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(54) **PANIC BAR DEVICE**

(57) Panic bar device (100) comprising a first bearing assembly (1) and a second bearing assembly (1'), a first arm (2) and a second arm (2') coupled to the first bearing assembly and second bearing assembly (1, 1') respectively by means of an operating shaft, and a bar (3) coupled to the first arm and second arm (2, 2'). The first arm (2) and the second arm (2') are selected from a plurality of pairs of arms (2, 2') configured for having different inclinations in the panic bar device (100) with respect to a front surface (104) of the door (101) in a standby state of the panic bar device (100) in which the bar (3) is not pushed, the different inclinations being obtained by varying the angular orientation of the operating shaft with respect to the arms (2, 2').

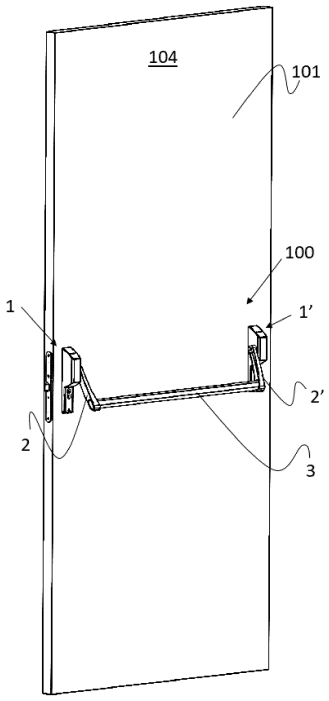

FIG. 1

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Description

TECHNICAL FIELD

[0001] The present invention relates to a panic bar device for a door.

PRIOR ART

[0002] Panic bar devices arranged in a door are known. EP2820209B1 discloses a mechanism with an operating handle in the form of a bar for a door, window, or the like, with a leaf mounted on a fixed frame. The mechanism comprises a bearing device on which the bar is supported, a lock with a lock mechanism, and a connecting device for connecting the lock. The bearing device comprises a bearing plate configured for fixing the bearing device to the door. The bearing device further comprises a bearing body with a U-shaped section. The bearing body has two U-shaped arms protruding from the bearing plate. Each U-shaped arm comprises a bearing receptor, the bearing receptors of both arms being aligned with one another. The bearing shaft of the bar is arranged in each of the bearing receptors. The connecting device comprises a driving lever attached to the bearing shaft of the bar in a rotation-resistant manner, and upon rotation it pushes a projection of an element which rotates about a shaft acting on the lock.

DISCLOSURE OF THE INVENTION

[0003] The object of the invention is to provide a panic bar device, as defined in the claims.

[0004] The panic bar device of the invention comprises a first bearing assembly and a second bearing assembly configured for being fixed to a door, a first arm pivotally coupled at a first end to the first bearing assembly by means of a first operating shaft, a second arm pivotally coupled at a first end to the second bearing assembly by means of a second operating shaft, and a bar coupled to a second end of the first arm and to a second end of the second arm, such that the bar, the first arm, and the second arm pivot with respect to the bearing assemblies when the bar is pushed.

[0005] The bearing assembly comprises a rotating shaft comprising a housing for the operating shaft, the rotating shaft being configured for rotating together with the operating shaft and the respective arm of the panic bar device.

[0006] The first arm and the second arm are selected from a plurality of pairs of arms configured for having different inclinations in the panic bar device with respect to a front surface of the door in a standby state of the panic bar device in which the bar is not pushed, the different inclinations being obtained by varying the angular orientation of the operating shaft with respect to the arms.

[0007] The fact that the same panic bar device can be used with different pairs of arms makes it possible that the same panic bar device can be used with different locks existing on the market, such that depending on the characteristics of the lock to be used with the panic bar device and the force that needs to be exerted on the pair of arms to open the lock, the pair of arms can be selected such that they have the suitable length and inclination with respect to the front surface of the door.

[0008] These and other advantages and features of the invention will become evident in view of the drawings and the detailed description of the invention.

DESCRIPTION OF THE DRAWINGS

[0009]

Figure 1 shows a perspective view of an embodiment of the panic bar device according to the invention.

Figure 2 shows a perspective view of a first arm with an operating shaft of the panic bar device of Figure 1 coupled thereto.

Figure 3 shows an exploded view of the first bearing assembly together with the first arm of the panic bar device of Figure 1.

Figure 4 shows a perspective view of a rotating shaft of the panic bar device of Figure 1.

Figure 5 shows a section view of the first bearing assembly with the first arm of the panic bar device of Figure 1 coupled thereto.

Figure 6 shows a perspective view of part of the first bearing assembly of the panic bar device of Figure 1.

Figure 7A shows a side view of the panic bar device of Figure 1, wherein the first arm of a first pair of arms is positioned with an inclination α, and Figure 7B shows a side view of the panic bar device of Figure 1, wherein the first arm of a second pair of arms is positioned with an inclination β.

Figures 8A and 8B show a side view of the first arm and of the second arm of a first pair of arms of the panic bar device of Figure 1 with the operating shaft positioned with a first angular orientation.

Figures 9A and 9B show a side view of the first arm and of the second arm of a second pair of arms of the panic bar device of Figure 1 with the operating shaft positioned with a second angular orientation.

Figure 10 shows a side view of the first bearing assembly with the first arm of the panic bar device of Figure 1.

Figure 11 shows a perspective view of part of the

first bearing assembly of the panic bar device of Figure 1.

Figure 12 shows a perspective view of a lock actuating element of the panic bar device of Figure 1.

Figure 13 shows a plan view of part of the first bearing assembly of the panic bar device of Figure 1, wherein the lock actuating element is in a first standby position.

Figure 14 shows a perspective view of part of the first bearing assembly of the panic bar device of Figure 1.

Figure 15 shows a perspective view of the first bearing assembly with the first arm of the panic bar device of Figure 1.

DETAILED DISCLOSURE OF THE INVENTION

[0010] Figures 1 to 15 show an embodiment of the panic bar device 100 of the invention.

[0011] The panic bar device 100 of the invention comprises a first bearing assembly 1 and a second bearing assembly 1' configured for being fixed to a door 101, a first arm 2 pivotally coupled at a first end to the first bearing assembly 1 by means of a first operating shaft 81, a second arm 2' pivotally coupled at a first end to the second bearing assembly 1' by means of a second operating shaft 81, and a bar 3 coupled to a second end of the first arm 2 and to a second end of the second arm 2', such that the bar 3, the first arm 2, and the second arm 2' pivot with respect to the bearing assemblies 1, 1' when the bar 3 is pushed.

[0012] The bearing assembly 1, 1' comprises a rotating shaft 21 comprising a housing 22 for the operating shaft 81, the rotating shaft 21 being configured for rotating together with the operating shaft 81 and the respective arm 2, 2' of the panic bar device 100.

[0013] The first arm 2 and the second arm 2' are selected from a plurality of pairs of arms 2, 2' configured for having different inclinations in the panic bar device 100 with respect to a front surface 104 of the door 101 in a standby state of the panic bar device 100 in which the bar 3 is not pushed, the different inclinations being obtained by varying the angular orientation of the operating shaft 81 with respect to the arms 2, 2'.

[0014] Figures 8A and 8B show arm 2 and arm 2' of a first pair of arms 2, 2' of this embodiment of the panic bar device 100, wherein the operating shaft 81 is coupled to arm 2 and to arm 2' with a first angular orientation. Upon coupling arm 2 to bearing assembly 1, in the standby state, arm 2 has an inclination with respect to the front surface 104 of the door 101 equal to angle α, as shown in Figure 7A. In the same manner, upon coupling arm 2' to bearing assembly 1', in the standby state, arm 2' has an inclination with respect to the front surface 104 of the door 101 also equal to angle α, that is, once arms 2, 2' of the first pair of arms are coupled to respective bearing assemblies 1, 1', they are both positioned with respect to the front surface of the door 101 with the same inclination, angle α.

[0015] Figures 9A and 9B show arm 2 and arm 2' of a second pair of arms 2, 2' of this embodiment of the panic bar device 100, wherein the operating shaft 81 is coupled to arm 2 and to arm 2' with a second angular orientation. Upon coupling arm 2 to bearing assembly 1, in the standby state, arm 2 has an inclination with respect to the front surface 104 of the door 101 equal to angle β, as shown in Figure 7B. In the same manner, upon coupling arm 2' to bearing assembly 1', in the standby state, arm 2' has an inclination with respect to the front surface 104 of the door 101 also equal to angle β. Therefore, upon varying the angular orientation of the operating shaft 81 with respect to arms 2, 2' of the first pair of arms 2, 2' to the second pair of arms 2, 2', it achieves positioning the second pair of arms 2, 2' with an inclination different from the inclination with which the first pair of arms 2, 2' is positioned with respect to the front surface 104 of the door 101. In the same manner, the panic bar device 100 of this embodiment can be used with other pairs of arms 2, 2' in which as the angular orientation of the operating shaft 81 is varied with respect to the arms 2, 2' different inclinations will be obtained.

[0016] In the installation of the panic bar device 100, arm 2 of each pair of arms 2, 2' is coupled to bearing assembly 1 from one end of the rotating shaft 21 and arm 2' of said pair of arms 2, 2' is coupled to bearing assembly 1' from another end of the rotating shaft 21. This is why the angular orientation of the operating shaft 81 with respect to arm 2 and the angular orientation of the operating shaft 81 with respect to arm 2' must be such that arm 2 and arm 2' are symmetrical with respect to a plane of symmetry located between both arms 2, 2' and at the same distance from both when both arms 2, 2' are viewed in side view, as shown in Figures 8A and 8B, or in Figures 9A and 9B.

[0017] The fact that the same panic bar device 100 can be used with different pairs of arms 2, 2' makes it possible that the same panic bar device 100 can be used with different locks existing on the market, such that depending on the characteristics of the lock to be used with the panic bar device 100 and the force that needs to be exerted on the pair of arms 2, 2' to open the lock, the pair of arms 2, 2' can be selected such that they have the suitable length and inclination with respect to the front surface 104 of the door 101.

