The lathe chuck wrench safety device design

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Abstract. Lathe chuck wrench safety device design, can be in the process of lathe operations to better solve the problems of potential safety hazard, thus ensuring lathe application process, can have high security. In the process of lathe chuck wrench safety device design, to safe hidden trouble for lathe, grasp the corresponding design principles, to give full play to its function and safety device design.

Introduction

Lathe chuck wrench safety device design, can reduce the accident risk, realize the effective protection of personal and equipment. In the process of lathe chuck wrench safety device design, to grasp the characteristics of the safety device design, realize the device has the advantages of simple structure, small volume, light weight, shock, and oil resistant design goal, to provide security for the lathe practice and application.

A hidden trouble in security, lathe practice in the process of analysis

In machining practice process, the common horizontal lathe with wider range of application in practice, is one of the colleges and universities to practice the necessary equipment. But in the process of the use of machine tools for internship, frequent safety accidents, brought interns personal injury, and also led to a larger equipment damage. To this, in the lathe practice process, the need to strengthen the lathe chuck wrench installation design, can exist in the process of lathe practice safe hidden trouble to prevent, to meet the needs of the lathe practice. At present, the lathe security hidden danger existing in the practice process mainly reflects in the following:

1. Machine tool rotation security hidden danger

On the lathe chuck parts damage in the process of problem analysis, this paper mainly to "CA6136" lathe as an example, in the process of application of the lathe of this type, through the clutch control, the middle position in a stop state, snapping up the main shaft is running, break down the main shaft reverse operation. When CA6136 lathe clutch friction plate gap adjustment is not at the time, or the operator to inaccurate positioning of the clutch, can lead to machine tool rotation. As a result, in the practice process, because often take one operator, a crowd of way, to handle the mistake touch is more, the condition of the personal injury may result in machine tool for interns.

2. Chuck wrench is not take security hidden danger

On CA6136 lathe operation process, because the interns will forget to take out the chuck wrench, machine starts, chuck rotation, may lead to wrench, the person near to produce harm. On lathe practice process, some beginner's attention to this problem is low, forget to take out the chuck wrench phenomenon is relatively common, it buried a larger potential safety hazard to lathe practice [1].

3. The lathe itself the fault cause potential safety hazard

In for lathe practice process, CA6136 lathe due to mechanical equipment failure, will lead to failure of parts, in the practice process, thus causing accidents are common. For example the clutch handle at an intermediate position, lathe chuck is in a state of stop work, in this time period to take out the chuck is safe. But if it is due to equipment malfunction, chuck is not in the condition of stop working, can produce safe hidden trouble.

Practice process, thus, lathe chuck wrench the safe hidden trouble of main is divided into two aspects of subjective factors and objective factors. In the process of safety device design, need to consider from the two aspects, one is able to solve the error caused by the operation security hidden danger; The second is to solve the window fault cause security problems.

The lathe chuck wrench safety device design and analysis

On the lathe chuck wrench safety device in the process of design and analysis, this article, based on the specific situation of CA6136 lathe, we design a reliable safety device lathe chuck wrench, avoid the happening of the accident. Lathe chuck wrench safety device design process, pay attention to in the form of an electrical switch, to solve the possible subjective and objective hazards, to ensure that the lathe practice has higher safety and reliability.

1. working principle of the lathe chuck wrench safety device

Lathe chuck wrench the essence of the safety device is equivalent to an electrical switch, it is set in the line of electrical circuits that can be implemented to control the motor driven work effectively [2]. In the design process for safety equipment, it is necessary to grasp the wrench inserted and left, a wrench in the insert equipment, circuit is in a state of connected, so that the motor starts to work, when the wrench is not inserted, the motor is in the condition of stop working. The application of the safety device, can guarantee a wrench in the condition of not taken, will not harm the other interns. At the same time, the advantage of this circuit device, can make the lathe into the normal working state, to avoid the phenomenon of lathe appear suddenly start [3]. Lathe chuck wrench set device design is relatively simple, easy to operate, can have a good protection effect.

2. The lathe chuck wrench safety device structure design

In structural design process, the need to take into account the specific function of the chuck wrench. With regard to its structure, we can see from Fig 1:

Fig. 1 Chuck wrench safety device structure

We can see from figure 1, chuck wrench safety device structure is mainly composed of electrical equipment operation switch, guide tube and chuck wrench of three parts, including chuck wrench have played an important role in a connection circuit. In the specific work of chuck wrench inserted, can make the motor in a working state, thus make the machine run properly. Chuck wrench structure design, want to make the design of the head can be inserted into the groove, connected to the power supply. At design time, you need to set up the corresponding dust prevention measures, to avoid the rust, the affect of the normal operation of equipment. About the specific design of the security device chuck wrench, as shown below:

On the lathe chuck wrench safety device in the process of production, we can use 100 mm * 70 mm * 6 mm plate and 13 mm radius, a length of around 80 mm iron pipe. In the process of iron pipe processing, make its head to form a radius of 5 mm, length is 24 mm slot, after the iron tube and iron plate welded together. In the safeguard production is completed, the motor running switch installed on it. The process, to avoid the walls appear when installing drilling oil situation, and make dust prevention measures, avoid harmful to the reliable operation of the safety device [4].

Conclusion

Based on the analysis of the above we can see that the lathe chuck wrench safety device design, adopted a circuit loop device structure design way, through a circuit loop, can make the machine in normal working condition. In the specific design process, must pay attention to the lathe chuck wrench the characteristics of the safety device for sure, and need to prepare for the corresponding dust, thus ensuring safety device can be in the process of practical application, better play to its function and role.

References

- [1] BaiShiJie. Lathe chuck wrench safety device design [J]. Journal of liaoning higher vocational journals, 2014 practices: 89-91.
- [2] Zhang Xin, wen-long pan. Lathe chuck wrench safety device design and application [J]. Journal of silicon valley, 2013 cutflower production potentials: 181 + 170.
- [3] Huang Jiechao. Lathe chuck wrench safety device design [J]. Journal of equipment manufacturing technology, 2014, 12:71-72.
- [4] Gao Dechong. Safety devices in the application of the lathe chuck wrench design improvements [J]. Journal of heilongjiang science and technology information, 2015,09:44.