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LATCHES FOR LATCHING TEMPERED GLASS DOORS FOR SWIMMING POOLS

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ABSTRACT

The invention relates to the technical field of door latch devices and discloses a latch for latching a tempered glass door for swimming pools, comprising a first latch and a second latch. The first latch comprises a first latch plate, a second latch plate, and a connecting screw. A first holding portion is arranged on a sidewall of the first latch plate, and a connecting column having a circular cross section is arranged on a top surface of the first holding portion. A sealing cover, a lock cylinder, a lock block and a magnetic column are successively and downward arranged in the connecting column. A through hole is formed on the sealing cover. A hexagonal blind hole is formed on a top surface of the lock cylinder, and a meshing gear is arranged on a bottom surface of the lock cylinder. A meshing slot is formed on the lock block. A first stopper is arranged at an end of the magnetic column close to the side of the lock block. The second latch has an h-shaped cross section, a second holding portion is arranged on a sidewall of a long side of the second latch, a first stopping slot is formed on a top surface of the second holding portion, and magnetic material is coated in the first stopping slot. The invention has the advantages of simple structure, easy use and high security.

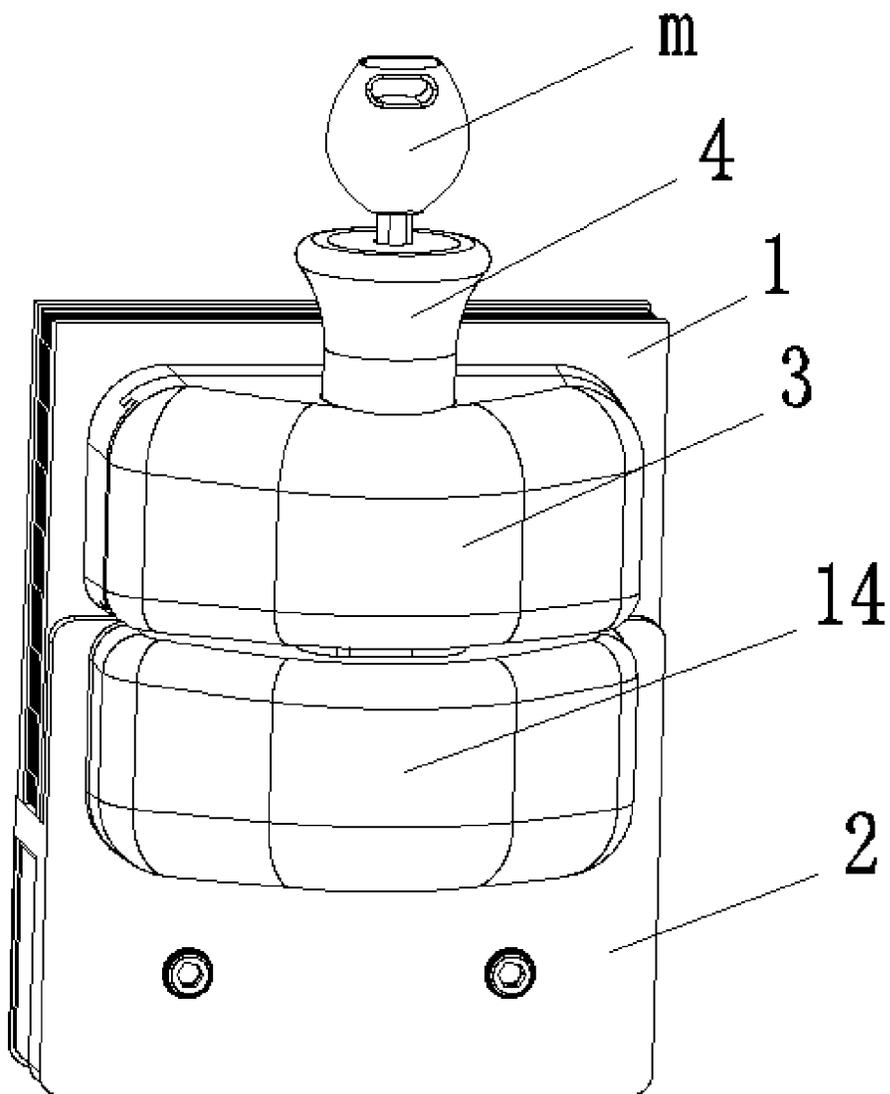


Fig. 1

LATCHES FOR LATCHING TEMPERED GLASS DOORS FOR SWIMMING POOLS

TECHNICAL FIELD

The invention relates to the technical field of door latch devices, and discloses a latch for latching a tempered glass door for swimming pools.

BACKGROUND OF THE INVENTION

With the continuous improvement of people's living standards, swimming pools become more and more popular in people's lives as places of amusement and recreation. In the prior art, tempered glass doors surrounding a swimming pool are usually arranged around the swimming pool. Without affecting the appearance, the tempered glass doors can prevent small animals or children from accidentally entering the swimming pool, or some flying objects, such as footballs, from flying into the swimming pool to result in danger. In the prior art, among the tempered glass doors surrounding the swimming pool, there is usually a tempered glass door that is movable so that the personnel can walk in or out from this door. Latches such as glass latches and locks may be arranged on this movable tempered glass door, by which this tempered glass door can be latched with the tempered glass doors beside it, to realize opening or closing. There are two kinds of such latches in the prior art: latches with a locking structure and latches without a locking structure. The latches with a locking structure are complex in structure and difficult to detach, and their lock cylinders are usually made of metal. In spite of compactness and good fixation effect, a mating key is required for unlocking. It is very difficult to unlock the latch if the key is accidentally lost. Thus, they are not convenient to use. In spite of convenient use, the latches without a locking structure can prevent only children who did not develop intellectually from entering the swimming pool. Fasteners, such as pins, are unable to prevent children, who have developed intellectually to some extent, for example, those just in elementary schools, from entering the swimming pool, because the children can enter the swimming pool by

pulling the pin in a correct direction. Thus, there are still some potential problems when such locks are used.

SUMMARY OF THE INVENTION

Accordingly, the invention provides a latch for latching a tempered glass door for swimming pools.

