
网球训练拾取机的设计及运动仿真

摘要

网球训练中需要大量球来进行练习,因此许多练习网球的人都会携带多个网球,以避免拾取的麻烦,然而这就导致在运动一段时间后,球场上满是网球,训练者需要大量时间来拾取球类,来避免球的数量不够、球在球场上影响安全等问题,更甚因为球跌倒造成严重的身体伤害,在许多大型场地、比赛中均有球童来进行拾取,且人员素质参差不齐,多为临时雇佣关系。所以网球运动的普及导致网球使用量的不断上升,对网球拾取的速度和便捷性提出了越来越高的要求。利用机电结合的方式设计一款网球拾取机,提高网球拾取效率,降低拾取人员的劳动强度。

本论文对设计的拾取机构进行分析。以机械拾取为手段,辅助以单片机控制的方法,对网球拾取机应用进行讨论和研究。主要内容为:

- 1.拾取机的机械结构进行设计,从而确定机器人整体,对各零件进行设计,如拾取机构、轴等机械零件。
- 2.对机器人单片机软件和硬件进行设计,从而实现基础功能,如加速、减速等控制功能。
- 3.在建立模型的前提下,对拾取机模型在拾取状态和运动状态采用仿真的方式进行验证。

关键词: 网球; 拾取机; 拾取机构

The Design and Motion Simulation of Tennis Training Pick.up Machine Abstract

Tennis training requires a lot of balls to practice, so many people who practice tennis will carry multiple tennis balls to avoid the trouble of picking up. However, after a period of exercise, the court is full of tennis balls, and the trainer needs a lot of time to come Picking up balls to avoid problems such as insufficient number of balls, impact on safety of the ball on the court, and even serious physical injury caused by the ball falling. In many large venues and games, caddies are used to pick up, and the quality of the personnel varies Uneven, mostly temporary employment relationship. The popularity of tennis has led to a continuous increase in the use of tennis, which has placed increasingly high demands on the speed and convenience of tennis pickup. Design a tennis picking machine by means of electromechanical combination to improve tennis picking efficiency and reduce the labor intensity of picking personnel.

This paper analyzes the designed picking mechanism. Using mechanical picking as a means, assisted by the method controlled by single chip microcomputer, discuss and study the application of tennis picking machine. The main content is:

1. The mechanical structure of the picking machine is designed to determine the overall robot and design each part, such as the picking mechanism, shaft and other mechanical parts.
2. Design the robot single.chip software and hardware to realize basic functions, such as acceleration, deceleration and other control functions.
3. Under the premise of establishing the model, the picking machine model is verified by simulation in the picking state and motion state.

Keywords:Tennis; pickup machine; pickup mechanis

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