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

(11) **EP 4 019 721 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
02.08.2023 Bulletin 2023/31

(21) Application number: **21211045.6**

(22) Date of filing: **29.11.2021**

(51) International Patent Classification (IPC):
E05D 3/18 *(2006.01)* ***E05D 11/10*** *(2006.01)*

(52) Cooperative Patent Classification (CPC):
E05D 3/186; E05D 11/1021; E05Y 2201/218; E05Y 2201/474; E05Y 2201/686; E05Y 2900/132

(54) **CONCEALED HINGE AND CONCEALED GLASS DOOR HINGE WITH TEMPORARY POSITIONING FUNCTION FOR OPENING ANGLE**

VERDECKTES SCHARNIER UND VERDECKTES GLASTÜRSCHARNIER MIT TEMPORÄRER POSITIONIERUNGSFUNKTION FÜR DEN ÖFFNUNGSWINKEL

CHARNIÈRE DISSIMULÉE ET CHARNIÈRE DE PORTE EN VERRE DISSIMULÉE DOTÉE D'UNE FONCTION DE POSITIONNEMENT TEMPORAIRE POUR L'ANGLE D'OUVERTURE

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

(30) Priority: **24.12.2020 TW 109146084**
24.12.2020 TW 109146086

(43) Date of publication of application:
29.06.2022 Bulletin 2022/26

(73) Proprietor: **Weider Metal Inc.**
New Taipei City (TW)

(72) Inventors:
- **WANG, Grace Show-Yin**
New Taipei City (TW)
- **WU, Andy**
New Taipei City (TW)
- **WU, Jacqueline**
New Taipei City (TW)
- **WU, Jennifer**
New Taipei City (TW)

(74) Representative: **Melchior, Robin**
Octrooibureau Vriesendorp & Gaade B.V.
Koninginnegracht 19
2514 AB Den Haag (NL)

(56) References cited:
EP-A2- 0 937 852 **CN-A- 111 779 393**

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 4 019 721 B1

Description

BACKGROUND

1. Field of the Invention

[0001] The present invention relates to a hinge, especially to a concealed hinge or a concealed glass door hinge that can temporarily position a door or a glass door at various opening angles and is adjustable in positioning angle.

2. Description of the Prior Arts

[0002] A concealed hinge is concealed in the door and door frame so the concealed hinge will not protrude out of the door and frame surface, thereby allowing a concealed door design with smooth and good-looking appearance and avoiding exposed construction being damaged by deliberate force or moving objects outside the door and frame surface. Thus, using the concealed hinge is a wise choice for appealing appearance and durable structure.

[0003] However, the concealed hinge can only allow the door to freely pivot relative to the door frame but cannot temporarily position the door at a particular pivoting angle. In other words, if there is not an object such as a magnetic door stop or a door wedge that positions the door, the door will arbitrary pivot relative to the door frame such that the door might be closed abruptly due to the wind, which is not only inconvenient but also quite dangerous when people are moving in and out carrying things.

[0004] In order to solve the above problems, the following three methods are usually applied on wood doors, metal doors, and even glass doors. First, add an exposed hydraulic door closer with a hold open positioning assembly onto the door. Second, add a concealed hydraulic door closer with a positioning assembly onto the door. Third, directly use a hydraulic floor spring to install the door. 3. A further method to solve the above problems is disclosed in CN 111 779 393 A which discloses a concealed hinge with an integrated positioning assembly.

[0005] With reference to Figs. 23 and 26, an exposed hydraulic door closer with a positioning assembly 90 is applied on the door.

[0006] For a wood door or a metal door, with reference to Fig. 23, if a user applies the exposed hydraulic door closer with the positioning assembly 90 on the wood door or the metal door, since the exposed hydraulic door closer with the positioning assembly 90 is completely exposed from the door and the door frame, it can be easily damaged by deliberate force or objects that are moving outside the wall surface. Having a damaged exposed hydraulic door closer will cause the door to be inoperable. In other words, the economical exposed hydraulic door closer with the positioning assembly 90 reduces the durability of the product as well as the structural strength.

[0007] For a glass door, with reference to Fig. 26, if the user applies the exposed hydraulic door closer with the positioning assembly 90 on the glass door, since the exposed hydraulic door closer with the positioning assembly 90 is completely exposed from the door and the door frame, it can be damaged via deliberate force or damaged easily by moving objects outside the wall surface which therefor causing the door to be inoperable.

[0008] In summary, wood, metal or glass doors with attachment of exposed door closer are prone to external damages due to the exposed hardware components.

[0009] With reference to Figs. 24 and 27, a concealed hydraulic door closer with a positioning assembly 91 is applied on the door.

[0010] For a wood door or a metal door, with reference to Fig. 24, if the user applies the concealed hydraulic door closer with the positioning assembly 91 on the wood door or the metal door, due to the door and door frame preparation the structural strength of the wood door or the metal door and the door frame will be decreased. The reason is that an elongated accommodating groove 92 must be formed on the door when mounting the concealed hydraulic door closer with the positioning assembly 91 on the wood door or the metal door, and thus the structure will be damaged and the strength will be decreased. Besides, when positioning the opening angle, a supporting arm 93 will be exposed from the door and the door frame, which the rod may be easily damaged and also breaks the flat and smooth appearance. Furthermore, the high damage rate and uneasy installation of alignment, large amount of structural damage due to the door and frame preparation as well as accumulated pivotal differentiation of the concealed hydraulic door closer with the positioning assembly 91 currently sold on the market causes unnecessary trouble for consumers.

[0011] For a glass door, with reference to Fig. 27, the elongated accommodating groove 92 must be formed on the door frame to install the door, such that the structural strength of the door frame will be decreased.

[0012] In summary, wood, metal or glass doors with attachment of concealed door closer causes a large amount of door and framing damages due to door and frame preparations which are required for installation. With such damage in framing and door construction it also reduces the durability, sound insulation and fire resistance of the door and frame structure.

[0013] According to the above, with reference to Figs. 23 and 24, for the wood door and the metal door, whether the exposed hydraulic door closer with the positioning assembly or the concealed hydraulic door closer with the positioning assembly is applied on the door, the supporting rod will definitely be exposed outside the door and door frame, and therefore the intended flat and smooth appearance can no longer sustain and increase the chances of external force damage.

[0014] With reference to Figs. 26 and 27, for the glass door, whether the exposed hydraulic door closer with the positioning assembly or the concealed hydraulic door

closer with the positioning assembly is applied on the door, the structural strength will be decreased and increase the chances of damage and also causing the final door construction interior design less aesthetic appealing. Since the glass door is usually thin but the exposed hydraulic door closer with the positioning assembly and the concealed hydraulic door closer with the positioning assembly are usually thick, two mounting holes must be formed through the glass door in order to assemble the door closer. Furthermore, the door closer is mounted on the glass door by two screw rods mounted through the two mounting holes and screwed with nuts or a board with screw holes, so the exposed hydraulic door closer is completely located outside the glass door, making the exposed hydraulic door closer prone to external damage and also causing less of an aesthetic appeal.

[0015] With reference to Figs. 25 and 28, other than the exposed hydraulic door closer with the positioning assembly and the concealed hydraulic door closer with the positioning assembly, a hydraulic floor hinge 94 is another choice for wood doors, metal doors, and even glass doors. However, when installing the door by the hydraulic floor hinge 94, the user must dig a rectangular hole in the floor and then embed the hydraulic floor hinge 94 below the flooring, so it is a cumbersome construction, difficult to install and hard to maintain and make adjustments on the alignment of the door during installation. Besides, since the hydraulic floor hinge 94 is usually thick, the rectangular hole must be deep enough and thus the rebar might be exposed, such that the structural strength of the floor will be damaged and the flat appearance of the floor cannot be restored.

[0016] Furthermore, both the exposed door closer and the concealed door closer are not on the same pivotal axis with the door hinge, and during installation these accumulated pivotal differentiation will cause long term structural, product durability damages as well as damages caused by moving objects or via external force. The above mentioned issues cause mechanical twisting and vibration which inevitably are transmitted to the edge of the glass door and thus the glass door might chip and shatter. As the hydraulic door closer and glass door mounting clamp is running on a different pivotable axis thus causing the structural strength of the glass door to be decreased due to different pivotal action. Therefore, applying the exposed door closer or the concealed door closer on the glass door is not durable and may cause danger to the end user.

[0017] Furthermore, it also causes durability of door hinge and door closer as door closers and door hinge are running on different pivotal axis and also further worsened by the accumulated pivotal differentiation during installation process and positioning of the door hinge and door closer.

[0018] In summary, in order to ensure the door hinge and hold open device are running on the same operational axis so as to ensure end user operational safety, durability of product, eliminating the chance of external damage due to hardware protrusion, minimal damage to the framing and door structure, creating an aesthetic appealing appearance to the door and framing, and most of all resolving a hold open positioning problem which a concealed hinge and a door closer are described above.

SUMMARY OF THE INVENTION

[0019] To overcome these shortcomings, the present invention provides a concealed hinge according to claim 1 or 9 and a concealed glass door hinge according to claim 10 with temporary positioning function for various opening angles which are running on the same pivotal axis to mitigate or obviate the aforementioned problems.

[0020] The main objective of the present invention is to provide a concealed hinge and a concealed glass door hinge that can be concealed in the door frame or between the door and the door frame, and can temporarily position a door or a glass door at particular opening angles.

[0021] The concealed hinge with a temporary positioning function for an opening angle is adapted to be mounted in a door frame and a door. The concealed hinge with a temporary positioning function for an opening angle has a first base, a second base, a pivotal-connecting assembly, and a positioning assembly. The first base is adapted to be mounted in the door frame. The second base is adapted to be mounted in the door. The pivotal-connecting assembly is connected to the first base and the second base. The first base and the second base are capable of pivoting relative to each other via the pivotal-connecting assembly. The pivotal-connecting assembly has a connecting block located in the second base. When the first base and the second base pivot relative to each other, the connecting block moves relative to the second base. The positioning assembly has a positioning base, a connecting rod, at least one positioning unit, and at least one elastic unit. The positioning base is securely mounted on the second base, is adapted to be mounted in the door, and has a connecting passage and at least one positioning passage. The connecting passage is formed inside the positioning base. The at least one positioning passage is formed inside the positioning base and has an inner end and an outer end. The inner end communicates with the connecting passage on a radial direction of the connecting passage. The outer end is opposite to the inner end. The connecting rod is moveably mounted in the connecting passage and has a connecting screw end and at least one positioning groove. The connecting screw end is located outside the connecting passage and is connected to the connecting block of the pivotal-connecting assembly. When the first base and the second base pivot relative to each other by the pivotal-connecting assembly, the connecting block of the pivotal-connecting assembly moves the connecting rod in the connecting passage. The at least one positioning groove is formed on an annular surface of the connecting rod and is selectively aligned to the inner end of the at least one positioning passage along with the movement

of the connecting rod. The at least one positioning unit is moveably mounted in the at least one positioning passage. The at least one elastic unit is mounted in the at least one positioning passage and pushes the at least one positioning unit toward the inner end to make the at least one positioning unit protrude out of the inner end and abut the annular surface of the connecting rod. When the at least one positioning groove of the connecting rod is aligned to the inner end of the at least one positioning passage, the at least one positioning unit is pushed by the at least one elastic unit and protrudes into the at least one positioning groove, such that the positioning unit stops the connecting rod from further moving and stops the connecting block from moving relative to the second base, and thus the first base and the second base cannot pivot relative to each other.

[0022] The present invention has the connecting rod mounted in the connecting passage of the positioning base and having a positioning groove capable of aligning to the positioning passage during movement of the connecting rod, and the present invention has the positioning unit mounted in the positioning passage and pushed by the elastic unit toward the connecting rod, so when the connecting rod is moved to the positioning groove aligned to the positioning passage, the positioning unit protrudes into the positioning groove to stop the connecting rod. Further, by configuring the positioning assembly, fixing the positioning base to the first base or the second base, and connecting the connecting rod and the pivotal-connecting assembly, when the first base and the second base are pivoted relative to each other via the pivotal-connecting assembly, the pivotal-connecting assembly will move the connecting rod in the connecting passage and selectively align the positioning groove to the positioning passage. When the positioning groove is aligned to the positioning passage, the positioning unit will be pushed by the elastic unit to protrude into the positioning groove to stop the connecting rod from further moving, thereby making the first base and the second base unable to pivot relative to each other again and achieving the positioning function.

[0023] For wood doors and metal doors, the first base, the second base, and the positioning assembly can be respectively mounted in the door or the door frame. For glass doors, the first base can be connected to the glass door and the second base and the positioning assembly can be mounted in the door frame. Since the positioning assembly can temporarily position the first base and the second base at particular angles, the present invention can temporarily position the door and the door frame at particular angles under the premise of not protruding from the wall surface. Therefore, the present invention not only keeps the appearance flat and smooth but also prevents the door from being hit and damaged, thereby being durable.

[0024] Additionally, the connecting rod forms the operating groove on the front end. The operating groove can be a flat screwdriver hole or a hexagonal hole for the user to rotate the connecting rod by a handheld tool. Therefore, the user can set the particular angle for temporary positioning.

[0025] Other objectives, advantages and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026]

Fig. 1 is a perspective view of a concealed hinge with a temporary positioning function in accordance with the present invention;

Fig. 2 is an exploded view of the concealed hinge in Fig. 1;

Figs. 3 and 4 are operational top views of the concealed hinge in Fig. 1, showing the concealed hinge mounted in a door and a door frame and pivoting from 0 degree to 90 degrees;

Figs. 5 and 6 are operational side views in cross-section of the concealed hinge in Fig. 1, showing the concealed hinge pivoting from 0 degree to 90 degrees;

Fig. 7 is a top view of the concealed hinge in Fig. 1, showing the concealed hinge mounted in a door and a door frame and positioned at 75 degrees;

Fig. 8 is a side view in cross-section of the concealed hinge in Fig. 1, showing the concealed hinge positioned at 75 degrees;

Fig. 9 is a perspective view of a concealed glass door hinge with in accordance with the present invention;

Fig. 10 is an operational perspective view of the concealed glass door hinge in Fig. 9, showing the first base and the second base pivoting relative to each other;

Fig. 11 is an exploded view of the concealed glass door hinge in Fig. 9, showing the positioning assembly, part of the pivotal-connecting assembly, and the second base;

Fig. 12 is another exploded view of the concealed glass door hinge in Fig. 9, showing part of the pivotal-connecting assembly and the first base;

Fig. 13 is still another exploded view of the concealed glass door hinge in Fig. 9, showing the first base and the glass door;

Figs. 14, 15, and 16 are operational top views of the concealed glass door hinge in Fig. 9, showing the concealed glass door hinge connected to a glass door, mounted in a door frame, and pivoting from 0 degree to 90 degrees;

Figs. 17, 18, and 19 are motional side views in cross-section of the concealed glass door hinge in Fig. 9, showing the concealed glass door hinge connected to a glass door and pivoting from 0 degree to 90 degrees;

Fig. 20 is a top view in cross-section of the concealed

glass door hinge in Fig. 9, showing the positioning protrusion and the casing.

Fig. 21 is an exploded view of the concealed glass door hinge in accordance with the present invention in another embodiment, showing the glass door clamped instead of mounted through;

Fig. 22 is a side view in cross-section of the concealed glass door hinge in Fig. 21, showing the glass door clamped instead of mounted through;

Fig. 23 is a perspective view of a conventional exposed hydraulic door closer with positioning assembly mounted on a door and a door frame;

Fig. 24 is a perspective view of a conventional concealed hydraulic door closer with positioning assembly mounted on a door and a door frame;

Fig. 25 is a side view in cross-section of a conventional hydraulic floor hinge mounted on a door and a door frame;

Fig. 26 is a perspective view of a conventional exposed hydraulic door closer with positioning assembly mounted on a glass door and a door frame;

Fig. 27 is a perspective view of a conventional concealed hydraulic door closer with positioning assembly mounted on a glass door and a door frame; and

Fig. 28 is a side view in cross-section of a conventional hydraulic floor hinge mounted on a glass door and a door frame.

DETAILED DESCRIPTION OF THE INVENTION

[0027] With reference to Figs. 1, 3 and 4, a concealed hinge with a temporary positioning function in accordance with the present invention is adapted to be mounted in a door frame A1 and a door A2, and herein the door A2 can be a wood door or a metal door. The concealed hinge with temporary positioning function has a first base 10, a second base 20, a pivotal-connecting assembly 30, and a positioning assembly 40.

[0028] The first base 10 and the second base 20 are respectively mounted in the door frame A1 and the door A2. Specifically, in this embodiment, the first base 10 is mounted in the door frame A1 and the second base 20 is mounted in the door A2. But in another embodiment, the first base 10 can also be mounted in the door A2 and the second base 20 can also be mounted in the door frame A1.

[0029] With reference to Figs. 2, 5, and 6, the pivotal-connecting assembly 30 is connected to first base 10 and the second base 20. The first base 10 and the second base 20 are capable of pivoting relative to each other via the pivotal-connecting assembly 30. The pivotal-connecting assembly 30 has a connecting block 31 located in the second base 20. When the first base 10 and the second base 20 pivot relative to each other, the connecting block 31 moves relative to the second base 20.

[0030] Specifically, the pivotal-connecting assembly 30 has two screw rods 32, two sliding blocks 33, and a pivotal-connecting unit 34. The pivotal-connecting unit 34 has two connecting segments 341. The aforementioned connecting block 31 is clamped between the two connecting segments 341. The two connecting segments 341 extend into the second base 20 from a front opening of the second base 20. The two sliding blocks 33 are respectively mounted into an upper sliding groove and a lower sliding groove from an upper sliding groove opening and a lower sliding groove opening formed on a rear side of the second base 20. The two screw rods 32 are mounted into the second base 20 respectively through a top hole and a bottom hole. The upper screw rod 32 is first mounted through the upper sliding block 33, and then mounted through the upper connecting segment 341, and at last downwardly screwed with the connecting block 31. The lower screw rod 32 is first mounted through the lower sliding block 33, and then mounted through the lower connecting segment 341, and at last upwardly screwed with the connecting block 31.

[0031] The positioning assembly 40 has a positioning base 41, a connecting rod 42, at least one positioning unit 43, at least one adjusting screw 44, and at least one elastic unit 45.

[0032] The positioning base 41 is securely mounted on the first base 10 or the second base 20, and is correspondingly mounted in the door frame A1 or the door A2. Specifically, in this embodiment, the positioning base 41 is securely mounted on the second base 20, so the positioning base 41 is correspondingly mounted in the door A2. But in other embodiments, the positioning base 41 can also be securely mounted on the first base 10 and be correspondingly mounted in the door frame A1. The positioning base 41 has a connecting passage 411 and at least one positioning passage 412 formed inside. The connecting passage 411 has a connecting outer end (the cylinder back check end) and a connecting inner end (the cylinder fixing screw end). The positioning passage 412 has a positioning inner end (the cylinder end) and a positioning outer end (the thread end). The positioning inner end communicates with the connecting passage 411 in the radial direction of the connecting passage 411. In this embodiment, the positioning outer end is formed through the positioning base 41, which means the positioning outer end forms an opening on the positioning base 41, but in other embodiments the positioning outer end may not be mounted through the positioning base 41.

[0033] The connecting rod 42 is moveably mounted in the connecting passage 411 and has a connecting screw end 421. In this embodiment, the connecting rod 42 is a conical rod, but in other embodiments the connecting rod 42 can also be a cylinder rod. The conical connecting rod 42 makes the positioning unit gradually lower down the friction applied to the hinge during pivoting. The connecting screw end 421 is located outside the connecting passage 411 and is connected to the connecting block 31 of the pivotal-connecting assembly 30. When the first base 10 and the second base 20 pivot relative to each other via the pivotal-connecting assembly 30, the connecting block 31 of the pivotal-connecting assembly 30 moves

the connecting rod 42 in the connecting passage 411. The connecting rod 42 has at least one positioning groove 422 formed on an annular surface of the connecting rod 42. The positioning groove 422 is in the connecting passage 411 and is selectively aligned to the positioning inner end of the positioning passage 412 along with the movement of the connecting rod 42.

[0034] The positioning unit 43 is moveably mounted in the positioning passage 412. The adjusting screw 44 is screwed in the positioning passage 412 and is capable of moving along the positioning passage 412 via the screw thread. The elastic unit 45 is mounted in the positioning passage 412 and pushes the positioning unit 43 toward the positioning inner end to make the positioning unit 43 protrude out of the positioning inner end and abut the annular surface of the connecting rod 42. When the positioning groove 422 of the connecting rod 42 is aligned to the positioning inner end of the positioning passage 412, the positioning unit 43 is pushed by the elastic unit 45 and protrudes into the positioning groove 422, such that the positioning unit 43 stops the connecting rod 43 from further moving. Since the connecting rod 42 is limited by the positioning unit 43, the pivotal-connecting assembly 30 that is interlocking with the connecting rod 42 will be limited by the limited connecting rod 42, and therefore the pivotal-connecting assembly 30 cannot pivot the first base 10 and the second base 20 relative to each other. In other words, when the first base 10 and the second base 20 pivot relative to each other to a particular angle, the positioning unit 43 will protrude into the positioning groove 422 to jam the connecting rod 42 to stop the connecting block 31 from moving relative to the second base 20, and therefore the first base 10 and the second base 20 cannot pivot relative to each other again.

[0035] Besides, in this embodiment, the elastic unit 45 abuts between the adjusting screw 44 and the positioning unit 43 so that the adjusting screw 44 is capable of adjusting a force by moving along the positioning passage 412, wherein the force is applied by the elastic unit 45 and pushes the positioning unit 43 toward the inner end. Additionally, since the outer end of the positioning passage 412 is formed through the positioning base 41, the user can rotate the adjusting screw 44 from the outer side of the positioning passage 412 to adjust the force that the positioning unit 43 abuts the connecting rod 42. But in other embodiments, the positioning assembly 40 can also be implemented without the adjusting screw 44. In that case, the elastic unit 45 abuts a wall that seals the outer end of the positioning base 41.

[0036] With reference to Figs. 2, 5, and 6, in this embodiment, the connecting screw end 421 of the connecting rod 42 is screwed with the connecting block 31 of the pivotal-connecting assembly 30 and can move through the connecting block 31, so that a relative position of the connecting rod 42 and the pivotal-connecting assembly 30 can be adjusted. Therefore, when the relative position of the connecting rod 42 and the pivotal-connecting assembly 30 is adjusted, a relative position of the positioning groove 422 and the positioning passage 412 is also adjusted, and then a distance for the positioning groove 422 of the connecting rod 42 to be moved to align to the positioning passage 412 by the pivotal-connecting assembly 30 will be changed. In other words, the positioning groove 422 of the connecting rod 42 will be moved to align to the positioning passage 412 by the pivotal-connecting assembly 30 when the first base 10 and the second base 20 are pivoted relative to each other at a different angle. To sum up, the user can set the positioning assembly 40 to temporarily fix the first base 10 and the second base 20 at a particular angle by adjusting the relative position of the connecting rod 42 and the pivotal-connecting assembly 30.

[0037] Furthermore, in this embodiment, an operating groove 423 is formed on an end surface of the connecting screw end 421 and is adapted to engage with a handheld tool. Specifically, the operating groove 423 can be a long narrow groove, a cross groove, or a hexagonal groove, so that the user can rotate the connecting rod 42 with a flat head screwdriver, a cross head screwdriver, or a hexagonal key to adjust the relative position of the connecting rod 42 and the pivotal-connecting assembly 30. In other words, the end surface of the connecting screw end 421 forms a long narrow operating groove 423 to engage with a flat head screwdriver, or forms a hexagonal operating groove 423 to engage with a hexagonal key.

[0038] In addition, in this embodiment, an amount of the positioning passage 412 of the positioning base 41 is two, and the two positioning passages 412 respectively communicate with the connecting passage 411 on two opposite sides in a radial direction of the connecting passage 411. An amount of the elastic unit 45 is two, and the two elastic units 45 are respectively mounted in the two positioning passages 412. An amount of the positioning unit 43 is two, and the two positioning units 43 are respectively mounted in the two positioning passages 412 and respectively abut two opposite sides of the annular surface of the connecting rod 42. An amount of the connecting rod 42 is one, and the positioning groove 422 is an annular groove. When the positioning groove 422 is aligned to the two positioning passages 412, the two positioning units 43 are respectively pushed by the two elastic units 45 to protrude into the positioning groove and fix the connecting rod 42. The aforementioned amounts are not limited thereto, and each of the amounts of the components can be at least one.

[0039] Specifically, in this embodiment, each of the two positioning units 43 is a ball, each of the two elastic units 45 is a compression spring, and the positioning groove 422 of the connecting rod 42 forms an arc line on a cross-section that passes and is parallel to an axis of the connecting rod 42. In other words, the positioning groove has a smooth and curved inner surface across two opposite sides, and the positioning units 43 abut the smooth and curved inner surface with a ball surface, so that the positioning units 43 escape form the positioning groove 422 easily. But the structures of the positioning units 43

and the positioning groove 422 are not limited thereto, as the positioning unit 43 can be a rod with two sliding inclined surfaces and the positioning groove 422 can have two sliding inclined side surfaces to cooperate with the two sliding inclined surfaces of the rod, which achieves the same effect.

[0040] With reference to Figs. 2, 5, and 6, in this embodiment, a step surface 4111 is formed inside the connecting passage 411, a nut 51 is screwed on an end of the connecting rod 42 opposite to the connecting screw end 421, and a gasket 52 is mounted on said end and is located between the nut 51 and the step surface 4111. When the pivotal-connecting assembly 30 moves the connecting rod 42 in the connecting passage 411, the nut 51 selectively abuts the step surface 4111 via the gasket 52 to stop the connecting rod 42 from further moving, thereby stopping the connecting block 31 of the pivotal-connecting assembly 30 from moving relative to the second base 20 so that the first base 10 and the second base 20 are not capable of pivoting relative to each other. Thus, a maximum distance that the pivotal-connecting assembly 30 can move the connecting rod 42 is adjustable by adjusting the position of the nut 51 located on the connecting rod 42, and therefore a maximum distance that the connecting block 31 can move relative to the second base 20 during pivoting can be limited, and a maximum angle that the first base 10 and the second base 20 pivot relative to each other can also be limited. Moreover, the gasket 52can reduce the noise and the force when the nut 51 hits the step surface 4111. The configuration that the nut 51 selectively abuts the step surface 4111 via the gasket 52 prevents the present invention from getting damaged by over-pushing the door (defined as Back Check Function).

