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SOLAR BASED SMART COVID PROTECTION SYSTEM

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Abstract:- The design shown shows the precautions that can be taken around the world during the COVID 19 pandemic. Disinfectants have become one of the most important products these days. Strong disinfection is required to survive the new WHO rules and regulations. The design provided a solution to the problem mentioned. This design introduces an automatic hand disinfection and temperature detection system that allows you to disinfect your hands at any time without touching the disinfectant. The temperature sensor shows the temperature of the person when touched.

Keywords:- *Automatic hand sanitizer, Arduino, ultrasonic sensor, PIR sensors, TMP36, covid-19.*

I. INTRODUCTION

Since December 2019, the world has been in tremendous tension and its numbers are increasing day by day, and to date, vaccines against pandemic pathogens have not been fully proven. Yes, it's COVID 19, it wasn't known to the race before it happened in Wuhan, China. When coming from a large family, continuous mutations occur, prohibiting researchers, microbiologists, and pharmacists from drawing conclusions about vaccines.

Impact on the most prestigious countries in the chain. China, Italy, Spain, USA, India, Russia [1] virus proves its strength and usefulness against technologically enhanced races. A race of Homo sapiens.

Actions taken around the world mitigated the impact to some extent, but did not eliminate it. The blockade has weakened many countries economically and has proved inadequate testing of various drugs. Livelihoods and livelihoods are the most prevalent issues today. The weak parts of society are faced with the difficulties posed by the fierce cross-country blockade. Faced with the image of India, one of the most promising tech countries, workers are rushing for small grains. A hungry face reveals pain.

Industry is losing money, workers are losing jobs, and the country's economic growth is lagging, but regular temperature monitoring and regular hand disinfection can prevent the spread of the pandemic to the masses. it is clear.

Given the global situation, disinfectants should be installed in all areas of the industry, corporate offices, educational institutions, shopping malls and more.

In this study, a prototype of an automatic hand sanitizer with temperature detection was created.

II. OBJECTIVES

With the above in mind, it is designed for easy hardware installation anywhere in the world.

The design contains several parameters that need to be calculated and considered as a priority issue, such as:

- Installation of temperature sensor.
- Installation of LCD to display the recorded temperature.
- Installation of ultrasonic and PIR sensors.
- Installation of spray pump / submersible pump.
- Synchronize all sensors with the Arduino UNOR3 microcontroller.

Circuit connections must be made carefully to avoid making any mistakes while operating the device.

Appropriate safety measures are taken to overcome all types of failures, taking into account overvoltages, short circuits, overcurrents and more.

III. COMPONENTS

➢ *Arduino UNOR3–*

This is an open source microcontroller-based computing platform used to facilitate programming and synchronization of various analog and digital sensors, and can also send and receive data over the Internet. increase. It is built with an 8-bit Atmel AVR or a 32-bit Atmel ARM microcontroller. It provides a convenient design platform for enthusiasts, students and professional designers [2]. Figure 1 shows the pinout of ARDUINO UNOR3.

