
Research On A Kind Of Lock With A Special Key And The Usability Of The Key

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Abstract

Locks and keys are indispensable safety devices in life and production. There are many kinds of locks and keys, which are mainly composed of mechanical locks and keys. Mechanical locks and keys have the advantage of long working life. However, it is very difficult to discharge or prolong the water in the keyhole in the case of high temperature and humidity. Besides, it is easy to have the rust on the lock core or keyhole, which causes the lock to be unable to open. Therefore, locks and keys made from rustproof metal are high in cost; When rust removal is carried out, if the key hole of the installed lock is in a horizontal state, it cannot be dropped into the derusting liquid. This study designed a rust-proof lock and key to solve the above deficiencies.

Keywords

Special, Keys , Usability.

1. Overall Design Scheme

This design includes the lock core assembly and the key used in conjunction with the lock core assembly and a fixed set for mounting a lock assembly. The features are as follows: The fixed set is on the outside of the core assembly and the lock assembly end is fixed to the fixing sleeve by the nut. A gap between the lock assembly and the fixing sleeve is formed to place the key. The core assembly consists of a rotary assembly, a core shaft installed in a rotary assembly, a rotary assembly installed at one end of the assembly and a top cover at the other end of the transfer assembly. The core end is installed at one end of the transfer assembly through the second and third bearings. The top cover is mounted on the third bearing and is fixed on the spindle. The rotary assembly is mounted on the other end of the core shaft through the first bearing and is fixed at the rotary assembly. The first bearing is fixed to the spindle through the round nut. Keys include locks and a number of lock teeth set on the lock. The lock head is mounted on the handle and the lock sleeve is set on the outer wall of the core assembly. The scheme provides a lock and key with a reasonable and simple structure which can effectively prevent rust on the lock or keyhole. The overall connection structure diagram provided by the embodiment is shown in figure 1.

2. Structure Design

The sleeve assembly includes the casing and the plug that is set at the end of the casing. The core axis includes shaft body, shaft ring, front axle head and rear axle head. The second bearing and the third bearing are respectively placed in the step hole. At one end of the core, it passes through the second bearing, step hole, and the third bearing. The second bearing is placed between the shaft ring and the plug, and the third bearing is placed between the top cover and the plug. The diagram of the breakdown structure of each component is shown in figure 2.

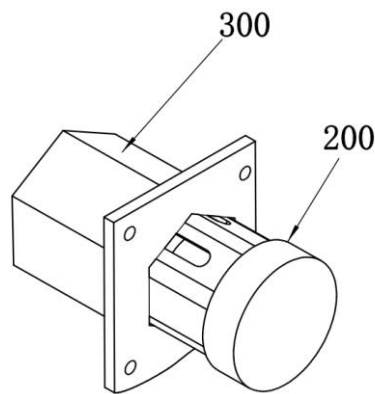


FIG. 1 Schematic Diagram Of Overall Connection Structure.

