SOLAR POWERED AUTOMATIC ELECTRONIC BUG SWATTER FOR ROOF TOP GARDERNS

[1]G.Krishna veni , [2]Dr.K.Prahladha Rao

[1]PG Scholar, [2]Assistant Professor, Department of Mechanical Engineering

[1,2]JNTUA College of Engineering, Anantapur, Andhra Pradesh 515002.

ABSTRACT:

In the current scenario, with the rising population more and more apartments are coming up on the rooftop gardens. The objective of our paper is to save the time and energy. The home gardens need to provide fresh fruits and vegetables for the better health of the family. In this project we use LED lights during night time to attract the insects. The LED lights will ON by using LDR. The electronic fly swatter them instantly thus preventing them from reaching the plants. We also have a provision to collect the dead insects and dispose them back to the soil to be used as natural manure in the day time. The solar energy is a renewable source, which is converts light energy into electric energy. These energy is used to recharge the batteries. The moisture level of the soil is also sensed automatically and accordingly water is fed to the plants. Our project is compact and movable. This will be very useful for the city dwellers. It will save their time and energy.

Key words: Rooftop gardens, agriculture, Solar Panel, Soil Moisture Sensor, LDR, ATmega328 Arduino uno Microcontroller, electronic fly swatter, Ultraviolet LED lights.

I.INTRODUCTION:

Urban populations face numerous challenges identified with the wellbeing and prosperity of residents. Huge numbers of these challenges emerge as the immediate aftereffect of consolidated urban environment. Extreme challenge for land diminishes green space, and there is a resulting profound separation from horticultural roots and the regular world. Rooftop gardens are a fantastic case of joining uninvolved, eco-accommodating innovation into the new condition. Rooftop gardens help decrease the negative effects of urban areas on the earth by: preserving water and vitality, improving air and water quality, helping in tempest water the executives, retaining sunlight based radiation, turning into a wellspring of nearby sustenance generation, giving environment rebuilding, and making common asylums. Additionally bother the board is one of the real consumptions caused by a rancher. From planting till the yields are harvested and sold, bugs should be overseen viably and monetarily. This paper means to structure and build up a programmed swatter to shield the rooftop plants from harm because of creepy crawlies, utilize the vermin by transforming it into bio pesticides and a programmed watering framework for the rooftop gardens.

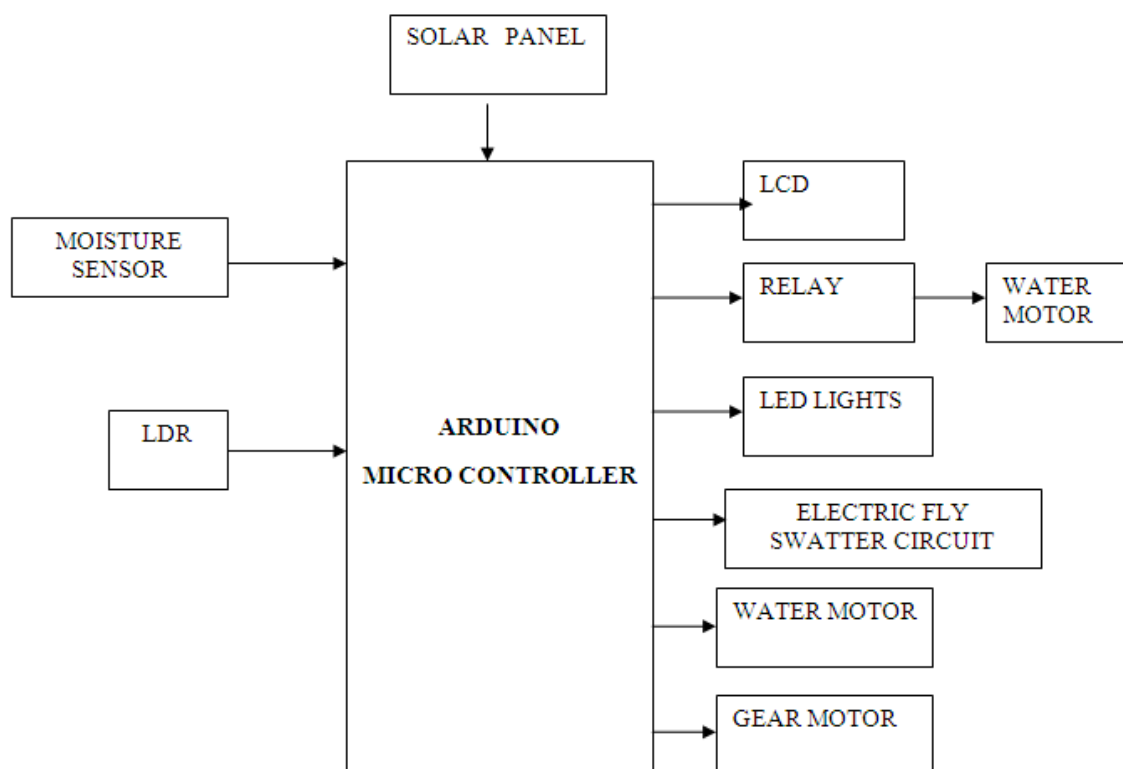## II.BLOCK DIAGRAM FOR AUTOMATIC ELECTONIC BUG SWATTER:

