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Canadian Intellectual Property Office
An agency of Industry Canada

CA 2776280 A1 2013/11/03

(21) 2 776 280

(12) DEMANDE DE BREVET CANADIEN
CANADIAN PATENT APPLICATION

(13) A1

(22) Date de dépôt/Filing Date: 2012/05/03

(41) Mise à la disp. pub./Open to Public Insp.: 2013/11/03

(51) Cl.Int./Int.Cl. *E05B 47/00* (2006.01), *A61L 2/24* (2006.01), *E05B 17/22* (2006.01), *E05F 15/20* (2006.01), *G06M 15/00* (2011.01), *A61L 2/16* (2006.01)

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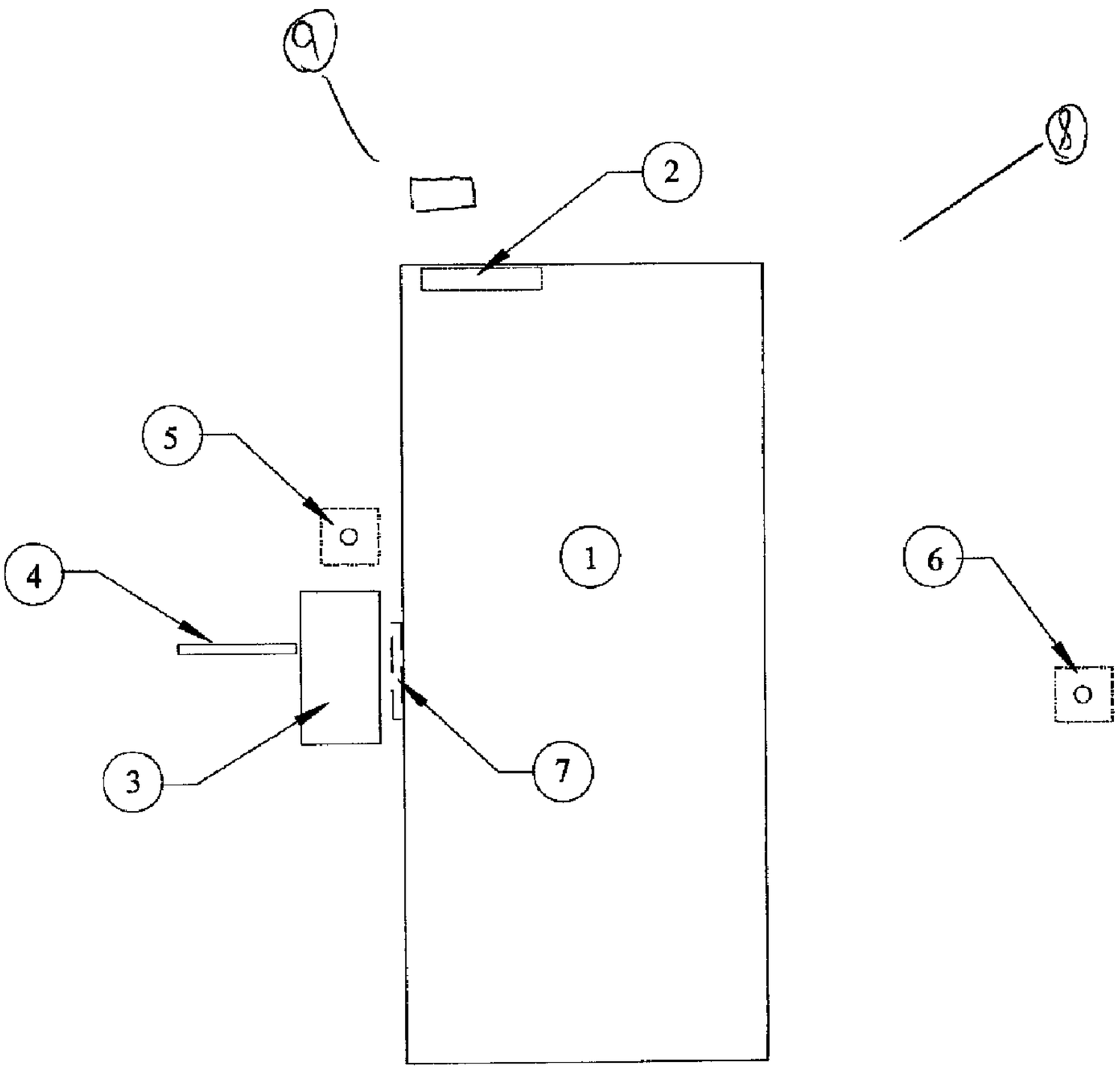
(54) Titre : SYSTEME DE DESINFECTION DES MAINS A VERROUILLAGE POUR PORTE
(54) Title: DOOR LOCKING HAND SANITIZER SYSTEM



