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Automatic Hand Dispenser & Temperature Scanner For Covid-19 Prevention

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Abstract - The automatic hand dispenser and temperature scanner design provides the preventive measure taken, during the COVID-19 pandemic. Sanitizers have become the most important commodities in the entire world. By the new rules and regulations delivered by "World Health Organization" states that sanitization is needed to encounter the new normal. In a contactless sanitising machine, the design incorporates an automatic hand sanitizer with a temperature detecting system to keep hands sanitised anytime a person desires. The temperature sensor senses gives the body temperature of the person. The system is deliberate to help prevent the spread of covid-19 infection and in improving community health. The system ensures precise progression of sanitizer essentially fluid up to 5 sec. Additionally, the system design is simple to establish, easy to use and, exact motion of the hand is identified. Considering, the worldwide situation, sanitization should be installed in industries, corporate office, educational institution and educational institution. This automatic hand sanitizer with temperature sensing scanner will definitely be a promising tool to ensure contactless application.

Keywords - covid-19, ultrasonic-sensor, contactless,automatic, temperature sensor.

I. INTRODUCTION

This project is to provide the design and implementation of a contactless temperature scanner and sanitizer dispenser system is presented. The system is implementation to prevent the spread of covid-19 virus and assist in improving society health and reduce the rate of risk. Affecting the most prestigious countries in a chain like China , Italy ,Spain , USA , India , Russia, the virus has proved it's strength and subservient a technologically enhanced race. Alcohol based hand-sanitizers can inactivate the virus[1]. A global pandemic was triggered by the spread of the life-threatening Severe Acute Respiratory Syndrome Corona Virus (SARS-COVID-19). Alcohol based

hand sanitizer is mandatory to protect ourself from covid- 19[3]. As there is an impact in the existing foot pressed sanitization system which can spread of the virus from one person to another[2]. The system is also made to be readily available and at a cheaper cost so that everyone can be afford. To truly attract finishing up line to extend, it can in every practical sense be really said that exceptionally Human actually have a creative psyche that can without much of a stretch basically eliminate the dread And can Change any circumstance effectively, exhibiting how this gadget truly is produced using reusing kind of material and doesn't, influence on Environment, genuinely as opposed to main stream thinking.

II. LITERATURE REVIEW

In[1], the paper says about the spread of corona virus and its causes. They employ a proximity sensor to detect the presence of adjacent objects, but the primary disadvantage is that it might be accidentally activated, causing problems, and it only recognizes metallic targets. They are primarily concerned with hospital-acquired infections, which impact around 2 million people each year and are the eighth leading cause of death in the United States.

In[2], they mainly use hand sanitizers with 60% to 70% of ethanol for decreasing the total number of significant pathogens. Using hand-sanitizers over 10-months can reduce the overall spread by 36%. Here the author explains the importance of hand washing but washing our hands with regular soap and water is time consuming in hospitals.

In[3], A Novel Automatic Sanitizer Dispenser [2020] The microcontroller used in this paper is Arduino nano which is smaller when compared to Arduino uno. This the main drawback of the system and also there is no external power supply source. The entire time taken for the whole procedure is approximately 4 seconds.

In[4], They'll be employing an Arduino Uno and an ultrasonic sensor, but they'll be able to increase the system's overall performance while lowering its cost. The author compared the differences between normal soaps and alcohol-based hand sanitizers. When there is presence of the hand within therequired range, the sound waves from the sensor are sent to the micro-controller which in turn triggers a relay board to activate the motor which causes the pumping of the sanitizer.

In[5], The authors conducted study to see if traditional hand pump sanitizer dispensers could be contaminated. They did this by growing bacteria in various areas of sanitizer dispensers and watching how it grew when people used them. They discovered that all hand sanitizer dispensers have a high level of collocation on the lever, which is in direct contact

with the user's hand. They came to the conclusion that hand sanitizer dispensers can become contaminated with diseases and hence pose a threat to humans. It is clear how important itis to use touchless automatic sanitizer dispensers.

