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ELECTRIC SAUNA BATH HEATING UNIT

Filed Jan. 29, 1964

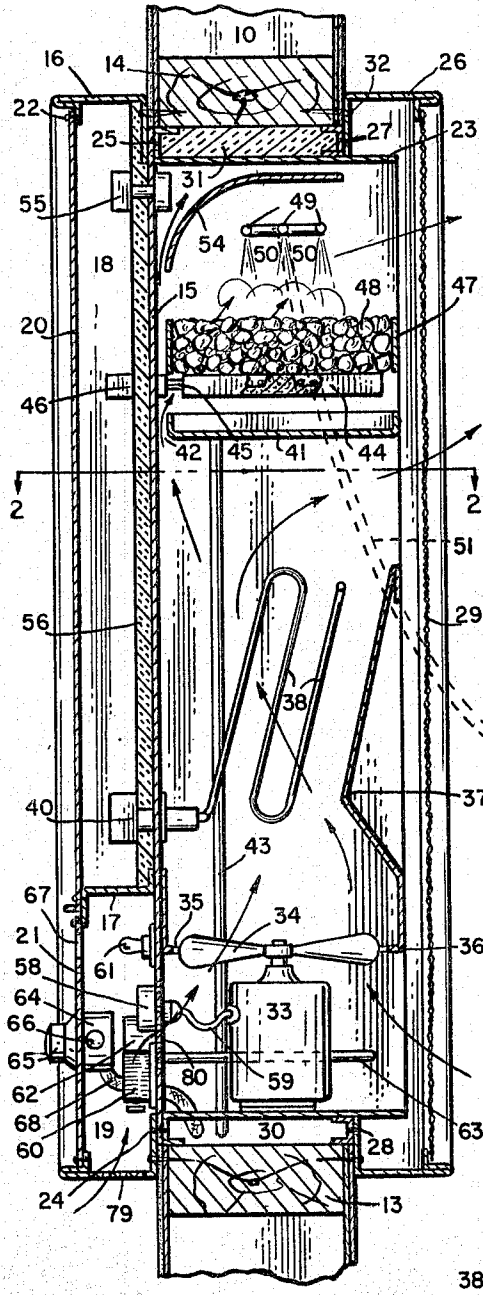


Fig 1

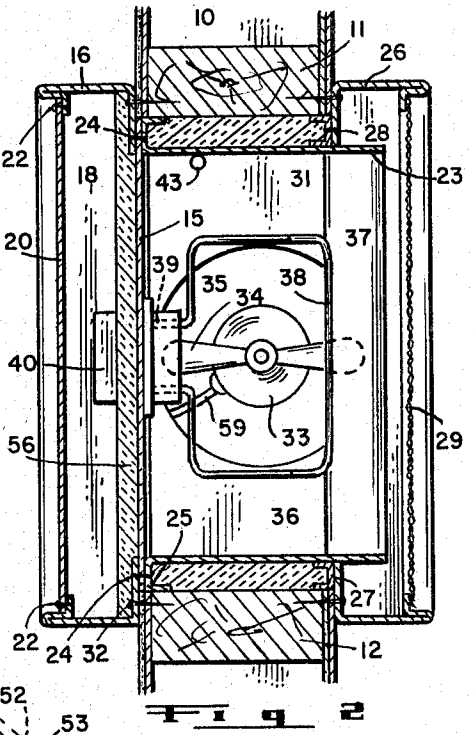


Fig 2

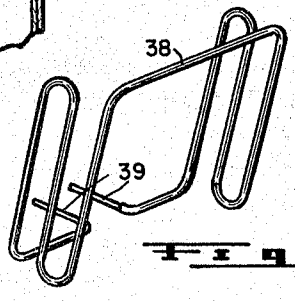


Fig 3

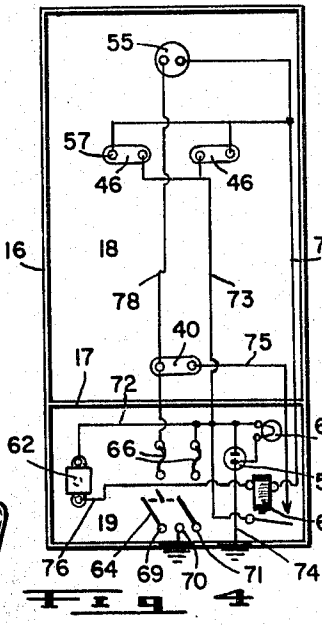


Fig 4

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ELECTRIC SAUNA BATH HEATING UNIT

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This invention relates to a Finnish bath or sauna for combining the application of both heat and moisture to a bather's body, and such that a number of bathers can use the bath at the same time.

