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3,110,301

HUMAN BODY HEATER

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3 Sheets-Sheet 1



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FIG. 7

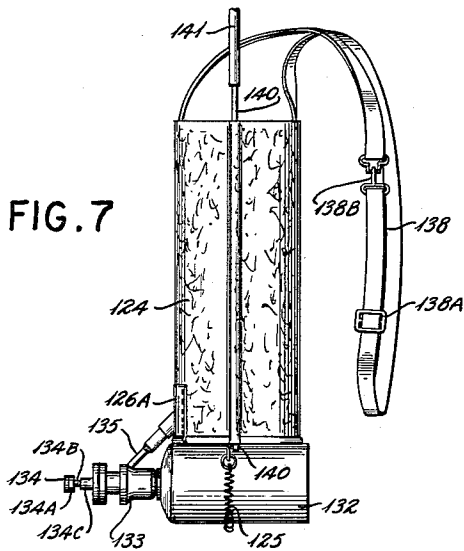


FIG. 8

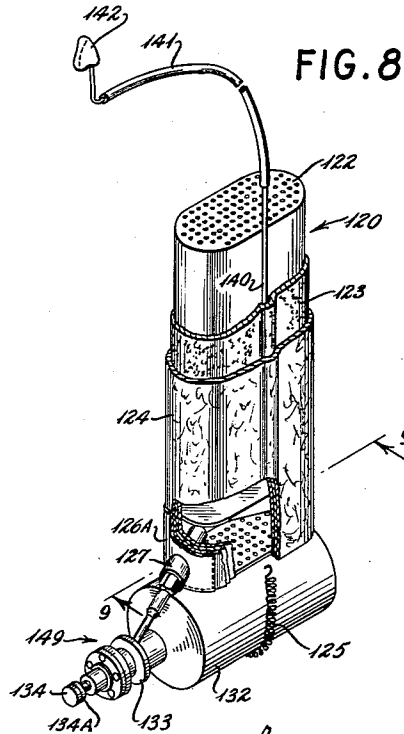


FIG. 9

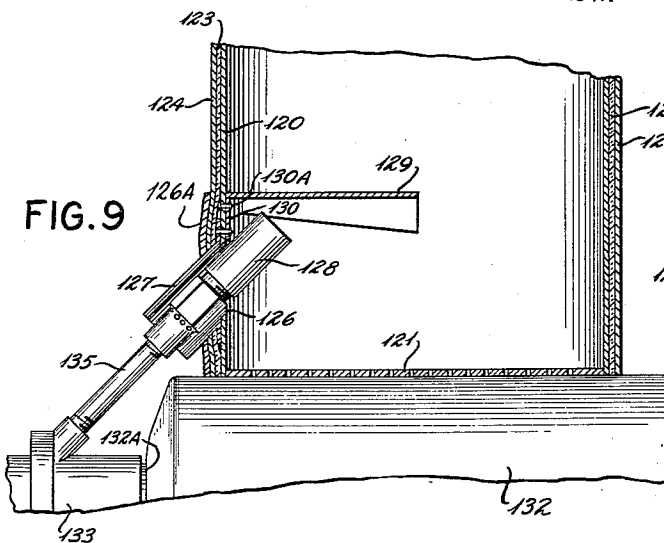
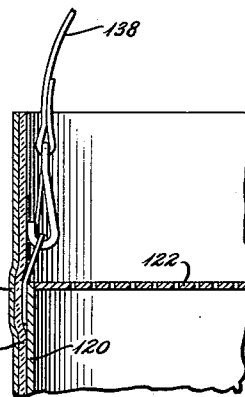


