SYSTEM FOR MANAGING HIGH TOUCH SURFACES

FIELD OF INVENTION

The present invention relates to a system for managing high touch surfaces.

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BACKGROUND

High-touch surfaces are recognized as a possible reservoir of infectious agents and their contamination can pose a substantial risk for the spread of multi-resistant organisms. Hence, they are recommended to be cleaned and disinfected on a more

10 frequent schedule than minimal touch surfaces.

Environmental cleaning and disinfection (C&D) protocols are important components of a comprehensive strategy to manage healthcare-associated infections, especially in venues such as intensive care units (ICUs) where patients with compromised

15 immunity systems are treated.

Typically, approximately 5~30% of surfaces remain potentially contaminated due to the inability of current detergent/disinfectant formulations to disrupt biofilms. Furthermore, the appearance of cleanliness does not always correlate with

20 microbiological cleanliness. Thus, it becomes challenging to ensure microbial contamination remains below a pre-defined threshold considered as safe for high-touch sites.

Currently, it is very difficult to implement C&D protocols when there is extensive

25 outsourcing of hospital cleaning services. These outsourced cleaning services are

typically not readily adaptable to deal with changing circumstances, such as, for example, unscheduled cleaning, changes in products, protocols, and so forth. The unsupervised cleaners generally receive little or no training and this lack of competence can lead to undesirable cleaning, regardless of the products in use.

5   Furthermore, outsourced cleaning services are associated with adverse patient perception of cleanliness.

Although auxiliary nurses have a greater awareness of C&D protocols and could be trained about the proper use of wipes, this manual process may not be adequate.

10   For example, the ready-to-use wipes have shown a variable effectiveness in removing microbial bioburden from inanimate surfaces and in reducing the pathogens transfer between surfaces

In view of these issues, current C&D strategies should be revamped.

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DESCRIPTION OF INVENTION

There is provided a system to optimize the thoroughness of a high-touch surface cleaning in high-risk areas or venues.

20   The system includes use of video analytics for detection of high-touch surfaces, for example, to pinpoint areas of surface contaminated and surface transmission of surface pathogens.

The data collectible via video analytics include:

25   ➢   identification of specific areas of high-touch surfaces;

> ➤ determination of frequency of touch points (e.g. number of contact per hour);

> ➤ identification of the specific time periods of high frequency touching; and

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> ➤ identification of areas of non-touch surfaces.

The system also includes use of disinfectant (cleaning) robots to treatment of the high touch surfaces determined using the aforementioned video analytics. Actionable tasks based on data collected include:

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> ➤ optimising the area, timing and frequency of cleaning and disinfection;

> ➤ optimising the dosage and concentration of disinfectant (chemical or UV);

> ➤ optimising the robots dispatch frequency to save power;

> ➤ optimising the disinfectant timings to suit venue activities;

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> ➤ reducing the use of human cleaners and reduce human-based errors; and

> ➤ standardising the cleaning procedure standard and cleaning efficiency via robots.

20 It should be noted that video-analytics-assisted cleaning robots can demonstrate their effectiveness in removing and retaining gram negative bacteria. The video-analytics-assisted cleaning robots also demonstrated effectiveness in reducing significantly TVC or hygiene failures on non-electromedical surfaces from baseline up to 6.5 h, showing a long residual disinfection activity and a better performance

when compared to the standard operative protocol, especially when the surfaces were highly contaminated (TVC > 50 CFU/24 cm2).

The robots can use pre-impregnated disposable cloths for cleaning and disinfecting which results in:

- ➢ a sanitization process that is faster and easier;
- ➢ increase in cleaning compliance;
- ➢ possible adverse environmental impact due to waste from disposal cloths; and
- ➢ possible higher cost.

The objectives of the present invention include:

- ➢ increasing the effectiveness on the field of cleaning and disinfection (Modified Operative Protocol, MOP);
- ➢ reducing environmental bacterial burden; and
- ➢ maintaining a standardised disinfection protocol on high-touch surfaces.

Referring to Fig. 1, embodiments of the application provide nano-stick anti-virus thin films, nano-stick adhesive thin films fight viruses and anti-viral disposable adhesive sticky tapes/films.

Referring to Fig. 2, embodiments of the application provide nano-stick fights corona virus, and anti-viral disposable adhesive sticky tapes/films.

Referring to Fig. 3, embodiments of the application provide samples of packaged products.

Referring to Fig. 4, embodiments of the application illustrate SDST & NIPPON competitors vs anti-coronavirus coatings.

Referring to Fig. 5, embodiments of the application provide scenarios of product usage.

Referring to Fig. 6, embodiments of the application provide experimental results of the anti-bacterial of nanomaterials (nano-coat).

Referring to Fig. 7, embodiments of the application further provide scenarios of product usage.

Referring to Fig. 8, embodiments of the application provide information on what users can do to disinfect surfaces and objects with a household cleaning spray or wipe.

Referring to Fig. 8, embodiments of the application provide a method of executing spray-on antivirus. Products of the embodiments include anti-virus vaccine boxes, anti-viral handphone/panel screen protector, doorknob/handle anti-viral film, lift panel anti-viral film, light switches anti-viral film, and tabletop anti-viral film. Target audience or customers of the invention or embodiments include cold chain logistic, mass consumer, hotels, offices, schools, apartments, shopping malls, and airlines. Target Markets include Singapore, Philippines, Malaysia and Indonesia.

Persons skilled in the art will appreciate that numerous variations and modifications will become apparent. All such variations and modifications which become apparent to persons skilled in the art, should be considered to fall within the spirit and scope

5   that the invention broadly appearing before described.

CLAIMS

1.   A system for managing at least one high touch surface, the system comprising:

>   a video analytics module configured to detect the at least one high touch surface;

>   a processing module configured to receive data from the video analytics module; and

>   at least one cleaning robot configured to receive instructions from the processing module.

2.   The system of statement 1, the video analytics module being configured to detect the at least one high touch surface in at least one manner selected from a group consisting of: identification of specific areas of high-touch surfaces, determination of frequency of touch points, identification of the specific time periods of high frequency touching, and identification of areas of non-touch surfaces.

3.   The system of either statement 1 or 2, the processing module being configured to receive the data wirelessly.

4.   The system of either statement 1 or 2, the processing module being configured to receive the data via a cabled connection.

5.   The system of any of statements 1 to 4, wherein the at least one cleaning robot is controllable by the processing module.

6.   The system of any of statements 1 to 4, wherein the at least one cleaning robot is autonomous.

7.   The system of any of statements 1 to 6, wherein the at least one cleaning robot uses pre-impregnated disposable cloths.

8.   The system of any of statements 1 to 7, wherein the video analytics module collects data including: location of high touch surfaces, frequency of touch points at high touch surfaces, and time periods of high frequency touching.

9.   The system of any of statements 1 to 8, wherein the at least one cleaning robot is configured to optimise standardised cleaning and minimise venue disruption.