IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 9, Issue 11, November 2021

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 7.542

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 7.542

|| Volume 9, Issue 11, November 2021 ||

| DOI: 10.15680/IJIRCCE.2021.0911020 |

Automatic Hand Dryer Using Arduino And HC-05

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ABSTRACT: In everyday life, particularly in colleges, schools hospitals, people typically use cloth or tissue to dry hands. It seems less practical, effective and hygienic. In addition, some restaurants still use cloth or tissue as well. To overcome this problem, we are proposing automated hand dryer using arduino. The proposed model is built using arduino Atmega328 microcontroller, ultrasonic object detection sensor, relay and hot air blower. This is designed in such a way that when user places his hand near the blower, the sensor will detect it and it will start blowing hot air for few seconds so that all the water droplets are vanished.

KEYWORDS: arduino, ultrasonic sensor.

I. INTRODUCTION

The transmission of bacteria is more likely to occur from wet skin than from dry skin, the proper drying of hand after washing should be essential component of hand hygiene producers. In the hand dryer system, hot air blower is used for air flow as a control element to operate sequentially that is control by the programmable relay and arduino. The arduino receives instruction from the object detection HC-05 sensor and then activates the dryer. It supplies warm air current to dry up the completely washed hand. This machine is specially designed for used in various restaurants, office, testing area, public toilet and as for the general domestic drying of the hand at home. The usage of these products is to promote hygienic lifestyle. Besides that, it produces new technology which helps to prevent the wastage of water and easy to use for all user

The advantages of automatic dryers are obvious. The first is hygienic hand dryer, reducing the possible spread of germs that could be left on the dryer. The second is energy savings. You only use the dryer for as long as you need it. Many timers are set for 30 seconds. But the user may choose to leave after only 10 seconds of drying, wasting energy used for the rest of the cycle. On the order hand, another user may dry his hands for 35 seconds, wasting almost an entire second's push of the button

Problem Statement: In most the public walk in places such as bars and restaurant all over the places resort to hand towels in cleaning of hands. This has brought about a problem of contracting diseases through the use of same hand towels by many people.

The recent covid-19 virus outbreak caused a very big wrath such that researches should be carried out in better techniques of hand drying in public places like bars, restaurants, hotels, colleges etc . A technique that should have a feature such that no two persons can use the some towel to clean hands is necessary and should be adopted. This quest resulted to a research on the design and implementation of automatic hand-drier that dries a wet hand without having handy contact with the system.

This proposed system will reduce/prevent contracting of deadly diseases through the use of contact-method of hand cleaning in public places.

II. RELATED WORK

Hand Hygiene is one of the most effective strategies to mitigate the transmission of pathogens and avoid outbreaks, such as the virus COVID-19. Community members will provide a vital role in the battle against COVID-19 by implementing regular hand hygiene as a component of their daily activity. Promoting the practice of handwashing with soap and water is one of the simplest, low tech and most cost-effective public health measures to prevent transmission of COVID 19 as well as many other communicable diseases[2]. The COVID- 19 outbreak has given renewed attention to the failure of community preparation and its effect on urban health in emerging nations [3]. Soap must be used in association with flowing water in handwashing is a primary method to avoid the transfer of COVID-19 [4] [5] [6].

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In this health practice, it will fight COVID-19 and will help individuals associated with health risks [7] and those of the children [8]. In fact, this is an important method of infection control [9] or limiting the spread of this pandemic [10]. Better soap-washing percentages on key public health instances have been shown to be very reliable [11].
The availability of handwashing stations is perceived to be a simple personal hygiene activity with a positive externality in terms of public health benefits. Its access also depends on the availability of a secure supply of a sufficient quantity of water and reasonable rates. From the study of Jolan Baccay Sy and his friends, they stated that multi-station automatic hand wash provides complete and hygienic hand washing activities with soap and water through its several stations that apparently and essentially operate independently of each other, satisfy the WHO handwashing duration standard and accommodate the WHO handwashing technique [12].

III. METHODOLOGY

Arduino UNO [9]–[6] is a type of microcontroller that is based on the concept of a Microchip ATmega328P microcontroller that controls the input or output of the smart irrigation system. Ultrasonic sensor is an electronic component that can determine the distance to an item by using a sound wave. It calculates distance by sending a sound wave to a particular frequency and by listening to the sound wave rebounding. Simple DC motor was also used in this project. It uses two voltage sources both DC with 5V and 12V output. Other important components utilized were 12V relay, blower fan with heating element. Whenever the people place hands near the sensor less than 15 cm it will trigger the hot air blower. The blower will run for 10 seconds then it will stop.

