a second main rod, and a connection anti-loose device, for connecting the first main rod and the second main rod; wherein, the connection anti-loose device comprises a first joint, provided on the first main rod; a second joint, provided on the second main rod; and a connecting structure, slidably sleeved on the first joint and restricted from slipping off from an end of the first joint facing the second joint, or slidably sleeved on second joint and restricted from slipping off from an end of the second joint facing the first joint; and further comprises anti-rotation structures, provided between opposite ends of the first joint and the second joint, and combined with each other to prevent the first joint and the second joint from rotating relative to each other; the connecting structure is adapted for sliding from the first joint or the second joint on which the connecting structure is sleeved to the second joint or the first joint, and driving the first joint or the second joint on which the connecting structure is sleeved to slide during detachable connection with the second joint or the first joint, so as so enable the anti-rotation structures between the opposite ends of the first joint and the second joint to be combined with each other.

In a class of this embodiment, the anti-rotation structure further comprises a clamping head or a clamping slot formed at an end of the first joint, and a clamping slot or a clamping head matched with the clamping head or the clamping slot and formed at an end of the second joint.

In a class of this embodiment, the connection structure is a connecting knob which is sleeved on the first joint; and the connecting knob and the second joint are detachably connected with each other by means of threads.

In a class of this embodiment, the end of the first joint facing the first main rod is ~~pyramidal~~conical, provided with a narrower upper part and a wider lower part; a corresponding ~~pyramidal~~ conical inner cavity is formed at the end of the connecting knob facing the first main rod; an internal thread is formed on the inner wall of the end of the connecting knob facing the second joint; an external thread matched with the

internal thread. is formed on an outer wall of the second joint.

In a class of this embodiment, further comprising a joint sheath is sleeved outside the second joint, for preventing the external thread of the second joint from scratching hands.

In a class of this embodiment, the joint sheath is provided with a hollow structure; the end of the joint sheath facing the second main rod is provided with a circumferential inner wall in threaded connection with the second joint provided with a circumferential outer wall; a clearance provided between the circumferential inner wall of the end of the joint sheath facing the first joint and the circumferential outer wall of the second joint is adapted for screwing the end of the connecting knob sleeved on the first joint facing the second joint therein.

In a class of this embodiment, the connection structure is a connecting knob, which is sleeved on the second joint; and the connecting knob and the first joint are detachably connected with each other by means of threads.

In a class of this embodiment, the end of the ~~first~~ second joint facing the ~~first joint~~second main rod is ~~pyramidal~~conical, provided with a wider upper part and a narrower lower part; a corresponding ~~pyramidal~~ conical inner cavity is formed at the end of the connecting knob facing the second main rod; an internal thread is formed on the inner wall of the end of the connecting knob facing the first joint, and an external thread matched with the internal thread is formed on the outer wall of the first joint.

In a class of this embodiment, the quick connection anti-loose apparatus further comprises a joint sheath sleeved outside the second joint, for preventing the external thread of the first joint from scratching hands.

In a class of this embodiment, the joint sheath is provided with a hollow structure; the

joined during connection to realize quick locking between the first main rod and the second main rod.

(3) In the invention, the connection structure is a connecting knob, which is sleeved on the first joint, and the connecting knob and the second joint are detachably connected with each other by means of threads; that is, in the invention, locking between the first main rod and the second main rod is realized by threaded connection of the connecting knob and the second joint, so the structure is simple, and the locking efficiency is high.

(4) In the invention, the end of the first joint facing the first main rod is ~~pyramidal~~ conical, provided with a narrower upper part and a wider lower part, and at the end of the connecting knob facing the first main rod is formed a corresponding ~~pyramidal~~ conical inner cavity; on the inner wall of the end of the connecting knob facing the second joint are formed internal threads, and on the outer wall of the second joint are formed matched external threads; that is, in the invention, as the first joint is configured to be ~~pyramidal~~conical, provided with a narrower upper part and a wider lower part, the connecting knob sleeved on the first joint can be prevented from slipping off from the end of the first joint facing the second joint; meanwhile, as the first joint and the connecting knob are fit to each other by ~~pyramidal~~ conical surfaces, the connecting knob applies to the first joint a certain extrusion force toward the first joint in the screwing process, so that the first joint can tightly abut against the second joint, and relative sliding will not occur after screwing tightly.