To solve the above technical problems, the invention employs the following technical solution. A latch for latching a tempered glass door for swimming pools is provided, comprising a first latch and a second latch, wherein the first latch comprises a first latch plate, a second latch plate, and a connecting screw that connects the first latch plate and the second latch plate together, with a spacing reserved between the first latch plate and the second latch plate for mounting a tempered glass door; a first holding portion is arranged on the sidewall of a side of the first latch plate, and a connecting column having a circular cross section is arranged on a top surface of the first holding portion, with one end of the connecting column running into the first holding portion downward and vertically and the other end of the connecting column extending from the top surface of the first holding portion upward and vertically; a sealing cover, a lock cylinder, a lock block and a magnetic column are successively and downward arranged in the connecting column, the sealing cover is arranged at a top end of the connecting column by interference fit, and a through hole is formed on the sealing cover; the lock cylinder is movably connected in the connecting column, a hexagonal blind hole is formed on a top surface of the lock cylinder, and a meshing gear is arranged on a bottom surface of the lock cylinder; the lock block is movably connected in the connecting column, a meshing slot is formed on the lock block, and the meshing slot is meshed with the meshing gear; the magnetic column is movably connected in the connecting column, a first stopper is arranged at an end of the magnetic column close to the side of the lock block, and the other end of the magnetic column runs through the connecting column vertically and downward and out of the first holding portion; the second latch has an h-shaped cross section, a second holding portion is arranged on the sidewall of a long side of the second latch, a first stopping slot is formed on a top surface of the

second holding portion, and magnetic material is coated in the first stopping slot.

Preferably, the through hole is arranged concentrically to the hexagonal blind hole, and the through hole has a shape greater than that of the hexagonal blind hole.

Preferably, the connecting column is in sliding connection to a first holding block.

Preferably, a second stopper is arranged on an outer wall of the lock cylinder, a third stopper is arranged on an inner wall of the connecting column, and the second stopper and the third stopper are fitted in position.

Preferably, a second stopping slot is formed on an inner wall of the connecting column, and the second stopping slot has a shape and a size matched with those of the lock block.

Preferably, a first stopping step is formed on the inner wall of the connecting column, the first stopping step is arranged on the bottom of the lock block, and the surface of the first stopping step is in sliding connection to the bottom surface of the lock block.

Preferably, a second stopping step is formed on the inner wall of the connecting column, at a position close to the bottom end, and the second stopping step has, in its middle, a linear distance less than the diameter of the first stopper.

Preferably, the connecting column, the sealing cover, the lock cylinder and the lock block are all made of plastic material.

Preferably, a spring, one end of which is fixedly connected to the first stopper and the other end is fixedly connected to the bottom of the connecting column, is sheathed on the magnetic column.

Compared with the prior art, the invention has the following advantages:

1. In the invention, a through hole is formed on the sealing cover and a hexagonal blind hole is formed on the top surface of the lock cylinder. By inserting the mating key into the hexagonal blind hole from the through hole and rotating the key, the lock cylinder is rotated. The lock block starts sliding, for the purpose of locking or unlocking. When the key is lost, due to better adaptability of the hexagonal blind hole compared with the metal keyhole in the prior art, a hexagonal tool, for example a hex key, can be inserted into the hexagonal blind hole for the purpose of unlocking. Furthermore, the

sealing cover is arranged in the connecting column by interference fit. Therefore, when there is no hexagonal tool, a small tool, for example a screwdriver, can be used. In this case, the screw rod is inserted into the through hole to remove the sealing cover, and then the lock cylinder is taken out. In this way, the lock can be detached to open the tempered glass door of the swimming pool. Meanwhile, the aforementioned tools are tools that are difficult for children to obtain. Thus, it is ensured that the tempered glass doors can be used normally, but cannot be opened by children easily. Compared with the latches with a locking structure in the prior art, the latch provided in the invention has the advantages of simple structure and convenient use.

2. In the utility mode, a magnetic column, a first stopping slot, a lock cylinder, a lock block and a second stopping slot are arranged. The magnetic column can, when magnetically attracted, run into the first stopping slot. The first stopping slot can prevent the magnetic column from moving up and down. Then, the lock cylinder is rotated so that the lock block can run into the second stopping slot. In this way, the back-and-forth movement of the connecting column is stopped. It is thus ensured that it is difficult to pull out the connecting column outward from the first holding portion, and further ensured that the magnetic column will not be pulled out because the connecting column is pulled out. Accordingly, this ensures the tightness between the tempered glass doors of the swimming pool. The children are well prevented from bringing themselves in danger by entering the swimming pool after damaging the latch, due to the poor tightness between the tempered glass doors of the swimming pool.

BRIEF DESCRIPTION OF THE DRAWINGS

In order to explain technical solutions of embodiments of the invention more clearly, the accompanying drawings to be used for describing the embodiments will be introduced simply. Apparently, the accompanying drawings to be described below are merely some embodiments of the invention. A person of ordinary skill in the art may obtain other drawings according to these drawings without paying any creative effort.

Fig. 1 is a schematic structure diagram of the invention;

Fig. 2 is a side view of the invention;

Fig. 3 is a first schematic structure diagram of a first latch in the invention;

Fig. 4 is a second schematic structure diagram of the first latch in the invention;

Fig. 5 is a third schematic structure diagram of the first latch in the invention;

Fig. 6 is a schematic structure diagram of a lock cylinder in the invention;

Fig. 7 is a schematic structure diagram of the connection of the lock cylinder with the lock block in the invention;

Fig. 8 is an enlarged view of part A;

Fig. 9 is an enlarged view of part B; and

Fig. 10 is a schematic structure diagram of the invention, when in the locked state.

Reference numerals:

1: first latch; 100: first latch plate; 101: second latch plate; 102: connecting screw; 2: second latch; 3: first holding portion; 4: connecting column; 5: sealing cover; 6: lock cylinder; 7: lock block; 8: magnetic column; 9: through hole; 10: hexagonal blind hole; 11: meshing gear; 12: meshing slot; 13: first stopper; 14: second holding portion; 15: first stopping slot; 16: second stopper; 17: third stopper; 18: second stopping slot; 19: first stopping step; 20: second stopping step; 21: spring; and m: key.

DETAILED DESCRIPTION OF THE INVENTION

The technical solutions in the embodiments of the invention will be described clearly and completely with reference to the accompanying drawings in the embodiments of the invention. Apparently, the embodiments to be described are merely some embodiments of the invention rather than all embodiments of the invention. Based on the embodiments of the invention, all other embodiments obtained by a person of ordinary skill in the art without paying any creative effort shall be included in the protection scope of the invention.