III. METHODOLOGY

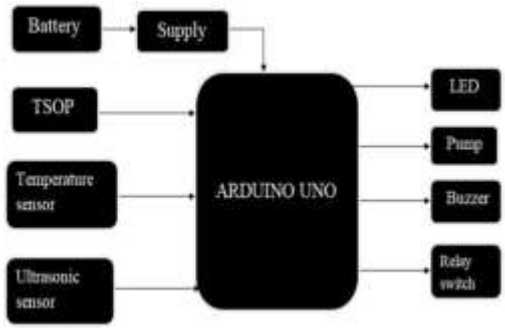

Figure 1. Block diagram of the proposed system Figure 1.

shows the implementation of the system. The system's main goal is to provide a contactless sanitising machine as well as a temperature scanner. This system differs from other systems in that it includes a temperature sensor. The design includes a few parameters that must be estimated and prioritised, such as:

- Temperature sensor installation.
- Installing an LCD to show the temperature that has been sensed.
- Ultrasonic and PIR sensors will be installed.
- Installing submersible and spray pumps.
- Using the Arduino uno R3 microcontroller to synchronise allof the sensors.

(a) **Temperature sensor** – LM35 sensor is used to measure the body temperature of the person. The body temperature is between -55°C to 150°C. It has been chosen for its cheaper cost and availability.

Figure 2. Temperature sensor

Figure 3. Circuit Diagram of Temperature Sensor

(b) **Ultrasonic sensor** – It is used to measure the distance to a wide range of objects. In our proposed system , it is used to check the presence of hands below the nozzle of the sanitizer machine and intimate the arduino to turn on the pump within the calculated distance.

Figure 4. Ultrasonic Sensor

(c) **LED** – Light Emitting Diode is a semiconductor based light source that emits light whenever current flows throughit.

Figure 5. LED

(d) **Buzzer** – Basically, it is a signaling device which creates a beep sound whenever voltage is applied across the two electrodes.

Figure 6. Buzzer

(e) **TSOP** - The TSOP sensor has the ability to read the output signals. TSOP-1738 is an IR Receiver Sensor, which can be used to receive IR signals of 38Khz.

Figure 7. TSOP

(f) **Relay switches -** switches that open and close circuits electromechanically or electronically. It control one electrical circuit by opening and closing contacts in another circuit.

(f)ARDUINO UNO - Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs the inputs here.

Figure 8. Ardiuno Module

(g)DC Motor - DC motors can be used in a various applications. They also function well in applications like dynamic braking and reversing, which are ubiquitous in industrial operations.

(h) Pump- is a device that moves fluids (liquids or gases) which is here used to move the hand sanitizer liquid.

Figure 9. Submersible spray pump

(i) LCD – Liquid Crystal Display is used to display the temperature observed. A 16x2 LCD display is very basic module and is very commonly used in different devices.

Figure 10. Liquid Crystal Display

Figure 11. shows the process flow of the proposed system. When we switch on the device , the sensors attached to the Arduino gets activated. We have two systems that work in tandem with one another. The automated sanitizer comes first, followed by the contacting temperature sensing. The Arduino is coupled to an ultrasonic sensor, which is used todetect human/object range and motion.

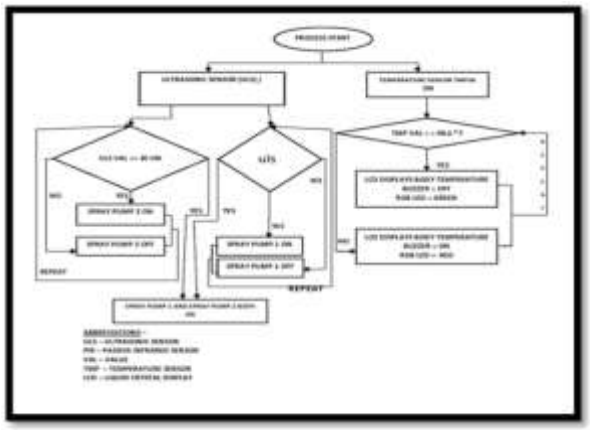

Figure 11. Process flow diagram

The ultrasonic sensor has a range of less than 30cm, so any movement, particularly a hand near(30cm), will trigger the spray pump 2, and the sanitizer will reach the hand through a short pipe.

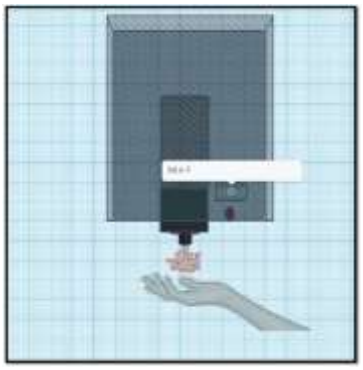

Figure 12.3D view of the system

Sanitization occurs simultaneously with sensor activation, ensuring that the area is clean and devoid of viruses, germs, and other infectious organisms. The temperature sensor detects the person's body temperature as soon as it is touched, and the temperature is displayed in degrees Fahrenheit (°F) on the LCD display (since it is set to convert °C to °F). The buzzer starts alarming if the temperature sensed is higher than normal body temperature (98.6 ° F), if the temperature sensed is equal to or lower than normal body temperature (98.6 ° F), the buzzer turns off, displaying a sign of safety.