(5) In the invention, outside the second joint is also sleeved a joint sheath preventing the external threads of the second joint from scratching hands. The joint sleeve is arranged to prevent the external threads on the second joint that are not connected with the part of the connecting knob from scratching users' hands or other objects during use.

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Reference numerals in the figures are as follows: 1 – first main rod; 11 – first joint; 111 – clamping head; 112 – stepped hole; 12 – connecting knob; 121 – ~~pyramidal~~ conical inner cavity; 122 – internal threads; 3 – second main rod; 31 – second joint; 32 – connecting construction; 311 – external threads; 312 – clamping slot; 4 – joint sheath.

Detailed Description of the Embodiments

The invention will be further discussed below using the following embodiments in conjunction with the drawings.

Embodiment 1

As shown in Figs. 1-4, a quick connection anti-loose apparatus of the embodiment comprises a first main rod 1, a second main rod 3, and a connection anti-loose device for connecting the first main rod 1 and the second main rod 3, the connection anti-loose device comprises a first joint 11 provided on the first main rod 1; a second joint 31 provided on the second main rod 3; and a connecting structure 12 slidably sleeved on the first joint 11 and restricted from slipping off from the end of the first joint 11 facing the second joint 31; between opposite ends of the first joint 11 and the second joint 31 are provided anti-rotation structures which are combined with each other to prevent the first joint 11 and the second joint 31 from rotating relative to each other; the connecting structure 12 is adapted for sliding from the first joint 11 on which the connecting structure is sleeved to the second joint 31, and driving the first joint 11 on which the connecting structure is sleeved to slide during detachable connection with the second joint 31, so as to enable the anti-rotation structures between the opposite ends of the first joint 11 and the second joint 31 to be combined with each other. In the invention, by providing the connecting structure, the first joint 11 and the second joint 31 abut against each other and are tightly connected together, and meanwhile, by providing the anti-rotation structures, the first main rod 1 and the second main rod 3 being connected cannot rotate relative to each other, thereby meeting the requirement on stability by photographic and video shooting equipment,

and more importantly, the anti-rotation structures of the invention are driven by the connecting structure during connection, and thus quick and convenient connection can be achieved.

Preferably, the connecting structure is a connecting knob 12, which is sleeved on the first joint 11; the end of the first joint 11 facing the first main rod 1 is ~~pyramidal~~conical, provided with a narrower upper part and a wider lower part, and at the end of the connecting knob 12 facing the first main rod 1 is formed a corresponding ~~pyramidal~~ conical inner cavity 121; and on the inner wall of the end of the connecting knob 12 facing the second main rod 3 are formed an internal thread 122, and on the outer wall of the second joint 31 are formed an external thread 311 matched with the internal thread. Locking between the first main rod 1 and the second main rod 3 is achieved by threaded connection of the connecting knob 12 and the second joint 31, so the structure is simple, and the locking efficiency is high. In the embodiment, as the first joint 11 is configured to be ~~pyramidal~~conical, provided with a narrower upper part and a wider lower part, the connecting knob 12 sleeved on the first joint 11 can be prevented from slipping off from the end of the first joint 11 facing the second joint 31; meanwhile, as the first joint 11 and the connecting knob 12 are fit to each other by ~~pyramidal~~ conical surfaces, the connecting knob 12 applies to the first joint 11 a certain extrusion force toward the second joint 31 in the screwing process, so that the first joint 11 can tightly abut against the second joint 31, and relative sliding will not occur after screwing tightly.