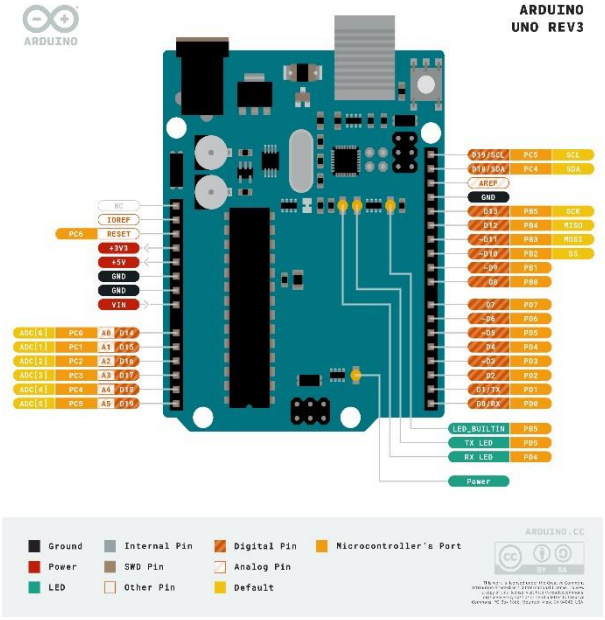

Fig 1:- Pinout of ARDUINO UNO R3

➢ *Ultrasonic rangefinder (PING SEN136B5B) –*

The sensor range is 3 cm to 400 cm. The sensor emits ultrasonic waves, receives an echo when it bounces off an obstacle after a period of time, and calculates the distance of the object accordingly. [4] The sensor sends an ultrasound and captures the echo with the same pin SIG. Figure 2 shows an ultrasonic rangefinder (PING SEN136B5B).

Fig 2:- Ultrasonic Range Finder (PING SEN136B5B).

➢ *DC Motor / Spray Submersible Pump–*

After the sensor emits the required signal, use the motor / pump to spray the disinfectant on your hand. It works at 3V. Figure 3 shows a submersible spray pump.

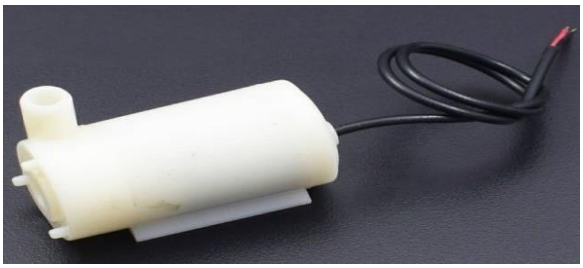

Fig 3:- Submersible spray pump.

➢ *LCD 16 × 2 –*

A liquid crystal display module that produces a visible display. 16 columns and 2 rows. Each character is

displayed in a 5x7 pixel matrix. A 250K ohm potentiometer is used to maintain the contrast of the display. A 220 ohm resistor is attached to the anode terminal. [Five]. Figure 4 shows a 16x2 LCD.

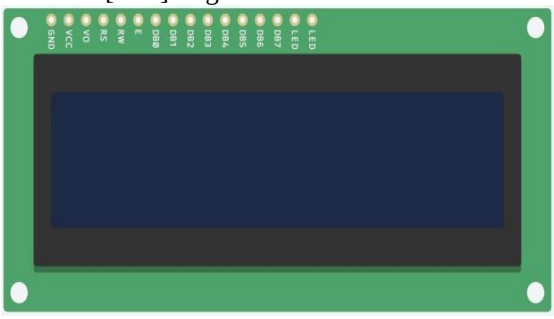

Fig 4:- LCD 16 × 2.

➢ *Temperature Sensor [TMP36] –*

Since the voltage of the diode changes constantly as the temperature changes, the sensor operates according to the characteristics of the diode. The analog input represents 0 as no voltage and 1023 as 5 V. According to the data sheet, the sensor provides an output of 0 to 1.75 V in the range of 175 ° C (50 ° C 125 ° C) every 0.01 V. = 1 □ represents. [6]. Figure 5 shows the TMP36.

Pin 1 – input voltage , Pin 2 – signal out , Pin 3 – ground.

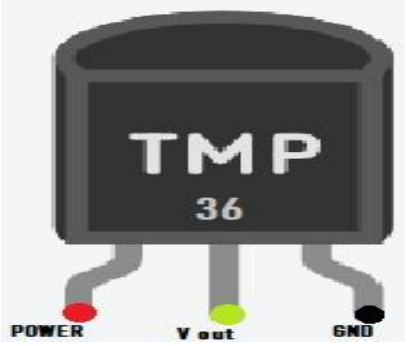

Fig 5:- Temperature Sensor [TMP 36].

➢ *LED RGB –*

This LED combines red, green and blue lights to produce 16 million tones of light. But while working on an Arduino, it's difficult to get the most out of it. Unlike

ordinary LEDs, it has four terminals: blue, green, cathode, and red. Figure 6 shows an RGB LED.

