Front Line Protection against Covid-19

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Abstract - *India has registered more than 5 million cases during this global pandemic. Out of which many are recovered but this problem is not is control. Every day we have seen a rapid increment in the corona virus case. Till date no medication or vaccine is available to cope with the COVID-19 infection and infection rate is increasing drastically across the globe. Only preventive measures and healthy life style with efficient immune system have been suggested by WHO to fight and stay safe from COVID-19. WHO recommended alcohol-based hand sanitizers for frequent hand hygiene. These preparations may become toxic to human health and environment. Particularly in situations like pandemic outbreak, it is crucial to interrupt the transmission chain of the virus by the practice of proper hand sanitization. It can be achieved with contact isolation and strict infection control tool like maintaining good hand hygiene in hospital settings and in public. The success of the hand sanitization solely depends on the use of effective hand sanitization. Further this article highlights the efficiency of alcohol-based hand sanitizers.*

***Key Words:** (Hand sanitizers, COVID-19, hand disinfectant, Infection control.)*

1. INTRODUCTION

During the end of 2019 and the beginning of 2020, multiple human cases of novel coronavirus infection were reported in relation to the Huanan Seafood Wholesale Market in Wuhan, China. At 9 O'clock, 7 January 2020, the Virus was identified as noval corona virus. According to the WHO, an ABHR is "an alcohol-containing preparation (liquid, gel or foam) designed for application to the hands to inactivate microorganisms and/or temporarily suppress their growth. International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), an autonomous R&D Centre of Department of Science and Technology (DST), Govt. of India and University of Hyderabad (UOH) together with the help of MEKINS Industries Ltd. (MIL), have developed a UVC based disinfection trolley to fight against COVID-19 by rapid cleaning of hospital environment. UV light in the range of wavelengths between 200 and 300 nm is capable of inactivating microorganisms, such as bacteria and viruses, thus disinfecting both air and solid surfaces. Temperature measurement is extremely important to COVID-19 detection and has already been widely used by numerous countries as an immediate test to determine if travelers or citizens may be infected with COVID-19.

2. DESCRIPTION

The project is regarding the protection against COVID-19 as cleared from the title of project "Front line protection against Covid-19". The project is divided into three crucial steps, that are as follows: 1. Touchless sanitizer dispenser 2. UV protection 3. Temperature detection. In touchless sanitizer dispenser, a 5V DC Pump is used and a proximity sensor is used to operate it. It is fully touchless device. In UV protection, the daily use articles are applied to the radiation to kill the bacteria or virus. At last the temperature detector which is used to display the temperature of a person by using a thermal sensor in it.

3. HARDWARE DETAILS

3.1 ARDUINO BOARD

Fig- 5V DC PUMP

Arduino is an open-source electronics platform based on easy-to-use hardware and software Arduino Board are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino board programming (based on Wiring), and The Arduino Programming, based on Processing. Here we are using two board first one for the touchless temperature detection and second one for fully Automatic UV Disinfection.

3.2 DC 5V PUMP

Fig- 5V DC PUMP

This is 5V DC Pump which is used to pull out the Alcohol based sanitization from the sanitization tank.

The switching of Pump that is turn off or turn on depends on the input of TIP 32 NPN Transistor.

3.3 INFRARED SENSOR

Fig- IR SENSOR

IR Sensor detects the presence of an object by emitting a beam of **Infrared Light.** Here two IR sensors are used first one for touchless Sanitization and second one for touchless UV Disinfection.
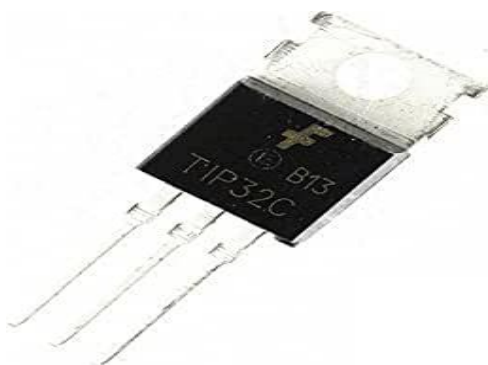
3.4 TIP 32 NPN TRANSISTOR