FIG. 10



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FIG. 11

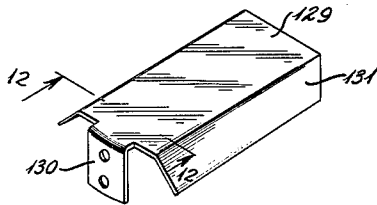


FIG. 12

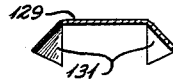


FIG. 13

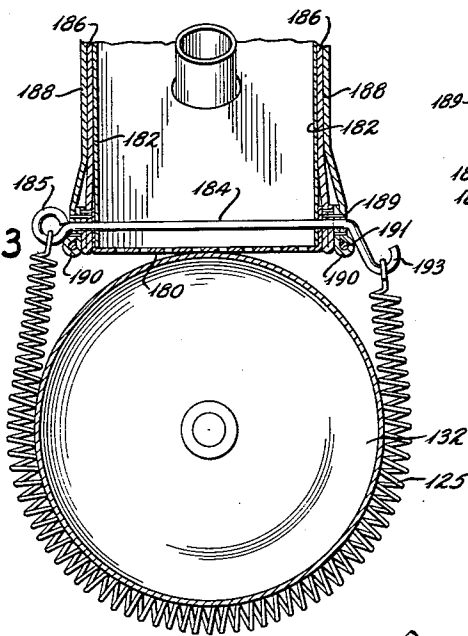


FIG. 14

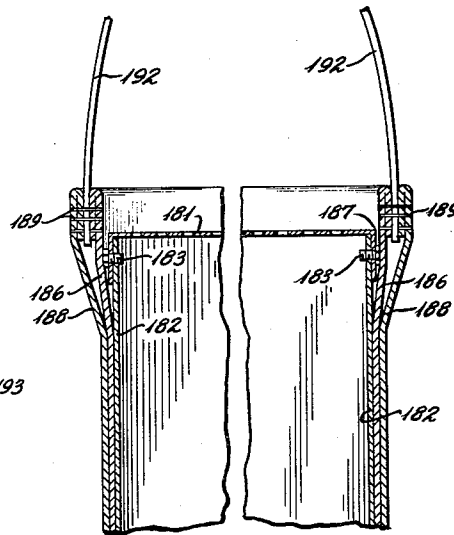
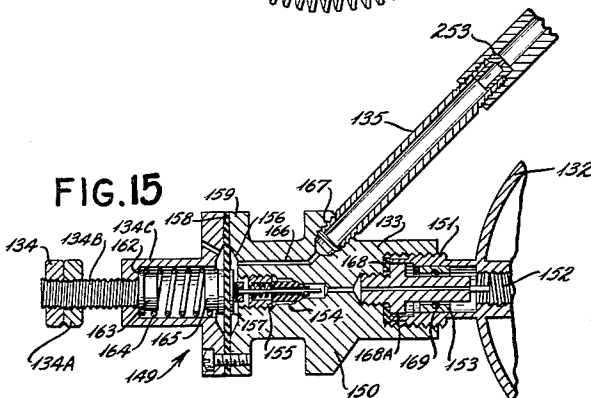


FIG. 15



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HUMAN BODY HEATER

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6 Claims. (Cl. 126-208)

This invention relates to the human body, its care and protection in order that the normal functions of the body may be maintained, and such protection includes severe temperature of the atmosphere and variations thereof, as well as to equipment by which such care and protection can be accomplished.

The invention relates specifically to a heater for the body and its circulatory system and to the installation and insulation of such heater in order to distribute heat over the body and protect against external temperature conditions and changes thereof.

Articles of clothing and heaters of various kinds have been employed particularly for supplementing body heat where the body is exposed to low temperatures over an extended period and for use in exploratory operations and where the temperature is low. The clothing and heating means heretofore employed include the structure shown in abandoned applications Serial No. 554,979, filed December 23, 1955, and 671,106 filed July 10, 1957, of which this application is a continuation in part.

It is an object of the invention to overcome the difficulties enumerated and to provide a body heater including an article of wearing apparel having incorporated therein a heater providing a circulatory system by which the heat may be properly distributed for obtaining maximum benefits.

Another object of the invention is to provide a body heater which is relatively simple and inexpensive in construction, easy to apply and remove, efficient in operation, as well as a heater which can be readily turned on and off and removed from an article of wearing apparel and replaced.

Another object of the invention is to provide a heater wholly contained within a garment or article of apparel in such a manner that although it may be readily installed and removed, when in place there is no danger of the fuel line becoming frozen or otherwise damaged.

Another object is to proportion the orifice and the pressure adjustment to maintain a safe flame in a body heater.

A further object is to provide a heater using readily available fuel with such heater providing sufficient additional heat to a person's body adjacent the heart so that the blood will carry sufficient heat to all parts of the body to maintain the temperature of the extremities of the limbs in comfortable condition and avoiding danger of freezing even though a person is not exercising.

