DESCRIPTION OF INVENTION

Title of Invention

DIGITAL THERMOMETER OF ANTIMICROBIAL COPPER.

Technical Field

The invention relates to a digital thermometer for medical use, in whole or in part external surface of antimicrobial copper.

Background Art

In medical practice today, to measure human body temperature, we use digital thermometers that their external part is mainly made of plastic, with metal tip mostly made of various metal alloys. The usual digital thermometers have a variety of sizes, designs and types, depending on the indicated part of the body to which they come into contact (armpit, ear, and forehead). In the market are also found thermometers measuring temperature with remote method (non contact, laser thermometer, etc.).

Generally, digital thermometers of all types, consist of the body, the battery cover, that is the removable part through which the thermometer battery is replaced, the power button, that is the key ON-OFF, the display and the tip, which forms the sensor for measuring temperature.

The thermometer, mostly when used in hospitals or other health facilities (e.g. elderly homes) is a carrier of microbes, as firstly it comes into direct contact with the human body and with the body cavities (oral cavity, rectum), secondly it is used by a large number of patients, without compliance with the disinfection rules. 80% of contagious diseases are spread by touch. The pathogens remain viable and infectious, on the surfaces for many hours, days, even months, forming a pool of infections transmitted by touch. Pathogens though, can not survive on the copper surface. Thus, the copper can break the chain of infections transmission and acts complementary to the regular cleaning, for hygiene improvement.

It is now scientifically proven that copper and some of its alloys, have antibacterial and bacteriostatic abilities, meaning, they have the capacity to eliminate or inactivate microbes such as bacteria, fungi (including mold) and viruses, including among others, the resistant Staphylococcus aureus, Staphylococcus aureus (MRSA), the clostridia Clostridium difficile, influenza A (H1N1) and the bacterium Escherichia coli O157: H7.

The pure copper and its alloys that have antimicrobial properties, consist the so-called antimicrobial copper (Antibacterial copper). The antimicrobial copper is safe, long lasting and destroys an extremely high amount of microbes (> 99.9%) in a colony, presenting a disruption of their cell's function in several ways. The antimicrobial copper efficacy is extremely rapid (usually within a few minutes to

several hours). The rapid death of bacteria will not allow their resistance in growing, since the cells do not have the opportunity to develop a defense mechanism. Less than 0.01% of germs survive on a copper surface after 24 hours exposure.

The antimicrobial copper products maintain antimicrobial properties in long term. Even if these surfaces are carved, the antimicrobial effectiveness continues to exist - not being degraded like other types of processed surfaces. Thus, antimicrobial copper offers a dynamic of significant reduction to the number of inner-hospital infections, both in laboratory and clinical environment, when used on touch surfaces. The use of antimicrobial copper already takes place in hospital and other health facilities abroad, as a touch pad on doorknobs, doors, patient's tables and patient's orostates.

The American Environmental Protection Agency (USA Environmental Protection Agency), has approved the copper registration, in a list that includes all the elements with antimicrobial properties, having officially registered 275 copper alloys as antimicrobial, with positive qualities for public health. To ensure and guarantee the quality of antimicrobial copper products, and their marking as antimicrobial copper products, it is provided an international certification with the mark CU + (Antimicrobial Copper) by the International Copper Association (International Copper Association (ICA).The International Copper Association determines which alloys are certified as antimicrobials, also the use conditions of

antimicrobial copper, in the production (www.copper.org.gr, www.antimicrobialcopper.com). For further details on the properties of antimicrobial copper (antimicrobial copper), its scientific evidence and practical significance, we refer to the International Copper Association (International Copper Association (ICA), the International Copper Association Study (International Copper Study Group (ICSG), the European Copper Institute and finally the Greek Institute Copper Development (E.I.A.CH, www.copper.org.gr).

A thermometer, comprising a body, a battery cover, a power button, a display and a tip, wherein the tip is made of copper, is described in US 6 146 015 A. Moreover, an electronic clinic thermometer, comprising a body, a battery cover, a power button, a display and a tip, wherein the body is made of an opaque resin containing silver zirconium phosphate (1-2.5 wt.%) as an antibacterial agent, is disclosed in JP H10 221177 A. Furthermore, US 2011/206817 A1 describes an antimicrobial coating formed from an antimicrobial metal such as copper or silver, which can be used for coating medical devices such as surgical equipment, diagnostic equipment (e.g., MRI machines and optical scanners), trays, hospital countertops, operating tables, hospital flooring, operating rooms, hospital room beds, toilets, sinks, and/or showers, wheelchairs, crutches, stethoscopes, and medical supplies such as tubing and adhesive bandages.