Embodiment: Referring to Figs. 1-10, the invention provides a latch for latching a tempered glass door for swimming pools, comprising a first latch (1) and a second latch (2). The first latch (1) comprises a first latch plate (100), a second latch plate (101), and a connecting screw (102) that connects the first latch plate (100) and the second latch plate (101) together, with a spacing reserved between the first latch plate (100) and the

second latch plate (101) for mounting a tempered glass door. The second latch (2) has an h-shaped cross section. During the mounting, the first latch 1 is mounted on a movable tempered glass door of the swimming pool, and the second latch 2 is inserted to a fixed tempered glass door of the swimming pool.

A first holding portion (3) is arranged on a sidewall of a side of the first latch plate (100) in the first latch 1. The first holding portion (3) is convenient for an operator to hold the first latch 1. In this embodiment, the first holding portion 3 is made of plastic material whose surface is frosted to ensure it is less likely to slip from the hand when the operator holds the first latch. A connecting column (4) having a circular cross section is arranged on a top surface of the first holding portion (3), and the bottom of the connecting column 4 is enclosed. One end of the connecting column (4) runs into the first holding portion (3) downward and vertically and the other end of the connecting column (4) extends from the top surface of the first holding portion (3) upward and vertically. The connecting column 4 is in sliding connection to the first holding portion 3, so that the connecting column 4 can vertically move up and down on the first holding portion 3. A sealing cover (5), a lock cylinder (6), a lock block (7) and a magnetic column (8) are successively and downward arranged in the connecting column (4), the sealing cover (5) is arranged at a top end of the connecting column (4) by interference fit, and a through hole (9) is formed on the sealing cover (5). The lock cylinder (6) is movably connected in the connecting column (4). A hexagonal blind hole (10) is formed on a top surface of the lock cylinder (6). The hexagonal blind hole (10) is arranged concentrically to the through hole (9), and the hexagonal blind hole (10) has a shape less than that of the through hole (9). A meshing gear (11) is arranged on a bottom surface of the lock cylinder (6). The lock block (7) is movably connected in the connecting column (4), a meshing slot (12) is formed on the lock block (7), and the meshing slot (12) is meshed with the meshing gear (11). When the latch cylinder 6 is rotated, the lock block 7 moves back and forth. The magnetic column (8) is movably connected in the connecting column (4), a first stopper (13) is arranged at an end of the magnetic column (8) close to the side of the lock block (7), and the other end of the magnetic column (8) runs through the connecting column (4) vertically and downward

and out of the first holding portion (3). A spring (21), one end of which is fixedly connected to the first stopper (13) and the other end is fixedly connected to the bottom of the connecting column (4), is sheathed on the magnetic column (8). By the spring 21, the magnetic column 8 can be retracted automatically, and it is thus convenient to use. A second holding portion 14 is arranged on the sidewall of a long side of the second latch 2, a first stopping slot 15 is formed on a top surface of the second holding portion 14, and magnetic material is coated in the first stopping slot 15. The position of the first stopping slot 15 enables the magnetic column 8 running out of the first holding portion 3 can be inserted into the first stopping slot 15.

A third stopper (17) is arranged on an inner wall of the connecting column (4), a second stopper (16) is arranged on an outer wall of the lock cylinder (6), and the second stopper (16) and the third stopper (17) are fitted in position. The fitting of the second stopper (16) and the third stopper (17) can limit the rotation angle of the lock cylinder 6 in the connecting column 4. A second stopping slot (18) is formed on an inner wall of the connecting column (4), and the second stopping slot (18) has a shape and a size matched with those of the lock block (7). A first stopping step (19) is formed on the inner wall of the connecting column (4), the first stopping step (19) is arranged on the bottom of the lock block (7), and the surface of the first stopping step (19) is in sliding connection to the bottom surface of the lock block (7). The first stopping step (19) is used to support the lock block 7. A second stopping step (20) is formed on the inner wall of the connecting column (4), at a position close to the bottom end, and the second stopping step (20) has, in its middle, a linear distance less than the diameter of the first stopper (13). The second stopping step (20) is used to limit the travel of the magnetic column 8.

The connecting column (4), the sealing cover (5), the lock cylinder (6) and the lock block (7) are all made of plastic material. Making them of plastic material can reduce the cost, and is also more convenient to detach them.

When in use of the latch of the invention, the first latch 1 and the second latch 2 are mounted on a proper tempered glass door for a swimming pool, respectively. The first latch 1 and the second latch 2 are adjusted in distance and position, so that the

magnetic column 8 can be inserted into the first stopping slot 15 when being attracted by the magnetic material coated in the first stopping slot 15, and it is ensured that the spring 21 is in the compressed state. Then, the key m is inserted into the through hole 9. The key m is inserted into the hexagonal blind hole 10 from the through hole 9. Then, the key m is turned. The lock cylinder 6 starts rotating, so that the lock block 7 slides on the first stopping step 19 and the lock block 7 is inserted into the second stopping slot 18. At this moment, the tempered glass door for the swimming pool is locked by the lock of the invention, and the connecting column 4 cannot be pulled out due to the lock block 7 and the second stopping slot 18. When it is required to unlock the lock, the key m is inserted into the hexagonal blind hole 10 from the through hole 9. Then, the key m is turned. The lock cylinder 6 starts rotating, so that the lock block 7 slides on the first stopping step 19 and the lock block 7 is removed from the second stopping slot 18. At this moment, the connecting column 4 is pulled outward, the connecting column 4 moves outward, and the first stopping step 19 moves together. The first stopping step 19 can get the first stopper 13 stuck, to drive the first stopper 13 to move together, in order to enable the magnetic column 8 to move together. The magnetic column 8 comes out of the first stopping slot 15 due to an external force and the elasticity of the spring 21. At this moment, the tempered glass door for the swimming pool is unlocked by the lock of the invention.

In the description of the invention, it should be understood that orientations or locations indicated by terms “coaxial”, “bottom”, “one end”, “top”, “middle”, “the other end”, “upper”, “a side”, “top”, “inner”, “front”, “center”, “two ends” are the orientations or locations illustrated on the basis of the accompanying drawings, merely used for conveniently describing the invention and simplifying the description and not intended to indicate or imply that the stated device or element must have the specific orientations or must be constructed and operated in the specific orientations, thus shall not be interpreted as any limitations to the invention.

