

Provisional Patent Application of

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for

DOOR-MOUNTED HAND SANITIZER DISPENSER

BACKGROUND

This invention relates to hand sanitizer dispensers, specifically to hand sanitizer dispensers with electronic triggering mechanisms. Here "hand sanitizer" or "hand sanitizing agent" refers to any chemical agent that is intended to clean a user's hand quickly, without requiring that the user rinses with water. Hand sanitizers are used as an alternative to cleaning one's hands with soap and water, and can be used to help prevent the transmission of communicable illnesses. Although hand sanitizer and hand sanitizer dispensers are often readily available (e.g. in schools and doctor's offices), they are used less frequently than is optimum for the spread of communicable disease, because they are inconvenient. As one example, in an environment like a school, the level of usage may be insufficient to provide "herd immunity" against flu.

Hand sanitizing agent is usually dispensed onto a user's hands in a foam, gel, liquid, or aerosol form, and is subsequently lathered into the hands. While in contact with the user's skin, the sanitizing agent eliminates some fraction of pathogenic materials (for example, bacteria) by chemical means, and then partially evaporates, is partially absorbed into the skin, and partially forms a residue on the skin of the user. While effective at eliminating pathogenic organisms, hand sanitizers are not designed to clean bulk matter off of a user's hands. Hand sanitizers are readily available commercially. One particularly well-distributed line of hand sanitizers is the Purell® line of instant hand sanitizers made by GOJO Industries.

Much of the prior art (e.g. the Purell® TFX™ Touch Free Dispenser, made by GOJO Industries) dispenses sanitizer from a device that is wall-mounted or affixed to a floor stand. Such designs require that a potential user deliberately approach the device, which may require

that the user go out of her way to stand before the dispenser, and then briefly pause at it while agent is dispensed. In other words, the user must dedicate time to sanitize her hands. By dispensing the sanitizing agent during the course of passing through a door, the present invention seeks to eliminate this inconvenience, and thus increase the frequency with which hand sanitizers will be used. Such an increase in usage has the potential to drastically lower the number of people who get ill each year from diseases that originate from bacteria and some viruses.

There exists prior art that relates to sanitizer dispensing in specific relation to door handles. Both U.S. Pat. No. 7,878,371 B2 to Sassoon, and U.S. Pat. No. 6,874,697 B2 to Callueng show devices that are designed to be mounted in proximity to a door handle, contain a sanitizing agent, and dispense the agent onto the handle. While these devices may help to sanitize door handles, they do not cleanse the user's hands of pathogens that may have been acquired from other sources. In fact, both devices describe methods for ensuring that the contained sanitizing agent is not directly dispensed onto the user. A pivotal feature of the present invention is that it attempts to eliminate all pathogens that are present on user's hands by dispensing the sanitizing agent directly to the user's skin.

U.S. Pat. No. 8,408,423 B1 to McKnight et al. shows a door handle with an embedded nozzle that dispenses sanitizing agent into the palm of the user when the user turns the handle. This invention, and other similar instances of prior art, require that the handle element of the door be replaced. These designs are therefore costly and labor-intensive to install, which is a major impediment to widespread implementation. Additionally, these designs afford no election process to the user; that is, there is no way for a user to open the door that does not result in sanitizer being dispensed on her hand. This becomes an issue for those who do not prefer to use hand sanitizers, or for those who may need to pass through doors often, and do not wish to be exposed to excessive amounts of the sanitizing agent. The present invention avoids such issues in that it is a retrofit, and can be installed quickly and easily, without replacing any pre-existing hardware, and also in that it provides the user with an election process. This election process allows individual users to decide, in real time, whether or not they want to receive the sanitizing agent, and is outlined in later sections of this application.

## SUMMARY

The present invention is an improved hand sanitizer dispenser that is mounted on a door above the handle, and can be triggered while the user opens the door. This invention is composed of a reservoir containing sanitizing agent, a pumping means, a dispensing nozzle, and a sensor array positioned so as to be engaged by the extended thumb of the user, as the user turns the door handle. The triggering mechanism is connected electronically to a microcontroller, which in turn is connected to the pump. When triggered, the pump activates, forcing sanitizing agent through the dispensing nozzle, spraying onto the back of the user's hand.

## BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings illustrate two preferred embodiments of the invention:

FIG. 1 is a front view of the invention positioned above a lever-style door handle

FIG. 2 is a front view close up of the sensor array housing of the invention, with light emitting elements



## DESCRIPTION OF THE INVENTION

Description will now be given with reference to the attached Figs. 1-2. It should be understood that these figures are exemplary in nature and in no way serve to limit the scope of the invention.

The present invention is a hand sanitizer dispenser **1** that is positioned above a pre-existing door handle **8** using attachment mechanism **9**. The invention is composed of a reservoir for hand sanitizing agent **2**, connected to a pumping means **3**, which is in turn connected to an aperture **6**. A capacitive sensor array **5** is housed in sensor array housing **7** and is electronically connected to a microcontroller **4** which sends a signal to activate pumping means **3** when the sensor array is triggered by a user swiping her thumb in a prescribed motion. Power source **11** can be a battery pack, a power outlet, or other source of low voltage electric power. Power source **11**, which powers the microcontroller and other electronic elements of the invention can be easily inserted or replaced by a user. The components of invention **1** are housed in housing **12**.

FIG. 1 shows hand sanitizer dispenser **1** mounted on a door, situated above the door handle, and positioned such that sensor array housing **7** forms an arc around the axis of rotation of the handle. In this position, the dispenser is ready for use. In order to have hand sanitizer dispensed, the user should move her thumb along some portion of the path laid out by sensor array **5**. In order to do this, the user can grip the door handle, and extend her thumb in order to position it near the bottom of sensor array **5**, and subsequently rotate the handle about its axis so as to move (or "swipe") her extended thumb along the path of the sensor array. Alternatively, if the user does not wish to have sanitizer dispensed, she is free to simply engage and actuate the door handle without utilizing the thumb triggering mechanism.

FIG. 2 shows a front view of a preferred embodiment of the invention that includes light emitting elements **10**, such as blue light emitting diodes (LEDs), connected to microcontroller **4** and interspersed between the elements of the sensor array. In this embodiment, lighting elements **10** could light up in sequence to indicate the proper thumb swiping direction, and to attract attention to the device. In other preferred embodiments, the illumination pattern of the light

emitting elements could be configured differently and light emitting elements other than LEDs could be used. Light emitting elements may be placed anywhere on the hand sanitizer dispenser so as to focus a potential user's attention on the dispenser.

In the embodiment of FIG. 1, reservoir **2** features a gravity feed to a pump located below it. In some embodiments this reservoir would be removable and replaceable. Alternatively, the reservoir could be non-replaceable, but easily refillable through an opening in the device, including, optionally, an opening in housing **12**. Aperture **6** would ideally be a nozzle, so that when the pump forces the sanitizing agent through it, the agent will atomize and spray onto the back of the user's hand in a fine mist – achieving better dispersal of the agent, more rapid evaporation of any excess agent, and for some users a more pleasant sensation as the agent lands on their hands.

Additionally, it would be readily apparent to an individual possessing ordinary skill in the art to make modifications to the preferred embodiments, such as the ones that are listed below:

1. The addition of hardware to detect that the electronic power source **11** (e.g. a battery) used to power the dispenser, or parts of the dispenser, is nearly depleted, and thus allow light emitting elements **10** to indicate this.
2. The addition of hardware to detect that reservoir **2** is nearly depleted, and thus allow light emitting elements **10** to indicate this.
3. The addition of a switch to allow for the enablement and disablement of the automatic dispensing of sanitizer at regularly timed intervals for the purpose of sanitizing door handle **8**.
4. A control device, for example, a potentiometer, for adjusting the duration of dispensing once triggered. This would allow the owner of the present invention to control the volume of sanitizing agent dispensed.
5. The elements of sensor array **5** may be capacitive, optical, acoustical, temperature based, pressure based, or based in any other means, so long as they are able to produce data that

can indicate the passage of a thumb of a user in the prescribed motion. This data may or may not require processing by microcontroller **4** in order to detect the prescribed motion. Some of these embodiments may not require direct contact to be made between the user's skin, and the sensing elements.