In the embodiment, the anti-rotation structures comprise a clamping head 111 formed at an end of the first joint 11, and a clamping slot 312 matched with the clamping head 111 and formed at an end of the second joint 31; and with the configuration of the clamping head 111 and the clamping slot 312, not only the first main rod 1 and the second main rod 3 do not rotate relative to each other after being locked, but also the first main rod 1 and the second main rod 3 can be quickly joined during connection to achieve quick locking between the first main rod 1 and the second main rod 3. As a preferred embodiment, in the embodiment, the clamping head 111 is pyramidal,

31; the clearance between the circumferential inner wall of the end of the joint sheath 4 facing the first main rod 1 and the circumferential outer wall of the second joint 31 is adapted to screw the end of the connecting knob 12 facing the second main rod 3 therein; and when the second main rod 3 is detached, the external threads 311 of the second joint 31 can be protected by the joint sheath 4 to avoid damage to the external threads 311.

Embodiment 2

As shown in Fig. 5, this embodiment differs from embodiment 1 in that the connecting structure is arranged on the second joint 31, so connection relation of components can be changed, specifically: the connecting structure is slidably sleeved on the second joint 31 and restricted from slipping off from the end of the second joint 31 facing the first joint 11; the connecting structure 12 is adapted for sliding from the second joint 31 on which the connecting structure is sleeved to the second joint 31, and driving the second joint 31 on which the connecting structure is sleeved to slide during detachable connection with the first joint 11, so that the anti-rotation structures between the opposite ends of the first joint 11 and the second joint 31 are combined with each other.

In the embodiment, preferably the connecting structure is a connecting knob 12; the end of the second joint 31 facing the second main rod 3 is ~~pyramidal~~conical, provided with a wider upper part and a narrower lower part, and at the end of the connecting knob 12 facing the second main rod 3 is formed a corresponding ~~pyramidal~~ conical inner cavity 121; and on the inner wall of the end of the connecting knob 12 facing the first main rod 1 are formed an internal thread 122, and on the outer wall of the first joint 11 is formed an external thread 311 matched with the internal thread. The locking between the first main rod 1 and the second main rod 3 is realized by threaded connection of the connecting knob 12 and the first joint 11, so the structure is simple, and the locking efficiency is high.

Claims

1. A quick connection anti-loose apparatus, comprising

a first main rod (1),

a second main rod (3), and

a connection anti-loose device, for connecting the first main rod (1) and the second main rod (3);

wherein, the connection anti-loose device comprises

a first joint (11), provided on the first main rod (1);

a second joint (31), provided on the second main rod (3); and

a connecting structure, slidably sleeved on the first joint (11) and restricted from slipping off from an end of the first joint (11) facing the second joint (31), or slidably sleeved on second joint (31) and restricted from slipping off from an end of the second joint (31) facing the first joint (11); and

further comprises anti-rotation structures, provided between opposite ends of the first joint (11) and the second joint (31), and combined with each other to prevent the first joint (11) and the second joint (31) from rotating relative to each other;

the connecting structure is adapted for sliding from the first joint (11) or the second joint (31) on which the connecting structure is sleeved to the second joint (31) or the first joint (11), and driving the first joint (11) or the second joint (31) on which the connecting structure is sleeved to slide during detachable connection with the second joint (31) or the first joint (11), so as so enable the anti-rotation structures between the opposite ends of the first joint (11) and the second joint (31) to be combined with each other;

wherein, the connection structure is a connecting knob (12) which is sleeved on the first joint (11); and the connecting knob (12) and the second joint (31) are detachably connected with each other by means of threads;

the end of the first joint (11) facing the first main rod (1) is conical, provided with a narrower upper part and a wider lower part;

a corresponding conical inner cavity (121) is formed at the end of the connecting

knob (12) facing the first main rod (1);

an internal thread (122) is formed on the inner wall of the end of the connecting knob (12) facing the second joint (31);

an external thread (311) matched with the internal thread (122) is formed on an outer wall of the second joint (31).

