

Sanitizing Cabin

Intelligent Systems and Automation

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Abstract

Objective: Reduce the risk of contagion of COVID-19 in squares, shopping centers, supermarkets with an automated disinfection cabin, using an alcohol-based solution suggested by the WHO as disinfectants.

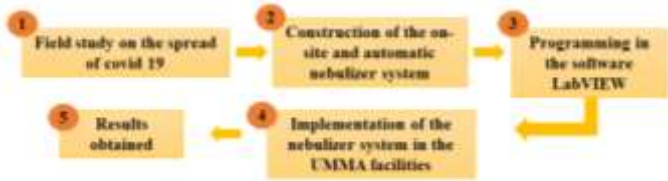


Figure 1 Implemented Methodology

Results

The implementation of the sanitizing cabin in high traffic areas helps us to potentially reduce the spread of viruses that could be found adhering to our clothing.

The antibacterial gel dispenser in this cabin guarantees frequent hand hygiene.

This cabin optimizes the necessary amount of sanitizer for the disinfection of a person, using 40 ml of spray sanitizer.

Conclusions

In general, a sanitizing booth requires two main parts, the structural one and the electronic control part being automated. The structure must be stable and as hermetic as possible, to avoid damage or disturbances. For example, areas with strong air flows that prevent the correct dispersion of the sanitizer when spraying, this project fulfills, by having only two openings to the cabin (inlet-outlet), the electronic control part implemented allows, due to the type of sensor the need not to touch the cabin with your hands, significantly improving the risk of contagion

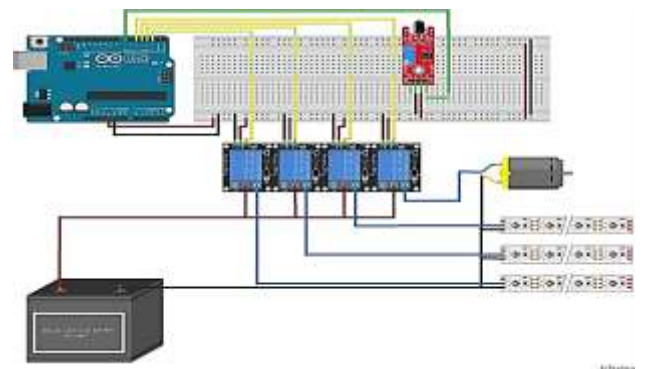


Figure 7 Electrical Diagram of the Sanitizing Cabin (Fritzing)

Introduction

The sanitizing cabin ensures the disinfection of the person who circulates within its structure, by means of an automatic in-person nebulizer system, ensuring the elimination of bacteria, viruses, fungi and spores that may be attached to the user's surface.



Figure 2 Sanitizing Cabinet Instructions



Figure 3 Access to the Sanitizing Cabin



Figure 4 Container of the sanitizing



Figure 5 Control system and circuitry of the Sanitizing Cabin

Materials and methods

Sanitizing booth operation:

The presence sensor, upon detecting the person, initializes the disinfection process, the control unit acts on the signal provided by the sensor, it activates a relay, which activates the diaphragm pump and it pumps the sanitizer with sufficient pressure to activate the sprinklers.

- 1 Atmega328P Microcontroller
- 1 12V @ 5A Diaphragm Water Pump
- 4 precision sprinklers
- 6 meters of 4/7 hose
- 1 Presence sensor E18-d80nk
- 3 LED indicators
- 1 DC 12V @ 5A source
- 1 4-channel relay module

Manufacturing cost per unit:
\$5,200 MX
255.88 USD



Figure 6 Operation of the Sanitizing Cabin

Future of research

One of the improvements to be implemented in this process is the integration of a body temperature sensor, which will give us the body temperature of the person before entering the sanitation cabin and thus can allow or not access to the person in question. It will seek to carry out all the improvements and implementations, for its possible commercialization, managing to offer a low-cost product with the same functionality as a cabin for industrial use.

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