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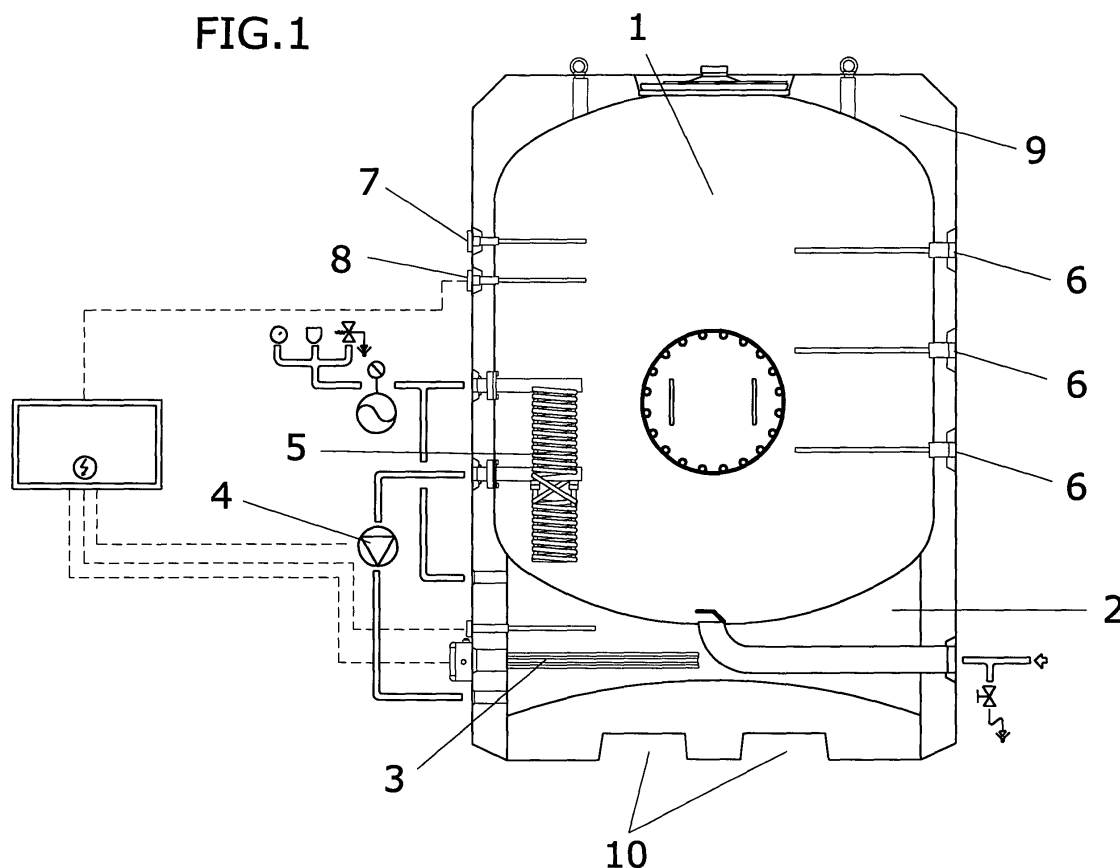
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(54) **Industrial electrical heated tank for sanitary hot water**

(57) Electric heated tank for the production and storage of sanitary water, where the means of heating are not immersed in the hot sanitary water, because of which they are not exposed to calcareous incrustations or corrosion, and also avoiding the formation of cold areas that facilitate the development of bacteriological conditions within the tank; for this purpose having a

heating chamber in whose interior the electrical means of heating, immersed in a heating fluid, are placed. The heat is transmitted by contact from the chamber to the tank, and by conduction of the heating fluid from the chamber to a heat exchanger placed inside the tank (or outside it), said circulation being carried out by means of a pump or circulator.

FIG.1



Description

OBJECT OF THE INVENTION

[0001] An industrial electrical tank for sanitary hot water, among those devices used for heating and storage of hot water for later use, is the purpose of this invention.

[0002] The present invention is characterized by the special configuration and design of the tank, by the means of heating, and by the interaction between both methods, that allows better conservation of the tank to be achieved, as well as avoiding the proliferation and formation of bacteriological conditions within it.

[0003] Therefore, the present invention is encompassed within storage devices and sanitary hot water heaters using electrical means of heating, also known as water storage-heater devices, in particular in the context of industrial electrical equipment.

BACKGROUND OF THE INVENTION

[0004] Up until the present, the equipment used for the heating of water known as "immersion heaters", have electrical resistances immersed within the actual water to be heated.

[0005] The placing of resistances in direct contact with the water entails various disadvantages. On one hand due to bad quality of the water, it critically influences the durability of the equipment, which undergoes corrosive processes and accumulations of lime, affecting both the actual performance of the heater and the actual lifetime of the components, the useful lifetime being directly affected by the quality of the water.