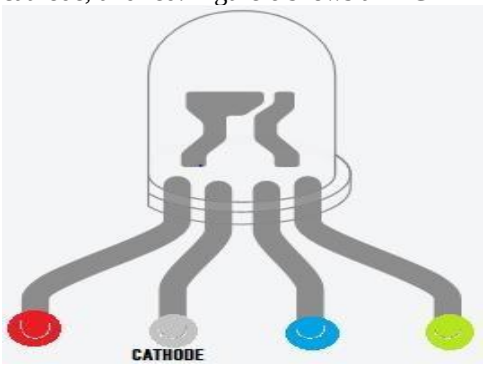

Fig 6:- RGB LED.

➢ *PIR Sensor –*

Passive infrared sensors are used to detect movement and detect almost human movement. The sensor consists of a pyroelectric sensor that detects infrared signals because all living organisms emit a certain amount of radiation. The sensor divides the sensed signal in half, they are wired to cancel each other out, and when some sense the signal more or less, the output swings high or low. [7]. Figure 7 shows the PIR sensor.

Fig 7:- PIR Sensor.

➢ *Piezo Buzzer –*

It makes a sound when synchronized with other sensors, or makes a sound for a specific purpose. Figure 8 shows the Piezo buzzer.

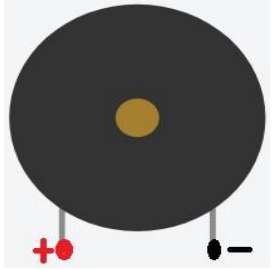

Fig 8:- Piezo Buzzer.

➢ *Bread Board –*

It is a construction base for making prototypes of various electronic circuits. A solder-free base that facilitates circuit modification. Figure 9 shows a breadboard.

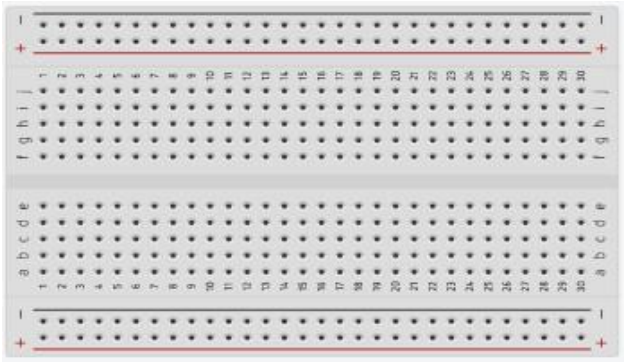

Fig 9:- Bread Board.

IV. METHODOLOGY

When you turn on your device, the sensors connected to

your Arduino will be activated. There are two systems running at the same time. The first is automatic disinfection and the second is contact-based temperature measurement.

The ultrasonic sensor and PIR sensor are connected to the Arduino and detect human / object distance and movement respectively.

The range of the PIR sensor is about 5m to 12m, and when detected within the specified range, the disinfectant is activated, the spray pump 1 with a fan is activated to disinfect the surroundings, and the disinfectant reaches the surroundings. will do so. .. Ultrasonic sensors, on the other hand, are specified within a range of less than 30 cm, with the spray pump 2 being activated, especially by hand near the device (<30 cm), and the disinfectant reaching through a small tube.

Disinfection takes place at the same time as sensor activation, thereby disinfecting each area and keeping it free of viruses, bacteria and other infectious substances.

The temperature sensor detects body temperature as soon as a person touches it and displays the temperature on the LCD display with □F (because it is programmed to convert □C to □F). If the measured temperature exceeds normal body temperature (98.6□F), the buzzer will warn and the connected RGB LED will turn red. The buzzer turns off when the sensor reading is 98.6 □ F or less. The RGB LED is green. Representation of symbols for safety and security.
Figure 10 shows a device model prototype

