Feb. 6, 1968 P. T. LAHTI 3,368,061

ELECTRICALLY HEATED SAUNA BATH STOVE

Filed July 19, 1965 2 Sheets-Sheet 1

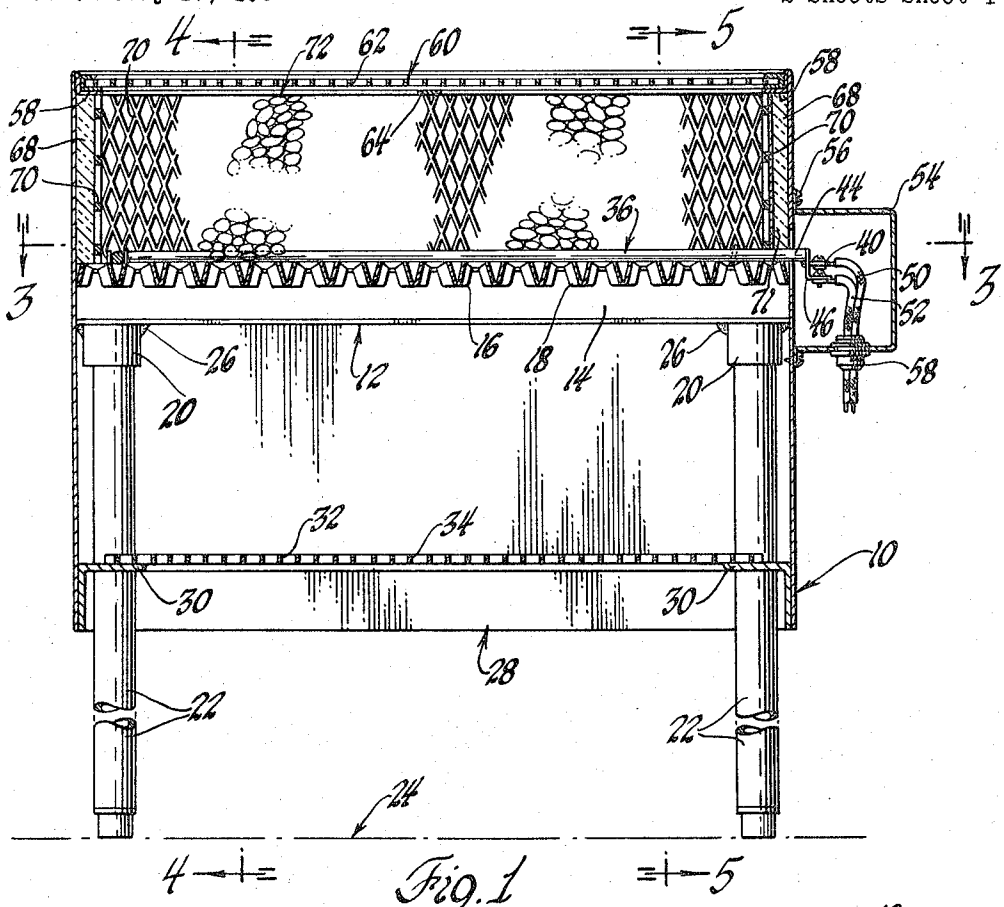

