

Automatic Hand Dispenser and Temperature Scanner for Covid-19 Prevention

Suhas. B. Khadake¹, Prajakta. V. Padavale², Priyanka. M. Dhere³, Bharati. M. Lingade⁴

Assistant Professor, Department of Electrical Engineering¹

Students, Department of Electrical Engineering^{2,3,4}

SVERI's College of Engineering Pandharpur, Maharashtra, India

sbkhadake@coe.sveri.ac.in, suhaskhadake@gmail.com

Abstract: The COVID-19 pandemic was prevented by the invention of the automatic hand dispenser and temperature scanner. The most valuable commodity in the entire world is now sanitizers. According to the new guidelines and laws presented by the "World Health Organization," sanitization is required to deal with the new normal. An automatic hand sanitizer with a temperature detection system is built into a contactless sanitizing machine's design to keep hands clean whenever a person wants. The body temperature of the person is determined by the temperature sensor. The technology was specifically designed to aid in halting the spread of the COVID-19 illness and in enhancing neighbourhood health. Up to 5 seconds of exact sanitizing fluid movement are guaranteed by the mechanism. Also, the system's architecture is straightforward to implement, user-friendly, and able to pinpoint the precise hand movements. Sanitation should be implemented in businesses, corporate offices, educational institutions, and institutions of higher learning in light of the current global scenario. This temperature-sensing scanner in the automatic hand sanitizer will undoubtedly be a valuable instrument to assure frictionless application. This also done by using PLC also.

Keywords: automatic hand dispenser

I. INTRODUCTION

In this project, a system for contactless temperature scanning and sanitizer dispensing is designed and implemented. The method is being used to stop the spread of the COVID-19 virus, improve societal health, and lower risk. The virus has demonstrated its might and subjugated a technologically advanced race by affecting several of the most prestigious nations in a chain, including China, Italy, Spain, the United States, India, and Russia. The virus can be rendered inactive by alcohol-based hand sanitizers [1]. Here also we use model which is a good predictor of the eye movements of subjects [4]. The emergence of the fatal Severe Acute Respiratory Syndrome Corona Virus precipitated a worldwide pandemic (SARS-COVID-19). It is necessary to protect ourselves from covid-19 by using alcohol-based hand sanitizer (4358 | Dr. B Sumathy Automated Hand Dispenser & Temperature Scanner for Covid-19 Prevention) [3].

Due to a flaw in the current foot press sanitization method, the virus may transmit from one person to another [2]. The system is also designed to be easily accessible and affordable so that everyone may afford it. To truly draw the conclusion, it can be said that humans in general possess a creative mind that can effortlessly get rid of fear and effectively alter any situation. This is demonstrated by the fact that this device was made using recycled materials and has no negative effects on the environment, which goes against conventional wisdom. here main work is signal coming from sensor [7].

II. METHODOLOGY

2.1 Block Diagram

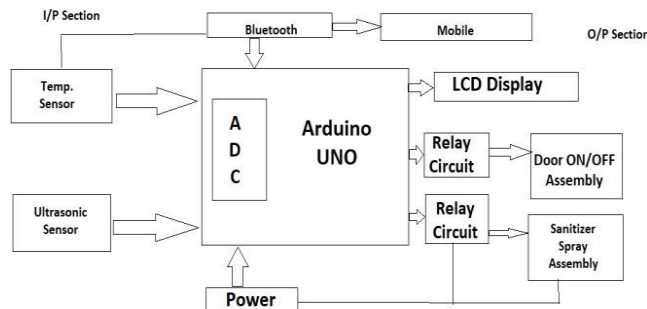


Fig.1: Block Diagram

The primary objective of the system is to deliver a temperature scanner and a contactless sanitizing machine. The temperature sensor in this system sets it apart from other systems. Many parameters in the design must be estimated and prioritized, including:

- 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 synchronize all of the sensors.

Temperature sensor

The person's body temperature is measured using an LM35 sensor. Body temperature ranges from -55 to 150 degrees Celsius. It has been chosen for its cheaper cost and availability.

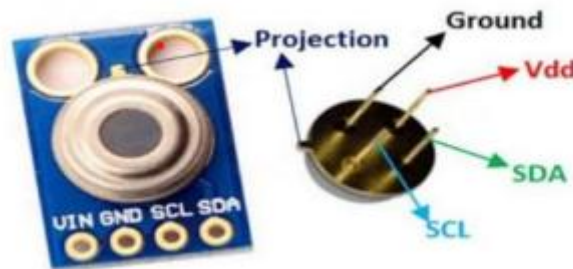


Fig.2: Temperature sensor

Ultrasonic sensor

It is utilized to calculate the distance to a variety of different objects. In the solution we've proposed, it's utilised to detect the presence of hands beneath the sanitizer machine's nozzle and alert the Arduino to turn on the pump when it's within the estimated range.

LED

A semiconductor-based light source called a light emitting diode produces light anytime current flows through it



Fig.3: LED

Buzzer

It functions as a signaling tool by beeping anytime voltage is supplied across the two electrodes.



Fig.4: Buzzer

TSOP

The output signals can be read by the TSOP sensor. The TSOP-1738 is an IR Receiver Sensor that can pickup 38Khz IR signals.

