An apparatus is provided for selectively heating and cooling an area. The apparatus comprises a heating assembly for heating an area and a cooling assembly for cooling the area.
APPARATUS FOR SELECTIVELY HEATING AND COOLING AN OUTDOOR AREA

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application relates to co-pending U.S. patent application Ser. No. ______ to Edward M. Sechiel and Theodore H. Stark, filed on the same date hereof, Attorney Docket No. 0006-002, entitled "PATIO UNIT," the entire contents of this application being incorporated by reference as fully set forth herein.

STATEMENT REGARDING FEDERA LLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] Not applicable.

THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT

[0003] Not applicable.

INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC

[0004] Not applicable.

BACKGROUND OF INVENTION

[0005] People have consistently enjoyed spending time outdoors. At home, residents participate in a variety of outdoor activities such as playing sports, gardening and barbecuing. Two common outdoor activities for residents are lounging and dining. While these activities may be enjoyed anywhere around a residence including a terrace, lawn or deck, residents commonly do these activities on a patio. Commercial or business owners such as restaurant proprietors (and companies etc.) have recognized that dining outdoors is quite desirable. Customers often times select a restaurant based on the size and nature of an outdoor dining area. For this reason, many restaurants offer outdoor dining areas for their customers. For restaurants located in areas in which the climate varies significantly, the outdoor dining areas are usually offered during the summer months. For those restaurants that are located in consistently warmer climates, the outdoor areas are typically offered throughout the year. This outdoor area may typically be a terrace, lawn, a deck or a patio. Depending on the size of the restaurant and the general climate in which the restaurant is located, the outdoor dining area may be covered in part or entirely by a conventional canopy or plastic sheet that is adaptable (flexible and movable) to weather variations.

[0006] Residents and business owners are both affected by temperature variations in a given season as well as a given day. In some climates, there may be daily temperature differences of 30 degrees. For example, the temperature may drop from 90 down to 60 degrees in a day. A large temperature drop can make outdoor activities uncomfortable if not prohibitive. In order to enable both residents and business customers to continue to enjoy activities outside, outdoor heaters are used for comfort and enjoyment of such activities. There are many types of outdoor heaters. Patio heaters are one such type, and they are commonly used by residents and business owners because they are safe, economical and easy to use. These heaters may provide a wide circle of warmth (possibly a 15-20 feet diameter) and raise outdoor temperatures significantly (e.g., 10 to 25 degrees Fahrenheit). Some patio heaters operate using a gas source such as a propane cylinder. The propane cylinder supplies propane gas to ignite and maintain a fire. The fire is used to heat material that absorbs and maintains heat from the fire and warms an outdoor area. Other conventional outdoor heaters operate using electricity as a source. While conventional outdoor heaters are adequate to maintain comfort in cool temperatures (intended purpose), they do have disadvantages. For one thing, conventional heaters are not capable of maintaining a comfortable outdoor environment when the temperature increases to uncomfortable levels (e.g., 90 degrees). In fact, conventional outdoor heaters are completely ineffective in dealing with high temperatures. A large temperature increase can make outdoor activities uncomfortable if not prohibitive. There is currently no free standing unit or apparatus for an outdoor area that offers cooling alone or together with heating as needed for climate changes.

[0007] It would be desirable to offer a solution that would overcome the disadvantages with the conventional units described above.

SUMMARY OF THE INVENTION

[0008] In accordance with an embodiment of the present invention, an outdoor apparatus is adapted to be free standing is provided. The apparatus comprises a cooling assembly for cooling an outdoor area.

[0009] In accordance with another embodiment of the present invention, an apparatus is provided for selectively heating and cooling an area. The apparatus comprises a heating assembly for heating an area and a cooling assembly for cooling the area.

[0010] In yet another embodiment of the present invention, an apparatus is provided for selectively heating and cooling an outdoor area. The apparatus comprises a heating assembly for heating an outdoor area and a cooling assembly for cooling the outdoor area. The cooling assembly includes at least one tube for delivering water and a nozzle attached to the tube for dispersing the water as a mist to the outdoor area.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The accompanying drawings, which are incorporated herein and constitute a part of the specification, illustrate embodiments of the invention, and together with the general description given above and the detailed description of the embodiments given below, serve to explain the principals of the invention.

[0012] FIG. 1 is a front perspective view of an apparatus for selectively heating and cooling an outdoor area in accordance with an embodiment of the present invention.

