

SAUNA APPARATUS

This invention relates to a sauna apparatus, more particularly to a sauna apparatus including a housing and a heating unit that has sheet-type heating elements attached respectively to walls of the housing.

A conventional sauna apparatus 1, as shown in Fig. 1, defines a chamber 10, and includes left, right, front and rear walls 12, 13, 11, 14, a ceiling (not shown), and a floor 16. The front wall 11 is provided with a door 18. A seat 17 is mounted in the chamber 10 proximate to the floor 16. A plurality of heating devices 19 are mounted respectively on the left, right, and front walls 12, 13, 11, and on the rear wall 14 above and below the seat 17 in the chamber 10. Each of the heating devices 19 includes a heating element 191, such as a ceramic heating plate or a heating tube, a grid element 192 serving as a first partition for separating users from the heating element 191, and a casing 193 that serves as a second partition for separating the users from the heating element 191 and the grid element 192 and that is available to be leaned against by the users.

When power to the heating devices 19 is turned on, the heating elements 191, such as the ceramic heating plates or the heating tubes, radiate heat so as to elevate the temperature of the chamber 10 of the sauna apparatus 1 to a range of 104°F to 170°F (40

°C to 77°C) and so as to help the users in enhancing metabolism, expelling poisonous substances from their bodies, keeping healthy, and combating fatigue. Although the heating devices 19 of the conventional sauna apparatus 1 are capable of elevating the temperature of the chamber 10, how to further improve the heating devices 19 is a pressing need because of the following drawbacks:

1. For example, for a single-user small sauna apparatus 1, the temperature of the chamber 10 is required to be elevated to a range of 104°F to 170°F (40°C to 77°C), so as to achieve the user's desired chamber temperature. Generally, the power supplied to the heating devices 19 is required to be higher than 1300 watts. Additional power of 300 watts is required for every additional user to maintain the desired chamber temperature. However, since the heat radiation area of the heating element 191 of the current sauna apparatus 1, such as the ceramic heating plate or the heating tube, is relatively small, the radiated heat per unit area of the heating element 191 is relatively high. Therefore, the operational temperature of the heating element 191 is higher than 250°F (120°C). The power required for each heating element 191 increases with a decrease in the number of the heating elements 191 mounted in the chamber 10 of the sauna apparatus 1. For example, if two

ceramic heating plates or two heating tubes are mounted in the chamber 10 of the single-user sauna apparatus 1, the power required for each of the heating elements 191 will be higher than 650 watts, and the temperature of each of the heating elements 191 will be higher than 572°F (300°C). The user is likely to be injured upon accidental contact with the heating devices 19.

2. Since the operational temperature of the heating elements 191, such as the ceramic heating plates or heating tubes, is relatively high and since the heating elements 191 are disposed proximate to the user, the grid element 192 is required to be disposed about 1 inch distant from the surface of the heating elements 191, and the casing 193 is required to be disposed about 3 inches distant from the surface of the grid element 192 so as to prevent the user from burn injury. Therefore, the thickness of the entire heating device 19 is relatively large and cannot be reduced.

3. Although the heating devices 19 can be disposed respectively on the left, right, front and rear walls 12, 13, 11, 14 in the chamber 10 of the sauna apparatus 1, a large portion of the inner space of the chamber 10 of the sauna apparatus 1 will be occupied due to the 4-inch thickness of the heating devices 19. The user is likely to feel uncomfortable and unsafe due to closeness to these heating devices

19. Alternatively, for maintaining the space of the chamber 10 as large as possible, the heating devices 19 may be mounted respectively in recesses that indent into the left, right, front and rear walls 12, 13, 11, 14 and protrude outwardly from the outer surface of the sauna apparatus 1. However, the sauna apparatus 1 will have an irregular appearance and will require a relatively large space for installation.

Consequently, there is a pressing need in the art to have a sauna apparatus capable of radiating heat uniformly, saving space and enhancing safety.

Therefore, the object of the present invention is to provide a sauna apparatus that can overcome the aforesaid drawbacks of the prior art.

According to the present invention, a sauna apparatus includes: a housing that defines a chamber therein and that has left and right walls, front and rear walls interconnecting the left and right walls, a floor interconnecting the left, right, front and rear walls, and a ceiling interconnecting the left, right, front and rear walls; and a heating unit including at least one sheet-type heating element disposed in the chamber and attached to one of the left and right walls, the front and rear walls, the floor, and the ceiling. The sheet-type heating element includes an assembly of first and second insulative sheets and a graphite film. The first and second

insulative sheets are connected to each other and are stacked one above the other. The graphite film is coated on one of the first and second insulative sheets and is sandwiched between the first and second insulative sheets.

Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiments of the invention, with reference to the accompanying drawings. In the drawings:

Fig. 1 is a perspective view to illustrate a conventional sauna apparatus;

Fig. 2 is a perspective view to illustrate the first preferred embodiment of a sauna apparatus according to this invention;

Fig. 3 is a cross-sectional view to illustrate the structure of a heating element of the sauna apparatus shown in Fig. 2;

Fig. 4 is a cross-sectional view to illustrate one arrangement of heating elements in a housing of the sauna apparatus shown in Fig. 2;

Fig. 5 is a cross-sectional view to illustrate another arrangement of heating elements in the housing of the sauna apparatus shown in Fig. 2;

Fig. 6 is a perspective view to illustrate the second preferred embodiment of a sauna apparatus according to this invention;

Fig. 7 is a perspective view to illustrate the structure of a heating element of the sauna apparatus shown in Fig. 6;

Fig. 8 is a front perspective view to illustrate one arrangement of heating elements in a housing of the sauna apparatus shown in Fig. 6; and

Fig. 9 is a perspective view to illustrate another arrangement of heating elements in the housing of the sauna apparatus shown in Fig. 6.

Referring to Figs. 2 and 4, the first preferred embodiment of a sauna apparatus 2 according to this invention includes a housing that has a plurality of walls and that defines a chamber 20 therein. The sauna apparatus 2 further includes a plurality of sheet-type heating elements 3 disposed in the chamber 20 and attached respectively to the walls. The walls include left and right walls 22, 23, front and rear walls 21, 24 interconnecting the left and right walls 22, 23, and a ceiling 25 and a floor 26 interconnecting the left, right, front and rear walls, 22, 23, 21, 24. The front wall 21 is provided with a door 28. The sauna apparatus 2 further includes a seat 27 that is disposed in the chamber 20 above the floor 26. The sheet-type heating elements 3 include left and right sheet-type heating elements 322, 323, and upper and lower sheet-type heating elements 324.

Referring to Fig. 3, each of the sheet-type

heating elements 3 includes an assembly of first and second insulative sheets 32 and a graphite film 31, and has a thickness less than 1/25 inch (1 mm). The first and second insulative sheets 32 are connected to each other and are stacked one above the other. The graphite film 31 is coated on one of the first and second insulative sheets 32, and is sandwiched between the first and second insulative sheets 32. Preferably, the graphite film 31 is enclosed in the first and second insulative sheets 32 through hot pressing techniques. The graphite film 31 is a type of electro-thermal material. The first and second insulative sheets 32 are a type of electrically insulative and heat-conducting material for insulating the graphite film 31, and preferably are made from thermo-resistant, pressure-resistant, acid-base resistant, and impact-resistant glass fiber materials.

Fig. 4 illustrates a preferred arrangement of the sheet-type heating elements 3 in the sauna apparatus 2 according to this invention. In the arrangement, the left and right sheet-type heating elements 322, 323 are attached to the left and right walls 22, 23, respectively, and are disposed above the seat 27. The upper and lower sheet-type heating elements 324 are attached to the rear wall 24 and are disposed above and below the seat 27, respectively. When power to

the sauna apparatus 2 according to this invention is turned on, the heat radiated by the graphite film 31 is conducted through the first and second insulative sheets 32 and into the chamber 20 in the sauna apparatus 2, and is distributed evenly throughout the chamber 20 by virtue of the large areas of the sheet-type heating elements 3. Thus, the temperature of the chamber 20 in the sauna apparatus 2 according to this invention can be evenly elevated and maintained at a suitable chamber temperature required by the user.

Since each graphite film 3 is relatively thin, the area of each of the sheet-type heating elements 3 can be relatively large without significantly reducing the volume of the chamber 20 or changing the design of the chamber 20. A lower temperature for each of the sheet-type heating elements 3 as compared to that of the conventional heating device can be achieved. Therefore, the user is able to touch and contact the sheet-type heating elements 3 without being injured. The safety of the sauna apparatus 2 is thus enhanced.

