IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 2, June 2022
Impact Factor: 6.252

Smart Hand Sanitizer Dispenser

Y. Manoj Naidu[1], K. Ranjith[2], V. Sai Srinivas Reddy[3], M. Srinivasa Rao[4]
B. Tech (IV-ECE), Department of Electronics and Communication Engineering[1,2,3]
Associate Professor, Department of Electronics and Communication Engineering[4]
Ace Engineering College, Hyderabad, Telangana, India

Abstract: *In this corona period hand sanitizer is an essential thing. Because it can kill the Covid -19 virus. but use the of normal sanitizer bottle become very danger. When an infected person presses the bottle trigger, The virus may spread from this hand sanitizer bottle. We can solve this by using Automatic hand sanitizer bottle. Automatic means, no need to trigger with our hand. Just place your hand near the bottle. the bottle will automatically trigger. Interfacing of Servo motor and interfacing of Ultrasonic sensor is explained in my previous articles. Links are given in the end of this article. We use an Ultrasonic distance sensor, Servo motor and Arduino board. here I am using Arduino Uno. You can also use any other microcontroller. When we place our hand in front of the distance sensor, it will help to the Arduino to measure the distance from the sensor to object (here the hand). if the object in the desired range, Arduino will write the servo to 180. Servo motor is mounded on the hand sanitizer bottle. And the trigger of bottle is connected to servo by a thread. When servo motor rotates, the trigger will press.*

Keywords: Covid-19, Hand Sanitizer Dispenser, Digital Temperature, Arduino uno, Arduino Nano.

I. INTRODUCTION

The COVID-19 pandemic has radically affected life for almost everyone around the globe and makers are no exception. With everyone being more careful of their interactions with humans and objects, personal hygiene has taken serious precedence over all other factors in public space. A lot of public places have hand sanitizers for visitors, but they need to be manually pressed. To avoid any contact at all, some no-touch hand sanitizer dispensers are commercially available, but they are expensive and most off-the-shelf commercial sanitizers cannot be automated. In this project, we create a contactless hand sanitizer dispenser that can be used for any press-to-release hand sanitizer available in the market. The project uses an Arduino Uno, an HCSR04 Ultrasonic sensor, and a servo motor. The system is adjustable to accommodate most sanitizer bottles. We'll cover the basics of how these sensors work before detailing how to make one of these on your own! Nowadays, Six different commercially available NCIT models from different manufacturers that measure temperature at the center of the forehead were selected (Table 1). All the selected NCIT models provided the option to choose oral temperature as the reference site temperature. Ten units of each model were purchased from commercial vendors. NCITs were divided into 10 identical sets; each measurement set contained one unit of each of the six different NCIT models, labeled A through F. The accuracy of these models stated in the manufacturers' instructions for use ranged from ± 0.2 °C to ± 0.3 °C. Thermometers were cleaned and prepared according to the manufacturer's instructions for use and had fresh batteries installed prior to testing. Non-contact Infrared Thermometers (NCITs) are being used as a temperature measurement tool for screening and isolating potentially infected people with elevated temperature in healthcare settings, ports of entry (PoEs), and in other settings during the Coronavirus Disease 2019 (COVID-19) pandemic. Elevated temperature greater than or equal to 38 °C (42 CFR 70.1) is one of the symptoms exhibited by persons with COVID-19. To successfully screen and track people with elevated temperature, it is essential that accurate temperature measurements are made, and that the thermometer outputs are correctly interpreted. ASTM E1965-98(2016) and ISO 80601-2-56(2017) are both FDA-recognized voluntary consensus standards used by device manufacturers to evaluate the performance of NCITs by i) testing the accuracy of the device against a standard blackbody source (BBS) and ii) performing a clinical study to evaluate the accuracy and effectiveness of the device in clinical settings. NCITs are FDA class-II medical devices (21 CFR 880.2910) approved under product code FLL. FDA's 510(k) premarket notification database shows that more than 20 NCITs have been cleared by the FDA in the past 3 years. NCITs do not measure the core body temperature directly but are designed to correlate with a reference body site temperature, such as the oral temperature.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 2, June 2022
Impact Factor: 6.252