[0013] FIG. 2 is a cross sectional view of the apparatus in FIG. 1 taken along lines 2-2 shown in FIG. 1.

[0014] FIG. 3 is an enlarged sectional view of the top portion of the apparatus shown in FIG. 2.

[0015] FIG. 4 is an enlarged sectional view of the top portion of the apparatus shown in FIG. 2 including the pilot light assembly.

[0016] FIG. 5 is a block diagram of a pilot assembly of the apparatus shown in FIG. 2.
Referring to FIG. 1, there is shown a perspective view of apparatus 10 for selectively heating and cooling an area that has an outdoor section or portion (“outdoor area”). The outdoor area may be part of a residential or commercial real estate property such as a patio, roof or floor deck, lawn, terrace or other outdoor grounds. The outdoor area may include areas covered in whole or in part by a canopy or plastic layer or other covering. Alternatively, apparatus 10 may be used indoors on various surfaces. Apparatus 10 is a free standing unit that includes an exterior shell or casing 12 which incorporates base 14, column 16 and support 18. Casing 12 is essentially a hollow structure to conceal the appropriate tubing and other components for the heating and cooling assemblies as described in detail below. As will be appreciated by those skilled in the relevant arts, however, casing 12 may take many forms and shapes to achieve the housing functions.

In the embodiment shown, based 14 is a rectangular housing that contains (i.e., houses) a gas source such as natural gas or a propane cylinder (part of heating assembly discussed below) for supplying gas and tubing for supplying water (part of cooling assembly discussed below). Base 14 has door 14a that is adapted to pivot about hinges and swing open to enable a resident or business owner to access the components within base 14 (by a door handle or other mechanism not shown). Column 16 extends vertically between base 14 and support 18. Column 16 includes a section of air induction holes 16a for exposing or introducing air into the interior of casing 12. Support 18, column 16 and base 14 are made of glass fiber reinforced concrete in this embodiment, but may be made of different compositions. A plurality of leaves 20 are supported by a portion of the cooling assembly as discussed below. Leaves 20 are merely employed for ornamental value and may take many different forms. Leaves 20 are made of aluminum with copper plating. Aluminum is used because it does not conduct heat well. Therefore, the tips of the leaves are not quite as hot as the temperature at the core of the heating assembly.

Referring to FIGS. 2 and 3, apparatus 10 is shown in cross section. Apparatus 10 includes a heating assembly 30. Heating assembly 30 includes or employs unit 31 incorporating the appropriate heating components. Unit 31 includes a conical section 32 and a generally rectangular section or shaft 34 attached to conical section 32. As shown in FIG. 2 and in more detail in FIGS. 3 and 4, conical section 32 has two portions (32a, 32b) at the bottom thereof, first portion 32a having a decreasing diameter at the top, first portion 32a is constructed to the same or similar diameter as a hole in the top of support 18, so that the conical section 32 fits snugly with the hole in support 18. Second portion 32b extends from first portion 32a downwardly within the interior of support 18. Second portion 32b has a diameter smaller than the variable diameter of first portion 32a, leaving a chamber or open area between the interior of support 18 and conical section 32. Second portion 32b has a plurality of holes equally spaced around the circumference. These holes are positioned generally near holes 16a within column 16 to enable air to pass through column 16 and into conical section 32 (as shown by the arrows in FIG. 3). In addition, air within column 16 is introduced into conical section 32 through holes in a metal sheet surrounding rectangular shaft 34. This is best seen in FIG. 3. It should be noted that conical section 32 may be designed (alternatively) in different shapes and constructions to provide proper air chambers or areas for ventilation (i.e., air induction to maintain a robust flame as described below).

Rectangular shaft 34 fits within a hole on the top of support 18 and extends down into an interior portion of column 16. Rectangular shaft 34 is attached to the interior of column 16 using a mounting bracket (not shown). Conical section 32 decreases in diameter from the top to the bottom thereof. Conical section 32 includes inner cone 36, conical mesh sheet 38 (screen), funnel sheet 39 and metal burn plate 40. Heating assembly 30 also includes gas supply tube 42 which is coupled to burn plate 40. In this embodiment, gas supply tube 42 is made of stainless steel. Supply tube 42 extends through rectangular section 34 and column 16 to base 14. As seen in FIG. 2, supply tube 42 is attached to natural gas line 44 in concrete (or alternatively into another ground material or surface) via valve 46 in accordance with this embodiment. Valve 46 enables the user to control the flow of natural gas to apparatus 10. Another embodiment of the gas source within base 14 is shown in FIG. 8.

