A PROJECT REPORT ON

"AUTOMATIC HAND SANITIZER USING ARDUINO & IR SENSOR FOR COVID-19"

Submitted by

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UNDERTAKING

I declare that the work presented in this project titled **"*AUTOMATIC HAND SANITIZER USING ARDUINO & IR SENSOR FOR COVID-19*"**, submitted to the All India council of robotics and Automation, for the award of the Internship in **INTERNET OF THINGS (IOT)**, is my original work. I have not plagiarized or submitted the same work for the award of any other Internship. In case this undertaking is found incorrect, I accept that my Project may be unconditionally withdrawn.

OCTOBER, 2021

B.E ELECTRICAL & ELECTRONICS

PURUSHOTTAM

PRAVEENKUMAR

MANJUNATH. S

CERTIFICATE

Certified that the work contained in the project titled **"*AUTOMATIC HAND SANITIZER USING ARDUINO & IR SENSOR FOR COVID-19***, by Purushottam, PraveenKumar & Manjunath.S, has been carried out under my supervision and that this work has not been submitted elsewhere for a Internship..

All India Council of Robotics and Automation
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PREFACE

The fundamental purpose of monitoring electronics appliances in the modern world by using IOT(Internet of Things) is to make everything in the house automatically control led using technology to control the demand perform the job that we normally do manually. Nowadays, efficient control is more and more needed to optimize performance and saves unnecessary wastage of power. The basics home appliances are light, fan and refrigerators, by controlling them unnecessary wastage of power and resources by turning on lights during day time and high speed fan while no one is around can be avoided. A system has been developed to control house hold appliances any where at anytime across the globe.Node MCU,an android operating system is used to achieve therefore mentioned automation.

This project proposes an efficient implementation forIOT (Internet of Things) used for monitoring and controlling the home appliances via Internet. Home automation uses portable devices as user interface. The Node MCU server communicates with the corresponding relay hardware circuits that control the appliances running at home. With this we provide a comfortable and effective home automation system.

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Purushottam
Praveenkumar
Manjunath.S

CONTENTS:

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CHAPTER-1

INTRODUCTION

Corona Virus disease (Covid19) is wreaking havoc in the world. Ever since WHO announced it as a Pandemic disease and many cities are under lockdown, people are not able to step out of their homes and already thousands have lost their lives. As the global Covid-19 crisis continues to unfold, washing and sanitization of hands have become an absolute necessity in daily affairs. Automatic mist based sanitizer dispensing systems is very useful resource in the fight against corona virus.

This contact less dispensing system helps to sanitize hands without getting in contact with the sanitizing surfaces and will help to reduce spread through cross contamination. This contactless dispensing unit sprays alcohol based sanitizer when both hands are placed under it.

The aerated mist based formula uses only 5- 6ml. of sanitizer ensuring optimum usage. It releases full cone spray mist for 12 seconds in single operation. Contactless technology works on Ultrasonic sensor to ensure zero touch, high operational precision to completely disinfect both hands at once. It could be wall mountable with LEDs displays to indicate on/off status and the progress of the process. The capacity tank ensures longer duration of usage thus eliminating hassle of refilling it frequently. The sanitizer container allows displaying the quantity in it.

Demand for hand sanitizers has surged as the coronavirus broke out and spread around the world [1–3]. Alcohol gel hand sanitizers are usually applied by squirting the sanitizer liquid when one presses a pump with one's hand [4].

This causes many people to come into contact with the pump handle, which increases the risk of viral transmission. Pressing the pump handle is bothersome, and many pass by without disinfecting their hands. Moreover, each person presses the pump handle differently, making it difficult to predict the amount of use and to manage refills and replacements. For this reason, the actual use of hand sanitizers is reduced, which does not help prevent spread of the virus [5].

Some hand sanitizers on the market are automatically pumped. However, because sanitizer containers and pump devices are designed to be compatible only between products produced by the same manufacturer, consumers must also repurchase the container for the liquid if they replace the hand sanitizer [6,7]. It is not economical and it has a negative impact on the environment by increasing waste emissions.

In addition, some users may think that it is a hassle to buy a hand sanitizer-containing device-compatible again, so they pour other hand sanitizers into previously used containers and reuse them. However, sanitizers that come directly into contact with the human body are classified as medicines or non-medical products, and they are safest to use in original containers [8].

In this paper, the design of an automatic hand sanitizer system compatible with various sanitizer containers is presented. The device was manufactured with polylactic acid (PLA) using a 3D printer.

