Aug. 19, 1969 J. M. KEMPER 3,461,862

HYDRO-MASSAGE UNIT

Filed Sept. 26, 1966 2 Sheets-Sheet 1

FIG. 1.

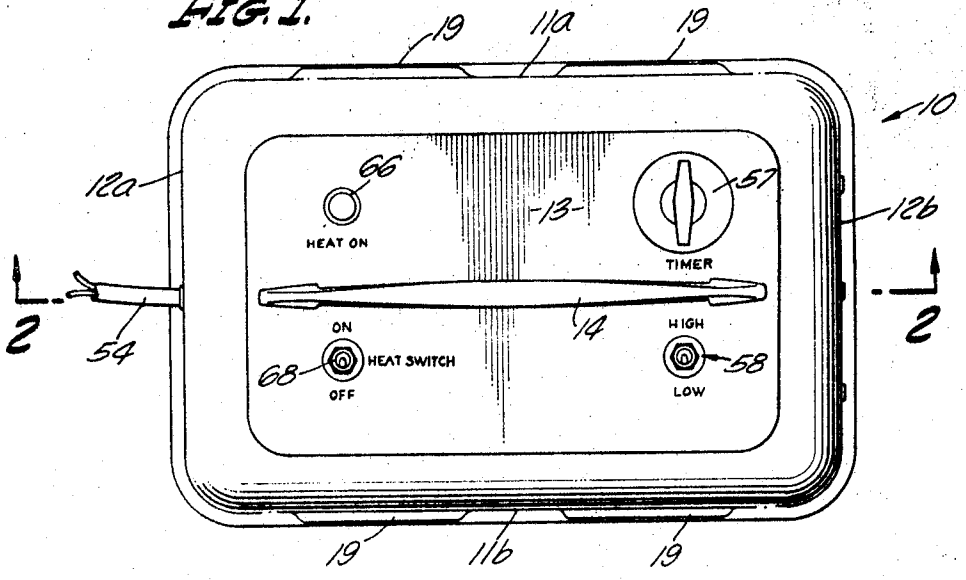
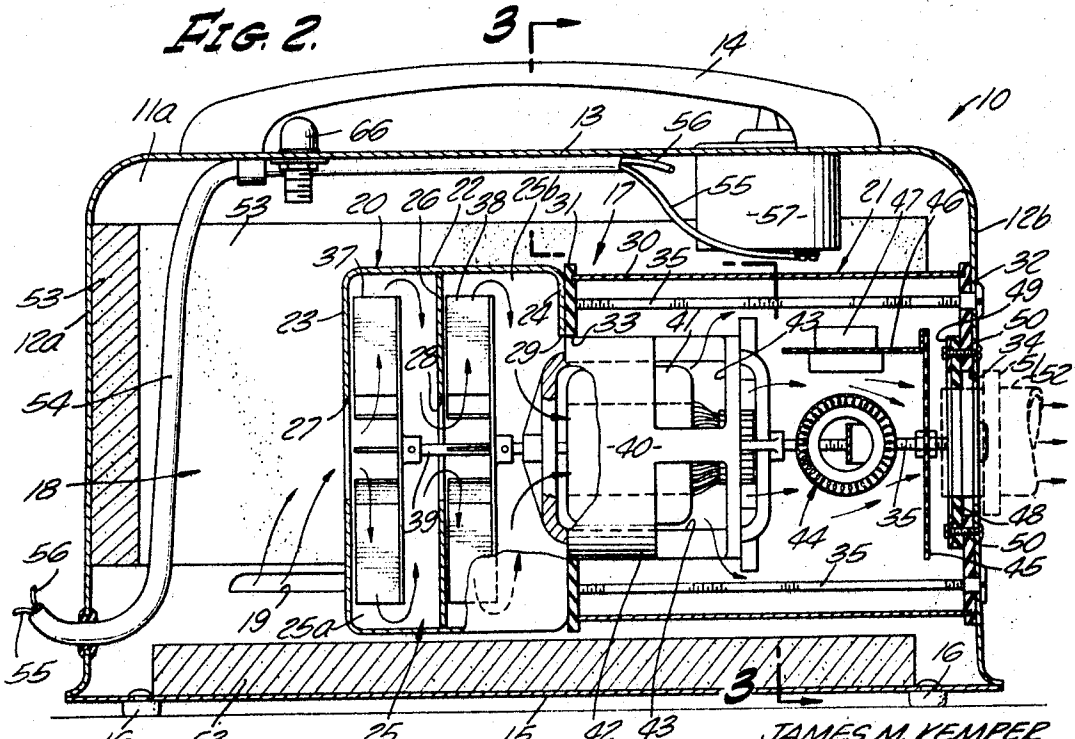


FIG. 2.