2. The quick connection anti-loose apparatus of 1, wherein, the anti-rotation structure further comprises a clamping head (111) or a clamping slot (312) formed at an end of the first joint (11), and a clamping slot (312) or a clamping head (111) matched with the clamping head (111) or the clamping slot (312) and formed at an end of the second joint (31).

~~3. The quick connection anti-loose apparatus of claims 1 or 2, wherein, the connection structure is a connecting knob (12) which is sleeved on the first joint (11); and the connecting knob (12) and the second joint (31) are detachably connected with each other by means of threads.~~

~~4. The quick connection anti-loose apparatus of claim 3, wherein,~~

~~the end of the first joint (11) facing the first main rod (1) is pyramidal, provided with a narrower upper part and a wider lower part;~~

~~a corresponding pyramidal inner cavity (121) is formed at the end of the connecting knob (12) facing the first main rod (1);~~

~~an internal thread (122) is formed on the inner wall of the end of the connecting knob (12) facing the second joint (31);~~

~~an external thread (311) matched with the internal thread (122).is formed on an outer wall of the second joint (31).~~

~~5~~3. The quick connection anti-loose apparatus of claim 4~~2~~, wherein, further comprising

a joint sheath (4) is sleeved outside the second joint (31), for preventing the external thread (311) of the second joint (31) from scratching hands.

~~6~~4. The quick connection anti-loose apparatus of claim ~~5~~3, wherein,

the joint sheath is provided with a hollow structure;

the end of the joint sheath (4) facing the second main rod (3) is provided with a circumferential inner wall in threaded connection with the second joint (31) provided with a circumferential outer wall;

a clearance provided between the circumferential inner wall of the end of the joint sheath (4) facing the first joint (11) and the circumferential outer wall of the second joint (31) is adapted for screwing the end of the connecting knob (12) sleeved on the first joint (11) facing the second joint (31) therein.

~~7. The quick connection anti-loose apparatus of claim 1 or 2, wherein,~~

~~the connection structure is a connecting knob (12), which is sleeved on the second joint (31); and~~

~~the connecting knob (12) and the first joint (11) are detachably connected with each other by means of threads.~~

~~8. The quick connection anti-loose apparatus of claim 7, wherein,~~

~~the end of the first joint (31) facing the first joint (11) is pyramidal, provided with a wider upper part and a narrower lower part;~~

~~a corresponding pyramidal inner cavity (121) is formed at the end of the connecting knob (12) facing the second main rod (3);~~

~~an internal thread (122) is formed on the inner wall of the end of the connecting knob (12) facing the first joint (11), and~~

~~an external thread (311) matched with the internal thread (122) is formed on the outer wall of the first joint (11).~~

~~9. The quick connection anti-loose apparatus of claim 8, wherein, further comprising~~

~~a joint sheath (4) is sleeved outside the second joint (11), for preventing the external thread (311) of the first joint (11) from scratching hands.~~

~~10. The quick connection anti-loose apparatus of claim 9, wherein,~~

~~the joint sheath is provided with a hollow structure;~~

~~the end of the joint sheath (4) facing the first main rod (1) is provided with a circumferential inner wall in threaded connection with the first joint (11) provided with a circumferential outer wall;~~

~~a clearance provided between the circumferential inner wall of the end of the joint sheath (4) facing the second joint (31) and the circumferential outer wall of the first joint (11) is adapted for screwing the upper end of the connecting knob (12) sleeved on the second joint (31) therein.~~

~~11~~5. The quick connection anti-loose apparatus of any of claims 2-~~4~~10, wherein,

the clamping head (111) is a pyramidal, provided with a wider upper part and a narrower lower part and formed at the end of the first joint (11) facing the second joint (31); and

the clamping slot (312) is a pyramidal inner cavity formed at the end of the second joint (31) facing the first joint (11).

