Solar powered air cooler with advance PIC micro-controller

[1]Gaurav Lohite, [2]Amol Bodade, [3]Yogesh Dudhe
Students,
Electrical, K. J. College of Engineering and Management Research, Pune

Abstract- The present air cooling methods are evaporative coolers, air conditioning, fans and dehumidifiers. But running these products need a source called electricity. The producing of electricity is ultimately responsible for hot and humid conditions i.e. global warming. In hot and humid conditions the need to feel relaxed and comfortable has become one of few needs and for this purpose utilization of systems like air-conditioning and refrigeration has increased rapidly. 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 more sustainable energy systems, considering solar-cooling systems in villages would comprise of many attractive features. This technology can efficiently serve large latent loads and greatly improve indoor air quality by allowing more ventilation while tightly controlling humidity. Despite increasing performance and mandatory energy efficiency requirements, peak electricity demand is growing and there is currently no prevalent solar air cooling technology suited to residential application especially for villages, schools and offices. This project reviews solar powered air cooler for residential and industrial applications.

***keyword*-transformer,levelsensor,temp.sensor,dcmotor,Solarenergy**

I. INTRODUCTION

In summer (hot) and humid conditions feel uncomfortable because of hot weather and heavy humidity. So it is necessary to maintain thermal comfort conditions. Thermal comfort is determined by the room's temperature, humidity and air speed. Radiant heat (hot surfaces) or radiant heat loss (cold surfaces) are also important factors for thermal comfort. Relative humidity (RH) is a measure of the moisture in the air, compared to the potential saturation level. Warmer air can hold more moisture. When you approach 100% humidity, the air moisture condenses – this is called the dew point. The temperature in a building is based on the outside temperature and sun loading plus whatever heating or cooling is added by the HVAC or other heating and cooling sources. Room occupants also add heat to the room since the normal body temperature is much higher than the room temperature. Need of such a source which is abundantly available in nature, which does not impose any bad effects on earth. There is only one thing which can come up with these all problems is solar energy.

II. PROPOSED SOLUTION

Need of such a source which is abundantly available in nature, which does not impose any bad effects on earth. There is only one thing which can come up with these all problems is solar energy.

III. OBJECTIVE

-To make aware of non conventional energy sources to reduce environmental pollutions.
-To provide solution for power cut problems in villages.
-To replace existing costlier and high energy consumption cooling methods.
-Free of cost minimizing home temperature.

IV. PRINCIPLE

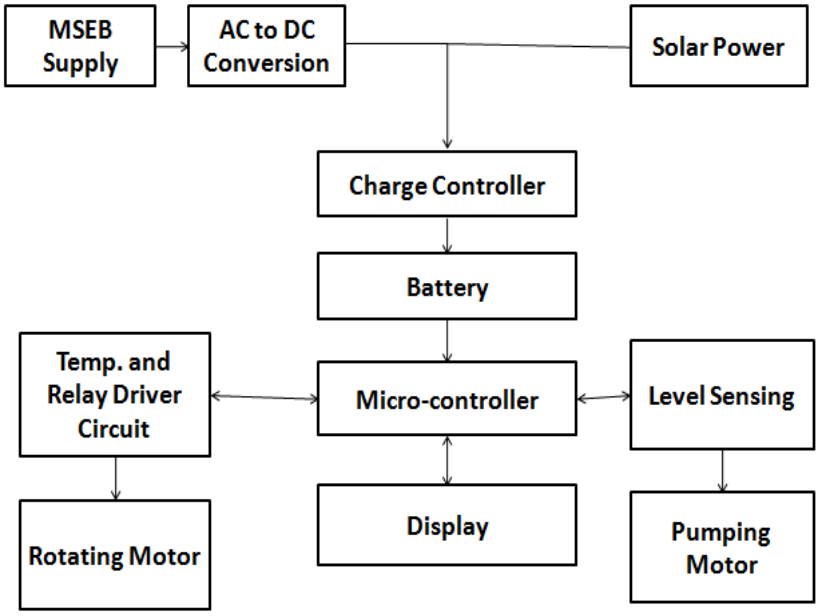

Fig1 block diagram

Solar energy conversion is done by using battery and charge controller. As sun light falls on solar panel, which converts into electrical energy by photoelectric effect. This electrical energy stored in battery in the form of chemical energy. Charge controller is employed in between solar panel and battery which prevents overcharging. Solar energy conversion process and may protect against overvoltage, which can reduce battery performance or lifespan, and may pose a safety risk. The stored energy directly can use for DC loads.

Cooling calculation in cubic meter-
1M=100cm/28.5cm
=3.57ft
Cooling measurement in M3
Time required to decrease temperature by 10C of 1M3= t1
1M3 is directly proportional to t1*10C-cooling ratio of machine
Let,
1M3- 1) power in watt
2) time in minute
3) temperature in 0C
Calculation for 10*10ft room-
Total volume of 10*10ft room= 2.80M3
Consider normal room temperature=350C
To reduce 10C= (18W rotating motor + 9W pumping motor) for 30min.
Power consumption to reduce 10C = 27W for 30min.
= 54W for 60min.
Working Model of the Project-

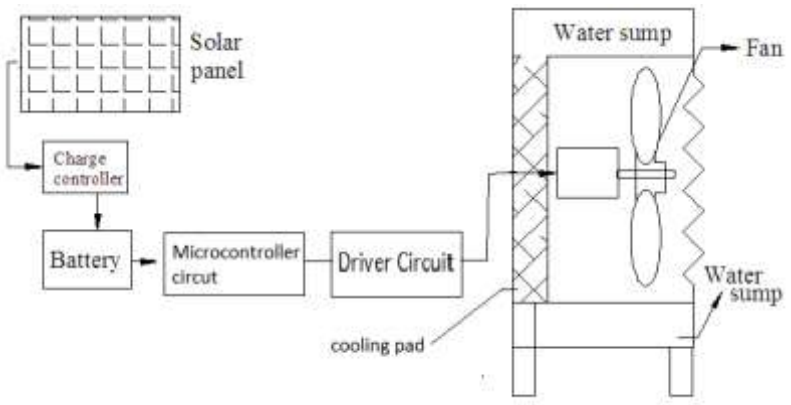

Figure No.2: Working Model of the Project

Advantages-

1) Free of cost minimizing of home temperature
2) Less maintenance
3) Long life

Applications-

1) Home
2) Hospitals
3) Hotels
4) Animal houses

V. CONCLUSION

Comparing the cost of this product with the existing products in the market is solar product appeals better and affordable by common people. This solar product perfectly suits for villages, schools and offices and thus an alternate to the power cut problems.

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