The sauna usually consists of a small insulated room, preferably in the basement, having suitable benches therein for sitting or lying, provided with a stove for heating the air, including the heating of stones for steam generation by water contact therewith. It is desirable of course that the room be provided with a drain for the removal of condensation, also means for supplying fresh air and means for the exhaust of used air.

The disadvantages of the above arrangement however are, that the hot stove occupies usable floor space, and is a constant hazard to the occupant or occupants, while fresh air and water must be piped thereto, usually under the floor as they could be tripped over, making an expensive installation. Regulating mechanisms must be provided to control the degree of heat and moisture, and these controls will be operated by the occupant while wet, which constitutes a dangerous condition, especially if the stove is electrical. And, a stove is an unsightly object in a bath room.

The principal object of the present invention is: to provide a compact electrically operated sauna stove unit for installation in a wall of the bath room, so the floor space therein will be clear and free of dangerous contacts to the occupant, while all electric controls are operated from an adjoining room.

A further object of the invention is: to install the unit so that all electric connections, as well as the water and drain connections, can be concealed in the wall, and there is nothing to mar the decor.

A further object of the invention is: to provide a forced air circulation through the unit and a separate heater for the air, so a fast rise in the bath room temperature is obtained from a relatively small sauna unit.

A further object of the invention is: to provide means in the unit, in combination with the above air circulation, for drawing fresh air from the adjoining room to mingle with the sauna air.

A further object of the invention is: to provide baffle means in the unit for directing the passing air over the heater, and at the same time protect the room occupant from the direct heat rays emanating from said heater.

A further object of the invention is: to provide a receptacle in the unit for holding stones, and a separate heater therein for heating said stones to a high temperature, so water can be sprayed thereon and generate steam for passage into the bath room with the heated air.

A further object of the invention is: to provide a manual control in the bath room, operable by the occupant thereof, to turn on or shut off the water supply to said stones, and so permit shock steam treatment to the body of said occupant, as he or she desires.

A further object of the invention is: to provide means for adequately insulating the unit from the wall for fire protection, including the provision of an upper baffle for the air to circulate around and to keep the roof of the unit insulated from the hot stones.

A further object of the invention is: to construct the unit for automatic electric operation, which includes adjustable temperature control for the air, a safety shut-off if a dangerous rise in the temperature of the unit should occur, fuse protection for the wiring, and a pilot light for indication of operation.

Further objects of the invention are: to construct the unit in a relatively simple manner, for maximum quantity production at minimum unit cost; in a two piece arrangement, so the parts can be assembled in a wall opening from opposite sides of the wall; for fast installation; adjustable to vary in wall thicknesses; all parts readily removable for repairs or replacements; and said unit presenting a strong rugged construction to stand up for many years of satisfactory service.

With the above important and other minor objects in view, which will become more apparent as the description proceeds, the invention consists essentially in the design, construction and arrangement of the various parts hereinafter more particularly described, reference being had to the accompanying drawings wherein like characters of reference indicate corresponding parts in the several figures, and wherein:

FIGURE 1 is a partial vertical sectional view of a wall of a bath room, with the sauna unit installed therein.

FIGURE 2 is a horizontal sectional view taken on the line **2—2**, of FIGURE 1.

FIGURE 3 is a perspective view of the air heating element.

FIGURE 4 is a diagrammatic view of the back of the sauna unit, and showing the wiring diagram therefor.

A wall of a Finnish bath room is indicated at **10** in FIGURES 1 and 2, and a pair of vertical wooden studs are shown in the wall at **11** and **12**, to support same. The two studs are connected by a lower horizontal baseplate **13** and an upper headplate **14**, which is spaced from the baseplate. These four members, **11** to **14**, form the framework for an opening through the wall, to receive the sauna unit now to be described.

The body of the sauna unit is preferably formed from sheet metal, and has a vertical rectangular-shaped reinforcing partition **15**. A rear boxing **16**, of an L-shaped cross section, is received against one side of the partition, the leg of the L being inward. This boxing carries a horizontal Z-shaped partition **17**, which divides same into a large upper wiring chamber **18** and a lower instrument chamber **19**. The chambers are plate closed at **20** and **21** by metal screws **22**. A deeper rectangular boxing **23**, of slightly less area, is received against the other side of the partition **15** and such that both can be welded to the partition, as indicated at **24**. This welded portion of the boxing **23** is outwardly turned in a square-cornered hook-shape, as shown at **25**. An open rectangular frame **26**, same as the boxing **16**, receives a rectangular frame **27** of U-shaped cross section thereagainst, for welding together as shown at **28**. The opposite side of the frame **26** carries a permanent screen **29** thereover.