~~12~~6. The quick connection anti-loose apparatus of any of claims 2-~~4~~10, wherein,

the clamping head (111) is a pyramidal, provided with a narrower upper part and a wider lower part and formed at the end of the second joint (31) facing the first joint (11); and

the clamping slot (312) is a pyramidal inner cavity formed at the end of the first joint (11) facing the second joint (31).

~~13~~7. The quick connection anti-loose apparatus of claim ~~11~~ 5 or ~~12~~6, wherein,

the clamping head is in the form of a hexagonal pyramidal boss, and the pyramidal inner cavity is in the form of a corresponding hexagonal pyramidal slot.

~~14~~8. The quick connection anti-loose apparatus of any of claims 1-~~7~~13, wherein,

the end of the second joint (31) facing the second main rod (3) is inserted into the second main rod (3) and is in threaded connection with the second main rod (3); and glue is further applied to surfaces of the second joint (31) and the second main rod (3) fit to each other.

~~15~~9. The quick connection anti-loose apparatus of any of claims 1-~~8~~14, wherein,

a stepped hole (112) extending in the axial direction is formed at the end face of the end of the first joint (11) facing the first main rod (1);

one end of the first main rod (1) is inserted into the stepped hole (112) and abuts against a step surface of the stepped hole (112);

an outer wall of an end head of the first main rod (1) is in threaded connection with an inner wall of the first joint (11) by means of threads; and glue is further applied to surfaces of the first main rod (1) and the first joint (11) fit to each other.

a second main rod, and a connection anti-loose device, for connecting the first main rod and the second main rod; wherein, the connection anti-loose device comprises a first joint, provided on the first main rod; a second joint, provided on the second main rod; and a connecting structure, slidably sleeved on the first joint and restricted from slipping off from an end of the first joint facing the second joint, or slidably sleeved on second joint and restricted from slipping off from an end of the second joint facing the first joint; and further comprises anti-rotation structures, provided between opposite ends of the first joint and the second joint, and combined with each other to prevent the first joint and the second joint from rotating relative to each other; the connecting structure is adapted for sliding from the first joint or the second joint on which the connecting structure is sleeved to the second joint or the first joint, and driving the first joint or the second joint on which the connecting structure is sleeved to slide during detachable connection with the second joint or the first joint, so as so enable the anti-rotation structures between the opposite ends of the first joint and the second joint to be combined with each other.

In a class of this embodiment, the anti-rotation structure further comprises a clamping head or a clamping slot formed at an end of the first joint, and a clamping slot or a clamping head matched with the clamping head or the clamping slot and formed at an end of the second joint.

In a class of this embodiment, the connection structure is a connecting knob which is sleeved on the first joint; and the connecting knob and the second joint are detachably connected with each other by means of threads.

In a class of this embodiment, the end of the first joint facing the first main rod is conical, provided with a narrower upper part and a wider lower part; a corresponding conical inner cavity is formed at the end of the connecting knob facing the first main rod; an internal thread is formed on the inner wall of the end of the connecting knob facing the second joint; an external thread matched with the

internal thread is formed on an outer wall of the second joint.

In a class of this embodiment, further comprising a joint sheath is sleeved outside the second joint, for preventing the external thread of the second joint from scratching hands.

In a class of this embodiment, the joint sheath is provided with a hollow structure; the end of the joint sheath facing the second main rod is provided with a circumferential inner wall in threaded connection with the second joint provided with a circumferential outer wall; a clearance provided between the circumferential inner wall of the end of the joint sheath facing the first joint and the circumferential outer wall of the second joint is adapted for screwing the end of the connecting knob sleeved on the first joint facing the second joint therein.

In a class of this embodiment, the connection structure is a connecting knob, which is sleeved on the second joint; and the connecting knob and the first joint are detachably connected with each other by means of threads.