DOOR LOCKING HAND SANITIZER SYSTEM

FIELD OF THE INVENTION

The present invention relates generally to an automated door locking hand sanitizing system, and, more particularly, to an automated door locking hand sanitizing system that reminds and forces a person to wash/disinfect their hands before permitting entry to or exit from such a facility, thereby reducing the spread of germs and contagions.

DESCRIPTION OF THE PRIOR ART

Many diseases, such as hepatitis, have been found to be transmittable due to a failure of people to wash their hands. In fact, certain public health laws require those in, for example, the food distribution field to wash their hands each time they exit these facilities before they resume their duties. In areas such as hospitals or labs, the spread of germs and contagions is a serious health concern. For this reason, many such facilities post visual signs which are intended to remind a person to wash their hands before entry/exit, but such signs can be easily ignored, and thus stronger warning systems are required if such spread of disease is to be checked or inhibited. While signs may be innocuous means of warning the public of the need to wash their hands, with a view to reducing the spread of germs and contagions, stronger warning means that provide audible or visual alerts should be used in certain public facilities to provide these reminders, such as for employees of a restaurant, hospitals, food processing or research facilities, or the like.

Accordingly, there is need for an automated door locking hand sanitizing system that utilizes a soap/disinfectant dispenser, and which can provide audible or visual alerts for use in a facility, such as restaurants, hospitals, food processing or research facilities, employees of a restaurant, hospitals, food processing or research facilities, dentist offices, restaurant entrances, food processing plant entrances, professional offices, drugstores, schools and day cares, prisons, turnstiles, restroom stall doors and any other location where the site owner desires to have every person entering or exiting through a doorway to sanitize their hands, or the like, such as on any building that features an automatic/ electric door opener or door held shut with a magnetic lock or similar locking device, for ensuring that persons entering or leaving such a facility must disinfect their hands. There is also a need for an automated door locking hand sanitizing system that only permits entry/exit into these facilities once the soap/disinfectant dispenser has been activated, with a view to reducing the spread of germs and contagions. To this end, the present invention effectively addresses this need.

SUMMARY OF THE INVENTION

A general object and advantage of the present invention is to provide an improved automated door locking hand sanitizing system that utilizes a soap/disinfectant dispenser, and which can provide audible or visual alerts for use in a facility, such as restaurants, hospitals, food processing or research facilities, employees of a restaurant, hospitals, food processing or research facilities, dentist offices, restaurant entrances, food processing plant entrances, professional

offices, drugstores, schools and day cares, prisons, turnstiles, restroom stall doors and any other location where the site owner desires to have every person entering or exiting through a doorway to sanitize their hands, or the like, or any building that features an automatic/ electric door opener or door held shut with a magnetic lock or similar locking device, for ensuring that persons entering or leaving such a facility must disinfect their hands.

A still further object and advantage of the present invention is to provide an improved automated door locking hand sanitizing system that only permits unalarmed entry/exit into these facilities once the soap/disinfectant dispenser has been activated and utilized, with a view to reducing the spread of germs and contagions.