As shown in more detail in FIGS. 3 and 4, cone 36 is conical in shape, and it fits within conical sheet 38. At the end of conical section 32, funnel sheet 39 (and 36) has a diameter that is slightly smaller than the diameter of conical sheet 38. In this way, funnel sheet 39 is essentially flush with the metal conical sheet 38. At the bottom of conical section 32, funnel sheet 39 has a diameter that is substantially smaller than the diameter of the bottom of conical sheet 38. In this way, the difference in diameter of the bottom of conical sheet 38 (screen) and funnel sheet 39 creates flame chamber 46. Cone 36 is constructed to essentially lie against funnel sheet 39. Cone 36 essentially decreases in diameter similarly as cone 39 from the top to the bottom thereof.

In this embodiment, conical sheet 38 is a steel mesh screen of small holes. Steel is used to withstand extreme temperatures. The temperature may increase to 300 degrees Fahrenheit at certain points within conical section 32. Mesh is used to enable the fire within flame chamber 46 to thrive (i.e., breath) and permit any gases produced to escape. In alternative embodiments, conical sheet 38 may have additional holes or slits (in addition to mesh holes within sheet 38) to help maintain a robust flame within flame chamber 46. Funnel sheet 39 engages (i.e., rests) on burn plate 40. Burn plate 40 provides the flames to heat an outdoor area. Cone 36 is made of fiber for its ability to absorb heat (and act as an insulator), maintain heat for extended periods of time and to project heat outwardly. Cone 36 may alternatively be made of another ceramic or other heat absorbing material. This heat is emitted from cone 36 for warming an area of a certain radius (e.g., 15-20 feet) from apparatus 10. The radius of warmth will depend on ambient air temperature and breeze or wind. Tube 42 actually directs gas to burn plate 40.
Conical section 32 of unit 31 includes pilot light assembly 50 for igniting and controlling gas that travels through tube 42 to burn plate 40 within conical section 32. As will be appreciated by those skilled in the relevant arts, pilot light assembly 50 functions similarly to the pilot mechanisms in stoves and other heating apparatus that utilize a fire as a heat source. Specifically, FIG. 5 is a block diagram illustrating the components of pilot light assembly 50 and the operation thereof. Pilot assembly 50 includes actuator 52 (user button), igniter 54, thermocouple 56, pilot light mechanism 58, control 60, valves 62 and valve 64. Actuator 52 is connected to igniter 54 via wire 66 (FIGS. 2, 4, 5 and 6). In this embodiment, actuator 52 is a battery powered switch (e.g., AA battery) that activates igniter 54 (i.e., piezo spark) via wire 66 when actuator 52 is depressed. Thermocouple 56 is used to sense heat from igniter 54 and pilot mechanism 58 as described below. When heat is sensed, thermocouple 56 sends a signal via valve sensor wire 68. Control 60 is coupled to thermocouple 56 and valves 62 and 64 to control the gas fed through tubes 70 and 42. In this way, gas is controlled with respect to pilot light mechanism 58 and burner plate 40. There is also a second button or knob for controlling the flame (e.g., high, medium and low).

In operation, a user presses actuator 52 and igniter 54 creates a spark. Thermocouple 56 senses heat from the spark and transmits a signal via valve sensor wire 68 to control 60. Control 60 thereby opens valve 62 to allow gas to travel through gas feed line 70. The spark created ignites a pilot fire at pilot light mechanism 58. Thermocouple 56 then senses the heat from the pilot fire at pilot light mechanism 58 and transmits a signal to control 60 to open valve 64. Gas is thereby released (assuming valve 64 is open) through tube 42 to burn plate 40 to enable the fire at pilot light mechanism 58 to light a fire at burn plate 40. As long as thermocouple 56 senses heat from pilot light mechanism 58, thermocouple 56 will continue to release gas (via control 60 and valves 62 and 64) to feed the fire at burner plate 40. Referring to FIGS. 2 and 4, an opening is shown in the bottom of conical section 32 to enable the tubing and wiring (i.e., wire 66, valve sensor wire 68 and gas feed line 70) of pilot assembly 50 to enter conical portion 32.

