"I hereby declared that I have read through this report and found that it has comply the partial fulfillment for awarding the degree of Bachelor of Electrical Engineering (Industrial Power)."

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Date : 07 MAY2007

FAN AUTAMATED SYSTEM USING TEMPERATURE SENSOR

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"I hereby declared that this report is a result of my own work except for the excerpts that have been cited clearly in the references."

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Date : 07 MAY 2007

Special dedication goes to my family, my supervisor En Fariz Bin Ali @ Ibrahim and all my supportive friends.

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ABSTRAK

Kipas ini bekerja secara automatik dan dikawal oleh mikro pengawal.Ia akan berfungsi apabila mikro pengawal mengesan suhu yang telah ditetapkan yang telah diprogramkan dalam mikro pengawal.Tujuan utama projek ini dijalankan adalah untuk mengelakkan penggunaan tenaga apabila tidak diperlukan.Kipas automatik ini mempunyai tiga tahap kelajuan yang berbeza.Kelajuan kipas akan bertukar bergantung pada suhu yang telah diprogramkan pada mikro pengawal.Projek ini merupakan kombinasi bekalan kuasa,kipas,sensor suhu dan juga mikro pengawal(ATMEL).Terdapat beberapa langkah yang perlu diambil bagi menyiapkan projek ini iaitu pemilihan pengesan suhu yang sesuai,bekalan kuasa,kipas,merekabentuk litar pengawal menggunakan ATMEL,mengaturcara kod program untuk ATMEL dan juga penggunaan alatan yang sesuai untuk membuat litar yang berkaitan.Kesimpulannya,projek ini adalah mereka dan membina system kipas automatik yang menggunakan pengesan suhu yang akan dikawal oleh mikro pengawal.Kelajuan kipas akan bertukar bergantung kepada suhu.

ABSTRACT

This autamated fan can be controlled using a microcontroller when it detects a certain temperature that has been set. The purpose of this project is to prevent the waste of voltage usage when it is not hot enough for fan to be needed. The autamated fan has three different speeds. Each speed will change according to a certain level of temperature that is set. This project is a combination of electric supply, fan, temperature sensor and microcontroller (ATMEL).To complete this project, there are a few steps need to be taken which are the selections of temperature sensor, power supply, fan, design controlling circuit using ATMEL, developing a source code for the ATMEL and use a suitable apparatus to design all circuit. As a conclusion, this project is to design and construct an autamated fan system using temperature sensor which will be controlled by microcontroller. The fan speed can be changed according to a certain level of temperature.

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CHAPTER 1

INTRODUCTION

This chapter introduces the objective of the project. It also provides brief information of the scope and the problem statements of this work.

1.1 Project Objective

The objective of this project is to design and construct a fan autamated system using temperature sensor which will be controlled by microcontroller. The fan speed can be changed according to a certain level of temperature.

1.2 Project Scope

In this project, the main key is that the fan speed can be changed automatically which will be controlled by microcontroller. There are three speed of fan which involved in this project which is speed 1, speed 2 and speed 3. The microcontroller which is used in this project is ATMEL 89S2051. The temperature will be detected by the temperature sensor. Thermistor is used as the temperature sensor.

1.3 Problem Statement

Time saving is very important nowadays. An automatic machine or electrical appliances does very important. The invention of this autamated fan will be saving time rather than it is manually done. The increase of tariff drives the invention of autamated fan where the fan can off or lower the speed when it is not hot enough.

CHAPTER 2

PROJECT BACKGROUND

2.1 Project Background

Before fan was invented, bird feathers had been used. As years goes by, human being very creative by created technology which make human's life easier. Nowadays, fan and air conditioner has been a must appliance to each home, offices and industries. Mostly each invention will be modified from years to years for a change. The same thing goes to fan.

Basically, fan has been run manually. To change the speed one has to push the speed button at the control panel of the fan. There are so many machines or electrical appliances that can function automatically. With the invention of fan autamated system using temperature sensor, one does not have to change the fan speed manually. It can change the speed to lower or higher speed according to the temperature. Figure 2.1 below showed the block diagram of the overall project.