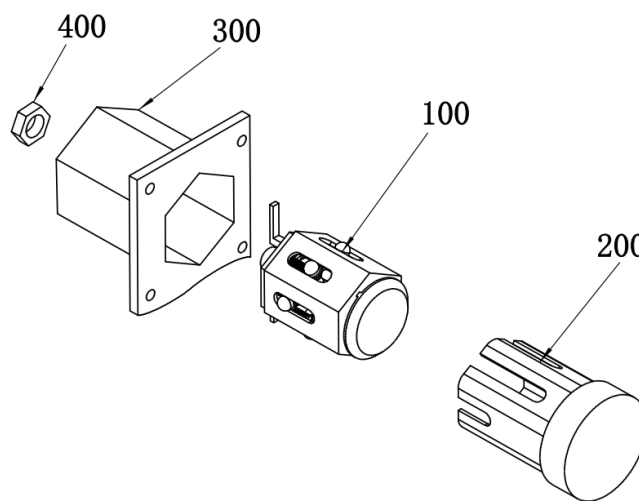


FIG. 2 Component Decomposition Diagram

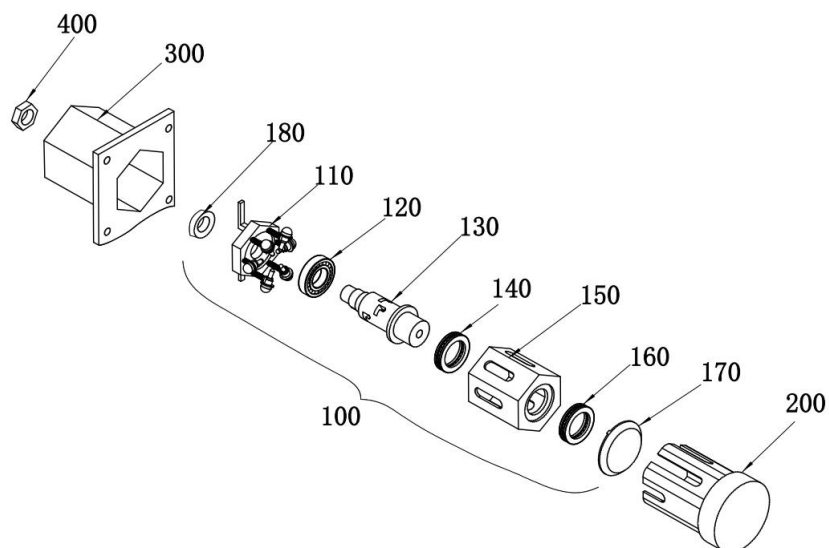


FIG. 3 Schematic Diagram Of Decomposition Structure

The second and third bearings are thrust ball bearings, and the first bearing is the aligning ball bearing. The casing pipe wall is provided with multi-set guide groove, and the shaft wall is arranged with multi-set and guide slot corresponding to the layout of the card hole. The rotary assembly comprises a disk body and a fork mounted on the back end of the disc as well as multiple sets of springs that are

installed in front of the disk and corresponding to the number of guide slots. One end of each set is fixed to the disk, and the other end is mounted with a pin. The inner ring of the first bearing is installed in the front axle, and the first bearing outer ring is installed in the positioning groove at the front end of the disc. The disk body is installed in the casing along the core axis. The top pin of each group is placed in the corresponding guide slot, and the other end is placed in the card hole. The diagram of the decomposition structure is shown in figure 3.

Each set of locking teeth is a "U" shaped slot structure with a deep and unequal depth. The number of locking teeth is equal to that of the top pin, and each group of top pin is placed in the corresponding lock tooth. The installation structure of the core assembly is shown in figure 4.

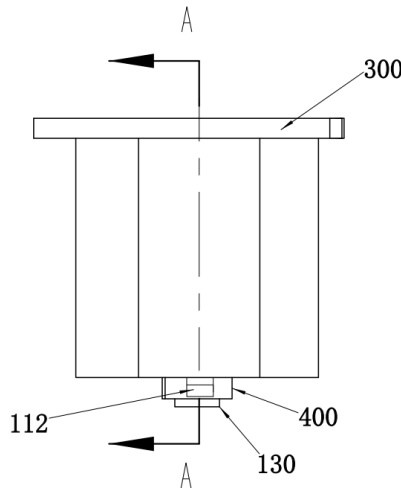


FIG. 4 Lock Assembly Installation

3. Detail Design Analysis

The lock and key of the special key include the lock core assembly and the key used in conjunction with the lock assembly as well as a fixed set for mounting a lock assembly. The fixed set is on the outside of the core assembly and the lock assembly end is fixed to the fixing sleeve by the nut. The gap between the core assembly and the fixed sleeve is formed to place the key, and the section structure is shown in figure 5.

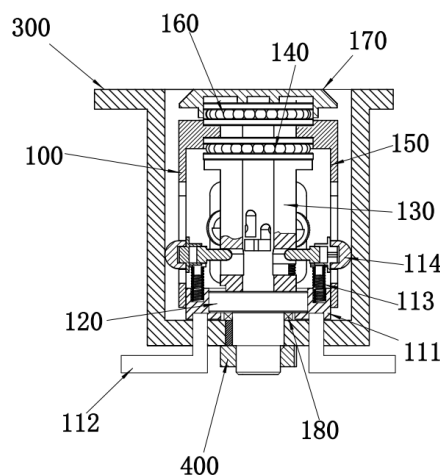


FIG. 5 Schematic Diagram Of Section View

The core assembly consists of a rotary assembly, a core shaft installed in a rotary assembly, a rotary assembly installed at one end of the assembly and a top cover at the other end of the transfer assembly. The core end is installed at one end of the transfer assembly through the second and third bearings. The top cover is mounted on the third bearing and is fixed on the spindle. The rotary assembly is mounted

on the other end of the core shaft through the first bearing and is fixed at the rotary assembly. The first bearing is fixed to the spindle through the round nut. As is shown in figure 6.