Another object is to provide a heater which can be readily applied on a person or removed with a minimum of delay and which will be safe in use.

A still further object is to provide a heater for location within a person's outer garment so that the products of the combustion will heat the body inside of the outer garment.

Other objects and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a perspective illustrating one form of the invention and its use;

FIG. 2 is an enlarged vertical section through a heater casing on the line 2-2 of FIG. 1;

FIG. 3 is an enlarged detailed vertical section on the line 3-3 of FIG. 2;

FIG. 4 is an enlarged detailed horizontal section on the line 4-4 of FIG. 2;

FIG. 5 is a perspective view illustrating the manner of attaching the heater;

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FIG. 6 a perspective view of a modified type of heater; FIG. 7, an elevation of another form of human body heater showing the shoulder carrying strap at the upper end of the heater housing and showing a tank of propane gas with the burner at the lower end;

FIG. 8, a perspective with parts broken away of the form of heater shown in FIG. 7;

FIG. 9, a fragmentary section taken substantially on line 9-9 of FIG. 8 showing the burner and the baffle in cooperative relation;

FIG. 10, a detail of the fabric cover and asbestos insulation and the carrier for the fuel tank and the combustion chamber.

FIG. 11 is a perspective view of the baffle made from a rectangular blank.

FIG. 12 is a section taken on line 12-12 of FIG. 11.

FIG. 13 is a vertical transverse section of the lower portion of the body heater looking toward the burner showing the assembly of parts.

FIG. 14 is a longitudinal vertical section of the upper portion of the body heater showing the attachment of the adjustable length carrying strap to the insulating jacket and the covering sleeve.

FIG. 15 is an axial section through the pressure regulating shut-off valve assembly applied to the discharge end of the fuel tank.

Briefly stated, the invention is a body heater which includes the combination of wearing apparel and heating means therefor, and with the apparel having a circulating system so that the heat will be properly distributed. Illustrative of the manner in which the invention may be practiced is by the use of a jacket or other article of apparel having a closed compartment with an opening in each of the two sides and a plurality of openings in the top and bottom to allow circulation. A heater casing or container adapted to contain suitable heating means is carried within the closed compartment.

Illustrative of the type of heating means that may be employed is a burner of conventional character which utilizes propane gas or other fuel from a burner supplied from a disposable tank, such burner extending through an opening in the side of the container. The disposable fuel tank is reversible so that the burner may be inserted in either end of the container. Also the fuel tank may be secured in place by means of an encircling spring at the bottom of the container.

The container is surrounded by heat insulating material such as asbestos or the like and the pocket of the jacket in which it is inserted likewise is of heat-insulating material. The pocket may be either fixed or detachably secured to the jacket or to the article of wearing apparel, the insulation of the container preventing injury to the wearer.

As the air in the combustion chamber container is heated it rises and passes through the openings in the top of the container thus allowing cold air to enter the container through the openings in the bottom. The hot air circulates around the body of the wearer so that the blood in that area receives the heat and the various parts of body are maintained warm.

With continued reference to FIGS. 1 to 6 of the drawing, the body heater of the present invention comprises a jacket 10 having a pocket 11 with a liner 12 secured therein by means of stitching 13. The lower edge of the pocket extends to the lower edge of the jacket 10 slightly below the belt 14 which holds the trousers 15.

The jacket 10 may be made of any desired material capable of insulating against the passage of heat to thereby retain the body heat. A heater and a circulating system may be provided such as for example the heater disclosed in the above identified abandoned application Serial

Number 554,579, although other type of structure may be used.

Within the pocket 11 is mounted a burner casing 16 the ends wall 17 of which are provided with inclined openings 18 and 19 for the reception of a conventional burner 20 the combustible gases of which are supplied through a pipe 21 and a T-coupling 22 and regulated by a control valve 23 from a disposable cartridge type fuel tank 24 adapted to be held in place by an encircling spring 25. End movement of the fuel tank 24 is restricted by the angular disposition of the nozzle 20 within the opening 19, the nozzle 20 being adapted to be inserted in either of the openings 18 or 19 for right or left hand operation.

The heater casing 16 is provided with top and bottom members 26 and 27 hard soldered, welded, or otherwise secured in place, and having perforations 28 and 29 respectively for the flow of air into and from the casing. Hot air heated by the burner 20 will pass upwardly through the openings 28 and will be replaced by the colder air entering through the openings 29 in the bottom 27.