[0018] In the panic bar device 100 of this embodiment, the first bearing assembly 1 will act on a lock installed on the first side or on the second side of the door 101, whereas the second bearing assembly 1' will not act on any lock. As a result, in the panic bar device 100 of this embodiment, the first bearing assembly 1, which acts on the lock, comprises a bearing element 11 comprising a base plate 12 configured for being fixed to the front surface

104 of the door 101, a first side plate 13 attached to the base plate 12 on one of its sides, and a second side plate 13' attached to the base plate 12 on the opposite side facing the first side plate 13, as shown in Figure 11. Each side plate 13, 13' comprises a bore 14, 14', both bores 14, 14' facing one another, and the rotating shaft 21 being housed in the bores 14, 14' of the side plates 13, 13'. The first bearing assembly 1 comprises at least one pushing element 41 coupled to the rotating shaft 21 and configured for rotating together with the rotating shaft 21, the pushing element 41 comprising a projection 42, as shown in Figure 10. The first bearing assembly 1 comprises a lock actuating element 31 coupled to the base plate 12 configured for rotating about an axis perpendicular to the base plate 12 and acting on the lock, the actuating element 31 comprising a projection 32 configured for being pushed by the projection 42 of the pushing element 41, thus causing the rotation thereof. The pushing element 41 is configured for delimiting the angular travel of the panic bar 3 cooperating with a standby position stop 121 and with an end-of-travel stop 122. The second bearing assembly 1', which does not act on the lock, is identical to the first bearing assembly 1, which acts on the lock, without the lock actuating element 31.

[0019] Figure 12 shows the lock actuating element 31 of this embodiment of the panic bar device 100. The lock actuating element comprises a projection 32 which, in this embodiment extends radially and outwardly with respect to the shaft on which the lock actuating element 31 rotates.

[0020] The rotating shaft 21 is configured for rotating with the arm 2, 2' of the panic bar device 100, such that when the bar 3 is pushed, the arms 2, 2' pivot with respect to the bearing assemblies 1, 1' causing the rotation of the rotating shaft 21 to which said arms 2, 2' are coupled. The rotating shaft 21 is coupled to the pushing element 41. Therefore, upon pushing the bar 3, the pushing element 41 rotates together with the rotating shaft 21, causing the rotation of the lock actuating element 31. In this embodiment, the lock actuating element 31 has a square-shaped bore in which there is coupled a shaft which rotates together with the lock actuating element 31. Said shaft is coupled to the lock arranged in the door 101, such that upon rotation of the lock actuating element 31, it will act on the lock, such that the lock will allow the door to open.

[0021] As shown in Figure 3, a sleeve 33 is arranged between the lock actuating element 31 and the base plate 12 to which said lock actuating element 31 is coupled, such that by means of the use of the sleeve 33 direct contact between the lock actuating element 31 and the base plate 12 is prevented.

[0022] As shown in Figure 6, the base plate 12 comprises at least one side projection 18 on one of the sides of said base plate 12, the side projection 18 comprising the standby position stop 121 and the end-of-travel stop 122. As shown in Figure 10, the pushing element 41 comprises a standby projection 411 which, in the standby state of the panic bar device 100, cooperates with the standby position stop 121. The pushing element 41 comprises an end-of-travel projection 441 which cooperates with the end-of-travel stop 122 when the user pushes the bar 3 and the end of the angular travel thereof is reached.

[0023] In the panic bar device 100 of this embodiment, the bearing assembly 1, 1' comprises at least one additional detachable end-of-travel stop 123 delimiting a smaller travel than end-of-travel stop 122, the end-of-travel stop 122 being a fixed stop. This allows the bar 3 of the panic bar device 100 to have two different angular travels, which makes it possible that the panic bar device can be used with locks existing on the market for which the bar 3 is to have a given angular travel, and with locks in which the bar 3 is to have a different angular travel. Therefore, when the additional detachable end-of-travel stop 123 is removed from the panic bar device 100, the bar 3 presents a certain angular travel, and when said additional detachable end-of-travel stop 123 is located in the panic bar device 100, the bar 3 presents a smaller angular travel.

[0024] In the panic bar device 100 of this embodiment, the additional detachable end-of-travel stop 123 is a shaft 91 configured for being housed in facing bores 17, 17' arranged in the side plates 13, 13'. Figure 11 shows the shaft 91 of this embodiment, housed in the bores 17, 17' of the side plates 13, 13'. The pushing element 41 comprises an additional end-of-travel projection 431 which cooperates with the additional detachable end-of-travel stop 123 when the user pushes the bar 3, as shown in Figure 8.

[0025] In the panic bar device 100 of this embodiment, the additional detachable end-of-travel stop 123 comprises a recess 92, and the bearing assembly 1, 1' comprises between the two side plates an elastic protrusion 73 configured for being housed in said recess 92 and fixing the axial position of said additional detachable travel stop 123.

[0026] In the panic bar device 100 of this embodiment, the bearing assembly 1, 1' comprises a guide element 71 positioned on the base plate 12 and coupled to the side plates 13, 13', the guide element 71 comprising the elastic protrusion 73. The guide element 71 is preferably manufactured in a plastic material. In the case of the first bearing assembly 1, which acts on the lock, the guide element 71 is positioned on the base plate 12 and the lock actuating element 31, the lock actuating element 31 being coupled to the guide element 71.

[0027] The guide element 71 of this embodiment of the panic bar device 100 comprises a plurality of flanges 72, and each of the side plates 13, 13' comprises at least two bores 16, such that the guide element 71 is coupled to the side plates 13, 13' when each flange 72 is introduced into its respective bore 16. The guide element 71 of this embodiment can be seen in Figure 3, wherein the guide element 71 comprises four flanges 72, two flanges 72 on one side of the guide element 72, and two other flanges 72 on the other side. The side plates 13, 13' of

this embodiment can be seen in Figure 12, wherein the first side plate 13 comprises two bores 16, and the second side plate 13' also comprises two bores 16, such that the two flanges of one side of the guide element 72 are introduced into the two bores 16 of the first side plate 13, and the two flanges of the other side of the guide element 71 are introduced into the two bores 16 of the second side plate 13', the guide element 71 thus being coupled to the side plates 13, 13'.

[0028] In the panic bar device of this embodiment, the operating shaft 81 comprises a fixing element 82 and pushing means 83 configured for pushing the fixing element 82 radially out of the operating shaft 81, and the rotating shaft 21 comprises a bore 23 on the periphery of the housing 22 in the radial direction, the fixing element 82 being configured for being housed in the bore 23 when the operating shaft 81 is introduced into the housing 22 and fixing the operating shaft 81 to the rotating shaft 21. The housing 22 comprises a contour, and the fixing element 82 at least partially protrudes from the contour of the operating shaft 81 when the operating shaft 81 is not introduced into the housing 22. The fixing element 82 is configured so that when it abuts with the contour of the housing 22 upon introducing the operating shaft 81 into the housing 22, it is retracted and is housed inside the operating shaft 81. To that end, the part of the fixing element 82 which protrudes from the operating shaft 81 when the latter is not introduced into the housing 22 preferably has a curved or planar upward surface which allows the fixing element 82 to be retracted upon abutting with the contour of the housing 22 during the introduction of the operating shaft 81 into the housing 22. In another embodiment, the part of the fixing element 82 which protrudes from the operating shaft 81 may have another shape which allows the fixing element 82 to be retracted upon abutting with the contour of the housing 22 during the introduction of the operating shaft 81 into the housing 22. When, during the introduction of the operating shaft 81 into the housing 22, the fixing element 82 is facing the bore 23, the pushing means 83 push the fixing element 82 such that the fixing element 82 once again at least partially protrudes from the contour of the operating shaft 81, said part of the fixing element 82 which protrudes from the operating shaft 81 being housed in the bore 23, thereby fixing the operating shaft 81 to the rotating shaft 21. Figure 2 shows an embodiment of the first arm 2 of the panic bar device 100, with the operating shaft 81 fixed to said arm 2. In another embodiment, the operating shaft 81 can be fixed to the arm 2 by means of a screw, by means of adhesive, by means of welding, or by means of the use of other fixing means known in the state of the art.

[0029] The panic bar device 100 of the invention shown in Figure 1 facilitates the installation thereof on the door 101 given that the arms do not need to be screwed to the corresponding bearing assembly 1, 1' to be fixed, but rather it is sufficient for them to be inserted until the fixing element 82 is fixed in the bore 23 of the housing 22 of the rotating shaft 21.

[0030] In this embodiment of the panic bar device 100, the housing 22 of the rotating shaft 21 and the operating shaft 81 have a cross section configured so that the operating shaft 81 can be introduced into the housing 22 in a single position. This thereby prevents a person in charge of fixing the arm 2, 2' to bearing assembly 1, 1' from fixing the arm 2, 2' incorrectly, given that there is only one possible position in which the operating shaft 81 can be introduced into the housing 22.

[0031] In this embodiment of the panic bar device 100, the cross section of the housing 22 of the rotating shaft 21 and of the operating shaft 81 is a regular polygon with a bevel 84 in one of the vertices of said polygon, as shown in Figures 1 and 4.

[0032] In this embodiment of the panic bar device 100, the rotating shaft 21 comprises an additional bore 23' on the periphery of the housing 22 in the radial direction, symmetrical to the bore 23 with respect to a plane perpendicular to a longitudinal axis of the rotating shaft 21 at the mid-point of said rotating shaft 21, such that when the operating shaft 81 is introduced into the rotating shaft 21 from a first end of the rotating shaft 21 the fixing element 82 is housed in the bore 23, and when the operating shaft 81 is introduced into the rotating shaft 21 from a second end of the rotating shaft 21 the fixing element 82 is housed in the additional bore 23'. The arm 2, 2' can be introduced into the first end of the rotating shaft 21, or into the second end of the rotating shaft 21, which enables being able to fix the bearing assembly 1, 1' on a first side or on a second side of the door 101. Furthermore, the panic bar device 100 of this embodiment prevents the person in charge of fixing the arm 2, 2' to bearing assembly 1, 1' from trying to fix the arm 2, 2' incorrectly, that is, trying to fix the arm 2, 2' in the bearing assembly 1, 1' that does not correspond to it. Since the cross section of the operating shaft 81 is a regular polygon with a bevel 84 in one of the vertices of the polygon, in the case of fixing the arm 2 to bearing assembly 1', that is, to the incorrect bearing assembly, the arm 2 is fixed with an inclination which is seen at first sight to be incorrect. Figure 5 shows a section view of this embodiment of the panic bar device 100, wherein the arm 2 has been introduced into the first end of the rotating shaft 21, the fixing element 82 of the operating shaft 81 being housed in the bore 23.