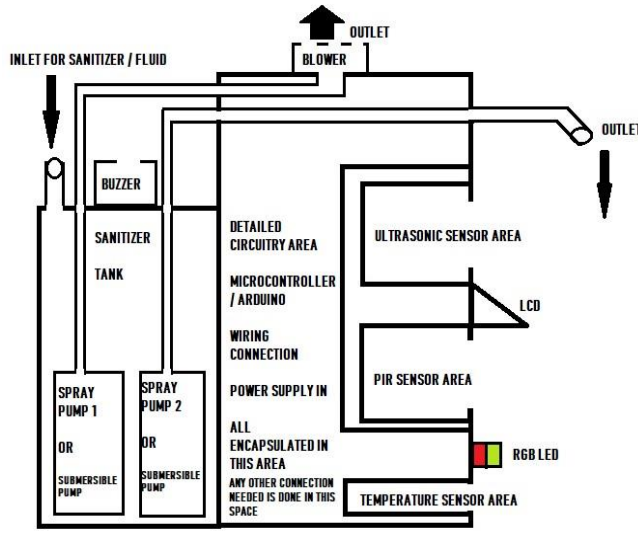

Fig 10:- Device model prototype.

The circuit is designed with TINKER CAD software and can be connected to the relays needed to drive the motor / pump. It is a connected circuit that is programmed, simulated, and working. Detailed scheme of working scheme. If the circuit is shown in Figure 11 below, power supply should not be the main concern.

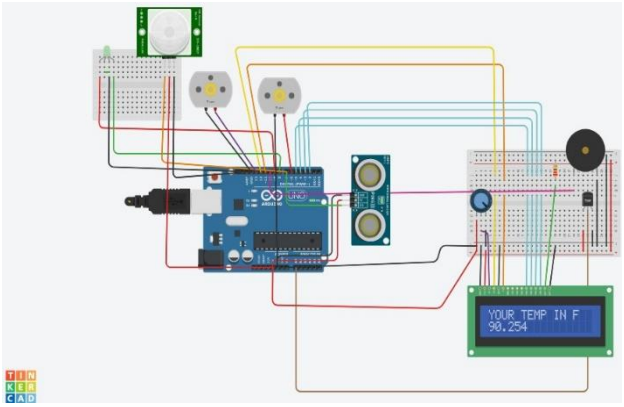

Fig 11:- Schematic of the working model.

V. RESULT AND DISCUSSION

By simulating the circuit in different instances, you can see the behavior of the two motors as the speed of the motors changes as the sensor readings change. If you check the LED and buzzer signal during the temperature measurement, you will see that the LED color changes and the buzzer is emitting a radiant signal / tone.

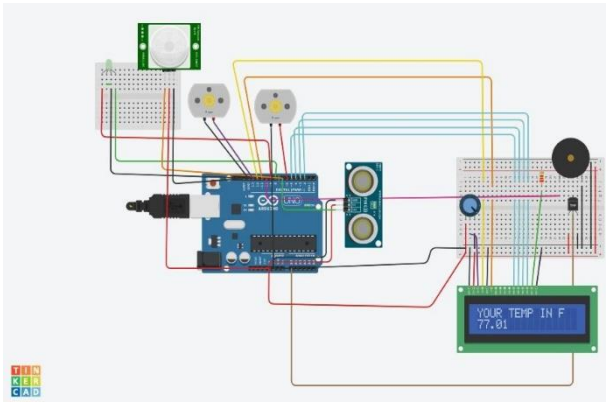

Fig 12:- Shows the led is green and buzzer is off as temperature is 77.01 □ F(< 98.6□ F).

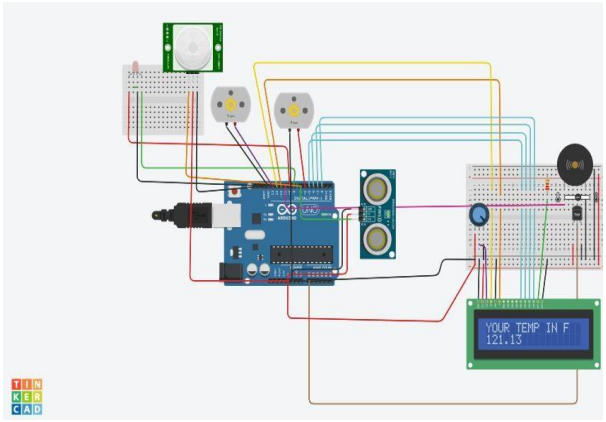

Fig 13:- Shows the led turns red and buzzer produces wave signal/tone as temperature changes to 121.13 □ F(> 98.6□ F).

