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Smart Disinfection and Sanitation Tunnel

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ABSTRACT: Covid-19 is an going pandemic and causing a drastic loss to every individual in the society. In order to eradicate the pandemic people, need to follow or use some preventional methods such as social distancing, wearing mask, using disinfection sprays. One of such method is “Smart Disinfection and Sanitation Tunnel”. The smart disinfection tunnel helps in spraying the disinfectant which is a combination of Sodium Hypo chloric and Water (NaOCl & H₂O). The smart disinfection tunnel is mostly stationed at crowded places such as malls, hospitals, government offices, etc.,In the way society can be freed from COVID-19.

KEYWORDS:COVID-19, Arduino, Ultrasonic sensor

I.INTRODUCTION

Covid-19 pandemic commonly known as coronavirus which is an ongoing worldwide pandemic. This pandemic is making everyone to suffer a lot.). The person affected by the virus can be recognized by mild symptoms like cold, cough, respiratory problems, fever. People should have good immune power in order to fight against the pandemic. The virus also causes breathing issues. The virus can be easily spreaded from one person to another person rapidly. Children and people senior citizens will be have numerous issues. There is a need to protect ourselves because it is more dangerous than we expect. People among every country are getting affected internally and externally, not only health wise it is also affecting economically. There are lots of issues which are included in economic aspect such as imports and exports between the countries has been stopped, this mainly affects the economy of the country. Both govt and private sector people who are contributing their services are facing problem. Every person is becoming hopeless on their lives based on the current situations of the pandemic. This pandemic is creating a drastic circumstances .

The first case of covid-19 is recorded in Wuhan city in China (2019). The virus in a person will be identified within 15 days and if the person affected by it is not quarantined it may spread to other person. The affected person should stay away from other people and animals too. In order to protect ourselves we need to follow some measures which are imposed by government of our country like maintaining social distance, wearing masks, using sanitizers etc., Sometime people may fail in following these rules at crowd places like malls, hospitals, temples, stations etc., So we have come up with an idea of designing a smart disinfection and sanitation tunnel that disinfects or sanitizes externally from head to toe. The solution which is used for spraying is the combination of sodium hypo chloride and water. In this way the presented smart disinfection and sanitation tunnel helps people to stay safe.

II.LITERATURE SURVEY

Ganti S .Murthy had decided to help society during COVID-19 pandemic by sanitizing passenger luggage in order to implement his idea of introduce the sanitization tunnel that make sure the passenger luggage get sanitized. This tunnels can be utilized at airports, stations, etc... This tunnel is designed with low capital. Murthy have designed UV-C based illumination system enclosed inside the tunnel. But this proposed/implemented tunnel cant used for human sanitization purpose there is no protection for human beings is protected.[1]

Kim and Lee have proposed a walk through screening centre for COVID-19 . It means their idea is based on the intention of scanning from individual suffering from respiratory problems, fevers. This screening centre only analyses internal problems but do not provide any protection to human beings externally.[2]

Jaiteerth R. Joshi, According to joshi, the COVID-19 can be easily spreaded through many ways like COVID-19 affected person may carry this virus in each and every part of him. Joshi had proposed a chamber to collect the samples related to throat ,nasal for the diagnosis of COVID-19 suspected person. The name of the proposed chambers COVID-



19 sample collection kiosk, it helps in the elimination of virus and the kiosk will be sanitized after, every 3min of collection.[3]

Giuseppe Lippi , Sunil Sethi, According to Giuseppe Lippi and Sunil Sethi, the coronavirus is an dangerous pandemic that begin in 2019. It is also causing severe damage to the laboratory professionals like scientist. The professionals play a key role in inventing the equipment’s or materials that are related to current situations. If these professional’s gets affected there will be no further solutions for the pandemic. In order to protect them the author recommended some bio-safety measures and techniques.[4]

Gen Taikagi, Kazuyoshi Yagishita, Now a days medical collapse became a major concern under coronavirus disease 2019 outbreak and there is a need for the prevention of medical accidents. The authors view is to provide the guidelines regarding the safety measures towards prevention of infection. The author also offers some precautions measures in some medical facilities like haemodialysis rooms, intensive care unit, hyperbaric oxygen therapy chambers.[5]

III.PROPOSED SYSTEM

The tunnel is designed to provide maximum protection to the human beings. The proposed smart disinfection sanitization is designed to sanitize is individual externally before they get affected internally. If a person, firstly is sanitize externally then there will be less chances of getting affected internally. The smart disinfection and sanitization tunnel can be designed in less time span.. The tunnel is designed in order to help the society against COVID-19. Smart Disinfection and Sanitization Tunnel plays a key role during during this pandemic.

Many components like ultrasonic sensors, sprinklers, motors. Arduino are used in order to carry out the project. The tunnel can be stationed at crowded places such as malls, hospitals, stations, airports, etc... The person in the tunnel will be sanitized for a time period of 12-15 seconds. This tunnel also helps in protecting a person from any kind of bacteria. If a person is protected in this way there will be no chance for the spread of COVID-19. The tunnel is designed in order to help the society against COVID-19. Smart Disinfection and Sanitization Tunnel plays a key role during during this pandemic.