[0041] Besides, there is a difference between the two features that "the nut 51 abuts the step surface 4111 to stop the connecting rod 42" and "the positioning unit 43 protrudes into the positioning groove 422 to stop the connecting rod 42", elaborated as follows. The positioning unit 43 is pushed by the elastic unit 45 to protrude into the positioning groove 422 and stop the connecting rod 42. Since the positioning unit 43 and the positioning groove 42 abut each other via curved surfaces, if the user applies a force greater than a spring force of the elastic unit 45, the positioning groove 422 will push the positioning unit 43 via the curved surface to make the positioning unit 43 slide relative to the positioning groove 422 and escape from the positioning groove 422, thereby releasing the connecting rod 42. Further, the effect of the cooperation of the positioning unit 43 and the positioning groove 422 is to temporarily position the door in both the opening and closing pivoting directions until the user applies a force greater than a spring force of the elastic unit 45. On the other hand, the effect of the cooperation of the nut 51 and the step surface 4111 is to stop the door only in the opening pivoting direction, and after the nut 51 abuts the step surface 4111, even if the user further pushes the door, the nut 51 will not slide relative to the step surface 4111 and allows the door to move again.

[0042] With reference to Figs. 3 and 5, when the door A2 is closed, which represents the door A2 and the door frame A1 pivoting in 0 degree, the connecting block 31 of the pivotal-connecting assembly 30 has not yet pulled the connecting rod 42 toward the second base 20, while the positioning unit 43 abuts against the annular wall of the connecting rod 42 at this time. Next, with reference to Figs. 4 and 6, when the door A2 pivots relative to the door frame A1 at an angle θ of 90 degrees, which means the door A2 is opened relative to the door frame A1 to 90 degrees, the connecting block 31 of the pivotal-connecting assembly 30 pulls the connecting rod 42 toward the second base 20, and the positioning groove 422 is aligned to the positioning passage 412 of the positioning base 41 during the movement of the connecting rod 42. At this time, the positioning unit 43 is pushed by the elastic unit 45 to protrude into the positioning groove 422 and fix the connecting rod 42, thereby stopping the connecting rod 42 from further moving and positioning the door A2 and the door frame A1 at 90 degrees. Until the door A2 is moved by a force which is greater than the force that the elastic unit 45 pushes the positioning unit 43 to fix in the positioning groove 422, the positioning groove 423 and the positioning unit 43 slide relative to each other via the curved surfaces and the positioning unit 43 is pushed by the curved surface of the positioning groove 423 toward the elastic unit 45 to compress the elastic unit 45 and at last escapes from the positioning groove 422, such that the door A2 and the door frame A1 are allowed to pivot relative to each other again.

[0043] Additionally, when the door A2 is opened to 90 degrees, the nut 51 abuts the step surface 4111 via the gasket 52, such that the door A2 cannot be further opened to a larger opening angle. The maximum opening angle of the door A2 can be adjusted by adjusting the position of the nut 51 and the gasket 52 located on the connecting rod 42. For example, in Fig. 6, if the user moves the nut 51 rightwards, the door A2 will be allowed to open relative to the door frame A1 more than 90 degrees. On the other hand, if the user moves the nut 51 leftwards, the door A2 will be limited by the nut 51 and the step surface 4111 before opening to 90 degrees and cannot further pivot relative to the door frame A1.

[0044] With reference to Figs. 7 and 8, by rotating the connecting rod 42 via the operating groove 423 to make the connecting rod 42 move relative to the connecting block 31 of the pivotal-connecting assembly 30 via the thread, the angle between the first base 10 and the second base 20 at a moment that the positioning groove 422 is aligned to the positioning passage 412 can be adjusted. Specifically, compared to the state in Fig. 6, the connecting rod 42 is moved toward the second base 20 and the positioning groove 422 is moved toward the second base 20, so the positioning groove 422 will be aligned to the positioning passage 412 and be fixed by the positioning unit 43 when the door A2 pivots relative to the door frame A1 at 75 degrees, which means the positioning angle is

advanced to 75 degrees. To sum up, the positioning angle is determined by the relative position of the connecting block 31 and the connecting rod 42.

[0045] The present invention has the connecting rod 42 mounted in the connecting passage 411 of the positioning base 41 and having a positioning groove 422 being capable of aligning to the positioning passage 412 during movement of the connecting rod 42, and the present invention has the positioning unit 43 mounted in the positioning passage 412 and pushed by the elastic unit 45 toward the connecting rod 42, so when the connecting rod 42 is moved to the positioning groove 422 aligned to the positioning passage 412, the positioning unit 43 protrudes into the positioning groove 422 to stop the connecting rod 42. Further, by configuring the positioning assembly 40, mounting the positioning base 41 on the first base 10 or the second base 20, and connecting the connecting rod 42 and the pivotal-connecting assembly 30, when the first base 10 and the second base 20 are pivoted relative to each other via the pivotal-connecting assembly 30, the pivotal-connecting assembly 30 will move the connecting rod 42 in the connecting passage 411 and selectively align the positioning groove 422 to the positioning passage 412. When the positioning groove 422 is aligned to the positioning passage 412, the positioning unit 43 will be pushed by the elastic unit 45 to protrude into the positioning groove 422 to stop the connecting rod 42 from further moving, thereby making the first base 10 and the second base 20 unable to pivot relative to each other again and achieving the positioning function.

[0046] Therefore, for wood doors and metal doors, the first base 10, the second base 20, and the positioning assembly 40 can be respectively mounted in the door A2 or the door frame A1. Since the positioning assembly 40 can temporarily position the first base 10 and the second base 20 at particular angles, the present invention can temporarily position the door A2 and the door frame A1 at particular angles under the premise of not protruding from the wall surface. Therefore, the present invention not only keeps the appearance flat and smooth but also prevents from getting hit and damaged, thereby being durable.

[0047] The structures of the concealed glass door hinge and the concealed hinge described above are substantially the same but with a few differences. The following gives a complete description of the concealed glass door hinge, including the same parts as well as the different parts. Some of the components mentioned below are named and labeled as those in the concealed hinge, but only refer to the components in the concealed glass door hinge and are not related to the components in the abovementioned concealed hinge.

[0048] With reference to Figs. 9, 10, and 14, the concealed glass door hinge with temporary positioning function for opening angle is adapted to be mounted in a door frame A1 and is adapted to be connected to a glass door A2. The concealed glass door hinge with temporary positioning function for opening angle has a first base 10A, a second base 20A, a pivotal-connecting assembly 30A, and the positioning assembly 40.

[0049] With reference to Figs. 13 and 20, the first base 10A is adapted to be connected to the glass door A3. Specifically, in this embodiment, the first base 10A has a front door fixing segment 11, a rear door fixing segment 12, a front anti-slip unit 13, a rear anti-slip unit 14, a pressing unit 15, two pressing screw rods 16, and a penetrating screw rod 17.

[0050] The front door fixing segment 11 is adapted to be located at a side of the glass door A3. The rear door fixing segment 12 is adapted to be located at another side of the glass door A3 and has three screw holes 121. The front anti-slip unit 13 is adapted to be located between the front door fixing segment 11 and the glass door A3 and is adapted to abut a side surface of the glass door A3. The rear anti-slip unit 14 is adapted to be located between the glass door A3 and the rear door fixing segment 12 and is adapted to abut another side surface of the glass door A3. The pressing unit 15 is located between the rear anti-slip unit 14 and the rear door fixing segment 12 and has two pressing grooves 151. The two pressing screw rods 16 are respectively screwed with two of the three screw holes 121 of the rear door fixing segment 12 and respectively protrude into and abut the two pressing grooves 151 of the pressing unit 15. The two pressing screw rods 16 are capable of moving relative to the rear door fixing segment 12 by rotating to push the pressing unit 15 toward the front door fixing segment 11 so as to tightly abut the pressing unit 15, the rear anti-slip unit 14, the glass door A3, the front anti-slip unit 13, and the front door fixing segment 11 to each other. The penetrating screw rod 17 is screwed with the other one of the three screw holes 121 of the rear door fixing segment 12, is sequentially mounted through the rear door fixing segment 12, the pressing unit 15, the rear anti-slip unit 14, the glass door A3, and the front anti-slip unit 13, and is mounted in and assembled with the front door fixing segment 11.

[0051] By the configurations of the abovementioned components, the front door fixing segment 11 and the rear door fixing segment 12 can tightly clamp and fix the glass door A3 via the pressing screw rod 16, the pressing unit 15, the front anti-slip unit 13, and the rear anti-slip unit 14, and can be assembled with the glass door A3 by the penetrating screw rod 17 mounted through the glass door A3.

[0052] The structure of the first base 10A connected to the glass door A3 is not limited to the abovementioned. With reference to Figs. 21 and 22, in other embodiments, the first base 10B can also be implemented without the penetrating screw rod but with three pressing screw rods 16B, and the pressing unit 15B can be implemented with three pressing grooves 151B. In this case, the three pressing screw rods 16B respectively protrude into and abut the three pressing groove 151B of the pressing unit 15B, and the three pressing screw rods 16B all push the

pressing unit 15B toward the front door fixing segment 11B. In other words, in the embodiment shown in Figs. 21 and 22, there is no need to form a hole on the glass door A3, thereby preventing decreasing the structural strength.

[0053] With reference to Figs. 11, 14, and 20, the second base 20A is adapted to be mounted in the door frame A1. Specifically, in this embodiment, the second base 20A has two positioning protrusions 21. Each of the positioning protrusions 21 has an abutting flat surface 21.

[0054] With reference to Figs. 11 and 12, the pivotal-connecting assembly 30A is connected to the first base 10A and the second base 20A. The first base 10A and the second base 20A are capable of pivoting relative to each other via the pivotal-connecting assembly 30A. The pivotal-connecting assembly 30A has a connecting block 31 located in the second base 20A. When the first base 10A and the second base 20A pivot relative to each other, the connecting block 31 moves relative to the second base 20A.

[0055] Specifically, the pivotal-connecting assembly 30A has two screw rods 32, two sliding blocks 33, two pivotal-connecting units 34, and two casings 35. The first base 10A has two pivotal-connecting segments 18. The connecting block 31 is clamped between the two pivotal-connecting segments 18, and the two pivotal-connecting segments 18 extend into the second base 20A from a front opening of the second base 20A. The two sliding blocks 33 are respectively mounted into an upper sliding groove and a lower sliding groove from an upper sliding groove opening and a lower sliding groove opening formed on a rear side of the second base 20A. The two screw rods 32 are mounted into the second base 20A respectively through a top hole and a bottom hole. The upper screw rod 32 is first mounted through the upper sliding block 33, and then mounted through the upper pivotal-connecting segment 18, and at last downwardly screwed with the connecting block 31. The lower screw rod 32 is first mounted through the lower sliding block 33, and then mounted through the lower pivotal-connecting segment 18, and at last upwardly screwed with the connecting block 31. In other words, the two screw rods 32 are screwed with the connecting block 31 respectively on two opposite sides. Thus, when the first base 10A and the second base 20A pivot relative to each other, the two pivotal-connecting segments 18 of the first base 10A will move the two screw rods 32 and the connecting block 31 relative to the second base 20A. Two ends of each of the pivotal-connecting units 34 are respectively pivotally connected to the first base 10A and the second base 20A, such that the first base 10A and the second base 20A can pivot relative to each other via the two pivotal-connecting units 34. The two casings 35 are respectively sleeved on the two screw rods 32.

[0056] With reference to Figs. 11, 17, and 18, the positioning assembly 40 has a positioning base 41, a connecting rod 42, at least one positioning unit 43, at least one adjusting screw 44, and at least one elastic unit 45.

[0057] The positioning base 41 is securely mounted on the second base 20A, and is adapted to be mounted in the door frame A1. The positioning base 41 has a connecting passage 411 and at least one positioning passage 412 formed inside. The connecting passage 411 has a connecting outer end (the cylinder back check end) and a connecting inner end (the cylinder fixing screw end). The positioning passage 412 has a positioning inner end (the cylinder end) and a positioning outer end (the thread end). The positioning inner end communicates with the connecting passage 411 in the radial direction of the connecting passage 411. In this embodiment, the positioning outer end is formed through the positioning base 41, which means the positioning outer end forms an opening on the positioning base 41, but in other embodiments the positioning outer end may not be mounted through the positioning base 41.

[0058] The connecting rod 42 is moveably mounted in the connecting passage 411 and has a connecting screw end 421. In this embodiment, the connecting rod 42 is a conical rod, but in other embodiments the connecting rod 42 can also be a cylinder rod. The conical connecting rod 42 makes the positioning unit gradually lower down the friction applied to the hinge during pivoting. The connecting screw end 421 is located outside the connecting passage 411 and is connected to the connecting block 31 of the pivotal-connecting assembly 30A. When the first base 10A and the second base 20A pivot relative to each other via the pivotal-connecting assembly 30A, the connecting block 31 of the pivotal-connecting assembly 30A moves the connecting rod 42 in the connecting passage 411. The connecting rod 42 has at least one positioning groove 422 formed on an annular surface of the connecting rod 42. The positioning groove 422 is in the connecting passage 411 and is selectively aligned to the positioning inner end of the positioning passage 412 along with the movement of the connecting rod 42.

[0059] The positioning unit 43 is moveably mounted in the positioning passage 412. The adjusting screw 44 is screwed in the positioning passage 412 and is capable of moving along the positioning passage 412 via the screw thread. The elastic unit 45 is mounted in the positioning passage 412 and pushes the positioning unit 43 toward the positioning inner end to make the positioning unit 43 protrude out of the positioning inner end and abut the annular surface of the connecting rod 42. When the positioning groove 422 of the connecting rod 42 is aligned to the positioning inner end of the positioning passage 412, the positioning unit 43 is pushed by the elastic unit 45 and protrudes into the positioning groove 422, such that the positioning unit 43 stops the connecting rod 43 from further moving. Since the connecting rod 42 is limited by the positioning unit 43, the pivotal-connecting assembly 30A that is interlocked with the connecting rod 42 will be limited by the limited connecting rod 42, and therefore the pivotal-connecting assembly 30A cannot pivot the first base 10A and the second base 20A relative to each other. In other words, when the first base 10A

and the second base 20A pivot relative to each other to a particular angle, the positioning unit 43 will protrude into the positioning groove 422 to jam the connecting rod 42 to stop the connecting block 31 from moving relative to the second base 20A, and therefore the first base 10A and the second base 20A cannot pivot relative to each other again.

[0060] Besides, in this embodiment, the elastic unit 45 abuts between the adjusting screw 44 and the positioning unit 43 so that the adjusting screw 44 is capable of adjusting a force by moving along the positioning passage 412, wherein the force is applied by the elastic unit 45 and pushes the positioning unit 43 toward the inner end. Additionally, since the outer end of the positioning passage 412 is formed through the positioning base 41, the user can rotate the adjusting screw 44 from the outer side of the positioning passage 412 to adjust the force that the positioning unit 43 abuts the connecting rod 42. But in other embodiments, the positioning assembly 40 can also be implemented without the adjusting screw 44. In that case, the elastic unit 45 abuts a wall that seals the outer end of the positioning base 41.

[0061] With reference to Figs. 10, 11, and 17, in this embodiment, the connecting screw end 421 of the connecting rod 42 is screwed with the connecting block 31 of the pivotal-connecting assembly 30A and can move through the connecting block 31, so that a relative position of the connecting rod 42 and the pivotal-connecting assembly 30A can be adjusted. Therefore, when the relative position of the connecting rod 42 and the pivotal-connecting assembly 30A is adjusted, a relative position of the positioning groove 422 and the positioning passage 412 is also adjusted, and then a distance for the positioning groove 422 of the connecting rod 42 to be moved to align to the positioning passage 412 by the pivotal-connecting assembly 30A will be changed. In other words, the positioning groove 422 of the connecting rod 42 will be moved to align to the positioning passage 412 by the pivotal-connecting assembly 30A when the first base 10A and the second base 20A are pivoted relative to each other at a different angle. To sum up, the user can set the positioning assembly 40 to temporarily fix the first base 10A and the second base 20A at a particular angle by adjusting the relative position of the connecting rod 42 and the pivotal-connecting assembly 30A.

[0062] Furthermore, in this embodiment, an operating groove 423 is formed on an end surface of the connecting screw end 421 and is adapted to engage with a handheld tool. Specifically, the operating groove 423 can be a long narrow groove, a cross groove, or a hexagonal groove, so that the user can rotate the connecting rod 42 with a flat head screwdriver, a cross head screwdriver, or a hexagonal key to adjust the relative position of the connecting rod 42 and the pivotal-connecting assembly 30A. In other words, the end surface of the connecting screw end 421 forms a long narrow operating groove 423 to engage with a flat head screwdriver, or forms a hexagonal operating groove 423 to engage with a hexagonal key.

[0063] In addition, in this embodiment, an amount of the positioning passage 412 of the positioning base 41 is two, and the two positioning passages 412 respectively communicate with the connecting passage 411 on two opposite sides in a radial direction of the connecting passage 411. An amount of the elastic unit 45 is two, and the two elastic units 45 are respectively mounted in the two positioning passages 412. An amount of the positioning unit 43 is two, and the two positioning units 43 are respectively mounted in the two positioning passages 412 and respectively abut two opposite sides of the annular surface of the connecting rod 42. An amount of the connecting rod 42 is one, and the positioning groove 422 is an annular groove. When the positioning groove 422 is aligned to the two positioning passages 412, the two positioning units 43 are respectively pushed by the two elastic units 45 to protrude into the positioning groove and fix the connecting rod 42. The aforementioned amounts are not limited thereto, and each of the amounts of the components can be at least one.

[0064] Specifically, in this embodiment, each of the two positioning units 43 is a ball, each of the two elastic units 45 is a compression spring, and the positioning groove 422 of the connecting rod 42 forms an arc line on a cross-section that passes and is parallel to an axis of the connecting rod 42. In other words, the positioning groove has a smooth and curved inner surface across two opposite sides, and the positioning units 43 abut the smooth and curved inner surface with a ball surface, so that the positioning units 43 escape from the positioning groove 422 easily. But the structures of the positioning units 43 and the positioning groove 422 are not limited thereto, as the positioning unit 43 can be a rod with two sliding inclined surfaces and the positioning groove 422 can have two sliding inclined side surfaces to cooperate with the two sliding inclined surfaces of the rod, which achieves the same effect.

[0065] With reference to Figs. 11, 18, and 19, in this embodiment, a step surface 4111 is formed inside the connecting passage 411, a nut 51 is screwed on an end of the connecting rod 42 opposite to the connecting screw end 421, and a gasket 52 is mounted on said end and is located between the nut 51 and the step surface 4111. When the pivotal-connecting assembly 30A moves the connecting rod 42 in the connecting passage 411, the nut 51 selectively abuts the step surface 4111 via the gasket 52 to stop the connecting rod 42 from further moving, thereby stopping the connecting block 31 of the pivotal-connecting assembly 30A from moving relative to the second base 20A so that the first base 10A and the second base 20A are not capable of pivoting relative to each other. Thus, a maximum distance that the pivotal-connecting assembly 30A can move the connecting rod 42 is adjustable by adjusting the position of the nut 51 located on the connecting rod 42, and therefore a maximum distance that the connecting block 31 can move relative to the second base 20A during pivoting can be limited, and a maximum angle that the first base 10A and

the second base 20A pivot relative to each other can also be limited. Moreover, the gasket 52 can reduce the noise and the force when the nut 51 hits the step surface 4111. The configuration that the nut 51 selectively abuts the step surface 4111 via the gasket 52 prevents the present invention from damaged by over-pushing the door (defined as Back Check Function).

[0066] Besides, there is a difference between the features "the nut 51 abuts the step surface 4111 to stop the connecting rod 42" and "the positioning unit 43 protrudes into the positioning groove 422 to stop the connecting rod 42", elaborated as follows. The positioning unit 43 is pushed by the elastic unit 45 to protrude into the positioning groove 422 and stop the connecting rod 42. Since the positioning unit 43 and the positioning groove 42 abut each other via curved surfaces, if the user applies a force greater than a spring force of the elastic unit 45, the positioning groove 422 will push the positioning unit 43 via the curved surface to make the positioning unit 43 slide relative to the positioning groove 422 and escape from the positioning groove 422, thereby releasing the connecting rod 42. Further, the effect of the cooperation of the positioning unit 43 and the positioning groove 422 is to temporarily position the door in both the opening and closing pivoting direction until the user applies a force greater than a spring force of the elastic unit 45. On the other hand, the effect of the cooperation of the nut 51 and the step surface 4111 is to stop the door only in the opening pivoting direction, and after the nut 51 abuts the step surface 4111, even if the user further pushes the door, the nut 51 will not slide relative to the step surface 4111 and allows the door to move again.

[0067] With reference to Figs. 14 and 17, when the glass door A3 is closed, which represents the glass door A3 and the door frame A1 pivoting for 0 degree, the connecting block 31 of the pivotal-connecting assembly 30A has not yet pulled the connecting rod 42 toward the second base 20A, and the positioning unit 43 abuts against the annular wall of the connecting rod 42 at this time. Next, with reference to Figs. 15 and 18, when the glass door A3 pivots relative to the door frame A1 at an angle θ of 27 degrees, which means the glass door A3 is opened relative to the door frame A1 to 27 degrees, the connecting block 31 of the pivotal-connecting assembly 30A pulls the connecting rod 42 toward the second base 20A, and the positioning groove 422 is aligned to the positioning passage 412 of the positioning base 41 during the movement of the connecting rod 42. At this time, the positioning unit 43 is pushed by the elastic unit 45 to protrude into the positioning groove 422 and fix the connecting rod 42, thereby stopping the connecting rod 42 from further moving and positioning the glass door A3 and the door frame A1 at 27 degrees. Until the glass door A3 is moved by a force which is greater than the force that the elastic unit 45 pushing the positioning unit 43 to fix in the positioning groove 422, the positioning groove 423 and the positioning unit 43 slide relative to each other via the curved surfaces and the positioning unit 43 is pushed by the curved surface of the positioning groove 423 toward the elastic unit 45 to compress the elastic unit 45 and at last escapes from the positioning groove 422, such that the glass door A3 and the door frame A1 are allowed to pivot relative to each other again.

[0068] By rotating the connecting rod 42 via the operating groove 423 to make the connecting rod 42 move relative to the connecting block 31 of the pivotal-connecting assembly 30A via the thread, the angle between the first base 10A and the second base 20A at a moment that the positioning groove 422 is aligned to the positioning passage 412 can be adjusted. Specifically, compared to the state in Fig. 18, the connecting rod 42 is moved toward the second base 20A and the positioning groove 422 is moved toward the second base 20A, so the positioning groove 422 will be aligned to the positioning passage 412 and be fixed by the positioning unit 43 when the door A1 pivots relative to the door frame A2 at an angle less than 27 degrees, which means the positioning angle is advanced to 27 degrees. To sum up, the positioning angle is determined by the relative position of the connecting block 31 and the connecting rod 42.

[0069] Then, with reference to Figs. 16 and 19, when the glass door A3 is kept open at 90 degrees, the nut 51 abuts the step surface 4111 via the gasket 52 such that the glass door A3 cannot be further opened to a larger opening angle. But the maximum opening angle of the glass door A3 can be adjusted by adjusting the position of the nut 51 and the gasket 52 located on the connecting rod 42. For example, in Fig. 19, if the user moves the nut 51 rightwards, the glass door A3 will be allowed to open relative to the door frame A1 more than 90 degrees. On the other hand, if the user moves the nut 51 leftwards, the glass door A3 will be limited by the nut 51 and the step surface 4111 before opening to 90 degrees and cannot further pivot relative to the door frame A1.

[0070] Additionally, with reference to Fig. 20, when the first base 10A and the second base 20A pivot relative to each other to the 90-degree angle between the glass door A3 and the door frame A1, the two pivotal-connecting segments 18 of the first base 10A move the two screw rods 32 of the pivotal-connecting assembly 30A, and the two casings 35 tightly abut the abutting flat surfaces 211 of the two positioning protrusions 21 respectively, such that the two positioning protrusions 21 fix the two screw rods 32 via the two casings 35 and stop the connecting block 31 from moving relative to the second base 20A, thereby preventing the first base 10A and the second base 20A from arbitrarily pivoting relative to each other. In other words, when the glass door A3 is opened to 90 degrees, the two positioning protrusions 21 of the second base 20A will temporarily hold the two casings 35 to temporarily position the glass door A3 at an opening angle of 90 degrees. The user needs to push the glass door A3 again so that the glass door A3 can be pivoted and closed again. In other words, in this embodiment, the glass door A3 can be temporarily positioned at 90 degrees (by the positioning protrusion 21 tightly abutting

the casing 35), and can also be temporarily positioned at any selected opening angle (by adjusting the relative position of the connecting rod 42 and the connecting block 31 to make the positioning unit 43 protrude into and fix the positioning groove 422 at the selected opening angle).

[0071] The present invention has the connecting rod 42 mounted in the connecting passage 411 of the positioning base 41 and having a positioning groove 422 capable of aligning to the positioning passage 412 during movement of the connecting rod 42, and the present invention has the positioning unit 43 mounted in the positioning passage 412 and pushed by the elastic unit 45 toward the connecting rod 42, so when the connecting rod 42 is moved to the positioning groove 422 aligned to the positioning passage 412, the positioning unit 43 protrudes into the positioning groove 422 to stop the connecting rod 42. Further, by configuring the positioning assembly 40, mounting the positioning base 41 on the second base 20A, and connecting the connecting rod 42 and the pivotal-connecting assembly 30A, when the first base 10A and the second base 20A are pivoted relative to each other via the pivotal-connecting assembly 30A, the pivotal-connecting assembly 30A will move the connecting rod 42 in the connecting passage 411 and selectively align the positioning groove 422 to the positioning passage 412. When the positioning groove 422 is aligned to the positioning passage 412, the positioning unit 43 will be pushed by the elastic unit 45 to protrude into the positioning groove 422 to stop the connecting rod 42 from further moving, thereby making the first base 10A and the second base 20A unable to pivot relative to each other again and achieving the positioning function.

[0072] Therefore, for glass doors, the first base 10A can be connected to the glass door A3, and the second base 20A and the positioning assembly 40 can be mounted in the door frame A1. Since the positioning assembly 40 can temporarily position the first base 10A and the second base 20A at a particular angle, the present invention can temporarily position the glass door A3 and the door frame A1 at the particular angle under without protruding from the wall surface. Therefore, the present invention not only keeps the appearance flat and smooth but also prevents from the door from being hit and damaged, thereby being durable.

