



Economical Automatic Sanitizing Machine

¹Achyuta Nand Mishra, ²Vijay Kumar Gupta, ³Pavan Kumar Shukla, ⁴Chandan Choubey,
⁵Anupam Kumar Yadav

¹Department of Electronics and Communication Engineering Supaul College of Engineering, Supaul

²Department of Electronics and Communication Engineering Government Engineering College, West
Champaran

^{3,4,5} Department of Electronics and Communication Engineering Noida Institute of Engineering and
Technology, Greater Noida

Abstract- The healthcare sector is one of the largest and most crucial fields, as it addresses people's health conditions and aims to enhance life expectancy. Numerous doctors and medical organizations are actively involved in this field, and we are also contributing to its ongoing development.

Many doctors are working day and night in this COVID pandemic to save the lives of these persons who are not even taking care of themselves and we have always learned that “preventions are better than cure”, all this pandemic is about taking proper sanitization and hygiene which is the only way to stop this spread to spread and get rid of this problem. But no-body is taking proper measures in the right direction so as a part of this nature we have to contribute to doctors by taking proper measures and reducing the pressure over them.

The primary objective behind developing this machine is to support the healthcare sector and assist doctors in maximizing their efforts during the pandemic, as they continue to serve the nation with dedication. The concept involves creating a sanitization device designed to disinfect individuals in an economical and efficient manner, with a strong emphasis on the importance of health.

The device will be constructed using 100% recycled and recyclable plastic, promoting sustainability and helping to reduce pollution. Arduino programming will be implemented to measure body temperature and activate the pumps automatically. The use of recycled materials not only lowers production costs but also makes the device an environmentally friendly and cost-effective solution.

Keywords

Automatic Sanitizer Machine, Sanitizer Machine, Disinfection, Hygiene Machine, Infection Control Machine

Introduction

The entire world is currently facing the challenges of the COVID-19 pandemic, and India is no exception. However, our government responded promptly by implementing an early lockdown, which played a significant role in controlling the initial spread of the virus. Despite these efforts, cases continue to rise gradually. In response, we have undertaken this project with the goal of helping to prevent further transmission of the infection.

The core idea of this project is to design a tunnel-like entry passage that can assist in minimizing the spread of the COVID-19 virus. Essentially, it is an entrance door with an aesthetically designed tunnel structure, featuring two enclosed sides made of sheet material and two open sides for entry and exit. When a person enters the tunnel, sensors placed on the side sheets detect human presence and activate the circuit system.

Once triggered, the system performs two key functions: First, a laser temperature sensor measures the individual's body temperature and displays it on a screen within seconds. Next, a set of sprayers is activated to dispense disinfectant over the person's body for approximately 5–7 seconds—an optimal duration for effective sanitization. After the spray cycle is complete, the system automatically shuts off, allowing the individual to exit through the other end, having completed the sanitization process.

Literature Survey

Halina Hotłoś [1] has controlled the pressure of the pipes and reduces to its optimum pressure, so that the ejection of liquid or gas should be efficient. R Lorz [2] has developed paper cardboard. C Chen [3] has established lithium ion battery with good safety and stability. P Lefferson [4] has got a control over pressure of water with the help of pressure pump. Thomas J. Batko [5] has introduced and used PIR sensor that sense the presence of human by sensing the temperature. Brian S. Hammond [6] has developed alcohol based liquid hand sanitizer that can be used to disinfect from viruses. Lee, J. [7] has introduced and developed automatic hand sanitizer device. Osman, K., Isa [8] has convert the spray of liquid into stream through various respective points. Vijaya kumar [9] has introduced strand like structure made with metal alloys. Petrescu, F. I [10] has developed and used Light emitting diode that can be used for light indications. Stefanopoulos, P. K [11] has discovered the flow of current. Higashi R. E [12] has developed IR sensor which can detect distance between the objects. Brittain, P. N. [13] has introduces cylindrical pipe made of plastic. Yoshioka, N. [14] has discover fibrous thick sheet of fiber in the different projects.

Principle and Methodology

As per the dynamics, if we talk about moving fluid either liquid or gas, the pressure, velocity and elevation, the compression and viscosity frictions (negligible) and the flow is steady, or laminar. It was first made in year 1738 by Swiss mathematician Daniel Bernoulli, in which that effect of total mechanical energy in flowing fluid is constant, without considering energy of pressure, gravity and elevation. It is conservation for fluids (ideal) in steady, or streamline flow, and also widely considered in real life engineering applications. Basically, when we are talking about the methodology of the project, we come across two different principles which are I. Bernoulli's theorem ii. Different types sensors.

Bernoulli's Theorem: As per the dynamics, if we talk about moving fluid either liquid or gas, the pressure, velocity and elevation, the compression and viscosity frictions (negligible) and the flow is steady, or laminar. It was first made in year 1738 by Swiss mathematician Daniel Bernoulli, in which that effect of total mechanical energy in flowing fluid is constant, without considering energy of pressure, gravity and elevation.

It is conservation for fluids (ideal) in steady, or streamline flow, and also widely considered in real life engineering applications. PIR sensor is a device that is used to measure (ir) light radiating from body in its field of view. & Thermal Sensor is device which is used to measure the temperature of body.

