Thinking on the Teaching Reform of Electronic Technology

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Abstract: with the rapid development of electronic technology, this paper starts with the design and manufacture of a kind of equipment in the reform of electronic technology teaching, and develops an electronic product. The reason is that the memory of the elderly is declining year by year, and people often forget to bring things when they go out of the house. For example, cell phones, door keys, etc., more serious is to forget to close the electric kettle in use, electromagnets, gas switches and so on. In view of the above phenomenon, I designed a warning device to go out, from shallow to deep in teaching, case teaching, to enhance students undefined interest in learning. The product can give a reminder when you go out, check to see if you have everything in place, and remind you to turn off the electrical appliances and gas switches that are in use. So that people can work in peace of mind, happy home.

1. introduction
the alarm is to use the principle of human body induction signal, through infrared pyroelectric processing chip to collect, signal processing, control confirmation and 555 time-base output. The circuit can sense whether you are going in or out of the door by using a thermal release infrared sensor. If you go out, you send a "toot-toot" audio signal to remind you whether you have everything in it.

2. Circuit Design Scheme
when the human body approaches the thermal release infrared sensor, the weak signal from the inductor is sent to the infrared pyroelectric processing chip, and compared with the reference signal of the chip. The buzzer sounds when confirmed by the confirmation circuit and then driven by the base circuit to drive the transistor saturation conduction. The schematic block diagram is shown in figure 1.
3. Circuit principle

3.1 Thermal release Infrared Induction receiver head
D03A thermal release infrared sensing receiver-the heat source signal of the human body, when people move in front of the thermal infrared head, they can sense the weak voltage change, the D03A working voltage is low, and the output is stable and so on.

3.2 Infrared pyroelectric chip
The thermal release human body sensing circuit uses the CS9803GP infrared pyroelectric integrated processing circuit, and when a person moves inward and outward before prompting, he can sense the possibility of someone going out of the door. The thermal release infrared sensing receiver can sense the human body signal. The CS9803 is made by CMOC process, and its characteristics are as follows: ① has few peripheral components and low power consumption; ② has noise suppression circuit, which works stably and has the function of human distance sensing; ③ wide voltage design, can work between 3 and 15 v, inductive distance 0 / 10 m, working current ≤ 1mA; ④ output can drive relay or thyristor, built-in two-stage operation amplifier, adjustable gain, adjustable control time, built-in voltage regulator output 3.1V voltage, internal circuit functions as shown in figure 2.[1]
3.3 body induction circuit

The human body sensing circuit works: when someone is moving in front of the sensor, the sensor senses the possibility of someone going out from inside out, and it will sense the change of voltage. This signal is passed through R1. The low-pass filter composed of C1 is added to the 2-pin of IC1 after the interference signal is removed.\(^2\) The sensing signal is amplified by CS9803 and compared with the reference signal to determine whether there is trigger or not and whether the control level can be output. If the output level is controlled, the processor chip starts timing controlled and enters the delay state. When the sensor detection time is longer than the chip clock cycle, the output level is high to prevent false triggering (the chip clock cycle is 768T). The timing output and the zero-crossing detection output are both high ordinary, only the positive pulse is output, the 11-pin CS9803 is high-level, and the output high-level time is controlled by the 8-pin TCI clock. (R\(^*\) C) can change the resistance value of WR1 to change the length of high-level time, I set the time parameter in the design is 10ns time, that is, when a person is going out of the house or passing through the induction zone, the thermoluminescence sensing head induces a thermal signal. Output 10nsundefineds inductive high-level Out1.\(^3\), at the 11-pin output of the CS9803 As shown in figure 3.
3.4 exit confirmation circuit

The principle of the out-of-the-door verification circuit is that people confirm whether the door is actually out of the door through the prompt, and if they do not go out, they will also go through the prompt. Without confirmation, the buzzer may produce a false action that causes the buzzer to make a constant sound and become a noise. If the real gate sensor IC4 senses that the signal is input to the processor IC3 processing, and the signal is outputted by the IC3undefineds 11-pin inverter, which consists of Q1 and peripheral circuits, a short low level, the alarm will not generate an alarm. There is no time control here, the time can be shortened, by adjusting the WR2 change this design to adjust 5 ns. As shown in figure 4.

3.5 Control output circuit

The function of the control output circuit is to process the above two signals, when the Out1 is high level and the Out2 is low level output signal drives the active buzzer to emit "beep-beep" sound.
The control output circuit is a NE555 circuit. It is a monostable circuit composed of NE555 and peripheral circuits. The working conditions of the NE555 circuit in the design are: 4, 8-pin high level, 2-pin input low-level trigger, 3-pin output high-level, 3-pin output high-level, 2-pin input-low level trigger, 3-pin output high level. The time constant of the circuit is determined by two parts: the time of 4-pin high level and the charging time composed of R18*C19. Note that the setting time is not too long and can only give a brief hint. The principle is that when the power is turned on, the output high-level Out1 of the human induction circuit provides a high level for the 4-pin of the NE555 and starts to work, and a low-level Out2, for the 2-pin of the NE555 is provided by the inverter Q1 when the circuit action is confirmed. Meet the low-level trigger condition, enter the transient steady state, 3-pin output high-level Q2 saturation conduction, buzzer "beep-beep" sound, to give a reminder, electrical diagram as shown in figure 5.

Fig. 5 Control output schematic diagram

3.6 distinguish between going out or entering
When a person goes out, let the circuit work to give an audio signal, but when a person enters the door, there is a trigger level on the two feet of the NE555, but at this time the four feet are low, the NE555 does not work, and when one reaches the thermoluminescence sensor receiver head of the human sensing circuit, Although the 4-pin is high-level, the 2-pin has been converted from low-level to high-level, and the alarms will not sound, which can effectively prevent the wrong action of human entering the door.

3.7 Power supply circuit
The designed circuit has a wide supply voltage range from 5V to 5V, and it can also be supplied in series with 3 batteries sold in series. If the AC power supply requires a voltage regulator, You can also assemble a 5V circuit diagram as shown in figure 6.

Fig. 6 Circuit diagram of stabilized power supply
4. concluding remarks
The above design now tells you the installation method, the design uses two thermoluminescence infrared sensors, because the thermoluminescence infrared sensors assembled on a circuit board has directivity, so we should adjust the angle of the two thermoluminescence infrared sensors. The plane direction is fixed in the direction of the opening of the upper cover at the time of assembly. When a person opens the door to confirm the door and make an audio signal "beep-toot", the phenomenon of forgetting to bring something is no longer there. The circuit uses high-tech thermal release infrared receiver and infrared pyroelectric processor to realize the function of the circuit through the heat source energy sensing signal of the human body. [6]. The design of the warning alarm is simple, the peripheral components are few, and it is especially suitable for installation at the door of public places such as rural families, urban residential buildings, hotels and other public places. It can remind people whether they have forgotten to bring all the things with them. To solve the worry that people forget to take things when they go out, it has some practical value in daily life.

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