DYNAMIC FAUCET USING ARDUINO FOR COVID-19

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Abstract: Coronavirus disease (COVID-19) is an infectious disease caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-Cov-2). To prevent ourselves, we should avoid touching the contaminated surface. At the same time, we should wash our hands. The sensor faucets of the present world will serve the purpose of water conservation and impediment to infection control. Generally active infrared (AIR) sensing technology is used in the hand free faucets. The receiver of this technique will demand a reflected ray (reflected by human hand) which activates the solenoid valve, so this design is complex and expensive. The sensor design of this approach will make things easy and cost efficient. Sometimes we could touch the faucet and soap bar carelessly after we wash our hands and the faucet could be contaminated. The person would then touch his/ her eyes, nose or mouth, and he/she has a higher chance of contracting this coronavirus disease. To prevent this from happening, we can use a dynamic faucet.

Keywords: COVID-19, Dynamic Faucet, Water, Hand wash.

I. INTRODUCTION

Virus spreads in two main factors: standing in close proximity with an infected person and touching a contaminated surface. To prevent touching a contaminated surface and then our eyes, nose or mouth, we must wash our hands properly for at least 20 seconds. WHO has advised us to use soap as it is a self-cleaning product and more effective at killing the virus. 20 seconds ?. It is not possible to check the clock while washing the hand. The dynamic faucet is used to wash our hand for 20 seconds and also it gives water and hand wash to wash our hand.

II. PROPOSED SYSTEM

Hands touch too many surfaces and can quickly pick up viruses. Once contaminated, hands can transfer the virus to your face, from where the virus can move inside your body, making you feel unwell. To prevent touching a contaminated surface and then our eyes, nose or mouth, we must wash our hands properly for at least 20 seconds. WHO has advised us to use soap as it is a self-cleaning product and more effective at killing the virus. Manually we can't wash our hands for at least 20 seconds because we can't check the clock while washing our hands. On that time this system is very useful. In this system, the water and soap liquid will be in stop mode for 20 seconds, so we can wash our hands for 20 seconds. The dynamic faucet is used to wash our hand for 20 seconds. The dynamic Faucet gives water and soap liquid to wash our hand. Sanitizer is a chemical product, it may be affects our hands. Some people feel that sanitizer is full of chemicals so it's not a good thing to our hands. This dynamic faucet gives the soap liquid. It will not affect our hand and the soap liquid prices is less, so all people can use this system to wash their hand. It prevents to touch the contaminated surface and also the over usage of water and soap liquid. Limited quantity of water and soap liquids is used in this system to wash our hands.

WORKING PRINCIPLE

Arduino to switch on the relay module, when the Infrared sensor detects the hand within 10 cm. The submersible water pump is switched on along with the relay module and begins to pump water through the tube connected to it. After the water flow will be stopped then begins to pump the hand wash. Both will be stopped for 20 seconds. Again it begins to pump the water. After the water flow and handwash will be stopped until the sensor detects the hand.
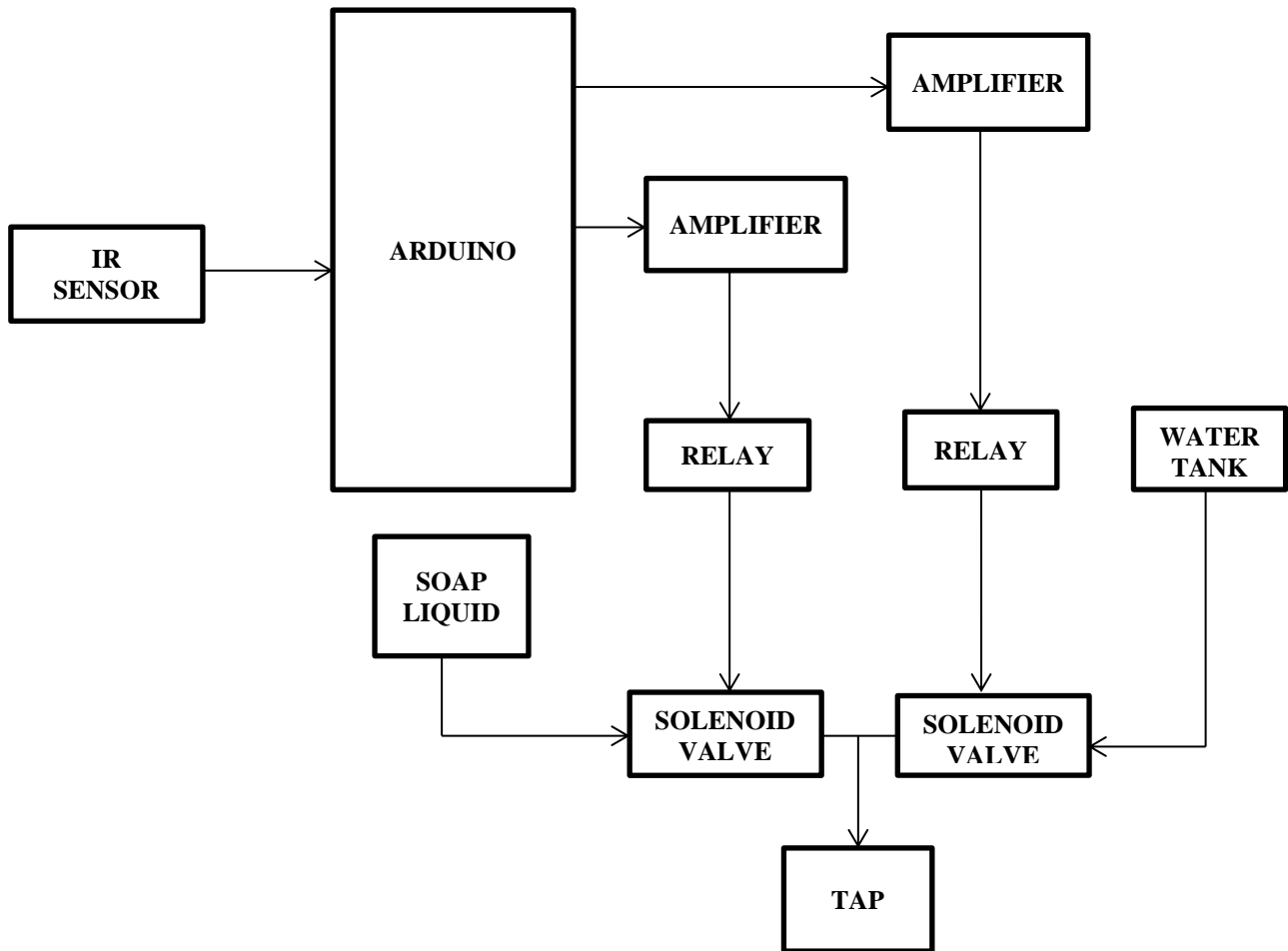
Fig. 1 Proposed System