[0006] On the other hand, within the actual tank and at certain temperatures, it is quite a suitable environment for the formation and proliferation of bacteriological conditions, such as, for example "legionella".

[0007] The development and formation of bacteriological conditions still continue in spite of storing water to a regulated temperature greater than the risk temperature, since zones exist within the actual tank that, due to its design, geometry or layout of the heating elements, never reach the recommended safety temperatures.

[0008] Therefore, the object of the present invention is to develop an industrial electrical tank for hot sanitary water, that overcomes the previous difficulties, where the heating elements are not in direct contact with the water to be heated, since it directly affects its lifetime, and where the formation and proliferation of bacteriological conditions within the actual tank are avoided.

DESCRIPTION OF THE INVENTION

[0009] The industrial electrical hot sanitary water tank basically consists of a storage unit or tank where the hot water is stored, additionally having a heating chamber whether located surrounding the actual tank in its entirety, or as a minimum, its lower part.

[0010] The heating chamber acts as primary heating circuit, which fills with a heating fluid such as water, oil etc, naturally with hydraulic security. Inside the chamber the electrical means of heating are located.

[0011] Heat transmission from the heating chamber to the tank is carried out in two ways: By conduction with the chamber being in direct contact with the tank, and by convection with the fluid contained in the heating chamber being made to circulate towards a heat exchanger placed inside the tank, said circulation being carried out by means of a pump or circulator.

[0012] The exchanger can be fixed, detachable, internal or external to the tank, in order to be able to adapt itself to the exchange surface and to the installed electrical power.

[0013] The tank of the present invention manages to avoid the formation of cold areas within the storage tank, that favor the development of bacteriological conditions, the deterioration of the electrical heating resistances, as well as taking 100% advantage of the storage capacity of the tank due to the total homogeneity of temperature of the water within the tank.

[0014] The present invention is for application to the production and storage of hot sanitary water, where heating is carried out by electrical and/or mixed means its instauration not being affected by power limitations, of the type and material of the resistances or by the materials used in the construction of the unit.

DESCRIPTION OF THE DRAWINGS

[0015] To supplement the description that will be carried out below and with the aim of leading to a better understanding of its characteristics, this descriptive report is accompanied by a set of drawings in whose figures, in an illustrative and non-limiting way, the most significant details of the invention have been represented.

[0016] Figure 1 shows a representation of the industrial electrical tank object of the invention.

PREFERABLE EMBODIMENT OF THE INVENTION

[0017] In the light of the figures a preferred means of embodiment of the invention proposed is described below.

[0018] In Figure 1, we observe that adjoining the tank (1) where the hot sanitary water is produced and stored, there is a heating chamber (2) attached, in this case located in the lower part of the tank, and it is where the electrical heating resistances (3) are housed.

[0019] The location of the heating chamber (2) in relation to the tank could be whatever, and is not limiting, as a minimum it will cover the low part of the tank, partially or completely, it could even surround the actual tank.

[0020] The interior of the heating chamber (2) fills with the heating fluid, which can be a water, oil or similar, acting as a primary circuit.

[0021] Due to the fact that the electrical resistances (3) are located within the heating chamber (2) and not in direct contact with the hot sanitary water of the tank (1), they are not exposed to the attack of the hot sanitary water, such as corrosion or calcareous incrustations, since the medium in which said resistances (3) are placed is treated previously treated.

[0022] The heat energy transmitted by the resistances (3) to the heating fluid held in the heating chamber (3) is transmitted to the tank water (1), whether directly by conduction via the direct contact that exists between the tank (1) and the heating chamber (2), or by convection with the heating fluid being made to circulate through an exchanger (5) located within the tank. The circulation of the heating fluid is carried out by means of a pump or circulator (4), which makes the heating fluid pass from the heating chamber to the exchanger (5).

[0023] In said figure it can be observed how within the tank (1) has distributed one cure anodes (6) with the target to endow to the deposit of a cathode protection. Equally on the tank there is a thermometer (7), as well as a safety regulating thermostat for the hot sanitary water. All the tank assembly (1) is covered by insulation (9), and has a series of in-cuts (10) of rectangular section, with the aim of facilitating the movement of the tank by means of a forklift or trolley.

[0024] Variations in materials, shapes, size and layout of the component parts, described in non-limiting way, do not alter the essential nature of this invention, this being sufficient for its reproduction to be undertaken by an expert.