[0033] As shown in Figure 5, in this embodiment of the panic bar device 100, the fixing element 82 is a pin.

[0034] As shown in Figure 5, in this embodiment of the panic bar device 100, the pushing means 83 are a spring.

[0035] In this embodiment of the panic bar device 100, the bore 23 on the periphery of the housing 22 in the radial direction is a through bore. It can be observed in Figure 5 that in this embodiment, the bore 23 communicates the housing 22 of the rotating shaft 21 with the outer surface of said rotating shaft 21.

[0036] In this embodiment of the panic bar device 100, if in the standby state the projection 32 of the lock actu-

ating element 31 is arranged in a first angular position, the projection 32 is pushed by the projection 42 of the pushing element 41, the lock actuating element 31 rotating in one direction, and if the projection 32 is arranged in a second angular position it is pushed by a projection 42' of an additional pushing element 41', the lock actuating element 31 rotating in the opposite direction.

[0037] In standby state, the lock actuating element 31 of this embodiment of the panic bar device 100 comprises a first standby position in which the projection 32 of the lock actuating element 31 is arranged in the first angular position, and a second standby position in which the projection 32 of the lock actuating element 31 is arranged in the second angular position. When the lock actuating element 31 is arranged in the first standby position and the bar 3 is pushed, the pushing element 41 pushes the projection 32 of the lock actuating element 31, rotating the lock actuating element 31 in one direction, and when the lock actuating element 31 is arranged in the second standby position and the bar 3 is pushed, the additional pushing element 41' pushes the projection 32 of the lock actuating element 31, rotating the lock actuating element 31 in the opposite direction.

[0038] In this embodiment of the panic bar device 100, the projection 32 comprises a first contact surface 321 and a second contact surface 322, such that when the lock actuating element 31 is in the first standby position and the bar 3 is pushed, the pushing element 41 pushes the projection 32, contacting with the first contact surface 321. In the same manner, when the lock actuating element 31 is in the second standby position and the bar 3 is pushed, the additional pushing element 41' pushes the projection 32, contacting with the second contact surface 322. The first and second standby positions of the lock actuating element 31 are positions of the lock actuating element 31 in which the bar 3 of the panic bar device 100 is not being pushed.

[0039] Figure 13 shows part of the first bearing assembly 1 of this embodiment of the panic bar device 100, wherein the lock actuating element 31 is in the first standby position. Figure 10 also shows this embodiment, wherein the lock actuating element 31 is in the first standby position, such that when the bar 3 is pushed the pushing element 41 pushes the projection 32 of the lock actuating element 31, rotating the lock actuating element 31 in one direction, for which purpose the pushing element 41 will contact with the first contact surface 321.

[0040] The first bearing assembly 1 of this embodiment is configured for being arranged interchangeably on the first side or on the second side of the door 101, such that when the lock is arranged on the first side of the door 101, the lock actuating element 31 of the first bearing assembly 1, which acts on the lock, will be arranged in the first standby position shown in Figure 10, such that when the bar 3 is pushed, the pushing element 41 will push the projection 32 of the lock actuating element, contacting with the contact surface 321, rotating the lock actuating element 31 in one direction, in the clockwise direction, acting on the lock and thus causing the door 101 to open. When the lock is arranged on the second side of the door 101, the lock actuating element 31 of the first bearing assembly 1, which acts on the lock, will be arranged in the second standby position, such that when the bar 3 is pushed, the additional pushing element 41' will push the projection 32 of the lock actuating element 31, contacting with the contact surface 322, rotating the lock actuating element 31 in the opposite direction, that is, in the counter-clockwise direction, acting on the lock and thus causing the door 101 to open.

[0041] In this embodiment of the panic bar device 100, the pushing element 41 and the additional pushing element 41' are coupled to the rotating shaft 21 and are configured for directly pushing the projection 32 of the lock actuating element 31. The rotating shaft 21 comprises at each of its ends four projections, and the pushing element 41 and the additional pushing element 41' each comprises a bore in which said projections are coupled, and after being riveted allow the rotating shaft 21 to be fixed to the pushing element 41 at one end and to the additional pushing element 41' at the other end.

[0042] In this embodiment, the projection 42 comprises a contact surface 421, such that when the lock actuating element 31 is in the first standby position and the bar 3 is pushed, the projection 42 of the pushing element 41 of the first bearing assembly 1, which acts on the lock, directly pushes the projection 32 of the lock actuating element 31, for which purpose the contact surface 421 of the projection 42 of the pushing element 41 pushes the first contact surface 321 of the lock actuating element 31. In the same manner, the projection 42' comprises a contact surface 421', such that when the lock actuating element 31 is in the second standby position and the bar 3 is pushed, the projection 42' of the additional pushing element 41' of the first bearing assembly 1, which acts on the lock, directly pushes the projection 32 of the lock actuating element 31, for which purpose the contact surface 421' of the projection 42' of the additional pushing element 41' pushes the second contact surface 322 of the lock actuating element 31.

[0043] The bearing assembly 1, 1' of this embodiment of the panic bar device 100 is configured for being positioned with the same orientation regardless of whether it is arranged on the first side or on the second side of the door 101. Consequently, the person in charge of fixing the bearing assembly 1, 1' to the door 101 does not have to take into account whether the bearing assembly 1, 1' is to be fixed on the first side or on the second side of the door 101, given that the bearing assembly 1, 1' does not need to rotate or change its position depending on the side of the door 101 in which it is to be fixed.

[0044] As shown in Figure 13, in the first bearing assembly 1 of this embodiment the lock actuating element 31 is arranged centered between the two side plates 13, 13', the projection 32 of said lock actuating element 31 being arranged close to the first side plate 13 when said lock actuating element 31 is arranged in the first standby

position, said projection 32 being arranged close to the second side plate 13' when said lock actuating element 31 is arranged in the second standby position, the pushing element 41 being arranged close to the first side plate 13, and the additional pushing element 41' being arranged close to the second side plate 13'. Therefore, when the person in charge of fixing the first bearing assembly 1 to the door 101 fixes the first bearing assembly 1 on the first side of the door 101, said person must take into account that the projection 32 of the lock actuating element 31 is to be arranged close to the first side plate 13, and when this person fixes the first bearing assembly 1 on the second side of the door 101, said person must take into account that the projection 32 of the lock actuating element 31 is to be arranged close to the second side plate 13'.

[0045] The pushing element 41 and the additional pushing element 41' of this embodiment of the panic bar device 100 are arranged outside a demarcated area between the two side plates 13, 13', as observed in Figure 13.

[0046] In the bearing assembly 1, 1' of this embodiment of the panic bar device 100, the first side plate 13 and the second side plate 13' are arranged symmetrically with respect to a plane of symmetry parallel to the first side plate 13 and to the second side plate 13', said plane of symmetry being situated at the same distance from both side plates 13, 13'. Furthermore, the axis on which the lock actuating element 31 rotates, which axis is perpendicular to the base plate 12, is contained in said plane of symmetry.

[0047] The bearing assembly 1, 1' of this embodiment of the panic bar device 100 comprises a calibrating element 51 configured for being coupled to the two side plates 13, 13' so that both side plates 13, 13' remain parallel to one another and perpendicular to the base plate 12. Since the calibrating element 51 is configured for keeping the first side plate 13 and the second side plate 13' parallel to one another, it prevents the occurrence of friction and accordingly friction between the pushing element 41 and the first side plate 13, and between the additional pushing element 41' and the second side plate 13' when the bar 3 is pushed, and accordingly, the pushing element 41 and the additional pushing element 41' rotate.

[0048] To enable being coupled to the side plates 13, 13', the calibrating element 51 of this embodiment comprises a U-shaped projection 52 at each of its ends, each projection 52 comprising two bars 54 facing and attached to one another by means of an additional bar 56, and a gap 53 between both bars. Each side plate 13, 13' comprises a through bore 15, 15', such that the calibrating element 51 is introduced through both through bores 15, 15' and slides in until the side plates 13, 13' abut with the additional bar 56, such that each of the side plates 13, 13' is housed in the gap 53 between both bars 54 of each U-shaped projection 52, the calibrating element 51 thus being coupled to both side plates 13, 13'. Figure 3 shows the calibrating element 51, and Figure 6 shows the calibrating element 51 coupled to the two side plates 13, 13'.

[0049] The bearing assembly of this embodiment of the panic bar device 100 comprises a sleeve 24 that is coaxial and external with respect to the rotating shaft 21, and a spring 61 arranged around the sleeve 24. The spring 61 is configured for returning the panic bar device 100 to the standby state. The calibrating element 51 comprises a projection 55 on which the spring 61 is held in place the spring 61 remaining tensioned, such that the calibrating element 51 is fixed to the side plates 13, 13' by the action of the spring 61. It can be observed in Figure 6 that one of the ends of the spring 61 is fixed to the pushing element 41, and the other end of the spring 61 is fixed to the additional pushing element 41', such that when the pushing element 41 and the additional pushing element 41' rotate because the bar 3 of the panic device 100 has been pushed, the spring 61 is subjected to a torsional force, such that when said torsional force disappears because the bar 3 is no longer being pushed, the spring 61 returns the panic bar device 100 to the standby state. The spring 61 is secured to the projection 55 of the calibrating element 51, thus pushing the calibrating element 51 towards the side plates 13, 13' such that the additional bar 56 of each U-shaped projection 52 abuts with the side plates 13, 13'.

Claims

1. Panic bar device comprising

- a first bearing assembly (1) and a second bearing assembly (1') configured for being fixed to a door (101),
- a first arm (2) pivotally coupled at a first end to the first bearing assembly (1) by means of a first operating shaft (81),
- a second arm (2') pivotally coupled at a first end to the second bearing assembly (1') by means of a second operating shaft (81), and
- a bar (3) coupled to a second end of the first arm (2) and to a second end of the second arm (2'), such that the bar (3), the first arm (2), and the second arm (2') pivot with respect to the bearing assemblies (1, 1') when the bar (3) is pushed,

the bearing assembly (1, 1') comprising a rotating shaft (21) comprising a housing (22) for the operating shaft (81), the rotating shaft (21) being configured for rotating together with the operating shaft (81) and the respective arm (2, 2') of the panic bar device (100),

characterized in that the first arm (2) and the second arm (2') are selected from a plurality of pairs of arms (2, 2') configured for

having different inclinations in the panic bar device (100) with respect to a front surface (104) of the door (101) in a standby state of the panic bar device (100) in which the bar (3) is not pushed, the different inclinations being obtained by varying the angular orientation of the operating shaft (81) with respect to the arms (2, 2').

