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Design of Auto Wiper Control System Based on Single Chip Microcomputer

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Abstract: At present, there are very large number of cars in our country, and more and more intelligent equipment for automobile are used. The traffic accidents caused by rain are more than one day. This paper improves the traditional car wiper, uses single chip microcomputer as the control center of the whole system, and improves the design on the basis of the raindrop sensor. An intelligent wiper system is proposed. The subject takes the single chip microcomputer as the control core of this system, the raindrop sensor uses the HY-3 type resistance sensor, the motor adopts the stepper motor as the wiper driving motor, the driving circuit uses ULN2003 chip, and the ULN2003 is a common motor drive integrated circuit. It is a large current driven array package, and the internal is integrated. The NPN transistor is very efficient.

Keywords: Intelligent wiper, single chip microcomputer, raindrop sensor, stepper motor.

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1. INTRODUCTION

This subject is aimed at the research and improvement of the traditional automobile wiper. Using the single chip microcomputer as the core of the control system, a kind of intelligent wiper system is designed with the raindrop sensor [1-3]. The main function of the system is to control the speed of the wiper by detecting the humidity. It can set the upper and lower limits by the key [4-6]. When the humidity is less than the set lower limit, the wiper is not working and the wiper is rotated at low speed between the upper and lower limits. When the upper limit is higher than the set limit, the wiper is running at a high speed. The set up and down limit can be set by key setting [7-8]. At the same time, through the size of the liquid crystal display, it is suggested that drivers should pay attention to safe driving.

2. AUTO WIPER SOFTWARE DESIGN

The design of system software is mainly composed of main program design, motor speed setting program design, interrupt service and another program design.

