SOLAR BASED AUTOMATIC SANITIZATION OF CLASSROOM

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Abstract: The purpose of this project was to develop an automatic Sanitization of the classroom . The energy demand of the system could be covered by solar panel system. In addition of toggle switch,it operate the device by both the supply. Sanitation is one of the largest problems faced by people in our country and how we could solve problem by devices and how the system is well stabilize by using wireless implementation. The final design consisted of a Solar panel system which is connected to charge controller and the AC source is connected to SMPS power supply, Ardunio and GSM module are used to control ON/OFF operation of the device, the pump of the sanitizer sprinkles switch ON automatically by call of mobile phone and also switch OFF by another call. we can also turn ON and OFF this device by manually. The relay is use to operate the pump and the pipes and nozzle of sprinkles are arrange in ceiling of the room in such a way resulted in a system that sanitizes the complete area of the room and operates automatically through mobile .

Keywords: Solar panel system, Arduino,GSM, Pump.

I. INTRODUCTION

According to the study, this device can be mounted anywhere and it works in an automated manner. The device can be installed in any premises. The machine will spray sanitizer. this will sanitize the person's entire body, clothes, and shoes. This device can be installed at any place where there is movement of people, so that the person getting sanitized. This device has been made according to today's requirement. We are using normal sanitizer currently being used by the government. Due to this sanitization , it is possible to avoid most of the viruses that cause harm to the person. Validation of the dose, exposure time, frequency is under process. However, even after being sanitized with this device, one is required to wear masks, make social distancing and wash hands with soap at regular intervals. In today's global environment, everyone is trying to fight against the covid-19 virus. At present, the only way to defend ourselves from corona is to sanitize properly and maintain social distance.this device helps to prevent from viruses by sprinkling the sanitizer to person and entair objects of area of classroom by automatically operate .

II. OBJECTIVES

1.The device operates on both the solar system panel and regular source.
2.The charging of the battery takes place by solar panel system and device is operate by charge controller.
3.It operates automatically by GSM module which works by mobile application.Also it operates manually by ON/OFF button.
4.The device shows ON/OFF operation on LED screen.
5.The Automatic sanitization device sanitizes complete area of the reeom as it set up in ceiling of the room and reduces human efforts

III.PROJECT METHODOLOGY

The block diagram of Solar based Automatic Sanitization of classroom.The block diagram of device consist of 3 parts , power supply,automation and pump.the device has dual power supply device has dual power supply.solar supply and AC source and It controlled by relay .voltage regulator,toggle switch are connected to Arduino. The output of Arduino connected to relay drive,relay and pump.
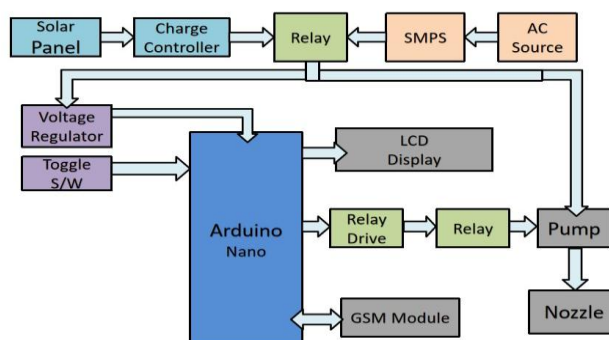
Fig 1. Block diagram of Solar based Automatic Sanitization of classroom

IV. WORKING OPERATION

The working of the module is divided into 3 major parts : The charging of the battery by the solar system panel and regulation of charge by the charge controller, Operation of module through mobile application , Operation of the pump to sprinkle the sanitizer. The panel that we are using is monocrystalline panel and the output current of solar panel is 2A. The output of solar panel is connected to the input of solar charger and the charge controller is connected to battery. The AC source is connected to the 12V SPDT. Power supply, output of the charge controller and SPDT is connected to the Toggle switch(DPDT).Here we are using 12V DC pump, 2 bridge rectifiers, two filter capacitors and 2 voltage regulators to operate GSM sim 800L module which is connected to the ARDUINO UNO R3 mode. 4,5 is connected to manual push button. 16×2 LCD display is connected to 8,9,10,11,12,13 and SPDT relay is used to switch ON/OFF the pump. After supplying power to the device, the LCD screen shows call to sim. So first call the no of GSM module and after disconnection of the call, pump will turn ON and we will get a message "pump ON successful". It is called to ON/OFF system. To switch OFF the pump, call again to the no of GSM module and after disconnection of the call, the motor will turn OFF and we will receive a message "pump OFF successful". The motor can be switched ON/OFF by manual push button and after switching ON by push button, we will get a message of "manual pump ON successful" and after switching OFF manually we will get a message of "manual pump OFF successful". The pump is operated by relay drive. The inlet of the pump is connected to the sanitizer tank and outlet of the pump is connected to the nozzle and pipe connected to it. The pipes and sprinklers are arranged in a ceiling of the classroom in such a way that it covers the complete area of the classroom. When the pump will turn ON, the nozzle of the sprinkle will sanitize the whole classroom.

V. COMPONENT RATING

Sr. No.	Components	Rating
1.	Solar panel	12v/50watt
2.	Charge controller for solar	12v/10A
3.	Relay	5v
4.	SMPS(Switch mode power supply)	12v/6A
5.	Voltage Regulator 7805	5v/2A o/p
6.	Arduino-NANO	-
7.	LED	16*2 Display
8.	GSM Module	-
9.	Bridge Rectifier and filter Capacitor	5-30 v
10.	Toggle switch -DPDT	-
11.	Pump	12v/4.5 to 5 A
12.	Capacitor	100micro F /25v-2 104microF
13.	Male to female bus strip	1 pair

VI. RESULT AND DISCUSSION

This system is operated by dual power supply system which is Solar power and AC source. In Solar system, whenever the energy gets reduced in the battery, then the battery is charged by the solar system panel. The power is controlled by charge controller. Toggle switch separates the way of using the supply either from solar panel system or by direct source using SMPS . It can operate automatically by GSM module mobile application network. When we give command to Arduino by GSM module, the relay contact will open and this will switch power ON ,then the pump will operate and drive the fluid forward to nozzle which sprinkles the sanitizer.

Observation Table

Sr.no	Switch Position	Condition of switch
1	POS 1	Supply connected from Solar Panel system
2	POS 2	Supply is OFF
3	POS 3	Supply is Connected from SPDT power system

* (Note- POS:Position Of Switch)

Sr.No	condition /command	LCD display	Message Recived
1	When device switch ON	CALL TO SIM	-
2	Call to GSM SIM number to mobile no. and disconnect it	PUMP ON SUCCESS	PUMP ON SUCCESS
3	Again Call to GSM SIM number to mobile no. and disconnect it.	PUMP OFF SUCESS	PUMP OFF SUCCESS
4	press the push Button to ON the device	PUMP ON SUCCESS	MANUAL PUMP ON SUCCESS
5	press the push Button to OFF device	PUMP OFF SUCCESS	MANUAL PUMP OFF SUCCESS

VII. CONCLUSION

The solar based automatic sanitization of classroom device shows the result after implementation and by the observation table we can conclude that this system fulfills all the objectives which are meantion above .

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