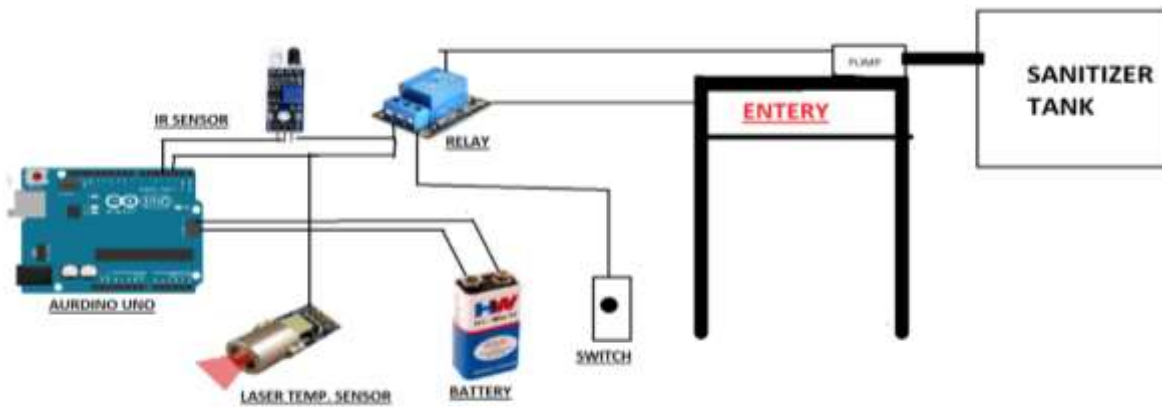


Figure 1. Hardware circuitry of automatic sanitizing machine

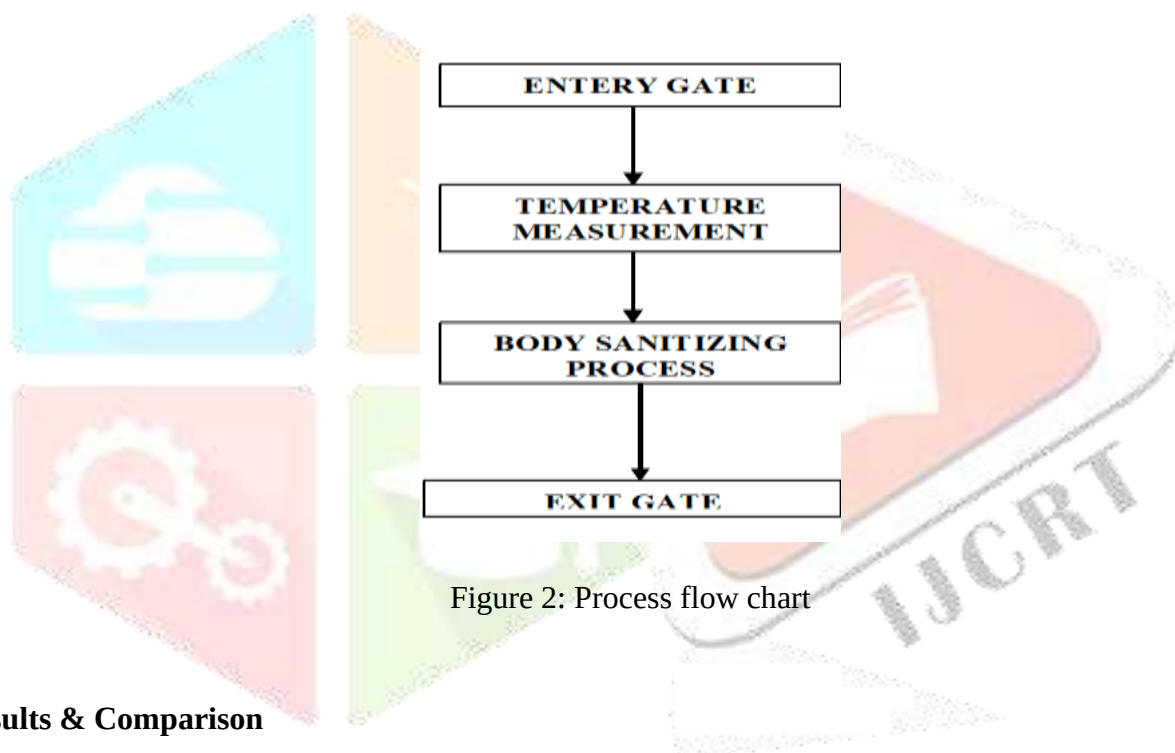


Figure 2: Process flow chart

Results & Comparison

After making all the possible connections and calculations we have reached to a final result, our device is capable of removing all type of bacteria and virus present on a human body by using the sensor such as PIR sensor for human body detection. Thermal sensor uses for temperature sense of human raw material, disinfected chemical which have fitted inside our device. When the people enter into tunnel types machine thermal sensor firstly measure the body temperature of people and PIR sensor sense the human body then after spray disinfected chemical on human body by which removing all the bacteria present on human body .finally we have come to a conclusion that our machine capable to make the person virus free & break the chain of spreading bacteria. Our machine is very less maintenance required and operated automatically without any need of human.

This results in a walk ways structure which will try to stop the COVID-19 pandemic wide spread.

Other projects	Proposed project
• Other project cost is very high approx. 40k-60k • High maintenance charge • Sanitization and temperature are possible individually • Less reliable • Use high cost material to cover the side of project. • Complex installation	• Our project cost is less. • Low maintenance charge. • Sanitization and temperature are possible at same time. • More accurate & reliable. • Use low cost material to cover the side of project. • Easy installation

Conclusion

Hence, the objective is to create a device which is very useful in removing all type of jobs and Corona causing virus with the help of sprayers and disinfected solution using a walk away door like structure through which human can pass and within a minute he will be totally disinfected by the spray this would surely going to help in health sector and widely can be used at any entrance of a huge gathering places like Malls, Schools and Hospitals and can easily get through all the Threats of coronavirus in our country.

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