



Smart Cooling Fan Using Embedded System

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Abstract

The microcontroller based cooling system that provides the room to be in cooling state. The major components include a Fan, LCD, Blower, and the microcontroller AT89S52. The system is fully controlled by an 8-Bit microcontroller. The process consists of warm air is sucked by the suction line and send to the compressor, the air discharge from the compressor is send to condenser for further process to push the warm air out. The vapour changes to a liquid state after the before process, the liquid flow through the liquid line and reaches the drier for refrigeration flow and after that the flow reaches metering device and finally evaporator is used to spread the cool air inside the room by using small fan near the copper tube. It has wide applications in the present world.

Keywords— Temperature sensor, 8bit microcontroller AT89S52, AC performance thermistor

1.0 Introduction

The survey did contain some cheer for the export sector, saying that green shoots have started to appear on the trade horizon with world trade growth projected at 3.8% and 3.9% in 2017 and 2018, respectively, and India's trade growth also picking up. The smart cooling fan has the advantages of simple and suddenly cool the room temperature. We can reduce the power usage by using this technique. The major components used in this technique was fan, air conditioner, temperature sensor, etc. The Home G Xides MenX Combining a ceiling fan with air conditioning saves energy without sacrificing comfort technology has never gone out of style. Today, ceiling fans are the best-selling variety of fan in the United States.

II. EXISTING WORKS

Once the circuit is powered, the microcontroller starts to operate according to the coding. The coding here we used based on temperature sensing by the use of Keil software. If the room temperature is low degree Celsius, the working of fan and AC will stop. If the room temperature is normal degree Celsius, the fan only will on. If the room temperature is high degree Celsius, both fan and AC will on simultaneously to give sudden cooling. Ceiling fans move large volumes of air at low velocity. In summer cooling mode, the fan directs air straight down into a room, exposing occupants to continuous air circulation and actually creating a limited indoor version of wind chill. when the air conditioner is running, ceiling fans circulate cooled air and make people feel even cooler no accxpanwv, no fan keep in mind that ceiling fans only make rooms seem cooler to humans and pets occupying them. they don't actually cool the air. There fore with air conditioning or without, running a ceiling fan when nobody's in the room is a complete waste of energy and money.

III. DESIGN

Smart cooling fan circuit design uses four major components – a Microcontroller, Fan, Air conditioning, LCD. Here AT89C52 microcontroller is used and it is an 8-bit controller. This controller requires a supply voltage of +5V DC. In order to provide regulated 5V DC voltage to the controller we need to use 7805 power supply circuit. We can use 9V DC battery or 12V, 1A adaptor as a power source.

Reset Circuit Design: The reset pin of the microcontroller is kept active till the power supply is in the specified range and a minimum oscillation level is maintained. In other words to ensure the supply voltage does not falls below the threshold level of 1.2V and the reset pulse width is greater than 100ms (recommended for 89C51). we select the values of resistor and capacitor such that $RC \geq 100ms$. Here we select a 10K resistor and a 10uF electrolyte capacitor.

Oscillator Circuit Design: A crystal oscillator is used to provide external clock signal to the microcontroller. To ensure smooth operation, we connect two ceramic capacitors ranges from 20pF to 40pF. This crystal oscillator is connected between pin 18 and 19 of the microcontroller.

THERMISTOR:

A semiconductor used as a temperature sensor. Many of them are used in medical equipment markets. Thermistors are also used for measurement in the transportation industry. Here the term thermister is used to calculate the room temperature. Thermister sense the room temperature ,when the room is hot and it indicate to the micontroller for further operation.

LIQUID CRSYSTAL DISPLAY:

Liquid display consists of backlight source, that is no emission of own light. It consists of two electrodes which act as polarised plates. They are easily programmable and much economical; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on. The data register used in our circuit to store the data to be displayed on the LED.

Pin Configuration:

1. Vcc: The vcc pin was connected to the + 5V DC
2. Trigg: When a valid trigger signal is applied, it generates 8 pulses of 40 KHz..
3. GND: Gnd pin is connected to the ground.