By observing FIGURE 1 it will be seen that the sauna casing is a two-section unit, the two boxings **16** and **23**, with partition **15** therebetween, forming one section while the frame **26**, with screen **29** and U-shaped frame **27**, forming the other section. When installing this sauna unit in the wall **10**, the boxing **23** is passed through the wall framework until the larger boxing **16** contacts same, at which time the hooks **25** will neatly fit in the framework and rest on the baseplate **13**, leaving a spacing **30** around the unit. After the wiring and piping connections are made to the unit, as will be later explained, this spacing will be filled with insulation **31**, except at the bottom. The frame **26** is then passed over the projecting open side of the boxing **23** on the other side of the wall, until it too contacts the wall, the U-shaped frame **27** being neatly received in the frame work, opposite the hooks **25**, to hold the insulation in the spacing, and to reinforce the

projecting end of the boxing **23**. Screws **32** pass through the inner edges of the boxing **16** and the frame **26**, and into the framework of the opening, to hold the unit firmly to the wall. Obviously, by this two-piece arrangement, the sauna unit is readily attachable to different thicknesses of walls.

A motor **33** is centrally mounted on the bottom of the boxing **23**, and is adapted to drive a fan **34** fastened on the shaft thereof. This fan is positioned in a circular opening **35** of a horizontal cross partition **36**, carried by the sides of said boxing and by the partition **15**, the front edge of the partition being turned up in a V-shaped baffle **37**, which also forms a heat guard in front of an electric element tubing **38**, best shown in FIGURE 3. This element is provided with two parallel spaced end contacts **39** which extend rearwardly for reception in an outlet **40**, carried by the partition **15**, and the element is supported by this outlet. A drip pan **41** is positioned across the boxing **23**, some distance above the element **38**, and is slightly horizontally spaced from the vertical partition **15**, as shown at **42**. This drip pan is provided with a lower vertical drain pipe **43** which passes down the side of the boxing **23** and into the spacing **30**, for connection to a sewer drain pipe (not shown) in the wall.

A pair of porcelain enclosed elements **44** are positioned side by side (not shown) across the boxing **23** and directly above the drip pan. These elements are supported from the sides of the boxing **23** (not shown) and their contact ends **45** are receivable in suitable outlets **46** carried by the partition **15**. A rectangular-shaped open box **47** overlies the elements **44** and is normally filled with stones **48**, which are adapted to be heated by the elements **44**. Three parallel and spaced tubings **49**, preferably of copper, are mounted across the boxing **23**, above the stones, and each are provided with a lower lengthwise line of perforations (not shown) for the spraying of water on said stones, as indicated at **50—50**. One end of each of the three tubings is connected to a water supply pipe in the wall **10** (note dotted lines **51**). This supply pipe is provided with a valve **52**, the control **53** of which passes out of the wall and into the bath room for operation by the occupant. A curving short partition **54** extends across the boxing **23**, above the tubings **49**, is spaced slightly from the partition **15** so air can pass therebehind to insulate the boxing roof from the hot stones. A high temperature control switch **55** is positioned behind the partition **54** and carried by the partition **15**.

The rear face of the partition **15**, above the partition **17**, is covered with a heavy insulation **56**. The rear ends of the outlets **40** and **46**, as well as the temperature switch **55**, pass through this insulation, and they are provided with suitable terminals, indicated by small circles **57** in FIGURE 4, for wire connections in the boxing **16**. The vertical partition **15**, in the chamber **19**, supports an outlet **58** which, on the other side of the partition, receives the plug of the wiring **59** from the motor **33** (see FIGURE 1). A relay **60** is also carried by the partition **15** in the chamber **19**, as well as a pilot light **61** and a thermostat **62**. The operable end **63** of this latter thermostat projects into the bottom of the boxing **23** for operation by the temperature of the air stream moving therepast. A switch **64** is also positioned in the chamber **19** and controls the power from the main leads. This switch is carried by the cover plate **21**, with the manual control therefor positioned on the outside. This switch is provided with a pair of fuses, one of which is indicated at **66** in FIGURE 1. It might also be mentioned that a hole **67** is provided in the plate **21** for visual observation of the pilot light **61**.