In order to prevent the flame of the burner 20 from causing injury to the body of the wearer or to the apparel during application and removal of the burner, the pocket 11 is provided with insulation members 30 and 31 attached to the liner 12 and which fit snugly about the heater casing 16, such insulating members 30 and 31 likewise extend over the front and rear of the heater casing as well as over the ends thereof. The upper portion of the heater casing is provided with an insulating sheet or covering 32 and an overlying covering of cloth or other material 33. The insulating sheet 32 and the cloth 33 are provided with a series of openings 34 and 35, respectively which, with the openings 28 in the top of the heater casing 16, permit the discharge of heated air and combustion gases for distribution within the garment in contact with the body of the wearer. In like manner the bottom of the heater casing is provided with a reinforcing plate or strip 36 having openings 37 for the entrance of auxiliary air to assure complete combustion and for air to be heated, and the bottom of the heater casing 16 and the reinforcing plate of strip 36 are provided with insulation 38 which joins the insulation 31 at the ends of the front and back of the heater casing 16. The insulation 38 is provided with openings 39 for the flow of air therethrough, the insulation being covered with a bottom layer of cloth 40 and having similar perforations 41 for the flow of air therethrough. The spring 25 is held in place by eye bolts 42 (FIG. 2), the bottom 27 and the reinforcing member 36 providing sufficient strength to support such eye bolts, the spring 25 and the disposable fuel tank 24. The cover sheet 40 has its front and rear extremities extended upwardly along the insulation 30 about the heater casing and on the inside next to the person the insulation 30 is provided with a cloth cover sheet 43.

In FIG. 5 the structure is similar to that of the preceding figures except that the liner 12' is provided with an end fold 12'' for the reception of snap fastener elements 44 for engagement by complementary snap fastener elements 45 on a reinforcing strip 46 carried within the garment 10. Thus the pocket and the heater may be detached from the garment.

It will be apparent from the foregoing that a body heater is provided which is a compact arrangement of garment with a pocket or compartment and a heater having openings bottom and top for the inlet and discharge respectively, of air to be circulated beneath the garment for heating the wearer. Also it will be apparent that the structure is relatively inexpensive, simple to produce and use, and can be operated efficiently at small cost.

Instead of being built into the garment, the heater of FIG. 5 may be independently supported by a shoulder strap 47. The heater may be suspended by the shoulder strap 47 beneath jacket 10 with the disposable tank secured thereto.

Referring to the burner 20, it will be apparent that air holes 19A are provided for obtaining air for combustion

within the burner head 20 and such air can be adjusted in the usual manner and the burner disclosed in the other modifications are similar including the burner 213A.

The person using the heater device is advised not to wear more than two garments between the heater and the body.

Referring to the modification shown in FIGS. 7-10, inclusive, the heater includes the upstanding housing 120 of oval shape cross-section providing a combustion chamber, the lower end 121 and the upper end wall 122 being provided with openings for the ingress of air and the egress of air and products of combustion respectively. A non-combustible insulating jacket made of asbestos sheet material 123 surrounds the side walls of the housing and a flexible stocking like sleeve 124 surrounds the asbestos insulating jacket 123 and protects the asbestos from abrasion and damage and also retains the insulating jacket in position while the sleeve 124 also provides additional insulation to prevent a person from being burned by heat from the combustion chamber. A tension spring 125 is secured to the bottom end of the housing on suitable lugs or the like and such spring underlies the bottom receiving and retaining a fuel tank 132 in position under the housing. A burner head receiving opening 126 is provided in the housing, and in the insulation jacket for receiving a burner nozzle or burner head 128. A tubular extension 127 is secured to and projects from the combustion chamber serving as a guide and guard for the burner head 128. A layer of non-combustible material such as an asbestos sheet 126A is secured to the outer surface of the sleeve 124 adjacent the nozzle guard 127 to prevent burning during the insertion of the lighted nozzle into the combustion chamber.

