



DESIGN AND FABRICATION OF SANITIZER SPRAY MACHINE

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Abstract: There have been a lot of confidence-building measures rapidly instituted in the current corona virus disease 2019 (COVID-19) pandemic without any scientific evidence to back them up. Foremost among these measures is the so-called 'disinfection tunnel' (DT) or 'sanitization tunnel.'¹ These are stationed outside crowded places such as vegetable markets, offices, shopping malls, and hospitals. People can walk through them or even ride through them on two wheelers. Essentially, these tunnels spray a mist of sodium hypochlorite solution. The first DT was installed in China and was imitated by other countries and cities.^{2, 3} These portable structures are made of steel and poly vinyl chloride (PVC) with the distance varying from 16 ft to 25 ft and can be of static and dynamic types.^{4, 5} In the static type, the person rotates inside the station for 10–15 min, and the disinfectant is sprayed from nozzles arranged in whole of the circumference

Index Terms – Fogging Nozzle, Disinfectant Tunnels. Sanitizer Spray Machine.

I. INTRODUCTION

The machine is uses atomizers to disinfect the area. these sanitization machines spray the disinfectants in a way that kill the germs and virus at any solid surfaces. It will kill up to 99.9% of common germs that can be transmitted by contaminated hands. It will provide a better skin tolerance and microbial killing strength when compared to antiseptic soap. The machine will operate without contact and its activated through sensor. It is particularly good destroying genetic material in covid-19. at the office, in the classroom, or in any space with lots of foot traffic, germs spread quickly. And even if you're not getting ready to eat or taking out the garbage, other people's germs can affect you (especially in close quarters).

That's why having hand sanitizer available is ideal for group settings. Teachers, students, and office workers can kill germs periodically throughout the day without having to leave their classroom or desk, and gym-goers can use a squirt of hand sanitizer before hopping on the next workout machine. Especially during flu season, minimizing your exposure to other people's germs is crucial for your health. When you take a moment to sanitize your hands a few times throughout the day, you reduce your chances of getting sick. Even a quick trip to a friend's house or the store can expose you to germs that could cause a cold, the flu, or other illnesses, so keeping your hands as clean as possible is important. This might be one of the most surprising benefits of hand sanitizer, but it isn't too good to be true. Hand sanitizers that do not contain alcohol can actually improve the texture of the skin on your hands.

II. LITERATURE REVIEW

Akshaya Sharma A S et.al [1] the hospital grasped infections, which is about 2 Million Patients per year and also says that it is 8th leading cause for deaths annually in USA. It also says that hand washing is important and also effective with proper hand washing steps, but washing with soap and water is time consuming for peak hours in hospitals. This paper also showed the effectiveness of the alcohol-based hand sanitizers, which reduced infection rates by whopping 30%. They used hand sanitizers with 60 to 70 percent ethanol or isopropanol for reducing significant number of pathogens. The patients were also given about.

Manjunath badri S M et.al [2] For 10-month period of using hand sanitizers showed a result of 36.1% infection reduction. The paper says about the infection caused by drug resistant micro-organisms which causes increase in death rate and also complications, the multidrug resistant bacteria include Methicillin Resistant Staphylococcus aureus (MRSA), Extended Spectrum Beta-lactamase (ESBL) producing bacteria, Multidrug Resistant Pseudomonas aeruginosa (MDRP), which are very common worldwide. Several antibiotics have increasing multidrug bacteria isolation rate, even personal protection equipment (PPE) can't be effective in isolation rate of MSRA. Hence, they emphasize about the use of alcohol-based hand sanitizers since the alcohol-based hand sanitizers had negative association with MRSA isolation rate, which means that hand hygiene is very important in hospitals.

Vickey rover J P et.al [3]: This paper says about emergence of the novel Corona virus (SARS-CoV-2), which has caused unexpected challenges to health of the people of this world, the paper also aims at reducing the transmission rate of the disease. The paper explains about the virus structure and how is it different from that of the bacterial structure, which means that virus has single stranded or double stranded RNA or DNA encapsulated in capsid and virus can replicate only in presence of a host and described as living entities. Bacteria also has almost the same structure including DNA or RNA along with Cell Membrane and can replicate without a host. The paper also gives a complete comparison between hand sanitizers and soap, foam vs gel, and it says that high concentration of ethanol can reduce the amount of virus particle present in the hand and hence proves the effectiveness of alcohol-based hand sanitizer

III. PURPOSE OF PRESENT STUDY

The objectives of our project work are as follows:

- To design a low cost sanitizer spray tunnel.
- To fabricate less complex sanitizer spray tunnel.
- Use of Silver ion technology to kill viruses & bacteria.

