Solar Power Cooler With Tracking System

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Abstract -The present air cooling methods is are evaporative coolers, air conditioning, fans and dehumidifiers. But running these products is need a source called electricity. The producing of electricity is ultimately responsible for hot and humid conditions also i.e. global warming. In hot and humid conditions and the need to feel relaxed and comfortable has become one of few needs and for this purpose utilization of systems like air-cooling and refrigeration has increased in quickly. These systems are most of the time not suitable for villages due to longer power cut durations and high cost of products. Solar power systems being considered as one of the path towards most sustainable energy systems, considering solar-cooling systems in rural areas would comprise of many attractive functions . This technology can efficiently serve large latent loads and greatly improve indoor air quality by allowing more ventilation while tightly controlling humidity. Despite improving performance and mandatory energy efficiency requirements, peak electricity demand is growing and there is currently no prevalent solar air cooling technology suitable to residential application especially for villages, schools and offices. This project model reviews solar powered air cooler for residential and industrial applications.

Key Words: Solar Panel, Arduino Uno, Fresh Cool Air

1.INTRODUCTION

The research paper "Solar Cooler with tracking system" is based on the concept of harvesting solar energy. That is easily interpretable from the name of the project that it is based on the solar energy for satisfying its need of power source. The functionality of Solar Cooler is dissimilar as that of the latest coolers. The solar energy is collected and stored in a battery. This battery is connected to the solar cooler for the power source. The concept of solar cooler sounds better and economical hence almost every class of our society can bear its expenses. The best part is that, it can be used even in rural areas where there will be no supply of electricity. This paper tells the comfort conditions achieved by the device for the human body. In summer and humid conditions we feel uncomfortable because of hot weather and heavy humidity. So it is needed to maintained thermal comfort conditions. Thermal comfort is determined by the room's temperature, humidity and air speed. Radiant heat or radiant heat loss are also important factor for thermal comfort For developing such a solar power cooler we start preparing for it but that time we don't have sufficient information or knowledge to developed it an then some difficulties are arrive in front of us like, Internal corrosion , If moisture finds its way into the solar panel it can cause internal corrosion Electrical issue like faulty wiring prevents your solar panel from presentation. Such a small queries are coming in front of us. But after suffering on internet we got some IEEE papers which helps us which type equipment are helpful for us and how to use it and after we are obtaining some web pages, we get each and every thing about of that then. We started making our solar power cooler

2. Literature review

In India the electricity demand is growing rapidly daily due to different increasing suburban, official and organizational buildings which requires more power. Power generation system is located by a hybrid renewable energy resources like wind and solar, approximately 36% from 2007 to till now, still power shutdown is applied compulsory by the Government of India. order to increase the amount of power generation to 100% with increased thermal, fossil-fuel, and bio-gas power generation is converted into complete solar, wind and thermal including peaking options. order to complete the demand, the wind capacity is increased from 35% into 100% by incorporating solar and thermal. Incorporating various energy systems into standalone power grid, the highest power demand can be fulfilled. This paper applied an application for mixing various energy resource for increasing the power generation and production[1]

The cutting-edge growing call for solar energy, this renewable electricity source may additionally become extra available to all householders. Solar power cannot simply provide good strength for your property; however it could additionally

employ underutilized land and generate sizeable value for the location. There are huge swaths of land in numerous international locations around the world that are far from major capitals or cities. Most people of these section won't be used at all. Solar energy, alternatively, can make better use of this underutilized land through installing photovoltaic solar panels on the website. Solar farms, addition of referred to as photovoltaic electricity stations, are big, and decentralized solar arrays that provide energy to the energy grid. Engineers and scientists are currently trying to find weather-alternate-affected sustainable power answers. There are numerous sustainable herbal strength resources available; however their implementation necessitates focuses generally on solar strength and discusses innovation, improvements, and the destiny of solar power technology[2]

The Solar Energy is produced by the Sunlight is a non-vanishing renewable source of energy which is free from environmentally safe. Every 60 minutes adequate sunlight energy reaches the earth to meet the world's energy demand for a whole year. In today's generation we needed Electricity every hour. This Solar Energy is produced by as per applications like industrial, commercial, and residential. It cans easily energy drawn from direct sunlight. So, it is very efficient & free environment contamination for surrounding. In this report, we have reviewed about the Solar Energy from Sunlight and consider about their future trends and aspects. dole out solar power plants, a system energy-saving depot device (ES) is installation system prosped A distinctive feature of the proposed model is the segmentation of places for the installation of power active filter-compensating devices, the use of which allows deliver the mandatory quality of electric energy and achieving the minimum energy losses in the elements of the energy supply structure. According to the results of the feigning, the comparison of the energy efficiency of the traditional energy supply system and Smart Grid has been made[3]

The overall sum of solar powered quality occurrence on the planet surpasses the sector's modern and anticipated power needs by implies of a huge edge. This outstandingly unobtrusive

1/daylight that comes to the ground is seen light, with the final forty-five rate counting infrared radiation and littler amounts of bright and distinctive assortments of electromagnetic radiation[4]

3. System Details :

While developing any microcontroller based electronic system, there are some steps which must be followed. These steps are: Deciding system specifications i.e., Block diagram

