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# CONTACTLESS AUTOMATED HAND SANITIZER

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***Abstract***: *Since the coronavirus broke out and spread over the world, demand for hand sanitizer has skyrocketed. Hand sanitizer is commonly applied by pressing a pump with one's hand and squirting the sanitizer liquid out. As a result, a large number of people come into touch with the pump handle, increasing the danger of viral transmission. On the market, several hand sanitizers are automatically pumped. However, because hand sanitizer containers and pump mechanisms are only designed to work with other products from the same manufacturer, consumers must also replace the liquid container if they replace the hand sanitizer. It is not cost-effective, and it has a negative environmental impact by increasing waste emissions. Furthermore, some users may believe that buying a hand sanitizer containing device-compatible hand sanitizer is inconvenient, so they pour other hand sanitizers into previously used containers and reuse them. Sanitizers that come into direct touch with the human body, on the other hand, are classed as medications or non-medical items, and are best used in their Original containers.*
*Key Word: Automatic, arduino, internet of things, hand sanitizer, water pump, ultrasonic sensor*.

## I. INTRODUCTION

Cleaning or sterilizing an object or body is referred to as sanitization. Hands, for example, or the entire body. Sanitization, soap sanitization, and other methods of sanitization are all options. Sanitization with alcohol, bleach, and other chemicals, for example. Among the Alcohol was found to be more effective than the other techniques. It vaporizes in humans because it is nontoxic to the skin surface. It is simple to use and destroys the majority of viruses, bacteria, and other microorganisms. Cleans the filth off our hands for some people, alcohol is prohibitively pricey. Sanitization of buildings or rooms on a large scale, as well as a big. The disadvantage is that alcohol is extremely flammable. To avoid disaster, cautious storage is required. Also, there's alcohol. Because it absorbs moisture, it keeps hands dry, and hence As a result, moisturizers must be added. Antiseptic disinfectants like Chlorohexidine Gluconate are also included in alcohol-based hand sanitizers. For hand sanitizers to be effective against viruses, the alcohol concentration must be greater than 70 percentages. Touching the hand sanitizer containers repeatedly to acquire a drop of sanitizer again, on the other hand, initiates contact with people, which could be dangerous. As a result, non-contact hand sanitizer dispensers are required.

## II.LITERATURE AND METHODS

**Literature survey:**

*The study [1] mostly discusses hospital-acquired infections, which affect around 2 million patients each year and are the eighth biggest cause of mortality in the United States. It also states that hand washing is vital and effective when done correctly, but that washing with soap and water takes too long at peak hours in hospitals. This study also demonstrated the efficacy of alcohol-based hand sanitizers, which lowered infection rates by a startling 30 percentage. They employed hand sanitizers with 60 to 70 percentage ethanol or isopropanol to kill a large number of germs. Along with their mattresses, the patients were given 4.25 ounce canisters of hand sanitizer. The use of hand sanitizers for a 10-month period resulted in a 36.1 percent reduction in illness.*

*The study [2].,The multidrug resistant bacteria include Methicillin Resistant Staphylococcus aureus (MRSA), Extended Spectrum Beta-lactamase (ESBL) generating bacteria, and Multidrug Resistant Pseudomonas aeruginosa (MDRP), all of which are quite common worldwide, Several medications are increasing the rate of MDR bacteria isolation, and even personal protective equipment (PPE) is ineffective in reducing MSRA isolation rates. As a result, they promote the usage of alcohol-based hand sanitizers.*

*The study [3] discusses the advent of a novel Coronavirus (SARS-CoV-2), which has posed unexpected problems to the world's health. The paper also attempts to lower the disease's transmission rate.*

*The study discusses how viruses differ from bacteria in terms of structure, stating that viruses have single or double stranded RNA or DNA wrapped in a 'capsid,' that they can only replicate in the presence of a host, and that they are referred to as 'living organisms.' Bacteria have a similar structure to humans, having DNA or RNA as well as a 'Cell Membrane,' and they can replicate without the help of a host.*

