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(54) BRAIDING MACHINE AND BRAIDING METHOD OF TAIL-PULLING ROPE

(57) The present invention provides a braiding machine (1) and a braiding method of a tail-pulling rope. The braiding machine (1) of the tail-pulling rope comprises a machine frame (2), two track plates (3), a plurality of yarn carriers (6) and a rope belt braiding mechanism. The track plates (3) are located on the machine frame (2), and the yarn carriers (6) are mounted on the track plates (3), wherein the rope belt braiding mechanism comprises a turbine speed change mechanism (5), two belt wheels (7) and two transmission wheels (9). A transmission rod (10) is arranged between the two transmission wheels (9); a belt rolling rod (8) is arranged between the two belt wheels (7); a first end of the turbine speed change mechanism (5) is located in a middle of the two track plates (3) and mounted on the machine frame (2); a second end of the turbine speed change mechanism (5) is connected to the middle of the transmission rod (10); and a rubber tube (4) is arranged on the machine frame (2) and located at a center of the track plates (3). The braiding machine (1) of the tail-pulling rope has simple structure, good stability and high yield.

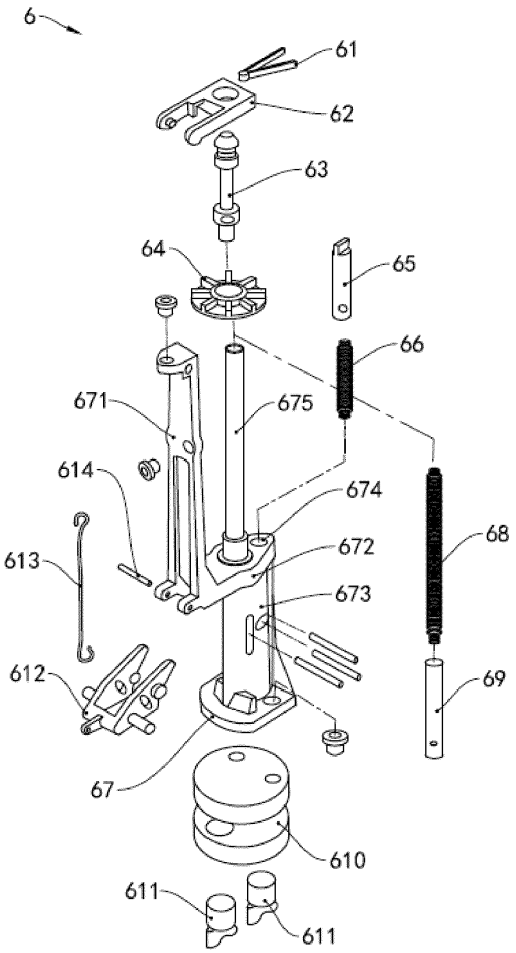

FIG. 2

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Description

TECHNICAL FIELD

[0001] The present invention relates to the technical field of automatic braiding mechanical equipment of tail-pulling ropes, and particularly relates to a braiding machine of a tail-pulling rope with excellent stability and a braiding method.

BACKGROUND

[0002] A current high-speed braiding machine of a tail-pulling rope is suitable for braiding a variety of circular or flat non-elastic and elastic tail-pulling ropes, and involves braided varieties including various shoelaces, elastic bands, high-tension bands, sports belts, curtain tapes and the like. The existing high-speed braiding machine of the tail-pulling rope has the advantages of fast braiding, diversified braiding types and simple operation, but has relatively low machine operating stability, resulting in unstable product quality, loud noise, short service life and maintenance inconvenience.

[0003] In a structure of the braiding machine of the tail-pulling rope, a gallop knitting ingot is a key component of the machine. How the gallop knitting ingot performs cross braiding on a disk surface stably and rapidly plays a decisive role in quality and pattern of braiding the tail-pulling rope by the machine. The existing gallop knitting ingot causes relatively low yield per unit time for the braiding machine of the tail-pulling rope.

SUMMARY

[0004] A first purpose of the present invention is to provide a braiding machine of a tail-pulling rope with simple structure, good stability and high yield.

[0005] A second purpose of the present invention is to provide a braiding method of a tail-pulling rope with simple structure, good stability and high yield.