In a class of this embodiment, the end of the second joint facing the second main rod is conical, provided with a wider upper part and a narrower lower part; a corresponding conical inner cavity is formed at the end of the connecting knob facing the second main rod; an internal thread is formed on the inner wall of the end of the connecting knob facing the first joint, and an external thread matched with the internal thread is formed on the outer wall of the first joint.

In a class of this embodiment, the quick connection anti-loose apparatus further comprises a joint sheath sleeved outside the second joint, for preventing the external thread of the first joint from scratching hands.

In a class of this embodiment, the joint sheath is provided with a hollow structure; the

joined during connection to realize quick locking between the first main rod and the second main rod.

(3) In the invention, the connection structure is a connecting knob, which is sleeved on the first joint, and the connecting knob and the second joint are detachably connected with each other by means of threads; that is, in the invention, locking between the first main rod and the second main rod is realized by threaded connection of the connecting knob and the second joint, so the structure is simple, and the locking efficiency is high.

(4) In the invention, the end of the first joint facing the first main rod is conical, provided with a narrower upper part and a wider lower part, and at the end of the connecting knob facing the first main rod is formed a corresponding conical inner cavity; on the inner wall of the end of the connecting knob facing the second joint are formed internal threads, and on the outer wall of the second joint are formed matched external threads; that is, in the invention, as the first joint is configured to be conical, provided with a narrower upper part and a wider lower part, the connecting knob sleeved on the first joint can be prevented from slipping off from the end of the first joint facing the second joint; meanwhile, as the first joint and the connecting knob are fit to each other by conical surfaces, the connecting knob applies to the first joint a certain extrusion force toward the first joint in the screwing process, so that the first joint can tightly abut against the second joint, and relative sliding will not occur after screwing tightly.

(5) In the invention, outside the second joint is also sleeved a joint sheath preventing the external threads of the second joint from scratching hands. The joint sleeve is arranged to prevent the external threads on the second joint that are not connected with the part of the connecting knob from scratching users' hands or other objects during use.

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Reference numerals in the figures are as follows: 1 – first main rod; 11 – first joint; 111 – clamping head; 112 – stepped hole; 12 – connecting knob; 121 – conical inner cavity; 122 – internal threads; 3 – second main rod; 31 – second joint; 32 – connecting construction; 311 – external threads; 312 – clamping slot; 4 – joint sheath.

Detailed Description of the Embodiments

The invention will be further discussed below using the following embodiments in conjunction with the drawings.

Embodiment 1

As shown in Figs. 1-4, a quick connection anti-loose apparatus of the embodiment comprises a first main rod 1, a second main rod 3, and a connection anti-loose device for connecting the first main rod 1 and the second main rod 3, the connection anti-loose device comprises a first joint 11 provided on the first main rod 1; a second joint 31 provided on the second main rod 3; and a connecting structure 12 slidably sleeved on the first joint 11 and restricted from slipping off from the end of the first joint 11 facing the second joint 31; between opposite ends of the first joint 11 and the second joint 31 are provided anti-rotation structures which are combined with each other to prevent the first joint 11 and the second joint 31 from rotating relative to each other; the connecting structure 12 is adapted for sliding from the first joint 11 on which the connecting structure is sleeved to the second joint 31, and driving the first joint 11 on which the connecting structure is sleeved to slide during detachable connection with the second joint 31, so as to enable the anti-rotation structures between the opposite ends of the first joint 11 and the second joint 31 to be combined with each other. In the invention, by providing the connecting structure, the first joint 11 and the second joint 31 abut against each other and are tightly connected together, and meanwhile, by providing the anti-rotation structures, the first main rod 1 and the second main rod 3 being connected cannot rotate relative to each other, thereby meeting the requirement on stability by photographic and video shooting equipment,

and more importantly, the anti-rotation structures of the invention are driven by the connecting structure during connection, and thus quick and convenient connection can be achieved.