Fig. 1

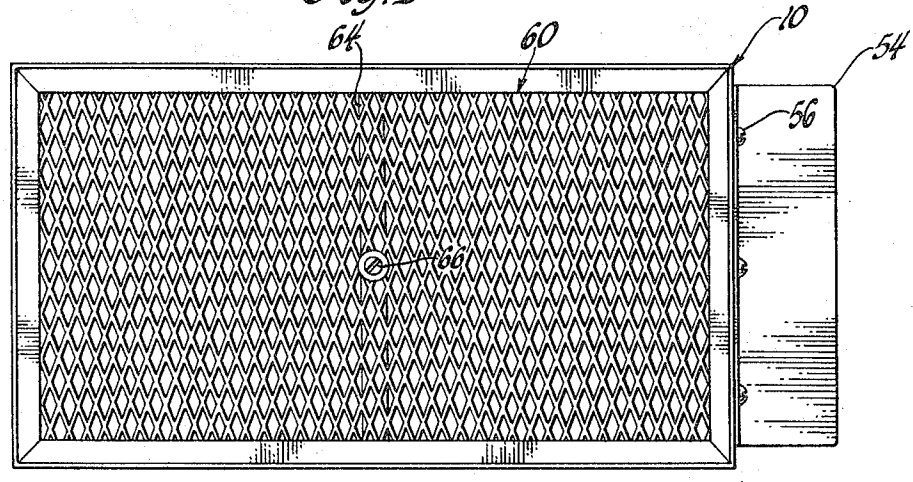

Fig. 2

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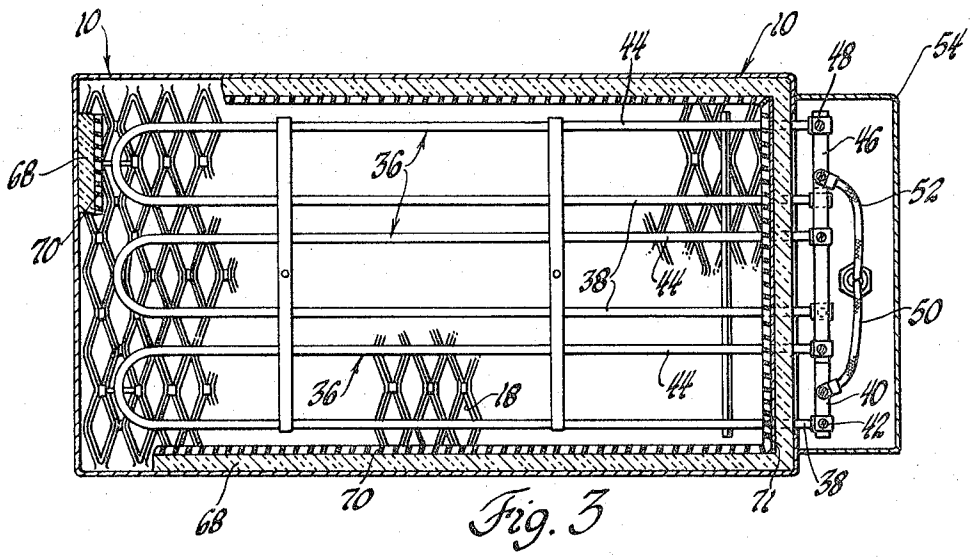