[0006] In order to achieve the first purpose of the present invention, the present invention provides a braiding machine of a tail-pulling rope. The braiding machine comprises a machine frame, two gallop knitting trays, a plurality of gallop knitting ingots and a tail-pulling rope braiding mechanism, wherein the gallop knitting trays are located on the machine frame; the gallop knitting ingots are mounted on the gallop knitting trays, wherein the tail-pulling rope braiding mechanism comprises a turbine speed change mechanism, two belt wheels and two transmission wheels; a transmission rod is arranged between the two transmission wheels; a belt rolling rod is arranged between the two belt wheels; a first end of the turbine speed change mechanism is located in a middle of the two gallop knitting trays and mounted on the machine frame; a second end of the turbine speed change mechanism is connected to the middle of the transmission rod; and a rubber tube is arranged on the machine frame and located at a center of the gallop knitting trays.

[0007] A further solution is as follows: each gallop knitting tray is composed of sixteen round trays arranged in a circumference; and two gallop knitting ingots are mounted on each round tray.

[0008] A further solution is as follows: four grooves are uniformly formed in the circumference of the round trays; two grooves are respectively provided with a gallop knitting ingot; and the remaining two grooves are used for rotating the positions of the gallop knitting ingots on adjacent round trays.

[0009] A further solution is as follows: each gallop knitting ingot comprises a gallop knitting body, a gallop knitting head, a yarn control seat and a rotating disk; the gallop knitting body is provided with a shoulder part, a connecting part and a head part; a cylinder is vertically arranged on the shoulder part; one end of the gallop knitting head is connected with the gallop knitting tray, and the other end of the gallop knitting head is connected with the connecting part; the yarn control seat is located on a side surface of the connecting part and is hinged with the shoulder part; and the rotating disk is rotatably sleeved on the cylinder.

[0010] A further solution is as follows: each gallop knitting ingot further comprises a V-shaped elastic sheet, a cover plate and a fixing head; one end of the fixing head is sleeved on a top end of the cylinder; one end of the cover plate is hinged with the top end of the head; the other end of the cover plate is connected with the other end of the fixing head; and the V-shaped elastic sheet is located in the cover plate.

[0011] A further solution is as follows: each gallop knitting ingot further comprises a brake lever and a brake spring; a circular hole is formed in the shoulder part; the brake lever is inserted into the circular hole; and the brake spring is abutted against the brake lever and a bottom of the circular hole.

[0012] A further solution is as follows: each gallop knitting ingot further comprises a guiding rod and a fastening spring; the cylinder is provided with a hollow cavity body; the guiding rod is put into the cavity body; and the fastening spring is abutted against a top end of the guiding rod and a bottom of the fixing head.

[0013] A further solution is as follows: each gallop knitting ingot further comprises a yarn control spring; and the yarn control spring is abutted against a side surface of the yarn control seat and a side surface of the head.

[0014] A further solution is as follows: each gallop knitting ingot further comprises a ship type guiding block; and the ship type guiding block is located on the bottom of the gallop knitting head.

[0015] It can be seen from the above solutions that the braiding machine of the tail-pulling rope has simple structure, good stability and high yield.

[0016] In order to achieve the second purpose of the present invention, the present invention provides a braiding method of a braiding machine of a tail-pulling rope. The used braiding machine of the tail-pulling rope is the

above-mentioned braiding machine of the tail-pulling rope. The braiding method comprises: starting the braiding machine of the tail-pulling rope and braiding a hollow rope with a certain length; winding a braided end of the hollow rope outside the braiding machine of the tail-pulling rope, then inserting into a hollow core of a braiding end by the rubber tube on the machine frame so as to coat the tail-pulling rope layer by layer in a braiding process, enabling a hollow rope section to be adjacent to an outmost layer and then braiding a tail end and the outmost layer of the hollow rope together to form a desired tail-pulling rope; and opening the gallop knitting tray and taking out the braided tail-pulling rope.