2. Panic bar device according to claim 1, wherein the bearing assembly (1) acting on a lock comprises

- a bearing element (11) comprising

◦ a base plate (12) configured for being fixed to the front surface (104) of the door (101),
◦ a first side plate (13) attached to the base plate (12) on one of its sides, and a second side plate (13') attached to the base plate (12) on the opposite side facing the first side plate (13), each side plate (13, 13') comprising a bore (14, 14'), both bores (14, 14') facing one another, and the rotating shaft (21) being housed in the bores (14, 14') of the side plates (13, 13'),

- at least one pushing element (41) coupled to the rotating shaft (21) and configured for rotating together with the rotating shaft (21), the pushing element (41) comprising a projection (42), and
- a lock actuating element (31) coupled to the base plate (12) configured for rotating about an axis perpendicular to the base plate (12) and acting on the lock, the actuating element (31) comprising a projection (32) configured for being pushed by the projection (42) of the pushing element (41), thus causing the rotation thereof,

the pushing element (41) being configured for delimiting the angular travel of the panic bar (3) cooperating with a standby position stop (121) and with an end-of-travel stop (122),
and the second bearing assembly (1'), which does not act on the lock, being identical to the first bearing assembly (1), which acts on the lock, without the lock actuating element (31).

3. Panic bar device according to claim 2, wherein the bearing assembly (1, 1') comprises at least one additional detachable end-of-travel stop (123) delimiting a smaller travel than the end-of-travel stop (122), the end-of-travel stop (122) being a fixed stop.

4. Panic bar device according to claim 3, wherein the additional detachable end-of-travel stop (123) is a shaft (91) configured for being housed in facing bores (17, 17') arranged in the side plates (13, 13').

5. Panic bar device according to claim 4, wherein the additional detachable end-of-travel stop (123) comprises a recess (92), and the bearing assembly (1, 1') comprises between the two side plates an elastic protrusion (73) configured for being housed in said recess (92) and fixing the axial position of said additional detachable travel stop (123).

6. Panic bar device according to claim 5, wherein the bearing assembly (1, 1') comprises a guide element (71) positioned on the base plate (12) and coupled to the side plates (13, 13'), the guide element (71) comprising the elastic protrusion (73).

7. Panic bar device according to any of claims 2 to 6, wherein if in the standby state the projection (32) of the lock actuating element (31) is arranged in a first angular position, the projection (32) is pushed by the projection (42) of the pushing element (41), the lock actuating element (31) rotating in one direction, and if the projection (32) is arranged in a second angular position it is pushed by a projection (42') of an additional pushing element (41'), the lock actuating element (31) rotating in the opposite direction.

8. Panic bar device according to any of claims 2 to 7, comprising a calibrating element (51) configured for being coupled to the two side plates (13, 13') so that both side plates (13, 13') remain parallel to one another and perpendicular to the base plate (12).

9. Panic bar device according to any of the preceding claims, wherein the operating shaft (81) comprises a fixing element (82) and pushing means (83) configured for pushing the fixing element (82) radially out of the operating shaft (81), and the rotating shaft (21) comprises a bore (23) on the periphery of the housing (22) in the radial direction, the fixing element (82) being configured for being housed in the bore (23) when the operating shaft (81) is introduced into the housing (22) and fixing the operating shaft (81) to the rotating shaft (21).

10. Panic bar device according to claim 9, wherein the housing (22) of the rotating shaft (21) and the operating shaft (81) have a cross section configured so that the operating shaft (81) can be introduced into the housing (22) in a single position.

11. Panic bar device according to claim 10, wherein the cross section of the housing (22) of the rotating shaft (21) and of the operating shaft (81) is a regular polygon with a bevel (84) in one of the vertices of said polygon.

12. Panic bar device according to any of claims 9 to 11,

wherein the rotating shaft (21) comprises an additional bore (23') on the periphery of the housing (22) in the radial direction, symmetrical to the bore (23) with respect to a plane perpendicular to a longitudinal axis of the rotating shaft (21) at the mid-point of said rotating shaft (21), such that when the operating shaft (81) is introduced into the rotating shaft (21) from a first end of the rotating shaft (21), the fixing element (82) is housed in the bore (23), and when the operating shaft (81) is introduced into the rotating shaft (21) from a second end of the rotating shaft (21), the fixing element (82) is housed in the additional bore (23').

13. Panic bar device according to any of claims 9 to 12, wherein the fixing element (82) is a pin.

14. Panic bar device according to any of claims 9 to 13, wherein the pushing means (83) are a spring.

15. Panic bar device according to any of claims 9 to 14, wherein the bore (23) on the periphery of the housing (22) in the radial direction is a through bore.