Fig. 3

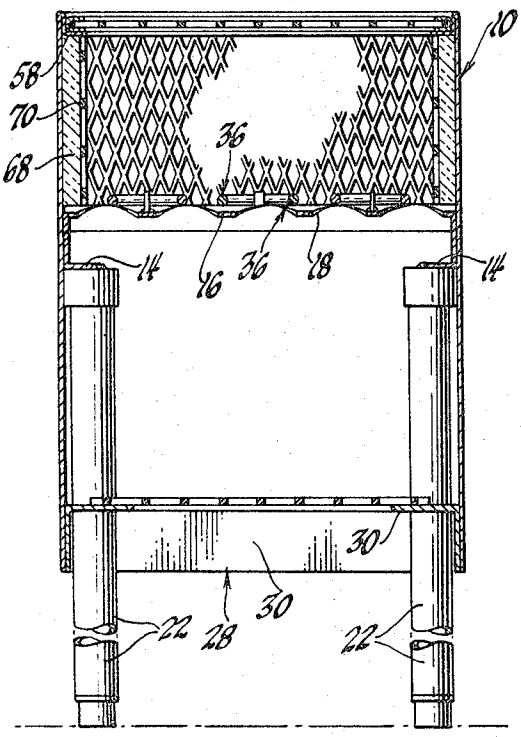

Fig. 4

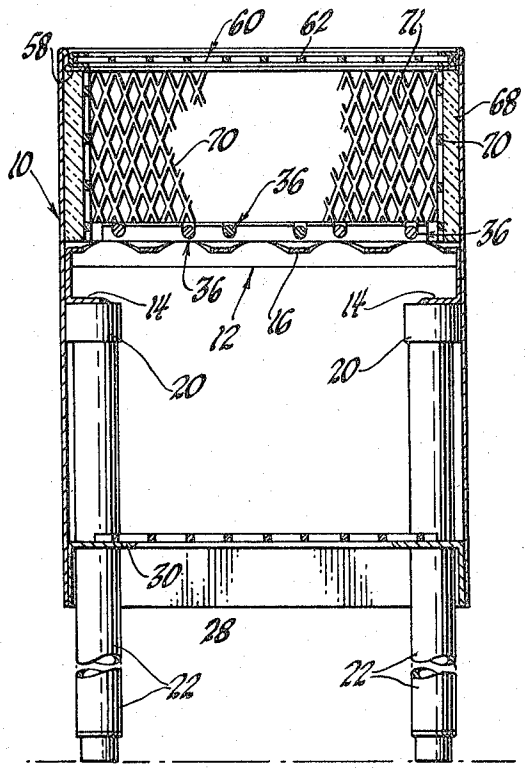

Fig. 5

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ELECTRICALLY HEATED SAUNA BATH STOVE

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ABSTRACT OF THE DISCLOSURE

A sauna stove including an outer enclosure having a lower support member and an upper support member disposed therein, and supported from the floor or ground by a plurality of legs. The transverse support members are open to permit air flow therethrough, and located above and engaging the surface of the upper transverse member is a resistance heating device. The rocks are disposed above the upper transverse member and in engagement therewith for heating by the resistance elements. The enclosure above the upper transverse member is insulated to prevent heat loss through the walls thereof.

This invention relates to sauna heating devices and more particularly to a sauna stove adapted to be placed in a suitable enclosure and containing a plurality of rocks adapted to be heated to supply the desirable dry heat required in a sauna bath.

The increasing popularity of the Finnish sauna is primarily due to the availability of suitably sized heating units that can be operated in a specially constructed sauna room to provide the necessary heat. The sauna bath is an old and well known concept, apparently originating in Finland, and which includes a hot room heated by a plurality of rocks heated by a suitable heat source, the rocks in turn heating the air within the room. Temperatures may vary from 130° Fahrenheit upward, and the humidity is extremely low because of the heat given off by the rocks. The humidity may be increased at intervals by sprinkling small amounts of water on the hot rocks to generate steam. It is also popular, after having spent some time in the heated room, to step into a cold shower or to roll in fresh snow.

Heating devices for saunas have progressed from a log fire in the middle of a room, upon which suitable rocks are thrown, to small portable devices that may be placed in an existing properly constructed room and provided with a basket or the like for receiving a plurality of rocks. However, presently existing stoves merely heat the rocks, and little or no provision is made for circulating air over the rocks and into the room to increase the efficiency of the stove or to properly heat the entire volume of air in the sauna room. To overcome these problems, complicated fans and circulation systems have been provided, either in association with the presently existing stoves, or externally of the stove and in the sauna room. Such forced air-circulating means are complicated and expensive to install and operate, increasing the overall expense of the sauna concept.

The device in which this invention is embodied comprises, generally, a stove structure which is so formed as to supply natural air circulation and air flow through the stove as well as through the rocks supported therein. The device includes an enclosure within which is mounted a transverse grate frame for supporting a plurality of rocks, the rocks varying in size from egg size to orange or grapefruit size. The rocks are placed in the enclosure and are supported by the grate frame. Below the grate frame is a lower frame on which is mounted a screen or like device, permitting free air circulation therethrough, the air continuing to circulate upwardly through the grate and the rocks to the atmosphere in the

room. Suitable heating means, such as electrical resistance elements, are disposed above the grate frame and below the plurality of rocks. By selecting the proper rock size and providing screens and grates within the enclosure means, air is allowed to circulate completely through the device and through the atmosphere in the sauna room. The lower screen, at the same time, prevents excess heat flow downwardly that might overheat the floor or supporting surface beneath the stove. The device may be made small enough to be portable, or movable from place to place or room to room, and is easily stored when not in use. The heating elements require only a connection to an existing electrical system, so that the stove may be used in homes as well as commercial constructions.