In the invention, unless otherwise expressly stated and defined, terms such as “mounted”, “arranged”, “connected”, “fixed” and “screwed” shall be understood in a broad sense. For example, “fixed ” may be fixedly connected, or detachably connected,

or integrated, may be mechanically connected or electrically connected, may be directly connected or connected by an intermediate medium, and may be internal communication of two elements or interaction of two elements, unless otherwise expressly defined. For a person of ordinary skill in the art, the specific meaning of those terms in the invention should be understood according to the specific situations.

The above content merely describes typical instances of the invention. In addition to those typical instances, the invention may have various other specific implementations. Any technical solutions on the basis of equivalent replacement or equivalent transformation shall be included within the protection scope of the invention.

CLAIMS

1. A latch for latching a tempered glass door for swimming pools, comprising a first latch and a second latch, wherein the first latch comprises a first latch plate, a second latch plate, and a connecting screw that connects the first latch plate and the second latch plate together, with a spacing reserved between the first latch plate and the second latch plate for mounting a tempered glass door; a first holding portion is arranged on a sidewall of a side of the first latch plate, and a connecting column having a circular cross section is arranged on a top surface of the first holding portion, with one end of the connecting column running into the first holding portion downward and vertically and the other end of the connecting column extending from the top surface of the first holding portion upward and vertically; a sealing cover, a lock cylinder, a lock block and a magnetic column are successively and downward arranged in the connecting column, the sealing cover is arranged at a top end of the connecting column by interference fit, and a through hole is formed on the sealing cover; the lock cylinder is movably connected in the connecting column, a hexagonal blind hole is formed on a top surface of the lock cylinder, and a meshing gear is arranged on a bottom surface of the lock cylinder; the lock block is movably connected in the connecting column, a meshing slot is formed on the lock block, and the meshing slot is meshed with the meshing gear; the magnetic column is movably connected in the connecting column, a first stopper is arranged at an end of the magnetic column close to the side of the lock block, and the other end of the magnetic column runs through the connecting column vertically and downward and out of the first holding portion; the second latch has an h-shaped cross section, a second holding portion is arranged on a sidewall of a long side of the second latch, a first stopping slot is formed on a top surface of the second holding portion, and magnetic material is coated in the first stopping slot.

2. The latch for latching a tempered glass door for swimming pools according

to claim 1, wherein the through hole is arranged concentrically to the hexagonal blind hole, and the through hole has a shape greater than that of the hexagonal blind hole.

3. The latch for latching a tempered glass door for swimming pools according to claim 1, wherein the connecting column is in sliding connection to a first holding block.

4. The lock for locking a tempered glass door for swimming pools according to claim 3, wherein a second stopper is arranged on an outer wall of the lock cylinder, a third stopper is arranged on an inner wall of the connecting column, and the second stopper and the third stopper are fitted in position.

5. The latch for latching a tempered glass door for swimming pools according to claim 4, wherein a second stopping slot is formed on an inner wall of the connecting column, and the second stopping slot has a shape and a size matched with those of the lock block.

6. The latch for latching a tempered glass door for swimming pools according to claim 5, wherein a first stopping step is formed on the inner wall of the connecting column, the first stopping step is arranged on the bottom of the lock block, and the surface of the first stopping step is in sliding connection to the bottom surface of the lock block.

7. The latch for latching a tempered glass door for swimming pools according to claim 6, wherein a second stopping step is formed on the inner wall of the connecting column, at a position close to the bottom end, and the second stopping step has, in its middle, a linear distance less than the diameter of the first stopper.

8. The latch for latching a tempered glass door for swimming pools according

to claim 1, wherein the connecting column, the sealing cover, the lock cylinder and the lock block are all made of plastic material.

9. The latch for latching a tempered glass door for swimming pools according to claim 1, wherein a spring, one end of which is fixedly connected to the first stopper and the other end is fixedly connected to the bottom of the connecting column, is sheathed on the magnetic column.