It is noted that the sheet-type heating elements 3 can be attached anywhere on the left, right and rear walls 22, 23, 24, the ceiling 25 and the floor 26. As shown in Fig. 5, the sheet-type heating elements 3 further include a bottom sheet-type heating element 326 that is attached to the floor 26. The bottom sheet-type heating element 326 is covered by a towel

in such a manner that the user can put his feet on the bottom sheet-type heating element 326.

It is noted that this invention can be embodied in a sauna apparatus for multiple users, although the
5 sauna apparatus 2 shown in the drawings is for a single user.

Since each of the sheet-type heating elements 3 is relatively thin, the size of the sauna apparatus 2 can be reduced to avoid occupying too much space.
10 In addition, the sheet-type heating elements 3 can be directly mounted on the walls of the sauna apparatus 2 without the need for the casing 193 as required in the conventional sauna apparatus. Therefore, use of the heating elements 3 is more convenient and
15 economical as compared to the conventional heating devices 19.

Figs. 6 and 7 illustrate the second preferred embodiment of a sauna apparatus according to this invention. This preferred embodiment is similar to
20 the embodiment shown in Fig. 2, except that the sheet-type heating element 3 can be modified by further including a frame 4 for framing the assembly of the first and second insulative sheets 32 and the graphite film 31. The frame 4 is formed with a slot 43 along
25 the perimeter 42 of the frame 4 for engaging a periphery of the assembly of the first and second insulative sheets 32 and the graphite film 31.

Alternatively, the assembly of the first and second insulative sheets 32 and the graphite film 31 may be directly nailed on the frame 4 without the need for formation of the slot 43.

5 Referring to Figs. 8 and 9, the sheet-type heating elements 3 that include the frame 4 and the assembly of the graphite film 31 and the first and second insulative sheets 32 can be randomly assembled depending upon the size of the sauna apparatus 2 and
10 the required heating area. The sheet-type heating elements 3 further include front sheet-type heating elements 321 attached to the front wall 21 of the sauna apparatus 2, in addition to the left and right sheet-type heating elements 322, 323 that are attached
15 to the left and right walls 22, 23, respectively, the upper and lower sheet-type heating elements 324 that are attached to the rear wall 24, and the bottom sheet-type heating elements 326 that are attached to the floor 26.

20 Moreover, since the sheet-type heating elements 3 have a relatively thin thickness and a relatively light weight, the front, upper and lower, left, right and bottom sheet-type heating elements 321, 324, 322, 323, 326 can be attached to the front, rear, left and
25 right walls 21, 24, 22, 23, and the floor 26 through hanging or magnetic means.

I claim:

1. A sauna apparatus including a housing that defines a chamber therein and that has left and right walls, front and rear walls interconnecting said left and right walls, a floor interconnecting said left, right, front and rear walls, and a ceiling interconnecting said left, right, front and rear walls; and a heating unit;

characterized in that said heating unit including at least one sheet-type heating element disposed in said chamber and attached to one of said left and right walls, said front and rear walls, said floor, and said ceiling; and

said sheet-type heating element including an assembly of first and second insulative sheets and a graphite film, said first and second insulative sheets being connected to each other and being stacked one above the other, said graphite film being coated on one of said first and second insulative sheets and being sandwiched between said first and second insulative sheets.

2. The sauna apparatus as claimed in claim 1, characterized in that said first and second insulative sheets are made from glass fiber.

3. The sauna apparatus as claimed in claim 1, characterized in that said sheet-type heating element has a thickness less than 1/25 inch.

4. The sauna apparatus as claimed in claim 1, characterized in that said sauna apparatus further includes a seat that is disposed in said chamber above said floor.

5 5. The sauna apparatus as claimed in claim 4, characterized in that said heating unit includes a plurality of said sheet-type heating elements, said sheet-type heating elements including

10 left and right sheet-type heating elements that are attached to said left and right walls, respectively, and that are disposed above said seat;

upper and lower sheet-type heating elements that are attached to said rear wall and that are disposed above and below said seat, respectively; and

15 front sheet-type heating elements that are attached to said front wall.

6. The sauna apparatus as claimed in claim 5, characterized in that said sheet-type heating elements further include a bottom sheet-type heating element that is attached to said floor.

20 7. The sauna apparatus as claimed in claim 1, characterized in that said sheet-type heating element further includes a frame for framing said assembly of said first and second insulative sheets and said graphite film, said frame being formed with a slot along the perimeter of said frame for engaging a periphery of said assembly of said first and second insulative sheets and said graphite film.

25