These and other advantages will become more apparent from the following description and drawings in which:

FIGURE 1 is an elevational view with parts broken away and in section of a sauna stove embodying the invention;

FIGURE 2 is a top plan view of the sauna stove illustrated in FIGURE 1;

FIGURE 3 is a horizontal cross-sectional view of the sauna stove illustrated in FIGURES 1 and 2 taken substantially along the line 3—3 of FIGURE 1 and looking in the direction of the arrows;

FIGURE 4 is a vertical cross-sectional view of the sauna stove illustrated in FIGURES 1 and 2 taken substantially along the line 4—4 of FIGURE 1 and looking in the direction of the arrows; and

FIGURE 5 is another vertical cross-sectional view of the sauna stove illustrated in FIGURES 1 and 2 taken substantially along the line 5—5 of FIGURE 1 and looking in the direction of the arrows.

For home use, a sauna may be conveniently built in a room as small as 5′ x 7′ with a 6′6″ ceiling. Such room should be panelled in soft wood, such as redwood, cedar, or white pine, the walls being insulated to retain the heat within the room. A heating device is used with which to heat a plurality of rocks, the rocks giving off a soft dry heat which permeates the atmosphere in the room and heats the atmosphere to a temperature of 130° Fahrenheit or more. Water may be sprinkled on the rocks from time to time to generate steam and increase the humidity in the room.

Referring more particularly to the drawings, a stove device is there shown which is adequate for heating a sauna room of a size up to about 9′ x 9′ to provide the adequate heat and steam for the sauna bath. The stove device is formed of an outside enclosure, illustrated generally by the numeral **10**, which may be constructed of stainless steel or any other suitable material. The enclosure **10** includes four sides and is open at the top and bottom, as best illustrated in FIGURE 1. Intermediate the open ends of the enclosure **10** is a frame structure, illustrated generally by the numeral **12**, the frame structure including longitudinal channel members **14** on the long sides of the enclosure and a grate structure **16** having a plurality of openings **18** on the lateral surface extending transversely of the enclosure **10**. Secured to the lower sides of the channel members **14** are sockets **20** for receiving suitable legs **22** supporting the frame and the enclosure **10** above the floor or other supporting surface, indicated generally by the numeral **24**. Leg mounts **20** may be secured to the channel members **14** in any suitable manner as by weldments **26**.

Secured at the lower end of the enclosure **10** is a second frame, illustrated generally by the numeral **28**, frame **28** being composed of angle irons or the like **30** extending peripherally around the inside of enclosure **10**. Angle members **30** are provided with suitable apertures through which the legs **22** extend, and assist in supporting the

enclosure structure 10 on the legs 22. Extending transversely of the enclosure and suitably supported on the frame 28, is a screen or lower grate 32 having a plurality of openings 34 formed therein.

Above the main frame 12 are located a plurality of U-shaped electrical resistor heating elements, indicated generally by the numeral 36. The U-shaped elements extend longitudinally of the housing 10 and the ends of the legs thereof extend through suitable apertures in the enclosure 10 to the exterior of the enclosure 10. Corresponding legs of each of the U-shaped elements 36, such as legs 38, are connected by a bus bar or the like 40, such connections being made by nut and bolt devices 42. The opposite legs 44 of the U-shaped elements 36 are connected by another bus bar or the like 46, the connections being made by nut and bolt assemblies 48. The two bus bars 40 and 46 are in turn connected to electrical conduits 50 and 52, respectively, the conduits being adapted to connect to a suitable power supply, not shown. Enclosing the electrical connections outside of the enclosure 10 is is a sheet metal housing 54 secured to the enclosure 10 in any suitable manner, as by machine screws or the like 56, and a suitable conduit and coupling device, such as illustrated at 58, permits passage of conduits 50 and 52 through the wall of housing 54. Suitable water sealing means are provided between the housing 54 and the enclosure 10 to protect the electrical connections from water sprayed on the rocks or in the vicinity of the housing 54.