[0017] It can be seen from the above solution that the above braiding method enables the braiding machine of the tail-pulling rope to braid a certain colored section with conspicuous distinguishing colors in the braiding process, and to braid the colored section into and adjacent to the outermost layer, thereby forming an indication layer of the tail-pulling rope, in order to conveniently remind and replace the worn tail-pulling rope in time. In addition, solid braids with different shapes can be braided in during braiding or at the beginning of braiding; and after the tail-pulling rope is coated by a certain length, the braided end is inserted into the hollow core of the braiding end so that the tail-pulling rope is coated layer by layer. Through this method, the solid braids with different shapes can be braided in an innermost layer of the tail-pulling rope, so that various tail-pulling ropes coated layer by layer and having different sectional shapes can be formed.

DESCRIPTION OF DRAWINGS

[0018]

Fig. 1 is a structural diagram in an embodiment of a braiding machine of a tail-pulling rope of the present invention;

Fig. 2 is a decomposition diagram of a gallop knitting ingot in an embodiment of a braiding machine of a tail-pulling rope of the present invention; and

Fig. 3 is a structural diagram of a gallop knitting ingot in an embodiment of a braiding machine of a tail-pulling rope of the present invention.

[0019] The present invention is further described below in combination with drawings and embodiments.

DETAILED DESCRIPTION

[0020] With reference to Fig. 1, a braiding machine 1 of a tail-pulling rope comprises a machine frame 2, two gallop knitting trays 3, a plurality of gallop knitting ingots 6 and a tail-pulling rope braiding mechanism. The gallop knitting trays 3 are located on the machine frame 2; and the gallop knitting ingots 6 are mounted on the gallop knitting trays 3. The tail-pulling rope braiding mechanism comprises a turbine speed change mechanism 5, two belt wheels 7 and two transmission wheels 9. A transmission rod 10 is arranged between the two transmission wheels 9; and a belt rolling rod 8 is arranged between the two belt wheels 7. A first end of the turbine speed change mechanism 5 is located in a middle of the two gallop knitting trays 3 and mounted on the machine frame 2; a second end of the turbine speed change mechanism 5 is connected to the middle of the transmission rod 10; and a fancy yarn or a rubber tube 4 is arranged on the machine frame 2 and located at a center of the gallop knitting trays 3. In a process of braiding an elastic tail-pulling rope, a rubber band penetrates through the colored yarn or the rubber tube 4 and is braided together with the tail-pulling rope, so as to braid various fancy elastic tail-pulling ropes with different shapes.

[0021] Each gallop knitting tray 3 is composed of sixteen round trays arranged in a circumference; and two gallop knitting ingots 6 are mounted on each round tray. Four grooves 31 are uniformly formed in the circumference of the round trays; two grooves 31 are respectively provided with a gallop knitting ingot 6; and the remaining two grooves 31 are used for rotating the positions of the gallop knitting ingots 6 on adjacent round trays. Such a design can achieve that the position of each gallop knitting ingot 6 among the round trays on the same gallop knitting tray 3 is rotated smoothly, so as to perform the braiding operation of the tail-pulling rope.

[0022] With reference to Fig. 2 and Fig. 3, each gallop knitting ingot 6 comprises a gallop knitting body 67, a gallop knitting head 610, a yarn control seat 612, a rotating disk 64, a V-shaped elastic sheet 61, a cover plate 62, a fixing head 63, a brake lever 65, a brake spring 66, a guiding rod 69, a fastening spring 68, a yarn control spring 613 and ship type guiding blocks 611. The gallop knitting body 67 is provided with a shoulder part 672, a connecting part 673 and a head part 671; a cylinder 675 is vertically arranged on the shoulder part 672; and a hollow cavity body is arranged on the cylinder 675. One end of the gallop knitting head 67 is connected with the gallop knitting tray 3, and the other end of the gallop knitting head 67 is connected with the connecting part 673. The ship type guiding blocks 611 are located at the bottom of the gallop knitting head 610. The quantity of the ship type guiding blocks 611 in the present embodiment is two. The yarn control seat 612 is located on a side surface of the connecting part 673 and is hinged with the shoulder part 672. In the present embodiment, the yarn control seat 612 and the shoulder part 672 are hinged through a plug pin 614, and the yarn control spring 613 is abutted against a side surface of the yarn control seat 612 and a side surface of the head 671. The rotating disk 64 is rotatably sleeved on the cylinder 675. One end of the fixing head 63 is sleeved on a top end of the cylinder 675; one end of the cover plate 62 is hinged with the top end of the head 671; the other end of the cover plate 62 is connected with the other end of the fixing head 63; and the V-shaped elastic sheet 61 is located in the cover plate 62. The guiding rod 69 is put into the cavity body of the

cylinder 675; and the fastening spring 68 is abutted against a top end of the guiding rod 69 and a bottom of the fixing head 63. A circular hole 674 is formed in the shoulder part 672; the brake lever 65 is inserted into the circular hole 674; and the brake spring 66 is abutted against the brake lever 65 and a bottom of the circular hole 674.