6. Reservoir **2** may be a compressed canister such as a spray can. In this embodiment, the pumping means may be replaced by a linear actuator or other mechanism capable of releasing the compressed material from the canister.
7. The addition of some hardware (manual or automatic) to make nozzle **6** repositionable, so that the owner of the present invention may position it appropriately for dispensing.
8. Housing **12** can be made in any convenient dimension, may consist of multiple pieces that may or may not be connected, and may be located in various locations with respect to the door handle. It can partially or entirely encompass any or all other elements of the invention. It may be constructed of any suitable material, including those that would, by inspection, allow an individual to tell if the reservoir is nearly depleted.
9. Attachment mechanism **9** may consist of any standard fastener suitable for affixing a relatively light (on the order of 1 kg.) device to a surface such as a metal or wood door. Such mechanisms might include, for example, hook and loop fastener, double stick tape, adhesives, or wood screws.

#### PRIOR ART LIST

US 2013/8408423 B1, McKnight et al. Method and apparatus for dispensing sanitizer fluid

US 2011/7878371 B2, Sassoon, Controllable door handle sanitizer

US 2005/6874697 B2, Callueng, Device for disinfecting door handles



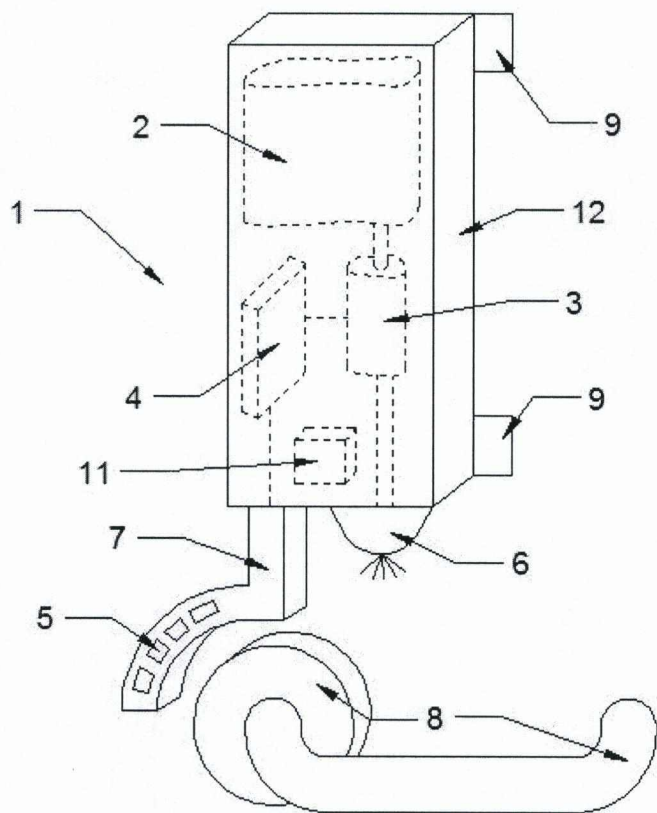


FIGURE 1

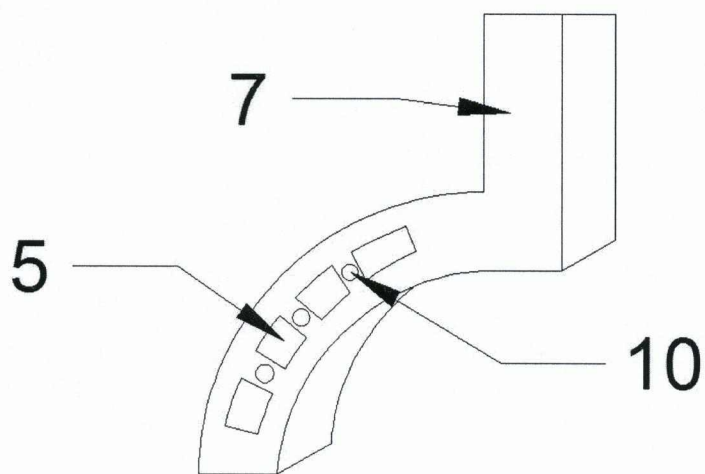


FIGURE 2