A still further object and advantage of the present invention is to provide an improved automated door locking hand sanitizing system that issues an audio message when the supply of soap/disinfectant in the soap/disinfectant dispenser is running low, or when when a battery powered power source is utilized and power is low.

According to one aspect of the present invention, there is provided an automated door locking hand sanitizing system for controlling access through a doorway comprising a housing being mounted near to a doorway; a motion/presence detector being mounted on the housing and being adapted for detecting an approach of a visitor to the doorway; a door lock mechanism for locking and unlocking a door permitting entry or exit through the doorway; a processor being mounted in the housing and being

electrically coupled to the motion/presence detector; and message conveying means being mounted on the housing and being electrically coupled to the processor; product dispensing means having at least one product dispensing signal emitter integrated therewith in electronic communication with the microprocessor; wherein when the product dispensing means are utilized, the at least one product dispensing signal emitter transmits a signal to the microprocessor, whereupon, the microprocessor transmits an unlocking signal to the door lock mechanism to unlock the door to permit entry or exit by the user.

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of the present invention is described below with reference to the accompanying drawing, in which:

Figure 1 illustrates a front view of the automated door locking hand sanitizing system of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention relates to an automated door locking hand sanitizing system, whereby a door will not be unlocked to to permit entry until a hand sanitizer has dispensed a pre-set amount of disinfectant. If the hand sanitizer is not utilized, the door shall remain shut, restricting passage until the hand sanitizer is used. With reference now to the drawings, and in particular to **Figure 1**, the automated door locking hand sanitizing system of the present invention, generally designated by the reference numeral **8**, will now be described. In one embodiment, the system of the present invention can be electrically coupled to a primary power supply (not shown),

preferably by hardwiring an electrical supply to components of the system. In an alternative embodiment an alternate power source, such as, for example, a battery source or through electrical wiring, or through other means, could also be utilized as would be apparent to one skilled in the art.

The automated door locking hand sanitizing system **8** is proximate to a door **1** of an entranceway (or doorway) to a facility, such as restaurants, hospitals, food processing or research facilities, dentist offices, restaurant entrances, food processing plant entrances, professional offices, drugstores, schools and day cares, prisons, turnstiles, restroom stall doors and any other location where the site owner desires to have every person entering or exiting through a doorway to sanitize their hands, or the like.

A proximity sensor **9** is included in the system **8** and is adapted for detecting an approach of a visitor to the door **1** of the entranceway, it being understood that the proximity sensor **9** can be conventional in nature, and can also be a proximity detector. In a preferred embodiment, a processor (not shown) can also be included within the system **8** it being understood that the processor is electrically coupled to other components of the system, as hereinafter described. It will, of course, be understood that the location of the processor or the proximity sensor **9** could be varied, as would be apparent to one skilled in the art. In an alternative embodiment, the processor can be housed in, or around the proximity of, the door **1** of the entranceway, but alternatively may be located in a nearby

location, or at a remote location from the door **1** or the entranceway.

A data storage device (not shown) can also be included in the system **8**, and preferably has recorded thereon a message indicating warnings such as a low supply warnings received from hand sanitizer **3**, it being understood that variations to the type of information collected and stored by the data storage device are possible. Examples of such information that could be collected and stored in the data storage device could include number of people entering and exiting the building, the number of people and/or percentage of people who used the hand sanitizer **3**, and malfunction alerts. In an alternative embodiment, the data storage device can also store a "low battery" warning, that can be issued through a message conveying apparatus (not shown), when a battery powered power source is utilized and power is low.

It will be understood that a message conveying apparatus (not shown) can also be included in the system **8**, and could be arranged to be mounted near to (or upon) any of the hand sanitizer **3**, door **1** or entranceway. It will also be understood that hand sanitizer **3** is, preferably, arranged to be mounted on the outside or inside of a building, near an exterior doorway, or located inside the building's vestibule, and that a second, or indeed a plurality of hand sanitizers may be utilized to compel hand sanitization prior to exit or entry. For example, the hand sanitizer **3** could also be mounted on another component in close proximity thereto.