Fig- TIP 32 NPN TRANSISTOR

TIP 32 NPN Transistor has high collector current of about 2A, this transistor can be used for Power switching or large signal amplification. This Transistor used to switch DC pump into ON condition when IR Sensor gives signals to the TIP 32 NPN Transistor.
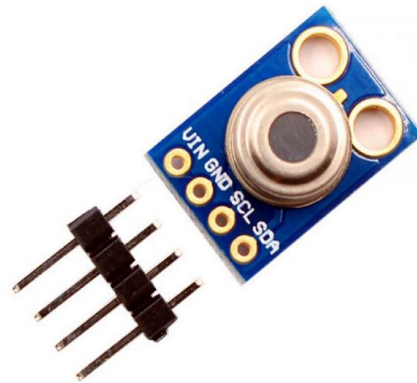
3.5 MLX 90614 TEMPERATURE SENSOR

Fig- MLX 90614 TEMPERATURE SENSOR

The MLX90614 is a Contactless IR digital Temperature sensor that can be used to measure the temperature of a particular object ranging from -70° C to 382.2°C. The sensor uses IR rays to measure the temperature of the object without any physical contact. This Sensor used in our contact less temperature detection mechanism.

3.6 OLED 128*32 SSD1306 DISPLAY

Fig- OLED 128*32 SSD 1306 DISPLAY

SSD 1306 is used to display the temperature which is coming from the MLX 90614 IR Sensor.

SSD 1306 directly connected to our Arduino Board which is used to collect the signal from MLX 90614 and send it to the SSD 1306.

3.7 SERVO MOTOR

Fig- SERVO MOTOR

A Servo motor is a rotary actuator or linear actuator that allows for precise control of angular or linear position, velocity and acceleration. Here Servo motor is used to control the gate of UV Disinfection that is Opening or Closing.

3.8 UV LIGHT

Fig- OLED 128*32 SSD 1306 DISPLAY

UV lights with the wavelength of 264nm is used as to disinfect the object such as wallets, masks etc.

But to use this light we have to avoid direct contact of light with human body so because of that we used automation.

3.9 5V RELAY MODULE

Fig- 5V RELAY MODULE

5V Relay Module is a relay interface board, it can be controlled directly by a wide range of microcontroller such as Arduino, AVR, PIC etc. Here 5 V Relay is used switch on or off the UV light.

4. SOFTWARE DETAILS

4.1 ARDUINO IDE

Arduino software IDE consists a text editor for writing code, a message area, a text console, a toolbar with buttons foe common functions and a series of menus. It connects to the Arduino board and Genuino hardware to upload programs and communicate with them.

