

Electrical system of a self-disinfecting touch keyboard

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Łukasiewicz – Institute of Microelectronics and Photonics, based in Poland (Warsaw), is a part of Łukasiewicz Research Network – one of the largest European organizations for applied research. Łukasiewicz – IMiF operates under the formula Science is Business and its strategy is to play a central role in the innovation process towards R&D for industry and business. One of the areas of our activity is printed electronics which can be used for instance in designing systems and sensors for various types of applications or products such as diagnostic inserts or self-disinfecting keyboards etc.

Patent information

Technology
readiness
level:
6

Title: Electrical system of a self-disinfecting touch keyboard

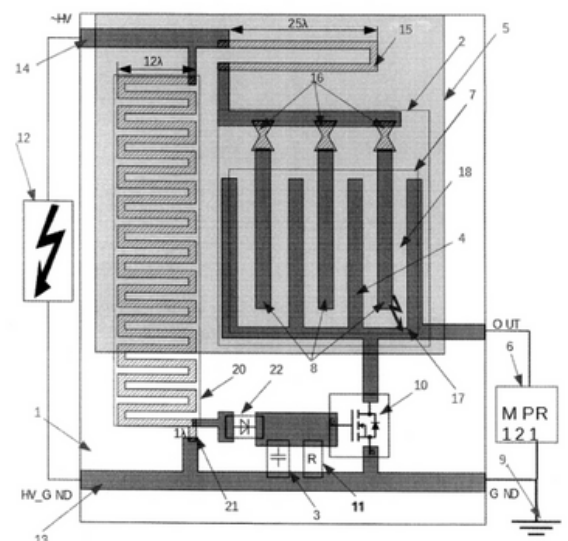
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Inventor: Krzysztof Zaraska

Jurisdictions: Austria, Belgium, Bulgaria, Denmark, Estonia, Finland, France, Germany, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, Slovenia, Sweden, Spain, Czech Republic, United Kingdom and Poland

The subject of the invention is an electrical system for a self-disinfecting touch keyboard with a cold plasma generation function. In short, in the keyboard system, the air is subjected to an electric field exceeding the breakdown voltage (3kV/mm), but there is a dielectric layer on the high-voltage electrode that prevents the arc from igniting. The resulting electric field ionizes the air and produces reactive oxygen species, particularly atomic oxygen and ozone, which have the ability to deactivate microorganisms. Presented solution is based on ceramic technology and can be used in all kinds of terminal devices containing at least one touch key.



The potential behind the technology

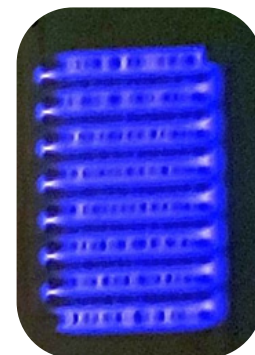
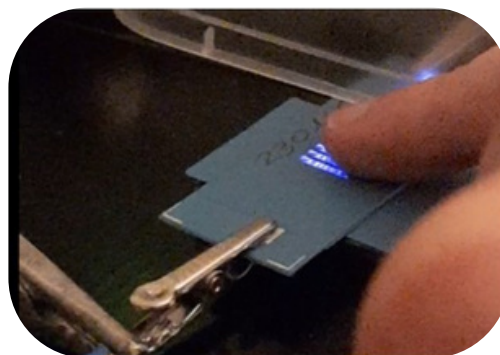
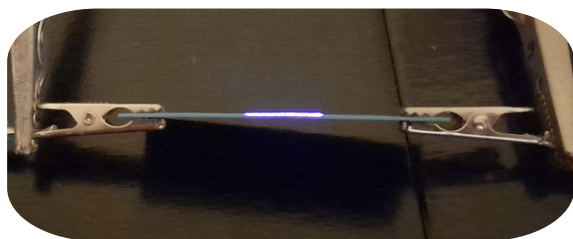
Thanks to the use of a cold plasma generator in the touch keypad, the possibility of killing a wide range of harmful human pathogens and chemicals is created, which, considering the consequences of Covid-19 pandemic, is of great importance. Used ceramic technology in our solution is well-suited for making plasma generators and its features such as chemical inertness (no corrosion) and good dielectric strength make it even more interesting in relation to current solutions on the market. What is more our solution can lead to another potential use – for instance plasma-activated water – decontamination of surfaces after floods, what having in mind current climate change and the unpredictability of the weather, could become an indispensable device for emergency services and residents of flooded areas.

Technology Advantages

The use of the same electrode array for touch detection (keypad reading) and disinfection (cold plasma generation) proposed in presented solution significantly simplifies both the design and operation of the device. Switching between keypad mode and disinfection mode is done electrically, without the need for moving parts. Disinfection can be started automatically, immediately after the end of service for a given user (e.g., at an ATM or payment terminal). The system requires no chemicals or other consumables. Notification to the user that disinfection is in progress and the surface should not be touched can be made by visual and audio signaling. Since the high-voltage electrode is covered with an insulator layer, touching the surface during plasma generation does not carry the risk of paralyzing the user as long as the dielectric layer is not damaged.

Application

Our self-disinfecting touch keypad is intended for use in all kinds of terminal devices containing at least one touch key. Especially in such devices as store cash registers, intercoms, ATMs, information terminals, payment terminals, etc. |



Collaboration type

License agreement or sale agreement

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