Disclosure of Invention

Subject matter of the present invention is a digital thermometer of antimicrobial copper, which is a medical digital thermometer, which consists externally of:

a body (1),

a battery cover (2) that is a removable part through which a battery is inserted into the thermometer,

a power button (3) that is a key ON-OFF,

a display (4), and

a tip (5) that is a sensor for measuring the temperature,

characterized in that

the outer surface of these parts, except of the display, is made of antimicrobial copper or bears antimicrobial copper or is externally coated with antimicrobial copper, or

the outer surface of the body (1), and/or the battery cover (2) and/or the power button (3) and the tip (5) is made of solid antimicrobial copper or is externally coated with antimicrobial copper.

According to the present invention, it is preferred that the outer surface of these parts is made of solid antimicrobial copper.

The digital thermometer of antimicrobial copper~~, according to the present invention~~ is a medical digital thermometer, of every type, design or size, consisting externally of the main body, the battery cover, that is the removable part through which we replace the thermometer battery, the power button that is the key ON-OFF, the

display and the tip, which comes into contact with a designated part of the human body and forms the sensor for measuring temperature.

The specific feature, however, of the digital thermometer made of antimicrobial copper is that, the outer surface of its components, meaning the outer casing of the thermometer, except of the display, is made of antimicrobial copper or bears antimicrobial copper, in its whole or in some parts of it.

The digital thermometer of antimicrobial copper~~, according to the present invention,~~ is not prevented to be constructed on its outer surface, by antimicrobial copper, only in some or part of the outer parts described above, selectively and not in its entirety, without significantly decreasing its effectiveness. That means, the digital thermometer of antimicrobial copper retains its effectiveness when made from antimicrobial copper parts as: tip -temperature sensor and / or power button given that the largest number of pathogenic microbes of a thermometer, is concentrated at these points.

The advantage of this invention is the achievement of the maximum natural- without any further act that is without use of disinfectants- the neutralization of pathogenic microbes that infest on the thermometer body, therefore achievement and limitation of further dispersion. Thus, the invention greatly contributes to the fight against infections transmitted by touch of the thermometer, particularly when using in hospitals and other health facilities.

Brief Description of Drawing

The attached Figure 1 shows the front side of an armpit thermometer. The thermometer consists of the body (1), the battery cover, i.e. the removable part through which the battery is inserted into the thermometer (2), the power button i.e. ON-OFF (3), the screen indications (4) and the tip i.e. the part that comes into contact with the designated part of the human body, which is the sensor for measuring temperature (5).

Modes for Carrying out the Invention

One way of producing a digital thermometer of antimicrobial copper, is, with the construction of the entire external surface of it, or part/s thereof, except of the display (4), that is the body (1) and / or battery cover (2) and / or the Power Button (3) and / or the tip - measuring temperature sensor (5) of solid antimicrobial copper, as the only material of all or part /s of the outer casing of the thermometer.

Another way of producing digital thermometer of antimicrobial copper, is, with an outer layer of antimicrobial copper over the entire outer surface of it, or part /s thereof, except of the display (4), that is the body (1) and / or battery cover(2) and / or the Power Button (3) and / or the tip-measuring temperature sensor (5), with all acceptable methods of coating, for which it is provided the international quality certification, a product made of antimicrobial copper.

Industrial Applicability

In Figure 1 displayed, it has been used as an example, the armpit thermometer. Nevertheless, the use of antimicrobial copper can be proportionate, in accordance with the above, also into other types of medical thermometers, as the ear thermometer, the forehead thermometer and the non-contact thermometer, since all of them are consisted externally of the same parts, having the same function and use.

According to an aspect, the antimicrobial copper in the digital thermometer destroys 99.9% of the microbes in a colony.

Claims

1. A digital thermometer of antimicrobial copper, which is a medical digital thermometer ~~of any type, design or size~~, which consists externally of:
   a body (1),
   a battery cover (2) that is a removable part through which a battery is inserted into the thermometer,
   a power button (3) that is a key ON-OFF,
   a display (4), and
   a tip (5) that is a sensor for measuring the temperature,
   characterized in that
   the outer surface of these parts, except of the display, is made of antimicrobial copper or bears antimicrobial copper or is externally coated with antimicrobial copper, or
   the outer surface of the body (1), and/or the battery cover (2) and/or the power button (3) and the tip (5) is made of solid antimicrobial copper or is externally coated with antimicrobial copper.

2. The digital thermometer of claim 1, wherein the outer surface of these parts is made of solid antimicrobial copper.

~~3. The digital thermometer of claim 1, wherein the antimicrobial copper destroys >99.9 % of microbes in a colony.~~