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# Solar Powered Smart Dry Hand Sanitizer Dispenser Machine with Level Monitoring System

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***Abstract: Corona virus disease (Covid-19) is endangered in the world. Since the WHO declared it a pandemic and many cities are in lockdown, people have been unable to get out of their homes and thousands of people have already lost their lives. With the outbreak of the global Covid-19 crisis, hand washing and hygiene have become an absolute necessity in daily affairs. The Automatic Mist Based Sanitizer Distribution System is a very useful resource with level monitoring in the fight against corona virus. This contactless delivery system helps clean dry hands regardless of clean surfaces and helps reduce the spread of cross-contamination.***

***Keywords: Hygiene, Hand sanitizer, Microcontroller, Ultrasonic sensor, Level sensor, Solar Based, LCD display etc.***

## I. INTRODUCTION

During this global epidemic of COVID-19, according to the WHO (World Health Organization), hand hygiene is a major preventive measure against disease and outbreaks, including regular hand washing
with water and soap, hand sanitizer and hand hygiene.
Hygiene refers to convenient practices to maintain health and prevent disease, especially through hand hygiene and coughing elbows.
This contactless dispensing unit delivers an alcohol-based sanitizer when both hands are placed under it. The aerated mist-based formula uses only 5-6 ml. of sanitizer to ensure maximum utilization. It distributes the complete cone spray mist for 12 seconds in a single operation. The contactless technology works on an ultrasonic sensor, with high operational accuracy to ensure zero contact and to completely disinfect both hands at once. A level sensor is used to measure the sanitizer level in the tank with the LED display to indicate the on / off status and the progress of the process. The capacity tank ensures longer use and thereby eliminates the hassle of refilling it. Sanitizer allows displaying the size in the container.
The contactless technology works on an ultrasonic sensor, with high operational accuracy to ensure zero contact and to completely disinfect both hands at once. A level sensor is used to measure the sanitizer level in the tank with the LED display to indicate the on / off status and the progress of the process. The capacity tank ensures longer use and thereby eliminates the hassle of refilling it. Sanitizer allows displaying the size in the container.

## II. METHODOLOGY

With this solar-powered smart hand sanitizer dispenser, an ultrasonic sensor is used to check the presence of hands under the sanitizer dispenser's outlet. It constantly calculates the distance between the sanitizer outlet and itself and tells the microcontroller to start the servo motor to push the sanitizer out whenever the distance is less than 10 cm and as soon as the sanitizer outlet drops some amount in your hands the LCD display shows the whole process. The whole system is solar powered, so the system is completely independent and can be placed in any open space.

## III.+OBJECTIVE

The main objective of this research project is to design and implement a level monitoring system with solar powered low cost Touch Free Smart Hand Sanitizer Dispenser. Complete controller with features like ultrasonic sensor, level sensor, LCD display and DC pump motor, solar panel based on microcontroller.

*A.* Touch Touch-less Hand Sanitizer Dispenser Design.
*B.* Power Design and implementation of low power intake structures.
*C.* To design solar powered systems
*D.* To design a monitor level monitoring system.

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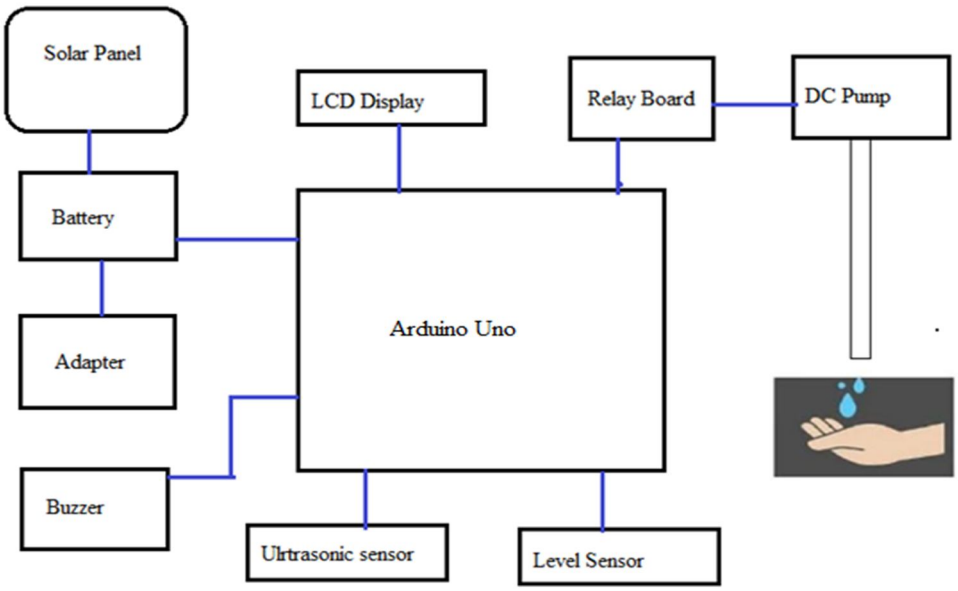
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## IV. LITERATURE REVIEW