In operation, when approaching the door **1** of the entranceway **2** to a facility, in a preferred embodiment, the system **8** will issue a voice command asking the approaching visitor to sanitize their hands. Alternatively, flashing lights or light could also be utilized to request the approaching visitor to sanitize their hands. Then, the visitor must first utilize hand sanitizer **3** to gain unalarmed entry to or exit from the facility through the door **1** of the entranceway, it being understood that the door **1** is normally in a locked position, the door being kept in a locked position by a door lock mechanism, such as a magnetic lock **2** as shown in **Figure 1**, or other similar device, for locking and unlocking the door **1** permitting entry or exit. When the hand sanitizer **3** is utilized by the visitor before approaching the door **1** to the entranceway, the hand sanitizer **3** transmits a signal to the processor, which then deactivates temporarily the proximity sensor **9** scanning an area immediately adjacent or close to the door **1** and the entranceway. At the same time, the hand sanitizer **3** transmits a signal to the processor, whereupon the processor will issue an unlocking signal to the electric door strike/lock mechanism **7** of the door **1** to unlock the door to permit entry or exit for the visitor.

However, it will be understood that if the hand sanitizer **3** has not been utilized, and no signal from the hand sanitizer **3** has been transmitted to the processor, it is to be understood that the processor will only issue the unlocking signal to the electric door strike/lock mechanism **7** of the door **1** to unlock the door if a signal has been received from the hand sanitizer **3**. In this scenario, if the visitor approaches the door **1** to the entranceway without utilizing the hand sanitizer **3**, the processor will retain the door lock mechanism of the door **1** in a locked

position to prevent passage through the door **1** until hand washing has occurred, and the processor then issues the access denied audio tone to be played through message conveying apparatus, and, simultaneously also activates the access denied emitter **13** to provide a visual indication to the visitor that passage is not permitted. In one embodiment, the visual indication that is given to the visitor to indicate that passage is permitted can be a "green" light, and the visual indication that is given to the visitor to indicate that passage is not permitted is a "red light", though it will, of course, be understood that numerous variations as to this can be effected.

To gain entry, as noted above, the visitor utilizes the hand sanitizer **3** before approaching the door **1** to the entranceway, and the signal emitter (not shown) from the hand sanitizer **3** transmits a signal to a processor, which then deactivates temporarily the proximity sensor **9** scanning an area immediately adjacent or close to the door **1** to the entranceway, and thus permits entry or exit for the visitor. At the same time, processor activates access allowed emitter **11** to provide a visual indication to the visitor that passage is permitted, and, simultaneously also activates the access allowed audio tone to be played through message conveying apparatus.

It will be appreciated by those skilled in the art that the processor is, preferably, in electronic radio communication with the hand sanitizer **3** and other components of the system through Radio Frequency Identification (RFID), electro-magnetic signals, or a combination thereof, as is conventionally known. It will also be appreciated by those skilled in the art that the electro-magnetic signals can include infra-red, RF, or any other electro-

magnetic signal, as are well known in the art. Alternatively, the connection between these components could also be hard wired. Preferably the hand sanitizer **3** is mounted near or proximate to the entranceway, though it will be understood that variations to the positioning of this are possible.

In a further embodiment, communication in the system **8** can be effected either through a hard wire connection or via wireless radio to a remote button **6** that can allow for a release of the electric door strike/lock mechanism **7.** This button **6** can be installed near the doorway on the inside of the building to allow exiting by releasing the magnetic lock **2** or electric door strike/lock mechanism **7**, or can be installed at some distance, say at a custodian's desk, to allow passage of a person not wishing to use the sanitizer **3.** An inside release button **5**,or another button or keyed switch on the system **8** could also be utilized to release the magnetic lock **2** or electric door strike/lock mechanism **7.**