Claims

1. A concealed hinge with a temporary positioning function for an opening angle, wherein the concealed hinge is adapted to be mounted in a door frame (A1) and a door (A2), and the concealed hinge comprises:

   a first base (10) adapted to be mounted in the door frame (A1);
   a second base (20) adapted to be mounted in the door (A2);
   a pivotal-connecting assembly (30) connected to the first base (10) and the second base (20); the first base (10) and the second base (20) being capable of pivoting relative to each other via the pivotal-connecting assembly (30); the pivotal-connecting assembly (30) having a connecting block (31) located in the second base (20); wherein when the first base (10) and the second base (20) pivot relative to each other, the connecting block (31) moves relative to the second base (20);
   a positioning assembly (40) having a positioning base (41) securely mounted on the second base (20), adapted to be mounted in the door (A2), and having a connecting passage (411) formed inside the positioning base (41); and a connecting rod (42) moveably mounted in the connecting passage (411);
   characterized in that the positioning assembly (40) has T
   at least one positioning passage (412) formed inside the positioning base (41) and having an inner end communicating with the connecting passage (411) on a radial direction of the connecting passage (411); and
   an outer end opposite to the inner end;
   a connecting screw end (421) located outside the connecting passage (411) and connected to the connecting block (31) of the pivotal-connecting assembly (30); wherein when the first base (10) and the second base (20) pivot relative to each other by the pivotal-connecting assembly (30), the connecting block (31) of the pivotal-connecting assembly (30) moves the connecting rod (42) in the connecting passage (411); and
   at least one positioning groove (422) formed on an annular surface of the connecting rod (42) and selectively aligned to the inner end of the at least one positioning passage (412) along with the movement of the connecting rod (42);
   at least one positioning unit (43) moveably mounted in the at least one positioning passage (412); and
   at least one elastic unit (45) mounted in the at least one positioning passage (412) and pushing the at least one positioning unit (43) toward the inner end to make the at least one positioning unit (43) protrude out of the inner end and abut the annular surface of the connecting rod (42); wherein when the at least one positioning groove (422) of the connecting rod (42) is aligned to the inner end of the at least one positioning passage (412), the at least one positioning unit (43) is pushed by the at least one elastic unit (45) and protrudes into the at least one positioning groove (422), such that the positioning unit (43) stops the connecting rod (42)

from further moving and stops the connecting block (31) from moving relative to the second base (20), and thus the first base (10) and the second base (20) cannot pivot relative to each other.

2. The concealed hinge as claimed in claim 1, wherein the connecting screw end (421) of the connecting rod (42) is screwed with the pivotal-connecting assembly (30) so that the connecting rod (42) can be adjusted relative to the pivotal-connecting assembly (30).

3. The concealed hinge as claimed in claim 2, wherein

the connecting screw end (421) of the connecting rod (42) is screwed with the connecting block (31) of the pivotal-connecting assembly (30) and is capable of moving through the connecting block (31); and
an operating groove (423) is formed on an end surface of the connecting screw end (421) and is adapted to engage with a handheld tool.

4. The concealed hinge as claimed in anyone of claims 1 to 3, wherein

an amount of the at least one positioning passage (412) of the positioning base (41) is two; and the two positioning passages (412) communicate with the connecting passage (411) respectively on two opposite sides on the radial direction of the connecting passage (411);
an amount of the at least one elastic unit (45) is two; the two elastic units (45) are respectively mounted in the two positioning passages (412);
an amount of the at least one positioning unit (43) is two; the two positioning units (43) are respectively mounted in the two positioning passages (412) and respectively abut two opposite sides of the annular surface of the connecting rod (42); and
an amount of the at least one positioning groove (422) of the connecting rod (42) is one; the positioning groove (422) is an annular groove; when the positioning groove (422) is aligned to the two positioning passages (412), the two positioning units (43) are respectively pushed by the two elastic units (45) to protrude into the positioning groove (422) and stop the connecting rod (42).

5. The concealed hinge as claimed in any one of claims 1 to 3, wherein

each of the at least one positioning unit (43) is a ball;
each of the at least one elastic unit (45) is a compression spring; and
the positioning groove (422) of the connecting rod (42) forms an arc line on a section through and parallel to an axis of the connecting rod (42).

6. The concealed hinge as claimed in any one of claims 1 to 3, wherein

the outer end of the at least one positioning passage (412) forms an opening on the positioning base (41) ;
the positioning assembly (40) has at least one adjusting screw (44) screwed in the at least one positioning passage (412) and being capable of moving along the at least one positioning passage (412); and
the at least one elastic unit (45) abuts between the at least one adjusting screw (44) and the at least one positioning unit (43) so that the at least one adjusting screw (44) is capable of adjusting a force by moving along the at least one positioning passage (412); wherein the force is applied by the at least one elastic unit (45) and pushes the at least one positioning unit (43) toward the inner end.

7. The concealed hinge as claimed in any one of claims 1 to 3, wherein

a step surface (4111) is formed in the connecting passage (411);
a nut (51) is screwed on an end of the connecting rod (42) opposite to the connecting screw end (421); and
when the pivotal-connecting assembly (30) moves the connecting rod (42) in the connecting passage (411), the nut (51) selectively abuts the step surface (4111) to stop the connecting rod (42) from moving, thereby stopping the connecting block (31) of the pivotal-connecting assembly (30) from moving relative to the second base (20) so that the first base (10) and the second base (20) are unable to pivot relative to each other.

8. The concealed hinge as claimed in claim 7, wherein

a gasket (52) is mounted on the end of the connecting rod (42) opposite to the connecting screw end (421) and is mounted between the nut (51) and the step surface (4111); and
the nut (51) selectively abuts the step surface (4111) via the gasket (52).

9. A concealed hinge with a temporary positioning function for an opening angle, wherein the concealed hinge is adapted to be mounted in a door frame (A1) and a door (A2), and the concealed hinge comprises:

a first base (10) adapted to be mounted in the door (A2);
a second base (20) adapted to be mounted in the door frame (A1);
a pivotal-connecting assembly (30) connected to the first base (10) and the second base (20); the first base (10) and the second base (20) being capable of pivoting relative to each other by the pivotal-connecting assembly (30); the pivotal-connecting assembly (30) having a connecting block (31) located in the second base (20); wherein when the first base (10) and the second base (20) pivot relative to each other, the connecting block (31) moves relative to the second base (20);
a positioning assembly (40) having a positioning base (41) securely mounted on the second base (20), adapted to be mounted in the door frame (A1), and having a connecting passage (411) formed inside the positioning base (41); and a connecting rod (42) moveably mounted in the connecting passage (411);
characterized in that the positioning assembly (40) has T
at least one positioning passage (412) formed inside the positioning base (41) and having

an inner end communicating with the connecting passage (411) on a radial direction of the connecting passage (411); and
an outer end opposite to the inner end;
a connecting screw end (421) located outside the connecting passage (411) and connected to the connecting block (31) of the pivotal-connecting assembly (30); wherein when the first base (10) and the second base (20) pivot relative to each other by the pivotal-connecting assembly (30), the connecting block (31) of the pivotal-connecting assembly (30) moves the connecting rod (42) in the connecting passage (411); and
at least one positioning groove (422) formed on an annular surface of the connecting rod (42) and selectively aligned to the inner end of the at least one positioning passage (412) along with the movement of the connecting rod (42);

at least one positioning unit (43) moveably mounted in the at least one positioning passage (412); and
at least one elastic unit (45) mounted in the at least one positioning passage (412) and pushing the at least one positioning unit (43) toward the inner end to make the at least one positioning unit (43) protrude out of the inner end and abut the annular surface of the connecting rod (42); wherein when the at least one positioning groove (422) of the connecting rod (42) is aligned to the inner end of the at least one positioning passage (412), the at least one positioning unit (43) is pushed by the at least one elastic unit (45) and protrudes into the at least one positioning groove (422), such that the positioning unit (43) stops the connecting rod (42) from further moving and stops the connecting block (31) from moving relative to the second base (20), and thus the first base (10) and the second base (20) cannot pivot relative to each other.

10. A concealed glass door hinge with a temporary positioning function for an opening angle, wherein the concealed glass door hinge is adapted to be mounted in a door frame (A1) and is adapted to be connected to a glass door (A3), and the concealed glass door hinge comprises:

a first base (10A) adapted to be connected to the glass door (A3);
a second base (20A) adapted to be mounted in the door frame (A1);
a pivotal-connecting assembly (30A) connected to the first base (10A) and the second base (20A) ; the first base (10A) and the second base (20A) being capable of pivoting relative to each other via the pivotal-connecting assembly (30A) ; the pivotal-connecting assembly (30A) having

a connecting block (31) located in the second base (20A); wherein when the first base (10A) and the second base (20A) pivot relative to each other, the connecting block (31) moves relative to the second base (20A) ;
a positioning assembly (40) having a positioning base (41) securely mounted on the second base (20A), adapted to be mounted in the door frame (A1), and having

a connecting passage (411) formed inside the positioning base (41); and a connecting rod (42) moveably mounted in the connecting passage (411);
characterized in that the positioning assembly (40) has
at least one positioning passage (412) formed inside the positioning base (41) and having

an inner end communicating with the connecting passage (411) on a radial direction of the connecting passage (411); and
an outer end opposite to the inner

end;

a connecting screw end (421) located outside the connecting passage (411) and connected to the connecting block (31) of the pivotal-connecting assembly (30A); wherein when the first base (10A) and the second base (20A) pivot relative to each other by the pivotal-connecting assembly (30A), the connecting block (31) of the pivotal-connecting assembly (30A) moves the connecting rod (42) in the connecting passage (411); and
at least one positioning groove (422) formed on an annular surface of the connecting rod (42) and selectively aligned to the inner end of the at least one positioning passage (412) along with the movement of the connecting rod (42);

at least one positioning unit (43) moveably mounted in the at least one positioning passage (412); and
at least one elastic unit (45) mounted in the at least one positioning passage (412) and pushing the at least one positioning unit (43) toward the inner end to make the at least one positioning unit (43) protrude out of the inner end and abut the annular surface of the connecting rod (42); wherein when the at least one positioning groove (422) of the connecting rod (42) is aligned to the inner end of the at least one positioning passage (412), the at least one positioning unit (43) is pushed by the at least one elastic unit (45) and protrudes into the at least one positioning groove (422), such that the positioning unit (43) stops the connecting rod (42) from further moving and stops the connecting block (31) from moving relative to the second base (20A), and thus the first base (10A) and the second base (20A) cannot pivot relative to each other.

11. The concealed glass door hinge as claimed in claim 10, wherein the connecting screw end (421) of the connecting rod (42) is screwed with the pivotal-connecting assembly (30A) so that the connecting rod (42) is adjustable relative to the pivotal-connecting assembly (30A) .

12. The concealed glass door hinge as claimed in claim 11, wherein

the connecting screw end (421) of the connecting rod (42) is screwed with the connecting block (31) of the pivotal-connecting assembly (30A) and is capable of moving through the connecting block (31); and
an operating groove (423) is formed on an end surface of the connecting screw end (421) and is adapted to engage with a handheld tool.

13. The concealed glass door hinge as claimed in any one of claims 10 to 12, wherein

the pivotal-connecting assembly (30A) has

two screw rods (32) respectively screwed with two sides of the connecting block (31); wherein when the first base (10A) and the second base (20A) pivot relative to each other, the two screw rods (32) move relative to the second base (20A) along with the connecting block (31); and
two casings (35) respectively sleeved on the screw rods (32);

the second base (20A) has

two positioning protrusions (21); each of the two positioning protrusions (21) having an abutting flat surface (211);
when the first base (10A) and the second base (20A) are relatively pivoted to an angle of 90 degrees between the glass door (A3) and the door frame (A1), the two casings (35) tightly abut the abutting flat surfaces (211) of the two positioning protrusions (21) respectively, such that the two positioning protrusions (21) position the two screw rods (32) via the two casings (35) and stop the connecting block (31) from moving relative to the second base (20A), thereby making the first base (10A) and the second base (20A) unable to pivot relative to each other.

14. The concealed glass door hinge as claimed in any one of claims 10 to 12, wherein the first base (10A) has

a front door fixing segment (11) adapted to be located at a side of the glass door (A3);
a rear door fixing segment (12) adapted to be located at another side of the glass door (A3) and having three screw holes (121);
a front anti-slip unit (13) adapted to be located

between the front door fixing segment (11) and the glass door (A3) and adapted to abut a side surface of the glass door (A3);
a rear anti-slip unit (14) adapted to be located between the glass door (A3) and the rear door fixing segment (12) and adapted to abut another side surface of the glass door (A3);
a pressing unit (15) located between the rear anti-slip unit (14) and the rear door fixing segment (12) and having two pressing grooves (151);
two pressing screw rods (16) respectively screwed with two of the three screw holes (121) of the rear door fixing segment (12) and respectively protruding into and abutting the two pressing grooves (151) of the pressing unit (15); the two pressing screw rods (16) being capable of moving relative to the rear door fixing segment (12) by rotating to push the pressing unit (15) toward the front door fixing segment (11) so as to tightly abut the pressing unit (15), the rear anti-slip unit (14), the glass door (A3), the front anti-slip unit (13), and the front door fixing segment (11) to each other;
a penetrating screw rod (17) screwed with the other one of the three screw holes (121) of the rear door fixing segment (12), sequentially mounted through the rear door fixing segment (12), the pressing unit (15), the rear anti-slip unit (14), the glass door (A3), and the front anti-slip unit (13), and mounted in and assembled with the front door fixing segment (11).

15. The concealed glass door hinge as claimed in any one of claims 10 to 12, wherein the first base (10B) has

a front door fixing segment (11B) adapted to be located at a side of the glass door (A3);
a rear door fixing segment (12) adapted to be located at another side of the glass door (A3) and having three screw holes (121);
a front anti-slip unit (13) adapted to be located between the front door fixing segment (11B) and the glass door (A3) and adapted to abut a side surface of the glass door (A3);
a rear anti-slip unit (14) adapted to be located between the glass door (A3) and the rear door fixing segment (12) and adapted to abut another side surface of the glass door (A3);
a pressing unit (15B) located between the rear anti-slip unit (14) and the rear door fixing segment (12) and having three pressing grooves (151B);
three pressing screw rods (16B) respectively screwed with the three screw holes (121) of the rear door fixing segment (12), mounted through the rear door fixing segment (12), and respectively abutting the three pressing grooves (151B) of the pressing unit (15B); the three pressing screw rods (16B) being capable of moving relative to the rear door fixing segment (12) by rotating to push the pressing unit (15B) toward the front door fixing segment (11B) so as to tightly abut the pressing unit (15B), the rear anti-slip unit (14), the glass door (A3), the front anti-slip unit (13), and the front door fixing segment (11B) to each other.

Patentansprüche

1. Topfscharnier mit einer temporären Positionierungsfunktion für einen Öffnungswinkel, wobei das Topfscharnier zur Montage in eine Türzarge (A1) und eine Tür (A2) geeignet ist und das Topfscharnier umfasst:

eine erste Grundplatte (10), die zur Montage in die Türzarge (A1) geeignet ist;
eine zweite Grundplatte (20), die zur Montage in die Tür (A2) geeignet ist;
eine Schwenkverbindungsanordnung (30), die mit der ersten Grundplatte (10) und der zweiten Grundplatte (20) verbunden ist; wobei die erste Grundplatte (10) und die zweite Grundplatte (20) durch die Schwenkverbindungsanordnung (30) relativ zueinander schwenken können; wobei die Schwenkverbindungsanordnung (30)
einen Verbindungsblock (31) aufweist, der in der zweiten Grundplatte (20) angeordnet ist; wobei, wenn die erste Grundplatte (10) und die zweite Grundplatte (20) relativ zueinander schwenken, sich der Verbindungsblock (31) relativ zu der zweiten Grundplatte (20) bewegt;
eine Positionierungsanordnung (40) mit
einer Positionierungsbasis (41), die fest auf die zweite Grundplatte (20) montiert ist, die zur Montage in die Tür (A2) geeignet ist und
einen Verbindungsdurchgang (411) aufweist, der in der Positionierungsbasis (41) ausgebildet ist; und eine Verbindungsstange (42), die beweglich in den Verbindungsdurchgang (411) montiert ist;
dadurch gekennzeichnet, dass die Positionierungsanordnung (40)
mindestens einen Positionierungsdurchgang (412) aufweist, der in der Positionierungsbasis (41) ausgebildet ist und
ein inneres Ende aufweist, das mit dem Verbindungsdurchgang (411) in einer radialen Richtung des Verbindungsdurchgangs (411) in Verbindung steht; und
ein dem inneren Ende entgegengesetztes äußeres Ende;
ein Verbindungsgewindeende (421), das außer-

halb des Verbindungsdurchgangs (411) angeordnet und mit dem Verbindungsblock (31) der Schwenkverbindungsanordnung (30) verbunden ist; wobei, wenn die erste Grundplatte (10) und die zweite Grundplatte (20) durch die Schwenkverbindungsanordnung (30) relativ zueinander schwenken, der Verbindungsblock (31) der Schwenkverbindungsanordnung (30) die Verbindungsstange (42) in dem Verbindungsdurchgang (411) bewegt; und
mindestens eine Positionierungsnut (422), die auf einer ringförmigen Oberfläche der Verbindungsstange (42) ausgebildet und einhergehend mit der Bewegung der Verbindungsstange (42) selektiv mit dem inneren Ende des mindestens einen Positionierungsdurchgangs (412) ausgerichtet ist;
mindestens eine Positionierungseinheit (43), die beweglich in den mindestens einen Positionierungsdurchgang (412) montiert ist; und
mindestens eine elastische Einheit (45), die in den mindestens einen Positionierungsdurchgang (412) montiert ist und die mindestens eine Positionierungseinheit (43) in Richtung des inneren Endes schiebt, um zu bewirken, dass die mindestens eine Positionierungseinheit (43) aus dem inneren Ende herausragt und an der ringförmigen Oberfläche der Verbindungsstange (42) anliegt; wobei, wenn die mindestens eine Positionierungsnut (422) der Verbindungsstange (42) mit dem inneren Ende des mindestens einen Positionierungsdurchgangs (412) ausgerichtet ist, die mindestens eine Positionierungseinheit (43) von der mindestens einen elastischen Einheit (45) geschoben wird und in die mindestens eine Positionierungsnut (422) hineinragt, sodass die Positionierungseinheit (43) die weitere Bewegung der Verbindungsstange (42) stoppt und die Bewegung des Verbindungsblocks (31) relativ zu der zweiten Grundplatte (20) stoppt und somit die erste Grundplatte (10) und die zweite Grundplatte (20) nicht relativ zueinander schwenken können.

2. Topfscharnier nach Anspruch 1, wobei das Verbindungsgewindeende (421) der Verbindungsstange (42) mit der Schwenkverbindungsanordnung (30) derart verschraubt ist, dass die Verbindungsstange (42) relativ zur Schwenkverbindungsanordnung (30) eingestellt werden kann.

3. Topfscharnier nach Anspruch 2, wobei

das Verbindungsgewindeende (421) der Verbindungsstange (42) mit dem Verbindungsblock (31) der Schwenkverbindungsanordnung (30) verschraubt ist und sich durch den Verbindungsblock (31) bewegen kann; und
eine Betätigungsnut (423) auf einer Stirnfläche des Verbindungsgewindeendes (421) ausgebildet und dafür ausgelegt ist, mit einem Handwerkzeug in Eingriff zu kommen.

4. Topfscharnier nach einem der Ansprüche 1 bis 3, wobei

eine Menge des mindestens einen Positionierungsdurchgangs (412) der Positionierungsbasis (41) zwei ist; und die zwei Positionierungsdurchgänge (412) mit dem Verbindungsdurchgang (411) jeweils auf zwei entgegengesetzten Seiten in der radialen Richtung des Verbindungsdurchgangs (411) in Verbindung stehen;
eine Menge der mindestens einen elastischen Einheit (45) zwei ist; die zwei elastischen Einheiten (45) jeweils in die zwei Positionierungsdurchgänge (412) montiert sind;
eine Menge der mindestens einen Positionierungseinheit (43) zwei ist; die zwei Positionierungseinheiten (43) jeweils in die zwei Positionierungsdurchgänge (412) montiert sind und jeweils an zwei entgegengesetzten Seiten der ringförmigen Oberfläche der Verbindungsstange (42) anliegen; und
eine Menge der mindestens einen Positionierungsnut (422) der Verbindungsstange (42) eins ist; die Positionierungsnut (422) eine Ringnut ist; wenn die Positionierungsnut (422) mit den zwei Positionierungsdurchgängen (412) ausgerichtet ist, die zwei Positionierungseinheiten (43) jeweils von den zwei elastischen Einheiten (45) derart geschoben werden, dass sie in die Positionierungsnut (422) hineinragen und die Verbindungsstange (42) stoppen.

5. Topfscharnier nach einem der Ansprüche 1 bis 3, wobei

jede der mindestens einen Positionierungseinheit (43) eine Kugel ist;
jede der mindestens einen elastischen Einheit (45) eine Druckfeder ist; und
die Positionierungsnut (422) der Verbindungsstange (42) eine Bogenlinie auf einem Schnitt durch und parallel zu einer Achse der Verbindungsstange (42) bildet.

6. Topfscharnier nach einem der Ansprüche 1 bis 3, wobei

das äußere Ende des mindestens einen Positionierungsdurchgangs (412) eine Öffnung auf der Positionierungsbasis (41) bildet;
die Positionierungsanordnung (40)
mindestens eine Einstellschraube (44) aufweist,

die in den mindestens einen Positionierungsdurchgang (412) geschraubt ist und sich entlang des mindestens einen Positionierungsdurchgangs (412) bewegen kann; und
die mindestens eine elastische Einheit (45) zwischen der mindestens einen Einstellschraube (44) und der mindestens einen Positionierungseinheit (43) derart anliegt, dass die mindestens eine Einstellschraube (44) eine Kraft einstellen kann, indem sie sich entlang des mindestens einen Positionierungsdurchgangs (412) bewegt; wobei die Kraft von der mindestens einen elastischen Einheit (45) ausgeübt wird und die mindestens eine Positionierungseinheit (43) in Richtung des inneren Endes schiebt.

7. Topfscharnier nach einem der Ansprüche 1 bis 3, wobei

eine Stufenfläche (4111) in dem Verbindungsdurchgang (411) ausgebildet ist;
eine Mutter (51) auf ein dem Verbindungsgewindeende (421) entgegengesetztes Ende der Verbindungsstange (42) geschraubt ist; und
wenn die Schwenkverbindungsanordnung (30) die Verbindungsstange (42) in den Verbindungsdurchgang (411) bewegt, die Mutter (51) selektiv an der Stufenfläche (4111) anliegt, um die Bewegung der Verbindungsstange (42) zu stoppen und dadurch die Bewegung des Verbindungsblocks (31) der Schwenkverbindungsanordnung (30) relativ zu der zweiten Grundplatte (20) zu stoppen, sodass die erste Grundplatte (10) und die zweite Grundplatte (20) nicht relativ zueinander schwenken können.

8. Topfscharnier nach Anspruch 7, wobei

eine Dichtung (52) auf das dem Verbindungsgewindeende (421) entgegengesetzte Ende der Verbindungsstange (42) montiert ist und zwischen die Mutter (51) und die Stufenfläche (4111) montiert ist; und
die Mutter (51) über die Dichtung (52) selektiv an der Stufenfläche (4111) anliegt.

9. Topfscharnier mit einer temporären Positionierungsfunktion für einen Öffnungswinkel, wobei
das Topfscharnier zur Montage in eine Türzarge (A1) und eine Tür (A2) geeignet ist und das Topfscharnier umfasst:

eine erste Grundplatte (10), die zur Montage in die Tür (A2) geeignet ist;
eine zweite Grundplatte (20), die zur Montage in die Türzarge (A1) geeignet ist;
eine Schwenkverbindungsanordnung (30), die mit der ersten Grundplatte (10) und der zweiten Grundplatte (20) verbunden ist; wobei die erste Grundplatte (10) und die zweite Grundplatte (20) durch die Schwenkverbindungsanordnung (30) relativ zueinander schwenkbar sind; wobei die Schwenkverbindungsanordnung (30) einen Verbindungsblock (31) aufweist, der in der zweiten Grundplatte (20) angeordnet ist;
wobei, wenn die erste Grundplatte (10) und die zweite Grundplatte (20) relativ zueinander schwenken, sich der Verbindungsblock (31) relativ zu der zweiten Grundplatte (20) bewegt;
eine Positionierungsanordnung (40) mit
einer Positionierungsbasis (41), die fest auf die zweite Grundplatte (20) montiert ist, die zur Montage in die Türzarge (A1) geeignet ist und
einen Verbindungsdurchgang (411) aufweist, der in der Positionierungsbasis (41) ausgebildet ist; und
eine Verbindungsstange (42), die beweglich in den Verbindungsdurchgang (411) montiert ist;
dadurch gekennzeichnet, dass die Positionierungsanordnung (40)
mindestens einen Positionierungsdurchgang (412) aufweist, der in der Positionierungsbasis (41) ausgebildet ist und
ein inneres Ende aufweist, das mit dem Verbindungsdurchgang (411) in einer radialen Richtung des Verbindungsdurchgangs (411) in Verbindung steht; und
ein dem inneren Ende entgegengesetztes äußeres Ende;
ein Verbindungsgewindeende (421), das außerhalb des Verbindungsdurchgangs (411) angeordnet und mit dem Verbindungsblock (31) der Schwenkverbindungsanordnung (30) verbunden ist; wobei, wenn die erste Grundplatte (10) und die zweite Grundplatte (20) durch die Schwenkverbindungsanordnung (30) relativ zueinander schwenken, der Verbindungsblock (31) der Schwenkverbindungsanordnung (30) die Verbindungsstange (42) in dem Verbindungsdurchgang (411) bewegt; und
mindestens eine Positionierungsnut (422), die auf einer ringförmigen Oberfläche der Verbindungsstange (42) ausgebildet und einhergehend mit der Bewegung der Verbindungsstange (42) selektiv mit dem inneren Ende des mindestens einen Positionierungsdurchgangs (412) ausgerichtet ist;
mindestens eine Positionierungseinheit (43), die beweglich in den mindestens einen Positionierungsdurchgang (412) montiert ist; und
mindestens eine elastische Einheit (45), die in den mindestens einen Positionierungsdurchgang (412) montiert ist und die mindestens eine Positionierungseinheit (43) in Richtung des inneren Endes schiebt, um zu bewirken, dass die mindestens eine Positionierungseinheit (43)

aus dem inneren Ende herausragt und an der ringförmigen Oberfläche der Verbindungsstange (42) anliegt; wobei, wenn die mindestens eine Positionierungsnut (422) der Verbindungsstange (42) mit dem inneren Ende des mindestens einen Positionierungsdurchgangs (412) ausgerichtet ist, die mindestens eine Positionierungseinheit (43) von der mindestens einen elastischen Einheit (45) geschoben wird und in die mindestens eine Positionierungsnut (422) hineinragt, sodass die Positionierungseinheit (43) die weitere Bewegung der Verbindungsstange (42) stoppt und die Bewegung des Verbindungsblocks (31) relativ zu der zweiten Grundplatte (20) stoppt und somit die erste Grundplatte (10) und die zweite Grundplatte (20) nicht relativ zueinander schwenken können.