*1)* Jessica Hilburn MT (ASCP), CIC, Brian S. Hammond, Eleanor J. Fendler PhD, Patricia A. Groziak MS, "Use of Alcohol Hand Sanitizer as an Infection Control Strategy in Acute Care Facility", American Journal of Infection Control Volume 31, Issue 2 April 2003. In [1], the paper mainly refers to hospital infections, which number approximately 2 million patients a year and are the 8th leading cause of death annually in the United States. It states that hand washing is also very important and effective due to proper hand washing, however in hospitals it takes maximum hours to wash with soap and water. This paper also showed the effectiveness of alcohol-based hand sanitizers, reducing the infection rate by 30%. They used hand sanitizers containing 60 to 70 percent ethanol or isopropanol to significantly reduce the number of pathogens. Patients were also given 4.25-ounce containers of hand sanitizer along with their beds. Infections decreased by 36.1% during the 10 months of using the hand sanitizer.

*2)* Satoru Mitsuboshi, Masami Sugita, "Alcohol-based hand sanitizer, antibiotic use and other measures on the rate of detection of antibiotic-resistant bacteria in hospitals in rural Japan", Journal of Infection and Chemotherapy, 2018 . In [2], the paper describes infections caused by drug-resistant microorganisms that can lead to death and complications, including methicillin-resistant Staphylococcus aureus (MRSA), an extended-spectrum beta-lactamase in multidrug-resistant bacteria. (ESBL) included. The bacteria that cause the multidrug-resistant Pseudomonas aeruginosa (MDRP) are the most common in the world. As multidrug bacterial isolation rates increase with many antibiotics, personal protective equipment (PPE) may also not be as effective in the isolation rates of MSRAs. Therefore, alcohol-based hand sanitizers are being urged to use alcohol-based hand sanitizers as they have a negative relationship with MRSA isolation rates, which means that hand hygiene is very important in hospitals.

## V. BLOCK DIAGRAM




## VI. WORKING

In this research project, we are using the ultrasonic sensor to detect the presence of a hand. When it detects presence of hand below 10cm, it will trigger the first servo motor to move from 0 degrees to 180 degrees in order to pour the liquid on the hand. It will delay for two (2) seconds before returning back to 0 degrees. After returning to 0 degrees, the dc pump will de-energize and a LED display will light up immediately.

In this system, the Arduino microcontroller is used to control all devices paired with external electronics: they include an ultrasonic sensor, level sensor, DC pump motor, LCD display and relay board, buzzer, etc. For the efficient functioning of the system. The electromagnetic lock is pressed directly from the 12V DC power source and then fed to the microcontroller and servo motor with a controlled DC power supply, which is 5V and 9V, respectively.

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## VII. HARDWARE COMPONENTS

*A.* Arduino Uno controller
*B.* Ultrasonic sensor
*C.* Level sensor
*D.* DC pump
*E.* 12V DC Power Supply, 9V and 5V DC Regulator
*F.* LCD display
*G.* Relay
*H.* Buzzer
*I.* LEDs
*J.* Resistors, Capacitors and Diodes.
*K.* Solar Panel
*L.* Adapter
*M.* Others

## VIII. ADVANTGES

*A.* It is Non contactable.
*B.* Protect from COVID 19.
*C.* Infrared sensor technology.
*D.* Design is compact.
*E.* Easy wall mounted installatio
*F.* Available in different sizes.
*G.* User friendly.
*H.* Maintenance is low.

## IX.DISADVANTGES

*A.* Dry skin
*B.* Fire hazards

## X. APPLICATIONS

*A.* It can be used hospitals.
*B.* Used in public locations
*C.* Also used in School & colleges
*D.* Use in Airports.
*E.* Used in hotel and restaurants.
*F.* Shopping malls.
*G.* Banks.

## XI.CONCLUSION

The system surely helps in implementing the hand hygiene without any challenges as it is a must to sanitizer if you are to access any entry point. It is safer and more recommended due to its touch less quality, which reduces the chance of cross contamination to zero. This is a low-cost user-friendly system that anyone can make use of. All the devices communicate well. Here it can be confirmed that the system has been successfully implemented and the target has been achieved without any differences. The results achieved in this project are real and a product of honesty and hard work.