The upper end of the enclosure 10 is formed in any suitable manner to provide a ledge 58, as by reversely bending the sheet metal forming the enclosure 10 and illustrated in FIGURES 1, 4 and 5. Ledge 58 extends peripherally around the inside of the upper edge of the enclosure 10 and serves to receive and retain an upper screen, illustrated generally by the numeral 60. Screen 60 has a plurality of apertures 62 formed therein. The upper screen 60 is secured in the enclosure by means of a strap 64 extending transversely of the enclosure 10 and secured to the walls thereof in any suitable manner. A bolt or the like 66, passing through the screen structure 60 and received in the transverse strap 64, secures the screen frame 60 in place.

Insulation material 68 is disposed about the interior wall of the upper portion of the enclosure 10 above the main frame 12. Any suitable insulation material may be used and the insulation is protected on its inner surfaces by suitable screen devices 70, disposed vertically in the enclosure 10 and spaced from the outer walls thereof. In order to protect the housing 54 and the electrical connections therein, a metallic panel 71 may be disposed on the inner surface of the insulation at that end of the enclosure 10.

The volume of the enclosure 10 above the main frame 12 and within the insulated walls, receives a plurality of rocks, illustrated generally by the numeral 72. Such rocks vary in size between egg size and grapefruit size, or from one inch to five inches in mean diameter. The rocks are preferably hard smooth stones which will not break up under heating conditions. The variation in size provides the optimum surface area for heat generation, and by reason of variation in size permits air flow therethrough in a manner to become hereinafter more apparent. The rocks are placed within the upper portion of the enclosure 10 and are heated by the electrical resistance elements 36 when properly activated. When water is sprinkled on the rocks 72, sufficient surface area is provided to permit rapid steam generation for increasing the humidity in the room in the desired fashion.

The correlation between the size of the rocks, the number of rocks and the size of the enclosure is important. It is necessary that these parameters be such that the temperature desired in the room be reached at about the same time as the maximum temperature of the rocks is reached. For example, if the temperature in the room is to reach 160° Fahrenheit, and the rocks are to

reach a temperature of 450° Fahrenheit, such temperatures should be arrived at within the same period of time. This is dependent upon optimum rock size, the proper number of rocks, the air circulation through the rocks, and, of course, the heat generated by the resistance elements.

The volume of the rocks in the device is important also in proper steam generation. There must be sufficient heated rocks available so that water, thrown on the upper rocks, will be turned to steam as soon as possible. Obviously, when water is thrown on the rocks those rocks the water contacts will cool down. If the volume of rocks is sufficient, additional water will flow down to dry rocks whose heat is still at a steam generating point. In the meantime, of course, heat is being generated to heat the rocks back to the proper temperature.

An additional advantage in providing the proper volume and size of the rocks is the retention of heat for a sufficient time to dry out the sauna room. After the heating elements are turned off, the rocks are still heated to a sufficient temperature, and there are enough rocks, that the moisture remaining in the room will be evaporated, thus avoiding humidity damage to the walls and equipment in the room.

It will now be apparent that with the open lower screen 32, the open grate 16 in the main frame 12, and the varied size rocks 72 in the enclosure 10, that a free air circulation path is provided in the sauna stove. The spacing of the enclosure 10 from the floor 24 allows the entry of air from beneath which will readily pass through the entire stove structure and the rocks for optimum heating of the sauna room. Such air circulation greatly increases the amount of heat and steam generated by the heating elements 36 and the rocks 32 and conveys such heat to the room with optimum efficiency.

Thus, a sauna stove is provided which is easily portable and of a size to be utilized in small sauna rooms for home use or the like. Such device provides free circulation of air therethrough, openings throughout the sauna stove and the proper variation in size of the rocks providing for such circulation. Modifications and alterations in the structure will occur to those having skill in the art after having had reference to the foregoing description and drawings. However, it is not intended to limit the scope of the invention by the foregoing but by the scope of the appended claims in which the embodiments of the invention in which an exclusive property or privilege are defined as follows:

1. A sauna stove comprising:
an enclosure open at the top and bottom thereof;
support means secured in said enclosure and spacing said enclosure from a floor;
grille means secured in said enclosure and disposed transversely thereof and intermediate the ends thereof;
heating means in said enclosure and engaging the upper surface of said grille means;
and a plurality of rocks of varying size filling said enclosure above said grille means and supported by said grille means, at least some of said rocks engaging said heating means, and said rocks being adapted to be heated by said heating means;
said enclosure and said grille means permitting air circulation therethrough and through said rocks.