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FIG. 3.

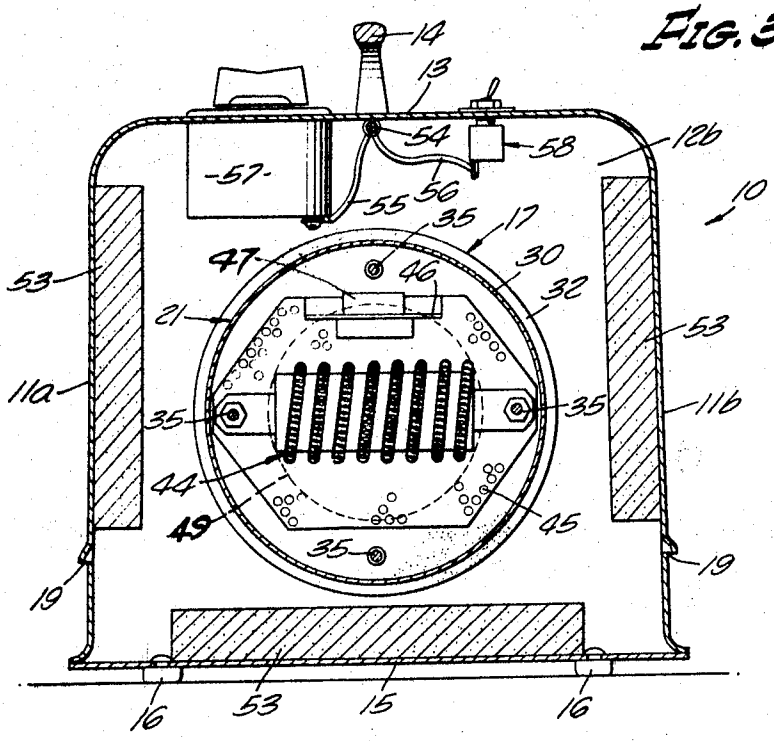
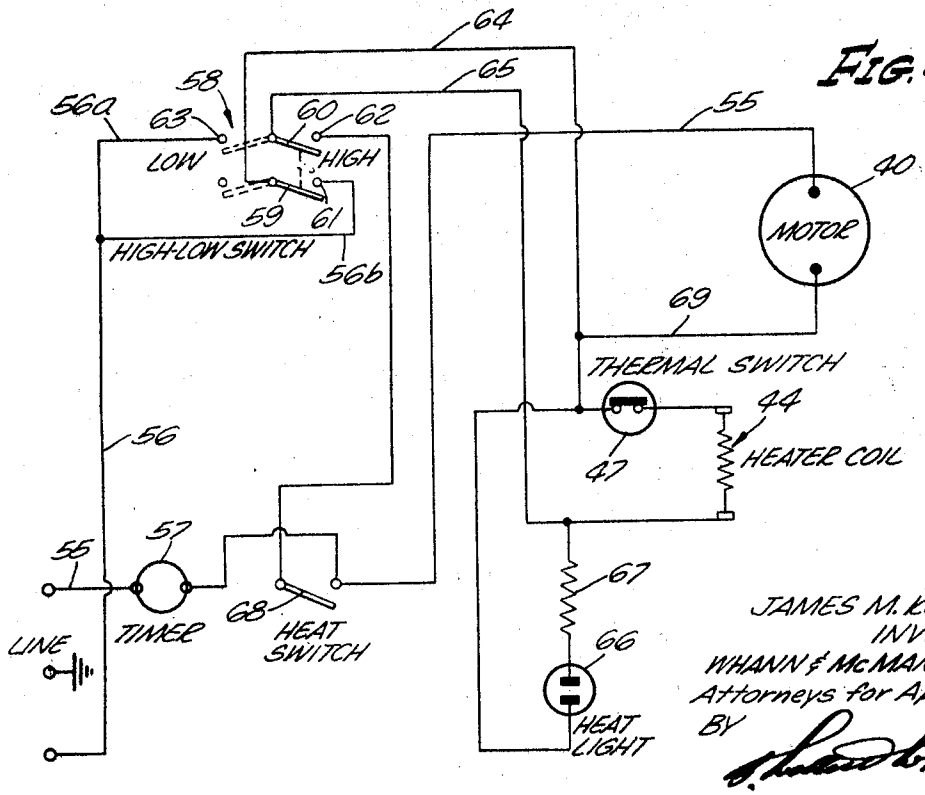


FIG. 4.



