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Design of Intelligent Watering System Based on STM32

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ABSTRACT. *The purpose of this paper is to develop intelligent watering robot based on STM32 for indoor breeding flowers and plants, which can realize functions such as intelligent watering, foliar spray and automatic watering. Considering that the water storage capacity of the airborne water tank is small, it is unable to cope with the needs of the water-loving plants or going out for a long time. By using the robot occupants, it is only necessary to regularly store the water in the water tank to ensure the living environment of the flowers and plants in the home, thereby reducing the burden on the occupants to care for the flowers and plants in the house, or to take good care of the flowers and plants at home when the occupants go out.*

KEYWORDS: *STM32, Intelligent watering system, Temperature and humidity sensor*

1. Introduction

As an emerging industry, smart home robots are slowly approaching people's lives and making people's lives more comfortable. The intelligent watering robot is a kind of smart home robot, which can reduce the burden of daily care for people to cultivate flowers and plants, or take good care of indoor flowers and plants when the occupants are absent.

2. Research Content

2.1 Machine mechanical structure design

The mechanical structure design of the whole machine includes the chassis (including wheel) design of the intelligent watering robot, the design of the air tank and the design of the water gun fog gun. The basic structure is shown in Figure 1.

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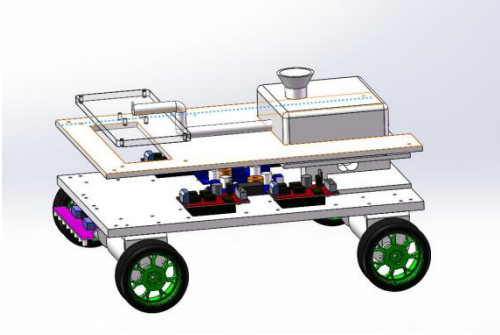

Figure. 1 The basic structure of the intelligent watering robot

2.2 Electronic control part design

The electronic control part is divided into electronic hardware design and various functional software programming. The electronic hardware design mainly includes the following contents: an RFID transmitter module based on a humidity sensor; an RFID receiving module based on STM32; a motor module driven by a robot drive and a water gun fog gun; each sensor module based on STM32; and an automatic water adding module.

The software programming of each function mainly includes: positioning and navigation; line and color recognition; PWM head adjustment.

3. Research Methods

3.1 The mechanical structure of the whole machine

The mechanical design software such as ProE or Solidworks is used to design and simulate the intelligent watering robot. After repeated argumentation, the hardware is assembled according to the design plan.

3.2 Electronic control part

The stm32 development board is equipped with RFID, various sensors, motors and other hardware to complete the electronic hardware design. In the Keil environment, based on the stm32 development board, the program development and machine debugging of the functions of the intelligent watering robot are carried out.

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3.3 Research objectives

The intelligent watering robot studied in this paper can finally achieve the following functions:

(1) Intelligent automatic watering;

(2) Automatic foliar spray;

(3) Automatic charging;

(4) The air tank is automatically filled with water;

(5) Lines to avoid obstacles.

4. Application Prospects

Although a large number of researchers have studied the intelligent watering automatic control system, they have achieved certain results. However, as the intelligent watering control system used in the home interior, the shortage of exposed wiring and the disadvantages of the system's scalability and poor experience are enough to make the user discouraged. The intelligent watering robot can just make up for the above shortcomings of the intelligent watering system. However, there are only a handful of studies on intelligent watering robots.

This paper considers that the airborne water tank has a small water storage capacity, can not cope with the needs of the water-loving plants or go out for a long time, and designed the function of automatically adding water to the water storage tank position when the water volume of the airborne water tank is small. For wet plants, watering does not guarantee healthy growth, which is in the north where the humidity is low indoors. In this paper, the automatic foliar spray function was designed to automatically and foliate the plants on a regular and regular basis by identifying the color markers of the wet plants.

5. Conclusion

The purpose of this paper is to develop intelligent watering robot based on stm32 for indoor breeding flowers and plants, which can realize functions such as intelligent watering, foliar spray and automatic watering. By using the robot occupants, it is only necessary to regularly store the water in the water tank to ensure the living environment of the flowers and plants in the home, thereby reducing the burden on the occupants to care for the flowers and plants in the house, or to take good care of the flowers and plants at home when the occupants go out.

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References

[1] Zhou Diehui. Clock-controlled watering machine with LED display [J]. Foreign electronic components, 2001 (05): 65-66.
[2] Wu Xiaomei. Application of PLC in Intelligent Watering Robot Arm Control System [J]. Mechanical & Electrical Integration, 2003 (02): 80-83.
[3] Wang Feng, Ma Xiaxia. Intelligent watering with 8051 single-chip microcomputer [J]. Electronic World, 2005 (10): 34-35.