When the boxing **23** is passed through the wall **10** and secured in place, and before the insulation **31** is inserted, suitable power wiring **68** in the wall is brought along the lower spacing **30**, passed through suitable holes in the unit (not shown), and brought out the chamber **19**, where it is connected to the switch **64**. At the same time, the necessary wall connections are made for the drain pipe **43** and the water supply piping **51**. The insulation **31** is then added and the frame **26** closed thereover, as explained.

The wiring at the back of the unit is as follows: The three main leads coming in on the cable **68** are indicated by the three circles **69**, **70** and **71** in FIGURE 4, the neutral wire **70** being grounded to the sauna unit. The leads **69** and **71** are controlled by the switch **64** which is adapted to make or break contact with the fuses **66**. A wire **72** connects the fuse of the lead **71** with one side of the thermostat **62**, the pilot light **61** and the outlet **58**, while a vertical cross wire **73** connects the same wire **72** with one side of the contact for the relay **60** and the outlets **46**. The opposite side of the pilot light **61** and the outlet **58** are grounded to the unit by a wire **74**. The opposite side of the contact for the relay **60** is connected by a wire **75** with one side of the outlet **40**. The opposite side of the thermostat **62** is connected by a wire **76** with one side of the coil for the relay **60**. The other side of this coil is connected by a wire **77** with the opposite sides of the outlets **46**, and to one side of the high temperature control switch **55**. The opposite side of this latter switch is connected by a wire **78** with the other side of the outlet **40** and to the fuse of the main lead wire **69**.

From the above disclosure it will be seen that the sauna unit is positioned in the wall **10** with the screen side thereof in the bath room, while the electric control side is in an adjoining room for manual operation in a relatively dry atmosphere. When the main switch **64** is manually closed, the pilot light will go on, the fan will start and the closed elements **44** will start to heat by current from the outlets **46**, as current can freely pass through the high temperature control switch **55**. As current will be flowing through the thermostat **62** and the coil of the relay **60**, the contacts will be closed to the wire **75**, so the element **38** will start to heat by current from the outlet **40**. Accordingly, air will be drawn from the lower part of the bath room by the fan, driven up thereby and directed over the hot element **38** by the baffle plate **37**, and then returned to the bath room over the baffle. At the same time, fresh air is drawn through the perforations **79** in the bottom of the chamber **19** from the adjoining room, through perforations **80** in the partition **15**, and then driven up by the fan over the element **38** with the first mentioned air, all as shown by the directing arrows in FIGURE 1. As previously mentioned, a used air exhaust (not shown) will be provided in the bath room, and this will permit the entrance of the fresh air. When the bath room reaches a pre-determined high temperature, the thermostat **62** will shut off current to the coil of the relay **60**, causing the contacts to open, thus shutting off current to the outlet **40**, and the element **38**. From then on, the thermostat will turn on and shut off the current as the air temperature fluctuates, so that a relatively steady heat is maintained. During these shut-offs, the fan continues to run and the closed elements **44** continue to heat the stones **48**, which reach a high temperature. If desired, an occupant of the bath room can now turn on the valve **52** for a water spray on the stones, and the quickly generated steam resulting passes into the bath room with the moving hot air for a shock treatment to the occupant. The steam treatment can be just as quickly stopped by the occupant turning off the water. Should the unit start to reach a dangerous temperature, for any reason, the switch **55** will be set to shut off the current to the heaters in time, so that just the fan and the pilot light will be operating, while the occupant or occupants of the bath room will be protected. The fan and pilot light will shut off when the main switch **64** is opened. Any water not turned into steam will run into the pan **41** for drainage down the pipe **43**. It will also be noted that during the heat treatment, the occupant of the bath room is protected against

heat rays from the element 38 by the baffle. If desired, a time switch (not shown) could also control the heat current, as a safety precaution.

What I claim as my invention is:

1. A sauna heating unit comprising: a hollow casing; a vertical partition between the side walls of said casing dividing same into a pair of separate boxings having open outer sides; a motor driven fan mounted in one of said boxings; a heating element mounted in the same boxing above said fan; a baffle plate mounted partially across the open side of the latter boxing opposite the element; said fan operable to draw air under said plate and into the first mentioned boxing and direct same upwardly and over the element for heat reception therefrom and then deliver the heated air out over the plate; means positioned in the second of said boxings and connected to the fan motor and the element to control said latter members; and a thermostat in the first mentioned boxing in the path of the air flow therethrough and operable with said control means to regulate the temperature of the air in said flow.

