卧式加工中心的主传动系统的设计

摘要

现如今，机械产业对数控加工中心的技术要求越来越高,卧式加工中心的工艺范围也变得更广泛，也让更多的新技术得以应用到卧式加工中心的设计当中。在对卧式加工中心进行设计的时候，主传动系统是其最重要的部分，其直接影响着加工中心的性能。

主传动系统的设计：1.要计算扭矩和功率来选择电动机 2.要通过计算和校核来确定传动系统的设计 3.最后设计零部件，完成设计。设计变速结构使主轴拥有不同的速度，来满足不同的加工要求。

本文通过对已给出的技术指标来进行对该卧式加工中心主传动系统设计。在设计中，参考了大量国内外卧式加工中心的布局，再结合已给技术指标对其进行分析与改善。之后应考虑设计方案能否实行，是否符合技术要求与生产成本的预算，结合到实际设计出最好的设计方案。本文设计的主传动系统方案中对主轴的性能以及结构都有了很大的提升，主传动系统的结构方案上采用了 4 轴的布局，简化了布局结构同时也满足了主轴升速与降速的要求。让所设计的卧式加工中心主动系统更加精巧，高效。

关键词：数控机床；卧式加工中心；主传动系统

Abstract

Nowadays, the mechanical industry has higher and higher technical requirements for CNC machining centers, and the process scope of horizontal machining centers has become more extensive, which also enables more new technologies to be applied in the design of horizontal machining centers. In the design of horizontal machining center, the main drive system is the most important part, which directly affects the performance of machining center.

Design of main drive system: 1. Choose the motor by calculating torque and power; 2. Determine the design of drive system by calculating and checking; 3. The design of variable speed structure enables the spindle to have different speeds to meet different machining requirements.

In this paper, the main drive system of the horizontal machining center is designed according to the technical indexes given. In the design, a large number of domestic and foreign horizontal machining center layout, combined with the technical indicators have been analyzed and improved. After that, we should consider whether the design scheme can be implemented, whether it conforms to the technical requirements and the production cost budget, and design the best design scheme based on the actual situation. The main drive system designed in this paper has greatly improved the performance and structure of the spindle. In the structural scheme of the main drive system, the 4-axis layout is adopted, which simplifies the layout structure and also meets the requirements of the rise and fall speed of the spindle. So that the design of the horizontal machining center active system more sophisticated, efficient.

Key words: CNC machine tools; Horizontal machining center; Main drive system

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