Fig 1: Solar based Automatic electronic bug swatter for roof top gardens.

A.WORKING:

From the above figure the power supply from 12V battery is regulated to 5V DC using regulator and given to Arduino uno microcontroller, as it works at 5V. A relay connected to the Arduino uno microcontroller switches ON the LED Strips during night time by using LDR (Light dependent resistor) and electronic fly swatter is automatically ON. Insects are collected automatically.The moisture Sensor sense the water content in soil. If the soil is dry condition the water is fed to plants. The bug is then mixed with water using a mixer. Gear motor operates the mixer which rotates at 30 rpm. Submersible Pump Motor is used to pump out the mixture through the outlet pipe.

B.HARDWARE COMPONENTS :

a) Solar Panel

b) Moisture Sensor

c) LDR

d) Arduino ATMEGA328 Microcontroller

e) Relay

f) LCD

g) LED Lights

h) Water Pump Motor

i) Electronic Fly Swatter

j) Gear Motor

C.SOFTWARE REQUIREMENTS:

1. Arduino

2.C- Language.

III. HARDWARE COMPONENTS AND ITS SPECFICATIONS:

a)Solar Panel:

Solar energy is the most abundant source of energy on the planet. Solar-powered photovoltaic (PV) boards convert the sun's beams into electricity. This created electricity can be put away in the battery for charging purposes.

Fig. 2: Solar panel

b) Relay:

A relay is an electrically operated switch. Relays are used where it is required to control a circuit by a low-power signal or where several circuits must be controlled by one signal.

c) LCD:

A liquid crystal display (LCD) is a display device. It is made up of any number of color or monochrome pixels arrayed in front of a light source or reflector.

d) LED Lights:

A LED is a semiconductor light source. The light transmits when current moves through it. Electrons in the semiconductor recombine with electron gaps and discharging energy as photons. The shade of the light is dictated by the energy required for electrons to cross the band hole of the semiconductor. White light is acquired by utilizing a layer of light-producing phosphor on the semiconductor device.

e) Moisture Sensor:

Soil moisture sensor assesses the volumetric water content in the soil .The prompt estimation of soil dampness requires removing, weighting of a model, soil dampness sensors measure the volumetric water content by suggestion by using other property of the dirt, for instance, electrical resistance..

f) LDR:

A photo resistor or Light Dependent Resistor or CdS (Cadmium Sulfide) Cell is a resistor whose resistance diminishes with expanding occurrence light power. It can likewise be alluded to as a photo conductor.
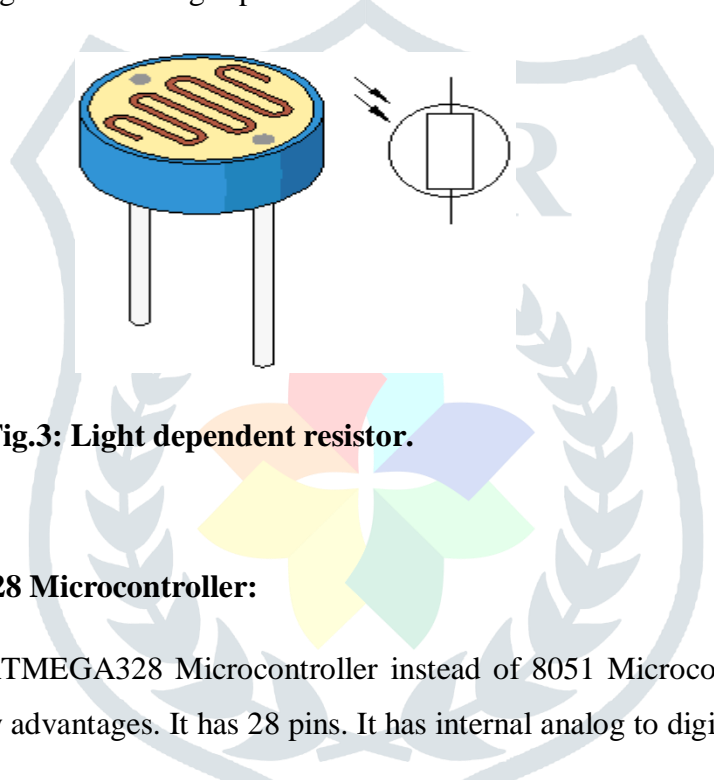

