三坐标数控铣床结构设计

摘　要：本次毕业设计的题目是三坐标数控铣床，该机床能通过三轴联动，实现曲线直线等不同的加工路线。三坐标数控铣床的基本原理是三个坐标方向的移动均由步进电机带动，主轴电机采用交流电机，所有电机均由单片机进行控制。而我们需要了解的单片机的工作原理，主要包括以下几个方面：首先对于机床整体结构的设计，仔细分析优缺点，充分考虑利弊，择优选取；其次是X、Y,Z工作台的传动机构设计，三轴联动的核心，其中滚珠丝杠的运用要重点把握；最后是单片机控制系统的设计。

此次设计的目的主要是是将原有普通铣床对其进行创新和改造，使之成为三坐标数控铣床。通过对普通铣床的数控化改造，提高加工精度和加工可靠性，扩大加工范围，增强加工能力。在实际应用中，三坐标数控铣床能够为机械加工企业节省成本，提高效率，具有良好的经济效益。数控机床的发展也为制造业的发展带来了革命性的转变。

关键词：三坐标；数控铣床；单片机；结构设计

Three-coordinate CNC milling machine design

Abstract: The topic of this graduation project is the three axis NC milling machine, which can realize different processing routes such as curves and straight lines through three axis linkage.he basic principle of three-coordinate CNC milling machine is that the movement of three coordinate directions is driven by stepper motor, the spindle motor adopts AC motor, and all motors are controlled by single .We need to understand the working principle of single-chip microcomputer, mainly including the following aspects: first of all, the overall structure of the machine design, careful analysis of advantages and disadvantages, fully consider the advantages and disadvantages, merit-based selection, followed by X, Y,Z Workbench transmission mechanism design, three-axis linkage of the core, in which the use of ball screw to focus on grasping ; Finally, the design of single-chip microcomputer control system.

The purpose of this design is mainly to innovate and transform the original ordinary milling machine, so that it becomes three coordinate CNC milling machine. The transformation of ordinary milling machine, improve the machining precision and processing reliability, expand the processing range, enhance the process .In practical applications, coordinate CNC milling machine for the mechanical processing enterprises can save costs, improve efficiency, good economic return.The development of CNC machine tools has also brought revolutionary changes to the development of manufacturing industry.

Keywords: Three coordinates、CNC machine、SCM、Servo mechanism