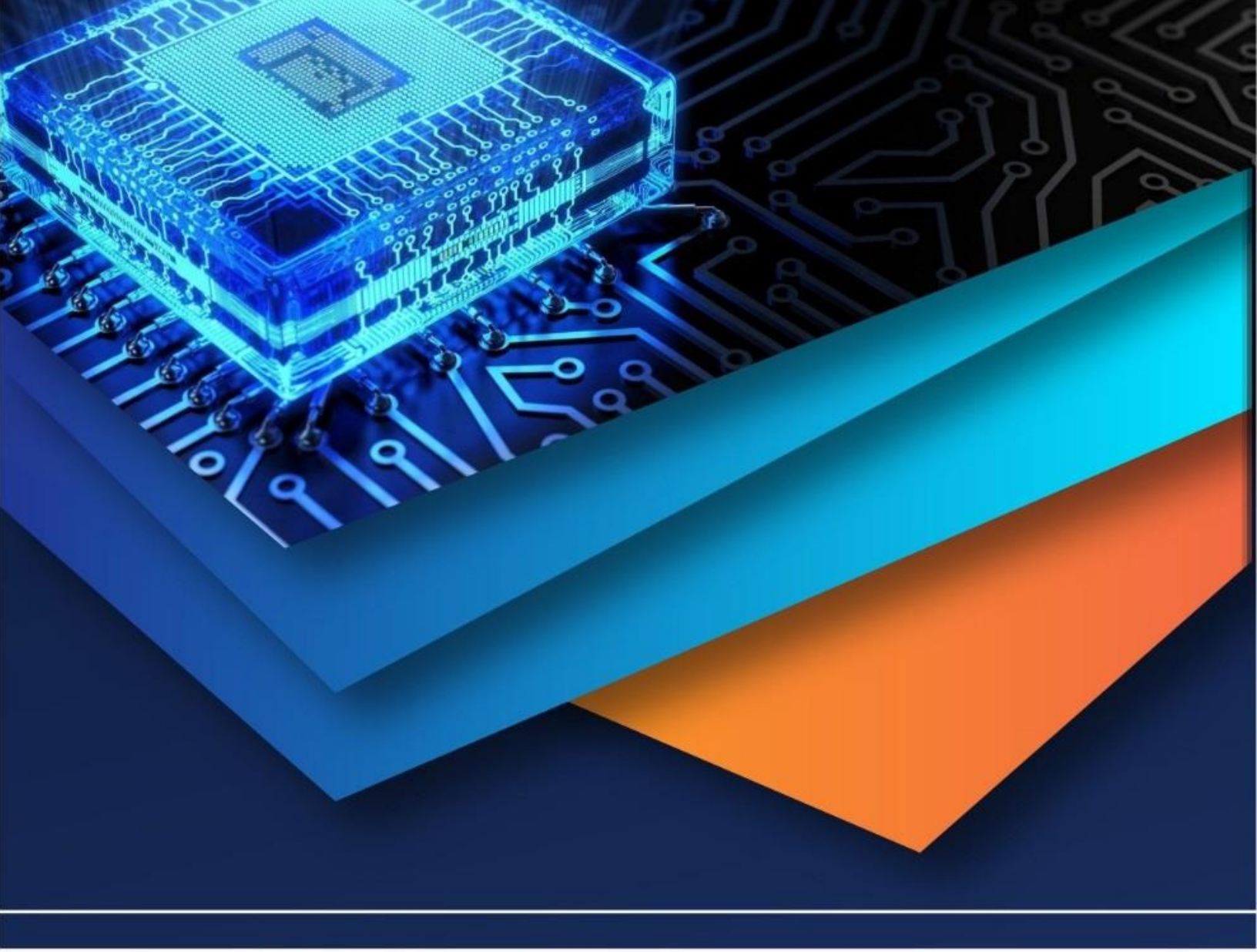
## REFERENCES

[1] Jessica Hillburn MT(ASCP),CIC, Brian S Hammond, Elanor J Fendler PhD, Patricia A Groziak MS, "Use of alcohol hand sanitizer as an infection control strategy in acute care facility", American Journal of infection control Volume 31,Issue 2, April 2003.
[2] Satoru Mitsuboshi, Masami Tsugita, "Impact of alcohol-based hand sanitizers, antibiotic consumption, and other measures on detection rates of antibiotic resistant bacteria in rural Japanes hospitals", Journal of Infection and Chemotherapy, 2018.

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[3] Golin, A. P., Choi, D., & Ghahary, A. "Hand Sanitizers: A Review of Ingredients, Mechanisms of Action, Modes of Delivery, and Efficacy Against Coronaviruses". American Journal of Infection Control ,2020.
[4] Davis MA, Sheng H, Newman J, Hancock DD, Hovde CJ. Comparison of a waterless hand-hygiene preparation and soap- and-water hand washing to reduce coliforms on hands in animal exhibit settings. Epidemiol Infect. 2006;134:1024–1028.
[5] Health impact of handwashing. WELL fact sheet 2006. at: http://www.lboro.ac.uk/well/resources/fact-sheets/fact-sheets htm/Handwashing.
[6] https://www.instructables.com/id/DIY-Easy-Non-Contact-Automatic-Hand-Sanitizer- Automatic-hand-sanitizer-disp
[7] https://www.theguardian.com/world/2020/feb/28/hand-sanitiser-or-hand-washing-which-more-effective-against- coronavirus-covid
[8] International Journal of Engineering Research & Technology (IJERT) Published by : ISSN: 2278-0181 http://www.ijert.orgVol. 9 Issue 07, July-2020
[9] International Journal of Engineering Research & Technology (IJERT) ISSN: 2278-0181 NCETESFT - 2020 Conference Proceedings
[10] ISO/IEC20922:2016.Informationtechnology-MessageQueuing Telemetry Transport (MQTT) v3.1.1, 2016.

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