

题 目： 自动化生产线装配系统设计

摘要

自动化生产线在整个行业和其他领域发挥着重要作用。它是现代工业的命脉，在现代工业中发挥着领导和支撑作用。现代工业的发展离不开自动化生产线。其发展速度决定了公司在市场上的竞争力。如今，对产品数量和多样性的需求不断增加，这意味着传统制造业对生产设备的自动化有着更严格的要求，特别是在制造业，大规模生产中。需求对公司的盈利能力至关重要。因此，大量的自动化生产线被用于快速批量生产，并且自动化协会的发展变得越来越迫切。

本文针对自动化生产线上装配系统装配效率低、自动化不完全等问题，设计了一个可以实现工件装配和紧和装配的自动化装配系统。系统可以分为气动系统，控制系统和机械系统，先是对机械系统各个部分的设计，包括轴，供料仓以及电机的选择等。完成系统的整体部分。再是根据工作的要求，选择合适的传感器安装位置和型号的确定以及气动控制回路的设计，最后在通过 PLC 的控制部分设计完成系统的整体设计，实现自动化。

整个系统以 PLC 为控制核心，利用三工位旋转工作台的旋转带动工件完成在各个单元的动作，每个单元都设有传感器，为 PLC 提供信号，以实时掌控各个部分的工作状况。

关键词：自动化；PLC；装配；气动系统；伺服电机

Abstract

The automated production line plays an important role throughout the industry and other areas. It is the lifeblood of modern industry and plays a leading and supportive role in modern industry. The development of modern industry is inseparable from the automated production line. Its development rate determines the company's competitiveness in the market. Nowadays, there is an increased demand for quantity and diversity of products, which will mean that the traditional manufacturing industry has stricter requirements for the automation of production equipment, especially in the manufacturing industry, mass production. Demand is extremely important for the company's profitability. Therefore, a large number of automated production lines are used for rapid mass production, and the development of automated associations is becoming increasingly urgent.

In this paper is an automated assembly system that can recognize the assembly and tightness of workpieces designed for the problems of low mounting efficiency and incomplete assembly system automation on automated production lines. The system can be divided into pneumatic system, control system and mechanical system. First, the design of different parts of the mechanical system, including selection of shaft, supply and motor. Complete the entire part of the system. According to the requirements of the work, the choice of the appropriate sensor's installation position and model and the design of the pneumatic control circuit are chosen. Finally, the overall design of the system is designed and automated via the control part of the PLC.

The entire system takes PLC as the control core and uses the rotation of the three-station rotary table to drive the workpiece to complete the operation in each unit. Each unit is equipped with sensors to provide signals for the PLC to control the work status of each part in real time.

Keywords:Automation; PLC; Assembly; Pneumatic system;; ervo motor

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