COMPONENTS USED

1. Arduino Uno
2. Ultrasonic sensors (HC SR-04)
3. Simple DC motor model 1 – 12-V DC voltage source
4. 5-V DC voltage source
5. Relay (12 Volts)
6. Blower Fan 1- with Heating Element

Flow Chart

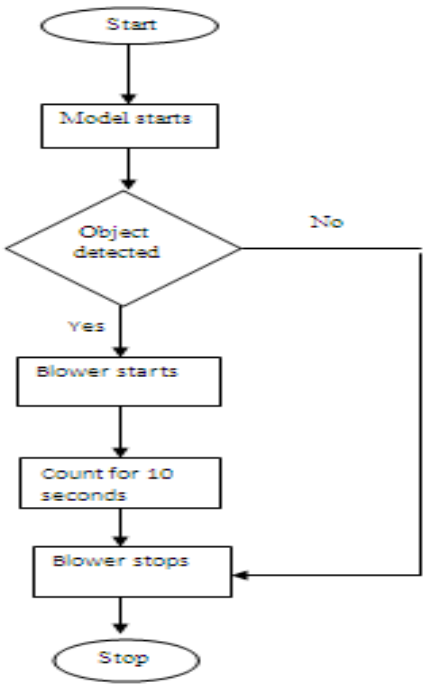

Figure 1: Work flow of the proposed model

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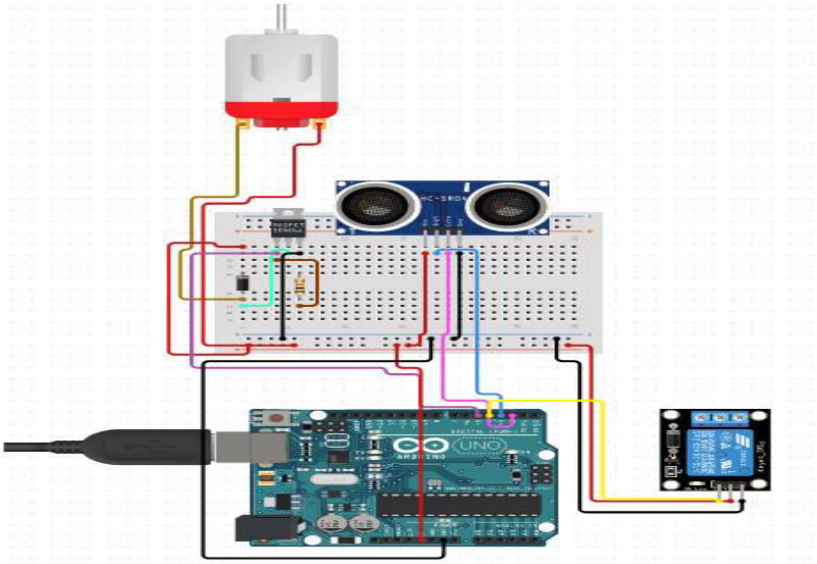