Fig.3: Light dependent resistor.

g) Arduino ATMEGA328 Microcontroller:

We are using Arduino ATMEGA328 Microcontroller instead of 8051 Microcontroller, because Arduino Microcontroller has many advantages. It has 28 pins. It has internal analog to digital converter.
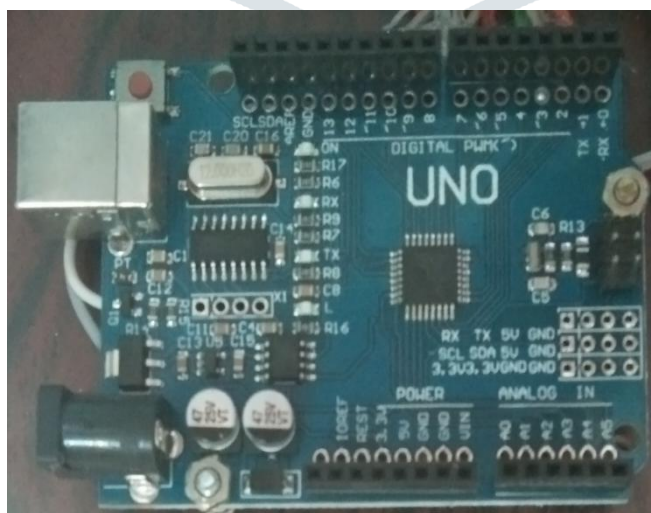

Fig. 4: Arduino Microcontroller

h) Electronic Fly Swatter:

Flies and mosquitoes are important to the food chain and serve a purpose in the ecosystem. Despite their purpose, we cannot deny that they are one of the common pests in the households. They bit that can cause itch and they are also potential carriers of diseases. Most common way of getting rid of them is through chemicals, which can also cause health hazard in long-term exposure. A way of eliminating them without the use of chemical is to use fly swatters. The design of a electric fly swatter circuit that looks like a tennis racket.

Fig. 5: Electronic Fly Swatter

i)Water Pump Motor:

DC 3-6V Micro Water Pump for Fountain Garden Mini water circulation System DRY project. It is a low cost and small size Water Pump Motor, which can be operated from a 3 to 6 V. power supply. It can be used up to 120 liters per hour with very low current consumption of 220 mA. A Tube is Connect the motor outlet, the water level is always higher than the motor.

J) GEAR MOTOR:

A gear motor is an electrical motor. It is intended to create high torque while keeping up a low drive, or low speed, motor output. Gear motors is utilized for a wide range of utilizations. The output of the rotor is diminished through a progression of enormous gears until the pivoting, RPM speed, of the last gear is low.

IV.RESULTS AND DISCUSSIONS:

