

智能搬运小车车体及控制系统设计

摘 要

智能搬运小车是集全轨道自动循迹、避障、智能停车于一体的工业物料搬运小车。本设计传动采用 130SZ03 直流电机作为智能搬运小车的动力源，经弹性联轴器、二级减速器和十字轴万向节将动力传递到驱动轮；采用 WSB-8 电磁失电电磁制动器进行刹车；车体采用悬架和减震万向轮来平衡车身。控制部分采用 STC89C52 单片机作为主控芯片；采用 L293D 电机驱动芯片，并经 PWM 来控制两个直流电机的转速；自动循迹采用红外对管传感器识别黑色导引轨迹；避障采用超声波传感器识别障碍物。最终进行模拟实验，验证设计的可靠性。

关键词：智能搬运小车，130SZ03 直流电机，STC89C52，红外对管传感器

ABSTRACT

The intelligent handling trolley, a vehicle designated for transporting industrial materials, integrates overall automatic line-tracking, obstacle avoidance and intelligent parking. In terms of the transmission of the design, the 130SZ03 DC motor was adopted as its power source, and the power was transmitted to the driving wheel through the elastic coupling, the secondary reducer and the cross-shaft cardan joint. Additionally, braking was achieved by the WSB-8 electromagnetic brake featured with electromagnetic power-off, while a suspension and damping universal wheels were utilized to balance the body. With regard to the controlling part, the STC89C52 single-chip microcomputer serves as the main chip. Moreover, the L293D motor was brought into full play to drive chips and the rotational speeds of double DC motors were under the control of PWM. Furthermore, so as to realize automatic line-tracking, the infrared sensor with geminate transistors was exerted to identify the black guiding trajectory. In the course of obstacle avoidance, the ultrasonic sensor unleashes its function of recognizing obstacles. Ultimately, the simulation experiment was launched to verify the reliability of the design herein.

Keywords:Intelligent transport trolley,130SZ03 DC,STC89C52,infrared sensor

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