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Research on Fast Lock Anchorage Tools

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Abstract: This paper deals with a new type of fast locking anchoring tool to meet the requirements of formwork fixing, which is mainly composed of electric wrench, rotary shaft, support bearing, cylinder liner, end cover plate, drive gear, gear jacket, drive rack, pin, crescent support, crescent buckle plate, shell and shell cover, etc. The process of machining and manufacture of each key component and the whole assembly process of key components are detailed, which prove that the product has good application effect.

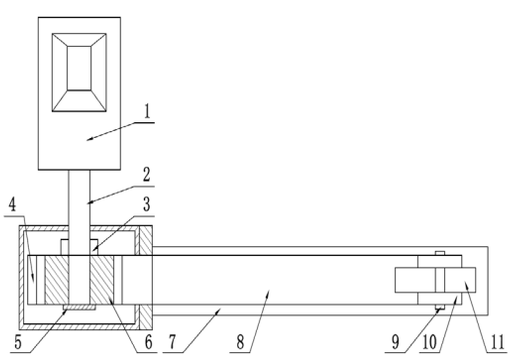
Keywords: Template fixing; locking anchoring tool; electric wrench; driving gear; driving rack

1. Introduction

The quality of building formwork affects the quality of concrete entity, and the key to the quality of formwork installation is the anchoring quality and anchoring mode. The traditional fixing method mainly depends on manual discharge. In the course of operation, it is necessary to put the parts to be processed first, then put the nails, finally carry out the processing operation, realize the combination of nails and materials, the time of single operation is long, and the manual operation has certain safety hidden trouble. The traditional riveting machine can not carry out smooth, efficient and uninterrupted riveting.

2. Composition of the device structure

The fast locking Anchorage tool mainly includes: electric wrench, rotary shaft, support bearing, cylinder liner, end cover plate, drive gear, gear jacket, drive rack, pin, crescent support, crescent buckle plate, shell and shell cover. The schematic diagram and model diagram are shown in figs .1 and 2, respectively.



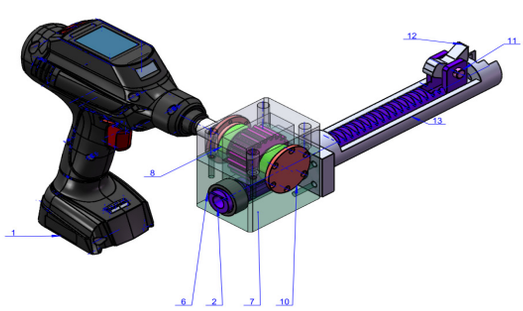


Fig.1 Schematic diagram of fast locking anchorage tool Fig.2 Model of Fast Lock Anchorage Tool

Among them, the electric wrench is connected with the rotating shaft, the rotating shaft is provided with a supporting bearing, the shaft end of the rotating shaft is equipped with a driving gear, the driving gear is meshed with the driving rack, and the driving rack is connected with the crescent support.

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3. Critical parts processing

3.1 Manufacture of electric wrench

Electric wrench is an electric tool for tightening and loosening bolts and nuts. It can be used to tighten high strength bolts. It is suitable for the initial twist, final twist and torsional shear type high strength bolt for the construction of high strength bolt with large hexagonal head, as well as for the situation where the torque or axial force of bolt fastener is strictly required, it belongs to single-phase series excitation electric wrench, and its motor device is in plastic shell. The plastic shell is not only used as the structure to support the motor, but also as the additional insulation of the motor stator.

3.2 Manufacture of rotary shaft

The rotating shaft is subjected to the following heat treatment steps :(1) The casting at room temperature shaft at room temperature is put into the heating furnace, Heating to 600℃ , Then heat preservation 2 hours after taking out; (2) After cooling the rotating shaft castings through step 1 to room temperature, Heating to 900℃ , After 4 hours of heat preservation, isothermal treatment immediately in an isothermal salt bath of 240℃ , Three hours, Then air cooling; (3) Heating the castings after step (2) to 420℃ , Tempering at medium temperature, This improves the fatigue resistance of the rotating shaft.

3.3 Processing of support bearings

the supporting bearing with mounting hole, inner gear or outer gear, lubricating oil hole and sealing device, the large bearing which can withstand comprehensive load can bear large axial and radial load and overturning moment at the same time, so it can make the main engine design compact, easy to guide and easy to maintain.

3.4 Processing and manufacture of crescent support and crescent buckle plate

The crescent support is welded by steel plate. Step 1: clean the groove of all steel plates to be welded; step 2: splice the steel plate into weld and position all welds; step 3: in all weld positions, pyrotechnic heating; Step 4: submerged arc welding. The crescent buckle plate is mainly formed by stereoscopic cam and has accurate positioning. There is no need for other locking elements, which can realize arbitrary dynamic and dynamic ratio and segmentation number.

4.Assembly of key components

The rack jacket can protect the drive rack from wear, prolong the service life, and increase the force area. The rack coat is connected to the housing, which is equipped with a housing cover. The inner hexagonal screw is often used in machinery. It is mainly easy to fasten, disassemble, not easy to slide, etc. The inner hexagonal wrench used in fastening or disassembling is generally a 90 bend. One end of the bend is long and one side is short. The effect after assembly is shown in figure 3.

Fig .3 Assembly Form of Fast Lock Anchorage Tool

5. Conclusions

The fast locking Anchorage tool is driven by gear rack. The gear rack can be spliced infinitely, run at high speed, have large bearing capacity, run smoothly, have high transmission precision, high transmission efficiency, accurate

transmission ratio, and has a large power range. It can adapt to large torque transmission and can carry out quick riveting operation. It has good use effect.

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