The protection can be done by spraying process in the disinfectant solution is a mixture/combination of sodium hypochloride (NaOCl) and water (H2O). There is no chance of getting infected/effected by using this solution

BLOCK DIAGRAM

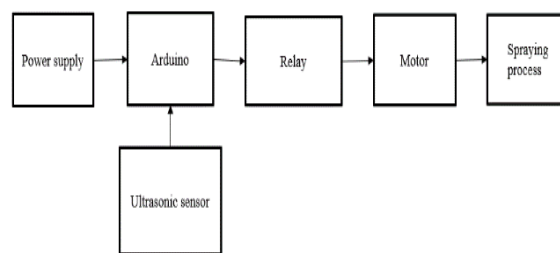


Figure 1:Block diagram for smart disinfection and sanitation tunnel

The Block diagram depicts the working of each component during the operation and connection between the components.The whole operation is controlled by Arduino and the main connections are given each component using Arduino and power supply . But Arduino works in the presence of power supply. Here Arduino and power supply plays a key role in working principle. LCD ,relay, ultrasonic sensor, motor are dependent of Arduino. Arduino has several pins which are connected to the pins of other components.

The Block diagram represents Hardware arrangement of components of smart disinfection and sanitation tunnel. When once a person enters a tunnel Ultrasonic sensor senses him/her using Arduino Uno. Once the person is detected Relay gets turned on as well as motor. The motor will make sure that sanitizer sprays all over the body of entered person.This process is determined using the block diagram.



FLOWCHART

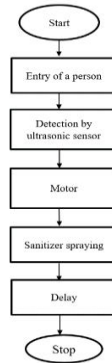


Figure 2: Flow Chart for Smart Disinfection and sanitation tunnel

The ultrasonic sensor here used for sensing purpose . when a person enters the tunnel ultrasonic sensor senses the person using Arduino connections and makes the power relay to get turned on. Power relay is used because it is responsible for spraying purpose. Relay gets turned on once it gets intimation from the sensor. Once the person leaves the tunnel ultrasonic sensor does not receive any signals or radiations and it make sure that the relay to turn off.

Once the relay gets turned on the motor starts working and starts to supply the sanitation liquid through every pipe. The liquid is passed through the pipes and sprayed on the person in the tunnel using sprinklers which are placed at some positions inside the tunnel .This process happens for the time limit that is provided in the code i.e., 10-15 seconds .The exit of person makes the operation to stop.In this way the whole block diagram works.

IV.RESULT

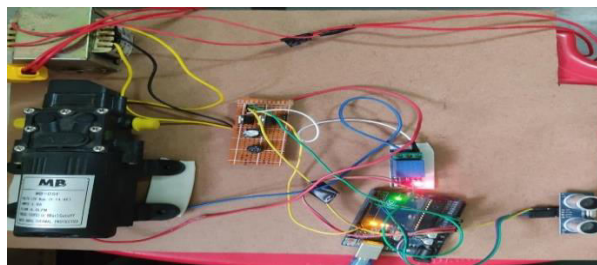


Figure 1: circuit before the input(human being)

The above figure represents the kit for smart disinfection and sanitation tunnel before the sensor sensing the human being.

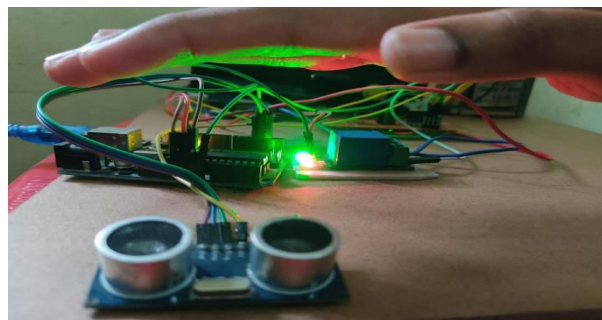


Figure 2: sensor sensing the human being



The above figure represents sensor sensing human being at a distance of 15cm.

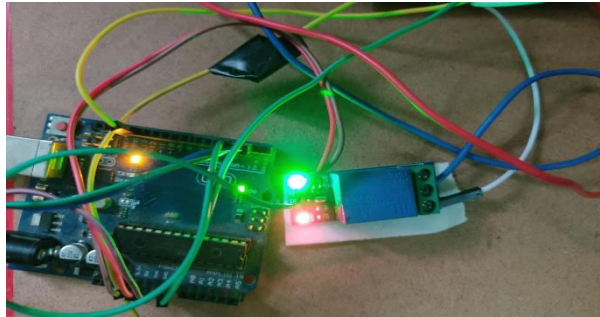


Figure 3: The Relay getting turned on after sensing human being

When the sensor senses the person relay gets turned on. The relay will be on for a time span of 15 sec and then gets turned off.



Figure 4: Working of Motor w.r.t Relay

Once the relay gets turned on motor starts working and motor helps in further process of sanitation.



Figure 5: sanitation process

The sanitation liquid is sprayed through tubing pipes and sprinklers.

V.CONCLUSION

The project is an IoT-based hardware related project. The complete project is controlled or operated using Arduino. The COVID-19 pandemic is causing severe damage to the world and we have to protect ourselves. We can use some techniques in order to prevent the spread of pandemic. Among all the techniques the main technique or process to prevent COVID-19 can be done by maintaining social distance, wearing mask, sanitizing ourselves. Smart disinfection and sanitation tunnel plays a key role in protecting a person externally before getting internally affected. This tunnel helps to have many advantages against the pandemic. At last we conclude that the main idea of us doing this project is to provide safety to the society.



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