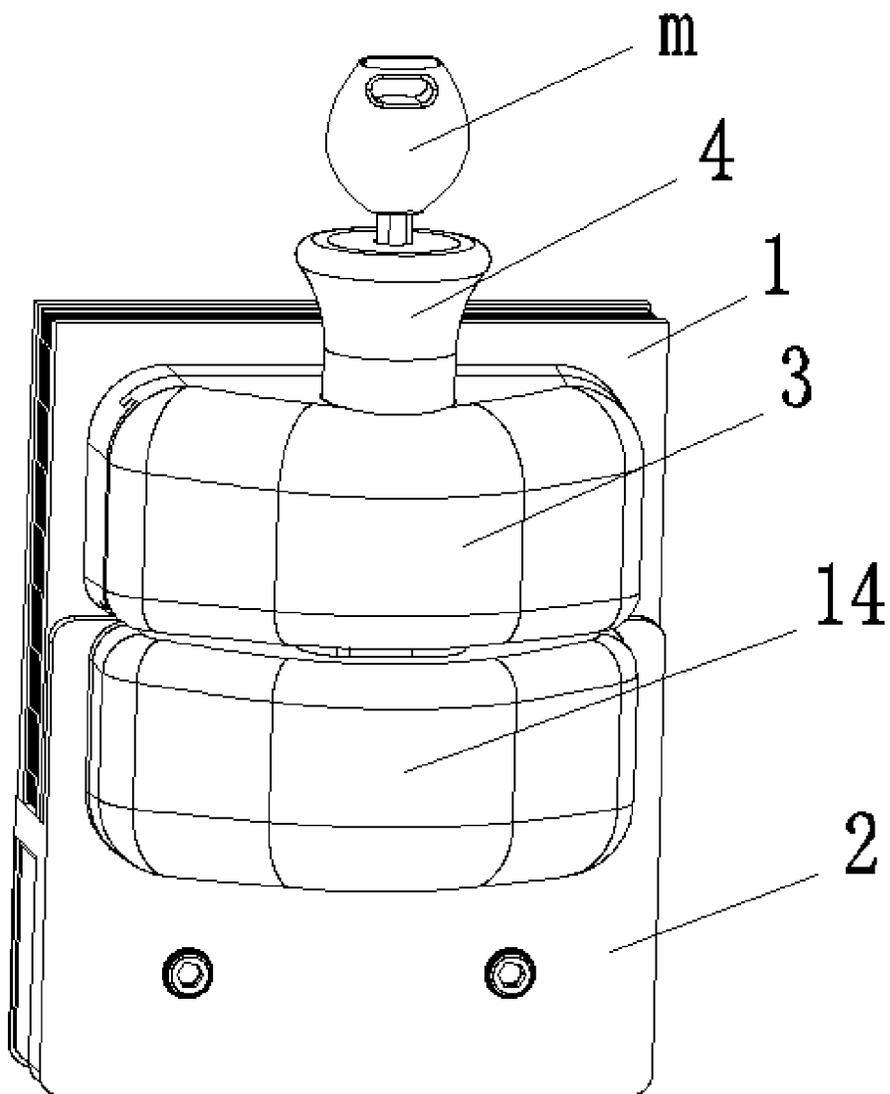


Fig. 1

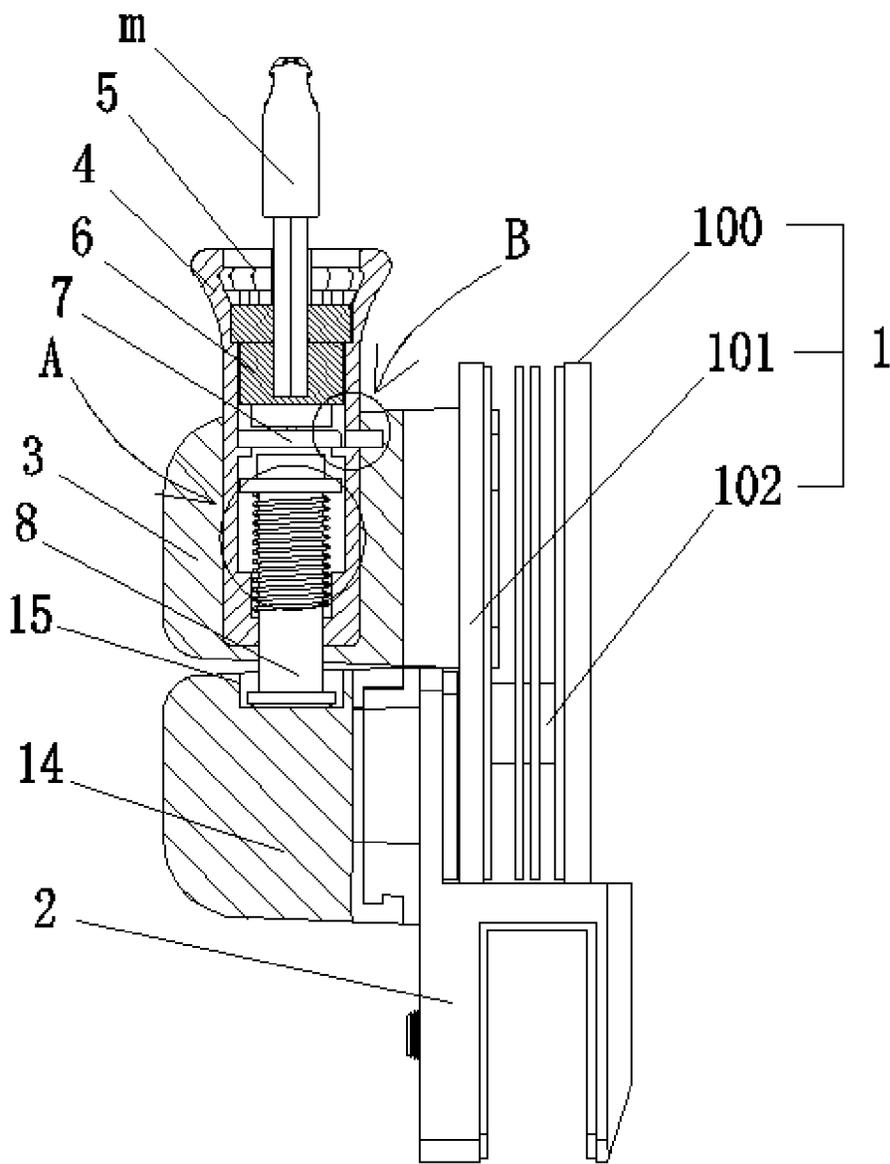


Fig. 2

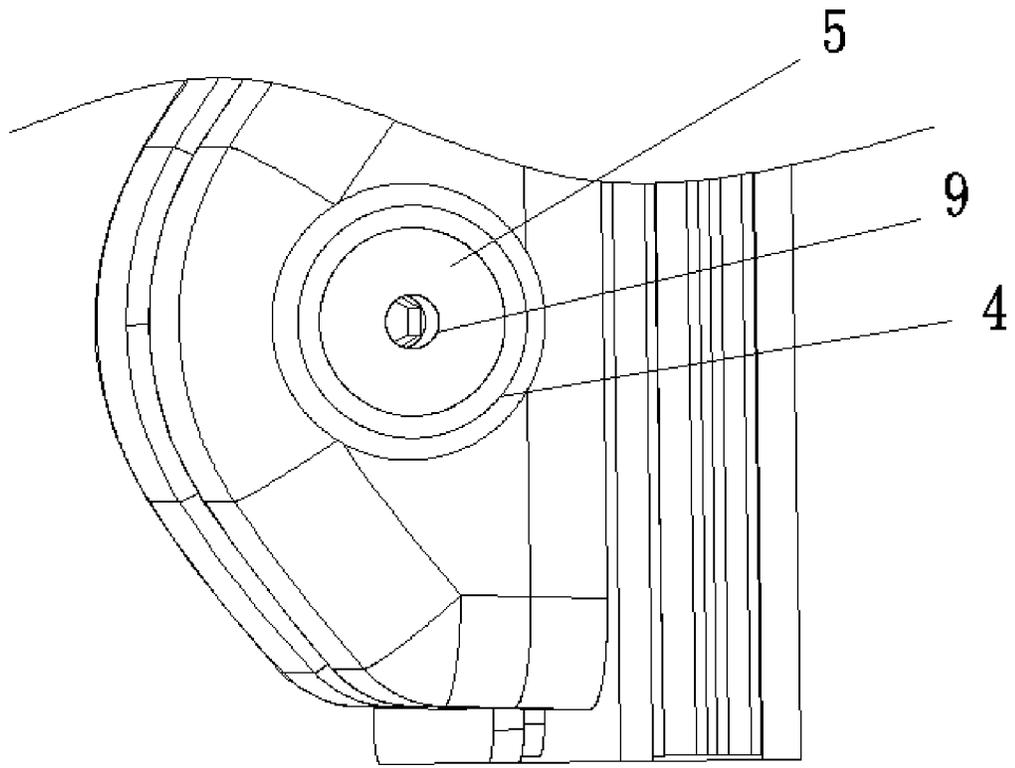