2. The sauna stove set forth in claim 1 wherein said rocks vary in size from two inches to five inches in mean diameter.

3. The sauna stove set forth in claim 2 wherein said heating means includes a plurality of electrical resistance elements extending along the upper surface of said grille means.

4. The sauna stove set forth in claim 3 and further including insulation means on the inner surfaces of said enclosure above said grille means.

5. A sauna stove comprising:
an enclosure open at the top and bottom thereof;

a frame secured in said enclosure and spaced between the top and bottom thereof;

grille means secured to said frame and extending transversely across said enclosure;

supporting means secured in said enclosure and spacing said enclosure from a floor;

a plurality of rocks of varying size in said enclosure and supported by said grille means;

and heating means in said enclosure and overlying and engaging said grille means for heating said rocks, said enclosure and said grille means permitting free air circulation therethrough and through said rocks for optimum heating of the atmosphere.

6. The sauna stove set forth in claim **5** wherein said rocks vary in size from two inches to five inches in mean diameter.

7. The sauna stove set forth in claim **6** wherein said heating means includes a plurality of electrical resistance elements extending along the upper surface of said grille means.

8. The sauna stove set forth in claim **7** and further including insulation means on the inner surfaces of said enclosure above said grille means.

9. A sauna stove comprising:

an enclosure open at the top and bottom;

first and second frames secured in said enclosure in relative spaced relation and between the top and bottom of said enclosure;

legs secured in said frames and supporting said enclosure above a floor;

a grille secured to said first frame and extending transversely across said enclosure;

a plurality of rocks of varying size in said enclosure and supported by said grille;

and heating means in said enclosure and overlying and engaging said grille for heating said rocks, said open top and bottom of said enclosure and said grille permitting free circulation of air therethrough and through said rocks for heating of the atmosphere around said stove.

10. The sauna stove set forth in claim **9** wherein said rocks vary in size from two inches to five inches in mean diameter.

11. The sauna stove set forth in claim **10** wherein said heating means includes a plurality of electrical resistance elements extending along the upper surface of said grille.

12. The sauna stove set forth in claim **11** and further including insulation means on the inner surfaces of said enclosure above said grille.

13. A sauna stove comprising:

an enclosure having an open top and an open bottom;

means supporting said enclosure and spacing said enclosure from a floor;

a first transverse member in said enclosure and intermediate the top and bottom thereof, said member having a plurality of openings therein to permit air flow therethrough;

a second transverse member in said enclosure and spaced below said transverse member, said second transverse member having a plurality of openings therein to permit air flow therethrough;

a plurality of electrical resistance heating elements extending through one wall of said enclosure and along the upper surface of said first transverse member and in engagement therewith said elements being actuatable to provide heat to a plurality of rocks disposed in said enclosure and supported on said first transverse member;

a housing mounted on the exterior of said one wall of said housing;

electrical connection means for said heating elements received in said housing;

insulation means along the interior of said enclosure above said first transverse member;

and a wall on the interior of said one wall of said enclosure and enclosing said insulation thereon, said wall protecting said electrical connection means from water sprayed into said enclosure, said openings in said first and second transverse members and said open top and bottom of said enclosure permitting free circulation of air through said enclosure for optimum heating of the atmosphere surrounding said stove.

14. The sauna stove set forth in claim **13** and further including a plurality of rocks varying in size from two inches to five inches in mean diameter, said rocks being disposed in said enclosure and supported by said first transverse member, said variations in size providing interstices for air flow therethrough and providing optimum surface area for generaton of steam when heated by said heating elements and sprayed with water.

15. The sauna stove set forth in claim **14** and further including protective screen members between said insulation means and said rocks to protect said insulation means from said rocks.

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