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RADIANT ENERGY STERILIZER LAMP FOR THERAPEUTIC
HYDROTHERAPY BATH TANKS
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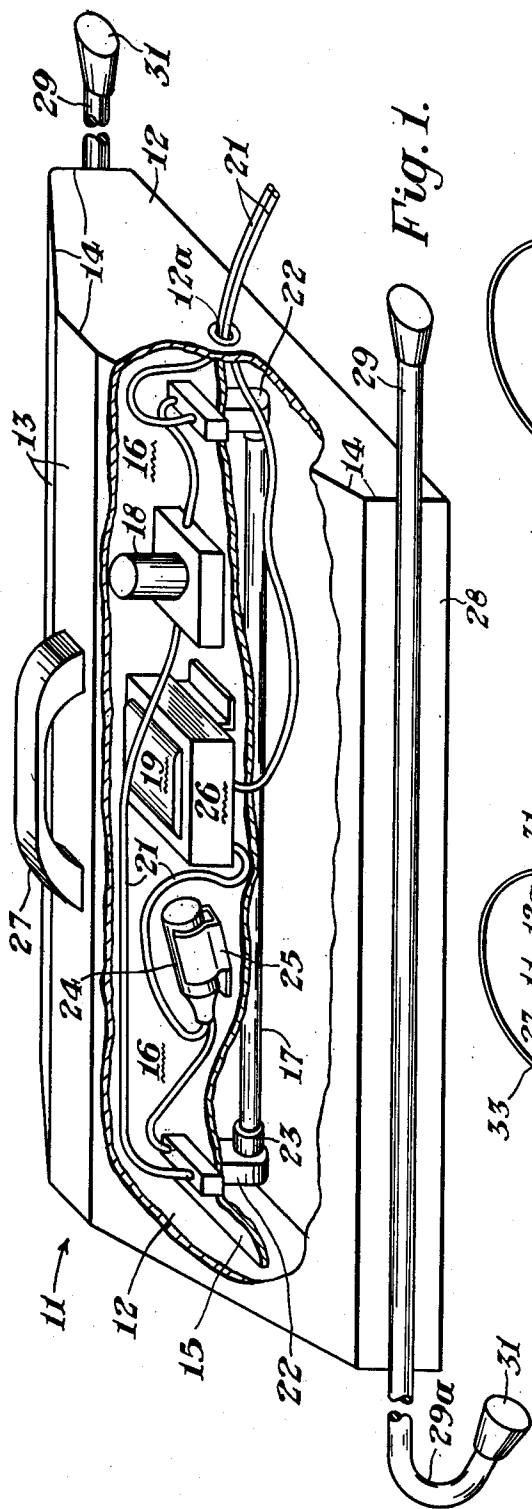


Fig. 1.

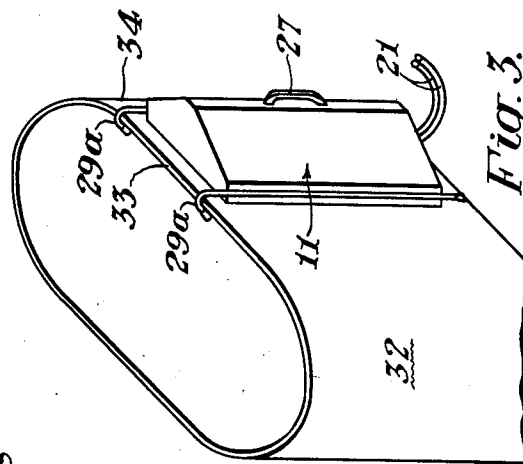


Fig. 3.

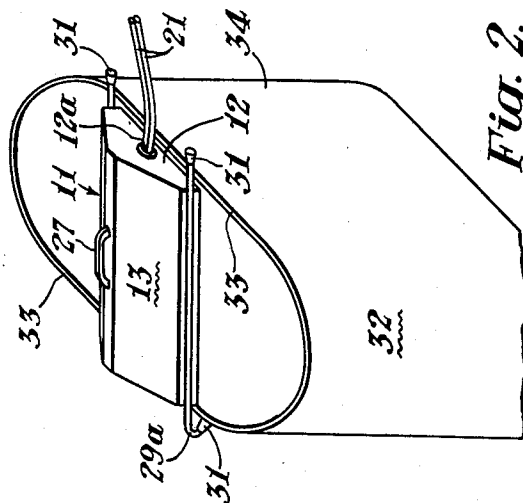


Fig. 2.