[0023] Therefore, the above braiding machine 1 of the tail-pulling rope has simple structure, good stability and high yield.

[0024] A braiding method of the braiding machine 1 of the tail-pulling rope is provided. The used braiding machine 1 of the tail-pulling rope is the above-mentioned braiding machine 1 of the tail-pulling rope. The braiding method comprises: starting the braiding machine 1 of the tail-pulling rope and braiding a hollow rope with a certain length; winding a braided end of the hollow rope outside the braiding machine of the tail-pulling rope, then inserting into a hollow core of a braiding end by the rubber tube 4 on the machine frame so as to coat the tail-pulling rope layer by layer in a braiding process, enabling a hollow rope section to be adjacent to an outmost layer and then braiding a tail end and the outmost layer of the hollow rope together to form a desired tail-pulling rope; and opening the gallop knitting tray 3 and taking out the braided tail-pulling rope.

[0025] The braiding method in the present embodiment enables the braiding machine of the tail-pulling rope to braid a certain colored section with conspicuous distinguishing colors in the braiding process, and to braid the colored section into and adjacent to the outermost layer, thereby forming an indication layer of the tail-pulling rope, in order to conveniently remind and replace the worn tail-pulling rope in time. In addition, solid braids with different shapes can be braided in during braiding or at the beginning of braiding; and after the tail-pulling rope is coated by a certain length, the braided end is inserted into the hollow core of the braiding end so that the tail-pulling rope is coated layer by layer. Through this method, the solid braids with different shapes can be braided in an innermost layer of the tail-pulling rope, so that various tail-pulling ropes coated layer by layer and having different sectional shapes can be formed.

[0026] The above embodiments are only preferred embodiments of the present invention and are not intended to limit an implementation scope of the present invention. Therefore, equivalent changes or modifications made according to structures, features and principles in a scope of the patent applied in the present invention should be included in an application scope of patent of the present invention.

Claims

1. A braiding machine of a tail-pulling rope, comprising a machine frame, two gallop knitting trays, a plurality of gallop knitting ingots and a rope belt braiding mechanism, wherein the gallop knitting trays are located on the machine frame; and the gallop knitting ingots are mounted on the gallop knitting trays, wherein
   the rope belt braiding mechanism comprises a turbine speed change mechanism, two belt wheels and two transmission wheels; a transmission rod is arranged between the two transmission wheels; and a belt rolling rod is arranged between the two belt wheels;
   a first end of the turbine speed change mechanism is located in a middle of the two gallop knitting trays and mounted on the machine frame; and a second end of the turbine speed change mechanism is connected to the middle of the transmission rod; and
   a rubber tube is arranged on the machine frame and located at a center of the gallop knitting trays.

2. The braiding machine of the tail-pulling rope according to claim 1, wherein
   each gallop knitting tray is composed of sixteen round trays arranged in a circumference; and two gallop knitting ingots are mounted on each round tray.

3. The braiding machine of the tail-pulling rope according to claim 2, wherein
   four grooves are uniformly formed in the circumference of the round trays; two grooves are respectively provided with a gallop knitting ingot; and the remaining two grooves are used for rotating the positions of the gallop knitting ingots on adjacent round trays.

4. The braiding machine of the tail-pulling rope according to any one of claims 1-3, wherein
   each gallop knitting ingot comprises a gallop knitting body, a gallop knitting head, a yarn control seat and a rotating disk; the gallop knitting body is provided with a shoulder part, a connecting part and a head part; and a cylinder is vertically arranged on the shoulder part;
   one end of the gallop knitting head is connected with the gallop knitting tray, and the other end of the gallop knitting head is connected with the connecting part;
   the yarn control seat is located on a side surface of the connecting part and is hinged with the shoulder part; and
   the rotating disk is rotatably sleeved on the cylinder.