In a further embodiment, the processor may also issue an audible message to individuals who are attempting to enter (or exit) the door **1** to the entranceway, and who have not utilized the hand sanitizer **3**, through the playing of a recorded audio message or reminder (such as, "*Soap and Rinse your hands*" or "*please sanitize your hands to gain entry to this building*") through the message conveying apparatus, it being understood that variations as to the type of message conveyed are possible. In this embodiment, the audible message is activated when the visitor has attempted to gain entry/exit by passing through the door **1** to the entranceway, and the processor recognizes that no

signal from the hand sanitizer **3** has been transmitted to the processor, at which point the processor issues a signal to the message conveying apparatus to issue the recorded access denied audio tone to the visitor. It will, of course, be understood that multiple such reminders could be effected, if the processor is so programmed.

It will also be understood that such reminder messages can also be conveyed in the form of a visual reminder, such as through use of an LED sign (not shown), or other types of sounds that are emitted for the user to hear, it being understood that variations to these conveyed messages are possible, such as MP3's for example.

In a still further embodiment, when supplies are low in the hand sanitizer **3**, the hand sanitizer **3** transmits a signal to the processor to activate the low supply (or low soap) warning to be played or conveyed (either through an audio of visual reminder) through the message conveying apparatus. In much the same manner, when battery power for the system is low, the processor activates the low battery warning to be played through message conveying apparatus when this occurs.

In a still further embodiment, an electronic counter and/or electric eye (not shown) component could be utilized to physically count the number of people entering/exiting the building versus the number of signals received by the processor from hand sanitizer **3**.

In a further embodiment, the automated door locking hand sanitizing system **8** will further comprise an attached shelf **4**

for placement on or around the doorway, for the convenience of placing a coffee or other liquid, a set of keys or small package that a person wishing to travel through the doorway may be carrying.

In a further embodiment, the automated door locking hand sanitizing system **8** will further comprise an accelerometer, which is designed to detect vandalism attacks. In a still further embodiment, the automated door locking hand sanitizing system **8** will further comprise an internal heater in connection therewith, whereby when the system is utilized outdoors in exterior installations, operation in cold weather is facilitated.

The present invention has been described herein with regard to preferred embodiments. However, it will be obvious to persons skilled in the art that a number of variations and modifications can be made without departing from the scope of the invention as described herein.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. An automated door locking hand sanitizing system for controlling access through a doorway comprising:

a housing being mounted near to the doorway;

a motion/presence detector being mounted on the housing and being adapted for detecting an approach of a visitor to the doorway;

a door lock mechanism for locking and unlocking a door permitting entry or exit through the doorway;

a processor being mounted in the housing and being electrically coupled to the motion/presence detector;

message conveying means being mounted on the housing and being electrically coupled to the processor;

product dispensing means having at least one product dispensing signal emitter integrated therewith in electronic communication with the processor; and

wherein when the product dispensing means are utilized, the at least one product dispensing signal emitter transmits a signal to the processor, whereupon, the processor transmits an unlocking signal to the door lock mechanism to unlock the door to permit entry or exit by the visitor.

2. The system of claim 1, wherein, if the product dispensing means are not utilized, the processor will retain the door lock mechanism in a locked position to restrict entry or exit through the door.

3. The system of claim 1, wherein the product dispensing means, when a supply of product in the product dispensing means is low, is arranged to transmit a low supply warning to the processor to be conveyed through the message conveying means.

4. The system of claim 1, further comprising a power source constructed and arranged for connection to components of the system.