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3,134,897 RADIANT ENERGY STERILIZER LAMP FOR THERAPEUTIC HYDROTHERAPY BATH TANKS

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1 Claim. (Cl. 250—42)

This invention generally relates to a radiant energy sterilizer, and, more particularly, to a radiant energy sterilizer or lamp for therapeutic hydrotherapy bath tanks and other open vessels to be maintained in sanitary condition.

Doctors engaged in the practice of medicine utilize the so-called hydrotherapy tanks for the treatment of patients. They are commonly used in doctors offices, hospitals and the like, and generally, during operating periods are used in succession by a number of patients. The tank is of course filled with fresh water with each use and emptied after the patient has been treated and great care is taken both before and after use of the equipment to prevent the affected member, as for example a foot, from contacting directly a surface previously or to be subsequently contacted by another, but heretofore no effective way of sterilizing the interior of the tank rapidly and completely has been available. While sterilizing lamps have been available for use and are used where the patient or nurse is not directly exposed to its rays, which are extremely dangerous to one's eyes, and have been employed in an environment which could be vacated while the lamp is in operation, there has heretofore been no provision for using such lamps where persons remain in the room and which could be safely employed in sterilizing tanks of this kind.

The disadvantages of known sterilizing lamps when used in conjunction with hydrotherapy bath tanks and the like as abovementioned have been obviated in the instant invention by the provision of a novel lamp having support structure which enables the tank of the whirlpool bath to be utilized both to store the lamp when not in use, and to support the lamp when the ultra-violet rays, or other rays of wave lengths known to destroy bacteria and fungi, are desired for sterilization of the tank. The electrical connection between the lamp and the commercial source of power remains undisturbed by the provision of a unique switching arrangement within the lamp which is responsive to changes in the orientation of the longitudinal axis of the lamp to turn the tube of the lamp "on" or "off."

It is, therefore, a principal object of this invention to provide a new and improved radiant energy sterilizer for sanitizing therapeutic bath tanks and the like.

Another object of the present invention is to provide an ultra-violet lamp having support members by which the lamp may be secured removably to a sterilizing tank.

Still another object is the provision of a radiant energy sterilizer having a switch operative to open or closed condition dependent upon the orientation of the lamp.

A complete understanding of the invention may be had from the following detailed description of a specific embodiment thereof when read in conjunction with the appended drawings, wherein:

FIG. 1 represents a perspective view, partly broken away, of the radiant energy sterilizer;

FIG. 2 shows the sterilizer resting on the top edges of a tank whereby the rays emitted from the lamp are projected downwardly into the interior of the tank; and

FIG. 3 depicts the sterilizer in stored position along the external wall of the tank.

Referring now to the drawings, wherein like reference characters designate like or corresponding parts throughout the several views, there is shown in FIGURE 1 a

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lamp generally designated as numeral 11 having trapezoidal end walls 12 to which is affixed a shield or housing 13 secured to the top edges 14 of the side walls. A shelf 15 is mounted removably along parallel lines between the uppermost and lowermost edges of the side walls 12 and extends between the walls 12 such that a cavity 16 is formed between the upper surface of the shelf 15 and the lower surface of the shield 13. Placed within this cavity 16 are the customary components of an ultra-violet tube 17, such as a starter element 18, a transformer coil 19, and a power supply line 21 connected to a suitable source of power, not shown, through a passage or orifice 12a in one of the side walls 12. Tube holders or brackets 22 depend below the shelf 15 through which the power supply line 21 makes contact with the terminals 23 of an elongated tube 17. The shelf surface adjacent the tube is preferably reflective.

An orientation-responsive circuit interrupter such as a gravity-responsive mercury switch 24 is supported by a clamp 25 on the shelf 15 in series connection with the power supply line 21. The mercury switch is so disposed on the shelf that when the radiant energy sterilizer 11 is placed in a horizontal position the switch is closed and the tube 17 is turned on. On the other hand, when the lamp 11 is tilted to a non-horizontal position, as is shown in FIG. 3, the mercury switch 24 is effective to open the circuit to the power supply through power line 21 whereupon the tube 17 is maintained in "off" condition. For ease in the manipulation of the lamp 11 the transformer armature 26 is arranged on the shelf 15 in a central position, and spaced above the transformer armature 26 is a handle 27, which is in turn fixed to the uppermost surface of the shield 13.