Preferably, the connecting structure is a connecting knob 12, which is sleeved on the first joint 11; the end of the first joint 11 facing the first main rod 1 is conical, provided with a narrower upper part and a wider lower part, and at the end of the connecting knob 12 facing the first main rod 1 is formed a corresponding conical inner cavity 121; and on the inner wall of the end of the connecting knob 12 facing the second main rod 3 are formed an internal thread 122, and on the outer wall of the second joint 31 are formed an external thread 311 matched with the internal thread. Locking between the first main rod 1 and the second main rod 3 is achieved by threaded connection of the connecting knob 12 and the second joint 31, so the structure is simple, and the locking efficiency is high. In the embodiment, as the first joint 11 is configured to be conical, provided with a narrower upper part and a wider lower part, the connecting knob 12 sleeved on the first joint 11 can be prevented from slipping off from the end of the first joint 11 facing the second joint 31; meanwhile, as the first joint 11 and the connecting knob 12 are fit to each other by conical surfaces, the connecting knob 12 applies to the first joint 11 a certain extrusion force toward the second joint 31 in the screwing process, so that the first joint 11 can tightly abut against the second joint 31, and relative sliding will not occur after screwing tightly.

In the embodiment, the anti-rotation structures comprise a clamping head 111 formed at an end of the first joint 11, and a clamping slot 312 matched with the clamping head 111 and formed at an end of the second joint 31; and with the configuration of the clamping head 111 and the clamping slot 312, not only the first main rod 1 and the second main rod 3 do not rotate relative to each other after being locked, but also the first main rod 1 and the second main rod 3 can be quickly joined during connection to achieve quick locking between the first main rod 1 and the second main rod 3. As a preferred embodiment, in the embodiment, the clamping head 111 is pyramidal,

31; the clearance between the circumferential inner wall of the end of the joint sheath 4 facing the first main rod 1 and the circumferential outer wall of the second joint 31 is adapted to screw the end of the connecting knob 12 facing the second main rod 3 therein; and when the second main rod 3 is detached, the external threads 311 of the second joint 31 can be protected by the joint sheath 4 to avoid damage to the external threads 311.

Embodiment 2

As shown in Fig. 5, this embodiment differs from embodiment 1 in that the connecting structure is arranged on the second joint 31, so connection relation of components can be changed, specifically: the connecting structure is slidably sleeved on the second joint 31 and restricted from slipping off from the end of the second joint 31 facing the first joint 11; the connecting structure 12 is adapted for sliding from the second joint 31 on which the connecting structure is sleeved to the second joint 31, and driving the second joint 31 on which the connecting structure is sleeved to slide during detachable connection with the first joint 11, so that the anti-rotation structures between the opposite ends of the first joint 11 and the second joint 31 are combined with each other.

In the embodiment, preferably the connecting structure is a connecting knob 12; the end of the second joint 31 facing the second main rod 3 is conical, provided with a wider upper part and a narrower lower part, and at the end of the connecting knob 12 facing the second main rod 3 is formed a corresponding conical inner cavity 121; and on the inner wall of the end of the connecting knob 12 facing the first main rod 1 are formed an internal thread 122, and on the outer wall of the first joint 11 is formed an external thread 311 matched with the internal thread. The locking between the first main rod 1 and the second main rod 3 is realized by threaded connection of the connecting knob 12 and the first joint 11, so the structure is simple, and the locking efficiency is high.

Claims

1. A quick connection anti-loose apparatus, comprising

a first main rod (1),

a second main rod (3), and

a connection anti-loose device, for connecting the first main rod (1) and the second main rod (3);

wherein, the connection anti-loose device comprises

a first joint (11), provided on the first main rod (1);

a second joint (31), provided on the second main rod (3); and

a connecting structure, slidably sleeved on the first joint (11) and restricted from slipping off from an end of the first joint (11) facing the second joint (31), or slidably sleeved on second joint (31) and restricted from slipping off from an end of the second joint (31) facing the first joint (11); and

