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SOLAR BASED SPRAYER PUMP WITH REMOTE AND HORIZONTAL MOVING MECHANISM

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ABSTRACT

The electric sprayer is used for agricultural purposes such as spraying pesticides, herbicides. Here the electric sprayer has a storage tank, and it will be moving in a horizontal motion, where it can be move forward and backward automatically, when the signal is given with the remote, these communications are designed with RF modules. The electric sprayer does not need any external power supply as it has its inbuilt rechargeable battery, where it will be recharged with the solar panel, which will be delivering a maximum current of 0.8Amps and it also acts as a roof of the sprayer. A metal rail is constructed such that, the sprayer can spray maximum of the area.

Keywords : RF module, Solar panel, Rechargable batteries, sprayer.

I. INTRODUCTION

In our country farming is done by traditional way. Nearly about 70% peoples are dependent upon agriculture The spraying is traditionally done by labour carrying backpack type sprayer which requires more human effort. So, to overcome these the agriculture system in India should be advanced to reduce efforts of farmers, we tried to eliminate these problems and designed the equipment which will be beneficial to the farmers for spraying Drizzling of Pesticides is a Crucial task in Agriculture for care of the crops from insects. Farmers mainly use hand operated, or fuel operated drizzle inflate for this task. This traditional drizzle causes user fatigue due to excessive enormous and heavy construction. In this project we will look at solar based sprayer pump which will be an effective solution at locations where spraying is difficult. Solar energy is used for spraying is stored in battery. Here the vehicle is designed using a 89c2051 microcontroller, solar panel. RF module which we can use remote control application to move vehicle front and back by using radio communication.

II. WORKING

Supply is given to 89c2051 microcontroller from solar panel from rechargeable batteries which is of 12v,2Amp which is connected to a dc motor which is driven with relay. The vehicle reverses its direction once it reaches the limit switch. And for spraying the crops z-pump is used which is driven by another relay. For moving the vehicle front and back we use RF communication where RF transmitter is attached to the remote and RF receiver is attached to the vehicle. Here transmitter is connected to the 3RD pin of 2051 microcontroller. So, through controller the data is transmitted from transmitter to receiver which starts the motor. The RF communication here we used will work around 6meters.

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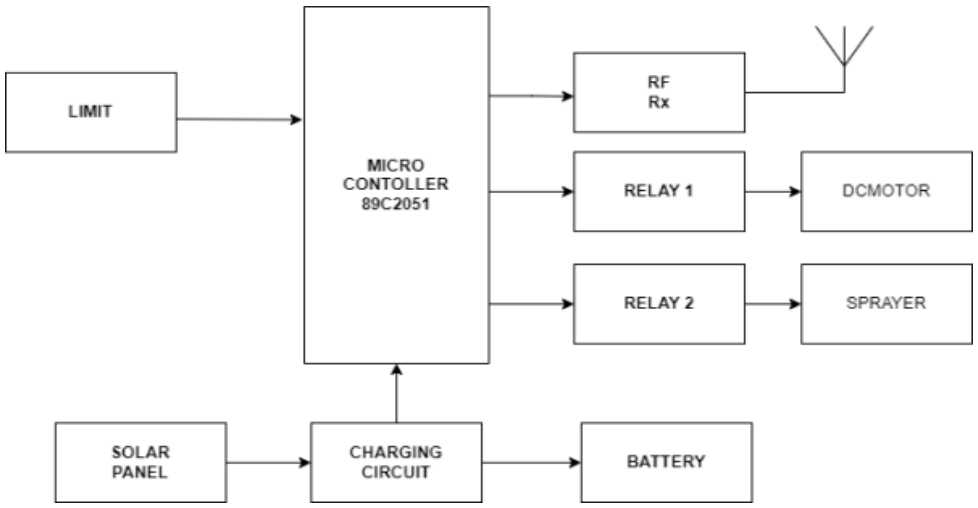
BLOCK DIAGRAM



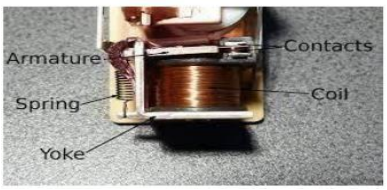
MODULES OF THE PROJECT

AT89C2051 MICROCONTROLLER

The AT89C2051 is a low-voltage, high-performance CMOS 8-bit microcomputer with 2K bytes of Flash programmable and erasable read only memory (PEROM). AT89C2051 is a powerful microcomputer which provides a highly flexible and cost-effective solution to many embedded control applications. The AT89C2051 provides the following standard features: 2K bytes of Flash, 128 bytes of RAM, 15 I/O lines, two 16-bit timer/counters, a five-vector two-level

RELAY

A Relay is a simple electromechanical switch made up of an electromagnet and a set of contacts. Relays are found hidden in all sorts of devices. In fact, some of the first computers ever built used relays to implement gate logics.



