

Sun Tracking Solar Panel System

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Abstract: This paper basically presents the sun tracking solar system. The working of the solar panel in this paper is similar to that of the solar energy consumption module available, but in a cheaper form. It basically works on the process of solar energy consumption and the usage of that energy in some efficient format for reducing heavy dependence on the natural resources, which will further reduce the depletion of natural resources which is a major concern and the major reason for global warming as well.

Keywords: Solar Panel, Arduino, Servo motor.

I. INTRODUCTION

Energy is one of the most important and fundamental element of the universe. Everything we do is connected to energy in one form or the other. Energy enables us to do work. Energy can be retrieved from two main forms which are fossil fuels and renewable resources. With the rigorous and abundant usage of fossil fuels there is a huge decrease in its availability. There will come a day where fossil fuels would no longer be available. We need to switch to another, more efficient option.

An efficient option is the use of renewable resources. Renewable resources are natural, organic resources which produce renewable energy. Renewable energy is generally defined as energy that comes from resources which are naturally replenished on a human timescale which includes sunlight, wind, rain, tides, waves and geothermal heat.

The renewable energy that we are using in our project is the energy from the sun. Sunlight is one source that would never exhaust. We could make effective use of this energy source and get suitable result for it.

II. MOTIVATION

The sun tracking solar panel is able to execute efficient amount of energy through solar energy, which is being converted from solar energy into that of the electrical energy, and being stored into the battery. The sun tracking solar panel provides an efficient amount of energy in the cheapest way possible. The system basically follows the solar energy utilisation concept, which is one of the major topics being discussed on in today's world in order to reduce our excess of dependence on natural resources. The rate at which the natural resources are being used may lead to a sudden decline in the quantity of these resources, which may prove out to be quite fatal for the future generation it aligned well with both team goals as well as the present requirement on the base of the decline of the natural resource it became the baseline and a motivational influence of this paper.

Research on this topic is being performed over the years throughout the world, for the better and accurate outcome. Natural resources, over the years, have attained quite a lot decline which could prove out to be quite fatal for the

coming time which may even cause our future generation prone of utilizing these resources. A moral responsibility towards the nature has also caused us to select and get motivated towards this paper.

III. RELATED WORK

Sun tracking solar panel is an efficient means of producing energy which is being conserved or preserved through the amount of energy being produced through sun. A solar panel basically refers to the device which converts a solar energy into an electrical energy. Solar panel in this paper basically is being used to obtain the energy and store it in the respective battery. The battery here will be storing the energy being acquired by the solar panel and use the respective energy to utilize it for the production of energy.

A solar panel is a set of solar photovoltaic modules electrically connected and mounted on a supporting structure. A photovoltaic module is a packaged, connected assembly of solar cells. The solar panel can be used as a component of a larger photovoltaic system to generate and supply electricity in commercial and residential applications. Photovoltaic (PV) is a method of generating electrical power by converting sunlight into direct current electricity using semiconducting materials that exhibit the photovoltaic effect.

Thus using the technique being proposed in this paper produces an efficient way of conserving energy and utilising it effectively without causing much burden on natural resources.

IV. SYSTEM OVERVIEW

The sun tracking solar panel being proposed in this paper basically consists of the elements such as that of LDR, ARDUINO microcontroller, Motor Driver, Stepper Motor, Solar panel and a battery. The functioning of this system basically starts with the LDR which detects the presence of light. The resistance of this resistor increases in the time of darkness. The presence of the light is being sent in the form of signal to the microcontroller. The microcontroller (Arduino) performs the respective functioning of managing the entire system thereafter. It activates the motor driver which further controls the working of a

stepper motor. Stepper motor on the other hand is being connected to solar panel, which manages the direction in which the solar panel is to be moved on the base detection of large amount of light, in order to attain the best possible amount of energy for conserving into the battery. The battery being used is for preserving the energy.

The present work basically works on the functioning of converting the solar energy into electrical energy. The conversion of this energy basically takes part through some photovoltaic cells attached on the face of these solar panels. Photovoltaic cell is nothing but a solar cell made up of certain semiconductor materials which are arranged in an order and converts the incident sunlight falling on the solar panel into certain electrical energy format and is being stored in the battery for further usage.

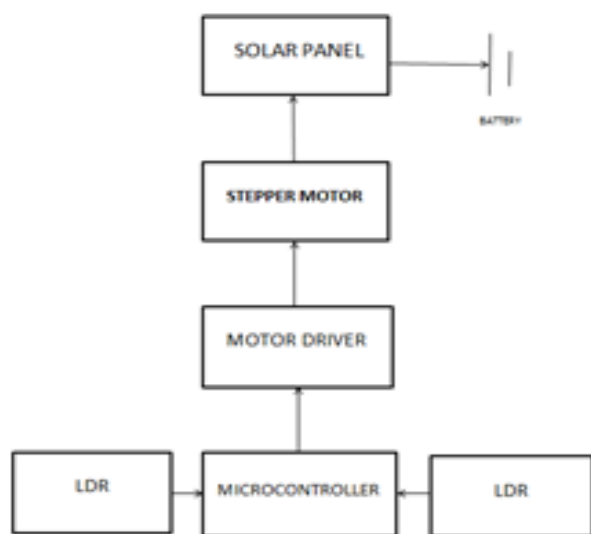


Fig 1: Block Diagram

V. EXPERIMENTAL RESULTS

The sun tracking solar panel being proposed in this system is being tested by students and is found to be quite effective for preserving and utilising the energy. They used two batteries both charged and uncharged. For showing the difference between both of them they made use of a voltmeter, which detects the presence and absence of charge in the two batteries. The battery being used in the proposed sun tracking solar panel was having higher charge as compared to the other one. The energy being stored in the battery through the solar panel was able to charge an electrical bulb on experimenting.

VI. CONCLUSION

The sun tracking solar panel provides an efficient amount of energy in the cheapest way possible. The system basically follows the solar energy utilisation concept, which is one of the major topics being discussed on in today's world in order to reduce our excess of dependence on natural resources. The rate at which our natural resources are being used may lead to a sudden decline in the quantity of these resources, which may prove out to be quite fatal for our future generation.

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