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HYDRO-MASSAGE UNIT

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Int. Cl. A61h 9/00
U.S. Cl. 128—66 4 Claims

ABSTRACT OF THE DISCLOSURE

A hydro-massage unit having a housing with an ambient air inlet and an air outlet hose connection, the interior of the housing being separated into an air compressing compartment, a motor compartment, and an air heating compartment which are connected for sequential air flow from the housing inlet to the outlet hose connection, said compartments respectively containing air moving elements, a motor having a driving connection with the air moving elements and a spiraled heating element extending transversely across the air flow stream in the air heating compartment, and including a control switching circuit for selectively connecting the heating element in series with the motor for one operating speed thereof, and in parallel with the motor for a different operating speed.

The present invention relates generally to the art of moving and treating fluids, and is more particularly concerned with a hydro-massage unit for the controlled pressurizing, heating and delivery of a fluid such as air so as to agitate water around parts of the human body in a water massaging operation.

Heretofore water massagers have for the most part utilized electric motor driven water pumps for agitating the water around the parts of the body to be massaged. Devices for this purpose have either had the electric motor submerged in water, or mounted above the water, the device being further arranged for fastening to the bath tub. These constructions present a very hazardous condition in which it is possible for a user to be electrocuted, if the equipment is not grounded and an electrical short should occur in the motor or connected wiring.

According to the concepts of the present invention, it is proposed to provide a separate portable unit for treating the air, this unit being in separated or detached relation to the tub and being in communication with the tub water through an insulated hose by which the air is delivered to a perforated ring placed in the bottom of the bath tub or other treatment container. This ring is provided with outlet openings or air holes through which the compressed air from the unit is projected into the water to provide the massaging turbulence of the water over the body areas during treatment. Safety of operation is assured and the above noted electrical hazards are completely eliminated.

With the foregoing in mind, it is one object of the herein described invention to provide a hydro-massage unit of portable type for use with a water container such as a bath tub for massage of the human body, which has simple controls for varying the pressure of delivered air, and which may be located out of physical electrical conducting contact with the tub and water therein.

A further object is to provide a self-contained air treating unit in which ambient air is conducted through a compressing chamber, motor chamber and heater chamber, and during passage through the motor chamber is utilized to cool the motor by absorbing heat therefrom, whereby the air is preheated prior to reaching the main heater chamber.

Another object is to provide in an air treating unit of the character described herein, a unique control system

wherein an electric heating element for heating the air is also utilized with respect to the motor energizing circuit in such a way as to provide a speed controlling element for the motor which is utilized for driving the air moving means.

Further objects of the invention will be brought out in the following part of the specification, wherein detailed description is for the purpose of fully disclosing the invention without placing limitations thereon.

Referring to the accompanying drawings, which are for illustrative purposes only:

FIG. 1 is a top plan view of a hydro-massage unit embodying the features of the present invention;

FIG. 2 is an enlarged longitudinal section through the same, taken substantially on line 2—2 of FIG. 1;

FIG. 3 is an enlarged transverse section through the same taken substantially on line 3—3 of FIG. 2; and

FIG. 4 is a schematic control diagram showing the circuitry for the various electrical components of the unit.

Referring more specifically to the drawings, for illustrative purposes, the hydro-massage unit of the herein described invention comprises a portable housing structure as generally indicated at **10**, and comprising a shell-like structure fabricated to have opposed side walls **11***a* and **11***b* which are connected with opposed end walls **12***a* and **12***b*. The housing is closed by a top wall **13** which serves as a control panel and is provided with a carrying handle **14** to permit transporting the unit from one location to another. The bottom of the housing structure is open, but is normally closed by a bottom wall member **15** which may be removably secured by conventional screws or other means not shown. This bottom wall may be provided with pads **16** which provide supporting feet for the unit.

The housing **10** has mounted therein an inner casing structure as generally indicated at **17**. This inner casing is of generally tubular cylindrical construction, and of such size that the surrounding space between it and the walls of the housing provide an internal chamber **18** for the reception of ambient air which is admitted from the exterior of the housing through a plurality of louver openings **19** provided in the side walls **11***a* and **11***b*.

