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Automatic Thermal ScannerAnd Hand Sanitization machine for Human Body

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ABSTRACT:An automatic hand sanitizer dispensing machine is automated, non-contact, alcoholbased hand sanitizer dispenser, which finds it's use in hospitals, work places, offices, schools and much more. Here, an ultrasonic sensor senses the hand placed near it, the Arduino uno is used as a microcontroller, which senses the distance and the result is the pump running to pump out the hand sanitizer. The temperature detector detects the normal room temperature when nobody present at sensing area. When person comes front of temperature sensor the machine will show human body temperature. The distance of measurement of human body temperature is about 2cm to 4cm for accurate reading of body temperature.

KEYWORDS: Sanitizer, Pump, Temperature detector, Alcohol, Ultrasonic sensor, Arduino Uno.

I. 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.

Sanitization means cleaning or sterilizing an object or body part like hands or whole body. Sanitization can be done in many ways including UV Sanitization, Soap Sanitization, Alcohol Sanitization, Bleach Sanitization and so on. Of the above methods, alcohol was found to be more useful for human beings since it is harmless on skin surface, vaporizes easily and kills most of the viruses, bacteria, and also removes dirt in our hands. Alcohol may be expensive for mass scale sanitization of buildings or rooms and a major disadvantage is that, alcohol is highly inflammable and requires careful storage to avoid catastrophe. Alcohol also makes hands dry since it absorbs moisture, and hence also needs addition of moisturizers. Alcohol based hand sanitizers are also provided with antiseptic disinfectants like Chlorohexidine Gluconate. Minimum concentration of alcohol in hand sanitizers must be greater than 70% for effectiveness aga nst viruses. But, repeatedly touching the hand sanitizer containers to get a drop of sanitizer again initiates contact with persons, which may be risky. Hence there is need for non contact based hand sanitizer dispenser. In offices, Schools and Malls lot of people comes from different areas. So to prevent from corona virus or prevent from those who have high temperature we have added temperature detector in machine. That machine will show human body temperature on OLED screen. Temperature either in Celsius or in Fahrenheit as you required. In this machine both temperature detection and sanitization are available in single model.

II. PROPOSED WORK

In [1], the paper says about, to stop the rate of spread of covid-19 virus we need to keep hygiene in each and every moment. For that we need to sanitize our hands regularly and we need to cover the face with the mask. Now a days people are going out for their work in offices, colleges etc. During these regular activities we need to take care of ourselves. So that we are making this machine which can help us to take temperature and sanitize the hands of humans.

In [2], this paper says about, in offices or in colleges we can take human temperatures with their daily attendance by RFID scanner. This will help us to monitor whether the person was defected or not while entering or exiting from office or college.

In [3], this paper says about, we can store the data of all people who are working in the company or studying in the college with their daily attendance and temperature. From this system we can control the spread of this virus in our offices and colleges.

III. METHODOLOGY

We built contactless thermal scanner and hand sanitizer for human body with following measures,

MODEL CONSTRUCTION:

The stand for model is made up of 18 SWG MS which is anticorrosion in nature. The height of model is about 5.25 feet from bottom. Height is considered as 5 feet for normal human beings. The temperature detection sensor is at 5.00 feet from the bottom on front side. The hand Sanitizer dispenser and ultrasonic sensor is at 3.50 feet from bottom on front side of model. The OLED display is at 4.50 Feet from bottom onfront side of model. The circuit assembly at 3.50 feet from bottom on back side of model. Sanitizer bottle of 1 Ltr is at 1 feet from bottom on back of the model. The height of model can be adjusted as per requirement. The 4 legs assembly of stand is for better stability of the model. All wiring of machine is through pipes of model. The complete stand is powder coated.
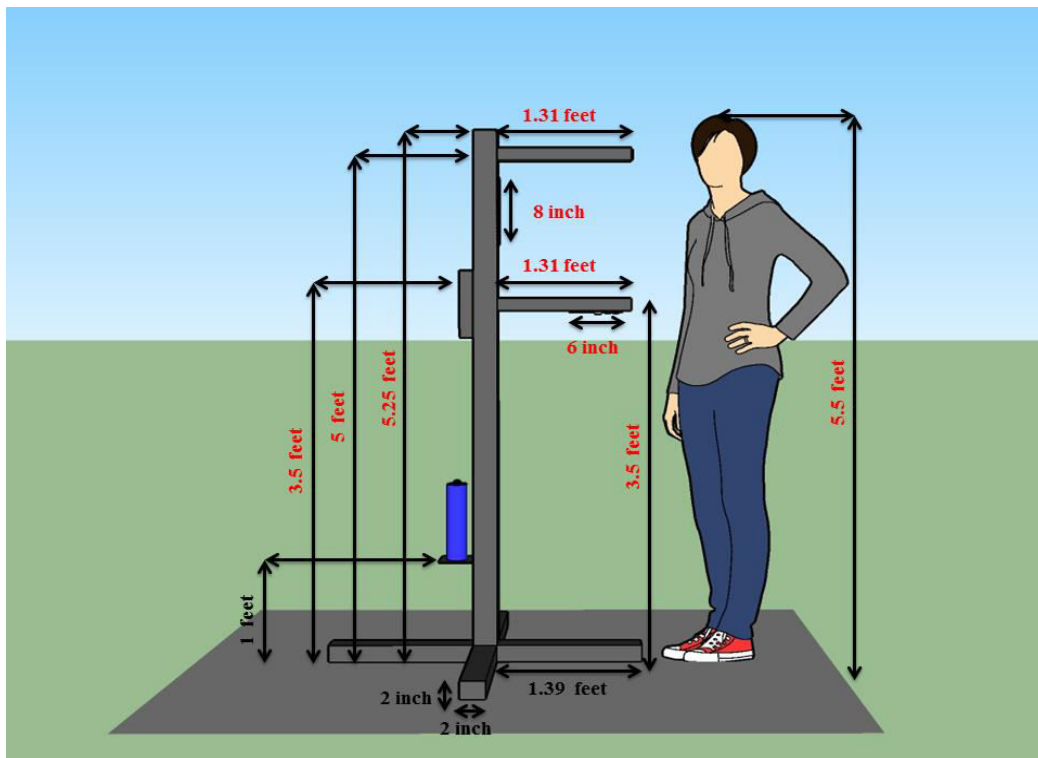

Fig. (a) Construction of Machine

WORKING:

Thermal Scanning:

Place Forehead in 2-4 cms (As close as possible) to Proximity of Temperature Sensor (MLX 90614). MLX90614 will take temperature of forehead and it will send data to microcontroller. If temperature of that person is below pre-set threshold value then Green LED will Glow and if Temperature is above Pre-set Threshold then Red LED will Glow.If Temperature is Above than the Pre-set Threshold. Also, Alarm will be Heard and we will get defected person. Then OLED will show us thermometer with °C and °F reading of human temperature. So that we can stop that person to enter into office or college.

Hand Sanitization:

Place Palm in 30 cm's below Proximity of Spraying Nozzle. (Ultrasonic Sensor HC-SR04). The ultrasonic sensor will sense the presence of hands and then it will pass signals to microcontroller. Microcontroller will give command to relay and relay will turn ON the pump of sanitizer. Pump will start by relay. Nozzle will Spray Sanitizer on the Palms. Remove Palms after Enough Quantity of Sanitizer in Palms. This will help us for contactless sanitizer.

FEATURES:

- Microcontroller, Ultrasonic Sensor Based Fully Automated as No Human Body Contact Require
- Thermal Scanning without Human Interface to Hold Thermometer
- Temperature Showcase in Both Option - Celsius & Fahrenheit
- Alcohol Based Hand Sanitizer Dispensing without Human Interface to Dispense it
- Alarm after Detection of Temperature Higher Than Threshold Value
- Ambient Temperature in Standby Mode
- Direct Plug & Play (240V)

ADDITIONAL FEATURES

- Foot Sanitizing can be Added.
- People Counter (total nos, nos of persons with high temperature) can be Added.i.e. attendance based.
- Data Storage of Persons' Temperature while Coming & while returning from Premises can be Added.
- Web Portal based Stored Data Transfer to Remote Places.

IMPLEMENTED MODEL:

Fig (c) Prototype

IV. RESULT AND DISCUSSION

The above paper says during pandemic we need to take all type of precautions like hand sanitisation and thermal scanning of people. Social distance and face mask can prevent spread of corona virus. But in offices, colleges and other work areas we need to check the temperature of employee. This can help us to stop spread of this covid virus. The above paper says we have made one model which can take human body temperature, human attendance. While taking such data machine will help us to give automatic dispense of sanitizer for hand sanitization. This machine will show temperature of humans on OLED and machine will automatically send data through wi-fi module of microcontroller to authorized computer. This complete process of thermal scanning and sanitization will start after scanning RFID.