5. The system of claim 1, wherein the product dispensing means is mounted proximate to the doorway.

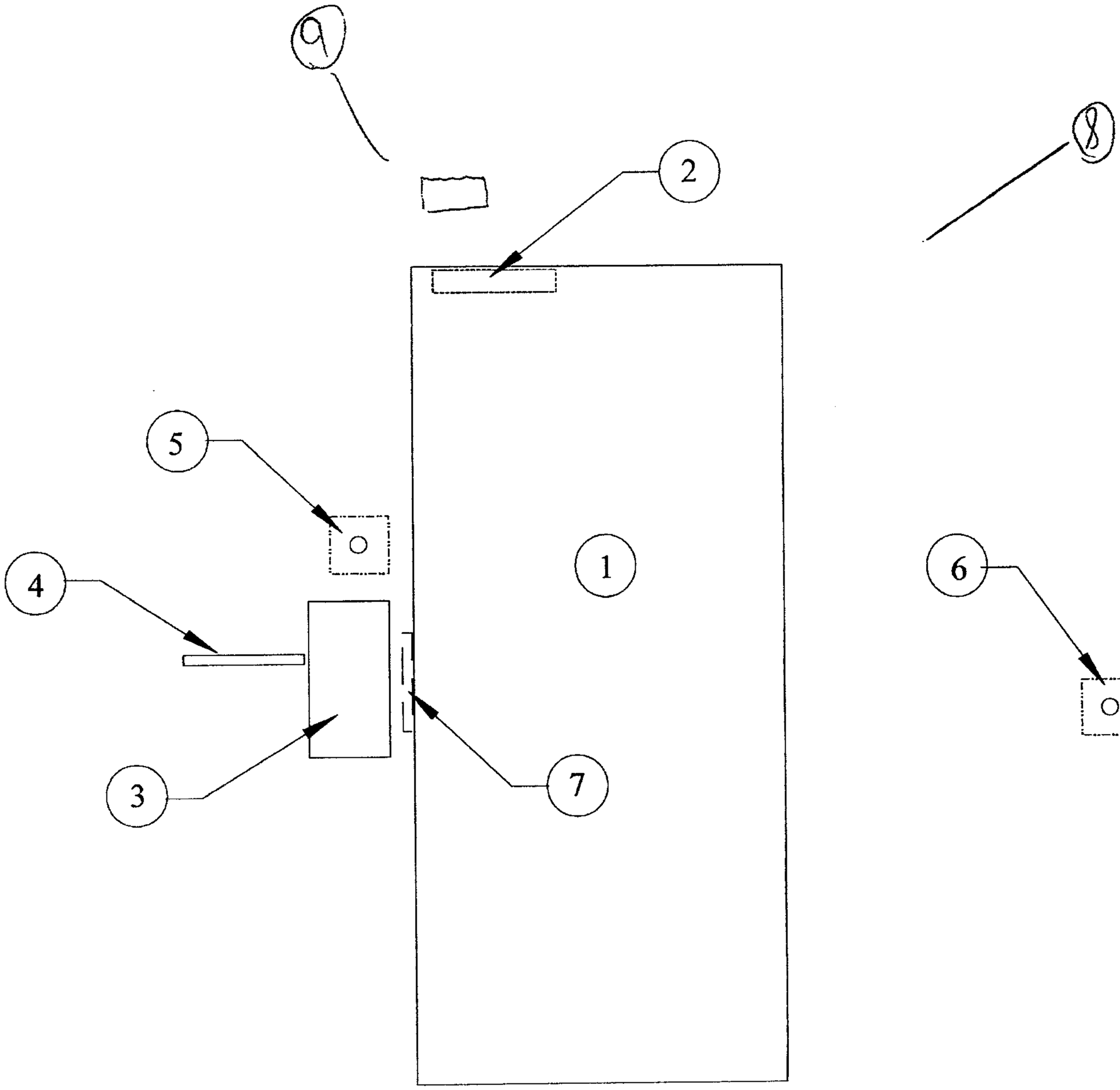
6. The system of claim 1, wherein the product dispensing means is mounted on an outside or inside of a building containing the doorway.