A baffle 129 made from a rectangular blank of stainless steel or other suitable material is secured at one of its ends by means of a downwardly turned flange 130 and rivet 130A to the adjacent wall of the housing 120 above the burner receiving opening 126 in the guard and guide tube 127 in a position overlying the burner head 128 and causing heat from the burner to be deflected. The rectangular baffle 129 is provided with side flanges 131 along the adjacent edges extending from the flange 130 where such side flanges are nearly horizontal to the free end where the flanges 131 are vertical for confining the flame to the lower portion of the combustion chamber. The flanges 131 are separated adjacent the nozzle receiving opening 126 to avoid contact of the burner head during insertion. It will be noted that the baffle 129 extends from the attaching flange 130 toward the opposite wall of the housing defining the combustion chamber to thereby cause uniform heating of the housing and gases therein.

The fuel tank 132 of the conventional propane type is provided with the usual nipple 132A which is received by a female connection in a pressure regulating valve of the Sensitne type. This valve 133 includes adjusting knurled knobs 134 which are preset at the factory to limit the flow of fuel to a maximum permitted within the housing to avoid dangerous heating thereof and therefore the adjustment cannot be varied except by a person skilled in this particular field. The adjusting knobs 134, 134A are threaded onto a threaded shaft 134B to provide a limit stop engaging against the hub 134C to determine the position of the valve at maximum opening. The burner head 128 is mounted on a tube 135 extending from the valve and such burner head is of a well known type and is adapted to be received in the guard and guide 127 while the fuel tank is retained in position by the tension spring 125. This structure assures that the fuel tank can be readily replaced and the burner can be mounted in a minimum of time without any danger of injury to a person while the insulation assures that there is no danger of fire during the insertion of the burner nozzle when flame is formed therein.

The valve assembly 149 is mounted on the tank 132 by having the internally threaded boss 150 of the body 133

threaded onto the threaded nipple 151 of the conventional fuel tank, such fuel tank having the usual valve insert 152 therein which is adapted to be engaged by the tubular projection 153 extending from the axial central bore 154 of the valve body 133. Another valve insert 155 is threaded into the axial bore 154 adjacent the outer end of the body 133 and the stem thereof extends outwardly from the bottom of the recess or chamber 156. A mushroom-shaped cap 157 having a valve stem receiving recess in its stem is positioned within the recess 156 receiving the valve stem of valve insert 155. A flexible diaphragm 158 is supported on an outwardly extending flange 159, while a hollow flanged boss member 134C is secured by its flange by means of machine screws extending through its flange and threaded into the flange 159 thereby providing a fluid-tight seal between the flange 159, the hollow boss 150 and the flexible diaphragm 158. A threaded valve operating shaft 134B is threaded into the outer end of the boss 134C and has a flange 162 and a projection 163 which engage the end and the interior respectively of a compression spring 164 which compression spring extends from the flange 162 to a second mushroom-shaped element 165 which presses against the diaphragm 158. In the position shown in FIG. 15 the spring 164 is at its maximum extension so that mushroom-shaped element 165 does not cause pressure against diaphragm 158 and valve insert 155 is closed. The internally threaded adjusting knobs 134 and 134A are secured to the threaded shaft 134B by being screwed together in a position such that when the shaft 134B is rotated in a clockwise direction to compress the spring 164 the valve insert 155 is caused to have its stem moved to open the valve and permit fuel such as gas from the tank 132 to pass into the chamber 156 and then to pass through a passageway 166 communicating with a threaded bore 167 which receives the tube 135 of the nozzle of the burner head.

The diaphragm 158 is caused to move against the pressure of compression spring 164 when the pressure of gas in the chamber 166 exceeds the desired value thereby controlling the pressure of the gas in the chamber 156 and in the passage 166 to the burner head, thereby providing an even pressure. The operating knobs 134 and 134A are adjusted longitudinally on the threaded shaft 134B so that upon clockwise rotation to the maximum extent the knob 134A will strike the boss 134C, thereby limiting the maximum pressure so that there is no danger of excessive pressure to the burner head and adjustment is made to provide a proper safe flame in the burner head when the burner is operating in the position shown in the drawing. The valve insert 155 is the conventional valve insert used in pneumatic tires and in the fully extended condition of FIG. 20 the valve head at the right end of the slidable valve stem is in closed condition. In the position shown in FIG. 20 the valve insert 155 is closed as the valve stem thereof is fully extended. The compression spring 164 in FIG. 20 is fully extended and in such fully extended condition it does not produce any force on either mushroom insert 165 or diaphragm 158 so that the flow of fuel is prevented by the extended condition of valve insert 155. It will be seen that the force on compression spring 164 is adjusted from no force in the position of FIG. 20 by threaded shaft 134B producing a displacement of mushroom shaped element 163 and a force reaction on the spring 164 and thence onto the mushroom shaped element 165 and thence on the diaphragm 158. The diaphragm 158 acts on the mushroom shaped cap element 157 and thereby reacts on the valve stem of the valve insert 155. The gas under pressure in the cylindrical tank 132 must flow through valve insert 155 when the valve stem is depressed and the pressure of the gas in the chamber 156 reacts against the spring adjustment of spring 164 until a balanced condition is obtained. This balanced condition results in a uniform pressure in chamber 156 and thereby a continuous flow of gas into the nozzle or burner head 128. Thus it will