Lcd working:

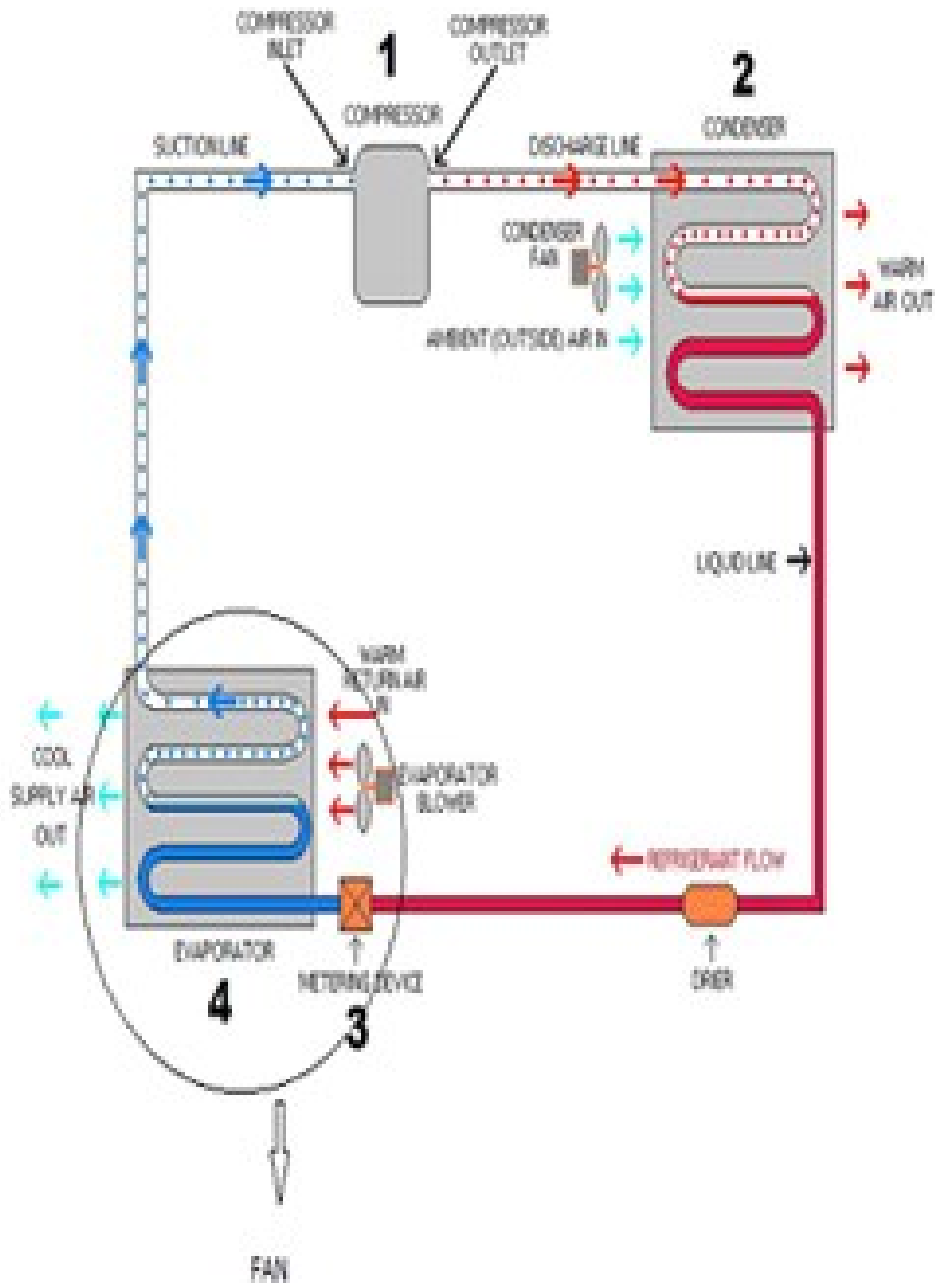
The lcd is used to display the values or temperature ranges. On the construction of LCD the reflected mirror is placed at the back. The term LCD is a Liquid Crystal Display.

AT89S52 Microcontroller Features:

- A CPU (Central Processing Unit) 8 Bit.
 - 256 bytes of RAM (Random Access Memory) internally.
 - Four-port I / O, which each consist of eight bits
 - the internal oscillator and timing circuits.
 - Two timer / counters 16 bits
 - Five interrupt lines (two fruits and three external interrupt internal interruptions).
 - A serial port with full duplex UART (Universal Asynchronous Receiver Transmitter).
 - Able to conduct the process of multiplication, division, and Boolean.
 - the size of 8 K Byte EPROM for program memory.
 - Maximum speed execution of instructions per cycle is 0.5 s at 24 MHz clock frequency.
- If the microcontroller clock frequency used is 12 MHz, the speed is 1 s instruction Execution.