IV. RESULTS AND DISCUSSION

Simulating the circuit at different instance we can see the working of motor as there is a change of rpm in the motors while changing the sensor values . Checking for the led and buzzer signal while sensing temperature there is a radiating wave signal/tone through the buzzer.

Sensors monitor temperature and object motion in this automatic hand sanitizer bottle. The micro-controller is attached to the sensor, which is programmed as an automatic water control. An ultrasonic sensor is used in this system. If the water level is 35 cm away from the ultrasonic sensor, it will detect it. The ultrasonic sensor's data will be sent to Arduino. The proposed automated hand sanitizing system that works with various sensors and with a hand sanitizer bottle which is pumped once when one moves their hand close to the ultrasonic sensor.

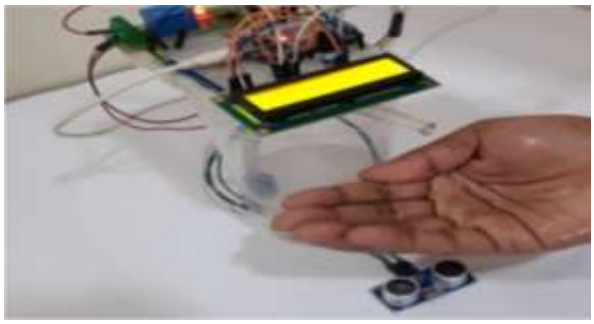

Figure 13. Hardware setup

The output from the temperature sensor in the LCD is tabulated below in degree Fahrenheit (Table No. 1) and also indegree Celsius (Table no. 2)

Body Temperature	Status
Less than 36°C	LOW
38°C and above	HIGH

Table 1. Temperature sensor output (°C)

Test	Observed Value	Result
Person 1	Above 98.6°F	Abnormal (Buzzer rings)
Person 2	Below 98.6°F	Normal
Person 3	98.6°F	Normal

Table 2. Temperature sensor output (°F)

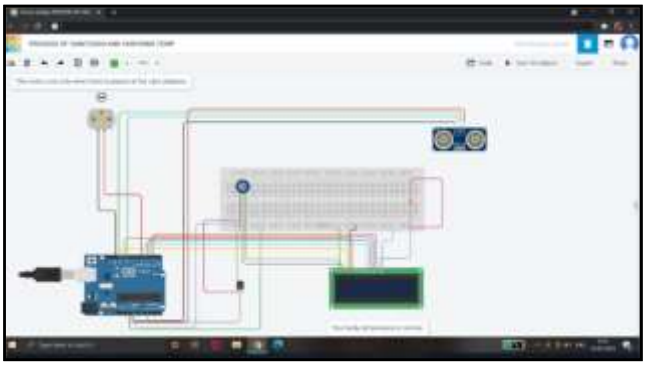

Figure 14. Circuit connections

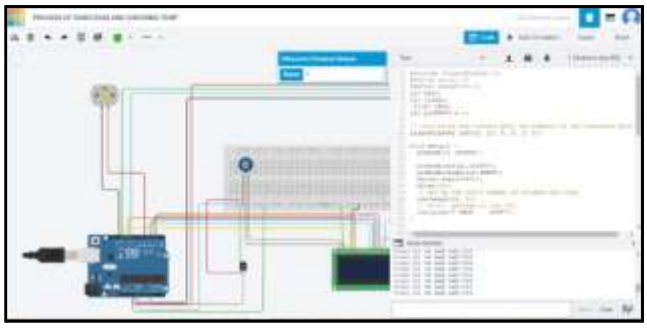

Figure 15. Schematic of the working model with code

V. CONCLUSION

As stated earlier the device circuit is made in a software and simulated accordingly. While prototyping the hardware, power distribution to each module can be a problem. To solve this, relays must be installed to drive the spray pumps/submersible pumps, ensuring that the sensors, lcd, and other minute modules receive enough power from the Arduino micro-controller's inbuilt 5 V and 3.3 V ports. It may be made at home for a very low cost and installed everywhere, including offices, educational institutions, public transportation, and conventional businesses. To bring the project to a close, the device can be described as a weapon for survival in the face of an invisible enemy in a pandemic situation.

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