III. MATERIALS AND METHODS

Materials used in this project are Arduino UNO, DC motor, IR Sensor, Amplifier, Relay, Solenoid Valve and Tap.

ARDUINO UNO

The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button.

Fig. 2 Arduino UNO

IR SENSOR

An infrared sensor is an electronic device, that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. These types of sensors measure only infrared radiation, rather than emitting it that is called a passive IR sensor.

Fig. 4 IR Sensor

AMPLIFIER

Amplifier is an amplifier that changes output current according to changing input voltage. The process of increasing the signal strength is called as Amplification. ... Almost all electronic equipment must include some means for amplifying the signals.
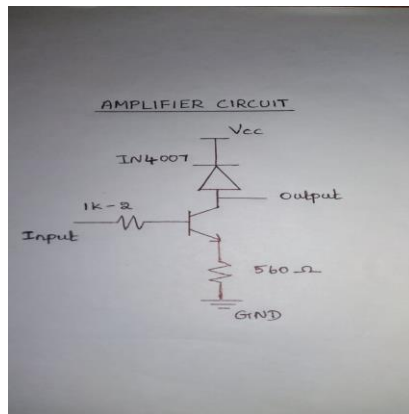

Fig. 5 Amplifier Circuit

RELAY

Relays are electrically operated switches. They are used to control a circuit by a separate low-power signal or to control several circuits with one signal. The three main types of relays are electromechanical, solid-state, and reed. This overload protection relay reacts to overheating. A relay allows circuits to be switched by electrical equipment: for example, a timer circuit with a relay could switch power at a present time.

Fig. 6 Relay

SOLENOID VALVE

Solenoid valves are used to close, open, dose, distribute or mix the flow of gas or liquid in a pipe. The specific purpose of a solenoid valve is expressed by its circuit function. Solenoid valves are control units which, when electrically energized or de-energized, either shut off or allow fluid flow. The actuator takes the form of an electromagnet.

Fig. 7 Solenoid Valve

TAP

A tap is nickname for faucet because it connects to water line so people began saying tap water.

IV. RESULT AND DISCUSSION

Fig. 8 Dynamic Faucet using Arduino

IR sensor is used to detect our hand within 10cm after that it gives input to the Arduino so the Arduino will turn ON. The Arduino is used to control the Solenoid valve so the water will flow for 5 Seconds then the water will be stop. Then, soap liquid will flow for 5 seconds after the water and soap will be stop for 20 seconds because WHO advices to wash our hand for at least 20 seconds. Finally water will flow for 15 seconds. After the Arduino will be in OFF mode until the IR sensor detects the hand.

V. CONCLUSION

COVID-19 has affected millions of people and has claimed the lives of hundreds of thousands of people from all over the world. We can curb the spread of coronavirus by using this dynamic hand wash. This dynamic faucet system is non contact and automated. This project says that non contact dispensing is again important to prevent pathogen spreading and finally, hand hygiene is most important and must be part of our daily life.

REFERENCES

[1]. R. Vedula, V. K. Bachu, and P. S. P. Reddy, "A Hygienic, Cost Effective, Hand Free & Water Conservative Sensor Faucet", International Journal of Engineering Inventions (IJEI), Vol. 3, Issue 2, pp: 32-37, September 2013, e-ISSN: 2278-7461, p-ISSN: 2319-6491 and Technology 2019 Journal of Physics: Conference Series 1569 (2020) 032073.
[2]. Akshay Sharma A S, Review on "Automatic Sanitizer Dispensing Machine", July 2020, International Journal of Engineering and Technical Research V9(07).