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HYBRID COOLER

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ABSTRACT

Solar energy is a need of 21st century, because of its inexhaustible supply and its nonpolluting character, in stark contrast to the finite fossil fuels coal, petroleum, and natural gas. It is significant to harness solar energy efficiently as it is important source of renewable energy. The applications of solar energy are vast. Our report concentrates on application of solar energy in air cooler. Our air cooler is a hybrid cooler which works on both solar and main supply, it is temperature cooler adjusts its speed according to surrounding temperature. This project serves us to usage of solar energy to produce cooler air. In the cooler the solar panel will give energy to charge the battery which will be controlled by controller circuit so that battery will not get damage due to high intensity of solar. The pump controller circuit will run on battery and the sensors attached will sense the level of water in the tank and the motor pump will be on as the level of water goes down and the pump will be of when the tank level is full .The dc fan will continuously run on battery. The main goal of this project is to design an air cooler which work on solar and main supply.

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I. INTRODUCTION

An air cooler is use to provide cool and dehumidify air and to reduce the temperature of the human body. If considered human body as thermal machine then 20% of heat is required work efficiently, rest 80% of heat needs to be dissipated out of the body. Like any other machine human body works efficiently on particular temperature. Air cooler is one of the ways to maintain human body in particular temperature. But regular air cooler works only on electricity and if the power supply is off than there is no use of cooler. Also it should be in proper observation to check the water level in cooler; if water level is less then it could damage the cooler severely. The cooler is mainly use in rural area where there is problem of electricity and proper supply is not provided to air cooler so air cooler would be of no use. Also the repair stations are not near in remote area so there is wastage of time and money for the consumer. The air cooler explained in the paper minimize the consumption of electricity by working on solar energy.

The potential of solar energy is enormous, since about 200,000 times the world total daily energy is received by earth in the form of solar energy. It is significant to harness solar energy efficiently as it is important source of renewable energy. Our cooler system will be hybrid which will work on solar energy during day time and battery in night time also it can change its speed with the surrounding temperature. Our air cooler will use the electricity efficiently and can be used in rural area where there is scarcity of electricity. It also consists of water level indicator to notify the level of water and temperature indicator to indicate surrounding temperature. This cooler is designed using solar panel, battery, pump, and temperature sensor to provide an efficient cooler working on solar energy

II. NEED OF SOLAR ENERGY

Human body emits around 100kcal per hour per person. The body of human beings maintains a particular temperature of 36.9 ◦C. The solar energy is renewable and free source of energy. The scarcity of fuel will be maximum in coming years so solar is conventional alternative for it. The use of solar energy in cooler will help to reduce the electricity consumption. In country like India where there is electricity scarcity the solar based cooler can be a cost effective alternative for the people.

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III. COMPONENTS USED

1.)Solar Panel- Solar panel reference to a panel design to absorb the sun rays as a source of energy for generating electricity. A photovoltaic module is package assembly of typically 6*10 solar cells. Panel constitutes the solar array of photovoltaic system that generates and supplies solar electricity in commercial and residential.

Figure 1: Solar Panel

2. Dc Motor

In a dc motor, armature rotates inside a magnetic field. The basic principle of DC motor is that whenever a current carrying conductor is placed inside a magnetic field, there will be mechanical forces experienced by the conductor.

Specifications-

Operating voltage- 4.5-18 V
Speed – 100 RPM

Figure 2: DC Motor

3. Beeping Buzzer

A buzzer is the audio signaling device which is used for raising the alarm if any faults has found. It is acting as a output device which make sure that the alarm indicates the fault, so that further actions should be taken

Specifications*-Power: 75W*

1. Voltage at Max Power (Vamp):17.60V

2. .current at max power (Imp):04.26V

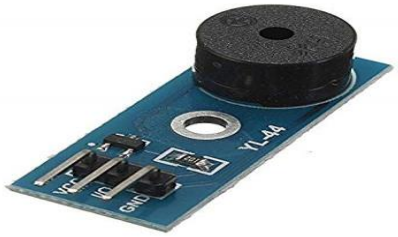

Figure 3: Buzzer

4. Temperature Sensor-

A temperature sensor is a sensing device which is used to measure temperature by measuring an electrical signal. A thermocouple is a combination of twodissimilar metals which can generate electrical voltage in direct proportion with change in temperature.

Specifications-

Type: LM35

Temperature Range: 0◦C to 100◦C

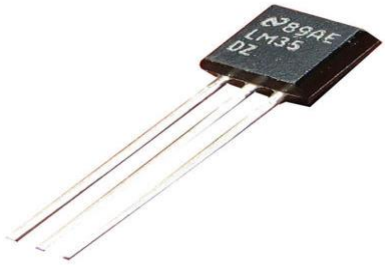

Figure 4: Temperature Sensor

5. Microcontroller

A microcontroller is a device which embedded in a system which is used to control functions of the system. It does this by interpreting data it receives from its I/O peripherals using its central processor. The microcontroller receives the required data and is stored in its data memory

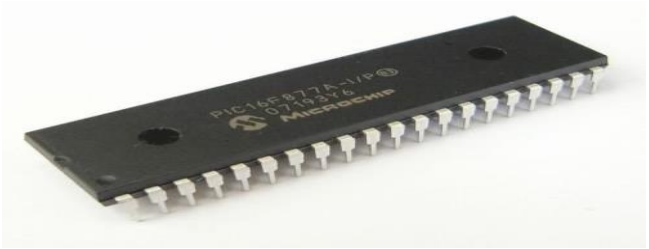

Figure 5: Microcontroller

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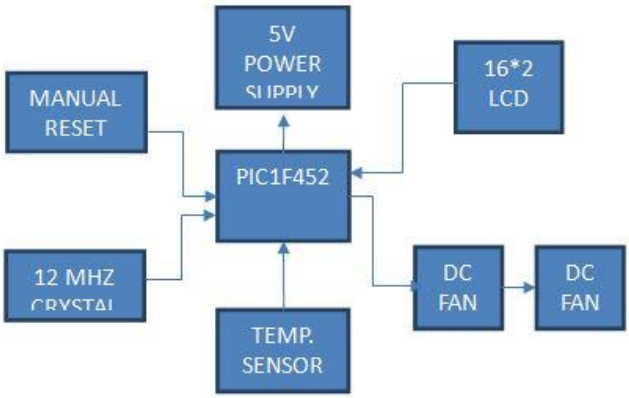
IV. BLOCK DIAGRAM



V. WORKING

In this system power supply is given to the microcontroller by solar panel then by DC driver voltage is increase to run fan. And relay driver is use to drive the pump. The temperature sensor is use to sense temperature with moisture sensor to notify water level to the server which give data to user. And user can control the cooler by WIFI.

VI. ADVANTAGES

- The speed of cooler will change according to temperature so no need of manual switching.
- The buzzer will notify the level of water when its low.
- As it works on solar the cooler will save electricity

VII.DISADVANTAGES

- Initial cost will be high compare to regular cooler. .
- Can become unhygienic very quickly unless maintained properly.
- Water has to be changed and the water pads have to be cleaned regular.

VIII. APPLICATION

- It can be used in villages.
- It can be used in school during daytime.

IX. CONCLUSION

So as comparing the cost of this product with the existing products in the market is, solar Products appeals better and affordable by common people. This solar product perfectly Suits for villages, schools and offices and thus Prevention from the power cut problem. It comprises of many attractive features such as solar energy cooler at low cost. The above method is ecofriendly and natural, electricity saves.

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