The inner casing **17** is of cylindrical construction and comprises two axially aligned sections **20** and **21** which are secured together in end-to-end engagement.

As best shown in FIG. 2, the section **20** comprises a cylindrical outer wall **22** which extends between end walls **23** and **24** to provide an air compressing compartment **25** which is divided into a first stage compartment **25***a* and a second stage compartment **25***b* by a partition **26**. Air flow through the air compressing compartment is from an inlet opening **27** in the end wall **23**, through an opening **28** in the partition **26** and thence through an outlet opening **29** in the end wall **24**.

The section **21** has a cylindrical wall **30** which has its ends seated in end rings **31** and **32** of plastic or other suitable material, the end ring **31** defining an opening **33** and the end ring **32** an opening **34**.

The sections **20** and **21** are secured in axially aligned end-to-end relation to the housing end wall **12***b* by means of threaded tie rods **35** which extend through the end rings **31** and **32** and also operate to secure the end ring **31** and end wall **24** in secured engagement. As thus mounted, the opening **34** of the end ring **32** is in axial registration with an outlet opening **36** formed in the housing end wall **12***b*. The left end of section **21** forms a motor compartment, while the right end of this section provides a heating compartment. The inner casing thus provides an air compressing compartment, a motor compartment and an air heating compartment which are physically connected for sequential air flow from the inlet opening **27** to the air outlet opening **36**.

In the section **20**, the air is moved and compressed by

a two stage compressor which includes radial impellers **37** and **38** respectively operable in the first stage compartment **25***a* and second stage compartment **25***b*, these impellers being affixed to a rotatable shaft **39** which may be the driving shaft of an electric motor **40** or a coupled extension thereof.

The driving motor is supported in the motor compartment at the left end of section **21**. As shown in FIG. 2, the motor is for operation on alternating current and comprises a conventional rotor **41** rotatably mounted in a stator frame **42** having end brackets for supporting the shaft. During operation of the motor, air is circulated in the space between the rotor and stator structures and discharged through outlet openings **43** in the stator frame and through the end bracket. The motor is mounted with its left end bracket, as viewed in FIG. 2, positioned in the registered openings **29** and **33** so that outlet air from the compressor compartment will be carried through the motor to serve as a cooling medium, the air thus being preheated by absorbing heat energy dissipated by the motor prior to the flow of preheated air into the heater compartment end of section **21**.

In the heating compartment section, there is provided on the downstream side of the motor **40** a transversely extending electrical heating element as generally indicated at **44**, this heating element being spirally wound about a cylinder axis and supported at its ends on a pair of the threaded tie rods **35**. Also, there is supported on the tie rods between the heater and the outlet opening **36** of the housing a perforated shield member **45** which prevents a person inserting a hand through the outlet opening into contact with the heater. This perforated shield member also serves as support for a bracket **46** which extends above the heating element and has mounted thereon a thermal switch **47** which is electrically in circuit with the heater and is set to operate automatically to disconnect the heating element when the temperature of the air for any reason reaches a predetermined temperature, for example 200° F.

At the outlet opening **36** of the housing, a sealing ring **48** of rubber or other suitable material is mounted and secured to the inner surface of the end ring **32** at this end of the housing by means of a clamping ring **49** held by a plurality of retaining screws **50**. The sealing ring is concentrically disposed with respect to the openings **34** and **36** and is adapted on its inner periphery to sealingly engage an inserted end of a hose coupler device **51** of a flexible hose **52** as shown in dotted lines for conducting treated air from the unit to the tub or other container for the water used in the massage treatment.

The physical construction of the device as thus far described lends itself particularly to the incorporation of conventional means for cutting down vibrational noises, such as by mounting the motor on resilient supporting means. Further, the interior of the housing may be provided with sound deadening liners as indicated at **53** on the end, side and bottom walls of the housing.

Referring now to FIG. 4, the unique control features of the unit will now be described. Electric supply to the unit it from a suitable alternating current source which may be led into the housing through a connection cord **54** having conductors **55** and **56** therein. The conductor **55** is connected with one terminal of the motor **40**, a timer **57** being installed in this conductor for presetting the time of operation of the unit, and so that at the end of the desired time interval the unit will automatically be disconnected without the necessity of any attention on the part of the person who is taking the massage treatment. This constitutes a safety factor in that it is not necessary for the person to touch the unit while in the bath.