The below figure shows the development of solar powered by automatic electronic bug swatter. Firstly, the switch is in ON condition, the LCD will be displayed as below like automatic electronic bug swatter.
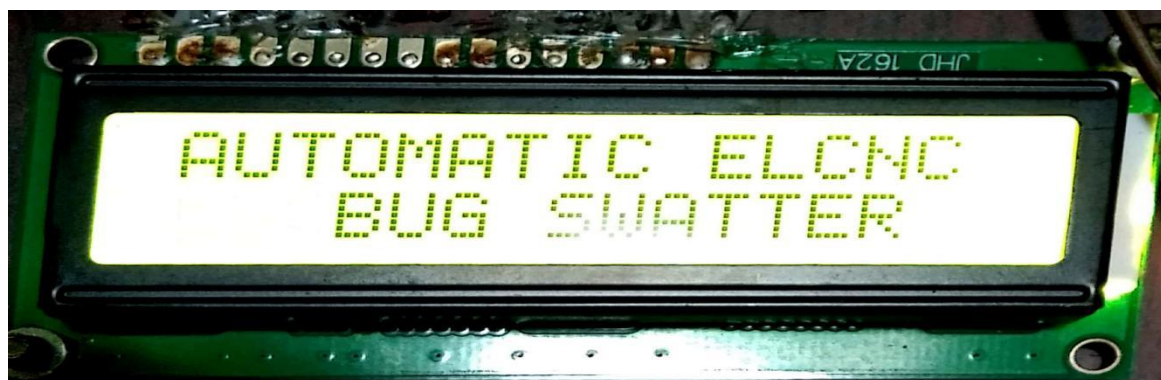
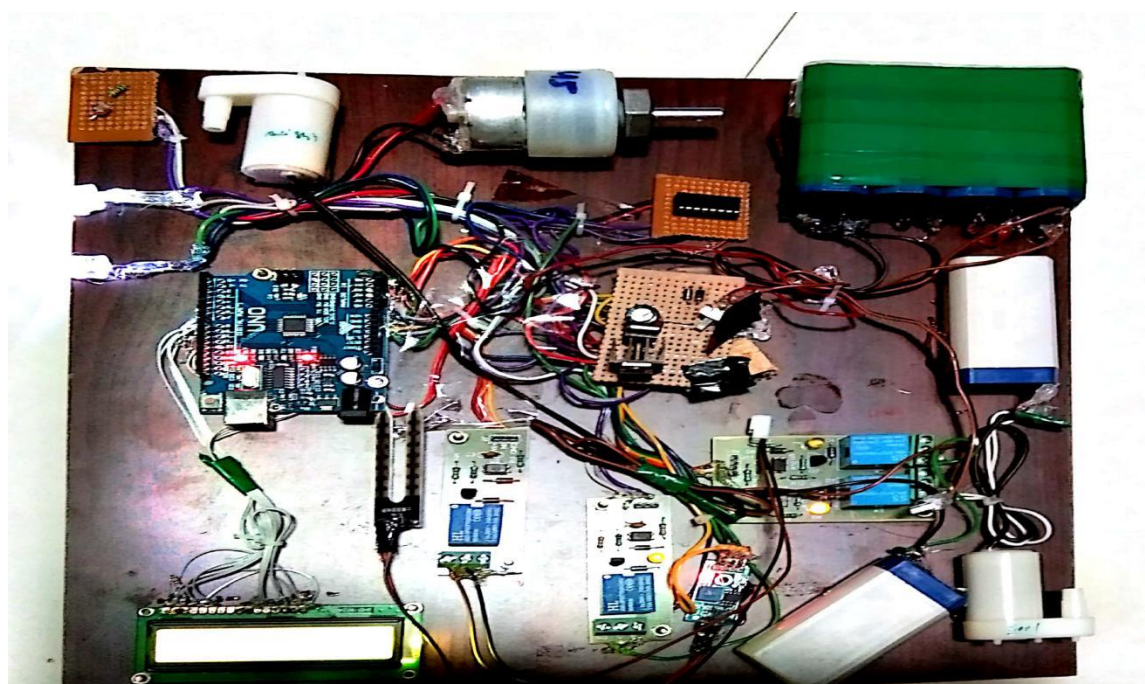**Figure 6: Automatic electronic bug swatter is displayed on LCD**

Figure 7: Experimental setup

Figure 7 shows the Hardware implementation of solar energy using for automatic electronic bug swatter by using this, we can reduce the labour cost and save the time.

V. CONCLUSION:

The advantage of this project is that we must no longer worry about the problems in the residential buildings which house rooftop plants. No need worry about the human effort to look after the rooftop plants. the electronic bug swatter is placing the inside residential buildings and just turning it ON will safeguard the plants automatically without human intervention. This project save the time and labour cost.

VI. FUTURE SCOPE:

The solar powered automatic electronic bug swatter is going to be very useful in the future. The prototype was implemented and tested. Laser can be used in the future to kill the bugs. This system will need very low power. An infrared beam may be able to track the bugs and a 3 - watt, 532-nanometer-wavelength

green laser can kill the insects. The killer beam blinds the system .The tracking laser can be used to kill the insects depending on the frequency of the wing beats.

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