10. Glastür-Topfscharnier mit einer temporären Positionierungsfunktion für einen Öffnungswinkel, wobei das Glastür-Topfscharnier zur Montage in eine Türzarge (A1) geeignet ist und dazu geeignet ist, mit einer Glastür (A3) verbunden zu werden, und wobei das Glastür-Topfscharnier umfasst:

eine erste Grundplatte (10A), die dazu geeignet ist, mit der Glastür (A3) verbunden zu werden;
eine zweite Grundplatte (20A), die zur Montage in die Türzarge (A1) geeignet ist;
eine Schwenkverbindungsanordnung (30A), die mit der ersten Grundplatte (10A) und der zweiten Grundplatte (20A) verbunden ist; wobei die erste Grundplatte (10A) und die zweite Grundplatte (20A) durch die Schwenkverbindungsanordnung (30A) relativ zueinander schwenkbar sind; wobei die Schwenkverbindungsanordnung (30A)
einen Verbindungsblock (31) aufweist, der in der zweiten Grundplatte (20A) angeordnet ist; wobei, wenn die erste Grundplatte (10A) und die zweite Grundplatte (20A) relativ zueinander schwenken, sich der Verbindungsblock (31) relativ zu der zweiten Grundplatte (20A) bewegt;
eine Positionierungsanordnung (40) mit
einer Positionierungsbasis (41), die fest auf die zweite Grundplatte (20A) montiert ist, die zur Montage in die Türzarge (A1) geeignet ist und
einen Verbindungsdurchgang (411) aufweist, der in der Positionierungsbasis (41) ausgebildet ist; und
eine Verbindungsstange (42), die beweglich in den Verbindungsdurchgang (411) montiert ist;
dadurch gekennzeichnet, dass die Positionierungsanordnung (40)
mindestens einen Positionierungsdurchgang (412) aufweist, der in der Positionierungsbasis (41) ausgebildet ist und
ein inneres Ende aufweist, das mit dem Verbindungsdurchgang (411) in einer radialen Richtung des Verbindungsdurchgangs (411) in Verbindung steht; und
ein dem inneren Ende entgegengesetztes äußeres Ende;
ein Verbindungsgewindeende (421), das außerhalb des Verbindungsdurchgangs (411) angeordnet und mit dem Verbindungsblock (31) der Schwenkverbindungsanordnung (30A) verbunden ist; wobei, wenn die erste Grundplatte (10A) und die zweite Grundplatte (20A) durch die Schwenkverbindungsanordnung (30A) relativ zueinander schwenken, der Verbindungsblock (31) der Schwenkverbindungsanordnung (30A) die Verbindungsstange (42) in dem Verbindungsdurchgang (411) bewegt; und
mindestens eine Positionierungsnut (422), die auf einer ringförmigen Oberfläche der Verbindungsstange (42) ausgebildet und einhergehend mit der Bewegung der Verbindungsstange (42) selektiv mit dem inneren Ende des mindestens einen Positionierungsdurchgangs (412) ausgerichtet ist;
mindestens eine Positionierungseinheit (43), die beweglich in den mindestens einen Positionierungsdurchgang (412) montiert ist; und
mindestens eine elastische Einheit (45), die in den mindestens einen Positionierungsdurchgang (412) montiert ist und die mindestens eine Positionierungseinheit (43) in Richtung des inneren Endes schiebt, um zu bewirken, dass die mindestens eine Positionierungseinheit (43) aus dem inneren Ende herausragt und an der ringförmigen Oberfläche der Verbindungsstange (42) anliegt; wobei, wenn die mindestens eine Positionierungsnut (422) der Verbindungsstange (42) mit dem inneren Ende des mindestens einen Positionierungsdurchgangs (412) ausgerichtet ist, die mindestens eine Positionierungseinheit (43) von der mindestens einen elastischen Einheit (45) geschoben wird und in die mindestens eine Positionierungsnut (422) hineinragt, sodass die Positionierungseinheit (43) die weitere Bewegung der Verbindungsstange (42) stoppt und die Bewegung des Verbindungsblocks (31) relativ zu der zweiten Grundplatte (20A) stoppt und somit die erste Grundplatte (10A) und die zweite Grundplatte (20A) nicht relativ zueinander schwenken können.

11. Glastür-Topfscharnier nach Anspruch 10, wobei das Verbindungsgewindeende (421) der Verbindungsstange (42) mit der Schwenkverbindungsanordnung (30A) derart verschraubt ist, dass die Verbindungsstange (42) relativ zur Schwenkverbindungsanordnung (30A) einstellbar ist.

12. Glastür-Topfscharnier nach Anspruch 11, wobei

das Verbindungsgewindeende (421) der Verbindungsstange (42) mit dem Verbindungsblock (31) der Schwenkverbindungsanordnung (30A) verschraubt ist und sich durch den Verbindungsblock (31) bewegen kann; und
eine Betätigungsnut (423) auf einer Stirnfläche des Verbindungsgewindeendes (421) ausgebildet und dafür ausgelegt ist, mit einem Handwerkzeug in Eingriff zu kommen.

13. Glastür-Topfscharnier nach einem der Ansprüche 10 bis 12, wobei
die Schwenkverbindungsanordnung (30A)

zwei Gewindestangen (32) aufweist, die jeweils mit zwei Seiten des Verbindungsblocks (31) verschraubt sind; wobei, wenn die erste Grundplatte (10A) und die zweite Grundplatte (20A) relativ zueinander schwenken, sich die zwei Gewindestangen (32) relativ zu der zweiten Grundplatte (20A) zusammen mit dem Verbindungsblock (31) bewegen; und
zwei Gehäuse (35), die jeweils auf die Gewindestangen (32) aufgesteckt sind;
die zweite Grundplatte (20A)
zwei Positionierungsvorsprünge (21) aufweist;
jeder der zwei Positionierungsvorsprünge (21)
eine flache Anschlagfläche (211) aufweist;
wenn die erste Grundplatte (10A) und die zweite Grundplatte (20A) relativ zueinander um einen Winkel von 90 Grad zwischen der Glastür (A3) und der Türzarge (A1) geschwenkt sind, die zwei Gehäuse (35) jeweils eng an den flachen Anschlagflächen (211) der zwei Positionierungsvorsprünge (21) anliegen, sodass die zwei Positionierungsvorsprünge (21) die zwei Gewindestangen (32) durch die zwei Gehäuse (35) positionieren und die Bewegung des Verbindungsblocks (31) relativ zu der zweiten Grundplatte (20A) stoppen, wodurch bewirkt wird, dass die erste Grundplatte (10A) und die zweite Grundplatte (20A) nicht relativ zueinander schwenken können.

14. Glastür-Topfscharnier nach einem der Ansprüche 10 bis 12, wobei die erste Grundplatte (10A)

ein vorderes Türbefestigungssegment (11) aufweist, das auf einer Seite der Glastür (A3) angeordnet sein kann;
ein hinteres Türbefestigungssegment (12), das auf einer anderen Seite der Glastür (A3) angeordnet sein kann und
drei Schraubenlöcher (121) aufweist;
eine vordere Anti-Rutsch-Einheit (13), die zwischen dem vorderen Türbefestigungssegment (11) und der Glastür (A3) angeordnet sein kann und dafür ausgelegt ist, an einer Seitenfläche der Glastür (A3) anzuliegen;
eine hintere Anti-Rutsch-Einheit (14), die zwischen der Glastür (A3) und dem hinteren Türbefestigungssegment (12) angeordnet sein kann und dafür ausgelegt ist, an einer anderen Seitenfläche der Glastür (A3) anzuliegen;
eine Presseinheit (15), die zwischen der hinteren Anti-Rutsch-Einheit (14) und dem hinteren Türbefestigungssegment (12) angeordnet ist und
zwei Pressnuten (151) aufweist;
zwei Pressgewindestangen (16), die jeweils mit zwei der drei Schraubenlöcher (121) des hinteren Türbefestigungssegments (12) verschraubt sind und jeweils in die zwei Pressnuten (151) der Presseinheit (15) hineinragen und daran anliegen; wobei sich die zwei Pressgewindestangen (16) relativ zu dem hinteren Türbefestigungssegment (12) durch Drehung bewegen können, um die Presseinheit (15) in Richtung des vorderen Türbefestigungssegments (11) zu schieben, um die Presseinheit (15), die hintere Anti-Rutsch-Einheit (14), die Glastür (A3), die vordere Anti-Rutsch-Einheit (13) und das vordere Türbefestigungssegment (11) eng aneinanderzufügen;
eine Durchgangsgewindestange (17), die mit dem anderen der drei Schraubenlöcher (121) des hinteren Türbefestigungssegments (12) verschraubt und sequenziell durch das hintere Türbefestigungssegment (12), die Presseinheit (15), die hintere Anti-Rutsch-Einheit (14), die Glastür (A3) und die vordere Anti-Rutsch-Einheit (13) montiert ist und in das vordere Türbefestigungssegment (11) montiert und mit ihm zusammengefügt ist.

15. Glastür-Topfscharnier nach einem der Ansprüche 10 bis 12, wobei die erste Grundplatte (10B)

ein vorderes Türbefestigungssegment (11B) aufweist, das auf einer Seite der Glastür (A3) angeordnet sein kann;
ein hinteres Türbefestigungssegment (12), das auf einer anderen Seite der Glastür (A3) angeordnet sein kann und
drei Schraubenlöcher (121) aufweist;
eine vordere Anti-Rutsch-Einheit (13), die zwischen dem vorderen Türbefestigungssegment (11B) und der Glastür (A3) angeordnet sein kann und dafür ausgelegt ist, an einer Seitenfläche der Glastür (A3) anzuliegen;
eine hintere Anti-Rutsch-Einheit (14), die zwischen der Glastür (A3) und dem hinteren Türbefestigungssegment (12) angeordnet sein kann und dafür ausgelegt ist, an einer anderen

Seitenfläche der Glastür (A3) anzuliegen;
eine Presseinheit (15B), die zwischen der hinteren Anti-Rutsch-Einheit (14) und dem hinteren Türbefestigungssegment (12) angeordnet ist und
drei Pressnuten (151B) aufweist;
drei Pressgewindestangen (16B), die jeweils mit den drei Schraubenlöchern (121) des hinteren Türbefestigungssegments (12) verschraubt und durch das hintere Türbefestigungssegment (12) montiert sind und jeweils an den drei Pressnuten (151B) der Presseinheit (15B) anliegen; wobei sich die drei Pressgewindestangen (16B) relativ zu dem hinteren Türbefestigungssegment (12) durch Drehung bewegen können, um die Presseinheit (15B) in Richtung des vorderen Türbefestigungssegments (11B) zu schieben, um die Presseinheit (15B), die hintere Anti-Rutsch-Einheit (14), die Glastür (A3), die vordere Anti-Rutsch-Einheit (13) und das vordere Türbefestigungssegment (11B) eng aneinanderzufügen.

Revendications

1. Charnière dissimulée avec une fonction de positionnement temporaire pour un angle d'ouverture, dans laquelle la charnière dissimulée est conçue pour être montée dans un cadre de porte (A1) et une porte (A2), et la charnière dissimulée comprend :

une première base (10) conçue pour être montée dans le cadre de porte (A1) ;
une seconde base (20) conçue pour être montée dans la porte (A2) ;
un ensemble de liaison-pivot (30) relié à la première base (10) et à la seconde base (20) ; la première base (10) et la seconde base (20) étant à même de pivoter l'une par rapport à l'autre via l'ensemble de liaison-pivot (30) ; l'ensemble de liaison-pivot (30) présentant
un bloc de liaison (31) situé dans la seconde base (20) ; dans laquelle lorsque la première base (10) et la seconde base (20) pivotent l'une par rapport à l'autre, le bloc de liaison (31) se déplace par rapport à la seconde base (20) ;
un ensemble de positionnement (40) présentant une base de positionnement (41) solidement montée sur la seconde base (20), conçue pour être montée dans la porte (A2), et présentant
un passage de liaison (411) formé à l'intérieur de la base de positionnement (41) ; et une tige de liaison (42) montée de façon mobile dans le passage de liaison (411) ;
caractérisée en ce que l'ensemble de positionnement (40) présente
au moins un passage de positionnement (412) formé à l'intérieur de la base de positionnement (41) et présentant
une extrémité intérieure communiquant avec le passage de liaison (411) sur une direction radiale du passage de liaison (411) ; et
une extrémité extérieure opposée à l'extrémité intérieure ;
une extrémité de vis de liaison (421) située à l'extérieur du passage de liaison (411) et reliée au bloc de liaison (31) de l'ensemble de liaison-pivot (30) ; dans laquelle lorsque la première base (10) et la seconde base (20) pivotent l'une par rapport à l'autre par le biais de l'ensemble de liaison-pivot (30), le bloc de liaison (31) de l'ensemble de liaison-pivot (30) déplace la tige de liaison (42) dans le passage de liaison (411) ; et
au moins une rainure de positionnement (422) formée sur une surface annulaire de la tige de liaison (42) et sélectivement alignée sur l'extrémité intérieure du au moins un passage de positionnement (412) le long du mouvement de la tige de liaison (42) ;
au moins une unité de positionnement (43) montée de façon mobile dans le au moins un passage de positionnement (412) ; et
au moins une unité élastique (45) montée dans le au moins un passage de positionnement (412) et poussant la au moins une unité de positionnement (43) vers l'extrémité intérieure pour que la au moins une unité de positionnement (43) fasse saillie hors de l'extrémité intérieure et vienne en butée contre la surface annulaire de la tige de liaison (42) ; dans laquelle lorsque la au moins une rainure de positionnement (422) de la tige de liaison (42) est alignée sur l'extrémité intérieure du au moins un passage de positionnement (412), la au moins une unité de positionnement (43) est poussée par la au moins une unité élastique (45) et fait saillie jusque dans la au moins une rainure de positionnement (422), de sorte que l'unité de positionnement (43) empêche la tige de liaison (42) de continuer à se déplacer et empêche le bloc de liaison (31) de se déplacer par rapport à la seconde base (20), et ainsi la première base (10) et la seconde base (20) ne peuvent pas pivoter l'une par rapport à l'autre.

2. Charnière dissimulée selon la revendication 1, dans laquelle l'extrémité de vis de liaison (421) de la tige de liaison (42) est vissée avec l'ensemble de liaison-pivot (30) de sorte que la tige de liaison (42) puisse être ajustée par rapport à l'ensemble de liaison-pivot (30).

3. Charnière dissimulée selon la revendication 2, dans laquelle

l'extrémité de vis de liaison (421) de la tige de liaison (42) est vissée avec le bloc de liaison (31) de l'ensemble de liaison-pivot (30) et est à même de se déplacer à travers le bloc de liaison (31) ; et
une rainure opérationnelle (423) est formée sur une surface d'extrémité de l'extrémité de vis de liaison (421) et est conçue pour s'engager avec un outil portatif.

4. Charnière dissimulée selon l'une quelconque des revendications 1 à 3, dans laquelle

un nombre du au moins un passage de positionnement (412) de la base de positionnement (41) est deux ; et les deux passages de positionnement (412) communiquent avec le passage de liaison (411) respectivement sur deux côtés opposés sur la direction radiale du passage de liaison (411) ;
un nombre de la au moins une unité élastique (45) est deux ; les deux unités élastiques (45) sont respectivement montées dans les deux passages de positionnement (412) ;
un nombre de la au moins une unité de positionnement (43) est deux ; les deux unités de positionnement (43) sont respectivement montées dans les deux passages de positionnement (412) et viennent respectivement en butée contre deux côtés opposés de la surface annulaire de la tige de liaison (42) ; et
un nombre de la au moins une rainure de positionnement (422) de la tige de liaison (42) est un ; la rainure de positionnement (422) est une rainure annulaire ; lorsque la rainure de positionnement (422) est alignée sur les deux passages de positionnement (412), les deux unités de positionnement (43) sont respectivement poussées par les deux unités élastiques (45) pour faire saillie jusque dans la rainure de positionnement (422) et arrêter la tige de liaison (42).

5. Charnière dissimulée selon l'une quelconque des revendications 1 à 3, dans laquelle

chacune de la au moins une unité de positionnement (43) est une boule ;
chacune de la au moins une unité élastique (45) est un ressort de compression ; et
la rainure de positionnement (422) de la tige de liaison (42) forme une ligne d'arc sur une section à travers et parallèlement à un axe de la tige de liaison (42).

6. Charnière dissimulée selon l'une quelconque des revendications 1 à 3, dans laquelle

l'extrémité extérieure du au moins un passage de positionnement (412) forme une ouverture sur la base de positionnement (41) ;
l'ensemble de positionnement (40) présente au moins une vis d'ajustement (44) vissée dans le au moins un passage de positionnement (412) et étant à même de se déplacer le long du au moins un passage de positionnement (412) ; et la au moins une unité élastique (45) vient en butée entre la au moins une vis d'ajustement (44) et la au moins une unité de positionnement (43) de sorte que la au moins une vis d'ajustement (44) soit à même d'ajuster une force en se déplaçant le long du au moins un passage de positionnement (412) ; dans laquelle la force est appliquée par la au moins une unité élastique (45) et pousse la au moins une unité de positionnement (43) vers l'extrémité intérieure.

7. Charnière dissimulée selon l'une quelconque des revendications 1 à 3, dans laquelle

une surface de palier (4111) est formée dans le passage de liaison (411) ;
un écrou (51) est vissé sur une extrémité de la tige de liaison (42) opposée à l'extrémité de vis de liaison (421) ; et
lorsque l'ensemble de liaison-pivot (30) déplace la tige de liaison (42) dans le passage de liaison (411), l'écrou (51) vient sélectivement en butée contre la surface de palier (4111) pour empêcher la tige de liaison (42) de se déplacer, empêchant ainsi le bloc de liaison (31) de l'ensemble de liaison-pivot (30) de se déplacer par rapport à la seconde base (20) de sorte que la première base (10) et la seconde base (20) ne soient pas à même de pivoter l'une par rapport à l'autre.

8. Charnière dissimulée selon la revendication 7, dans laquelle

un joint (52) est monté sur l'extrémité de la tige de liaison (42) opposée à l'extrémité de vis de liaison (421) et est monté entre l'écrou (51) et la surface de palier (4111) ; et
l'écrou (51) vient sélectivement en butée contre la surface de palier (4111) via le joint (52).

9. Charnière dissimulée avec une fonction de positionnement temporaire pour un angle d'ouverture, dans laquelle la charnière dissimulée est conçue pour être montée dans un cadre de porte (A1) et une porte (A2), et la charnière dissimulée comprend :

une première base (10) conçue pour être montée dans la porte (A2) ;
une seconde base (20) conçue pour être montée dans le cadre de porte (A1) ;

un ensemble de liaison-pivot (30) relié à la première base (10) et à la seconde base (20) ; la première base (10) et la seconde base (20) étant à même de pivoter l'une par rapport à l'autre par le biais de l'ensemble de liaison-pivot (30) ; l'ensemble de liaison-pivot (30) présentant
un bloc de liaison (31) situé dans la seconde base (20) ; dans laquelle lorsque la première base (10) et la seconde base (20) pivotent l'une par rapport à l'autre, le bloc de liaison (31) se déplace par rapport à la seconde base (20) ;
un ensemble de positionnement (40) présentant une base de positionnement (41) solidement montée sur la seconde base (20), conçue pour être montée dans le cadre de porte (A1), et présentant
un passage de liaison (411) formé à l'intérieur de la base de positionnement (41) ; et une tige de liaison (42) montée de façon mobile dans le passage de liaison (411) ;
caractérisée en ce que l'ensemble de positionnement (40) présente
au moins un passage de positionnement (412) formé à l'intérieur de la base de positionnement (41) et présentant
une extrémité intérieure communiquant avec le passage de liaison (411) sur une direction radiale du passage de liaison (411) ; et
une extrémité extérieure opposée à l'extrémité intérieure ;
une extrémité de vis de liaison (421) située à l'extérieur du passage de liaison (411) et reliée au bloc de liaison (31) de l'ensemble de liaison-pivot (30) ; dans laquelle lorsque la première base (10) et la seconde base (20) pivotent l'une par rapport à l'autre par le biais de l'ensemble de liaison-pivot (30), le bloc de liaison (31) de l'ensemble de liaison-pivot (30) déplace la tige de liaison (42) dans le passage de liaison (411) ; et
au moins une rainure de positionnement (422) formée sur une surface annulaire de la tige de liaison (42) et sélectivement alignée sur l'extrémité intérieure du au moins un passage de positionnement (412) le long du mouvement de la tige de liaison (42) ;
au moins une unité de positionnement (43) montée de façon mobile dans le au moins un passage de positionnement (412) ; et
au moins une unité élastique (45) montée dans le au moins un passage de positionnement (412) et poussant la au moins une unité de positionnement (43) vers l'extrémité intérieure pour que la au moins une unité de positionnement (43) fasse saillie hors de l'extrémité intérieure et vienne en butée contre la surface annulaire de la tige de liaison (42) ; dans laquelle lorsque la au moins une rainure de positionnement (422) de la tige de liaison (42) est alignée sur l'extrémité intérieure du au moins un passage de positionnement (412), la au moins une unité de positionnement (43) est poussée par la au moins une unité élastique (45) et fait saillie jusque dans la au moins une rainure de positionnement (422), de sorte que l'unité de positionnement (43) empêche la tige de liaison (42) de continuer à se déplacer et empêche le bloc de liaison (31) de se déplacer par rapport à la seconde base (20), et ainsi la première base (10) et la seconde base (20) ne peuvent pas pivoter l'une par rapport à l'autre.

10. Charnière pour porte en verre dissimulée avec une fonction de positionnement temporaire pour un angle d'ouverture, dans laquelle la charnière pour porte en verre dissimulée est conçue pour être montée dans un cadre de porte (A1) et est conçue pour être reliée à une porte en verre (A3), et la charnière pour porte en verre dissimulée comprend :

une première base (10A) conçue pour être reliée à la porte en verre (A3) ;
une seconde base (20A) conçue pour être montée dans le cadre de porte (A1) ;
un ensemble de liaison-pivot (30A) relié à la première base (10A) et à la seconde base (20A) ; la première base (10A) et la seconde base (20A) étant à même de pivoter l'une par rapport à l'autre via l'ensemble de liaison-pivot (30A) ; l'ensemble de liaison-pivot (30A) présentant
un bloc de liaison (31) situé dans la seconde base (20A) ; dans laquelle lorsque la première base (10A) et la seconde base (20A) pivotent l'une par rapport à l'autre, le bloc de liaison (31) se déplace par rapport à la seconde base (20A) ;
un ensemble de positionnement (40) présentant une base de positionnement (41) solidement montée sur la seconde base (20A), conçue pour être montée dans le cadre de porte (A1), et présentant
un passage de liaison (411) formé à l'intérieur de la base de positionnement (41) ; et une tige de liaison (42) montée de façon mobile dans le passage de liaison (411) ;
caractérisée en ce que l'ensemble de positionnement (40) présente
au moins un passage de positionnement (412) formé à l'intérieur de la base de positionnement (41) et présentant
une extrémité intérieure communiquant avec le passage de liaison (411) sur une direction radiale du passage de liaison (411) ; et
une extrémité extérieure opposée à l'extrémité intérieure ;
une extrémité de vis de liaison (421) située à l'extérieur du passage de liaison (411) et reliée

au bloc de liaison (31) de l'ensemble de liaison-pivot (30A) ; dans laquelle lorsque la première base (10A) et la seconde base (20A) pivotent l'une par rapport à l'autre par le biais de l'ensemble de liaison-pivot (30A), le bloc de liaison (31) de l'ensemble de liaison-pivot (30A) déplace la tige de liaison (42) dans le passage de liaison (411) ; et

au moins une rainure de positionnement (422) formée sur une surface annulaire de la tige de liaison (42) et sélectivement alignée sur l'extrémité intérieure du au moins un passage de positionnement (412) le long du mouvement de la tige de liaison (42) ;

au moins une unité de positionnement (43) montée de façon mobile dans le au moins un passage de positionnement (412) ; et

au moins une unité élastique (45) montée dans le au moins un passage de positionnement (412) et poussant la au moins une unité de positionnement (43) vers l'extrémité intérieure pour que la au moins une unité de positionnement (43) fasse saillie hors de l'extrémité intérieure et vienne en butée contre la surface annulaire de la tige de liaison (42) ; dans laquelle lorsque la au moins une rainure de positionnement (422) de la tige de liaison (42) est alignée sur l'extrémité intérieure du au moins un passage de positionnement (412), la au moins une unité de positionnement (43) est poussée par la au moins une unité élastique (45) et fait saillie jusque dans la au moins une rainure de positionnement (422), de sorte que l'unité de positionnement (43) empêche la tige de liaison (42) de continuer à se déplacer et empêche le bloc de liaison (31) de se déplacer par rapport à la seconde base (20A), et ainsi la première base (10A) et la seconde base (20A) ne peuvent pas pivoter l'une par rapport à l'autre.

11. Charnière pour porte en verre dissimulée selon la revendication 10, dans laquelle l'extrémité de vis de liaison (421) de la tige de liaison (42) est vissée avec l'ensemble de liaison-pivot (30A) de sorte que la tige de liaison (42) soit ajustable par rapport à l'ensemble de liaison-pivot (30A).

12. Charnière pour porte en verre dissimulée selon la revendication 11, dans laquelle

l'extrémité de vis de liaison (421) de la tige de liaison (42) est vissée avec le bloc de liaison (31) de l'ensemble de liaison-pivot (30A) et est à même de se déplacer à travers le bloc de liaison (31) ; et

une rainure opérationnelle (423) est formée sur une surface d'extrémité de l'extrémité de vis de liaison (421) et est conçue pour s'engager avec un outil portatif.

13. Charnière pour porte en verre dissimulée selon l'une quelconque des revendications 10 à 12, dans laquelle

l'ensemble de liaison-pivot (30A) présente

deux tiges de vis (32) respectivement vissées avec deux côtés du bloc de liaison (31) ; dans laquelle lorsque la première base (10A) et la seconde base (20A) pivotent l'une par rapport à l'autre, les deux tiges de vis (32) se déplacent par rapport à la seconde base (20A) le long du bloc de liaison (31) ; et

deux carters (35) respectivement emmanchés sur les deux tiges de vis (32) ;

la seconde base (20A) présente

deux saillies de positionnement (21) ; chacune des deux saillies de positionnement (21) présentant

une surface plate de butée (211) ;

lorsque la première base (10A) et la seconde base (20A) sont pivotées relativement d'un angle de 90 degrés entre la porte en verre (A3) et le cadre de porte (A1), les deux carters (35) viennent étroitement en butée contre les surfaces plates de butée (211) des deux saillies de positionnement (21) respectivement, de sorte que les deux saillies de positionnement (21) positionnent les deux tiges de vis (32) via les deux carters (35) et empêchent le bloc de liaison (31) de se déplacer par rapport à la seconde base (20A), faisant ainsi que la première base (10A) et la seconde base (20A) ne sont pas à même de pivoter l'une par rapport à l'autre.