The other conductor **56** leads to a double-throw switch **58** having movable contacts **59** and **60** which are selectively movable to one position into connection with fixed contacts **61** and **62** respectively and to another position in which the movable contact **60** engages a fixed contact **63**. The conductor **56** has a branch **56***a* which connects to contact **63** and a branch **56***b* which connects to contact **61**. Movable contacts **59** and **60** are connected through conductors **64** and **65** to a circuit containing the thermal switch **47** and heating element **44** in series. A Neon lamp **66** and series connected resistor **67** are connected in series in a parallel circuit across the thermal switch **47** and heating element **44**. The Neon lamp provides an indicating means showing when the heater coil is energized or deenergized. A switch **68** functions to connect and disconnect the contact **62** of switch **58** with conductor **55** to establish the connection of one side of the heater coil circuit with the electric source of supply as represented by conductor **55**. The other side of the heater coil is connected to the other side of the electric source through conductor **56** and the switch **58**. A conductor **69** connects the other terminal of the motor with conductor **64**. For convenience, the timer **57**, switch **58**, indicating Neon lamp **66** and switch **68** are all mounted on the top wall **13** of the housing.

With the control circuit shown in FIG. 4 and the switch **68** in its closed or on position, the unit may be operated in two different modes. These two modes of operation are established by the selective movement of switch **58** either to its low position or its high position.

In the low position of switch **58**, in which case the movable contact **60** is in engagement with fixed contact **63**, the heating element **44** will be connected in series with the motor **40** so that the motor will operate at reduced speed and provide a very gentle massaging air pressure which will be delivered from the unit at a temperature of approximately 140–160° F. In the other mode of operation, in which case the switch **58** is moved to its high position, movable contacts **59** and **60** will be in engagement with fixed contacts **61** and **62**. In this mode of operation, the heating element **44** will be connected in parallel relation with the motor to give maximum agitation of the water and deliver the heated air at substantially the same temperature as before.

By providing a controlled supply of heated pressurized air to the hose **52** it is possible to maintain a comfortable water temperature. If unheated air were provided, the cool air would enter the higher temperature water and cause this temperature to be lowered. The use of heated air also prevents the rapid evaporation caused by the temperature differential where cooler air is utilized.

From the foregoing description, it is believed that it will be readily apparent that the objectives of the present invention have been accomplished.

Various modifications may suggest themselves to those skilled in the art without departing from the spirit of my invention, and, hence, I do not wish to be restricted to the specific form shown or uses mentioned, except to the extent indicated in the appended claims.

I claim:

1. A hydro-massage unit, comprising:

(a) a housing having an ambient air inlet and an air outlet adapted for connection with an air delivery hose;

(b) means separating the interior of said housing into an air compressing compartment having air moving and compressing elements therein, a motor compartment having electric motor means therein connected with said elements through a driving connection, and an air heating compartment having electrically energizable air heating means therein, said compartments being connected for sequential air flow from an air inlet to the air compressing compartment from said housing interior, thence through the motor compartment and heating compartment to said air outlet; and

(c) means for controlling the operating speed of said motor including a switching circuit for selectively connecting said air heating means and said motor in series and in parallel relation.

2. A hydro-massage unit, comprising:

(a) a housing having an ambient air inlet and an air

outlet adapted for connection with an air delivery hose;

(b) means separating the interior of said housing into an air compressing compartment, a motor compartment and an air heating compartment connected for sequential air flow from an air inlet to the compressing compartment from said housing interior, thence through the motor compartment and heating compartment to said air outlet;

(c) air moving means in the air compressing compartment;

(d) motor means in the motor compartment having a driving connection with the air moving means;

(e) electric heater means in the air heating compartment including an elongate heating element spirally wound about a cylinder axis extending transversely across the air stream flow through the heating compartment; and

(f) control means for selectively varying the speed of said motor.

3. A hydro-massage unit according to claim 2, wherein

the control means comprises a switching circuit including said heating element.

4. A hydro-massage unit according to claim 2, including temperature responsive switching means in said air heating compartment connected in series with said heating means, and wherein said control means includes a switching circuit for selectively connecting said series connected heating means and switching means as a unit in series with said motor for operation at one speed, and in parallel with said motor for operation at another speed.

References Cited

UNITED STATES PATENTS

2,793,640	5/1957	Schwartz	128—66
3,138,153	6/1964	Osborn et al.	128—66

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U.S. Cl. X.R.

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