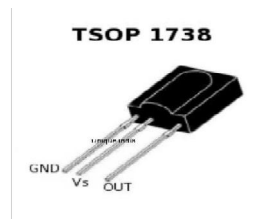


Fig.5: TSOP 1738

Relay Switches

Switches that either operate electromechanically or electronically to open and close circuits. By opening and closing contacts in another circuit, it may control one electrical circuit.



Fig.6: Relay module

Arduino UNO

Open-source electronics platform Arduino is built on user-friendly hardware and software. The inputs can be read by Arduino boards.



Fig.7: Arduino UNO

DC Motor

There are many applications for DC motors. In applications like dynamic braking and reversing, which are common in industrial operations, they also perform effectively.



Fig.8: DC Motor

Pump

Is a tool that transports fluids (liquids or gases), which is used here to transport.



Fig.9: DC Pump

LCD

The temperature that was measured is displayed using a liquid crystal display. A16x2 LCD displays are a very fundamental component that are utilized in many different product comes to electronics and communication, wireless connectivity is quickly displacing traditional connections. A replacement for cable connectors. The electronics are communicated with by HC-05 using serial communication. Typically, a short-range wireless connection is used to exchange files between small devices likemobile phones. It operates in the 2.45GHz range. Data can be transferred at a rate of up to 1Mbps over a distanceof ten metres. The operating range of the HC-05 module is 4-6V of power supply. Baud rates of 9600, 19200, 38400, 57600, etc. are supported. The ability to function in Master-Slave mode, which prevents receiving or sending data from an external source, is its most significant feature.



Fig.10: LCD Display



Fig.11: Bluetooth Module

I2C Protocol

Since the microcontroller transmits the clock message over SCL, this convention uses two-line SDL and SCL, one for the clock and one for information transmission. It transmits the location parts to the necessary gadget in order to identify the associated devices. The location has seven digits, and the eighth bit is used to indicate read or write activity. The microcontroller issues a command to start taking the person's temperature before the sensor. The sensor saves the intentional value to the Memory. The RAM address cannot be changed by the client and must be read. The microcontroller then sends a read message for the user to review the intentional value. The microcontroller can combine the EEPROM locations to choose the MLX90614's operating system.

Bluetooth Module

When it



Fig.12:I2C Protocol

III. WORKING

The sensors connected to the Arduino are active when the gadget is turned on. There are two interconnected systems that we use. The contacting temperature sensing comes after the automatic sanitizer. The Arduino is connected to an ultrasonic sensor, which measures the proximity and motion of people and objects. Any movement, especially a hand close to (30cm), will activate the spray pump 2, and the sanitizer will reach the hand through a short pipe because the ultrasonic sensor has a range of less than 30cm.

In order to make sure that the space is clean and free of viruses, bacteria, and other infectious organisms, sanitization happens concurrently with sensor activation. The temperature is displayed on the LCD display in degrees Fahrenheit ($^{\circ}\text{F}$) as soon as the person's body temperature is detected by the temperature sensor. (because the conversion setting is $^{\circ}\text{C}$ to $^{\circ}\text{F}$). If the temperature sensed is equal to or lower than normal body temperature (98.6°F), the buzzer switches off, indicating safety. If the temperature sensed is higher than normal body temperature (98.6°F), the buzzer begins alarming

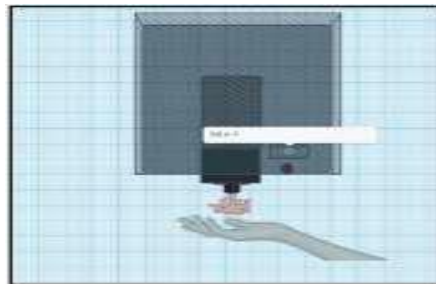


Fig.13: 3D view of the system

IV. RESULTS AND DISCUSSION

As we simulate the circuit at various times, we can observe how the motors function since their rpm changes as the sensor values change. A radiating wave signal or tone is present through the buzzer when checking for the led and buzzer signals and monitoring temperature. This autonomous hand sanitizer bottle has sensors that keep tabs on the temperature and movement of objects. The sensor is connected to the micro-controller, which is set up to automatically control the flow of water. In this system, an ultrasonic sensor is employed. The ultrasonic sensor will detect the water level if it is 35 cm away from it. Data from the ultrasonic sensor will be transmitted to Arduino. The suggested automated hand-washing system uses a number of sensors and a hand-washing solution bottle that is pumped once when a person moves their hand in close proximity to an ultrasonic sensor.

Body Temperature	Status
Less than 36°C	Low
38°C and above	High

Table-1

Test	Observed Value	Result
Person No-1	Above 98.6°F	Abnormal(Buzzer rings)
Person No-2	Below 98.6°F	Normal
Person No-3	98.6°F	Normal

Table-2

V. CONCLUSION

The device circuit is created in software and simulated as previously said. Power delivery to each module during hardware prototyping might be a challenge. This can be fixed by installing relays to power the spray pumps or submersible pumps while ensuring that the sensors, lcd, and other tiny modules have access to enough power through the Arduino microcontroller's built-in 5 V and 3.3 V interfaces. It can be produced at home for a very low cost and may be deployed everywhere, including in offices, schools, transit systems, and traditional enterprises. The device can be thought of as a weapon for survival in the face of an invisible opponent in a pandemic crisis, to wrap up the project.

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