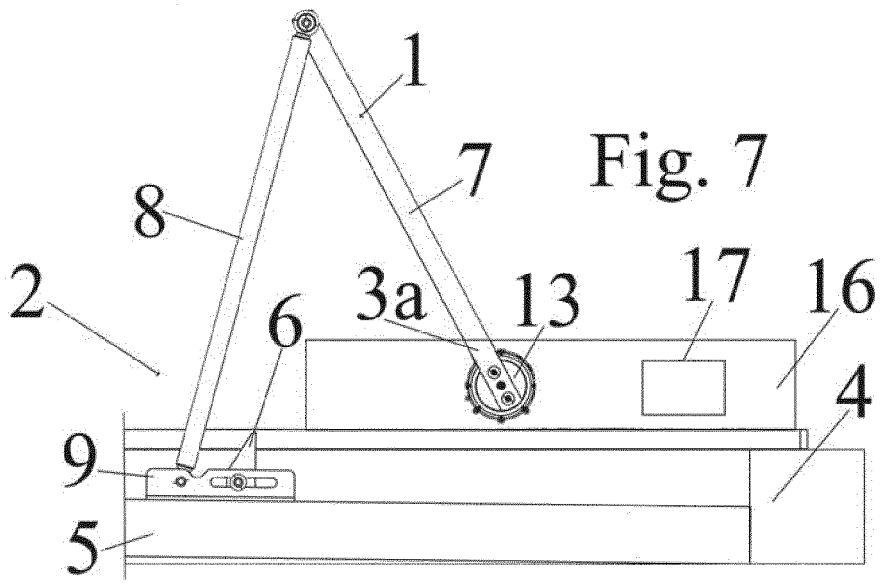

Fig. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 22 21 5819

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	EP 2 029 525 B1 (NICE SPA [IT]) 9 December 2009 (2009-12-09) * paragraph [0015] - paragraph [0021]; figures 1-5 * * paragraph [0007] * -----	1-15	INV. E05D15/28 E05F3/22 E05F15/63

TECHNICAL FIELDS SEARCHED (IPC)

E05D
E05F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	1 May 2023	Viethen, Lorenz

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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01-05-2023

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