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AUTOMATIC HAND SANITIZER

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Abstract: Automatic hand sanitizers are innovative devices that are designed to provide hygiene and avoid cross contamination. In the context of global health concerns maintaining proper hand hygiene has become a crucial aspect in order to prevent infection. It is a great way to minimize the spread of germs by eradicate the need to use a button .In the pandemic condition the necessary to use the Automatic hand sanitizer is very important The designed touchless sanitizer dispenser can be used commercially to develop a good sanitization approach towards the community In covid pandemic period the hand hygiene play a major role from getting infected and spreading of diseases. Where hand sanitizer is stationed at entrance doors in hotels ,schools, malls etc.

Keywords: Automatic hand sanitizer dispensing system, touchless dispensing ,hand hygiene, sensor technology, microcontroller.

I. INTRODUCTION

The demand for hand sanitizer has come into picture because of coronavirus . Sanitization is referred to as cleaning or sterilizing an object or hands . There are different types of sanitization process like steam sanitization, soap sanitization, flash sanitization, alcohol sanitization but alcohol sanitization is most effective.To avoid the spread of infectious diseases in the wake of the COVID-19 pandemic, it is essential to practice proper hand hygiene. People can sanitize their hands without touching any surfaces by using automatic hand sanitizer dispensers, which are a practical and hygienic alternative. A device known as an automatic hand sanitizer dispenser is one that can automatically deliver disinfection or hand sanitizer solutions. It combines many technologies and elements to offer a touchless and effective sanitization experience. In public settings where lots of people congregate, such as hospitals, schools, companies, malls, and airports, these dispensers are frequently seen.Maintaining good hand hygiene has become more crucial than ever in the present global health scenario.

The continuing COVID-19 pandemic and other bacteria and viruses can be prevented from spreading by using hand sanitizers.Automatic hand sanitizer dispensers are quite popular because they improve hand hygiene habits and reduce contact with frequently touched surfaces. An automatic hand sanitizer dispenser's idea and advantages will be discussed in this introduction.The primary characteristics and advantages of an automatic hand sanitizer dispenser are as follows:

1. Touchless Operation: The touchless operation of an automatic dispenser is one of its main features. By placing their hands under the dispenser, users can cause a sensor to release the right amount of sanitizer. As a result, there is no need to contact any buttons or levers, lowering the possibility of cross-contamination.

2. Safety and hygiene: Automatic dispensers encourage safer practices for hygiene by reducing interaction with potentially contaminated surfaces. In order to promote frequent hand sanitization and stop the transmission of germs and viruses, they make sure that users have access to hand sanitizer at strategic areas.

3. Effectiveness and efficiency: Automatic dispensers are made to dispense the right amount of sanitizer, preventing waste and assuring cost-effective use. In order to deliver a specified amount of sanitizer, the dispensing mechanism is typically calibrated.

4. Simple Maintenance: Automatic hand sanitizer dispensers are made for simple maintenance and refilling. They frequently have transparent reservoirs or indicators that let users or maintenance staff keep an eye on the sanitizer level. With quick and effective refilling, sanitizer is always available.

5. Visual Indicators: To convey essential information, many automatic dispensers include visual indicators like LED lights or screens. These indications may show battery life, sanitizer levels, or operational modes, making it simpler for users.

6. Convenience and Accessibility: People can quickly and conveniently sanitize their hands using an automatic dispenser without having to struggle with manually pumping or squeezing a bottle.

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II. LITERATURE SURVEY

In[1] the paper mentions the importance of hand sanitizer and also to stay away from getting infected from germs and microorganisms and by using hand sanitizer for a long period of time we could see that there was a reduction in the number of people getting infected.

In[2] the paper mainly tells us about the importance of alcohol based sanitizers where alcohol based sanitizers are more effective in killing the germs than other kinds of sanitizer.

In[3] the paper talks about the significance of hand washing and maintaining the cleanliness of the individual person and reducing the infection rate by using alcohol based sanitizer.