II. LITERATURE SURVEY

The paper mainly says about the hospital grasped infections, which is about 2 Million Patients per year and also says that it is 8th leading cause for deaths annually in USA. It also says that handwashing is important and also effective with proper hand washing steps, but washing with soap and water is time consuming for peak hours in hospitals. This paper also showed the effectiveness of the alcohol based hand sanitizers, which reduced infection rates by whopping 30%. They used hand sanitizers with 60 to 70 percent ethanol or isopropanol for reducing significant number of pathogens. The patients were also given about 4.25 ounce containers of hand sanitizer alongside their beds. For 10- month period of using hand sanitizers showed a result of 36.1% infection reduction. In , the paper says about the infection caused by drug resistant micro-organisms which causes increase in death rate and also complications, the multidrug resistant bacteria includes Methicillin Resistant Staphylococcus aureus(MRSA), Extended Spectrum Betalactamase (ESBL) producing bacteria, Multidrug Resistant Pseudomonas aeruginosa(MDRP), which are very common worldwide. Several antibiotics have increasing multidrug bacteria isolation rate, even personal protection equipment(PPE) can't be effective in isolation rate of MSRA. Hence they emphasize about the use of alcohol based hand sanitizers since the alcohol based hand sanitizers had negative association with MRSA isolation rate, which means that hand hygiene is very important in hospitals. In , the paper says about emergence of the novel Coronavirus(SARS-CoV-2), which has caused unexpected challenges to health of the people of this world, the paper also aims at reducing the transmission rate of the disease. The paper explains about the virus structure and how is it different from that of the bacterial structure, which means that virus has single stranded or double stranded RNA or DNA encapsulated in 'capsid' and virus can replicate only in presence of a host and described as 'living entities'. Bacteria also has almost the same structure including DNA or RNA along with 'Cell Membrane' and can replicate without a host. The paper also gives a complete comparison between hand sanitizers and soap, foam vs gel, and it says that high concentration of ethanol.

III. EXISTING SYSTEM

The foot operated sanitizer dispenser stand is a device which dispense a controlled amount of soap solution (or a similar liquid such as a hand sanitizer). The hand sanitizer dispensing machine market can be segmented based on type, capacity, operation mode, end-use, distribution channel, and geography. Based on type, the market can be classified into gel hand sanitizer dispensing machines, liquid hand sanitizer dispensing machines, foam hand sanitizer dispensing machines, and others. In terms of capacity, the market can be categorized into less than 1.5 liters 1.5–2 liters, 2.5–3 liters, and more than 3.5 lit. Based on end use, the hand sanitizer dispensing machine market can be divided into health care, coffee shops, colleges & universities, schools, shopping complexes, subway stations, hotels & restaurants, and others. Rise in hygiene concerns in the healthcare industry is expected to create significant opportunities for the hand sanitizer dispensing machine market. A hand sanitizer dispensing machine is a hand washing unit that can either be self-standing or in combination with other hygiene stations. Hand sanitizer dispensing machines are available in different sizes, price ranges, operation modes, and capacities. They are installed in public and commercial washrooms. Hand sanitizer dispensing machines are user friendly and cost effective with lower maintenance costs. All these features are expected to contribute to the growth of the hand sanitizer dispensing machine market soon.

Figure 1: Foot Operated Hand Sanitizer Dispenser

IV. PROPOSED SYSTEM

To avoid any contact at all, some no-touch hand sanitizer dispensers are commercially available, but they are expensive and most off-the-shelf commercial sanitizers cannot be automated. In this project, we create a contactless hand sanitizer dispenser that can be used for any press-to-release hand sanitizer available in the market.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 2, June 2022
Impact Factor: 6.252

The project uses an Arduino Uno, an HCSR04 Ultrasonic sensor, and a servo motor. The system is adjustable to accommodate most sanitizer bottles. We'll cover the basics of how these sensors work before detailing how to make one of these on your own! The COVID-19 pandemic has radically affected life for almost everyone around the globe, and makers are no exception. With everyone being more careful of their interactions with humans and objects, personal hygiene has taken serious precedence over all other factors in public space. A lot of public places have hand sanitizers for visitors, but they need to be manually pressed.

V. METHODS AND METHODOLOGIES

An embedded system is a combination of computer hardware and software designed for a specific function. Embedded systems may also function within a larger system. The systems can be programmable or have a fixed functionality. Industrial machines, consumer electronics, agricultural and processing industry devices, automobiles, While embedded systems are computing systems, they can range from having no user interface (UI) -- for example, on devices designed to perform a single task -- to complex graphical user interfaces (GUIs), such as in mobile devices. User interfaces can include buttons, LEDs (light-emitting diodes) and touchscreen sensing. Some systems use remote user interfaces as well. Medical equipment, cameras, digital watches, household appliances, airplanes, vending machines and toys, as well as mobile devices, are possible locations for an embedded system.

System Design and Implementation of stage 1:

Here, we use an Ultrasonic distance sensor, Servo motor and Arduino board. here I am using Arduino Uno.

You can also use any other microcontroller. When we place our hand in front of the distance sensor, it will help to the Arduino to measure the distance from the sensor to object (here the hand). if the object in the desired range, Arduino will write the servo to 180. Servo motor is mounded on the hand sanitizer bottle. And the trigger of bottle is connected to servo by a thread. When servo motor rotates, the trigger will press.