CHAPTER-2

ABOUT IOT

The **Internet of things** - (**IoT**) describes physical objects (or groups of such objects) that are embedded with sensors, processing ability, software, and other technologies, and that connect and exchange data with other devices and systems over the Internet or other communications networks.[1][2][3][4]

The field has evolved due to the convergence of multiple technologies, including ubiquitous computing, commodity sensors, increasingly powerful embedded systems, and machine learning.[1] Traditional fields of embedded systems, wireless sensor networks, control systems, automation (including home and building automation), independently and collectively enable the Internet of things. In the consumer market, IoT technology is most synonymous with products pertaining to the concept of the "smart home", including devices and appliances (such as lighting fixtures, thermostats, home security systems and cameras, and other home appliances) that support one or more common ecosystems, and can be controlled via devices associated with that ecosystem, such as smartphones and smart speakers. The IoT can also be used in healthcare systems.[5]

CHAPTER-3

BLOCK DIAGRAM

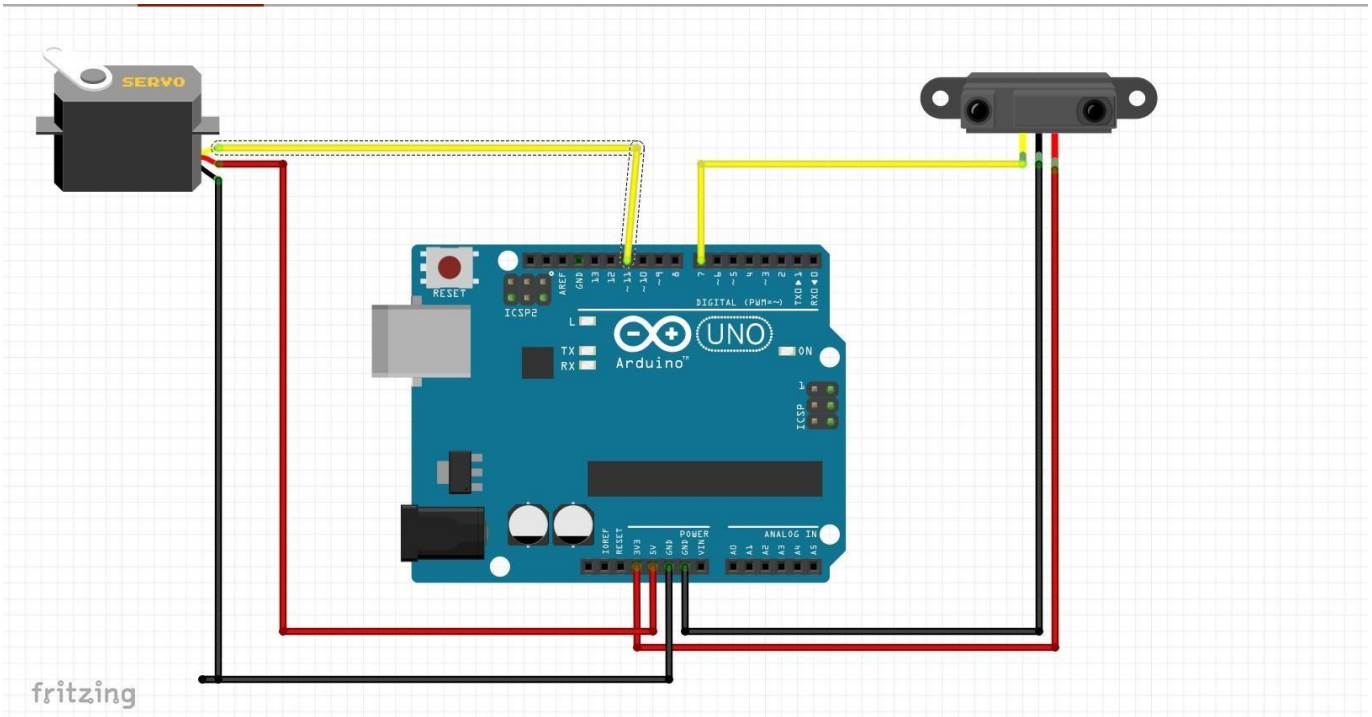

Fig 3.1 block diagram

CHAPTER-4

PROJECT DESCRIPTION

This is touchless hand sanitizer which uses IR proximity sensor to detect any motion. I have used a Arduino Uno as my microcontroller, but you can use any other microcontroller too, like Arduino Nano to build this project.

We have used servo motor to move the pump, which dispenses the sanitizer.

Connect the ground and power pin of the servo motor to the ground and 5v pin of the Arduino respectively. Then connect the signal pin(yellow wire) of the servo to the pin 11 of the Arduino.

Now for the IR proximity sensor, similarly connect the ground and power pin to the ground and 3.3v pin of the Arduino respectively. then connect the signal pin (yellow/orange wire) to the pin 7 of the Arduino.

Now connect the Arduino Uno to a computer, using the Arduino IDE upload the given code.