In[4] the paper tells us that coronavirus is a highly contagious infectious disease caused by severe acute respiratory syndrome coronavirus 2.It had a catastrophic effect on the world resulting in more than 6 million deaths across the world.

III. METHODOLOGY

Connect the VCC and GND pins of the ultrasonic sensor to the 5V and GND pins of the Arduino Uno board.

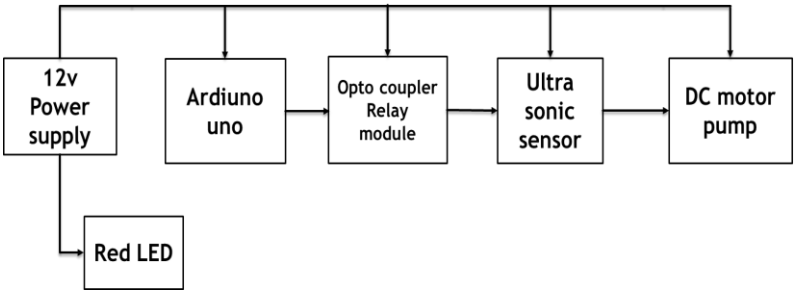
Connect the trigger (Trig) and echo (Echo) pins of the ultrasonic sensor to any two digital pins of the Arduino Uno board.

Connect the collector (C) pin of the optocoupler to the 5V pin of the Arduino Uno board and the emitter (E) pin to the GND pin. Connect the base (B) pin of the optocoupler to a digital pin of the Arduino Uno board.Connect the collector (C) pin of the optocoupler to the signal input pin of the relay module.

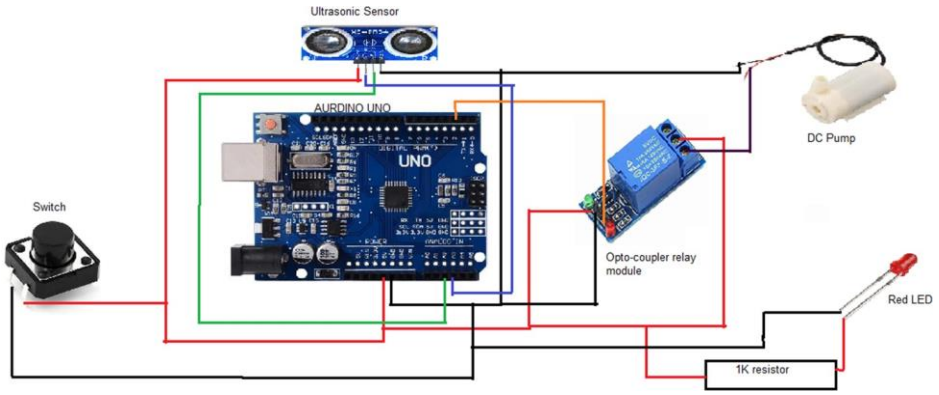
Connect the normally open (NO) terminal of the relay to the positive terminal of the hand sanitizer dispenser.

Connect the common (COM) terminal of the relay to the negative terminal of the hand sanitizer dispenser.

BLOCK DIAGRAM



CIRCUIT DIAGRAM



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IV. COMPONENTS OF SANITIZER DISPENSER MACHINE

A. Arduino Uno

The ATmega328P microprocessor is the foundation of the open-source Arduino Uno microcontroller board. It is among the Arduino family's most well-liked and often used development boards. The board was created to give professionals, students, and amateurs a simple and economical means of developing interactive projects and prototypes. Here are the key features and specifications of the Arduino Uno:

1. Microcontroller: ATmega328P
2. Operating Voltage: 5 volts 3.Analog Input Pins: 6
4. Flash Memory: 32KB
5. SRAM: 2KB (ATmega328P)
6. EEPROM: 1KB (ATmega328P)
7. Clock Speed: 16 MHz

Overall, Arduino Uno is a versatile and beginner-friendly development board that is widely used for prototyping, education, and DIY electronics projects. Its simplicity, affordability, and extensive community support make it a popular choice among both beginners and experienced users.

