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Smart Temperature Sensor and Automatic Sanitizer Machine

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***Abstract*: The design depicted shows the preventive measure that can be taken during the COVID-19 pandemic in the whole world. Sanitizers have become the most significant commodities right now. By the new rules and regulations given by WHO vigorous sanitization is needed to survive. The design gave the solution for the problem stated. The design introduces an automatic hand sanitizer and temperature sensing system, to keep the hand sanitized whenever a person wants to do it, without a contact with the sanitizing machine. The temperature sensor on touching gives the body temperature of the person.**

***Keywords*: Automatic hand sanitizer, Arduino, Ultrasonic sensor, PIR sensors, TMP36, COVID-19.**

1. Introduction

Since December 2019 the world is under tremendous tension, the numbers are increasing day by day, and till date no vaccine has been full proved against the pandemic agent. Yes, it is COVID-19, it was unknown to the race before it outbroke in Wuhan, China. Being from a large family, a continuous mutation is occurring, forbidding the researchers, microbiologist, pharmaceuticals to draw the line of conclusion on the vaccine. Affecting the most prestigious countries in a chain; China, Italy, Spain, USA, India, Russia, [1] the virus has proved its strength and subservient a technologically enhanced race. The race of homo-sapiens. The policies taken worldwide has lessen its affect to some extent but could not eradicate it. Lockdown has economically weakened many nations, and testing of different medicines has also not proven to be satisfactory. The question now prevail is Life vs. Livelihood. The weaker section of the society is facing the hardship due to vigorous lockdown across the nations. Seeing the picture of India, one of the most promising countries in technology, the labourers are rushing for a little piece of grain. The starving faces reveal the pain. Industries are in losses, workers are losing jobs, economic growth of the nation has taken a back seat, but it should be realized that a regular monitoring of body temperature and periodical hand sanitization can prevent the spread of the pandemic to the masses. Keeping in mind, the situation worldwide, sanitization commodities should be installed in each and every corner of the sphere, be it an industry, a corporate office, an educational institute or a shopping mall. In this research work, an automatic hand sanitizer with temperature sensing design prototype has been made.

A. Objective

With the above stated aspects, the design has been done for easy installation of the hardware in every possible place across the globe. The design encompasses few parameters to be calculated and taken as priority, such as, Installation of temperature sensor. Installation of LCD to display the sensed temperature. Installation of ultrasonic and PIR sensors. Installation of spray pumps/submersible pumps. Synchronizing all the sensors with Arduino UNO R3 microcontroller. The circuit connection should be done minutely to avoid any kind of fault while working of the device. Proper safety measure has been taken to overcome any kind of fault in consideration of over-voltage, short circuit, excessive current flow etc.

2. Circuit Diagram of Ignition System

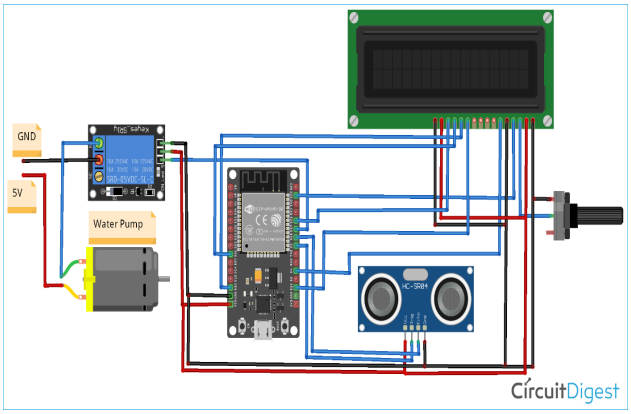

Fig. 1. Circuit diagram

A. Working

As we switch on the device, the sensors attached to the Arduino gets activated. We have two systems to work simultaneously to each other. First the automatic sanitizer and secondly the contacted temperature sensing. The ultrasonic sensor and PIR sensor is attached to the Arduino for detection of human/object ranging and motion respectively. PIR sensor has a range of around 5m–12m and any detection in the specified range will activate the sanitizer and it will sanitize the surroundings with activation of spray pump 1 accompanied

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with a blower so that the sanitizer reaches the surrounding. The ultrasonic sensor on the other side has been specified with a range of less than 30cm, any movement especially hand near(<30cm) the device will activate the spray pump 2 and the sanitizer reaches the hand through a small pipe.

The sanitization is done simultaneously with the activation of the sensors , keeping the particular region sanitize and free from virus or bacteria or any infectious agents.

The temperature sensor senses the body temperature of the person as soon as it is touched, and displays the temperature in ^{o}F in the lcd display (as it is programmed to convert ^{o}C to ^{o}F).

If the temperature sensed is above the normal body temperature (98.6 ^{o} F) the buzzer starts alarming and the RGB led attached turns red, if the sensed value of the sensor is equal or below 98.6 ^{o} F then the buzzer is off and the RGB led is green. Depicting a symbol of safe and safety.

3. Result

Simulating the circuit at different instance we can see the working of two motors 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 it can be seen that the led changes its colour and there is a radiating wave signal/tone through the buzzer.

Fig. 2. Automatic hand sanitizer dispenser

4. Conclusion

As stated earlier the device circuit is made in a software and simulated accordingly. While prototyping the hardware some power distribution to each module can be a hindrance, to overcome the problem, relays must be installed to drive the spray pumps/submersible pumps, so that the sensors, lcd and other minute modules get enough power supply from the inbuilt 5 V and 3.3 V ports of the Arduino microcontroller. It can be manufactured in any household at a very low cost and can be installed anywhere be it in offices, educational institutes, public transport, regular shops etc. To draw a concluding line to the project it can be said that in a war with an invisible enemy the device is a weapon for survival in this pandemic situation.

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