further comprises anti-rotation structures, provided between opposite ends of the first joint (11) and the second joint (31), and combined with each other to prevent the first joint (11) and the second joint (31) from rotating relative to each other;

the connecting structure is adapted for sliding from the first joint (11) or the second joint (31) on which the connecting structure is sleeved to the second joint (31) or the first joint (11), and driving the first joint (11) or the second joint (31) on which the connecting structure is sleeved to slide during detachable connection with the second joint (31) or the first joint (11), so as so enable the anti-rotation structures between the opposite ends of the first joint (11) and the second joint (31) to be combined with each other;

wherein, the connection structure is a connecting knob (12) which is sleeved on the first joint (11); and the connecting knob (12) and the second joint (31) are detachably connected with each other by means of threads;

the end of the first joint (11) facing the first main rod (1) is conical, provided with a narrower upper part and a wider lower part;

a corresponding conical inner cavity (121) is formed at the end of the connecting

knob (12) facing the first main rod (1);

an internal thread (122) is formed on the inner wall of the end of the connecting knob (12) facing the second joint (31);

an external thread (311) matched with the internal thread (122) is formed on an outer wall of the second joint (31).

2. The quick connection anti-loose apparatus of 1, wherein, the anti-rotation structure further comprises a clamping head (111) or a clamping slot (312) formed at an end of the first joint (11), and a clamping slot (312) or a clamping head (111) matched with the clamping head (111) or the clamping slot (312) and formed at an end of the second joint (31).

3. The quick connection anti-loose apparatus of claim 2, wherein, further comprising

a joint sheath (4) is sleeved outside the second joint (31), for preventing the external thread (311) of the second joint (31) from scratching hands.

4. The quick connection anti-loose apparatus of claim 3, wherein,

the joint sheath is provided with a hollow structure;

the end of the joint sheath (4) facing the second main rod (3) is provided with a circumferential inner wall in threaded connection with the second joint (31) provided with a circumferential outer wall;

a clearance provided between the circumferential inner wall of the end of the joint sheath (4) facing the first joint (11) and the circumferential outer wall of the second joint (31) is adapted for screwing the end of the connecting knob (12) sleeved on the first joint (11) facing the second joint (31) therein.

5. The quick connection anti-loose apparatus of any of claims 2-4, wherein,

the clamping head (111) is a pyramidal, provided with a wider upper part and a narrower lower part and formed at the end of the first joint (11) facing the second joint (31); and

the clamping slot (312) is a pyramidal inner cavity formed at the end of the second joint (31) facing the first joint (11).

6. The quick connection anti-loose apparatus of any of claims 2-4, wherein,

the clamping head (111) is a pyramidal, provided with a narrower upper part and a wider lower part and formed at the end of the second joint (31) facing the first joint (11); and

the clamping slot (312) is a pyramidal inner cavity formed at the end of the first joint (11) facing the second joint (31).

7. The quick connection anti-loose apparatus of claim 5 or 6, wherein,

the clamping head is in the form of a hexagonal pyramidal boss, and the pyramidal inner cavity is in the form of a corresponding hexagonal pyramidal slot.

8. The quick connection anti-loose apparatus of any of claims 1-7, wherein,

the end of the second joint (31) facing the second main rod (3) is inserted into the second main rod (3) and is in threaded connection with the second main rod (3); and glue is further applied to surfaces of the second joint (31) and the second main rod (3) fit to each other.

9. The quick connection anti-loose apparatus of any of claims 1-8, wherein,

a stepped hole (112) extending in the axial direction is formed at the end face of the end of the first joint (11) facing the first main rod (1);

one end of the first main rod (1) is inserted into the stepped hole (112) and abuts against a step surface of the stepped hole (112);

an outer wall of an end head of the first main rod (1) is in threaded connection with an inner wall of the first joint (11) by means of threads; and glue is further applied to surfaces of the first main rod (1) and the first joint (11) fit to each other.