14. Charnière pour porte en verre dissimulée selon l'une quelconque des revendications 10 à 12, dans laquelle la première base (10A) présente

un segment de fixation de porte avant (11) conçu pour être situé sur un côté de la porte en verre (A3) ;

un segment de fixation de porte arrière (12) conçu pour être situé sur un autre côté de la porte en verre (A3) et présentant trois trous de vis (121) ;

une unité antidérapante avant (13) conçue pour être située entre le segment de fixation de porte avant (11) et la porte en verre (A3) et conçue pour venir en butée contre une surface latérale de la porte en verre (A3) ;

une unité antidérapante arrière (14) conçue pour être située entre la porte en verre (A3) et le segment de fixation de porte arrière (12) et conçue pour venir en butée contre une autre surface latérale de la porte en verre (A3) ;

une unité de pression (15) située entre l'unité

antidérapante arrière (14) et le segment de fixation de porte arrière (12) et présentant deux rainures de pression (151) ;
deux tiges de vis de pression (16) respectivement vissées avec deux des trois trous de vis (121) du segment de fixation de porte arrière (12) et faisant respectivement saillie jusque dans et venant en butée contre les deux rainures de pression (151) de l'unité de pression (15) ; les deux tiges de vis de pression (16) étant à même de se déplacer par rapport au segment de fixation de porte arrière (12) en tournant pour pousser l'unité de pression (15) vers le segment de fixation de porte avant (11) de manière à mettre étroitement en butée les uns contre les autres l'unité de pression (15), l'unité antidérapante arrière (14), la porte en verre (A3), l'unité antidérapante avant (13) et le segment de fixation de porte avant (11) ;
une tige de vis pénétrante (17) vissée ave l'autre des trois trous de vis (121) du segment de fixation de porte arrière (12), montée séquentiellement à travers le segment de fixation de porte arrière (12), l'unité de pression (15), l'unité antidérapante arrière (14), la porte en verre (A3) et l'unité antidérapante avant (13), et montée dans et assemblée avec le segment de fixation de porte avant (11).

15. Charnière pour porte en verre dissimulée selon l'une quelconque des revendications 10 à 12, dans laquelle la première base (10B) présente

un segment de fixation de porte avant (11B) conçu pour être situé sur un côté de la porte en verre (A3) ;
un segment de fixation de porte arrière (12) conçu pour être situé sur un autre côté de la porte en verre (A3) et présentant trois trous de vis (121) ;
une unité antidérapante avant (13) conçue pour être située entre le segment de fixation de porte avant (11B) et la porte en verre (A3) et conçue pour venir en butée contre une surface latérale de la porte en verre (A3) ;
une unité antidérapante arrière (14) conçue pour être située entre la porte en verre (A3) et le segment de fixation de porte arrière (12) et conçue pour venir en butée contre une autre surface latérale de la porte en verre (A3) ;
une unité de pression (15B) située entre l'unité antidérapante arrière (14) et le segment de fixation de porte arrière (12) et présentant trois rainures de pression (151B) ;
trois tiges de vis de pression (16B) respectivement vissées avec les trois trous de vis (121) du segment de fixation de porte arrière (12), montées à travers le segment de fixation de porte arrière (12), et venant respectivement en butée contre les trois rainures de pression (151B) de l'unité de pression (15B) ; les trois tiges de vis de pression (16B) étant à même de se déplacer par rapport au segment de fixation de porte arrière (12) en tournant pour pousser l'unité de pression (15B) vers le segment de fixation de porte avant (11B) de manière à mettre étroitement en butée les uns contre les autres l'unité de pression (15B), l'unité antidérapante arrière (14), la porte en verre (A3), l'unité antidérapante avant (13) et le segment de fixation de porte avant (11B).