Figure 2: Circuit Diagram proposed model

IV. RESULTS

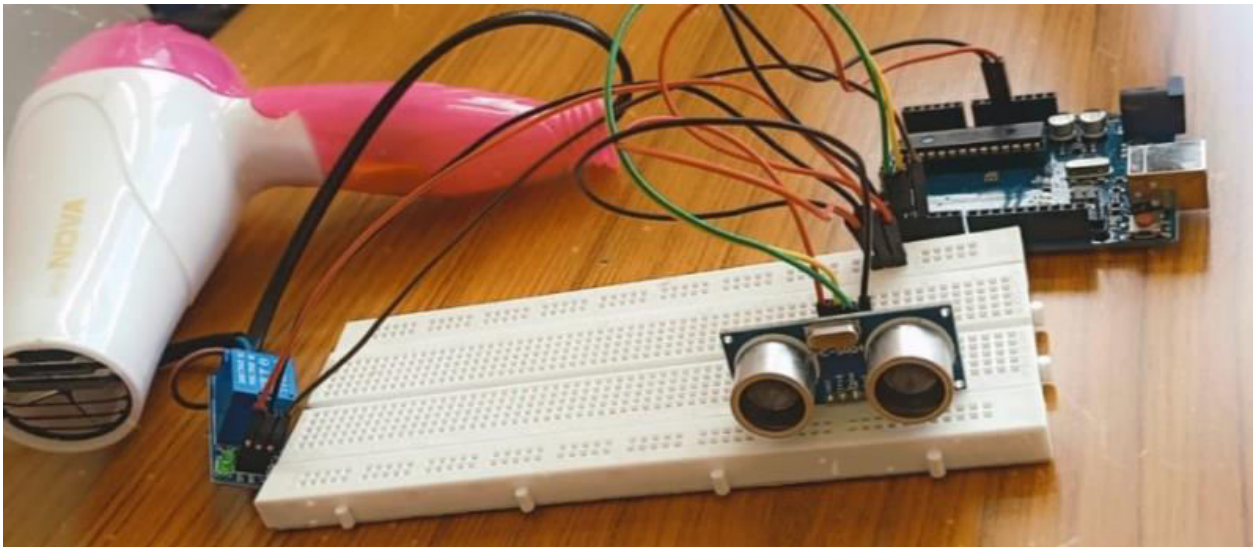

Figure 3: The proposed Hand dryer Model

V. CONCLUSION

The task of construction of the automatic hand drier was challenging and interesting. It can be seen that the described circuit (Automatic hand drier) will operate when a user places his hands in the direction zone and remains there for a short moment, but the drier will not operate for an overly long period of time, which would waste power. Neither would the drier operate in response to momentary or passing signals, but it will shut off if a user momentarily removes his hands from detection zone. The objective of this project work was actually realized.

The automatic hand drier is recommended for us in colleges, offices, hotelsand residential home etc. This automatic hand drier is recommended for use in any circumstances to dry the hands. It is also recommended that more research should be carried out on the design and construction of the hand drier so that a reduced size can be achieved.

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REFERENCES

1. Ansari, SA; Springthorpe, SV; Satter, SA; Tostowaryk, W; Well, GA (1991). Comparison of Cloth, Paper and Warm air drying in eliminating viruses and bacteria from washed hands. Am. J. Infect. Cont. 19(5):243-249.
2. Bezerra, AS (2007). Economic viability analysis of replacing paper towels by electric hand dryers in public restrooms. Revista Ciências do Ambiente On-Line.3(1):1-6.
3. Bonol, JW (2007). International Association of Societies of Design Research. The Hong Kong Polytechnic University. Huang, C; Wenjun, MA; Stack, S (2012).The Hygiene Efficacy of different Hand drying Methods. Mayo Clinic Proceedings. 87(8):791-798.
4. Hareendran, TK (2014).Design and Construction of automatic hand dryer with temperature display.www.electroschematics.com//1040/autom atichand-dryercircuit
5. Matthews, JA; Newsom, SWB (1987). Hot air electric dryers compared with paper towels for the potential spread of airborne bacteria. J. Hos. Infect. 9(1): 85- 88.
6. Moltalbo, T; Gregory, J; Kirchain, R (2011). Life Cycle Assessment of hand drying systems. Massachusetts Institute of Technology. http://msl.mit.edu/publications/handDryingLCH. Ramos, RG; Filho, RCP; Lobo, RRS (2009). Analysis of the efficiency of electric dryers and paper towels for hand drying. 5(2):1-5.
7. Ramos, RG; Filho, RCP; Lobo, RRS (2009). Analysis of the efficiency of electric dryers and paper towels for hand drying. 5(2):1-5.
8. Rochester Institute of Technology (2013). Sustainable Hand Drying. www.rit.edu/affiliate/ nysp2i/sites/rit.edu.affiliate.nysp2i/files/12rdsc15_sus tainable_hand_drying.
9. Stephen, R (2018).Microcontroller based automatic hand-dryer system. http://afribay.com/works/ Microcontroller-based-automatic-hand-dryersystem.
10. Yamamoto, Y; Ugai, K; Takahashi, Y (2005). Efficiency of Hand Drying for Removing Bacteria From Washed Hands Comparison of Paper Towel Drying With Warm Air Drying. Infect. Cont. Hos. Epidemiol. 26(3):316-320.

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Impact Factor: 7.542

doi cross ref

ISSN INTERNATIONAL STANDARD SERIAL NUMBER INDIA

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