IV. METHODOLOGY

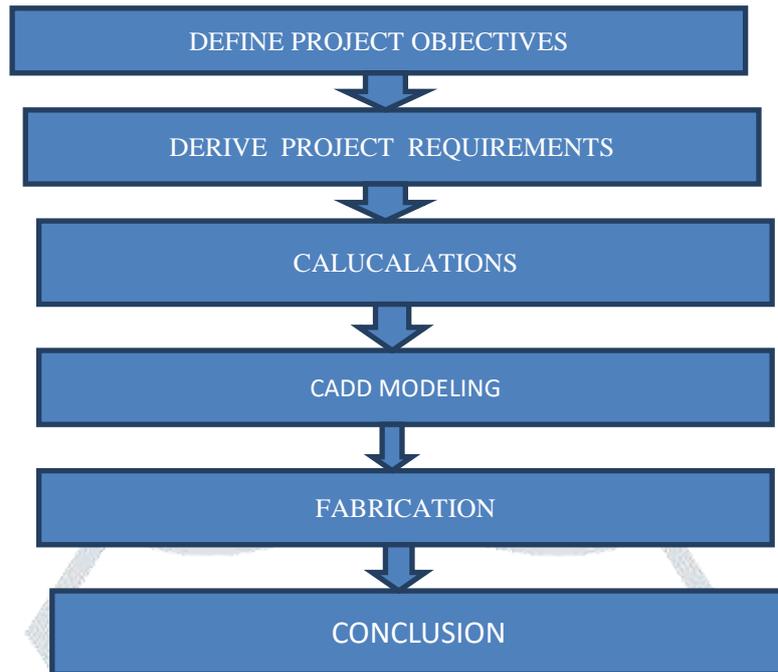


Figure.1 Methodology of Project work

The sequence of the work carried out is represented by a flow chart in Figure1. The project work commenced from identifying the problem followed by collecting the available relevant work through literature survey.

V.EXPERIMENTAL WORK

At its core, a disinfection tunnel is a passageway outfitted with nozzles that spray a sanitizing agent in the form of fine mist. The microscopic size of the particles makes the mist completely dry (hence the name of the procedure — dry fogging) and allows them to disperse evenly on surfaces. Some disinfection tunnel manufacturers also outfit their tunnels with additional sanitation measures, such as UV lamps or ozone generators. The size of the tunnel may vary depending on the area of application, with models for humans usually large enough for one person to comfortably pass through.



Figure.2 Photograph of fabricated sanitizer spray machine

5.1 BASIC COMPONENTS OF SANITIZER SPRAY MACHINE

The basic and essential components of a sanitizer spray machine are Mist nozzle, Star Flex, switch-mode power supply, Timer, Step motor, Hose Pipes

. The images of these components is shown below in above mentioned sequence.



Figure.3 Image of Mist nozzle



Figure.4 Image of Star Flex



Figure.5 Image of switch-mode power supply



Figure.6: Image of Timer



Figure.7: Step motor



Figure.8: Hose pipes

VI. CONCLUSION

The conclusions of the project review work are as follows:

- ❖ The system surely helps in implementing the hand hygiene without any challenges as it is a must to sanitizer if you are to access any entry point.
- ❖ It is much safer and more recommended due to its touch less property which zeros down any chances for cross contamination.
- ❖ This is a low-cost user-friendly system that anyone can make use of. All the devices communicate well.
- ❖ It can be concluded here that the system has been successfully implemented and the aim is achieved without any deviations.

REFERENCES

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- [2] Hurriyatul Fitriyah et al, "Interaction design of automatic faucet for standard hand-wash" MATEC Web of Conferences (2018)
- [3] E. Stanley et al, Automatic Hand Washing and Drying Machine, U.S. Patent US5924148A