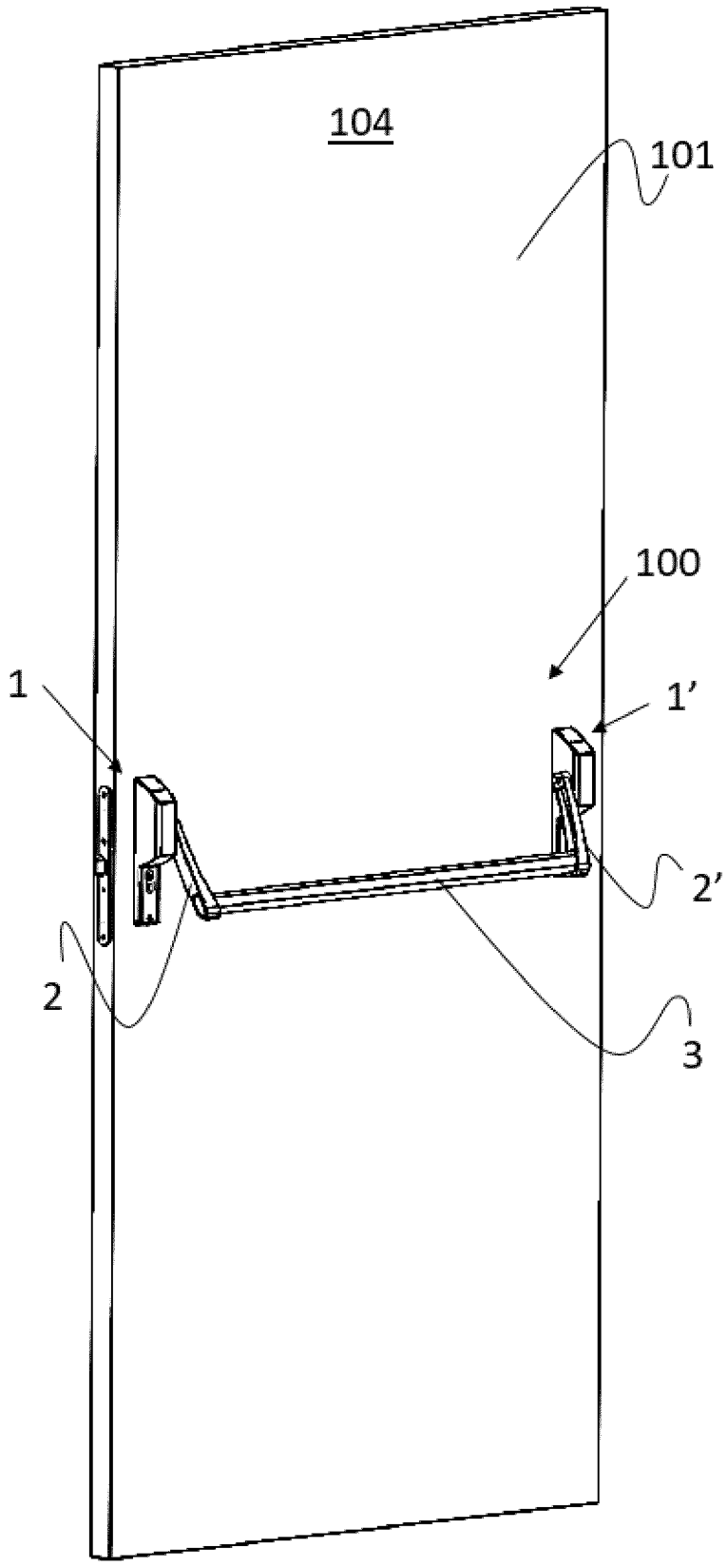

FIG. 1

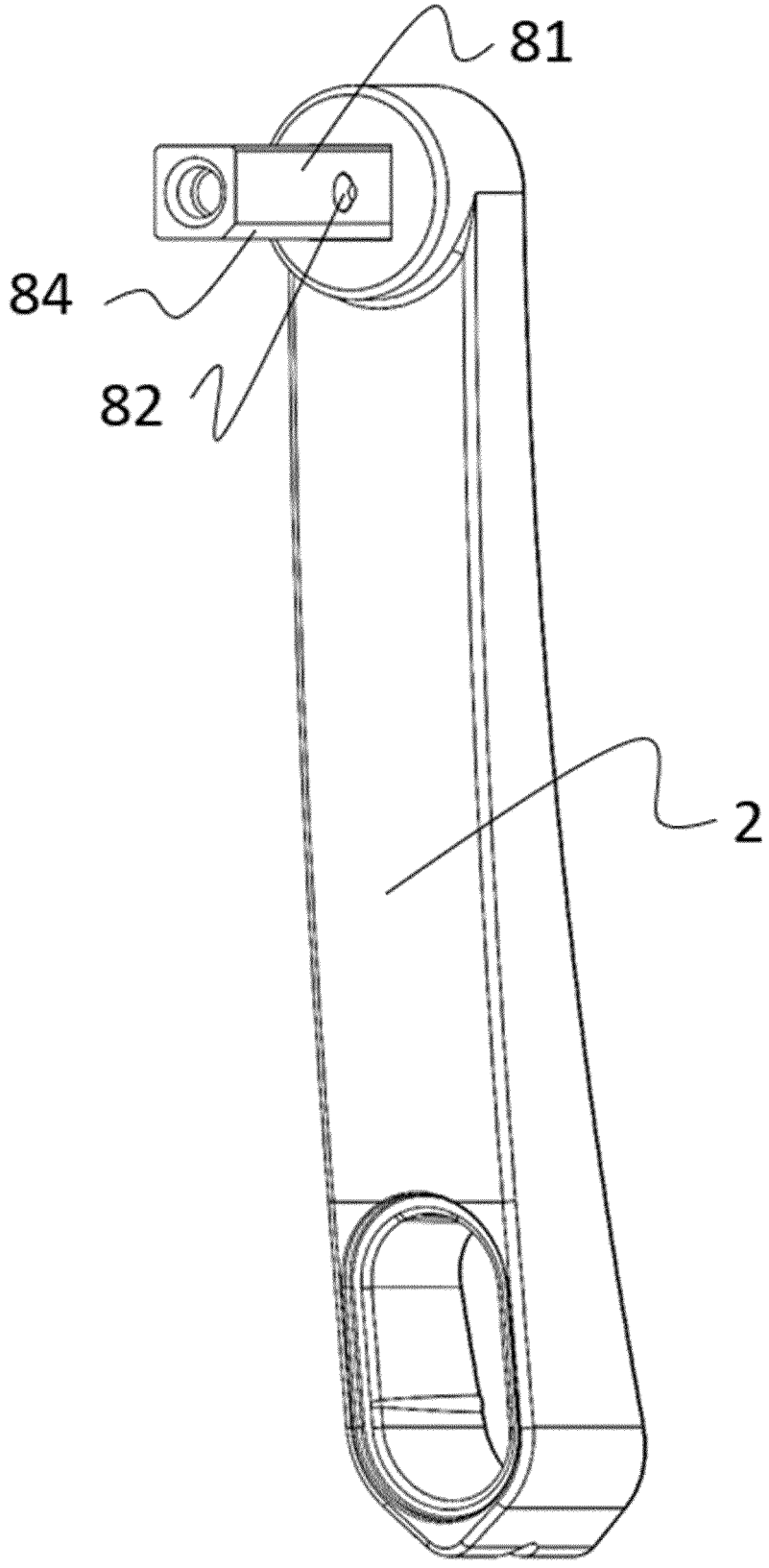

FIG. 2

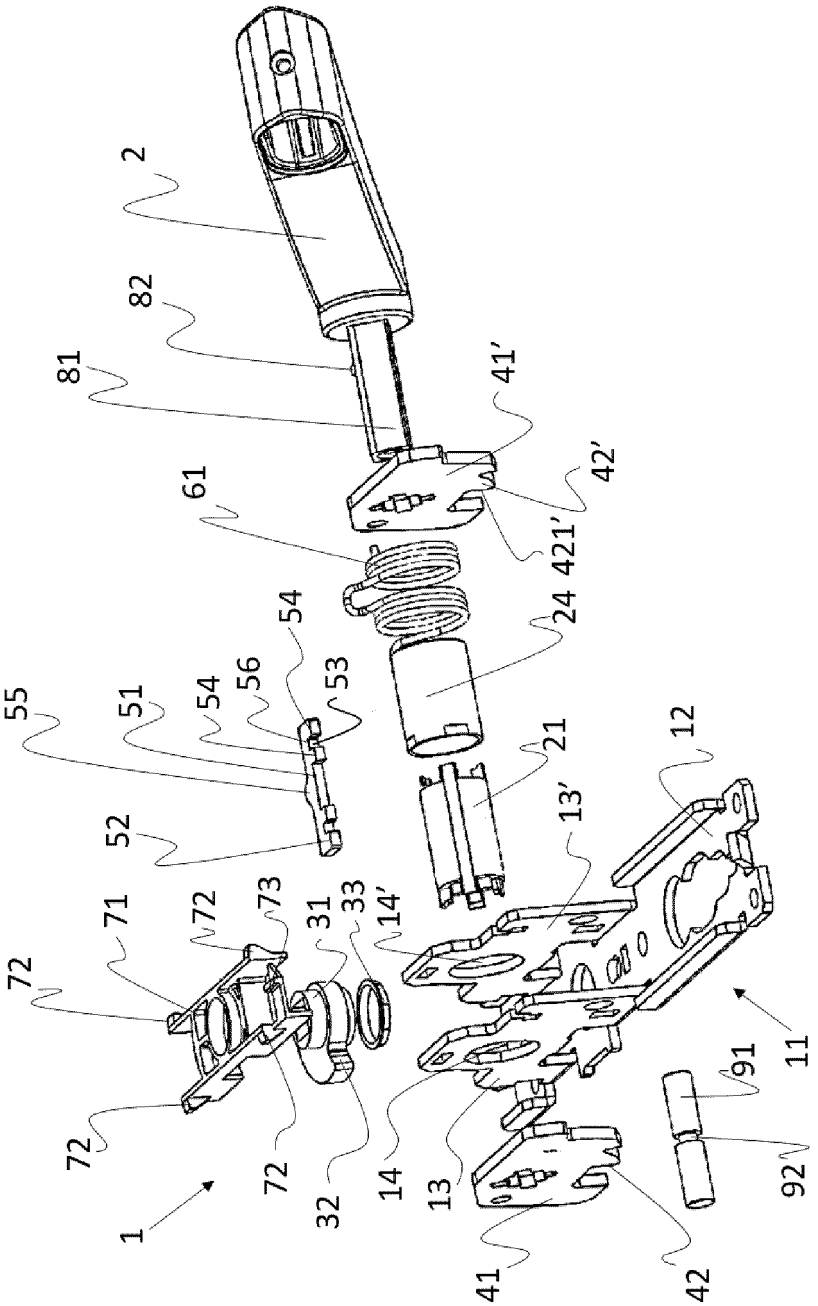
2
82
81
41'
42'
61
421'
24
54
56
53
55
51
54
52
21
12
13'
71
72
73
31
33
14'
72
72
72
72
1
32
14
13
41
42
91
11
92