2. A sauna heating unit comprising: a hollow casing; said casing formed from a pair of telescoping sections; one of said sections adapted to be partially passable through a wall opening from one side for the reception of the other section thereover on the opposite side to retain said casing on the wall; a vertical partition between the side walls of said first mentioned section dividing same into a pair of separate boxings having open outer sides; a heating element mounted in one of said boxings; a container mounted in the same boxing above said element; a plurality of stones in said container to receive heat from said element; spray means above the container for directing water onto said stones when hot to generate steam; manual means for controlling a supply of water to said spray means; fan means in the first mentioned boxing below said container for directing air over the element and said stones for heat reception therefrom and for removal of said steam from the boxing; means in the other of said boxings for electrically controlling said element and said fan; thermostat means positioned above said stones in the air flow of the first mentioned boxing and operable to shut-off the electric current to said element at a pre-determined maximum temperature of the air in said flow; and means positioned below said container and above the heating element for draining surplus water from said stones.

3. A sauna heating unit comprising; an open hollow casing section; a vertical partition between the side walls of said section dividing same into an outer boxing and an inner boxing of reduced size in respect to the first boxing and said boxings each having open outer sides; said inner boxing adapted to pass through an opening in a wall for contact of said outer boxing therewith and to leave a spacing between the portion of said wall defining the opening and said inner boxing therearound; insulation positioned in said spacing; a frame section telescopically receivable over the open side of the inner boxing for contact with the opposite side of the wall and to retain the insulation in said spacing; means for securing said sections to the wall; a motor driven fan mounted in the inner boxing; a heating element mounted in the inner boxing above the fan; a baffle plate mounted partially across the open side of the inner boxing opposite the element; said fan operable to draw air under the plate and into the inner boxing and direct same up and over the element for heat reception therefrom and then deliver said heated air out over said plate; means positioned in the outer boxing and electrically connected to the fan motor and the element to control said latter members; and a thermostat in the path of the air flow through the inner boxing and operable with said control means to regulate the temperature of the air flowing through said inner boxing.

4. A sauna heating unit comprising: an open hollow casing; a vertical partition between the side walls of said casing dividing same into a pair of separate boxings having open outer sides; a motor driven fan mounted in one of said boxings; a heating element mounted in the same boxing above the fan; a vertical baffle plate mounted partially across the open side of said latter boxing opposite the element; said fan operable to draw air under the plate and into said latter boxing and move said air upwardly and over the element for heat reception therefrom and then deliver the heated air out over the plate; a horizontal partition in the other of said boxings above the level of said fan to divide the other of the boxings into an upper wiring chamber and a lower instrument chamber; insulation covering said vertical partition within said upper chamber; electrical means in the lower chamber connected with the fan motor and the heating element to control said latter two members; perforations through the walls of the lower chamber for passage of air therethrough to the fan; and a thermostat in the path of the air flow through the first mentioned boxing and operable with said electrical control means to regulate the temperature of the air flowing through said casing.

5. A sauna heating unit comprising: a hollow casing formed from a pair of telescoping sections; one of said sections partially passable through a wall opening from one side of the wall to receive the other section thereover on the opposite wall side and retain said casing on the wall; heat insulating means between the wall and said casing therearound; a vertical partition between the side walls of said first mentioned section and dividing same into a relatively deep boxing and a narrow boxing each having open outer sides; an electric air heating element mounted in the deep boxing; a fan mounted below said element; a relatively vertical baffle plate mounted partially across the open side of the deep boxing and in front of said element; said fan operable to draw air under the baffle plate into the deep boxing and drive same upward to be directed by said baffle plate over the element for heat reception therefrom and then deliver the heated air out over said baffle plate; means in the second boxing connected to the fan motor and the element to control said latter members; a thermostat in the air flow path of said first mentioned boxing and operable with said control means to regulate the temperature of the flowing air in said latter boxing; a container positioned in the upper part of said deep boxing; a plurality of stones in said container; a second electric heating element below said container for heating said stones; spray means in the deep boxing above the stones for directing a supply of water thereon when hot to generate steam; manual means for controlling the supply of water to the spray means; said fan adapted to also drive said air up through and over said stones for removal of said steam; an air baffle between the spray means and the roof of said deep boxing to direct said latter air out of the boxing and to protect said roof from the heat of the stones; and a thermostatic electric shut-off for the second element positioned above the spray means and operable when the air flowing past the shut-off reaches a pre-determined high temperature.

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