B. Ultrasonic Sensor

In automatic hand sanitizer dispensers, optocouplers provide electrical isolation, protection, and accurate signal transfer, enabling safe and effective system operation while maintaining user safety and avoiding damage to delicate electronic components.

C. OptoCoupler Relay module

Optocouplers can be utilized to interface between the microcontroller and other high-power components or external devices, ensuring that the sensitive microcontroller circuitry is protected from voltage spikes or electrical noise.

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Where IN pin is used to control the circuit.Where we have Normally Open(NO) which is used to connect when the relay is activated,the circuit is disconnected when the relay is inactive.Also consist of Normal Closed(NC) contacts disconnect the circuit when the relay is activated ,the circuit is connected when the relay is inactive.

D. 1K ohm resistor

The 1kohm resistor can be used as a current-limiting resistor in combination with led or other low-power components. For instance, if the dispenser has indicator led to show the status of the system, the resistor can be used to limit the current flowing through the led, preventing excessive current that could damage the LED or other components

E. LED

These are used to represent whether the system is in on or off condition.If it is in on condition then led is on or else it is in off condition.

F. 12V Power Supply

The dispenser's control circuitry is driven by the power supply, which supplies the necessary voltage and current. The operation of the dispenser is managed by microcontrollers, sensors, timers, and other electronic parts. The control circuitry is in charge of controlling several operations, including operating indication lights, keeping track of liquid levels, and activating the dispenser when it detects a user's hand.

G. 12V DC Pump

Which is a small and submersible pump .Which operates in between the range of 2.6V to 6V power supply .And consumes low power and its capacity is almost around 120 liters.

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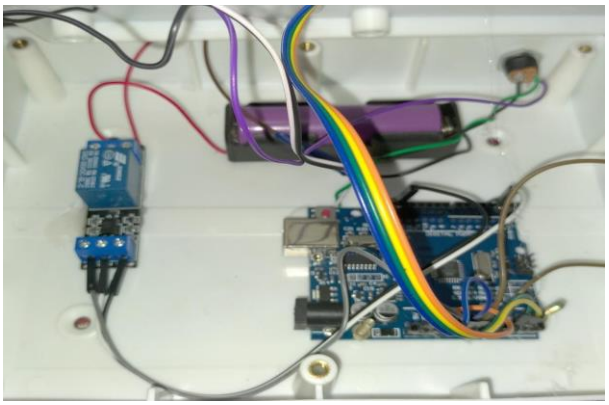
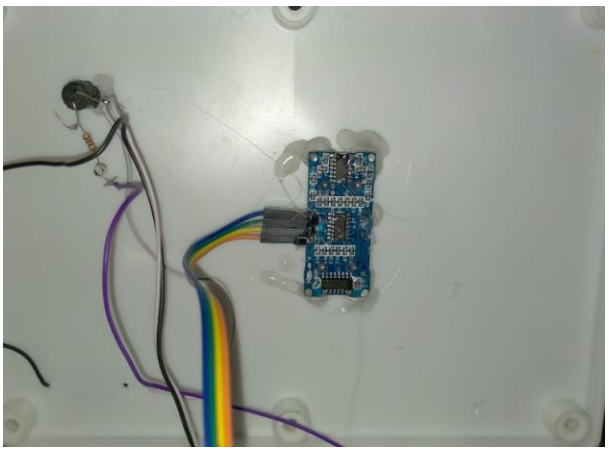
V. RESULT

In the above paper , Arduino is used as a microcontroller and it says that the hand should be placed below the sensor and sense the hand then it automatically dispenses the sanitizer and it can be refilled as per requirement .





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VI. CONCLUSION

The automatic hand sanitizer dispenser which uses arduino uno board,ultrasonic sensor,optocoupler relay module can provide a convenient and hygienic solution for dispensing sanitizer by reducing the risk of cross contamination .Where this machine is user friendly.And also it is environment friendly because the wastage is almost negligible.

VII. REFERENCES

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