## III. PROCEDURE METHODOLOGY

An Arduino Uno is utilized as the control unit in this project. It's simple to programmer and includes an ADC and DAC. An ultrasonic sensor is used to provide input to the Arduino. It detects distance by emitting ultrasonic frequency from one side and recording the time it takes for the sound wave to be reflected back. When the sensor detects a hand within 7cm of the sensor, the Arduino sends a 100ms pulse through its digital output pin. Because the pump cannot be turned on directly, a relay is employed to act as a switch. The relay receives the Arduino pulse and activates the pump. The pump is a 3 to 12V submersible kind that sprays a few drops of hand sanitizer into the hands, then measures the distance every 5 seconds for scanning purposes. We'll need a container to hold sanitizer before we can make an automatic hand sanitizer dispenser. Following that, we'll need something to pump soap water, which is a DC water pump. The soapy water will be pumped out for us by the DC water pump.

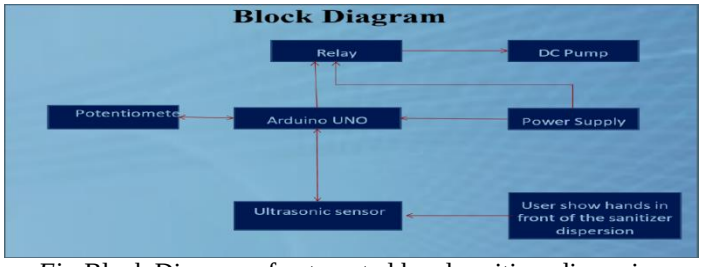


*Fig*-Block Diagram of automated hand sanitizer dispersion

**Components Required**

1. Potentiometer
2. Water pump
3. Relay
4. Ultra-Sonic Sensor
5. Connecting wire
6. Bread board
7. Sanitizer

## IV. RESULT

The main control device is an Arduino Uno, which is simple to programmer and features built-in ADC and DAC. An ultrasonic sensor is used to provide input to the Arduino. It senses distance by emitting ultrasonic frequency from one side and recording the time it takes for the sound wave to be reflected back. When the sensor detects a hand within 7cm of the sensor, the Arduino sends a 100ms pulse to its digital output pin. Because the pump can't be turned on directly, a relay is employed as a switch. The relay receives the Arduino's pulse and activates the pump. The pump is a submersible 3 to 12V pump that sprays a few drops of hand sanitizer on the hands.

## V. FUTURE WORK

This method assures that a single machine can be used for sensitization, pulse-oxygen level measurement, and temperature monitoring without the need for additional equipment, reducing the risk. The system may be improved by adding a smart electromagnetic lock that ensures that the person is only permitted inside after sanitizing their hands. Installing a speech converter that translates the measured readings into voice signals and receiving the alarm message through a speaker can be extended to help persons with weak eye sight or blind people. In the event that the conventional power supply fails or is turned off, alternative power sources such as solar can be deployed to keep the system running. Sensors with higher precision produce significantly better outcomes. Sanitizer-resistant ultrasonic sensors can be

Utilized as sanitizer level indicators, eliminating the need to refill sanitizer. A camera module with image processing techniques and a database can be constructed to keep track of how many people went through the process in a company or industry, providing us with statistics that will help us plan more effectively. These are the areas of concern that should be addressed in order for this system to become more advanced.

## VI. CONCLUSION

When one presses a pump with one's hand, hand sanitizer usually squirts sanitizing liquid. On the market, several hand sanitizers are automatically pumped. Sanitizer containers and pump devices, on the other hand, are only meant to work with other items from the same manufacturer. To address this issue, we created an automatic hand sanitizer system that can be used in a variety of containers. It is feasible to avoid many persons coming into contact with the pump handle with the proposed mechanism. As a result, the spread of the fomite virus is prevented, and the use of hand sanitizer is made much easier. Furthermore, the system dispenses a consistent amount of hand sanitizer at all times, making refills and replacements simple. It can also work with a variety of sanitizer containers, so customers won't have to buy a new container for the liquid if they replace their hand sanitizer. As a result, it is both cost-effective and environmentally friendly because it reduces waste.

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