5. The braiding machine of the tail-pulling rope according to claim 4, wherein
   each gallop knitting ingot further comprises a V-shaped elastic sheet, a cover plate and a fixing head; one end of the fixing head is sleeved on a top end of the cylinder; one end of the cover plate is hinged with the top end of the head; the other end of the cover plate is connected with the other end of the fixing head; and the V-shaped elastic sheet is located

in the cover plate.

6. The braiding machine of the tail-pulling rope according to claim 5, wherein
each gallop knitting ingot further comprises a brake lever and a brake spring; a circular hole is formed in the shoulder part; the brake lever is inserted into the circular hole; and the brake spring is abutted against the brake lever and a bottom of the circular hole.

7. The braiding machine of the tail-pulling rope according to claim 6, wherein
each gallop knitting ingot further comprises a guiding rod and a fastening spring; the cylinder is provided with a hollow cavity body; the guiding rod is put into the cavity body; and the fastening spring is abutted against a top end of the guiding rod and a bottom of the fixing head.

8. The braiding machine of the tail-pulling rope according to claim 7, wherein
each gallop knitting ingot further comprises a yarn control spring; and the yarn control spring is abutted against a side surface of the yarn control seat and a side surface of the head.

9. The braiding machine of the tail-pulling rope according to claim 8, wherein
each gallop knitting ingot further comprises a ship type guiding block; and the ship type guiding block is located on the bottom of the gallop knitting head.

10. A braiding method of a braiding machine of a tail-pulling rope,
the braiding machine of the tail-pulling rope being the braiding machine of the tail-pulling rope of any one of claims 1-9, and the braiding method comprising:

starting the braiding machine of the tail-pulling rope and braiding a hollow rope with a certain length;
winding a braided end of the hollow rope outside the braiding machine of the tail-pulling rope, then inserting into a hollow core of a braiding end by the rubber tube on the machine frame so as to coat the tail-pulling rope layer by layer in a braiding process, enabling a hollow rope section to be adjacent to an outmost layer and then braiding a tail end and the outmost layer of the hollow rope together to form a desired tail-pulling rope; and
opening the gallop knitting tray and taking out the braided tail-pulling rope.

