Self-Sanitizing Door Control System – Continuous Viral Control with Integrated UVC Light

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Revenue Opportunity:
- Upsell to existing customer by replacing existing hardware.
- New customer installations.
- Additional service revenue in the form of monitoring and servicing contracts.

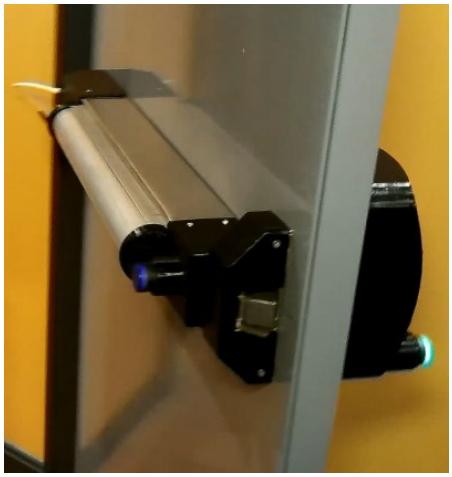
Patent:
"METHOD FOR SELF-STANITATION OF DOOR CONTROLS"
Patent Pending# 65/053126

Reference Material:
"*Evaluation of an UVC Light-Emitting Device for Disinfection of High Touch Surfaces in Hospital Critical Areas*", Beatrice Casini, Department of Translational Research, University of Pisa, 2019

"*Does improving surface cleaning and disinfection reduce health care associated infections?*", Curtis Donskey, Chairman, Infection Control Committee, Cleveland VA Medical Center, 2013

Market Applicability & Uses:
- Door push bars for high-traffic public buildings including hospitals, schools, and airports
- Nursing Homes and Assisted-Living locations
- Military housing and commissaries
- Essential personnel locations including police, fire and EMTs

Mfg and Usage Costs:
- Power usage per door under $0.05 per day at 10hrs/day.
- Pushbar: $25, PullDisk: $30



The US market for door hardware is $2.64B with a projected annual growth rate of 3.9%. How is the industry addressing the spread of viruses during a pandemic? Disinfection comes in many forms and is often misunderstood. What is generally believed to be a straightforward approach is far more complex than what most non-virologists understand. Viruses and bacteria have a wide range of biological characteristics and react to disinfection efforts differently. Depending on the approach, chemical disinfection will only temporarily disable the ability of an organism to replicate (deactivation), while other physical approaches will fully neutralize and eradicate an organism.

To mitigate the potential spread of viruses in public buildings, Cambridge Research & Development has developed a solution which deactivates the impact of contagious viruses by developing a continuous solution to high-touch locations with the integration of UVC light.

Opportunity

Industry has turned to three established approaches to disinfecting and deactivating organisms: chemical, biological and physical (light, sound, pressure, etc.). Chemical and biological approaches require regular reapplication of agents as they lose their effectiveness over time because of dilution and evaporation. Physical solutions damage, deactivate, or destroy an organism using energy-based methods.

What if, through the integration of a UVC light approach to the existing doorway product design, one could either mitigate, reduce or remove contagious viruses in high-traffic locations in building doorways? What if a clever door design could also be used as an IoT device for remote monitoring and another revenue source?

Solution – Self-Sanitizing Door Control System – Continuous Viral Control with UVC Light

The Self-Sanitizing Door Control System is a door opening system that allows door handles and push bars to be disinfected with UVC light between uses. A UVC light source in incorporated right into the door design. The door surface is exposed to UVC light after every use, for both entrance and exit at doorways.

After a person goes through the door, the touched surface is rotated into a chamber that contains the UVC lightsource, eliminating organisms that reside on the door surface. The cleaned surface can now be rotated back into the opening where the next person entering (or exiting) can engage a clean push bar.

Safety Significance:

The introduction of a door system with UVC light will lessen the probability of viral distribution, especially during a pandemic. This is extremely important for professionals dealing with high-traffic locations. As a result, patient survival rates will increase, and institutions will realize a reduction in expenses related to unnecessary legal action. To validate the safety of theses solutions, Cambridge R&D contracted ResInoova Laboratories to conduct an antimicrobial evaluation.

The results are shown below.

Antimicrobial Lab Test Results	
Exposure Time (Sec)	*Percent Reduction vs. Control*
5 seconds	97.60%
10 seconds	98.90%
30 seconds	99.98%

Additional Specifications:

Specification	**Description**
# of units per 20Amp 120v AC	Approximately 100 units can be run off of one circuit
Low voltage requirement	Unit can be run off a 12/24v AC or DC power source, class 2 circuit
Battery power	One unit could operate by battery for approximately month based on 100 activations a day. This could support power interruptions.
POE Power	Unit could be powered by Power over Ethernet (POE) which would supply both power and communication.
Operating power	Unit operates at about 18 Watts. Less than 1 Watt in standby mode.
UV exposure timing	Timing is configurable and variable if needed. Intelligent processing can be used to vary durations. Current duration is 5 seconds of UVC exposure.
Building Management System (BMS)	Unit can be integrated into BMS for remote monitoring, self-diagnosis, configuration, security, and preemptive service.
Pinch-resistance design	Rotating surfaces are designed with slip clutching systems that eliminate the risk of pinched skin. This also eliminates any carried or clothing article from getting caught.
Retrofit	Unit fits standard hardware patterns which allow for retrofit of existing customer base.
Component lifetime	LED lights have a service life of over 50,000 hours. Gear motors have a service life of over 20,000 hours.