You can power the Arduino Uno using a 9v battery, connect the positive terminal of the battery to Vin pin and negative terminal of the battery to GND.

CHAPTER-5
HARDWARE REQUIREMENTS

1. **IR SENSOR**
2. **ARDUINO UNO**
3. **12V ADAPTOR**
4. **TIP 41C**
5. **SANITIZER PUMP**

1. IR SENSOR

An infrared sensor (IR sensor) is **a radiation-sensitive optoelectronic component with a spectral sensitivity in the infrared wavelength range 780 nm** … 50 µm. IR sensors are now widely used in motion detectors, which are used in building services to switch on lamps or in alarm systems to detect unwelcome guests.

Fig 5.1 IR sensor

2. ARDUINO UNO

The **Arduino Uno** is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc.[2][3] The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits.[1] The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable.[4] It can be powered by the USB cable or by an external 9-volt battery, though it accepts voltages between 7 and 20 volts. It is similar to the Arduino Nano and Leonardo.[5][6] The hardware reference design is distributed under a Creative Commons Attribution Share-Alike 2.5 license and is available on the Arduino website. Layout and production files for some versions of the hardware are also available.

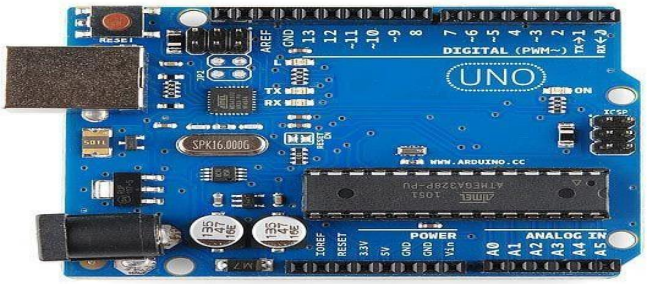

Fig 5.2 Arduino UNO

3. 12V ADAPTOR

An **adapter** or **adaptor** is a device that converts attributes of one electrical device or system to those of an otherwise incompatible device or system. Some modify power or signal attributes, while others merely adapt the physical form of one connector to another.

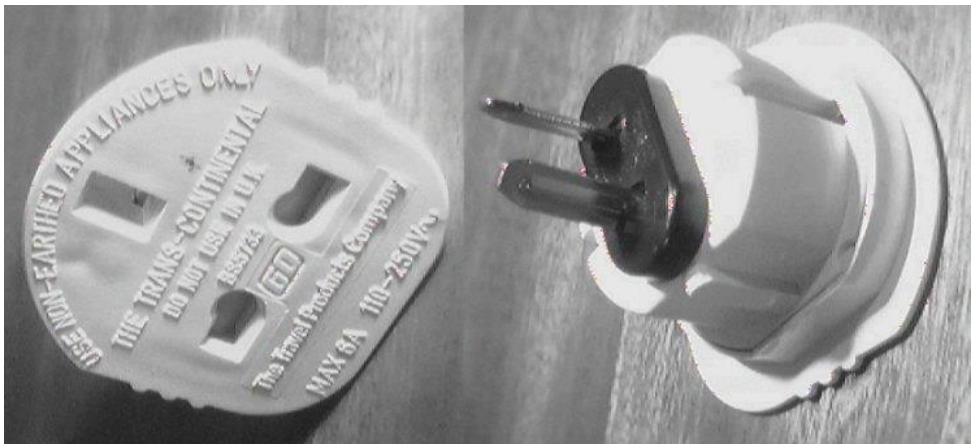

Fig 5.3 12V Adaptor

4.TIP 41C

TIP41 transistor is used in Medium Power Linear Switching. TIP41 is Complement to 42A/42B/42C.

Fig 5.4 TIP 41C

5.SANITIZER PUMP

Fig 5.5 Sanitizer Pump

CHAPTER-6

SOURCE CODE

```
 #define IRsensor 2
#define DCwater_pump 8
 void setup()
{
pinMode(IRsensor, INPUT);
 pinMode(DCwater_pump, OUTPUT);
 Serial.begin(9600);
}
 int readPin = 0;
 void loop()
 {
 readPin = digitalRead(IRsensor);
 if (readPin == HIGH)
 {
 digitalWrite(DCwater_pump,HIGH);
 Serial.println("DC Pump is ON Now!!");
 delay(500);
 }
 Else
 {
 digitalWrite(DCwater_pump,LOW);
Serial.println("DC Pump is OFF Now!!");
delay(500);
 }
 }
```