1. Selection of system components
2. Design of circuit diagram
3. Simulation of circuit

supply has the capacity to fulfill all predetermination power wishes in the event that appropriately saddled. Solar based power, in differentiate to the limited fossil fills coal, petroleum, and herbal gas, is anticipated to conclusion up increasingly engaging as a renewable power source interior the twenty-first century since of its boundless convey and nonpolluting nature. Indeed, in spite of the fact that the solar could be a fantastically viable power supply, and sunshine is by way of a ways the foremost significant supply of quality gotten through Soil, its profundity at the surface is exceedingly moot hat's commonly due to the considerable outspread unfurling of radiation from the faraway solar. The Earth's environment and clouds splash up or

diffuse up to fifty four percent of the approaching sunshine, resulting in a colossally minor extra misfortune. Nearly
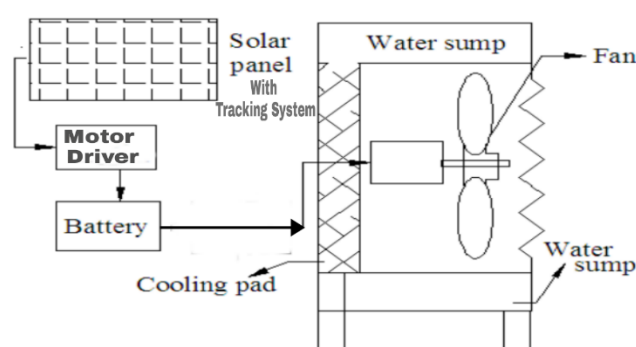

Figure 1: System Block Diagram

The Solar panel use to Collect the PV cell.in the Backward of Solar Panel the Tracking System is Attach by using Aurdino Uno. For the operation the Programming has done in the Aurdino Uno. After that motor Driver is use to connect the solar Panel and Battery. Battery is use to give the supply to the cooler. The supply of battery is given to the motor of cooler and

the water pump is use to lift the water.
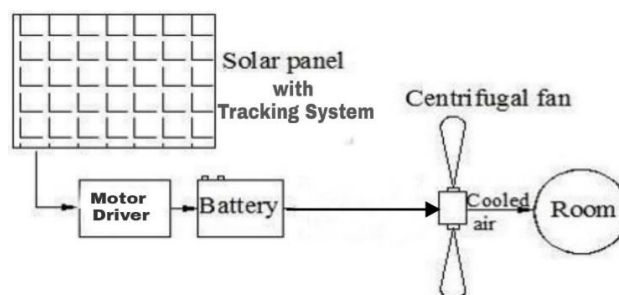.

3.SYSTEM DESIGN

Fig 2.Working Model Diagram

3.1 Arduino UNO :

The board features an Atmel ATmega328 microcontroller operating at 5 V with 2Kb of RAM,Kb of flash memory for storing programs and 1 Kb of EEPROM for storing parameters. The clock rate is 16 MHz, which read to about executing about 300,000 lines of C source code per second. The board has 14 digital I/O pins and 6 analog input pins.
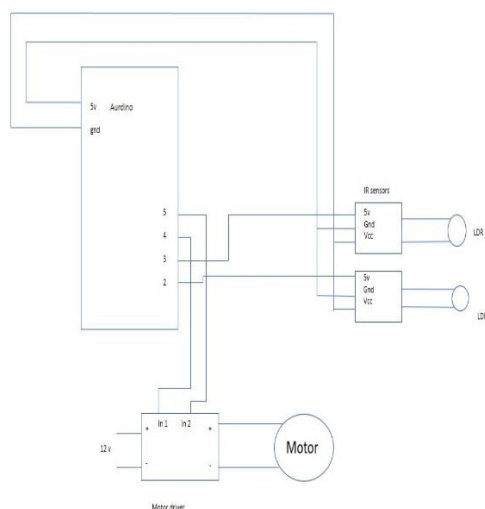

Figure 3: Circuit Connection For Aurdino UNO

In the connection the two IR sensor are connected to the LDR with the help of Auridon UNO. For the motor the 12v battery supply is given to run the motor. The two inputs of battery connected to the Auridon UNO.

4. RESULTS

Figure 4: Model Of Solar Power Cooler

LDR are used as the main light sensors. LDR are sense the Sunlight falling on them they two. LDR are connected to solar panel on top and bottom site. Both the sensors send digital information about presence and absence of light intensity to the Micro controller (Arduino). The micro controller decides the output signals for the motor driver so as to drive the motor in CW or ACW direction.The motor driver module receives the signals from the micro controller and drives the motor in the
specified direction with the specified speed. The motor in turn   controls the orientation of the solar panel mounting structure. Thus, maintaining constant exposure to sunlight throughout the day. And After completion of solar tracking, We connect the solar power cooler And After Solar tracking solar get connected BMS

(Battery Management System) And the output of BMS is connected To 12 Volt lead Acid battery And then Output of battery is connected to Solar Cooler DC motor And we use the cooling pads for cooling purpose for cool air and then we use submersible DC pump for cooling the pads And output is fresh natural air

5.CONCLUSION

In the light of this information the model of solar power cooler is about, a real-life prototype of a solar tracking system had built by using Arduino based controller. The design modeling is referenced to the mechanical construction of the solar tracking structure discussed by previous research. The prototype consists of a control system from the Arduino board light-sensing from the light sensor, rotate mechanism from the gear motor, and a solar panel as the main component. To achieve the objective, an outdoor experiment is conducted to measure. Parameter of solar panels and compare the performance of solar panels with a tracking mechanism and static solar panel. Based on the result obtained, the performance of solar panels had an increased efficiency of 38.89%. After being implemented with a solar tracking mechanism. It is proved the advantage of a solar tracking mechanism throughout the day as it can track the Sun's position compared with static solar panels.
This allows the solar panel to absorb more solar irradiance to generate electricity, result in reducing the cost of electricity.

This model although fulfill all requirement, has further scope for improvements. Some of the improvements that could be made in this solar air cooler with auto tracking unit are listed below. By adding solar panel auto tracking system By adding some components to make solar heater cum cooler

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