be seen that the valve control mechanism of FIG. 20 can be adjusted by the screw 134B to obtain any desired rate of combustion resulting from a controlled flow of gas from the fuel tank.

The orifice in the mushroom element 253 is accurately made to a value which will permit pressure control by the pressure control valve to produce a flame of the precise maximum to avoid overheating. A value for a single orifice when using propane gas has been found to be 3.9 to 4 one-thousandths of an inch in diameter. This adjustment has been determined by trial and error after assembly by observation of the flame issuing from the burner head. The inner cone of the flame of .5 inch when the flame is low and .7 inch when the flame is high has been found to be satisfactory with a maximum length of flame in the order of 1 inch.

A gasket 163 abuts against the end of the threaded nipple 151 of the tank to provide a tight seal when the valve assembly is mounted on the tank. The gasket 163 also seals the hexagonal nut flange 163A of the tubular projection 153 with respect to the valve body 133. A further seal is obtained by means of O-rings 169 mounted on a tube pressed into the nipple 151 of the fuel tank 132.

The valve assembly of the present invention serves the function of the usual needle valve when the knobs 134, 134A are in their outermost position. The valve also serves as a pressure regulator valve. In previously known valves in gas burning equipment it was customary to have a separate shut off valve and a separate pressure regulating valve and, therefore a new combination is provided. The valve assembly of the present invention when used in the manner described prevents the possibility of freezing which has occurred in needle type valves.

For supporting the heater, a flexible adjustable carrying shoulder strap 138 is secured to the heater housing by suitable means such as suitable lugs on the upper end of the housing and the strap 138 is adapted to be carried over a person's shoulder. The adjustment for length is accomplished by buckle 138A so the fuel tank and burner are just below the bottom edge of a person's coat and the separable hook like fastener 138B permits ease of applying the heater even when the outer garment is kept on. It is deemed preferable to have the heater on the left side of a user to minimize interference with normal activity and also to provide heat closer to the main supply of blood. A piece of fireproof asbestos insulating material 126A is secured to the stocking at the opening 125 to prevent flame damage when the burner head is inserted into the tube 127.

A modification of the support for the fuel tank and burner is shown in FIGS. 13 and 14 and the housing 182 is provided with a perforated flanged bottom cap 180 and a perforated flanged top cap 181 with the flanges extending outwardly of the tubular housing 182. The top cap 181 is secured by screws or rivets 183 while the bottom cap is secured by a rod like wire fastening member 184 which passes through aligned openings through the center of the side walls of the tubular housing 182 and the flanges of the cap 180. Such rod is provided with an eye 185 at one end to which the coil spring 125 is permanently secured. The asbestos insulation 186 is hemmed at its upper edge by suitable stitching 187 and the outer stocking cover 188 is hemmed at its upper edge by suitable stitching and secured to the upper end of the asbestos insulation by stitching 189. The lower end of the stocking like sleeve is provided with a hem 190 which surrounds a wire 191 within the hem being stitched in place by suitable stitching and the asbestos insulation extends downwardly to the bottom of the heater. In assembling the heater, the upper cap 181 is secured in place by fasteners 183. The lower cap 180 is mounted with the holes in the flanges in alignment with the holes in the side walls of the tubular housing 182 and the eyed rod 184 is passed through such aligned openings and through

the material of the stocking sleeve and of the asbestos insulation above the wire 191 in the hem of the stocking sleeve so the wire 191 in the hem is below the rod 184 whereby the bottom of the stocking sleeve is secured in position.