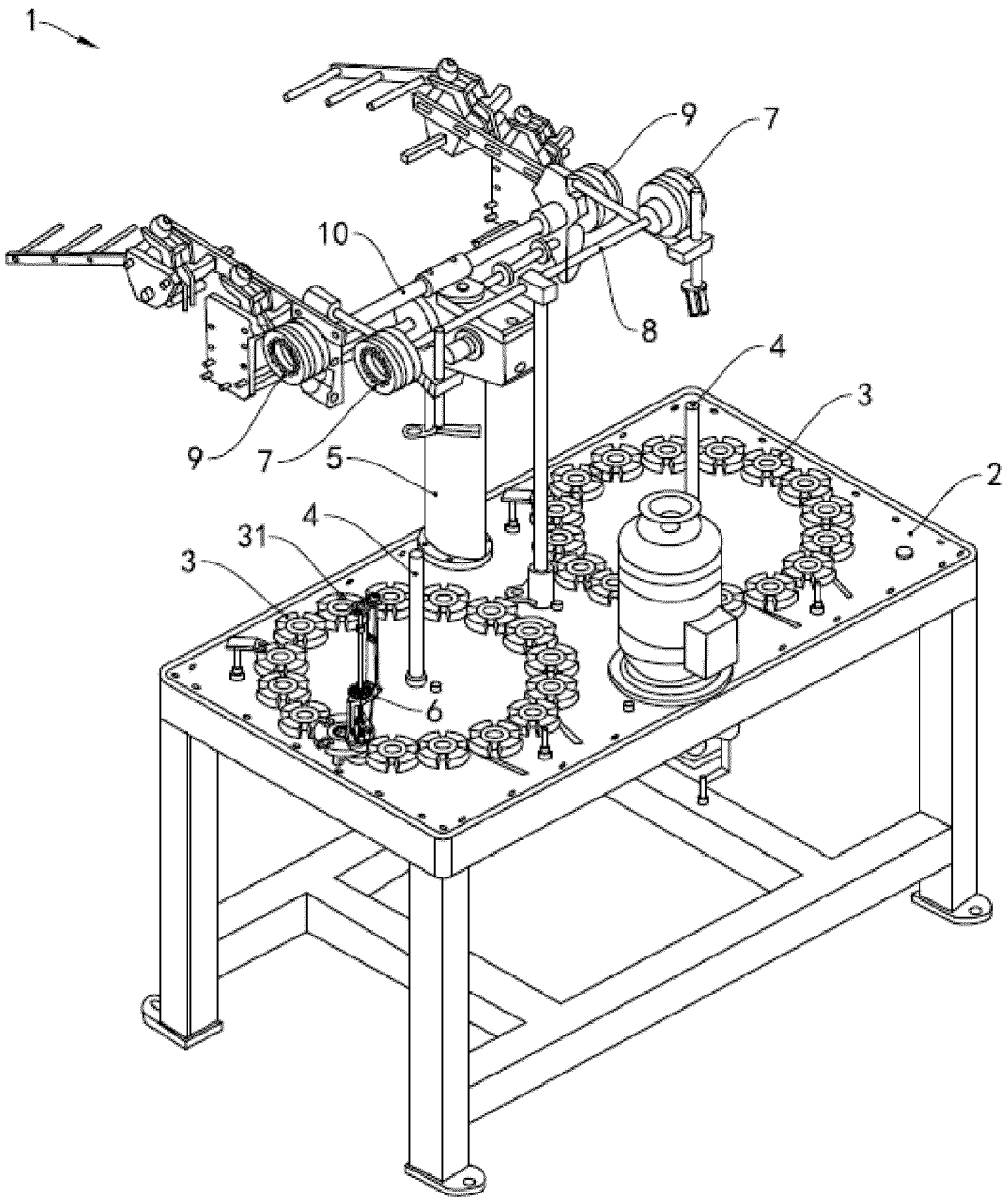

FIG. 1

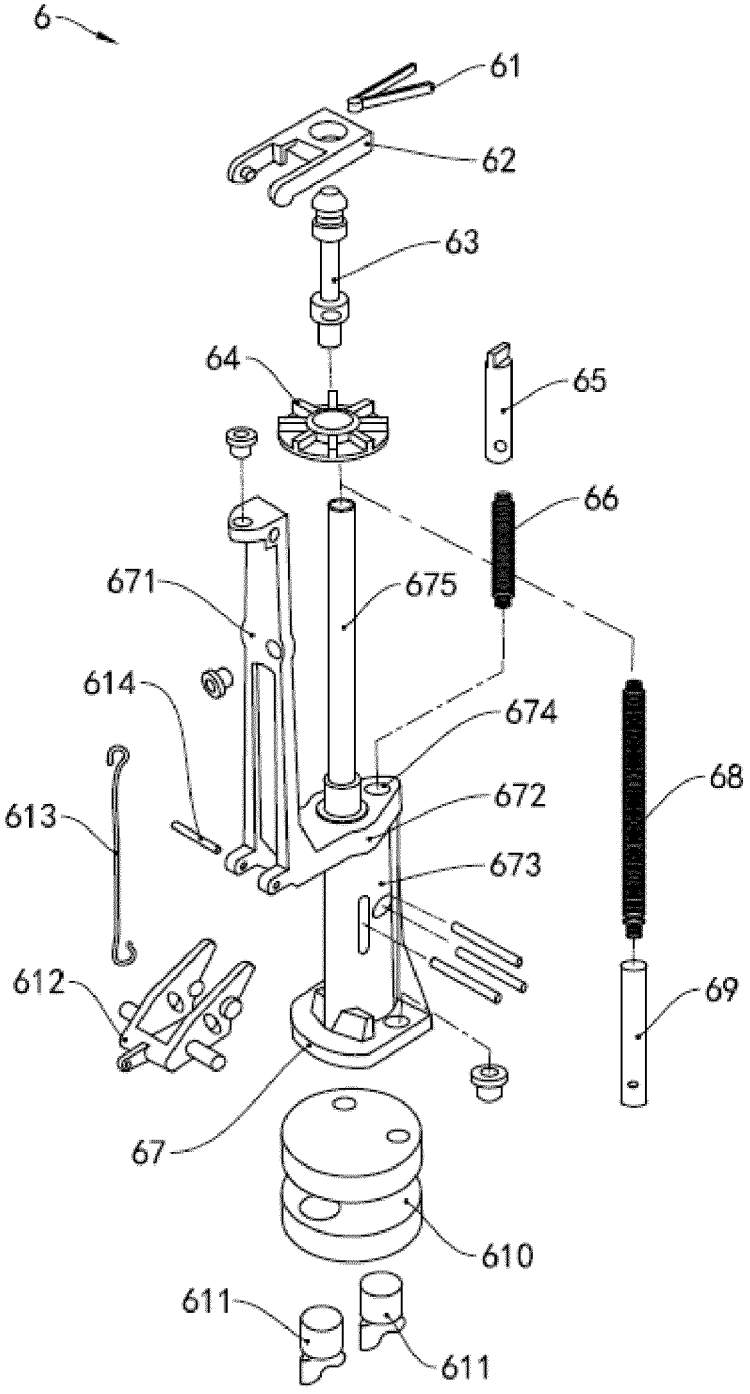
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FIG. 2

