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Topic of the Speech:

COVID-19 Personal Protective Equipment Sterilization System

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Professor Uwe Reischl is a Professor in the Department of Community and Environmental Health at Boise State University, USA. Dr. Reischl is a public health physician with research interests in occupational health, ergonomics and human factors. He received his undergraduate and graduate training at the University of California at Berkeley obtaining the Ph.D. degree in Environmental Health Sciences from the School of Public Health. He received his medical training at the University of Ulm in Germany where he obtained the M.D/Ph.D. degrees in clinical medicine.

Professor Reischl's current international research collaborations include projects with the University of Zagreb in Croatia, Hong Kong University of Science and Technology, and Soochow University in China. His research publications have focused on the physiological consequences of protective clothing, heat-stress, sweat evaporation characteristics from fabrics, and UV and IR radiation penetration through clothing ensembles. Additional areas include disaster preparedness planning research, asynchronous telemedicine applications in medicine and physiological monitoring of workers

ABSTRACT SUBMISSION
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COVID-19 Personal Protective Equipment Sterilization System

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ABSTRACT (NO MORE THAN 500 WORDS:)

The current coronavirus pandemic has sparked global efforts to develop new and creative approaches to solve shortages of personal protective equipment. These include facemasks, coveralls, gloves, shoes and other devices used by medical workers who treat COVID-19 patients and used by the public to reduce the spread of the virus within the community. While most currently available personal protective equipment is intended for single-use only, safe and effective disinfection will now allow the equipment to be reused multiple times.

A portable system based on a non-destructive sterilization method was developed that consists of a chamber producing ozone concentration levels reported in the scientific literature to deactivate 99.9% of all microorganisms. The system includes a small battery powered ozone generator placed inside the chamber. Personal protective equipment is loaded into the chamber and automatically exposed to an ozone concentration of 18 ppm for 30 minutes. The personal protective equipment is then removed and ventilated in open air to allow residual ozone to degrade to oxygen.

Ozone is a disinfectant known to kill bacteria and viruses upon contact. Ozone (O3) is an unstable gas that degrades back into its original stable state of O2 by forming a reactive free oxygen atom that oxidizes organic and inorganic compounds. Ozone gas can reach poorly accessible spaces such as dense textile materials that other methods such as hydrogen peroxide vapors, laser light or UV radiation cannot. Ozone does not produce harmful residues since residual ozone always converts back to oxygen within a few minutes. Therefore, this method provides an ideal solution for sterilizing personal protective equipment against COVID-19.

The paper will describe the design and performance of this technology.