FIG. 3

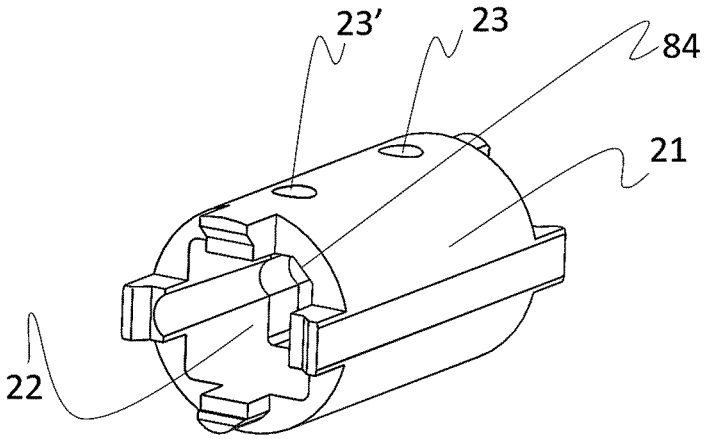

FIG. 4

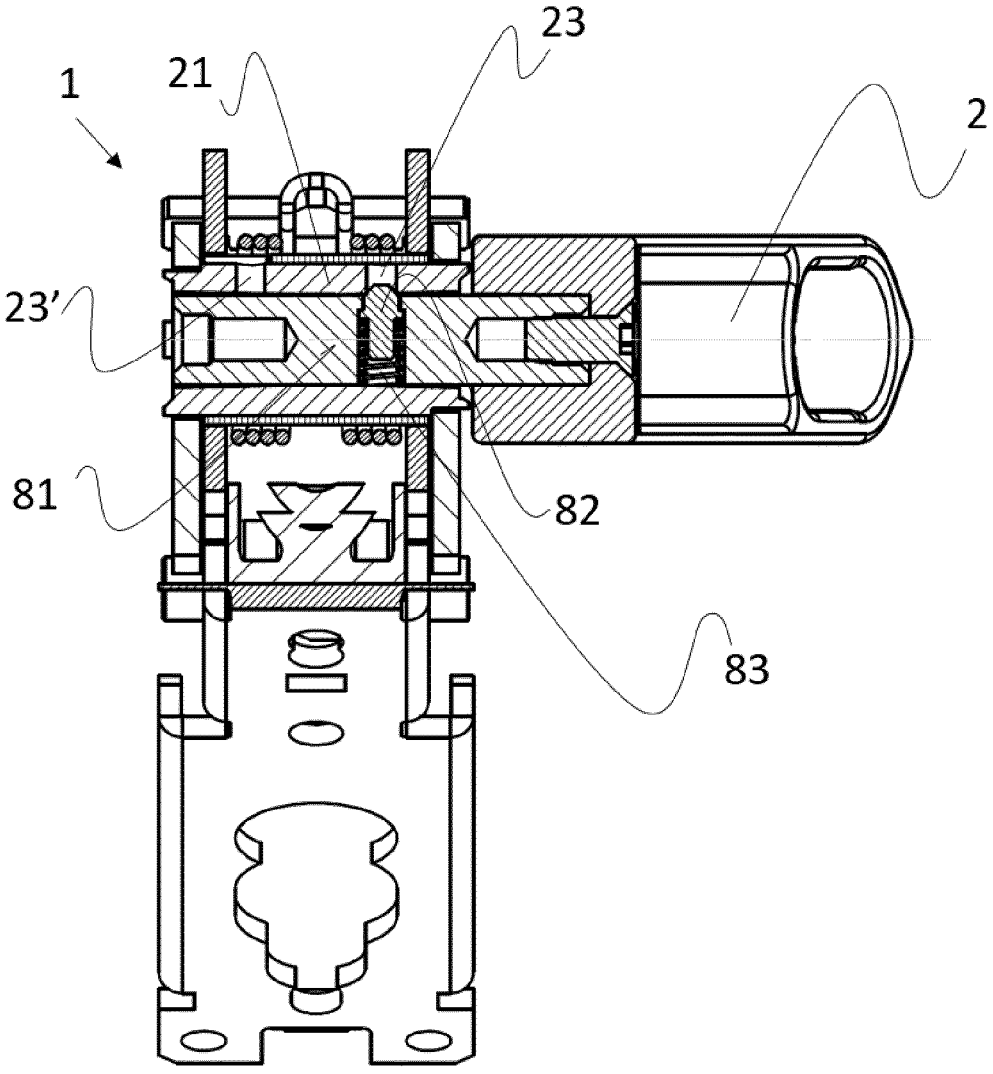

FIG. 5

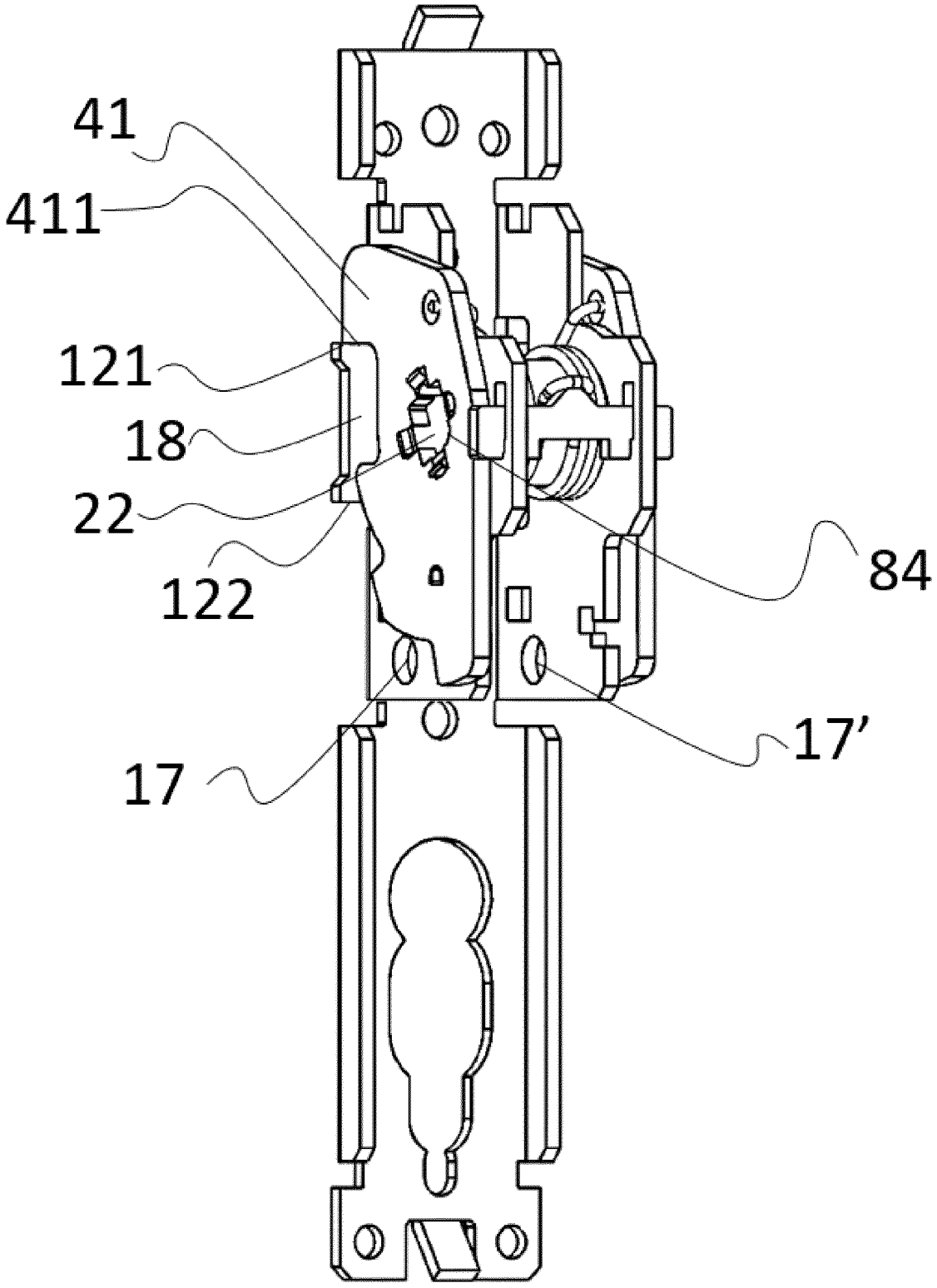

FIG. 6

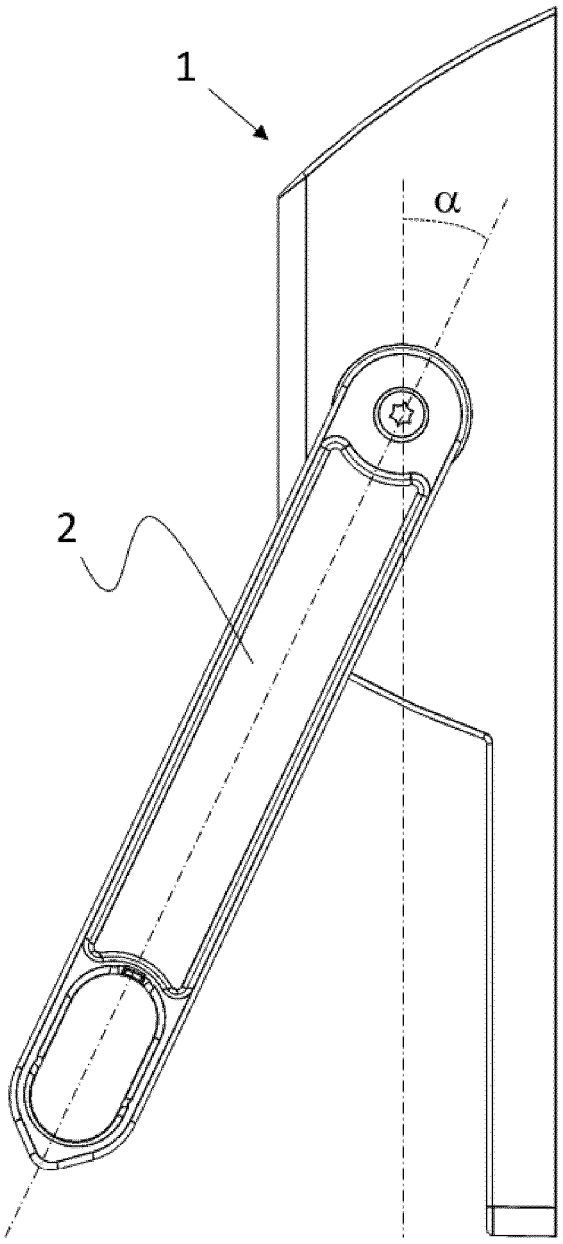

FIG. 7A

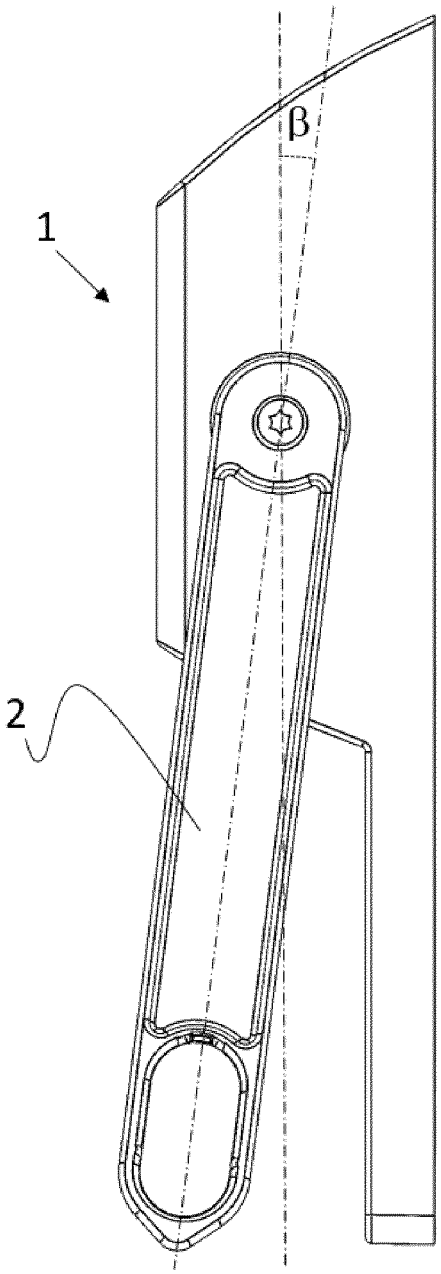

FIG. 7B

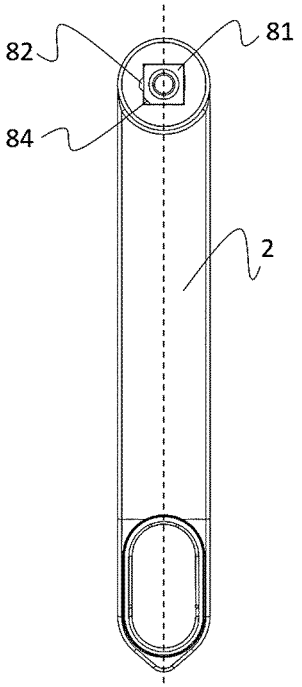

FIG. 8A

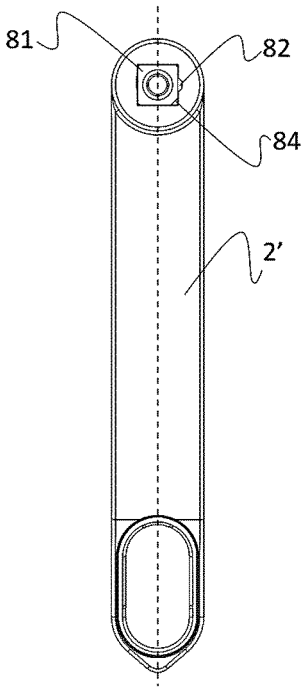

FIG. 8B

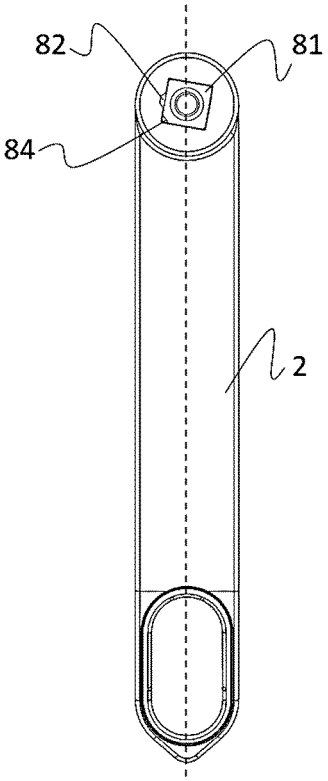

FIG. 9A

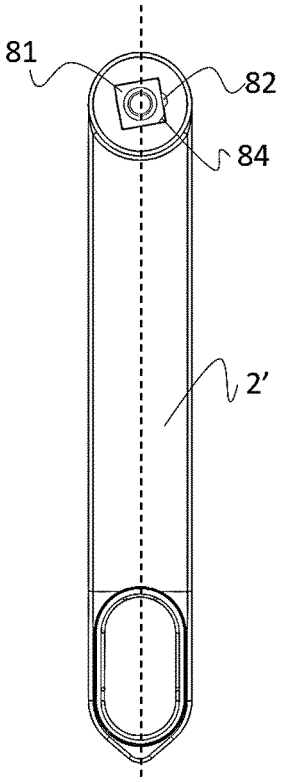

FIG. 9B

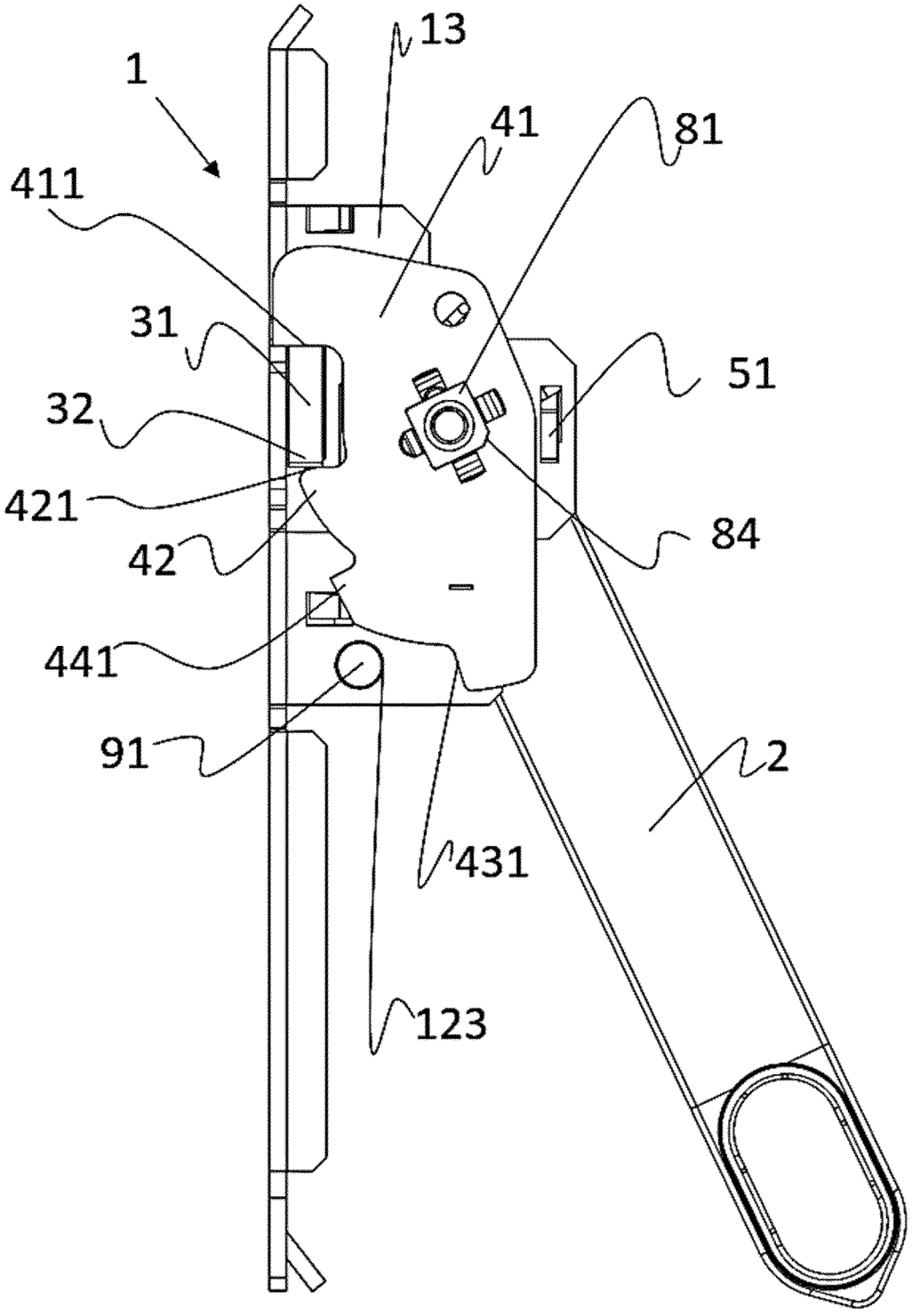

FIG. 10

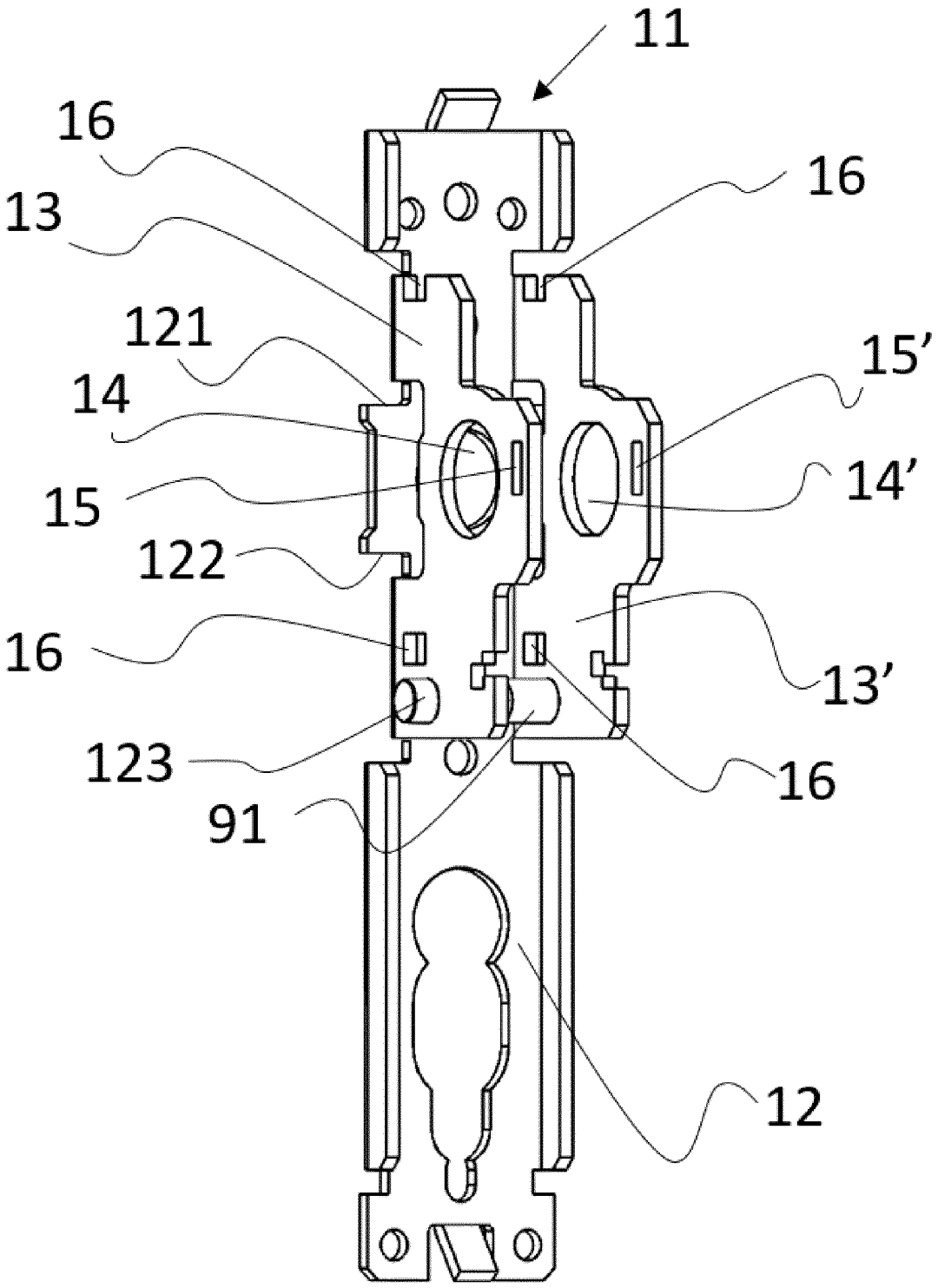

FIG. 11

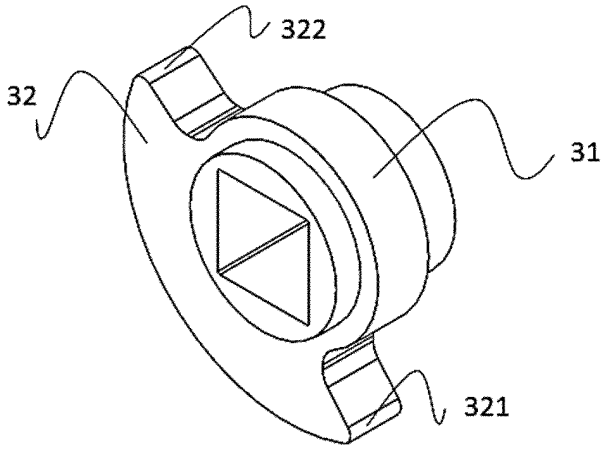

FIG. 12

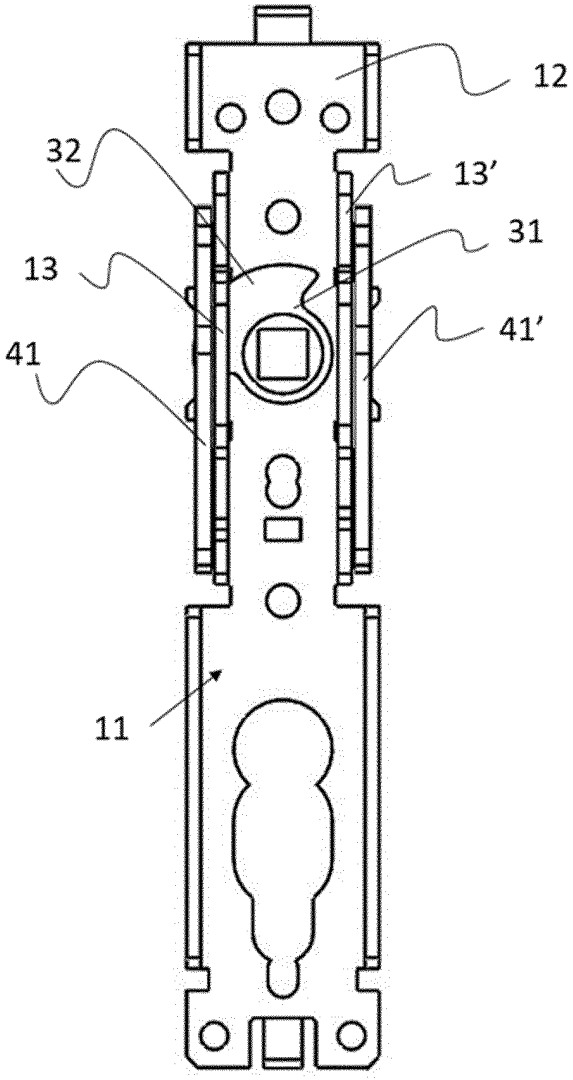

FIG. 13

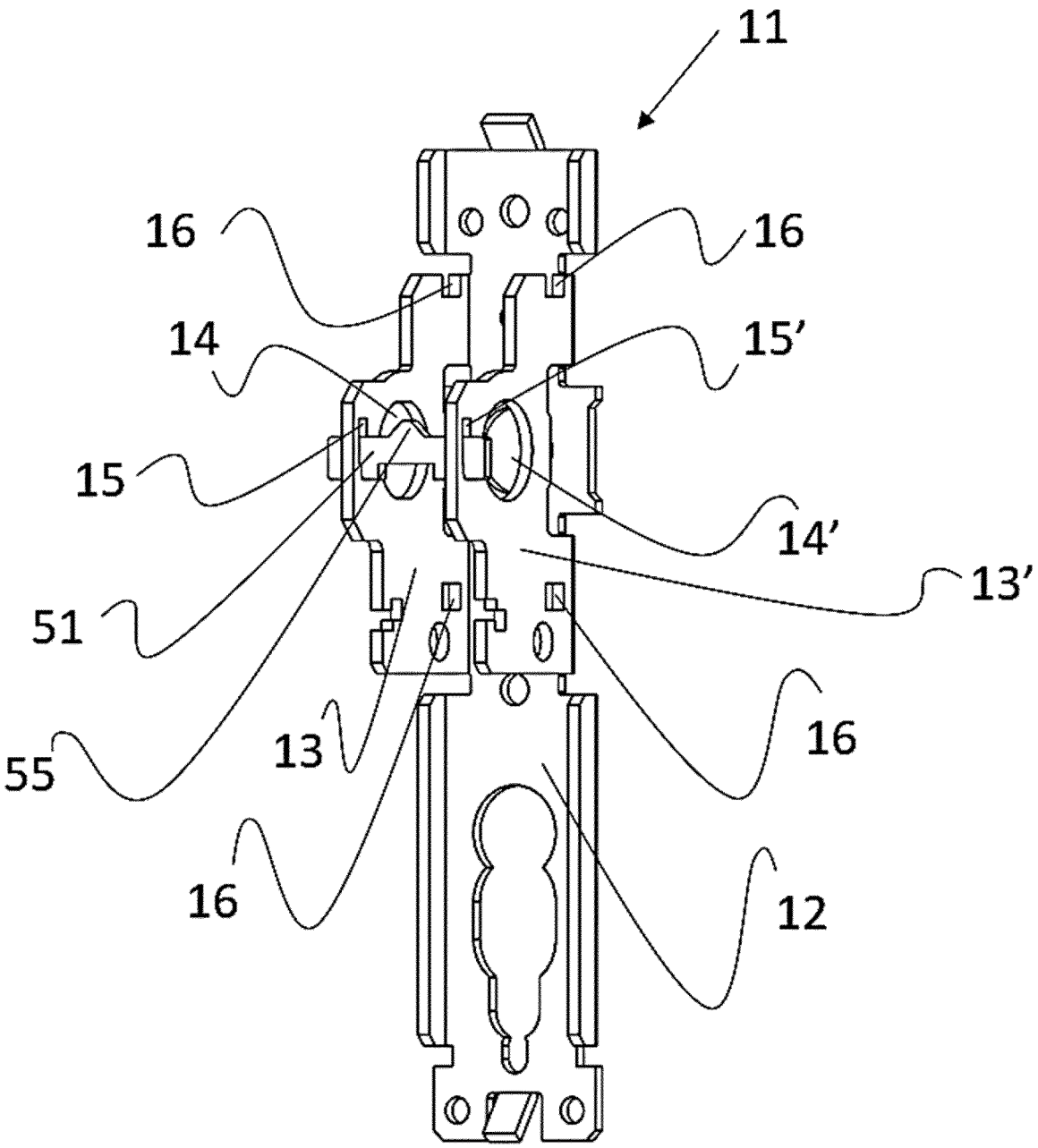

FIG. 14

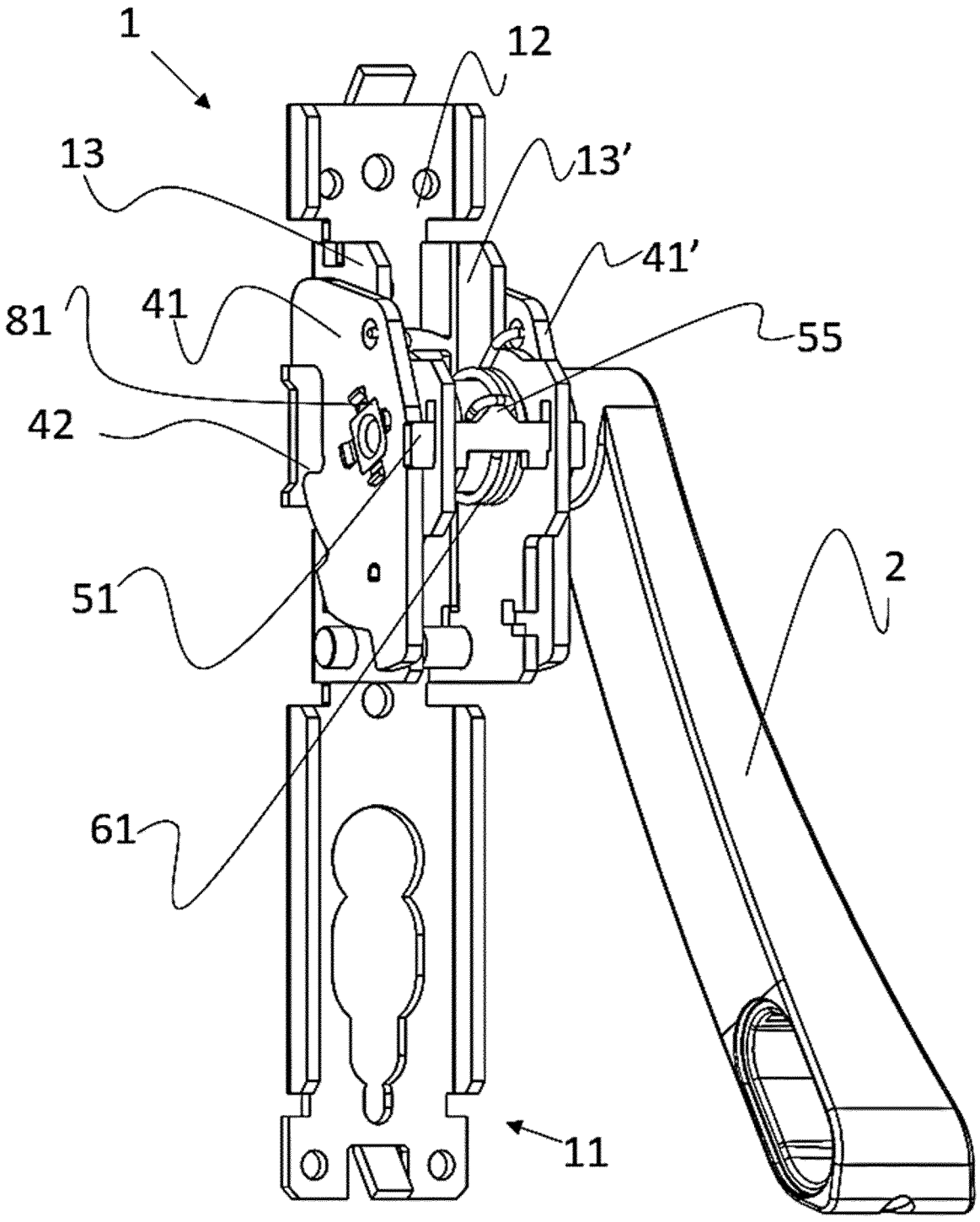

FIG. 15

INTERNATIONAL SEARCH REPORT

International application No
PCT/ES2020/070795

A. CLASSIFICATION OF SUBJECT MATTER