DC MOTOR

A DC motor or direct current motor is an electrical machine that transforms electrical energy into mechanical energy by creating a magnetic field that is powered by direct current. When a DC motor is powered, a magnetic field is created in its stator. The field attracts and repels magnets on the rotor; this causes the rotor to rotate. To keep the rotor continually rotating, the commutator that is attached to brushes connected to the power source supply current to the motors wire windings.

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SOLAR PANEL

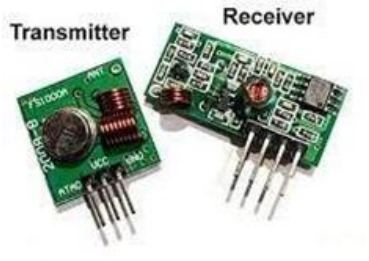
Solar photovoltaic systems use solar energy to produce electricity. Photovoltaic technology relies on the electrical properties of certain materials known as semiconductors. When hit by sunlight, a semiconductor material responds by creating an electrical charge which can then be transferred to anything that uses electricity. These semiconductors are produced in the form of cells, which can then be assembled in groups in a panel.

BATTERY

Electric battery is a device consisting of one or more electrochemical cells with externals connections provided to power electrical devices such as flashlights, smart phones, and electric cars. When a battery supplying a electrical power, its positive terminal is cathode and its negative terminal is anode.The terminal mark negative is the source of electrons that when connected to an external circuit will flow and deliver energy to an external device. When a battery is connected an external circuit, electrolytes are able to move as ions within, allowing the chemical reactions to be completed at separate terminals and so delivered energy to the external circuit.

RF MODULE

The RF modules are very small in dimension and have a wide operating voltage range i.e., 3V to 12V. RF stands for radio frequency and means the remoteis multi directional. Both receiver and the remote control can be put in to either IR or RF mode. Here we are using RFtype control. Instead of sending out light signals, an RFremote transmits radio waves that correspond to the binary command for the button that we are pushing A radio receiver on the controlled device receives the signal and decodes it. When logic one is sent carrier is fully on to about 4.5mA with a 3volts power supply. The data is sent serially from the transmitterwhich is received by the tuned receiver



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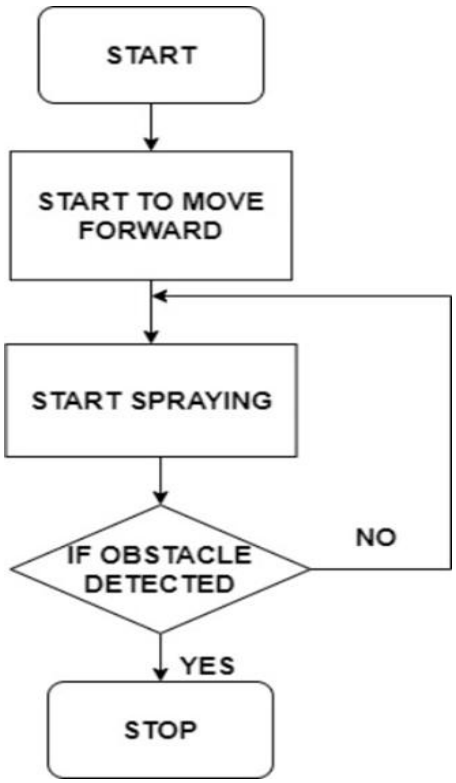
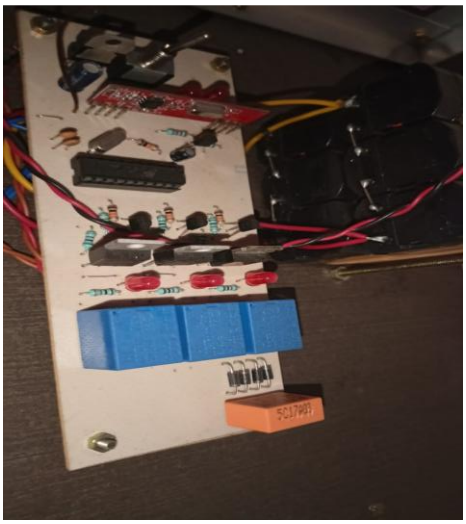
FLOW CHART



III. RESULT



IV. CONCLUSION

In this project we have successfully achieved the design and development of a working model of solar spraying pump that can pump in fields during the sunny and cloudy day. During sunny day the spraying pump runs by the solar energy. During cloudy day the spraying pump runs by the energy stored in batteries. This cost efficient solar sprayer can save lot of man power and also prevents farmers from attacking diseases while spraying the harmful pesticides.

V. ACKNOWLEDGEMENT

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thanks go to Dr.P.SATISH KUMAR, Head of the department of Electronic and Communication Engineering at Ace Engineering College, for his support and time.

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