Shoulder strap 192, FIG. 14, with suitable adjusting buckles such as 133A, 133B are sewed into the upper seam by the stitching 189 and other suitable stitching and the heater housing, fuel tank and burner are thereby supported from the stocking and from a person's shoulder by the strap 192 thereby assuring that the insulation sleeve will always be maintained in effective operative position.

After the rod 184 is inserted, a hook 193 is formed therein which opens upwardly and serves to engage the eye in the free end of the coil spring 123 to permit detachment when inserting or removing the burner or replacing a fuel tank 132.

The valve arrangement assures a limited flow of gas and that there is no danger of overheating, the flame size being controlled to limit the size of the flame so that the inner cone is in the nature of one-half inch high while the outer cone does not exceed half the width of the heating chamber.

A tube 140 (FIGS. 7 and 8) of conducting material such as metal extends along the side of the housing 120 in heat conducting relation and is heated by conduction from the housing in the middle portion of the tube and a flexible tube 141 extends from the tube 140 to a nose receiving cup 142 similar to the nose receiving cup 219 described in another modification so that such nose cup is adapted to be located adjacent the nose to provide heated air to be mixed with other air and thereby prevent excessive cooling of a person's lungs.

Referring to FIG. 19 the strap 138 is shown as secured to lugs adjacent the top wall 122 and the sleeve like fabric covering 124 and asbestos insulating covering 123 extend above the upper end wall 122 and thereby provide a chimney to further guide heated air from the combustion chamber into the space between an outer garment and the body adjacent the heart thereby heating a person's blood.

It will be obvious to those skilled in the art that various changes may be made in the invention without departing from the spirit and scope thereof and therefore the invention is not limited by that which is illustrated in the drawing and described in the specification, but only as indicated in the accompanying claims.

What is claimed is:

1. A human body heater for ready attachment and support from a person comprising an elongated upstanding housing providing a combustion chamber and having a plurality of openings in the bottom and a plurality of openings in the top for the reception of air for combustion and the passage of products of combustion respectively with the products of combustion adapted to pass directly into the space between an outer garment and a person's body to heat portions of the body adjacent the heart so that the blood stream will be maintained warm to maintain the body at a comfortable temperature, a tube extending along the elongated upstanding housing in heat conducting relation with the combustion chamber and with the lower end thereof outside of the combustion chamber for receiving fresh air and the upper end thereof projecting above the combustion chamber for attachment of a tube for conducting breathing air, and a flexible tube connected to the upper end of said heat conducting tube, a mask in communication with said flexible tube for positioning close to a person's nose for directing warm air from said flexible tube for inhalation into a person's lungs whereby heated air may be inhaled to maintain the body temperature, and means for suspending the body heater directly from a person's body without requiring alterations in the garment.

2. A human body heater to be used without modification of a person's garment comprising an elongated up-

standing housing having side walls, edge walls and top and bottom walls, said housing being of a thickness between its side walls substantially less than the width between the edge walls thereof, said housing providing a combustion chamber and having a plurality of openings in the bottom wall encompassing a major portion thereof for the ingress of air and a plurality of openings in the top wall encompassing a major portion thereof for the egress of products of combustion, a cylindrical fuel tank of an axial length approximately the width of said housing and having a portion of its cylindrical surface in direct contact with the bottom wall of said housing, a burner nozzle projecting from one end of said cylindrical fuel tank in a direction toward said fuel tank to overlie the cylindrical surface in contact with the bottom wall of said housing, said housing having a burner receiving opening in one edge wall for reception of said burner nozzle whereby said fuel tank can be applied to said housing by a lateral motion in the direction of the width of said housing and a motion in the direction of the length of said housing, an insulating sleeve open at both ends mounted on said housing and extending from the bottom of said housing to above the top end thereof, means to secure the bottom end of the insulating sleeve to the bottom end of said housing, strap means secured to the upper end of said insulating sleeve for carrying the human body heater, and tension spring means connected to and extending from the bottom of said side walls around said cylindrical tank and maintaining said cylindrical tank and said burner nozzle in operative position while permitting ready replacement.

3. The invention according to claim 2 in which a tube is positioned in heat conducting relation to said housing with one end adjacent the bottom of said housing and the other end adjacent the top of said housing, and a flexible tube connected to said tube in heat conducting relation to said housing for conveying air to a person's mouth and nose whereby a person upon inhalation may draw warm air through said tube in heat conducting relation to said housing and said flexible tube.