Rigidly fastened to both the front and back surfaces 28 of the shield 13 are a pair of rods 29 disposed on parallel axes, and the switch 24 is adjusted in relation to the rod axes such that the circuit of tube 17 is closed when the rods are placed on a tank for a sterilizing operation. Corresponding ends 29a of the rods 29 are downwardly turned to form a hook configuration, and rubber tips 31 are provided on the extreme ends of the rods 29 to preclude metal-to-metal contact of the straight ends of the rods 29 with the surfaces of a tank upon which the lamp is to be mounted for storage when in non-use, and for contact of the rubber tips 31 on the hook-shaped ends 29a with the tank on which the lamp 11 is placed for ray emission into the tank.

As best shown in FIGURE 2, the straight portions of the rods 29 are of sufficient length to span the opening of a tank 32 or the like, with the top edges 33 of the tank 32 in supporting contact with the bridging rods 29. The rubber tips 31 on the curved ends 29a of the rods 29 assist an operator in the placement of the lamp 11 across the span between the edges 33 of the tank 32 by frictionally engaging the sidewall 34 of the tank opposite the location of the operator. Since the rods 29 are constructed to orient the lamp 11 in a horizontal position when placed on the top of a tank 32, the mercury switch 24 is closed in the arrangement shown in FIGURE 2 such that the lamp or tube 17 is in operating condition; i.e., emitting germicidal rays.

In FIGURE 3 the sterilizer 11 is shown in stored position. The downwardly turned ends 29a of the rods 29 extend inside the tank 32 with the center of gravity of the lamp 11 being located substantially in the area of the transformer armature 26 as shown in FIGURE 1. Accordingly, the center of gravity of the lamp 11 lies outside the tank 32 and the curved ends 29a in their contact with the edge 33 of the tank 32 dependently supporting the lamp 11 alongside the exterior wall 34 of the tank 32. As above described, when the mercury switch on the shelf

15 is disposed in a non-horizontal position the contacts of the switch are open to interrupt the circuit of the line 21 with the tube 17; therefore, when the sterilizer is in stored position the tube 17 is "off."

The present invention eliminates the manual switching of a sterilizing lamp from one condition to another dependent upon its use or non-use, removing the possibility of leaving the lamp "on" when in non-use. The support structure of the invention makes it possible to utilize a tank, or other vessel with which the lamp is to be employed, as a stand for both storage and operation of the lamp, thereby eliminating the need for a pedestal which is cumbersome to adjust when the beneficial rays of the lamp are desired and awkward to store away from a tank or the like when the tank is in use. The positioning of the lamp on the edges of a tank opening makes possible the emission of rays only within the tank, thereby eliminating the hazard of exposing one's eyes to the rays.

It is manifest that the above-described embodiment of the invention is merely illustrative and that numerous modifications may be made within the spirit and scope of the invention. Further, it will be understood that the particular embodiment illustrated is only an example of one type of germicidal tube and accompanying components which may be operated in practicing the invention and that the invention is not limited to use with the one type of tube or tank disclosed.

I claim:

A self-contained apparatus for sterilizing the interior of an open top hydrotherapy tank comprising a space enclosing opaque housing in the form of a hood with end walls, side walls and a cover, the hood having one face open, a combined shelf and reflector in the housing dividing the space therein into inner and outer portions with the reflector being turned toward the open face of the housing, a sterilizing lamp supported in the housing extending lengthwise of the housing between the reflector

and the open face of the housing, accessory electrical equipment on the shelf in the inner portion of the space within the housing comprising a transformer and a starter, a gravity-responsive switch on the shelf positioned to close a circuit through the accessory electrical equipment for operating the lamp when the housing is in a horizontal position with the open face down and to open the circuit when the open face of the housing and the shelf are in a vertical plane with a selected end of the housing turned up, extensions at said selected end adapted to support the housing on a hydrotherapy tank when the housing is in horizontal position over the tank, said extensions having hook-forming terminal portions by which the housing may be hung in a vertical position against the outside of the tank by engagement of said hook-forming terminals over the top edge of the tank with said selected end up, the hook-forming terminal portions being turned in a direction such that the open face of the housing will be turned toward the tank walls when the hooks are engaged over the top edge of the tank, means at the outer end of the housing extending in a plane only beyond the sterilizing lamp at the level of the extension on said selected end and reflector for supporting the housing on an opposite edge of the hydrotherapy tank when the housing is in horizontal position whereby the housing may be set in a horizontal position across the top of the tank and supported entirely thereby with the open face downward or hung in a vertical position against the outside of the tank only when said selected end is uppermost, and handle means on the housing to facilitate the changing of the position thereof from one location to the other.

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