2.1 Main program design

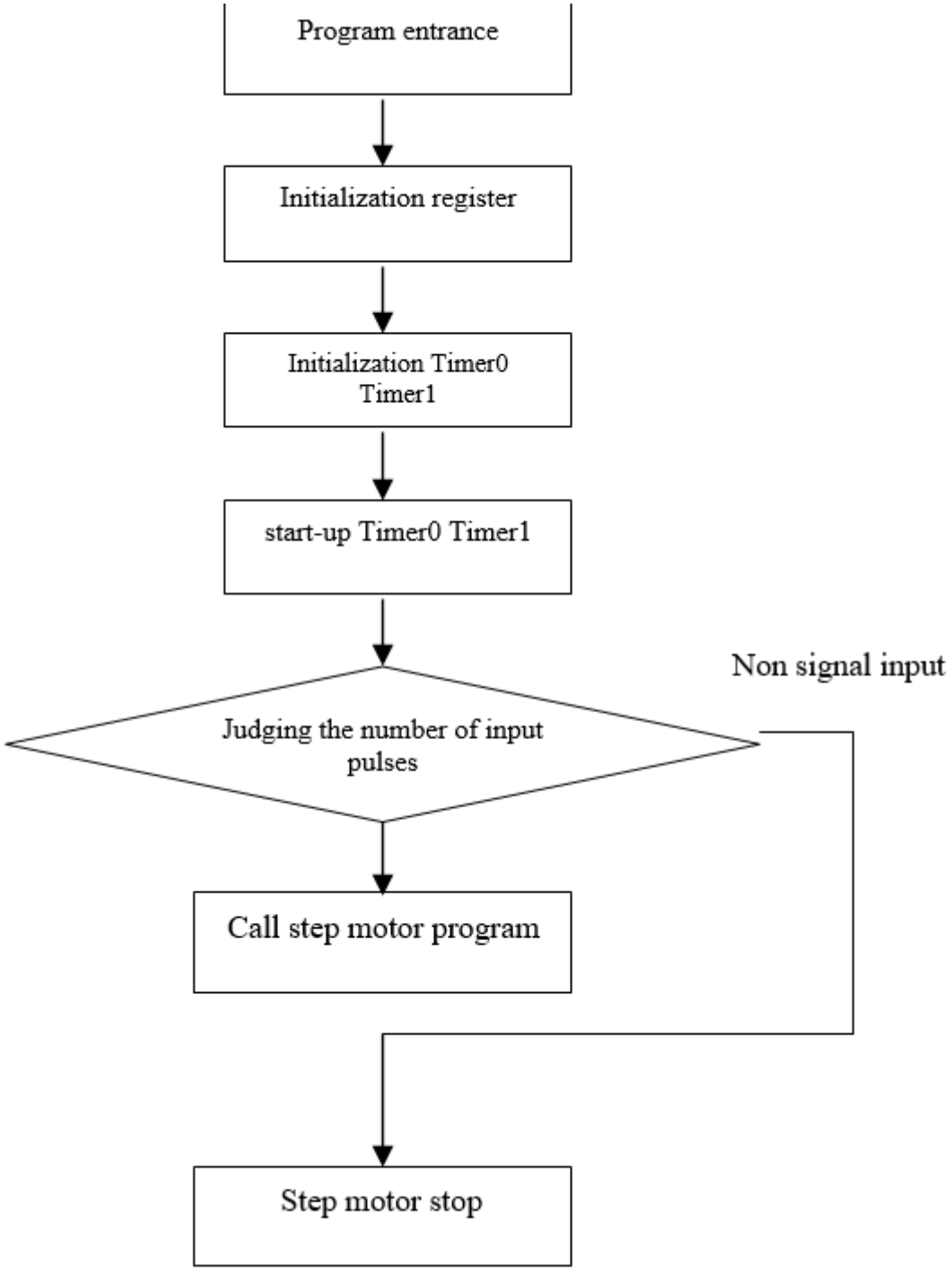

Fig 1. System program design

Using two timing counters, Timer0 is interrupted (10ms interrupts every time); Timer1 is used as a count, used as a count (Timer0 is not interrupted once, read his one value, and make the corresponding processing).

2.2 Interrupt service program

In order to quickly respond to raindrop sensor information in this system, the interrupt system of MCU is used in the key part. The interrupt system of the single chip is generally to give priority to certain specific instructions, let the system jump out of the main program, interrupt

the operation of the main program, and then return to the main program after running the specific task in the interrupt task [9-10]. The execution process of interruption is divided into several steps: interrupt triggering, interrupt protection, interrupt execution and interrupt return. Interrupt is divided into internal interrupt and external interrupt, timing interrupt and serial interrupt. The wiper system designed in this paper is external interruption. The interrupt processing flow chart is shown in the following figure. Its program flow diagram is shown in Figure 2.

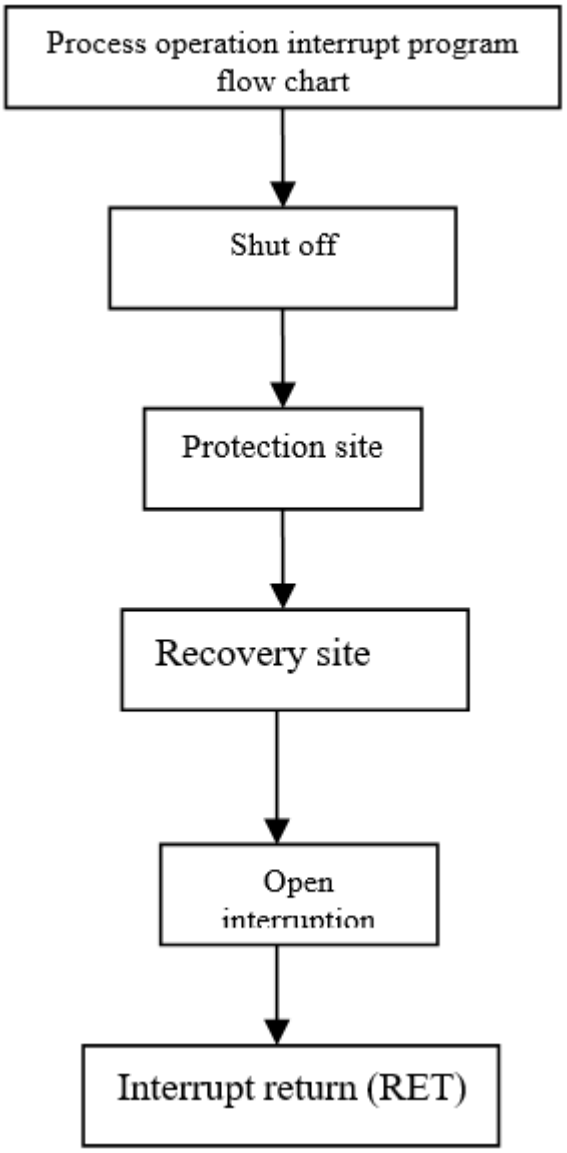

Fig 2. Process operating

2.3 Design of detection pulse and motor running program

Measuring the output pulse of the rainfall sensor is a very important step in the realization of this system. According to the information of the measurement of the rainfall size, the operation of the step electrode can be manipulated accurately [11-12]. The program flow diagram for the implementation of the detection is shown in Figure 3.