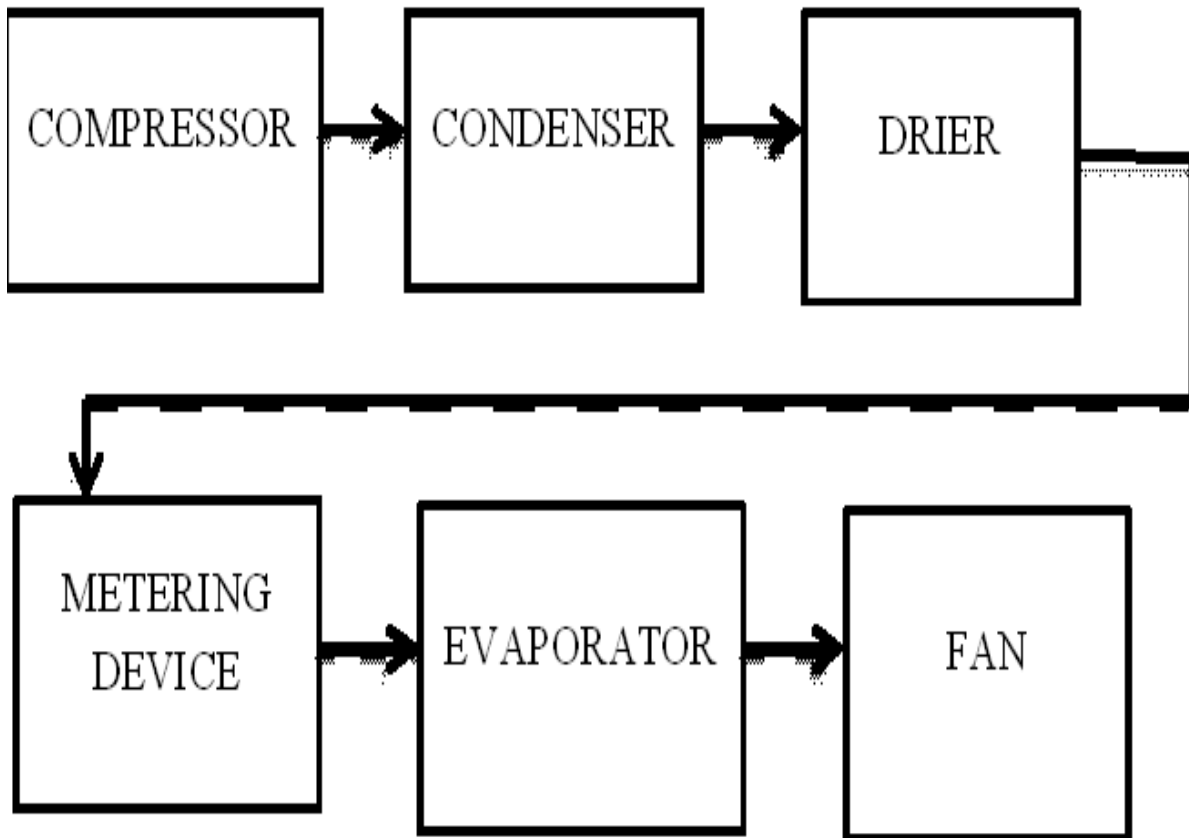
PIN DIAGRAM:

Diagram above shows the pin configuration of the AT89S52, where the function of each pin is written next to it, and, if it exists, the dual function is written between brackets. Note that the pins that have dual functions can still be used normally as an input/output pin. Unless the program uses their dual functions, all the 32 I/O pins of the microcontroller are configured as input/output pins.



CIRCUIT DIAGRAM:

BLOCK DIAGRAM:



LED:

The term LED is a Light Emitting diode. It is mainly used for indication in the circuit. LED is of low cost ,less power usage. The LED efficiency is greater than of simple tungsten lamp. The response time for LED is very speed.

ADVANTAGES:

- ▶ High sensitivity to small temperature changes
- ▶ Temperature measurements become more stable with use
- ▶ Copper or nickel extension wires can be used

DISADVANTAGES:

- ▶ Limited temperature range
- ▶ Fragile
- ▶ Some initial accuracy “drift”
- ▶ Decalibration if used beyond the sensor’s temperature ratings
- ▶ Lack of standards for replacement

IV WORKING THE PROJECT:

We are using temperature sensor to measure the room temperature and working according to the temperature. Here now, we use 3 led to mention the smart cooling fan operation If the temperature is of low degree celsius, led 1 will be in on conditions, while the other led’s are off conditions.

If the temperature is of normal degree celsius, led 2 will be in on conditions, while the other led’s are off conditions.

If the temperature is of high degree celsius, led 3 will be in on conditions, while the other led’s are off conditions.

RESULT:

By this project we produce sudden cooling in the houses, industries etc. Through this project we reduce the power usage. This technique worked based on room temperature.

CONCLUSION AND FUTURE WORK:

In summary, the microcontroller based smart cooling fan is used for sudden cooling. In future we can use the gesture to operate the fan with ac project.

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