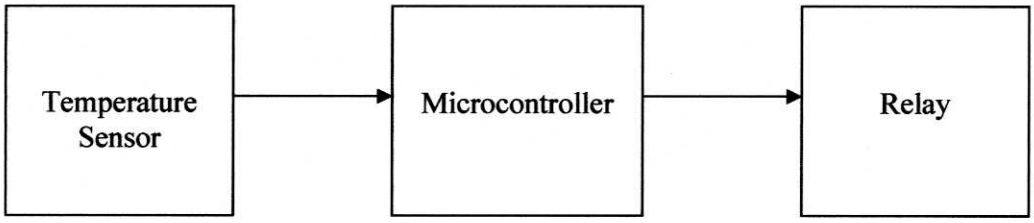

Figure 2.1: Fan Autamated System Using Temperature Sensor Project Block Diagram

2.1.1 Fan Autamated System Using Temperature Sensor

As said earlier, to change the fan speed one has to run it manually. With this invention of project, the fan can be run automatically. This autamated fan will be controlled using a microcontroller. Basically, it has three different speeds. Each speed will change according to a certain level of temperature that is set. In this project, three different range of temperature will be notified. Each range related to each fan speed. Temperature sensor is used to detect the current temperature and will transmit the reading to microcontroller .Source code will be programmed to the microcontroller which is ATMEL. When the ATMEL understand the instruction of the source code it will send the signal to the output, and the output which is involved will operate.

CHAPTER 3

LITERATURE REVIEW

3.1 Fan

Fan is a device to move air or gas. Old English *fann* referred to a basket or shovel for winnowing. It was loan from Latin *vannus*, with the same meaning, derived from *ventus* "wind" or a related root (cf. vates). In the sense of "device for moving air" the word is first attested 1390; the hand-held version is first recorded in 1555 [1].

From the history, the earliest fan was founded around 3200 B.C in Egypt. During these time, electric fan have not been invented yet. The fan that exists at that time was made of tied up together of bird feathers and was put on top of long wood paddle. It was called 'screen fans' or 'fixed leaf fans' [1]. Figure 3.1 showed an electric fan which is commonly used nowadays.

	Fan History and their Power Sources
4000 BCE	Mechanical power water wheel mentioned in a poem, GreekWriterAntipater
3000 BCE	China pictoial record
	Greeks,Roman,China, Egypt, Assyria, and Phoenicia used them during thier religious ceremonies
	Romans used wood construction
	China construction: feathers
	Greeks construction: linen with wood, leaf shaped
500 - 900	Wind Mills Persia
1600's	Japanese are credited with developing the folding fan, theory is that the
	design process was aided by the anatomy of a bat. Ivory or Mica used to construct the slats.
	Traveled to Europe via Portugal. Italian women made it a fashion statement.
	Construction: calfskin and leaves woven.
1700's	Fashion Fans spreads to France and England
1752	Benjamin Franklin proposes notion of postive and negative charge, kite experiment
1800's	Hand fan construction included: painted lace, silk or parchment
1831	elctromagnetic induction discoved by Michael Faraday
1833	Thomas Davenport's Electric Motor
1879	Electric Motor for 110 to 120 constructed by Thomas Edison
1884	ceiling fan to run on electricity was made by Electro Dynamics which was battery operated
1886	Hunter Fan and Motor Company assortment of products including a water-powered belt-driven ceiling fan.
1887	Philip Diehl developed a type of flat motor for Singer sewing machines.
	He attached a fan blade to it and installed it in his house.
	Believe to be the first direct drive ceiling fan
1888	Induction motor patented by Nikola Tesla
1888	Alternating Current designed, Nikola Tesla, purchased by Georg Westinghouse
1891	Emerson Electric founded by A.W.Meston in 1890 introduced thier commercially available fan
1894	General Electric produces a fan that collectors label "pancake"
1897	Robbins & Myers (founded in 1878) introduced their ceiling fan