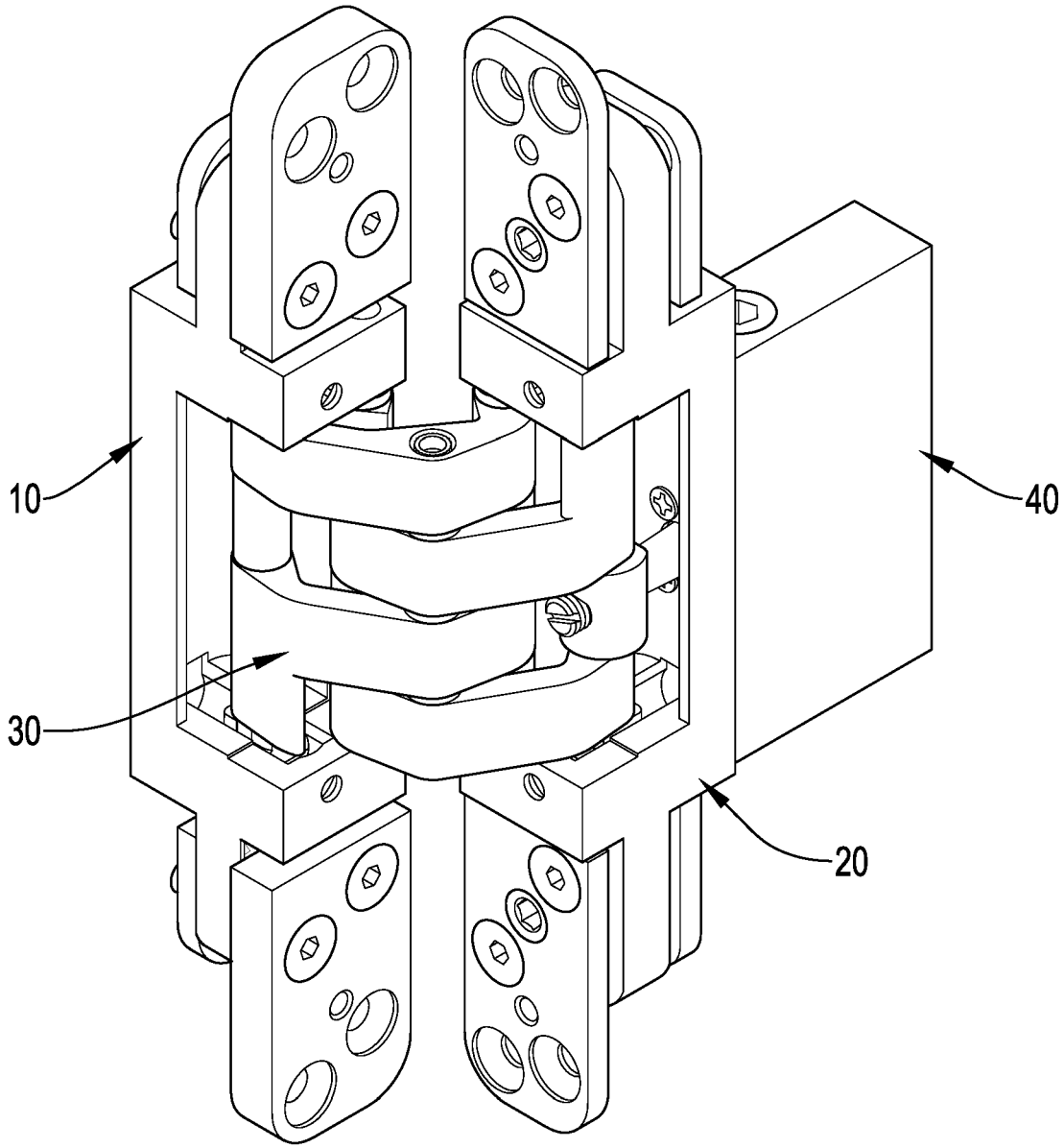


FIG.1

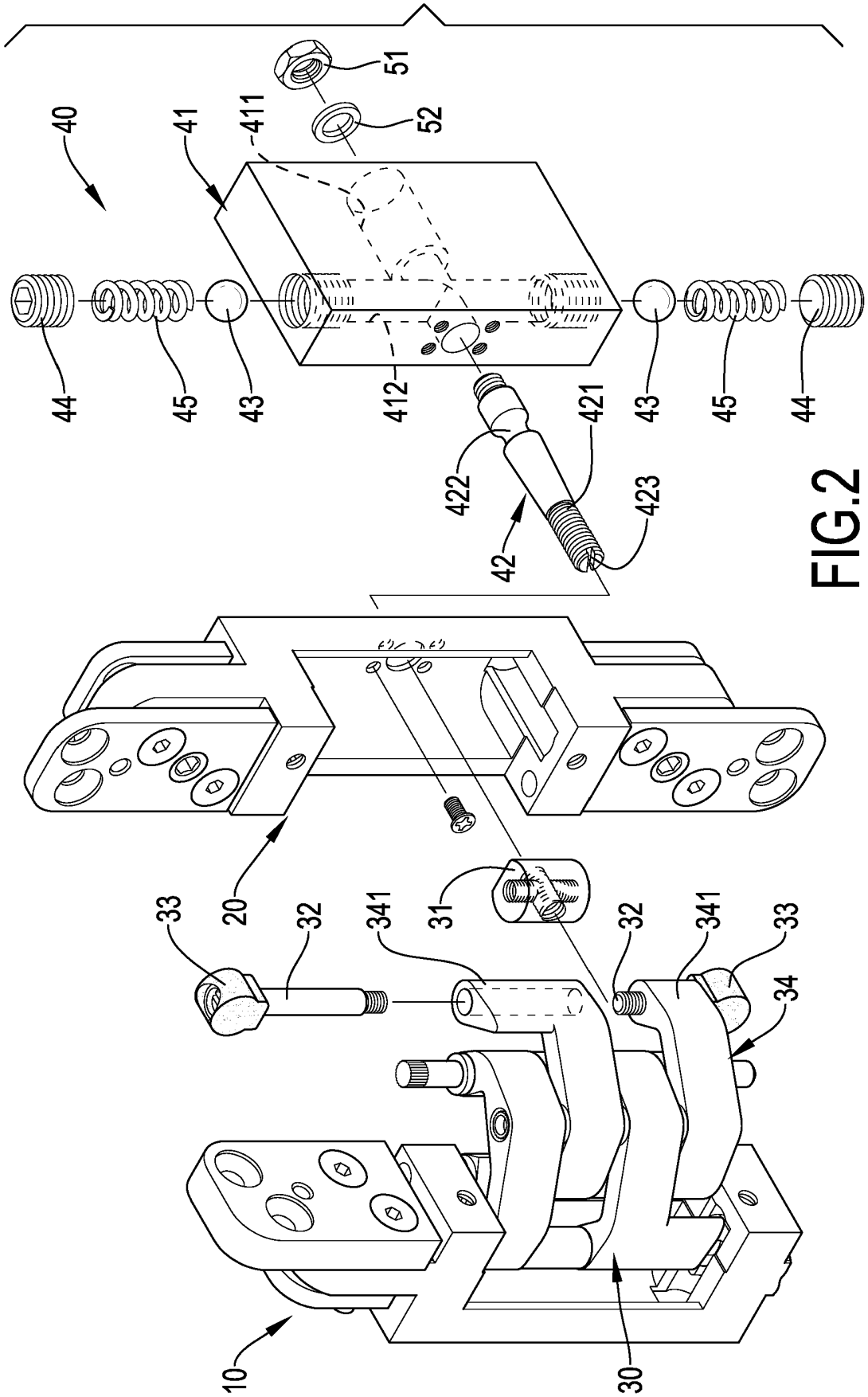


FIG.2

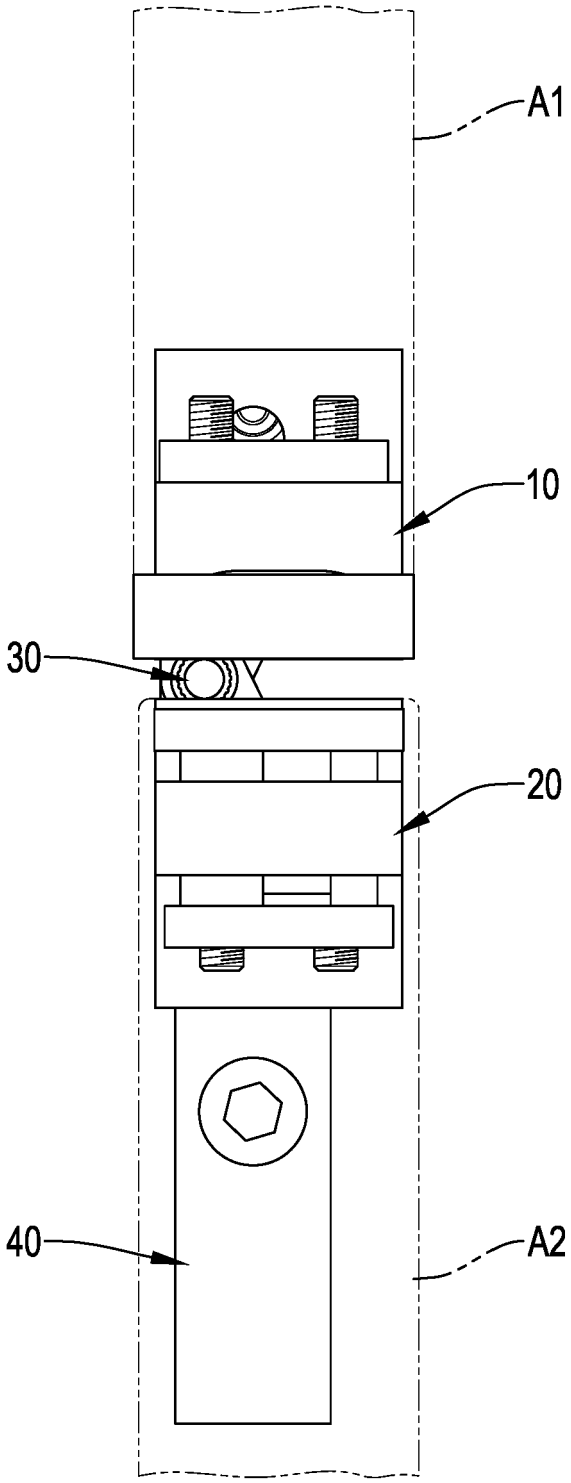


FIG.3

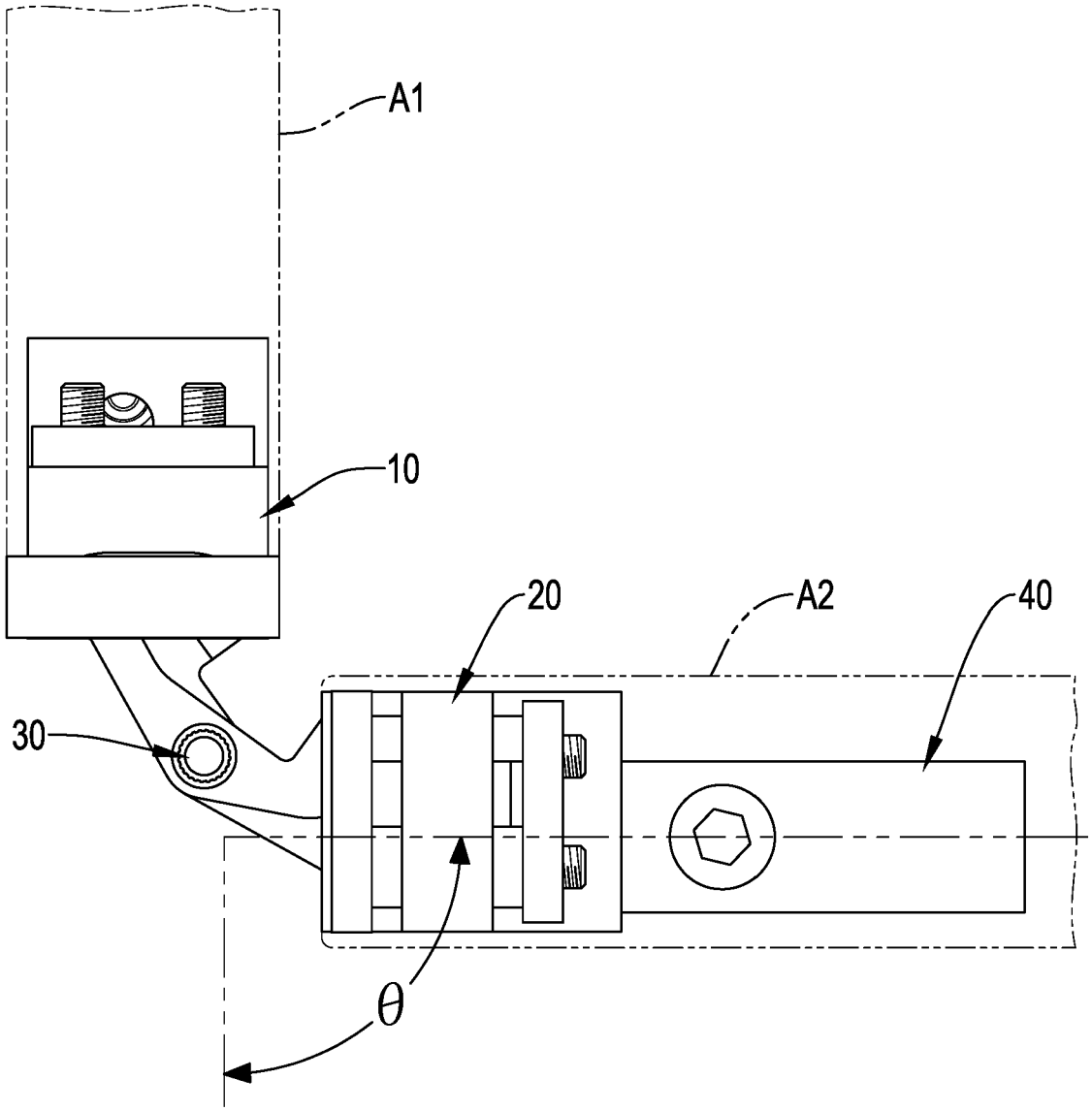


FIG.4

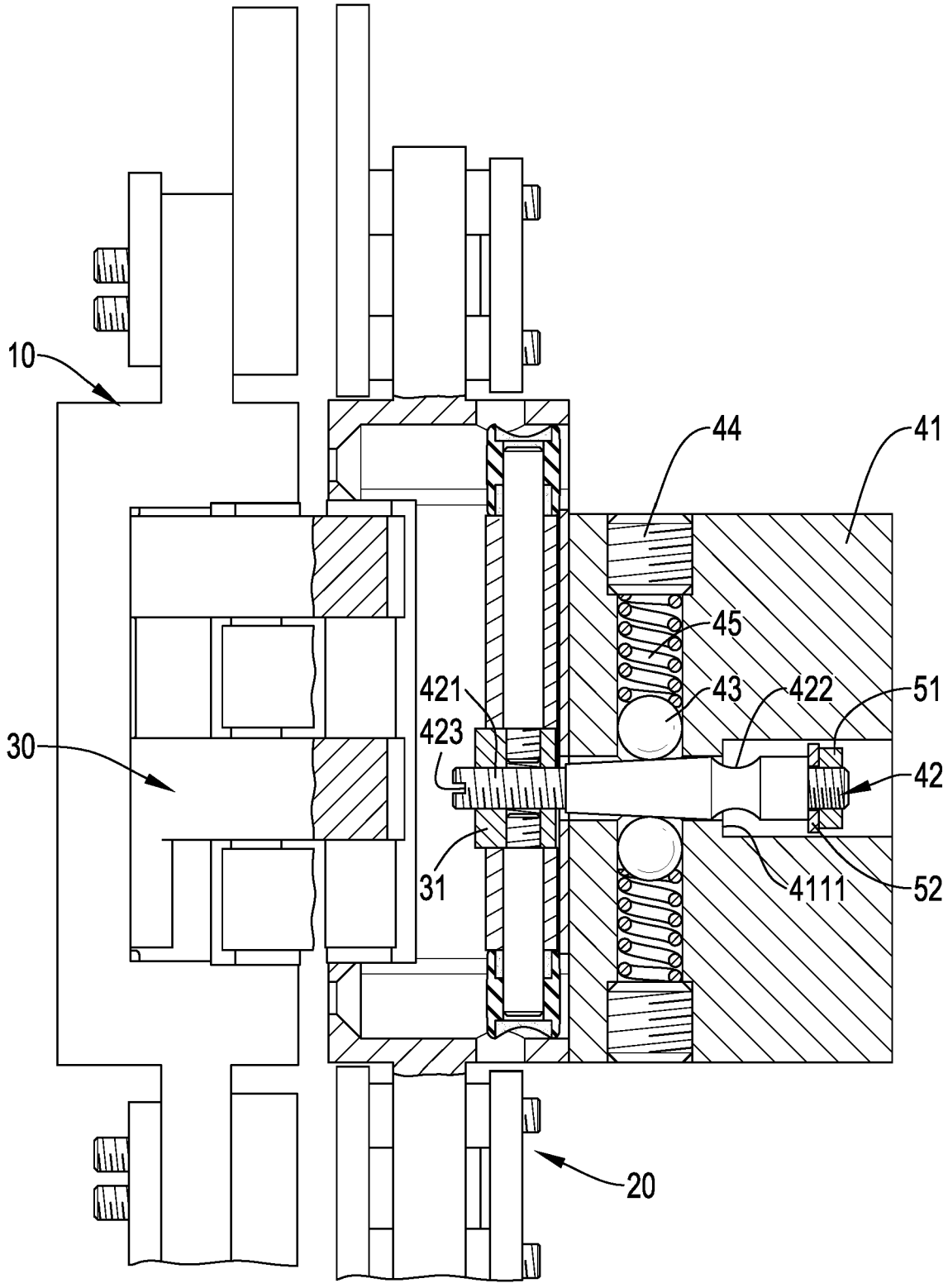


FIG.5

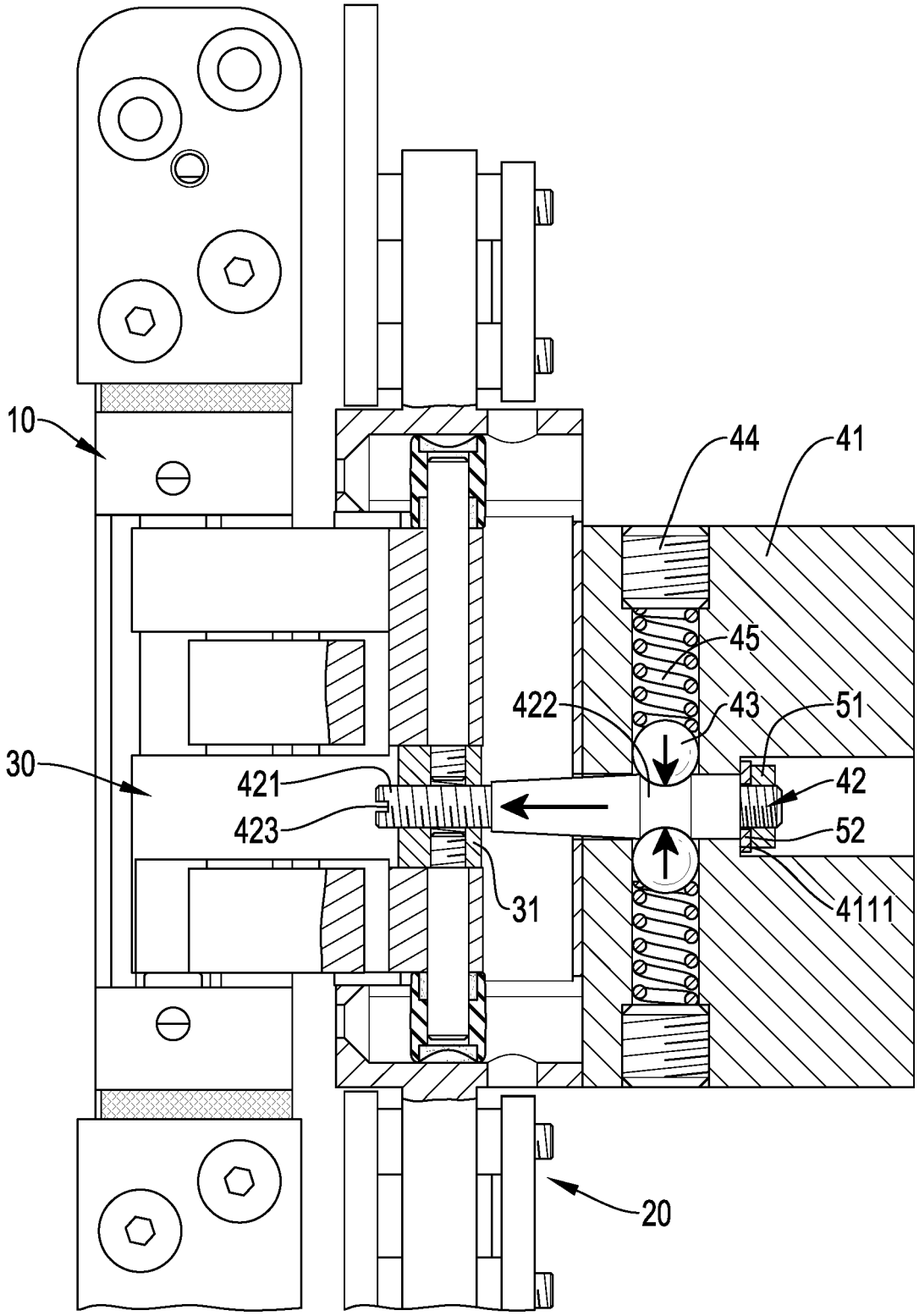


FIG.6

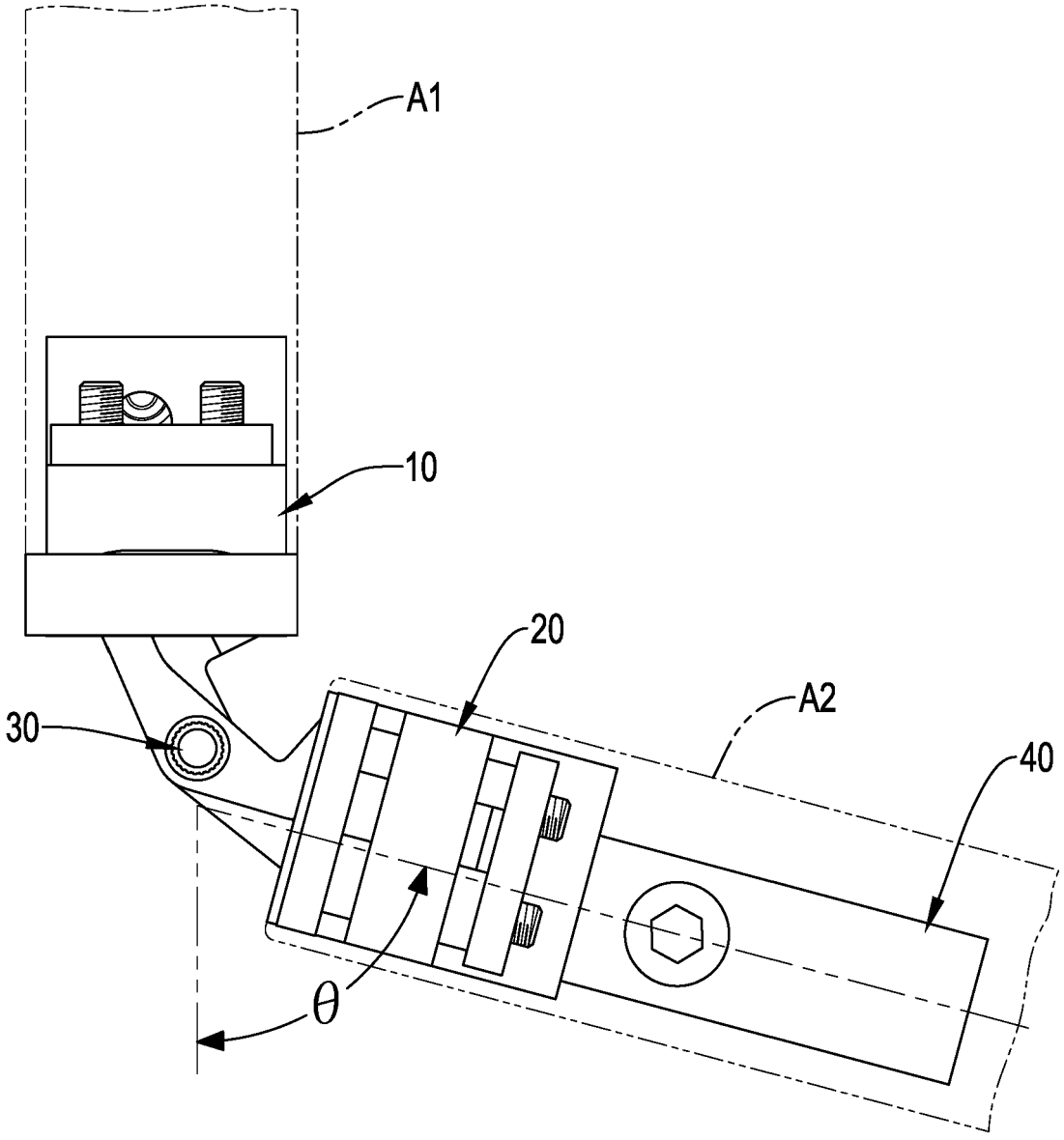


FIG.7

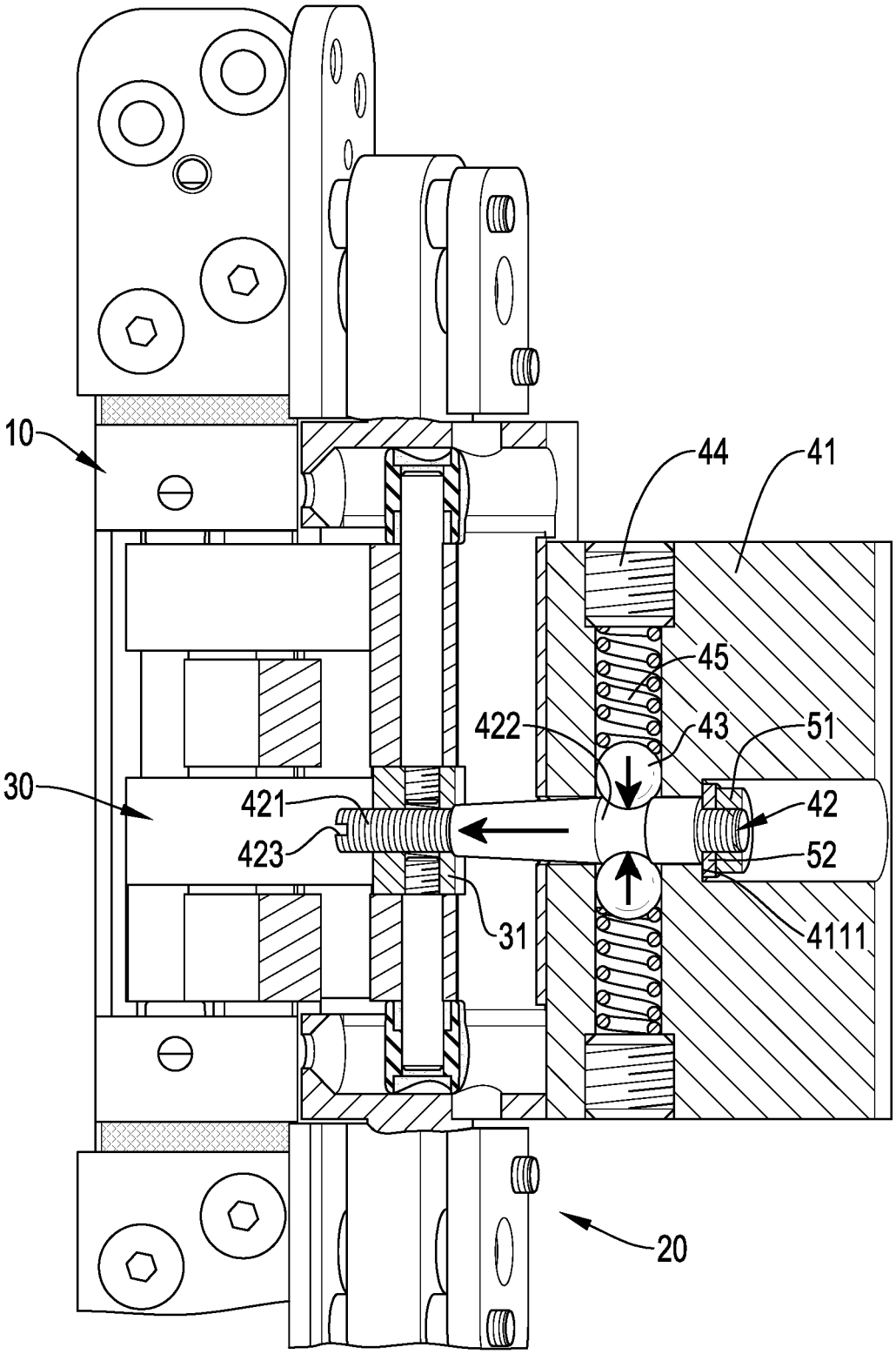


FIG.8

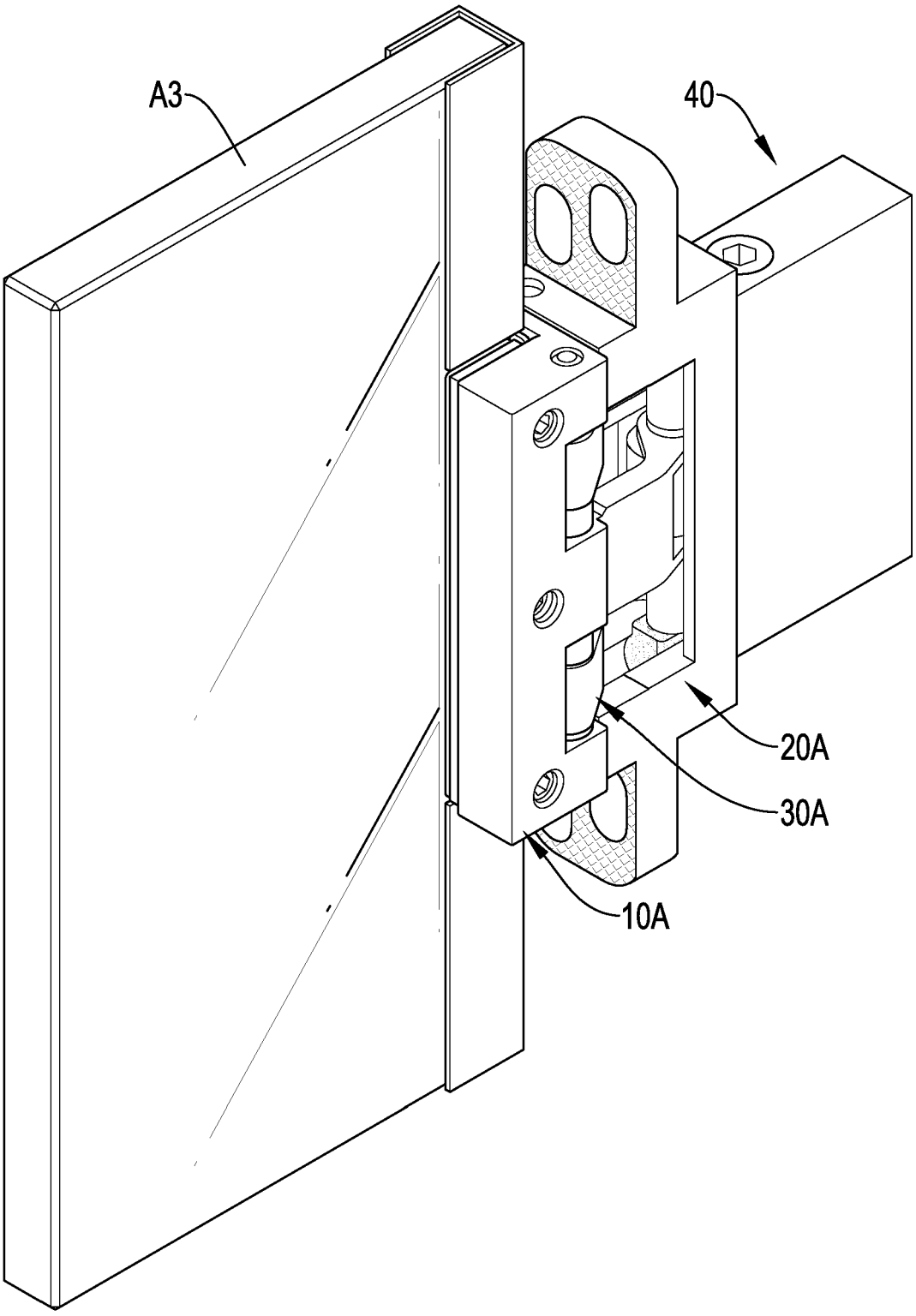


FIG.9

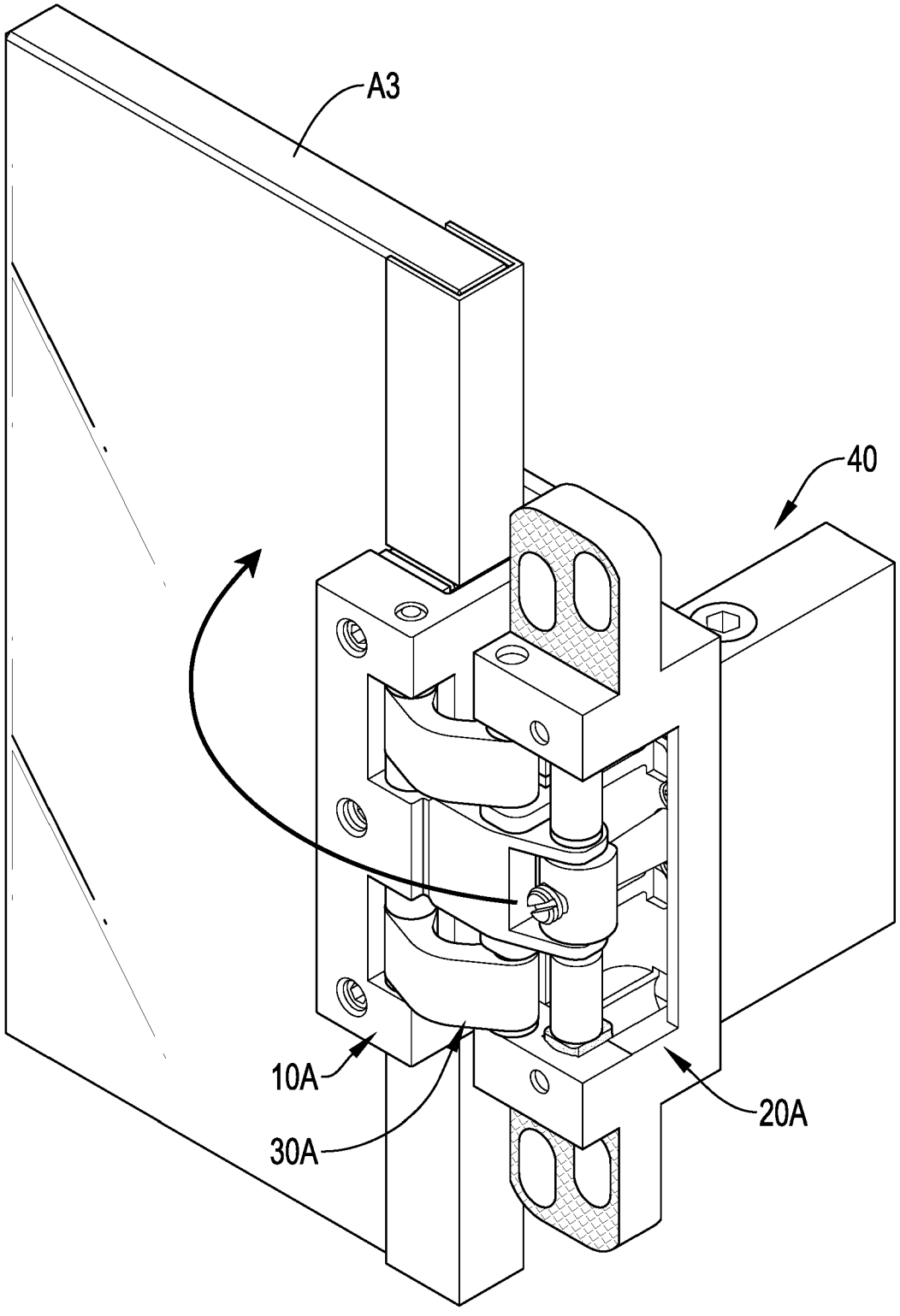


FIG.10

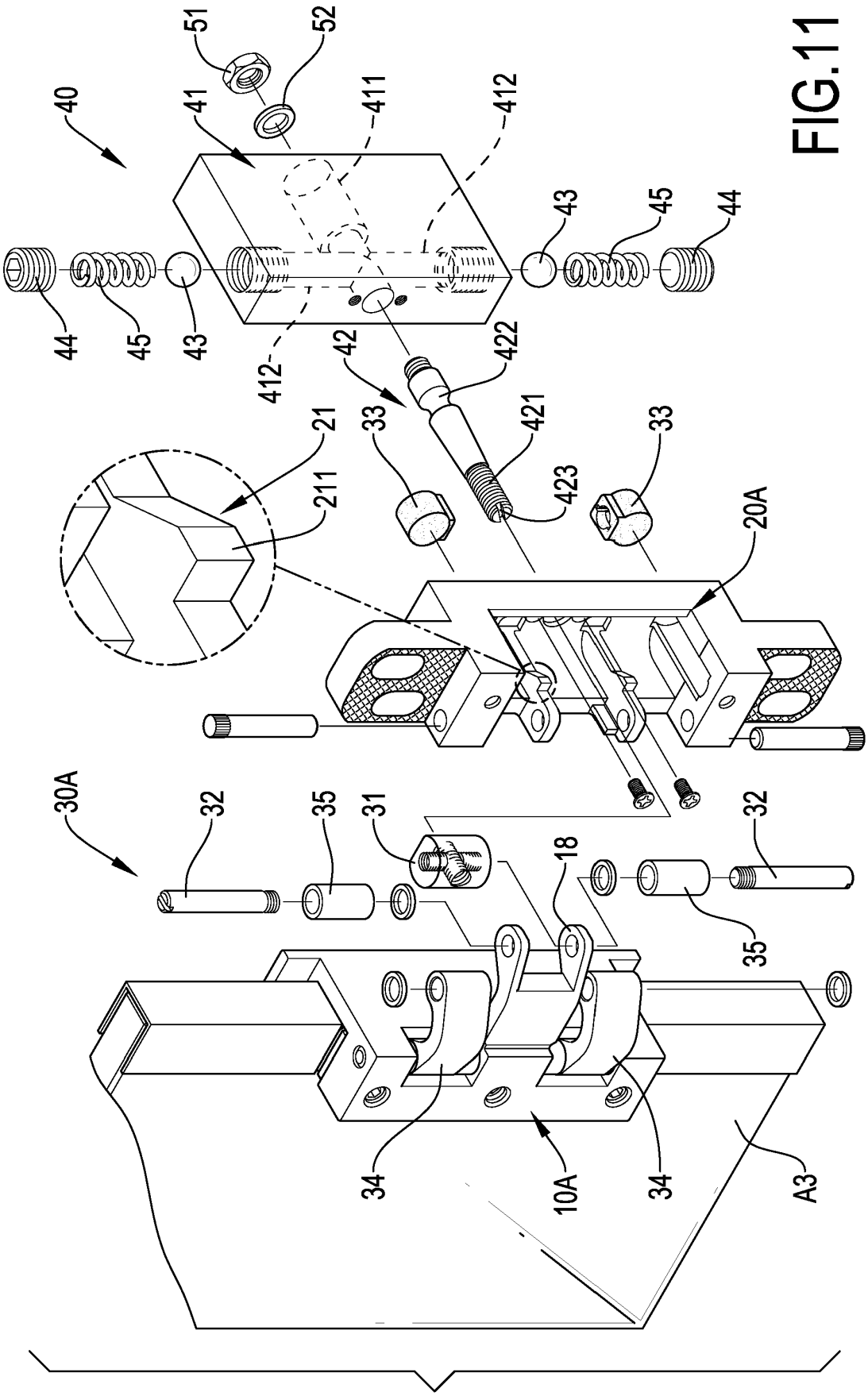

51
52