Fig. 3

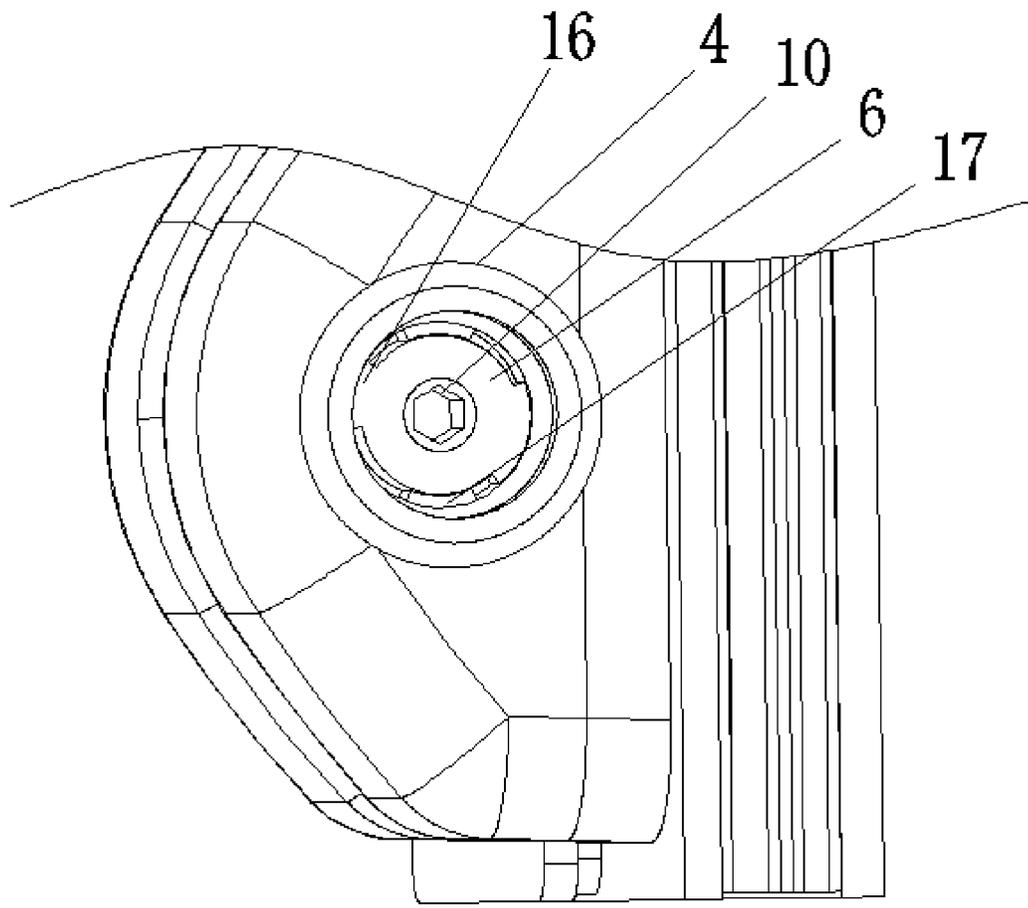


Fig. 4

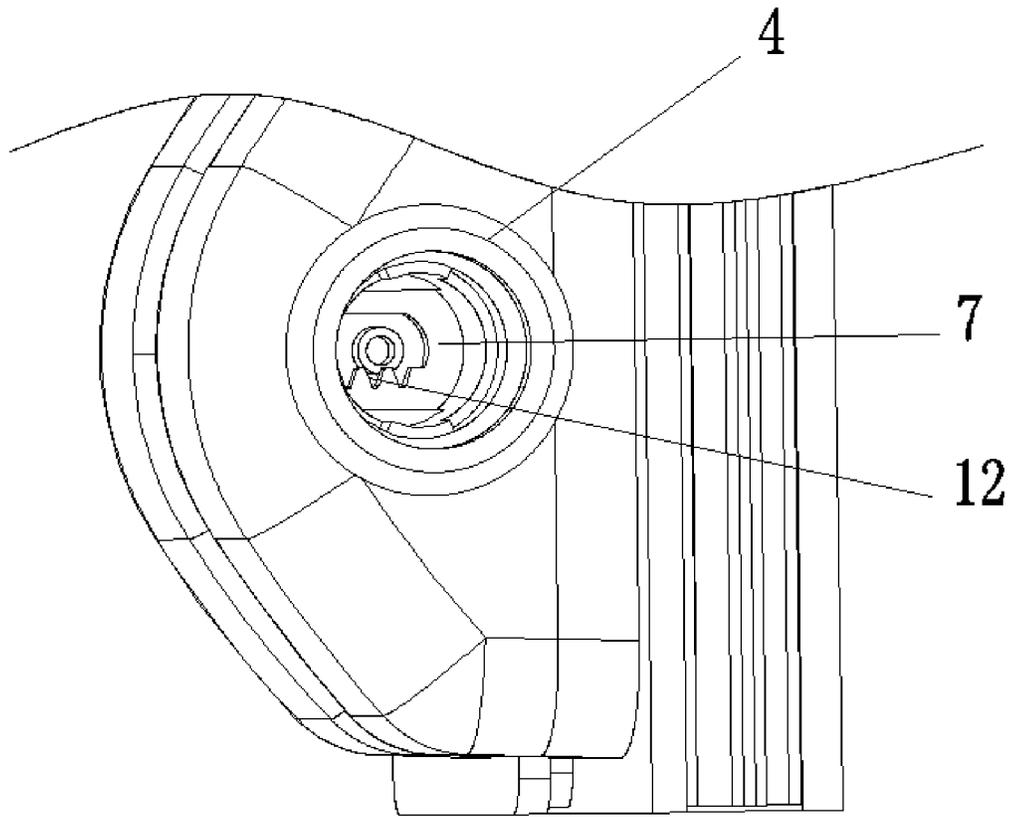


Fig. 5