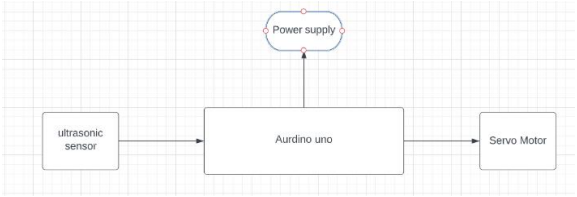

Figure 2: Block diagram of Smart Hand Sanitizer Dispenser

System Design and Implementation of stage 2:

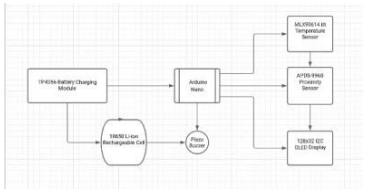

Figure 3: Block diagram of Smart Hand Sanitizer Dispenser stage 2

In this corona period hand sanitizer is an essential thing. Because it can kill the Covid -19 virus. but use the of normal sanitizer bottle become very danger. When an infected person press the bottle trigger, The virus may spread from this hand sanitizer bottle. We can solve this by using Automatic hand sanitizer bottle. Automatic means, no need to trigger with our hand. Just place your hand near the bottle. the bottle will automatically trigger. Interfacing of Servo motor and interfacing of Ultrasonic sensor is explained in my previous articles. Links are given in the end of this article.

V. RESULT

Circuit Diagram of Stage 1:

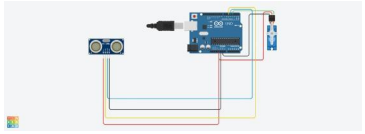

Figure 3: Circuit connections of stage 1

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 2, June 2022
Impact Factor: 6.252

Circuit Diagram of Stage 2:

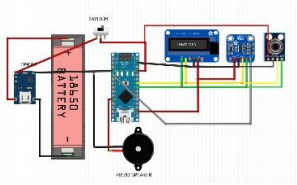

Figure 4: Circuit connections of stage 2

VI. CONCLUSION

This paper has addressed the design and construction of an electronic system based on Internet of things (IoT) concept. The main aim of the designed IoT system, although it is not limited to this, is to monitor and then control the industrial environments, such as factories, or even labs. Detailed description of the electronic evolution has been provided in this research. Control and sensor units represent the main parts of the designed system. Low cost microcontroller, sensors and other electronic components have been utilized in this research. These include Aurdino Nano microcontroller, using Arduino IDE. To allow the remote and wireless monitoring and control option to the responsible people a mobile application has been developed.

The proposed algorithm has also deliberated alerting the in-charge people in the abnormal situations using mobile messaging. In addition to automatic and wireless control capabilities manual control function has been enabled on the system. The final product has then been enclosed using custom built plastic box in order to be ready for use and work and to keep it safe. However, the utilized electronic components have individually been tested, thus, the next step is to conduct a real test by using the developed IoT system in an industrial environment and then analyses the captured data.

ACKNOWLEDGMENT

We would like to thanks to our guide Mr. R. Srinivasa Rao and Mr. B. Giri Raju for their continuous support and guidance. Due to his guidance, we can complete our project successfully. Also, we are extremely grateful to Dr. P. Sathish Kumar, Head of the Department of Computer Science and Engineering, Ace Engineering College for his support and invaluable time

REFERENCES

[1]. Wang C, Horby PW, Hayden FG, Gao GF. A novel coronavirus outbreak of global health concern. Lancet. 2020;395(10223):470–3. [PMC free article] [PubMed] [Google Scholar]

[2]. Wu F, Zhao S, Yu B, Chen YM, Wang W, Song ZG, et al. A new coronavirus associated with human respiratory disease in China. Nature. 2020;579(7798):265–9. [PMC free article] [PubMed] [Google Scholar]

[3]. Lai CC, Shih TP, Ko WC, Tang HJ, Hsueh PR. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): the epidemic and the challenges. Int J Antimicrob Agents. 2020;55(3):105924. [PMC free article] [PubMed] [Google Scholar]

[4]. Spears L, inventor. Decorative Liquid Soap Container (DLSC) 12/291,938. United States patent application.2010 Mar 25;

[5]. Bloomfield SF, Aiello AE, Cookson B, O'Boyle C, Larson EL. The effectiveness of hand hygiene procedures in reducing the risks of infections in home and community settings including handwashing and alcohol-based hand sanitizers. Am J Infect Control. 2007;35(10):S27–S64. [Google Scholar]

[6]. Cittadino AM, Byl CC, Wilcox MT, Paal AP, Budz GD, Cornell RW, inventors. Pumping dispenser. 8,261 950. United States patent US. 2012 Sep 11;

[7]. Iseri M, Malina Y, Hardman J, inventors. Dispenser for hand sanitizer. 9,060, 655. United States patent US. 2015 Jun 23;

[8]. Ministry of Food and Drug Safety. Introduction of non-medical products [Internet] Sejong, Korea: Ministry of Food and Drug Safety; c2020. [cited at 2020 Aug 4]. Available from: https://www.mfds.go.kr/wpge/m_637/de0508011001.do. [Google Scholar]