40
41
411
412
43
45
44
42
422
421
423
33
21
211
20A
30A
32
35
31
18
34
10A
A3

FIG.11

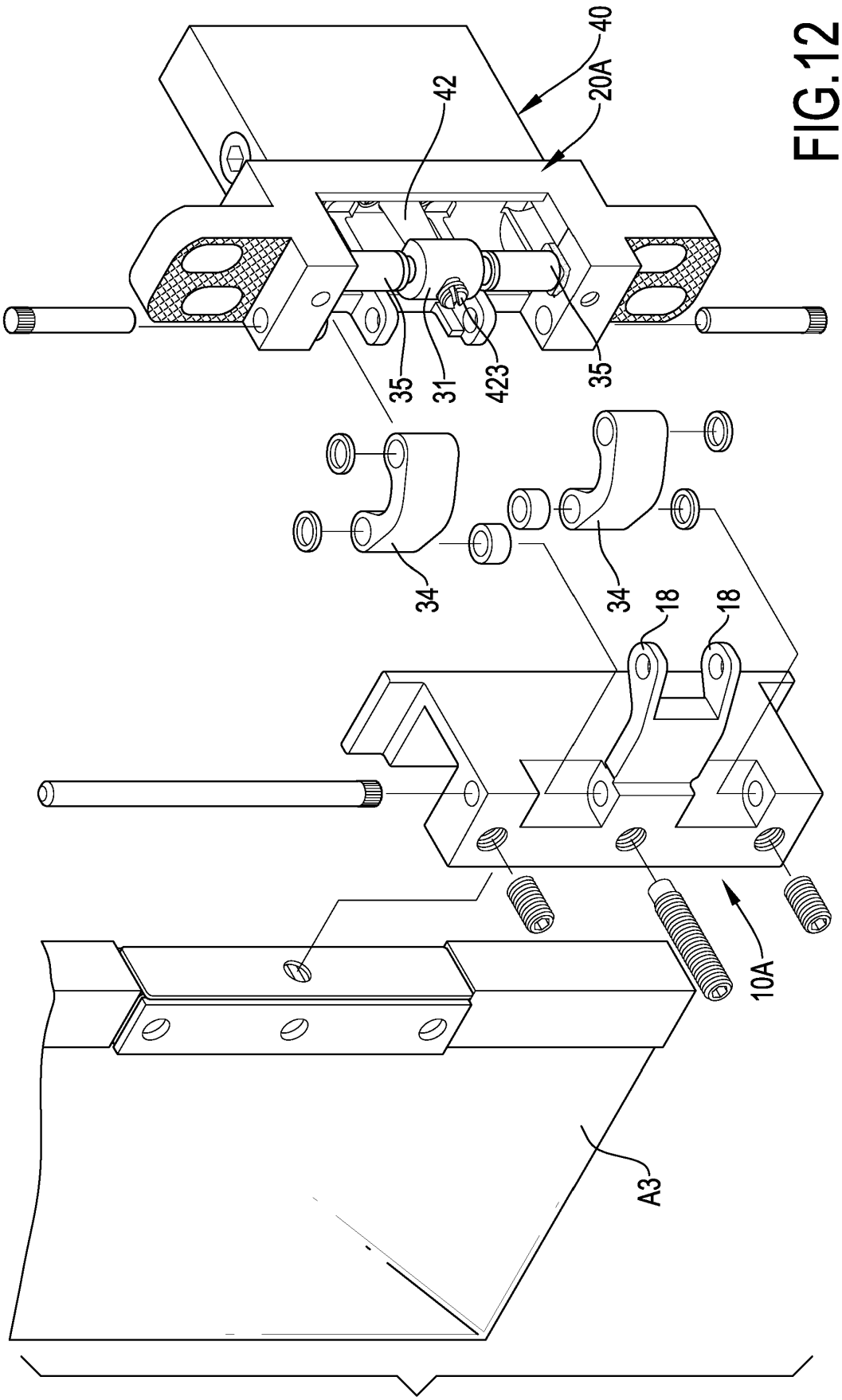


FIG.12

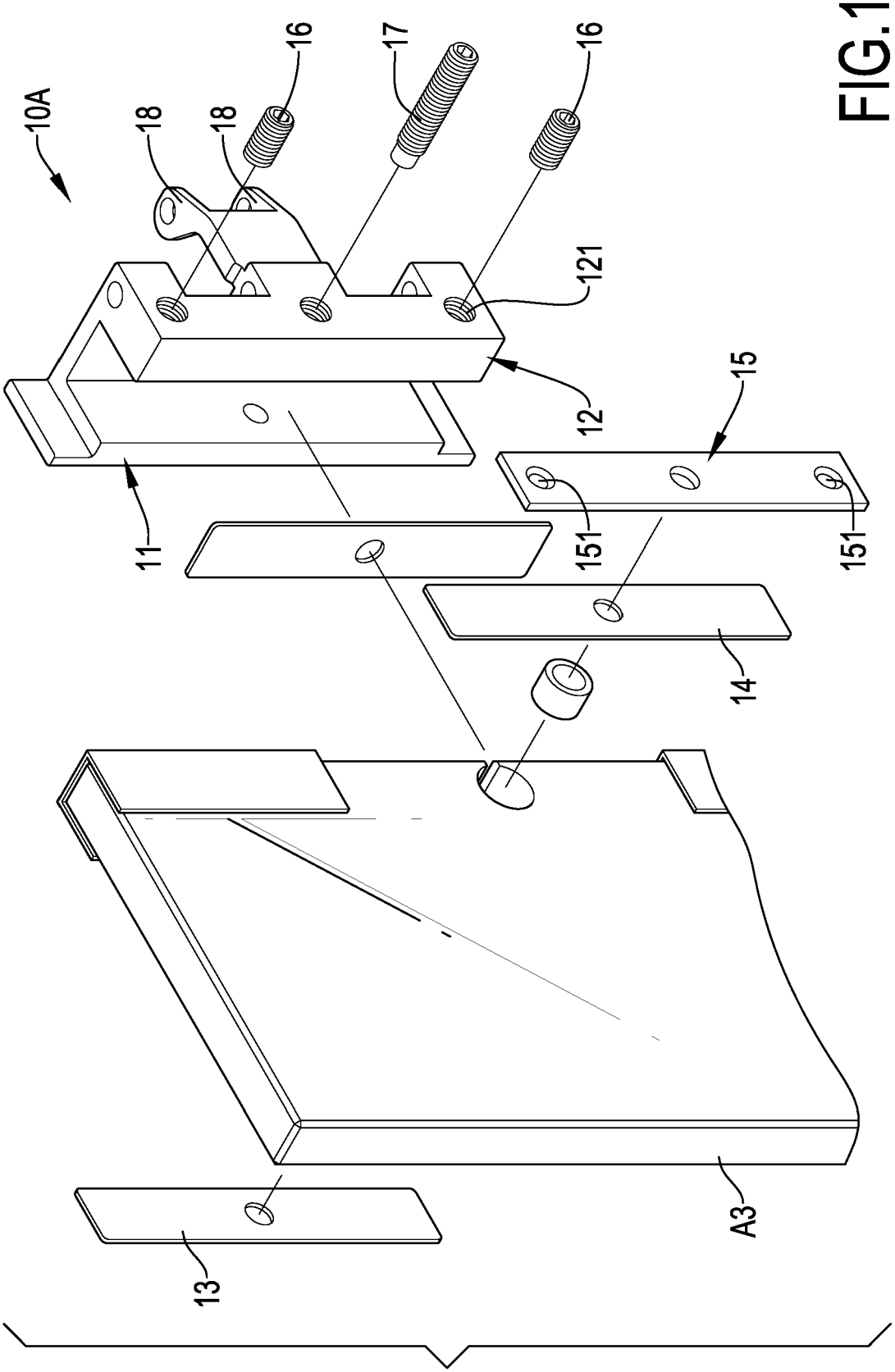


FIG.13

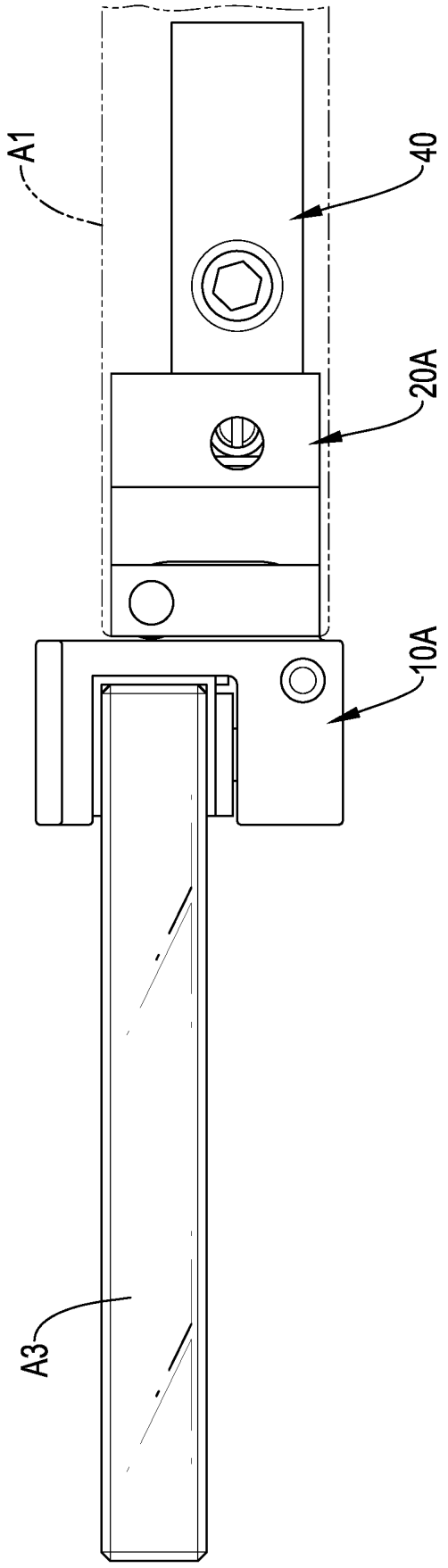


FIG.14

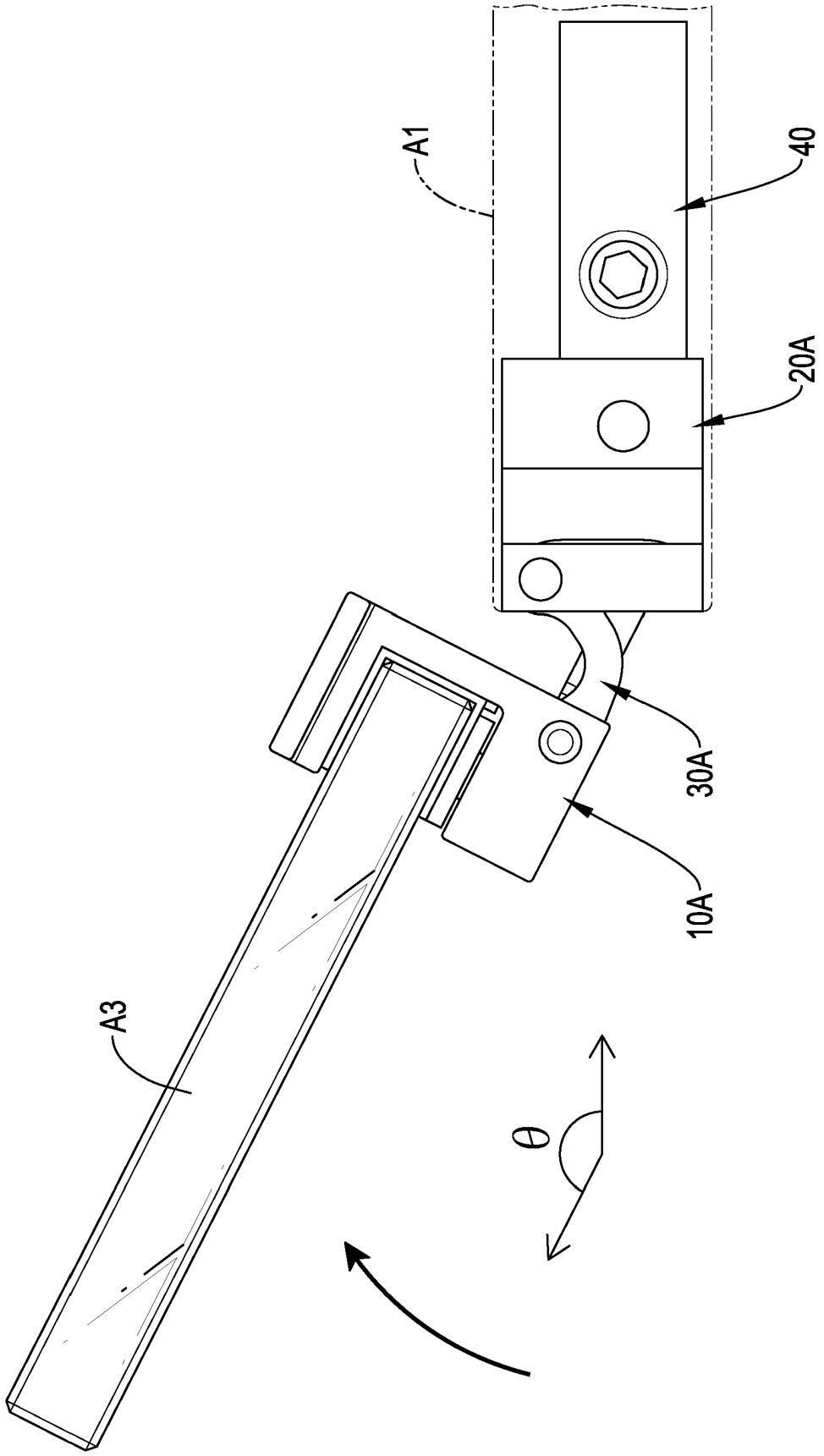


FIG.15

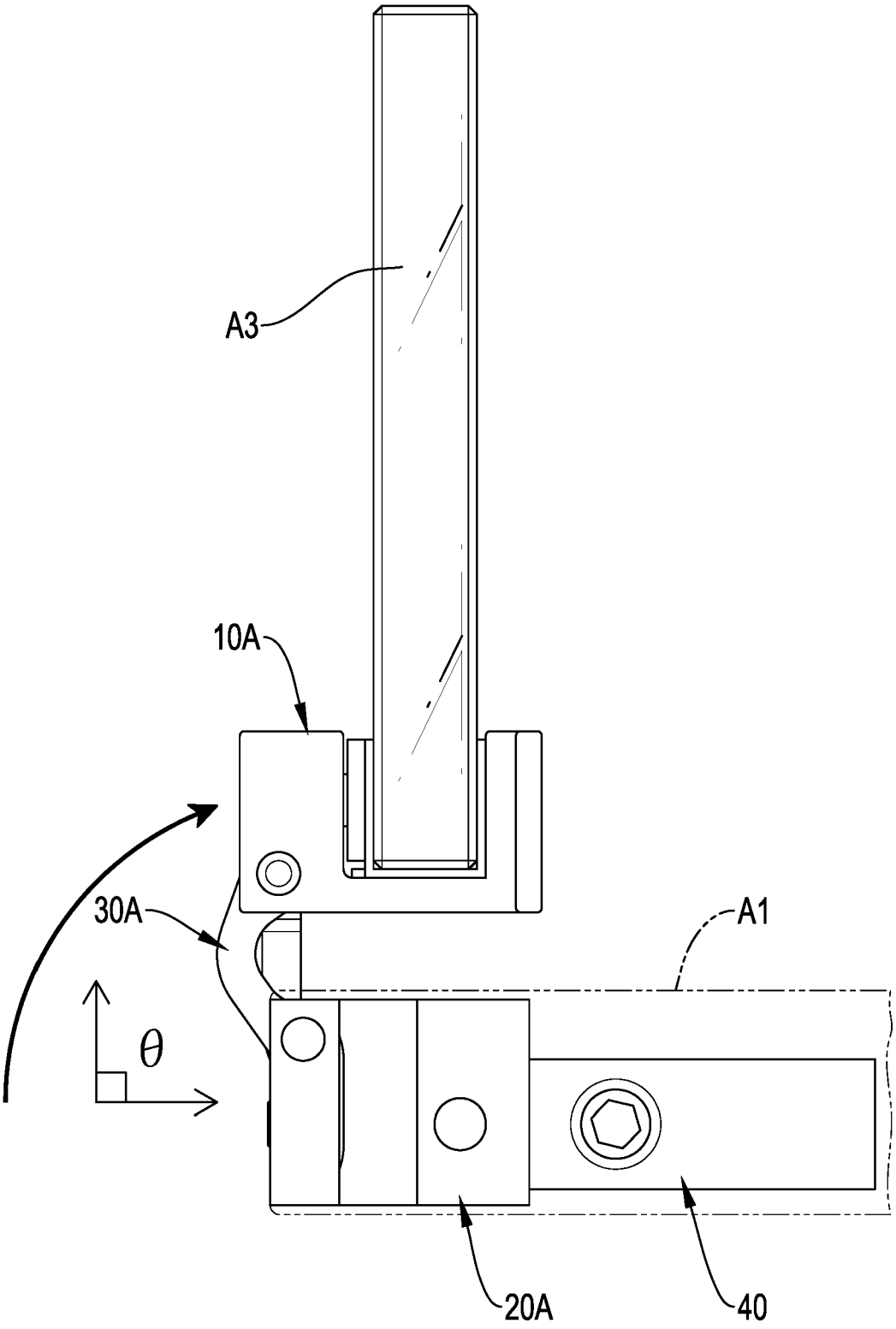


FIG.16

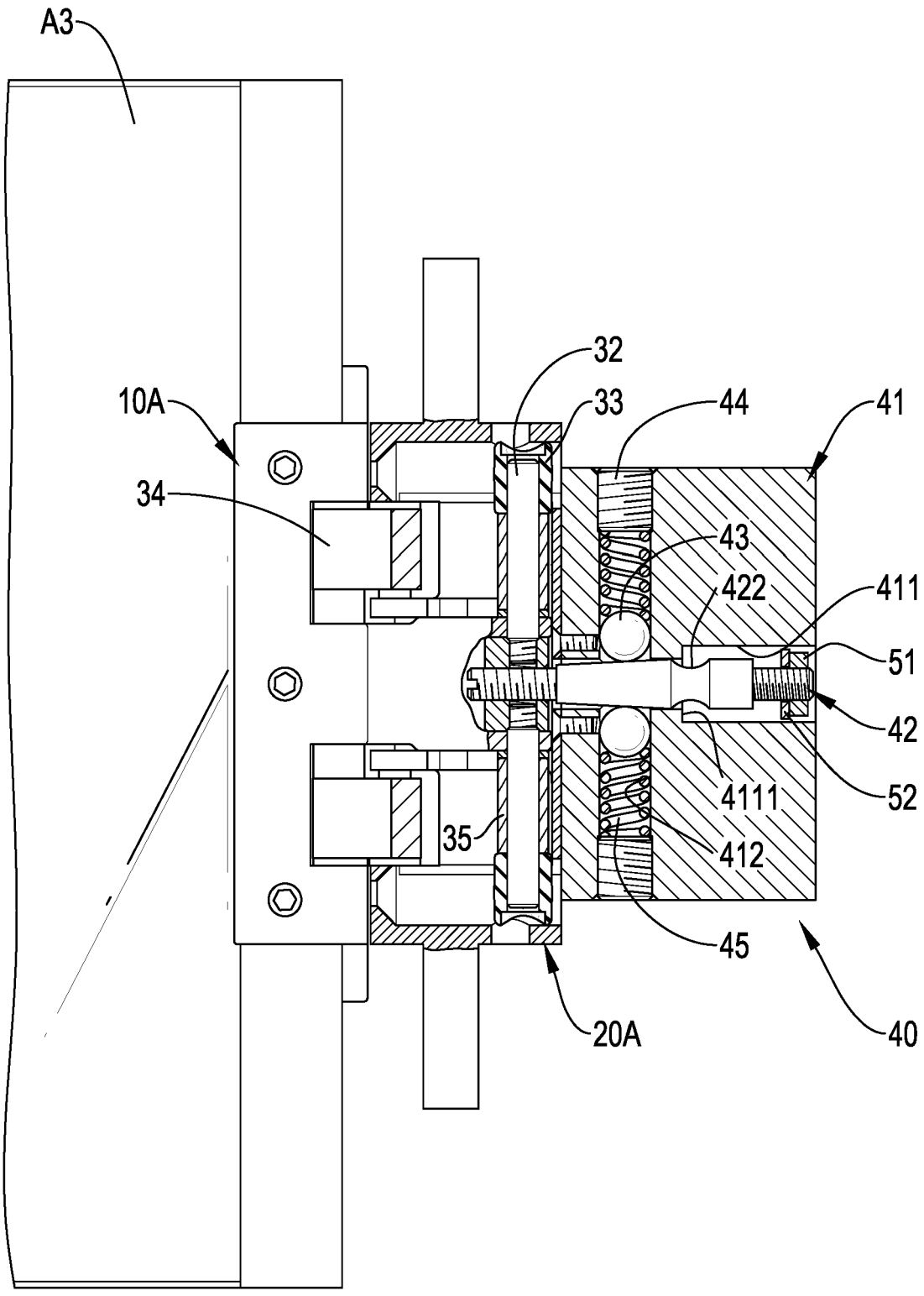


FIG.17

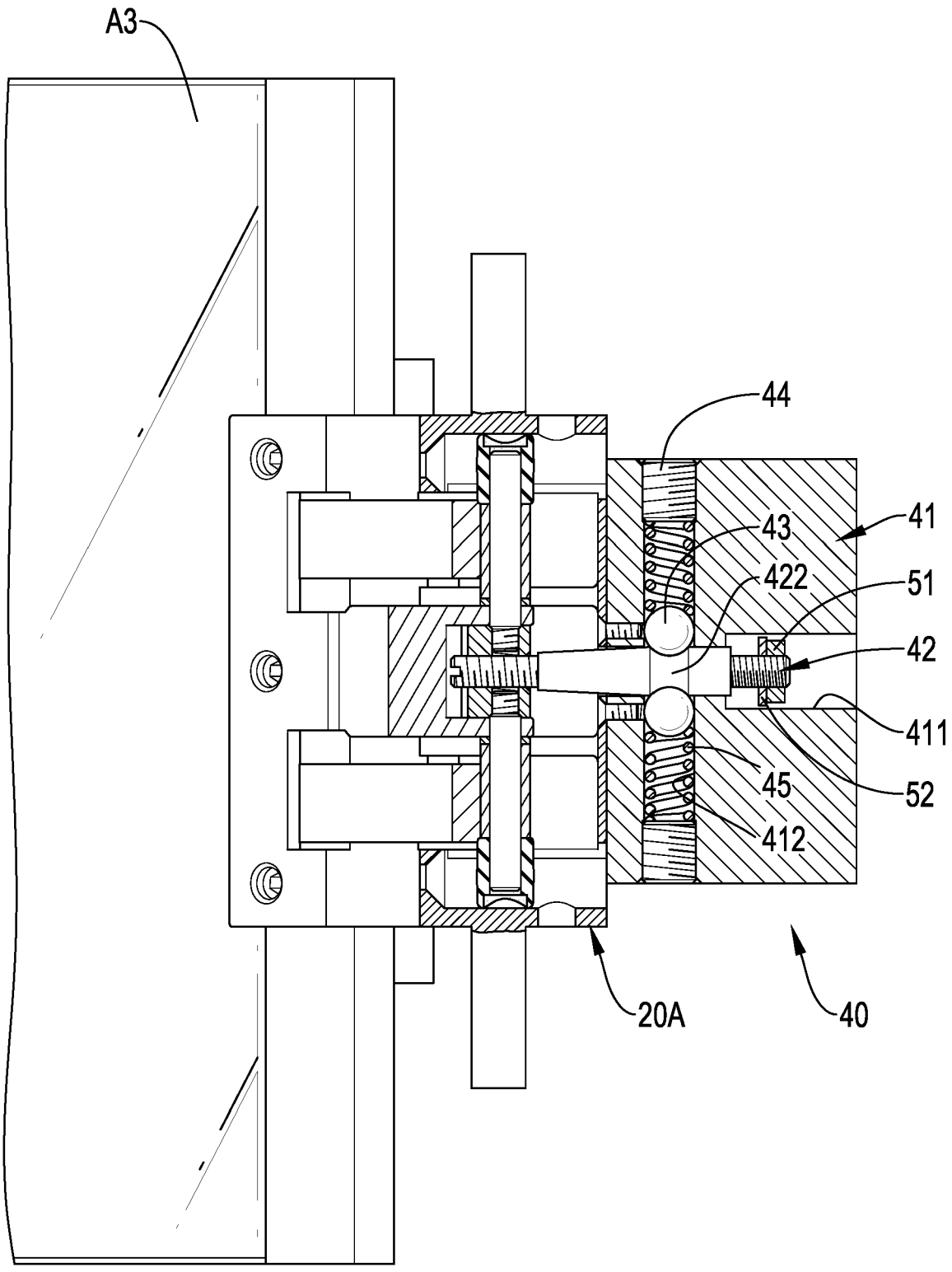


FIG.18

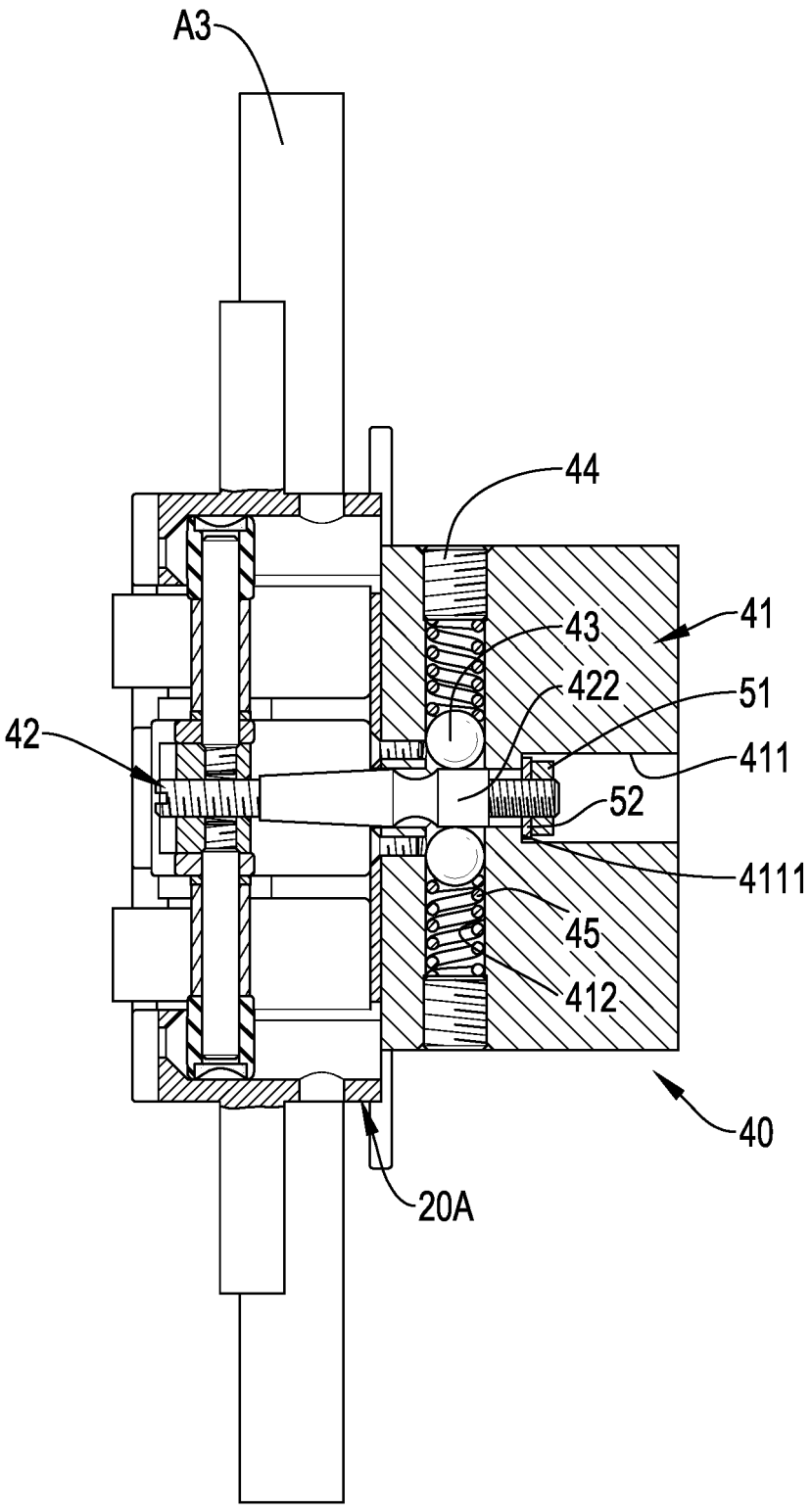


FIG.19

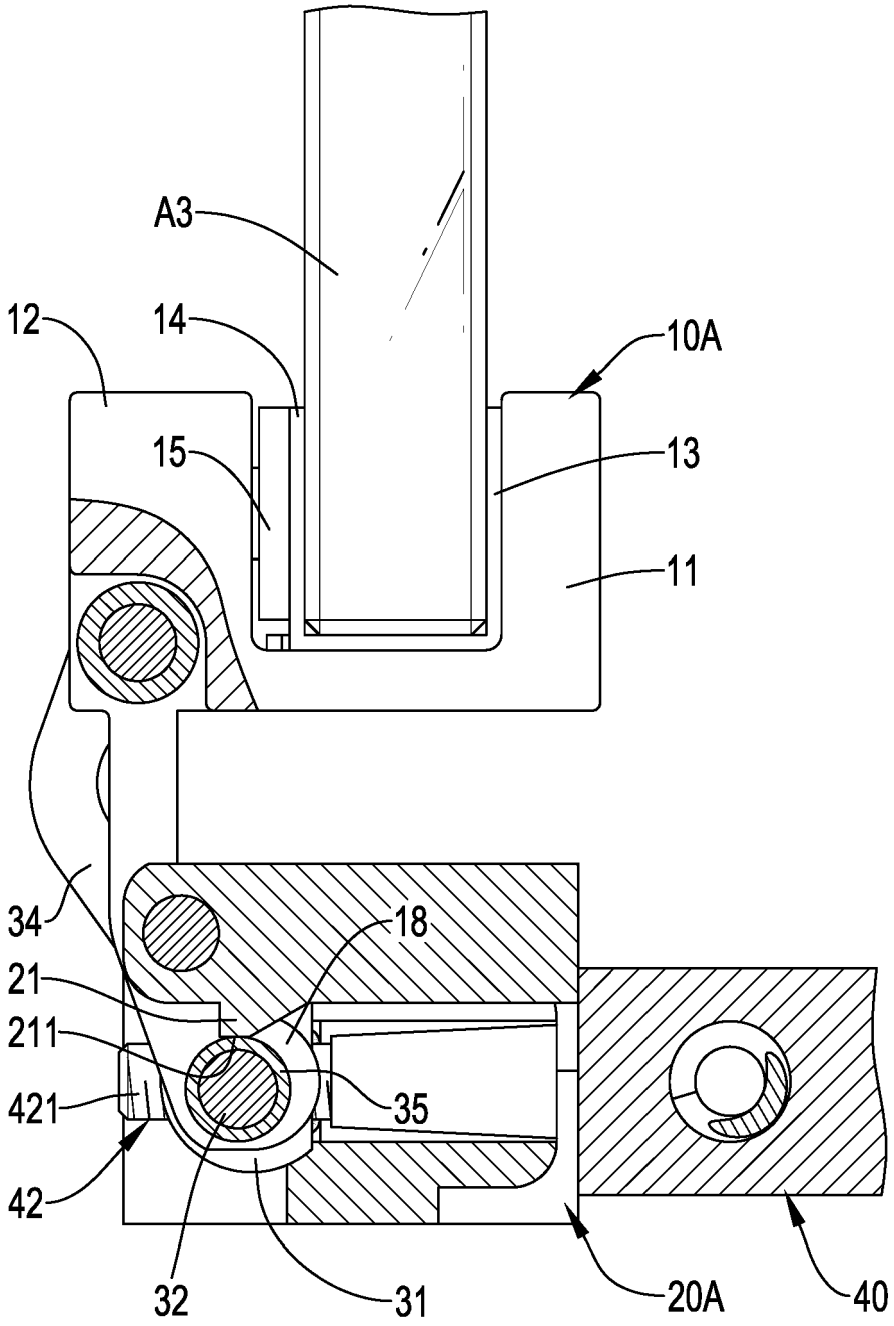


FIG.20