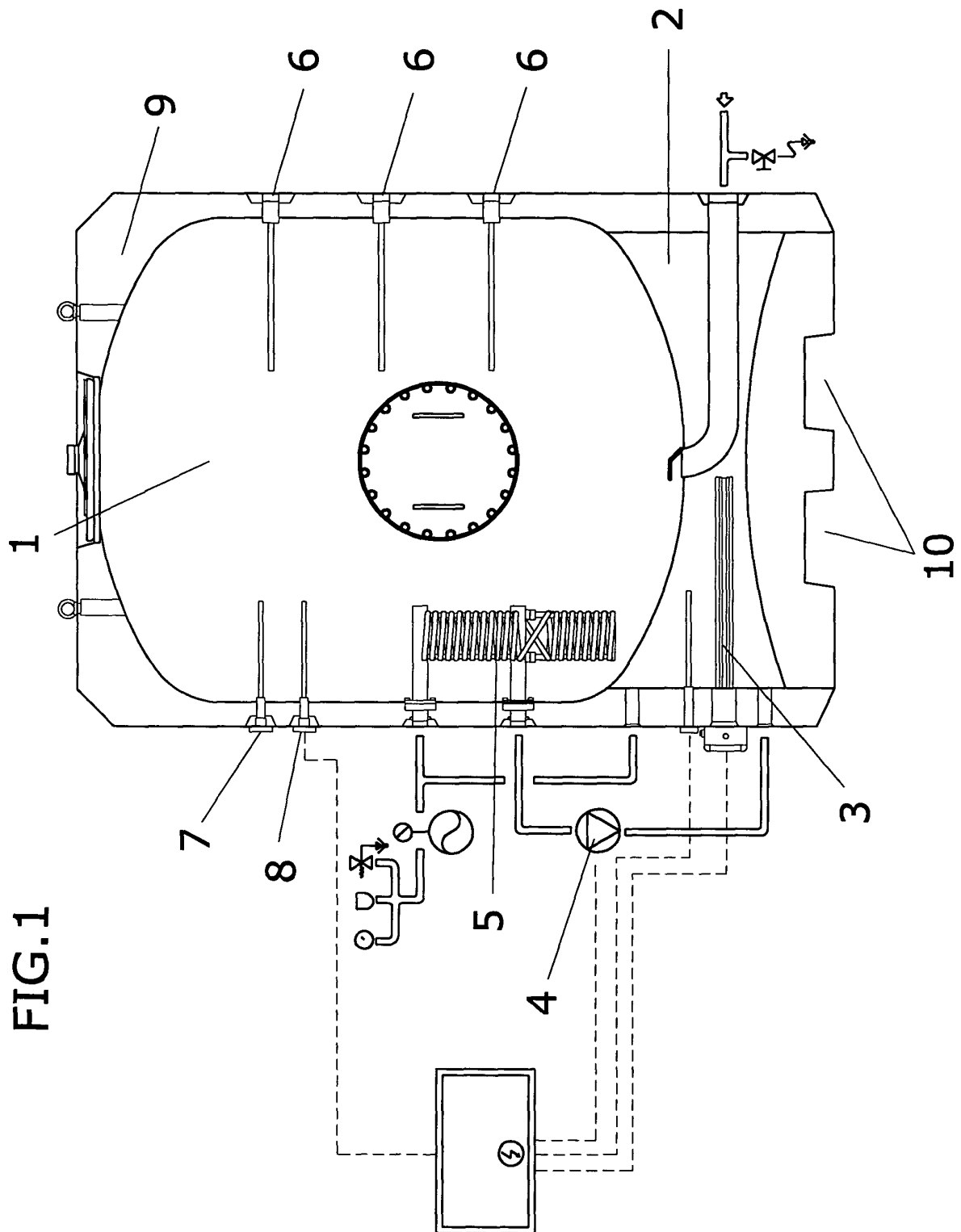
responding hydraulic safety devices for both circuits.

3. Industrial electrical tank for sanitary hot water, according to claim 1, **characterized in that** all of the tank is covered by thermal insulation and it has a support in its lower part that has a number of cut-outs of rectangular section for its movement using a fork-lift or trolley.

Claims

1. Industrial electrical tank for sanitary hot water, **characterized in that** the production and storage of the hot sanitary water is carried out in a tank in whose interior there are no electrical means of heating in direct contact with the water; consisting of a tank and of a heating chamber that is joined to the tank at its lower part, even surround it completely; an electrical means of heating in direct contact with a heating fluid being installed in the interior of the heating chamber, and where the heat transmission from the heating chamber to the tank is carried out by conduction on being in direct contact with the tank, and by circulation of the heating fluid, contained within the heating chamber, with the assistance of a pump or circulator, to a heat exchanger placed inside the tank, (or outside of it).

2. Industrial electrical tank for sanitary hot water, according to claim 1 **characterized in that** the tank has a series of means of cathodic protection, a thermometer, and a safety regulating thermostat for the hot sanitary water, of a safety regulating thermostat for the heating chamber fluid, as well as for the cor-





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 38 0280

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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A	CH 681 044 A (GNOSIS ETS) 31 December 1992 (1992-12-31) * figure 1 *	1	
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 19 April 2004	Examiner García Moncayo, 0
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 03 38 0280

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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