V. CONCLUSION

Thus we can use this machine for hand sanitization and thermal scanning of human body to check their body temperature. This will help us to prevent employees/student of our office/college from covid-19 spread. This machine will reduce work of 1 employee who does these activities of thermal scanning by temperature gun and sanitization of hands of employees while entering into the office. This machine is reliable for mobility during this pandemic, easy to use, contactless and time saving.

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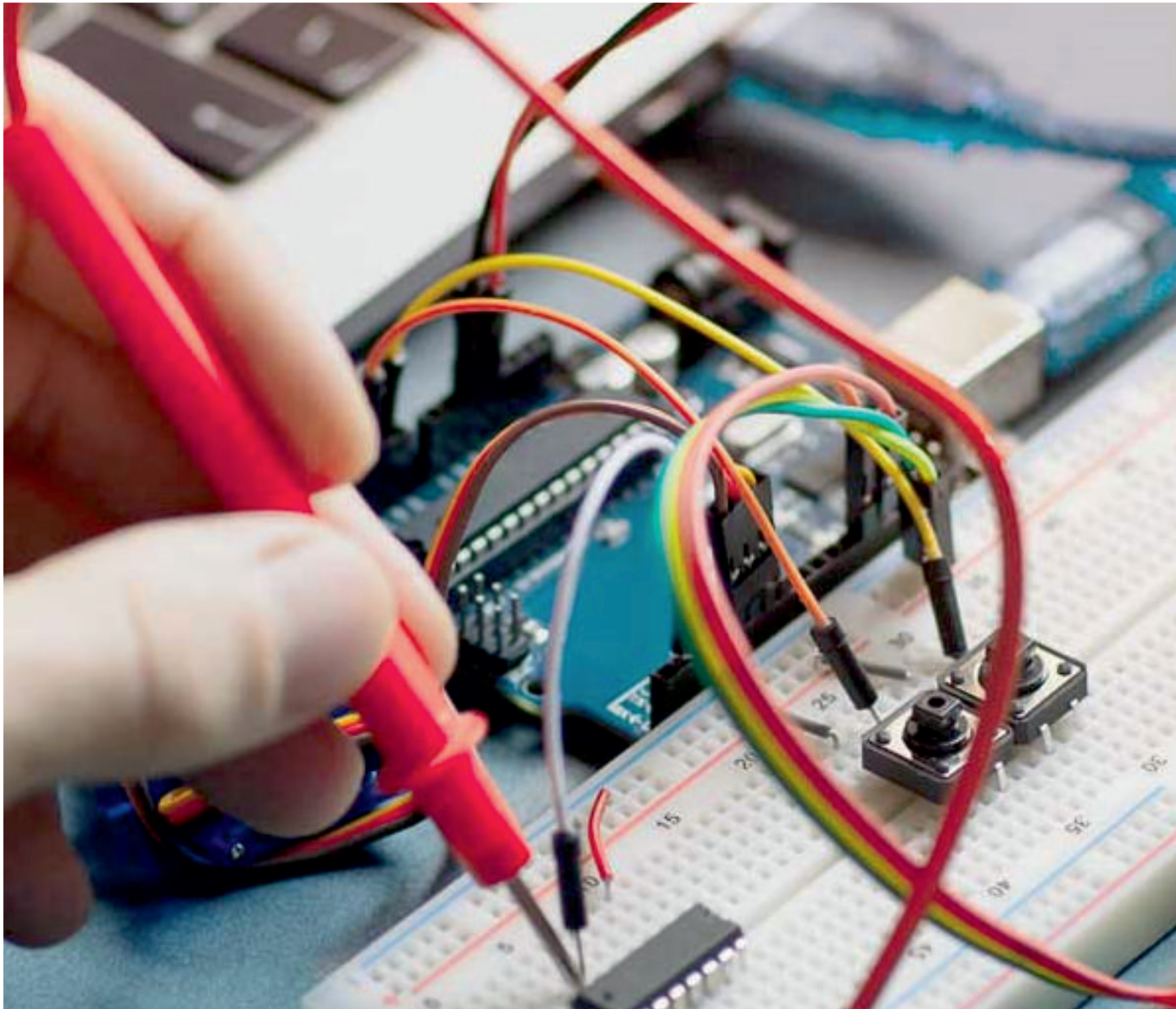
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