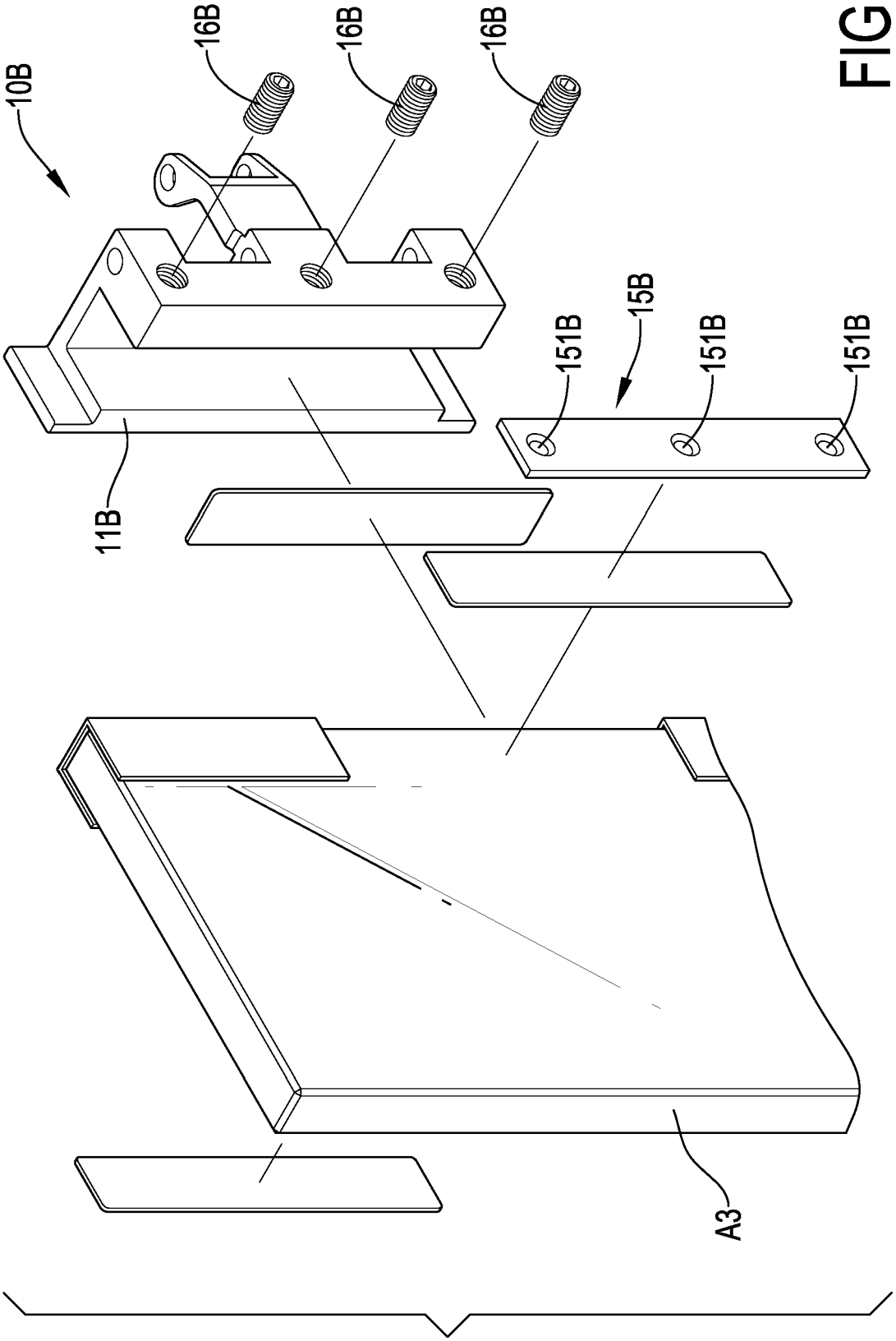


FIG.21

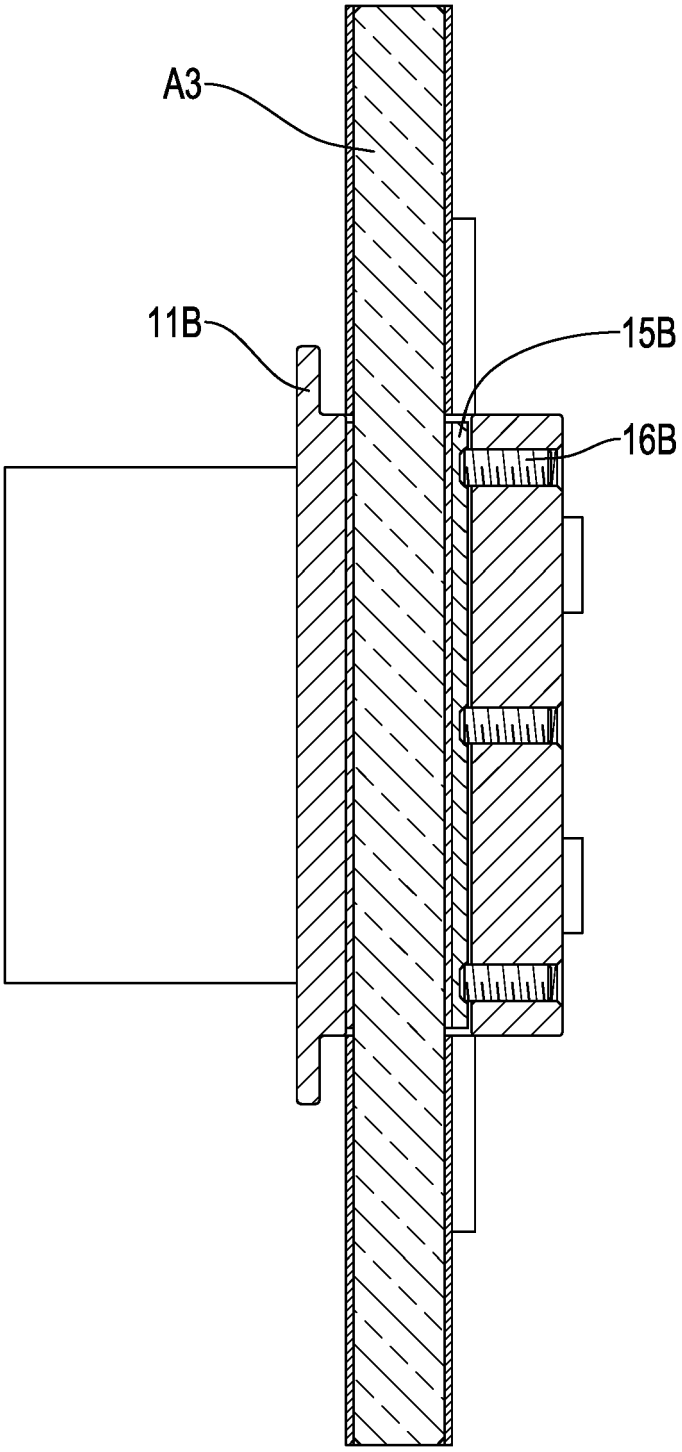


FIG.22

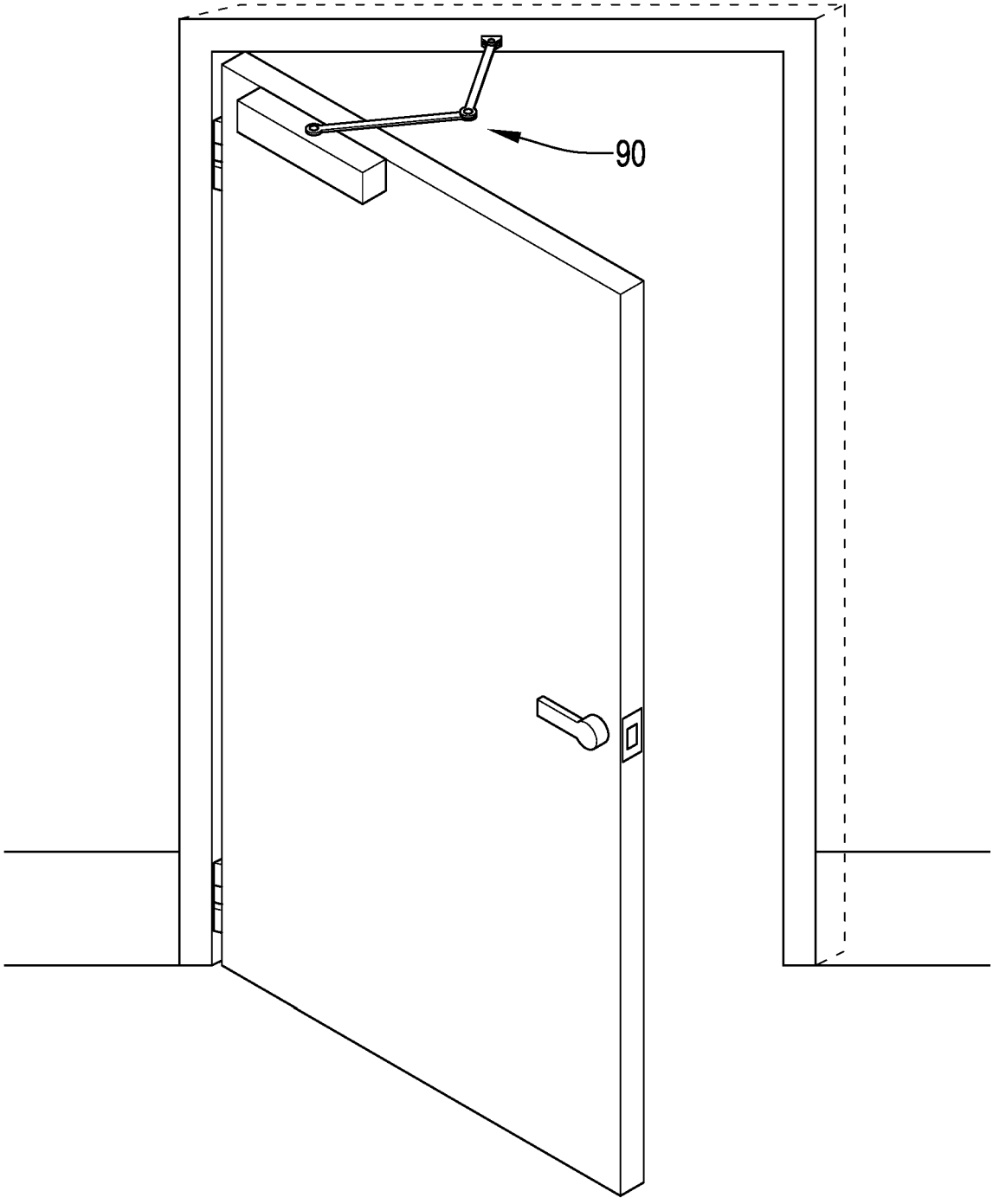


FIG.23
PRIOR ART

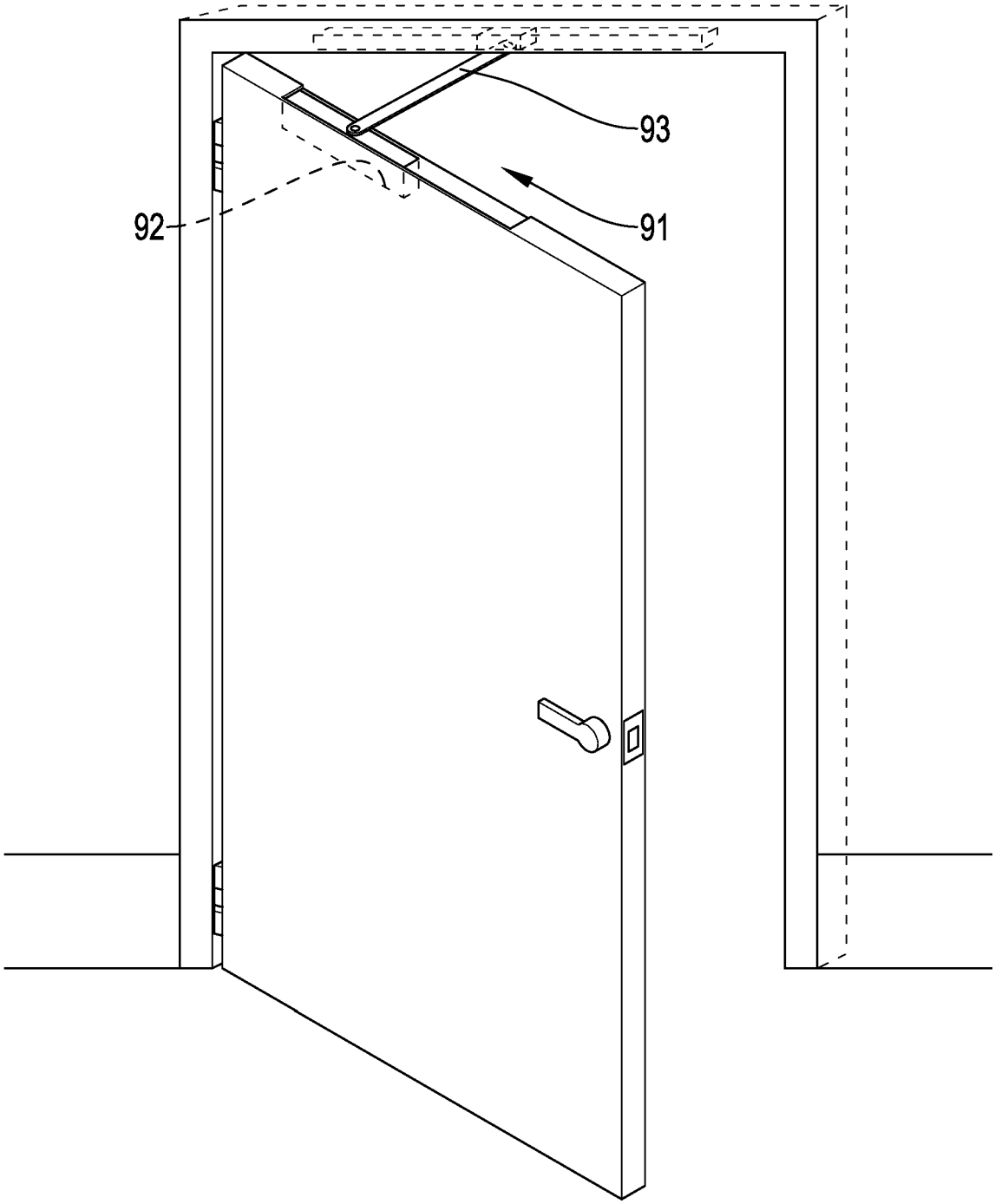


FIG.24
PRIOR ART

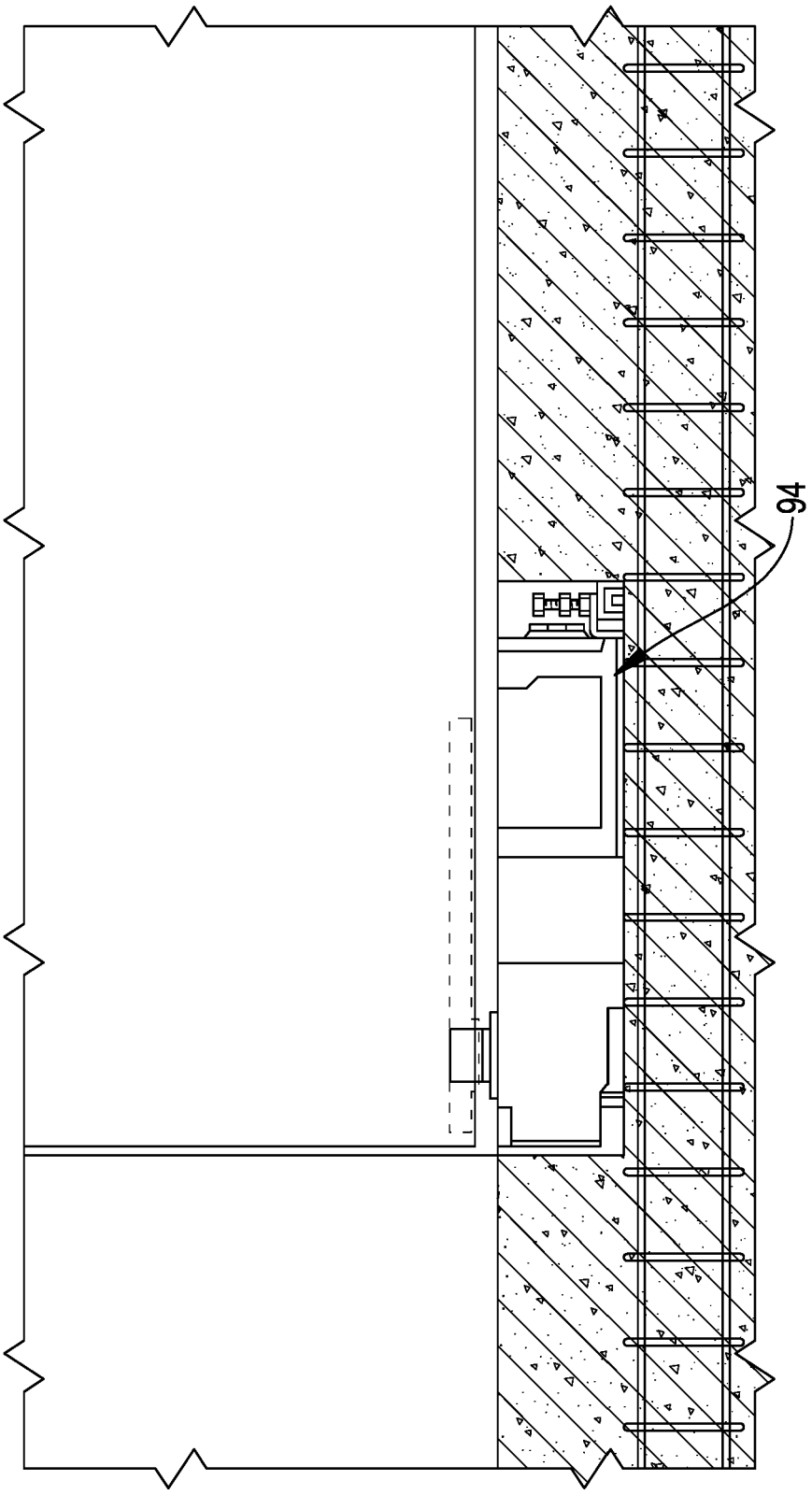


FIG.25
PRIOR ART

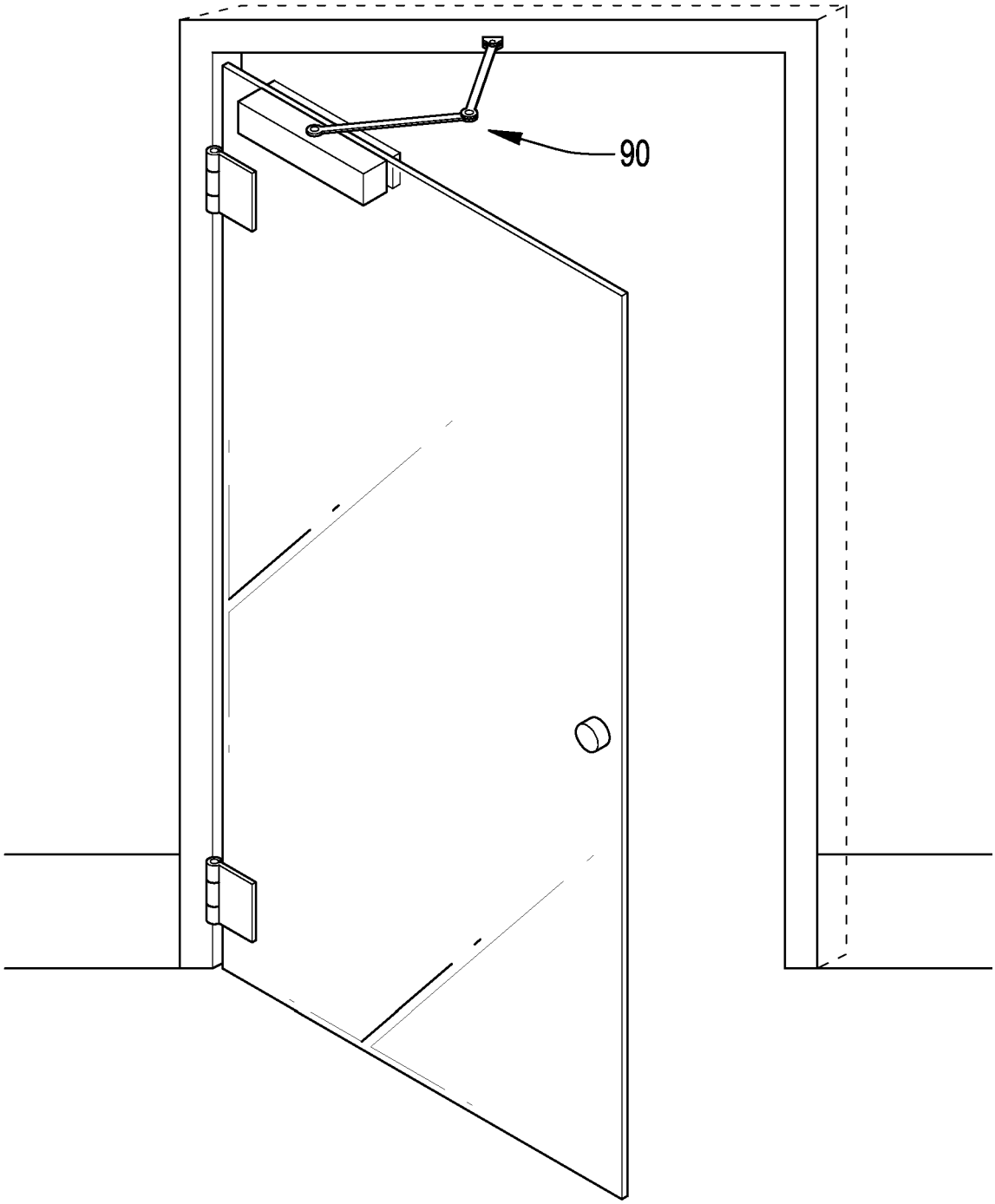


FIG.26
PRIOR ART

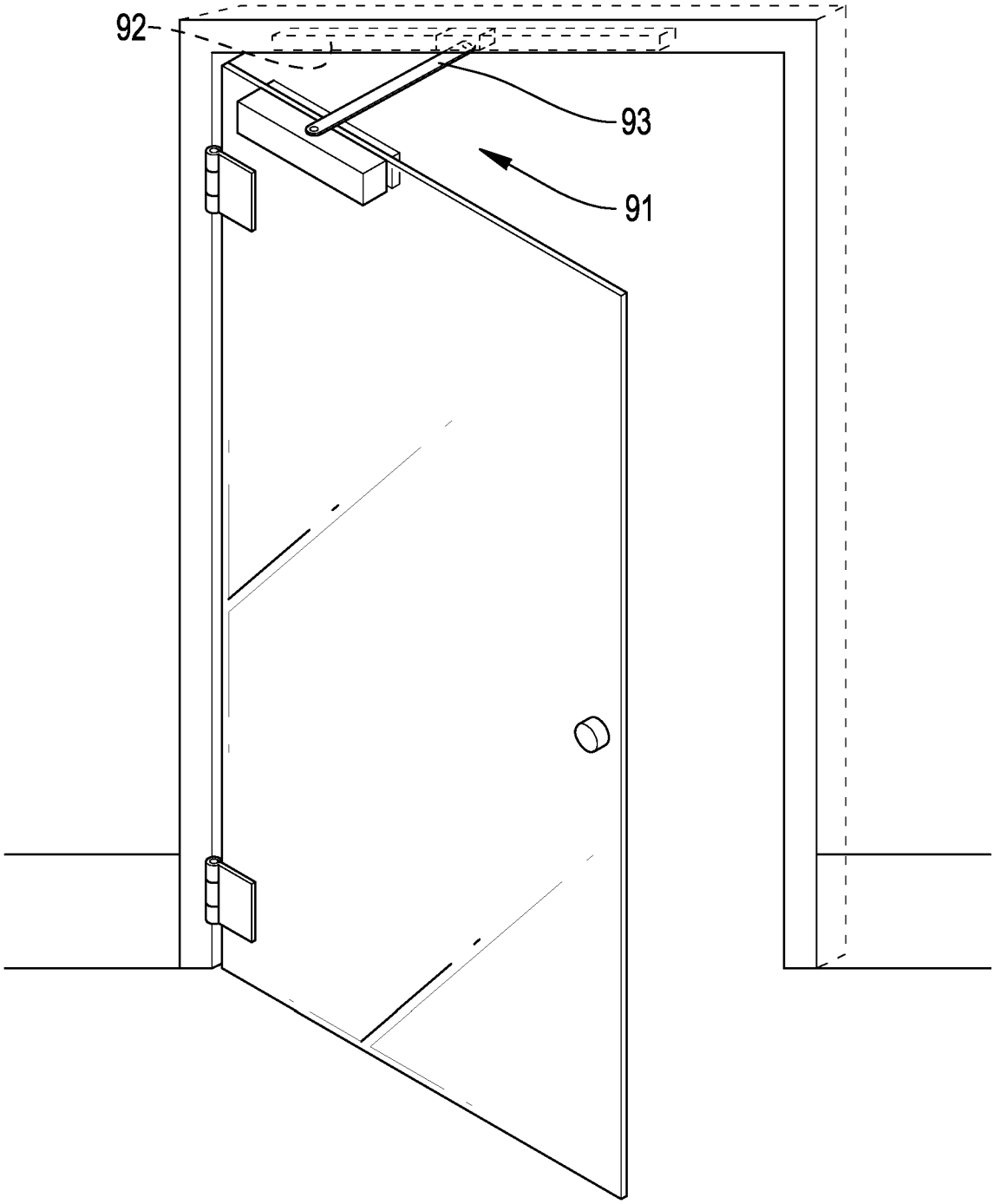


FIG.27
PRIOR ART

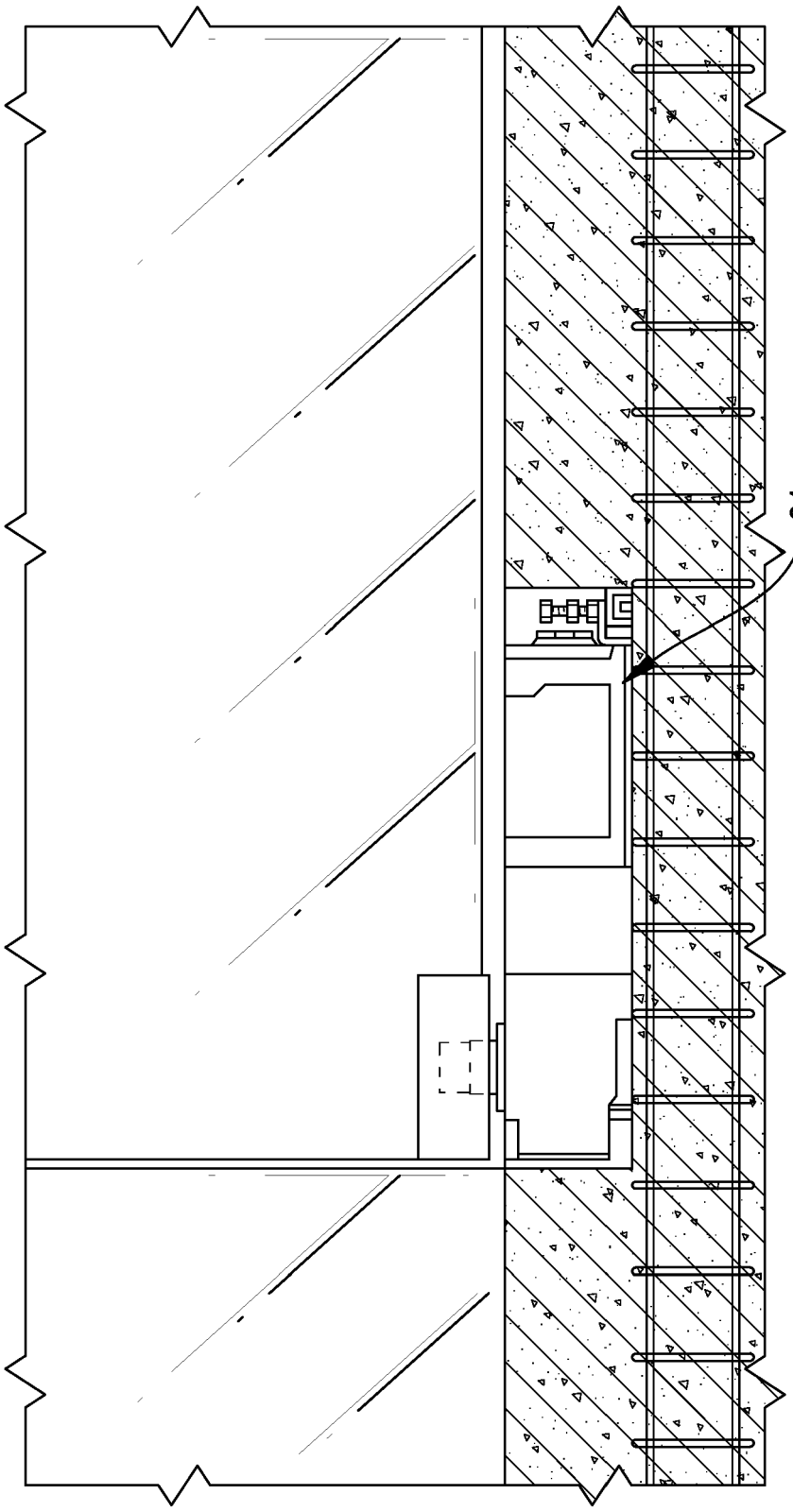


FIG.28
PRIOR ART

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- CN 111779393 A **[0004]**