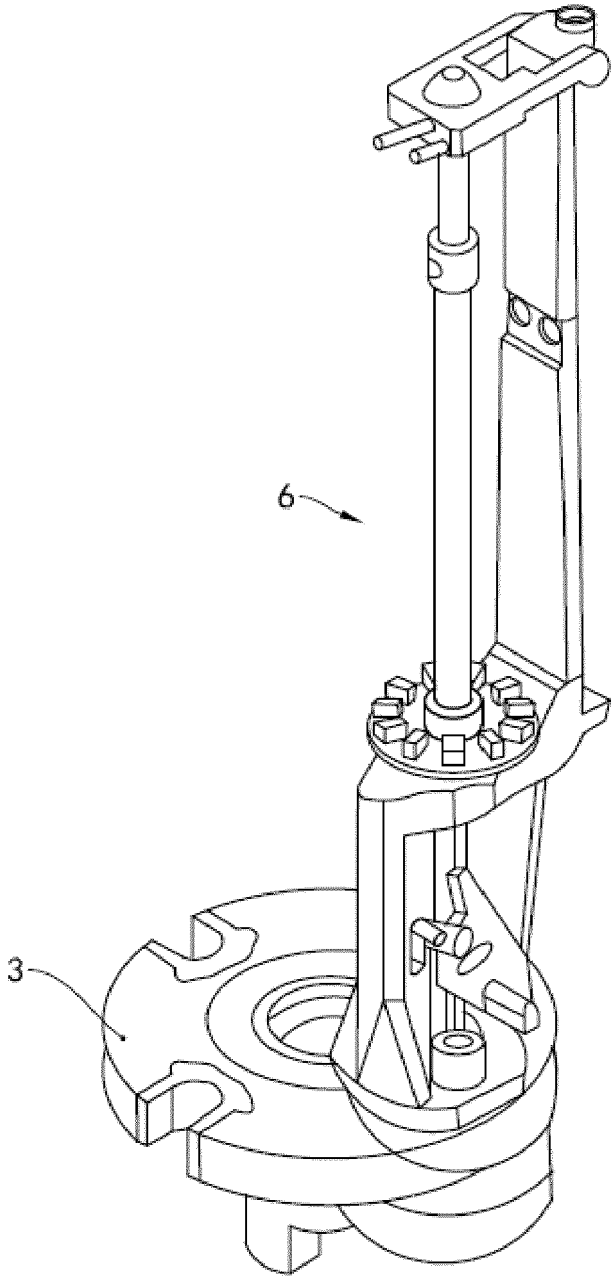

FIG. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 18 16 1889

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	CN 203 113 047 U (FUJIAN YITAI SCIENCE & TECHNOLOGY CO LTD) 7 August 2013 (2013-08-07) * figures 1-5 *	1-10	INV. D04C1/12 D04C3/08 D04C3/18 D04C3/48
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TECHNICAL FIELDS SEARCHED (IPC)
D04C D07B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	17 September 2018	Kirner, Katharina

CATEGORY OF CITED DOCUMENTS

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17-09-2018

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