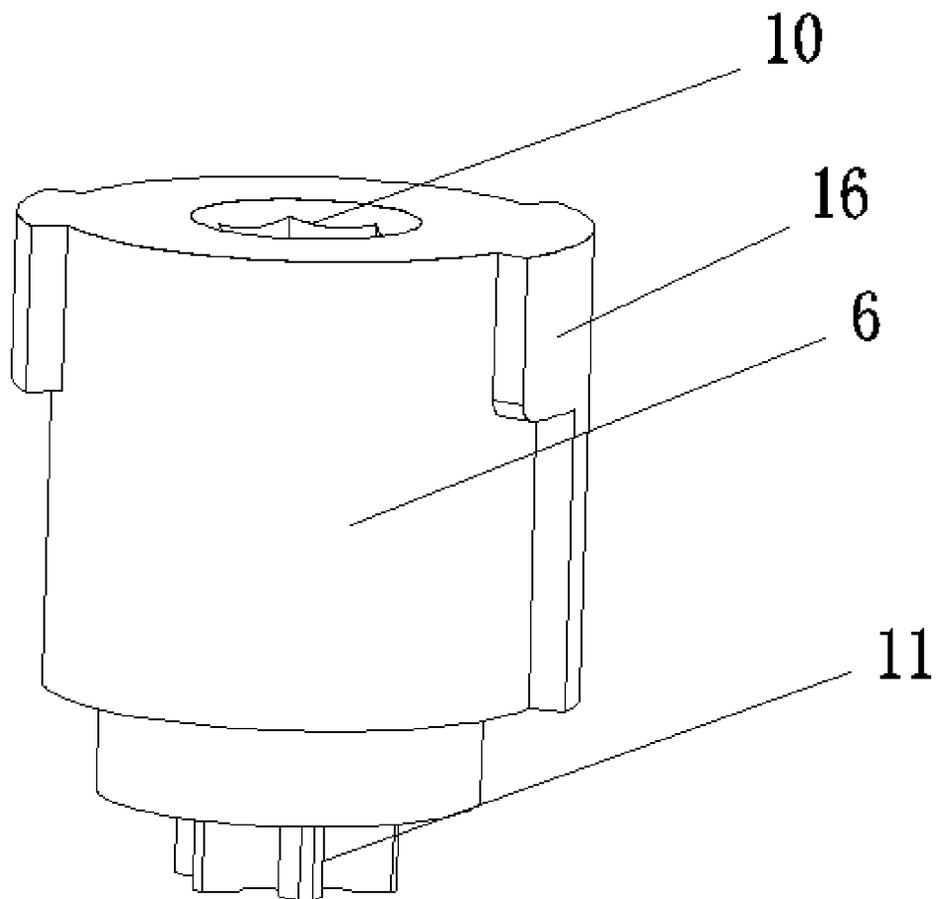


Fig. 6

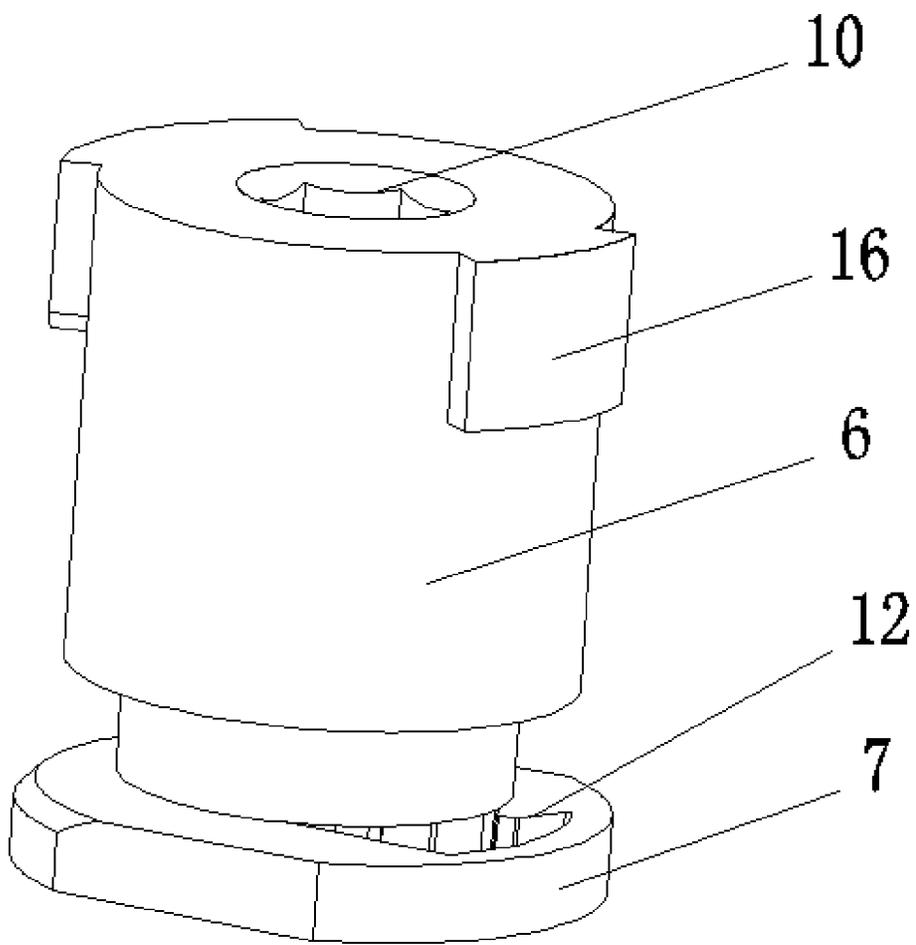


Fig. 7

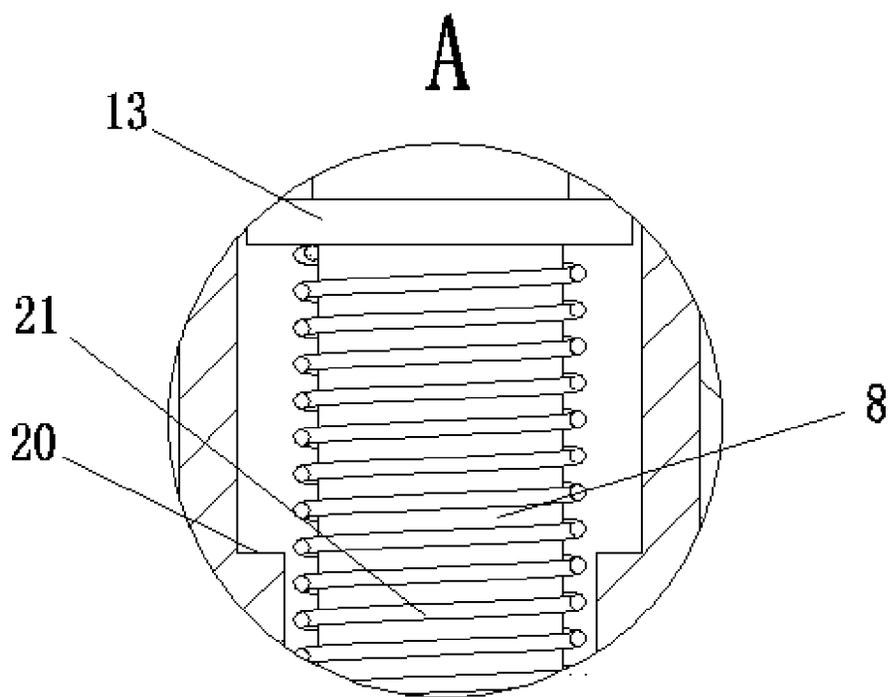