4.2 PROTEUS

Proteus is a simulation and design software tool developed by Lab center Electronics for Electrical. and Electronic circuit design. It also possess 2D CAD drawing feature. We have used this software for the simulation of our all three mechanism.
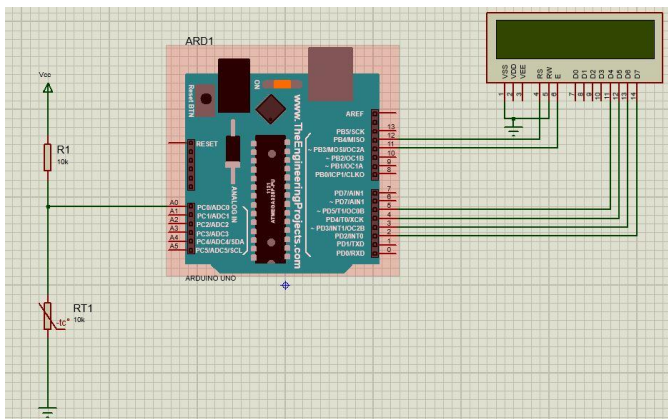
4.2.1 TOUCHLESS SENITIZATION
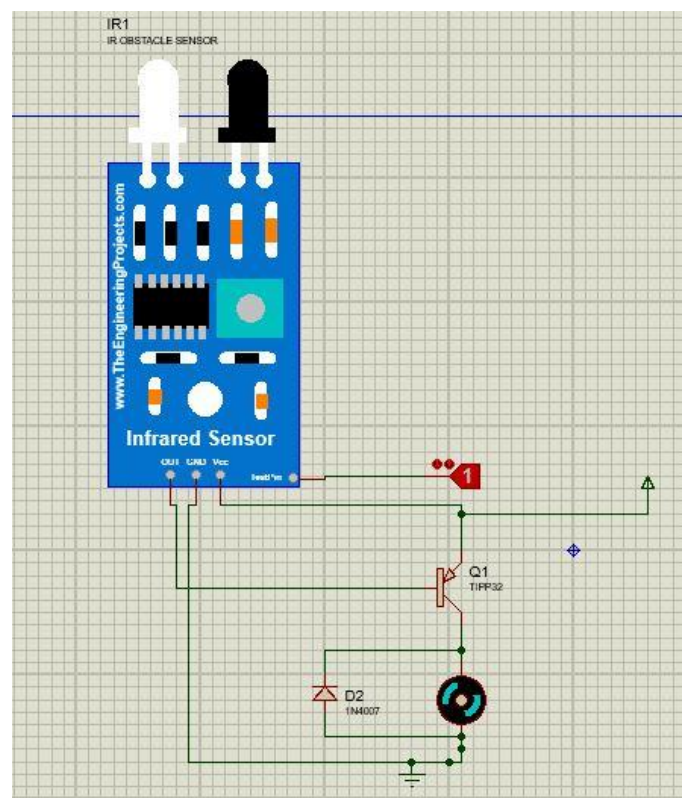
CIRCUIT SHOWS THE SIMULATION OF TOUCHLESS SENITIZATION

4.2.2 AUTOMATIC UV LIGHT DISINFECTION
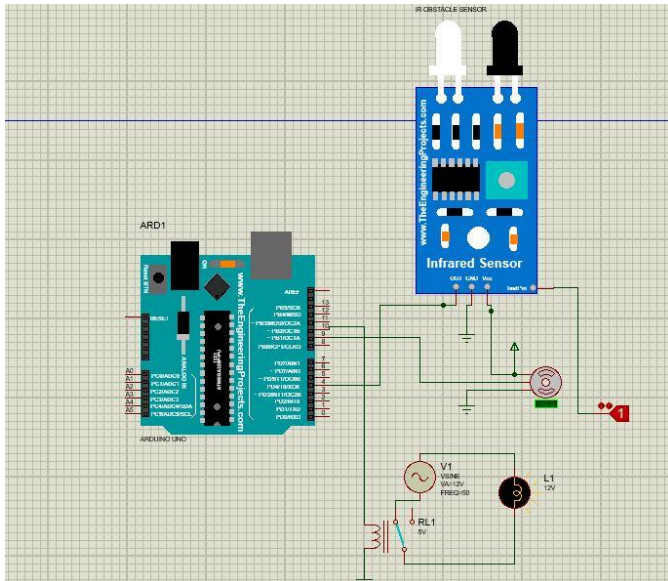
CIRCUIT SHOWS THE SIMULATION OF AUTOMATIC UV LIGHT DISINFECTION

4.2.3 CONTACTLESS TEMPERATURE DETECTION

CIRCUIT SHOWS THE SIMULATION OF CONTACTLESS TEMPEARTURE MEASUREMENT

5. CONCLUSIONS

This project "Front line protection against Covid-19" is a step towards the safety from COVID-19. The project is beneficial for the household as well as the commercial use. It is the first step towards the betterment of humankind. The project provides the three-way benefits such as Automatic sanitizer dispenser, UV protection, Temperature detector. This project is epitome for the use of technologies for the betterment of society.

6. ACKNOWLEDGEMENT

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