INV. E05B65/10 E05B63/00 E05B3/04 E05B63/04
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
E05B E05C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 10 2009 045440 A1 (BKS GMBH [DE]) 14 April 2011 (2011-04-14) paragraph [0010]; figures 1-3	1-15
A	EP 0 491 486 A1 (CORBIN CO [IT]) 24 June 1992 (1992-06-24) column 4, line 42 - line 53; figure 1	1
A	EP 3 406 829 A1 (BKS GMBH [DE]) 28 November 2018 (2018-11-28) paragraph [0026]; figures 1,1	1
A	EP 3 018 272 A1 (WILH SCHLECHTENDAHL & SÖHNE GMBH & CO KG [DE]) 11 May 2016 (2016-05-11) paragraph [0020]; figures 1-16	1

-/--

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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Date of the actual completion of the international search	Date of mailing of the international search report
6 April 2021	15/04/2021

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Pérez Méndez, José F

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INTERNATIONAL SEARCH REPORT

International application No
PCT/ES2020/070795

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 2 820 209 B1 (ASSA ABLOY SICHERHEITSTECHNIK GMBH [DE]) 22 March 2017 (2017-03-22) cited in the application paragraph [0030] - paragraph [0058]; figures 1-5 -----	1

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/ES2020/070795

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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		EP 0491486 A1	24-06-1992
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		PL 2895672 T3	30-11-2018
		WO 2014041135 A1	20-03-2014
		WO 2014041137 A1	20-03-2014

Form PCT/ISA/210 (patent family annex) (April 2005)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 2820209 B1 **[0002]**