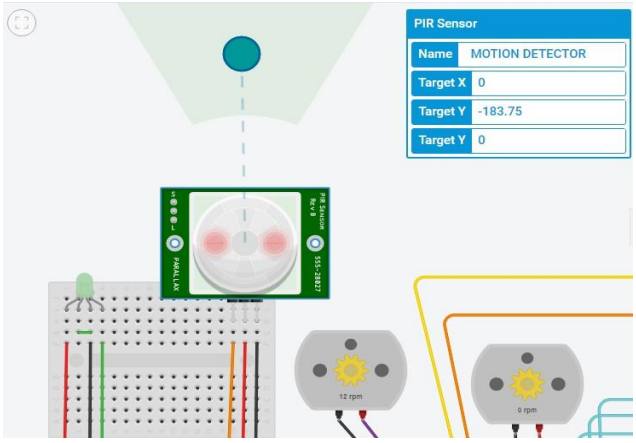

Fig 14:- Shows that spray pump/motor 1 runs with certain rpm as the PIR sensor gets activated.

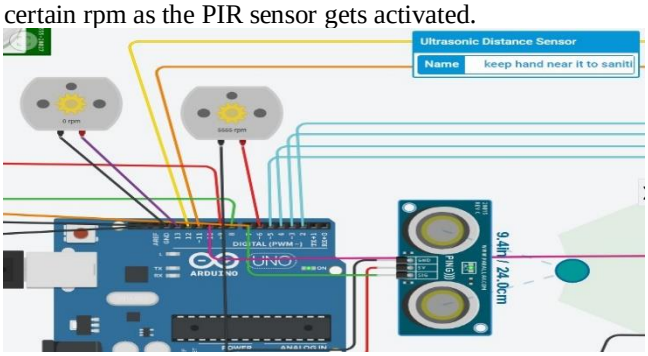

Fig 15:- Shows that spray pump/motor 2 runs with certain rpm as the Ultrasonic sensor gets activated.

VI. CONCLUSION AND FUTURE SCOPE

As mentioned earlier, device circuits are created in software and simulated accordingly. When prototyping hardware, power distribution to each module can be an obstacle. To solve the problem, you need to install a relay that drives the spray / submersible pump so that the sensors, LCD, and other small modules can get enough power. Built-in 5-Arduino microcontroller V and 3.3V pins. It can be created in any home at a very low cost and can be installed anywhere in offices, educational institutions, public transportation, ordinary stores, etc.

It also contains all emergency numbers such as women's emergency numbers, ambulance number emergency numbers, emergency numbers and more. The number of police.

In conclusion, in the war against the invisible enemy, the device is a weapon to survive in this pandemic situation.

VII. REFERENCES

[1]. February 24-21, Public Health Response to Pandemic COVID 19 Outbreak and Epidemic in the United States. April 2020 Weekly / May 8, 2020/69 (18); 551–556 May 1, 2020, this report was posted online as an early release of MMWR. Early Release.Anne Schuchat, MD; CDC COVID-19 Compatible Team. (https://www.cdc.gov/mmwr/volumes/69/wr/mm6918 e2.htm)

[2]. ARDUINO operating principles and use as a tool for research and research LeoLouis International Journal of Control, Automation, Communication and Systems (IJCACS), Volume 1, No. 2, April 2016

[3]. https://store.arduino.cc/usa/arduino-uno-rev3

[4]. https://www.arduino.cc/en/Tutorial/ping

[5].https://www.electronicsforu.com/resources/learnelectronics/16x2-lcd-pinout-diagram

[6].https://www.bc-robotics.com/tutorials/using-a-tmp36- temperature-sensor-with-arduino/

[7].https://learn.adafruit.com/pir-passive-infraredproximity-motion-sensor