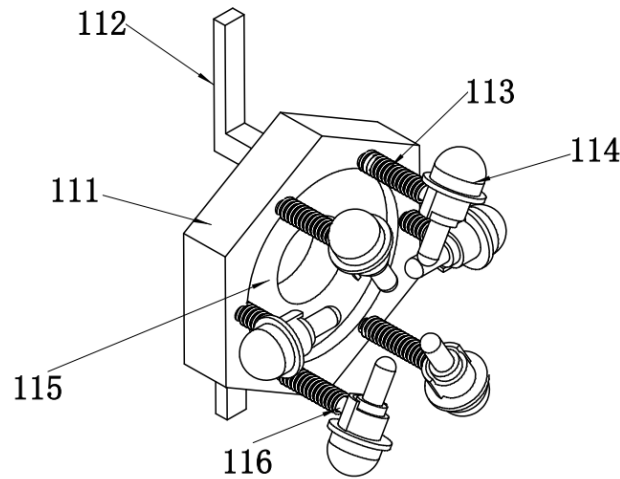


Figure 6 Spindle

The core axis includes shaft body, shaft ring, front axle head and rear axle head. The second bearing and the third bearing are respectively placed in the step hole. One end of the core is passed through the second bearing and the step hole. The third bearing is mounted with a top cover, and the second bearing is placed between the shaft ring and the plug, and the third bearing is placed between the top cover and the plug, as shown in figure 7.

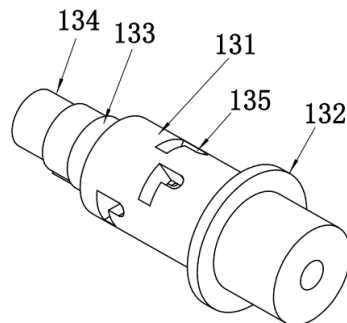


Figure 7 Spindle

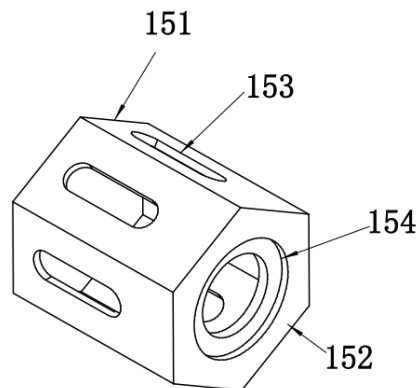


FIG. 8 Schematic Diagram of Assembly Structure

The second and third bearings are thrust ball bearings, and the first bearing is the aligning ball bearing.

The inner ring of the first bearing is installed in the front axle, and the first bearing outer ring is installed in the positioning groove at the front end of the disc. The disk body is installed in the casing along the core axis. The top pin of each group is placed in the corresponding guide slot, and the other end is placed in the card hole, as shown in fig.8.

The front end of the disc is provided with a blind hole for the spring. The spring end is fixed to the bottom of the blind hole. A guide rod is installed on the top pin wall and the guide bar runs through the spring to the blind hole. A curved hole structure is provided at one end of the fixed sleeve, and the fork is extended through the curved hole structure to the outside of the fixed set. The card hole is the "L" structure, and each group of cavities is different from that of the core end, as shown in FIG. 9.

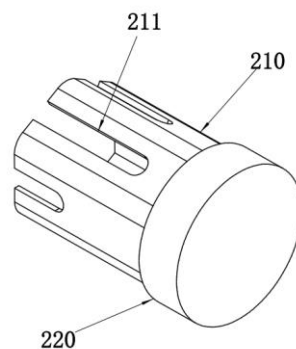


FIG. 9 Schematic Diagram Of Key Structure

4. Conclusion

This design includes the lock core assembly and the key used in conjunction with the lock core assembly as well as a fixed set for mounting a lock assembly. A gap between the lock assembly and the fixing sleeve is formed to place the key. The core assembly consists of a rotary assembly, a core shaft installed in a rotary assembly, a rotary assembly installed at one end of the assembly and a top cover at the other end of the transfer assembly. The rotary assembly is mounted on the other end of the core shaft through the first bearing and is fixed in the transfer assembly. The lock sleeve is set on the outer wall of the core assembly. The new design has the advantages of reasonable design and convenient use and it can enhance the operational reliability of the lock and key. Meanwhile, it can prevent keyhole from water and avoid rusting. At the same time, the overall structure is simple, and it is easy to maintain and repair. Therefore, it is suitable for all kinds of occasions.

References

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