4. A lightweight human body heater for use in maintaining body temperatures, said heater comprising an upstanding housing having top and bottom walls and side wall means forming a combustion chamber, said housing having openings in the top and bottom walls thereof, insulating material surrounding the side wall means of said housing, a burner extending into said housing adjacent the bottom thereof, a fuel tank connected to said burner, control means between said fuel tank and said burner for controlling the rate of supply of fuel for combustion, means to mount said housing with the fuel tank and burner in operative relation inside of an outer garment whereby a person's body will be kept warm, a breathing tube extending closely adjacent to the combustion chamber and in heat transfer relation with the products of combustion within the combustion chamber for receiving heat, said breathing tube being out of communication with the interior of said housing, a flexible tube adapted to extend from said breathing tube to adjacent a person's nose and a nose-receiving outlet cup in communication with and secured to the free end of said flexible tube whereby a person may breathe warm air through said breathing tube and said flexible tube.

5. A heater for use on a person to provide additional heat in extreme weather comprising an upstanding hollow combustion chamber having top, bottom and side wall means, said combustion chamber having a plurality of openings for air adjacent the bottom encompassing a major portion thereof and having a plurality of openings adjacent the top thereof and encompassing a major portion thereof for heated products of combustion, insulation around the side wall means of the hollow upstanding chamber to prevent injury to persons contacting such side wall means, means to support said insulated combustion chamber from a person's body underneath a person's gar-

ment adjacent to the hips of a person, means to provide a supply of fuel directly below said insulated combustion chamber, a nozzle for fuel connected to said means to provide a supply of fuel and positioned within the lower portion of the combustion chamber, means to control the flow of fuel from the supply of fuel to the nozzle whereby the heater may be supported underneath a person's garment to provide heat between the garment and a person directly to the body of a person whereby the blood may be heated and the heart may carry a warm supply of blood to the body extremities, an air conductor provided in heat exchange relation to the combustion chamber and extending below the combustion chamber, a flexible conduit connected to said heat exchange air conductor, and means at the extremity of said flexible conduit for discharging pure heated air adjacent the nose of a user.

6. A human body heater comprising a closed upstanding housing of substantial height and of substantially greater width than thickness providing a combustion chamber, said housing having a closed lower bottom end and closed upper top end and side wall means extending between said ends, the lower and upper ends of said housing being provided with a plurality of small openings encompassing a major portion of the ends for the ingress of air and the egress of air and products of combustion respectively, a non-combustible insulating jacket sleeve surrounding the side wall means of said housing, a flexible stocking sleeve substantially completely open at the top and bottom surrounding said insulating jacket, means to secure said flexible stocking sleeve to the bottom end of said housing, a fuel tank, means to support said fuel tank below the bottom end of said housing, a burner extending from said fuel tank, said housing being provided with a

burner receiving aperture adjacent its lower end for the reception of said burner, control means for fluid between said burner and said fuel tank, flexible means connected to and extending upwardly from the upper end of said stocking sleeve for mounting on a person and supporting said housing in upright position while maintaining said stocking sleeve in protecting relation around the housing to assure that the stocking sleeve covers the housing preventing excessive heat of the housing from contacting a person, said heater being usable to heat the body of a person within a garment and thereby heat the blood stream providing for the carrying of heat by the blood stream to the extremities of the body.

References Cited in the file of this patent

UNITED STATES PATENTS

912,527	Batter	Feb. 16, 1909
1,998,327	McGuire	Apr. 16, 1935
2,295,177	King	Sept. 8, 1942
2,357,575	Benz	Sept. 5, 1944
2,392,587	Goerg	Jan. 8, 1946
2,460,269	Appeldoorn	Feb. 1, 1949
2,498,983	D'Albora	Feb. 28, 1950
2,514,506	Mueller	July 11, 1950
2,561,531	Mueller	July 24, 1951
2,652,824	Hopp	Sept. 22, 1953
2,683,484	Falligant	July 13, 1954
2,780,280	Allen	Feb. 5, 1957
2,829,635	Teller	Apr. 8, 1958

FOREIGN PATENTS

13,969	Great Britain	1891
--------	---------------	------