Touchless Auto Hand Sanitizer Using Arduino

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Abstract—**Demand for hand sanitizers has surged since the coronavirus broke out and spread around the world. Hand sanitizers are usually applied by squirting the sanitizer liquid when one presses a pump with one's hand. This causes many people to come into contact with the pump handle, which increases the risk of viral transmission. Some hand sanitizers on the market are automatically pumped. This work focused on using the elasticity of pumps and improving people's access to devices. The automatic hand sanitizer device proposed in this paper is ultimately expected to contribute to contactless hand disinfection in public places and virus infection prevention. Addi tionally, it is economical and eco-friendly by decreasing waste emissions.**

Index Terms- Sanitizer, Pump, Alcohol, Soap, Coronavirus, Ultrasonic Sensor, Relay.

I. Introduction

Demand for hand sanitizers has surged as the coronavirus broke out and spread around the world . Alcohol gel hand sanitizers are usually applied by squirting the sanitizer liquid when one presses a pump with one's hand . This causes many people to come into contact with the pump handle, which increases the risk of viral transmission. Pressing the pump handle is bothersome, and many pass by without disinfecting their hands. Moreover, each person presses the pump handle differently, making it difficult to predict the amount of use and to manage refills and replacements. For this reason, the actual use of hand sanitizers is reduced, which does not help prevent spread of the virus .

As the global Covid-19 crisis continues to unfold, washing and sanitization of hands have become an absolute necessity in daily affairs. This contact less dispensing system helps to sanitize hands without getting in contact with the sanitizing surfaces and will help to reduce spread through cross contamination. This contactless dispensing unit sprays alcohol based sanitizer when both hands are placed under it. Contactless technology works on Ultrasonic sensor to ensure zero touch, high operational precision to completely disinfect both hands at once both hands at once.It could be wall mountable with LEDs displays to indicate on/off status and the progress of the process.

Our project can be upgraded in future by adding some extra features in the auto hand sanitizer. So, we hope that our project will create a new dimension in future. In fine, this project will help the people to prevent infected from pandemic situation of covid-19.

II. Todays hand sanitizer

A. *Uses of ordinary hand sanitizer*:

Hand sanitizers usually operate by squirting sanitizer liquid when one presses a pump with one's hand.Basically an ordinary hand sanitizer are used in every public places.

B. *Limitations of Ordinary Hand sanitizer :*

Ordinary hand sanitizer are usually applied by squirting the sanitizer liquid when one presses a pump with one's hand . This causes many people to come into contact with the pump handle, which increases the risk of viral transmission. Pressing the pump handle is bothersome, and many pass by without disinfecting their hands.

III. Our touch less auto hand sanitizer

A. *Short description:*

Our project of auto hand sanitizer are expected to contribute to contactless hand disinfection in public places and virus infection prevention. 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.

B. *How it works:*

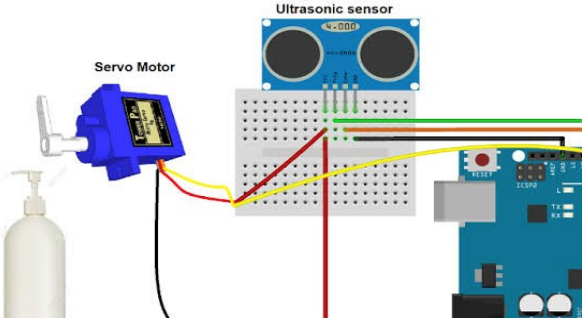
In this project we use an Ultrasonic distance sensor, Servo motor and Arduino board. here I am using Arduino Uno. You can also use any other microcontroller. When we place our hand in front of the distance sensor, it will help

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 rotate, the trigger will press.

C. *Components Used:*

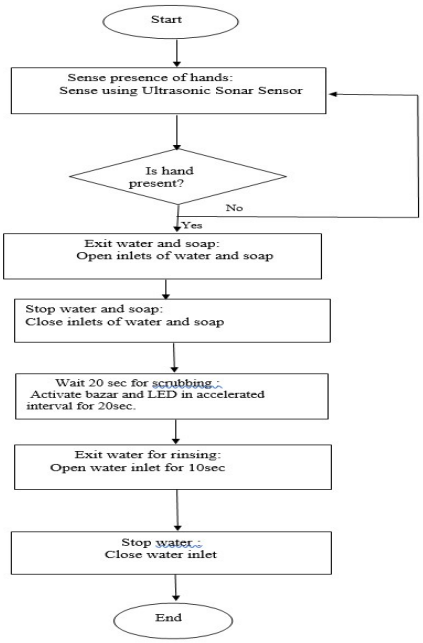
1. Arduino Uno
2. A breadboard
3. Ultrasonic sensor module-HC-SR04 (Generic)
4. Servo motor SG90
5. 9V battery
6. Hand sanitizer
7. Miscellaneous (hot glue gun, plastic tube, etc.)
8. Connecting wire
9. Led light
10. LCD display 16×2

D. *Circuit Diagram*



IV. Control Algorithm of The Touchless Auto Hand Sanitizer

A. *Flow Chart of the algorithms in Microprocessor*



B. *Arduino Code :*

```
#include<Servo.h>
#define echoPin 4
#define trigPin 5
Servo Myservo;

int long duration;
int distance;
void setup(){
Myservo.attach(3);
pinMode(echoPin,INPUT);
pinMode(trigPin,OUTPUT);

}

void loop()
{
digitalWrite(trigPin,LOW);
delayMicroseconds(2);
digitalWrite(trigPin,HIGH);
delayMicroseconds(10);
digitalWrite(trigPin,LOW);
duration=pulseIn(echoPin,HIGH);
distance=(duration*0.034/2);

 if(distance<=5){
Myservo.write(180);
}
else {
Myservo.write(0);


}
 delay(500);

}
```

V. Scope and Limitations of our Projects

A. *Future Uses of Touchless auto hand sanitizer:*

We hope that in future some of extra components will be used in our project and adding some more advanced upgraded technology our project will be more digitalized.

B. *Limitations of this project:*

Batteries wear down:

Most automatic dispensers have some sort of LED indicator that will alert maintenance staff that the batteries are low. But, when an automatic dispensers stops working, hand hygiene stops as well.

Batteries add cost:

Most touchless dispensers are very efficient and continue to work for many, many months. But, batteries do run down and will need to be replaced at a cost of at least a few dollars per dispenser. Over time, and with a lot of dispensers in a facility, this cost can really add up.

Batteries are not always available:

Maintenance personnel do not typically carry batteries with them. They also don't typically stock batteries in their inventory.

VI. Conclusions:

From the above project paper, we come to know that alcohol based hand sanitizers are more effective than soaps, and also easy to use. This project paper also says that non contact dispensing is again important to prevent virus spreading and finally, hand hygiene is most important and must be part of our daily life

References

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