CHAPTER-7

OUTPUT

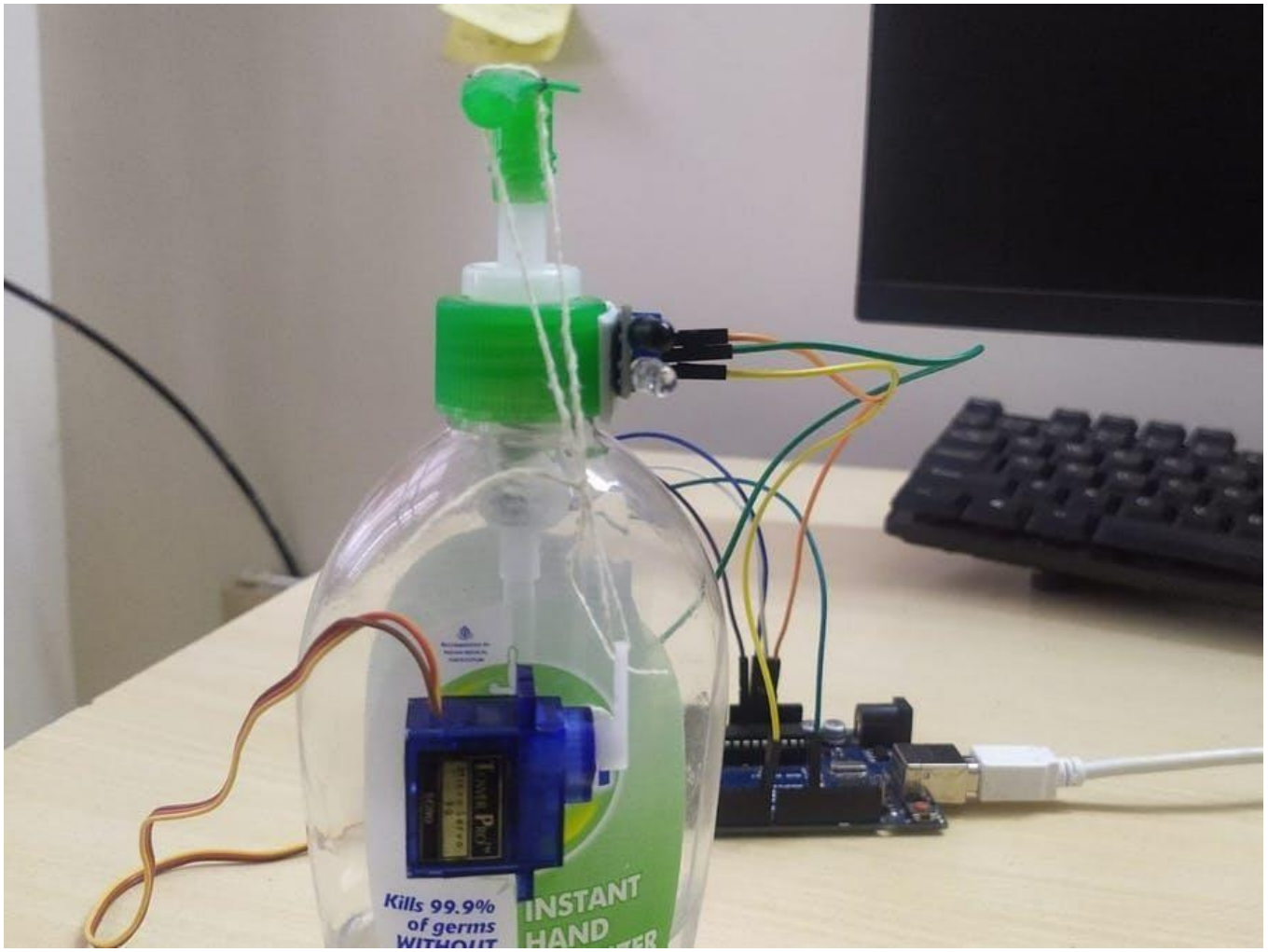

Fig 7.1 OUTPUT/WORKING MODEL

CHAPTER-8

CONCLUSION

Hand sanitizers usually operate by squirting sanitizer liquid when one presses a pump with one's hand. Some hand sanitizers on the market are automatically pumped. However, sanitizer containers and pump devices are designed to be compatible only between products produced by the same manufacturer.

To address this problem, we have designed an automatic hand sanitizer system that is compatible with various containers. With the proposed device, it is possible to avoid many people coming into contact with the pump handle, thus preventing fomite viral transmission and making the use of hand sanitizer much more convenient. Moreover, the system squirts a certain amount of hand sanitizer at all times, making it easy to manage refills and replacement. Furthermore, it can operate compatibly with various designs of sanitizer containers, so consumers do not need repurchase a container for the liquid if they replace the hand sanitizer. Thus, it is economical and eco-friendly by decreasing waste emissions. The automatic hand sanitizer device proposed by this paper is ultimately expected to contribute to contactless hand disinfection in public places and virus infection prevention.

CHAPTER-9

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