

特种纽扣电池正负极连接片--自动装配设计

摘 要

本着学以致用的基本原则，这篇毕业论文围绕着纽扣电池制造业的生产进行了一些实际问题的探究，做到了理论和实际情况的有机结合。本文所研究的系统主要有两大主体模块构成：一是就装配前的物料所进行的筛选、定向传输部分；二是针对所筛选的物料做自动装配。前者在对机械手予及振动盘，而后者所实施的为自动装配工作。对于这样两个方面的自动化设计方案，笔者在运用了整体化设计思想的前提下，展开了一系列分析以及设计：一是 PLC 控制；二是气动驱动振动传输。在对硬件以及软件的特点加以掌握的前提下，笔者注意到了两者间的互补和优化。就 PLC 所控制的自动装配系统而言，笔者既实施了诸如编程思路和控制方案以及控制要求的剖析，也以此为基础，进行了组态软件 WINCC 方面的系统研究。而在驱动系统的研究之中，笔者对诸如故障报警和系统功能初始化等方面进行了重点研究。研究表明：无论是各种各样的工种，还是各种各样的行业，都能够在可编程控制器控制装配工序功能得到利用的前提下，取代手工作业。PLC 强大的控制功能所能够提升的工作效率高达五到十倍。而对于劳动密集型企业来说，为企业创造效益，推动两化融合在企业的有效落地。

关键词：可编程控制器（PLC）；物料分拣；振动盘；机械手；自动装配；控制系统。

ABSTRACT

Based on the basic principle, this thesis explores some practical problems around the production of button battery manufacturing, and achieves the organic combination of theory and actual situation. Such two large main modules constitute the main part of the system studied in this paper: one is the screening part of the material before assembly; the other is the automatic assembly of the material selected. The former is based on the adoption of the manipulator, screening and the use of vibration disk. The latter implements automatic assembly. Based on these two aspects, the author applied the idea of integrated design. A series of analyses and designs were carried out: one was PLC control and the other was pneumatic drive. On the premise of mastering the characteristics of hardware and software, the author notes the complementarity and optimization between them. With regard to the automatic assembly system controlled by the PLC, the author not only carried out the analysis of programming ideas and control and control requirements, but also carried out the systematic research on configuration software WINCC. In the research of drive system, the author focuses on such aspects as fault alarm and system function initialization. The results of the study showed that whether it was a variety of jobs or jobs in all industries, manual work can be replaced on the premise that the function of programmable controller control assembly process is utilized. PLC powerful controls can boost productivity up to five to ten times. For labor-intensive enterprises, such a function in the creation of benefits has a huge role in promoting.

Keywords: programmable controller (PLC); material sorting; manipulator; automatic assembly; vibrating plate ; control system.

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