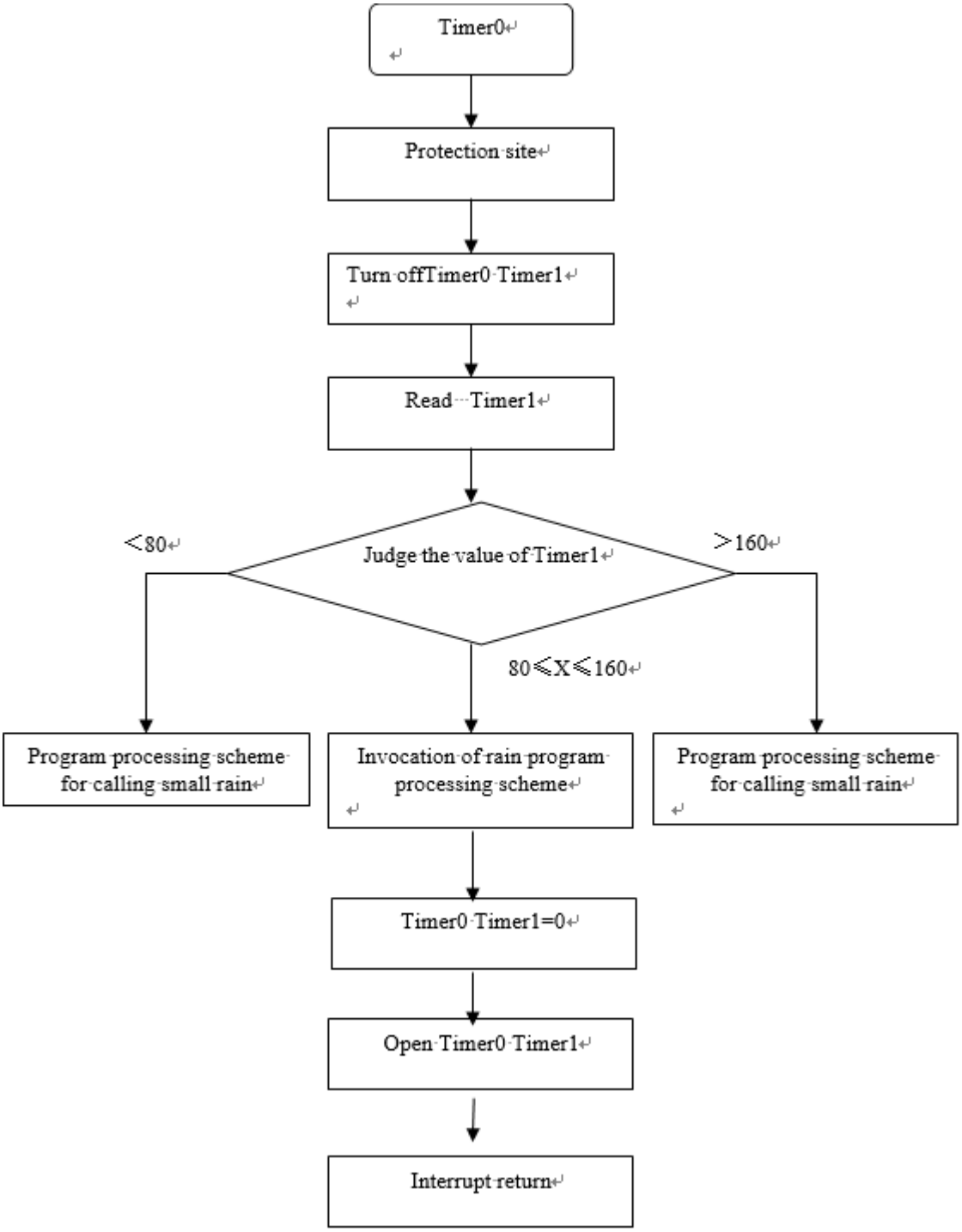

Fig 3. Pulse detection and motor running program design.

The broad application of the rotary kilns in a variety of industrial branches for thermal processing of residual materials with a different origin and mostly for fire treatment of hazardous wastes. The rotary kilns were used as rotary dryer to remove moisture and water from solid substances, primarily by introducing hot gases into a cylinder, it acts as a conveying device and stirrer.

3. CONCLUSION

This subject is aimed at the research and improvement of the traditional automobile wiper. Using the single chip microcomputer as the core of the control system, a kind of intelligent wiper system is designed with the raindrop sensor. The main function of the system is to control the speed of the wiper by detecting the humidity. It can set the upper and lower limits by the key. When the humidity is less than the set lower limit, the wiper is not working and the wiper is rotated at low speed between the upper and lower limits. When the upper limit is higher than the set limit, the wiper is running at a high speed. The set up and down limit can be set by key setting. At the same time, through the size of the liquid crystal display, it is suggested that drivers should pay attention to safe driving.

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