1898	Hurricane fan motor used. Motor was of an enclosed nature, with rectangular carbon brushes
1902	James J Wood received patent for a electric fan
1903	Lollipop fan patented by Eck
1903	Gear driven oscillating fan: Eck
1904	Diehl develops a D.C. Fan that can be adjusted back and forth
1907	Diehl cousin's son Frederick developed a type of oscillating fan
1907	Universal Electric Motor introduced by Thomas Edison
1915	Electric fans, "The Mysto" by the A. C. Gilbert Company
	construction:cast iron base, steel blade, with minimal guard
1918	Fitzgerald Mfg Co is selling thier all chrome 10" fans in both stationary and oscillating models
1933	F.A.Smith, which became FASCO, introduced their 8" fan powered by a motor of thier own design
1938	Stirling Fan, a united driven by hot air heated by kerosene lamp, advertised in the London Times
1938	Steam driven fan aboard ships

[2]

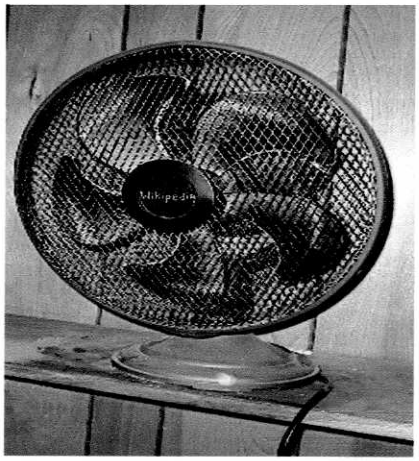

Figure 3.1: Table Fan

3.2 SAMPLE FROM PREVIOUS PROJECT:

TITLE: FOUR-SPEED FAN CONTROL USING SIMPLE REMOTE DIODE TEMPERATURE SENSOR

This project is controlling fan speed using temperature sensor which is Remote Diode Temperature Sensor (RTDS).In this project LM88 has been used which is one of the type of RTDS. It has 3 digital comparators and 3 open-drain output which are (O_SPO,O_SP1,O_CRIT). The digital comparator can be programmed independently to make a greater than or less than comparison. The hysteresis of each comparator is internally set to 1°C.

The three output of the LM88 are connected to resistors which will be formed a crude 2-bit DAC. Output from DAC is fed to PNP emitter follower which will be controlling the voltage on the negative pin of then fan. The range of the voltage is from 1.25V to 5.7 V. The maximum speed of the fan is dependent on the minimum of its output voltage. It is dependent on the drain to source on resistance of the output.

All of the LM88's output will be deactivated, when the temperature of the diode is less than the SPO, SP1 and T_CRIT. The output voltage will be set approximately to 5.7V which will be the slowest speed of the fan. The first intermediate fan speed will only be set when only O_SPO is activated. The second intermediate speed of the fan will be set when both O_SPO and O_SP1 are activated. The fourth and the maximum speed will be set when all three outputs O_CRIT, O_SPO and O_SPI are activated [3]. The complete circuit for this project can be referred in figure 3.2.

The circuit for the project is as below:

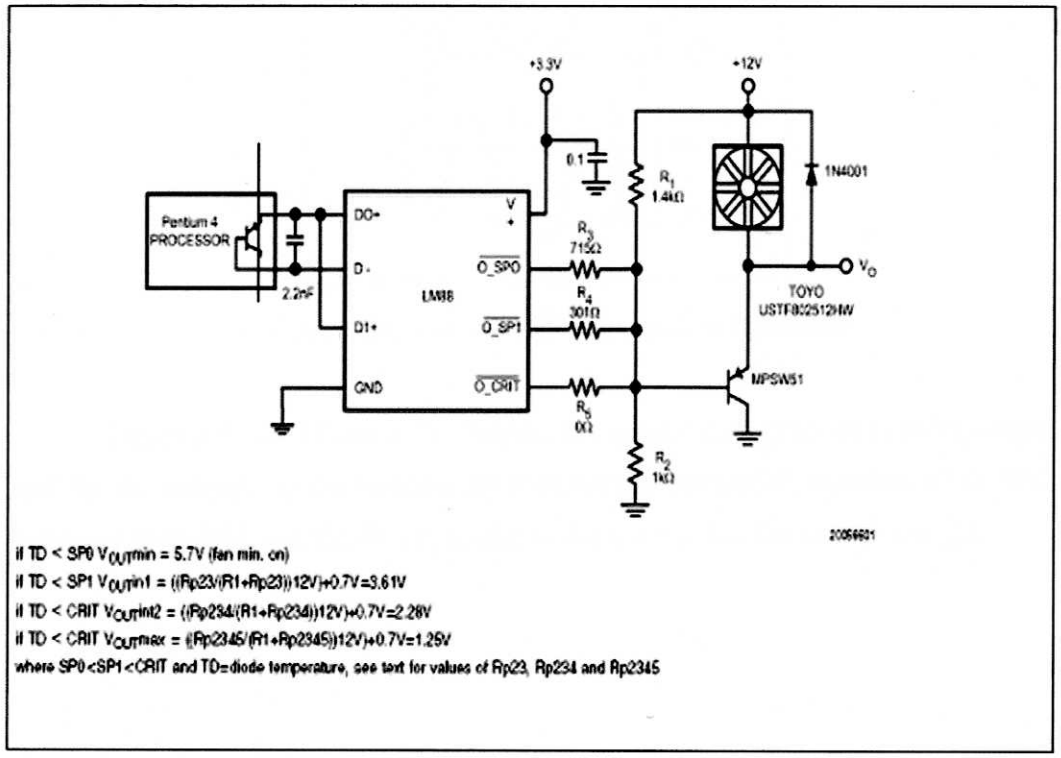

Figure 3.2: Low Cost Remote Diode Temperature Speed Control

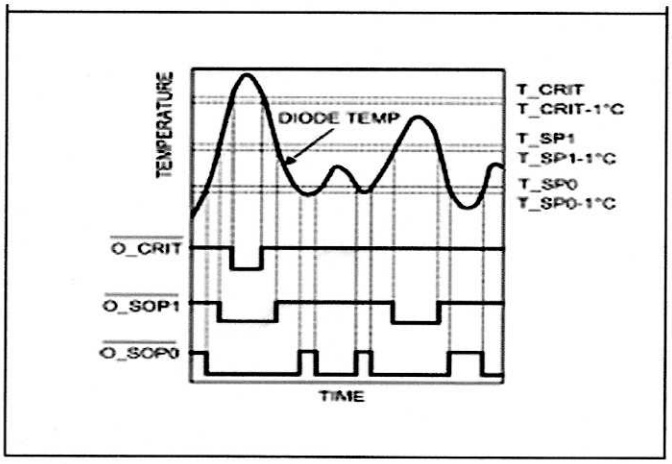

Figure 3.3: Temperature Response Diagram of The LM88's Output

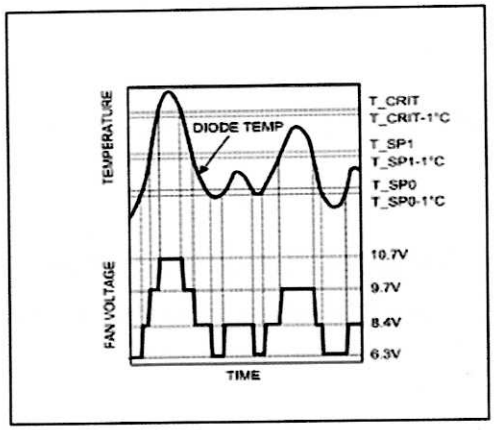

Figure 3.4: Fan Voltage Temperature Response

Figure 3.3 and 3.4 show the temperature response diagram of LM88's output and the fan voltage. As the temperature increase the sequential activation of O_SPO followed by O_SP1 and finally causes the voltage across the fan to increase [3].

CHAPTER 4

THEORY, HARDWARE AND SOFTWARE

To understand this project, some research has been done throughout making this a successful project. The research includes the hardware and software.

4.1 HARDWARE

4.1.1 Major Components

4.1.1.1 Microcontroller (ATMEL 8051)

Microcontroller can be found in most products these days. Normally it applies to washing and vending machine, microwave, air conditioner and robotics. The main task for this component is for control applications. The ATMEL is programmed in C language. Other programming language that can be used to program this ATMEL are assembly language (low level language), High-Tech C and PicBasic.

In this project, AT89S2051 is used. It is one of the most commonly used ATMEL microcontrollers .The reason why microcontroller is chosen for this project is because, it is cheap and light compared to computer. It has less instruction set and it is much simpler than a computer. Therefore, it is less likely to fail so it is reliable. Finally, it runs much faster than it does on a computer.