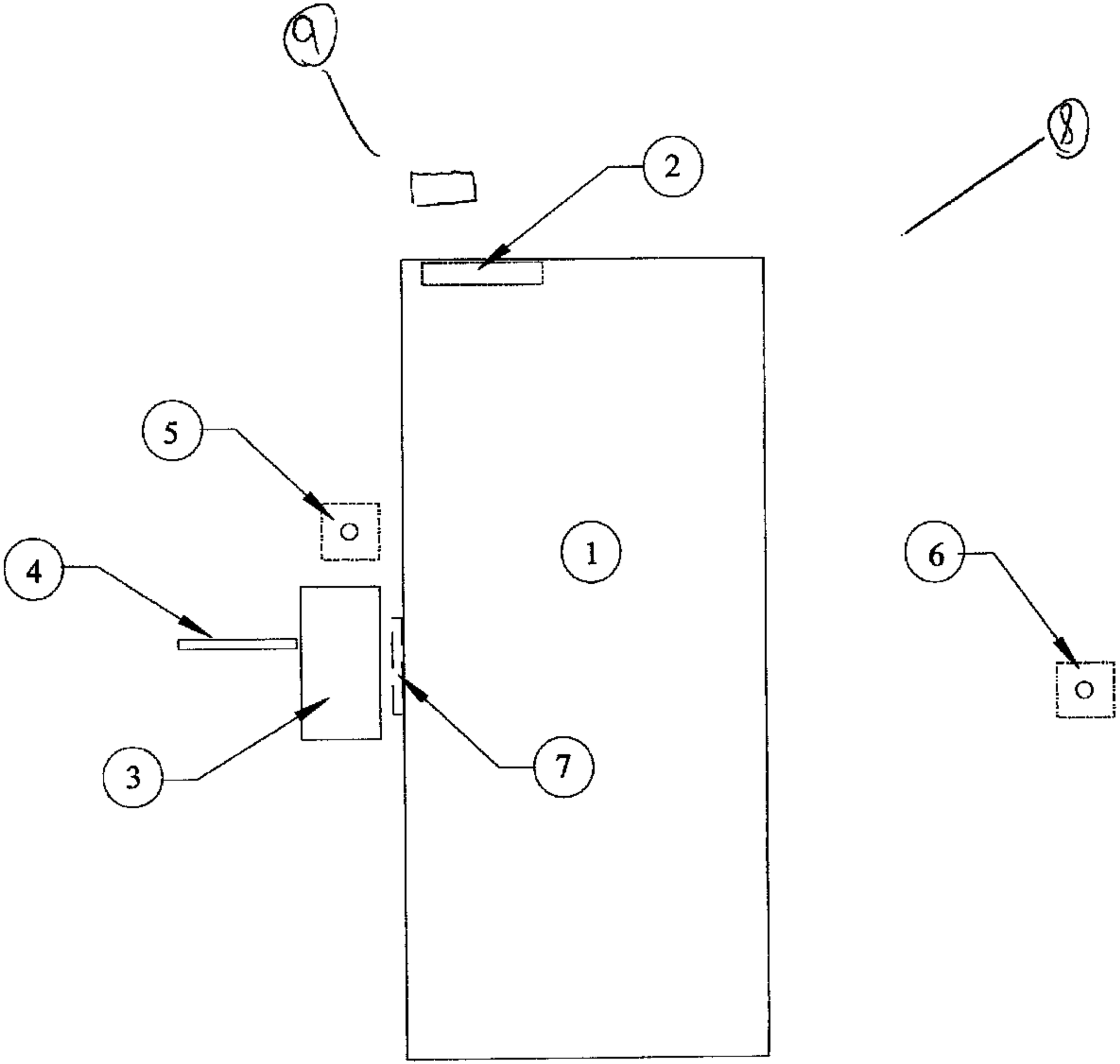
7. The system of claim 1, further comprising a plurality of product dispensing means.

8. The system of claim 1, wherein the system further comprises an electronic counter in electronic communication with the processor, the electronic counter being constructed and arranged for counting a number of visitors entering or exiting through the door.

Figure 1

Door Locking Hand Sanitizer drawing

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