喷粉线智能上下料设计

摘 要

智能上下料是将工件按照一定的次序及间隔摆放，然后按照生产线工作循环的周期送至一定位置上进行加工，完成后再从生产线上取下并定向排列的过程。文中进行设计的就是一种智能上下料装置。

上下装置分为六个加工工位，由伺服电机驱动链传动带动工作板运动。工位一为空工位；工位二与排料机构连接，排料机构利用分离轮，传送带，气缸和带传动组合将成箱装的拉杆分离开来并按照工作板沟槽的位置摆放好再运送至工位二的工作板上；工位三空置；工位四与工业机器人配合，机器人将生产线上的挂杆取下放在工位四的工作板上；工位五与上料装置连接，上料装置利用气缸将拉杆推入挂杆中，完成装配；工位六与另一个工业机器人配合，机器人将完成装配的挂杆放入生产线中；工位六变成空置工位，运转至工位一，成为工位一，开始循环。

下料装置由工业机器人（带电磁铁）利用电磁铁的通电断电实现取料。

本文主要涉及上料装置机械部分的设计计算，将其分为传动机构设计、上料机构设计和排料机构设计三部分，其中包括链传动设计，同步带传动设计，伺服电机的选型，轴的设计及校核,气缸的选型及计算，轴承寿命计算等。

关 键 词：智能，上下料，机械设计，工业机器人，工位

ABSTRACT

Intelligent loading and unloading is a process in which the workpieces are placed in a certain order and interval, and then sent to a certain place for processing in accordance with the cycle of the work cycle of the production line, and then removed from the production line and aligned. An intelligent loading and unloading device is designed in this paper.

Feeding device is divided into six processing stations, driven by servo motor chain drive plate movement. The first station is empty; The second station is connected with the discharging mechanism. The discharging mechanism USES the combination of the separation wheel, the conveyor belt, the cylinder and the belt drive to separate the pull rod packed in boxes and arrange them according to the position of the working plate groove before transporting them to the working plate of the second station. Station 3 vacant; Working with the industrial robot, the robot takes down the hanging rod on the production line and puts it on the working board of working position four. Station 5 is connected with the feeding device, which USES the cylinder to push the pull rod into the hanging rod to complete assembly; The six work stations cooperate with another industrial robot, which puts the assembly rod into the production line. The six stations become vacant, run to one, become one, and start the cycle.

Cutting device by industrial robot (with electromagnet) using electromagnet power off to achieve the material.

This paper mainly involves the design and calculation of the mechanical part of the loading device, which is divided into three parts: transmission mechanism design, loading mechanism design and discharge mechanism design, including chain drive design, synchronous belt drive design, servo motor type selection, shaft design and check, cylinder