Fig. 8

B

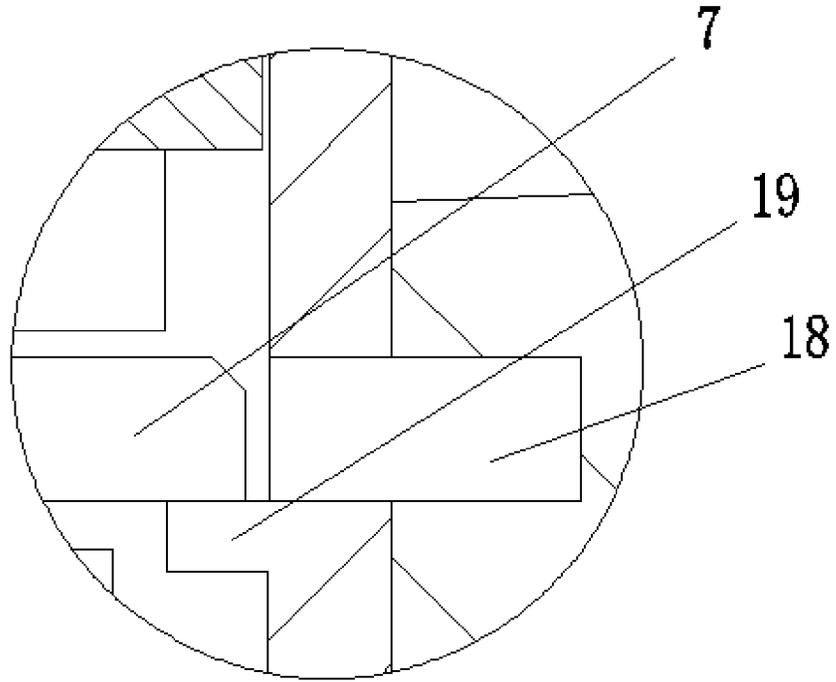


Fig. 9

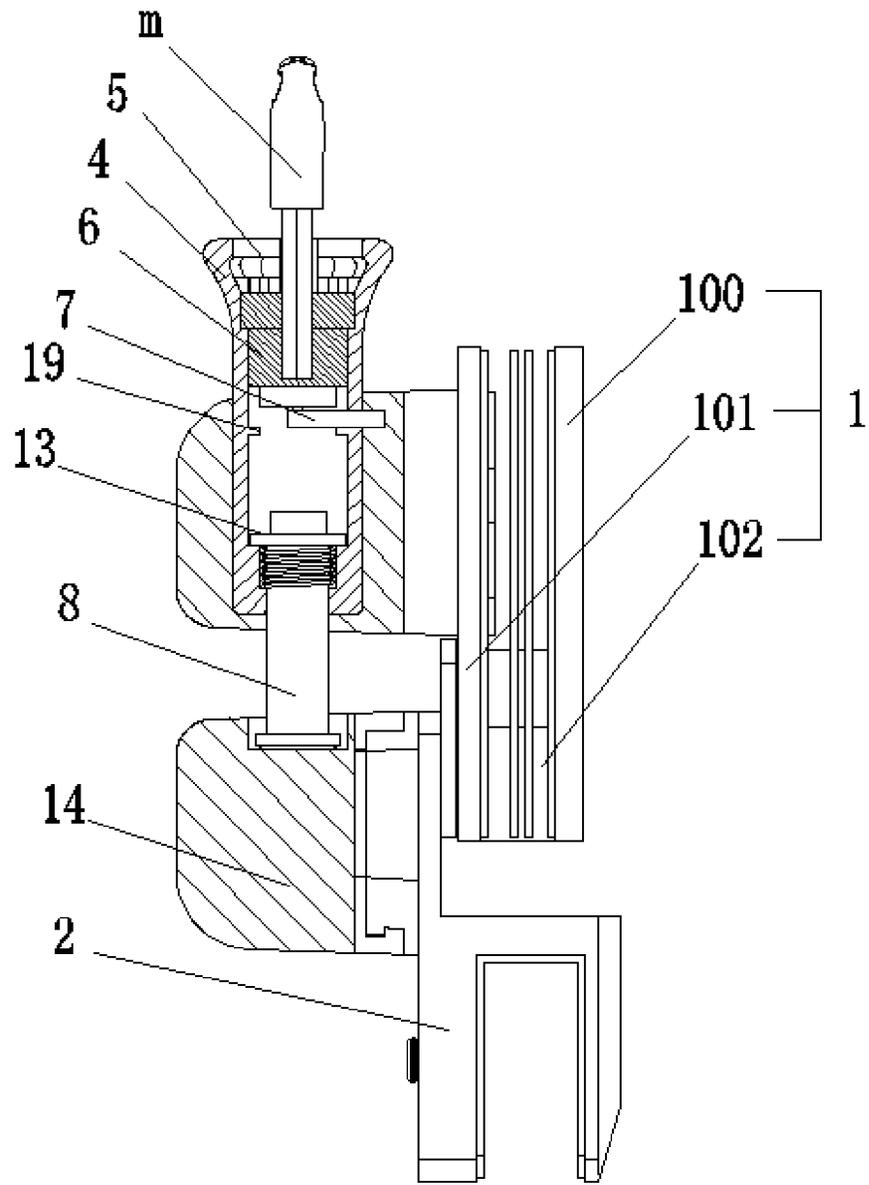


Fig. 10