It should be noted that heating assembly 30 may take many other (alternative embodiments) constructions, shapes and forms to achieve the same heating functions as described above. For example, unit 31 (conical section 32 and rectangular shaft 34) may be rectangular or circular in shape as desired. In alternative embodiments, rectangular shaft 34 may not be present at all. Unit 31 may also include any number of internal and external sheets of various materials with various chambers and ventilation holes or openings for maintaining a fire. Alternatively, the heating assembly or heating mechanism may be an electric heating component including a coil/wire, lamp, quartz element or other electrical element (instead of fire) to heat an outdoor area (e.g., spot or space heater). This electric heating mechanism may be positioned against or within casing 12 to provide heat to an area. In this respect, the electrical heating mechanism will be connected to an appropriate electrical outlet.

As seen in FIGS. 1, 2, 6 and 7 (in enlarged detail), apparatus 10 also includes a cooling assembly 80 (in addition to heating assembly 30). In alternative embodiments, however, apparatus 10 may incorporate cooling assembly 80 only without any heating assembly or other mechanism for heating an area. In this embodiment, cooling assembly 80 employs tubes 82,84,86 for delivering water ("delivery tubes 82,84,86"), supply tube 88 for supplying water to delivery tubes 82,84,86, and three way splitter 90 coupling supply tube 88 to delivery tubes 82,84,86. Cooling assembly 80 also includes nozzles 92,94,96 that are attached to the ends of delivery tubes 82,84,86, respectively for dispersing the water into mist. Delivery tubes 82,84,86 are copper plated stainless steel tubes. Apparatus 10 employs three leaf support brackets 98,100,102 for supporting delivery tubes 82,84,86 and leaves 20. Because leaves 20 may wilt under extreme heat, support brackets 98,100,102 are used to ensure that leaves 20 do not wilt downwardly. Support brackets 98,100,102 are held together at one end by screw and bolt 104,106 and carried by the top edge of conical section 32 via mounting tabs 108,110,112, respectively. Specifically, support brackets 98,100,102 are attached to one end of mounting tabs 104,106,108, respectively (via screws and bolts). The other end of mounting tabs 104,106,108 are attached to the edge of conical portion 32 of heating assembly 30 (via screws and bolts). Leaves 20 are also held together by screw 104 and second bolt 105 (shown best in FIG. 2).

Supply tube 88 is a stainless steel high pressure tube that extends through a hole in cone 36, into column 16 toward base 14. Toward the bottom of column 16, supply tube 88 is connected to a flexible tube or lead 120 that extends through the bottom portion of column 16 and entirely through base 14. Flexible lead 120 exits a small hole in the bottom of base 14 to enable connection between supply tube 88 and a water supply (e.g., garden hose). It is important to note that the water supply hose and valve controlling same (residence or business) dictates the amount of water pressure (and hence misting production) provided by cooling assembly 80. In another embodiment, the delivery tubes 82,84,86, the supply tube 88 and flexible lead 110 may be constructed to be a single piece component.

In FIG. 7, there is shown a cross sectional view of a portion of heating assembly 30 and cooling assembly 80. Delivery tube 86 is supported by support bracket 102 which is attached to conical sheet 38 by way of mounting tab 112 (and bolt and screws). Nozzle 90 is attached to delivery tube 86 at the end thereof to convert the water delivered into mist.

FIG. 8 illustrates an alternative embodiment of the components within base 14. In this embodiment, apparatus 10 may be moved or placed in any location as desired. Supply tube 88, flexible tube 120 and gas tube 42 remain the same as FIG. 2. However, gas tube 42 is shown connected to propane cylinder 122. In this embodiment, propane is used as a gas source for heat assembly 30. Propane cylinder 122 is typically a 5 gallon/25 lb unit. However, other size cylinders may be used that fit inside base 14.

As indicated above, apparatus 10 (in accordance with the embodiments of the invention) is a free standing apparatus or unit. That is, apparatus 10 is not attached to or does not hang from or otherwise engage a residence or building structure itself (other than the ground on which apparatus 10 is placed or positioned). In addition, apparatus 10 as described above may be movable or made to be securely fastened to the ground on which it is placed. Further, apparatus 10 may be constructed in many forms to selectively achieve cooling and heating if desired. However, apparatus 10 in accordance with an alternative embodiment
may include a cooling assembly only without any heating assembly or other heating mechanism.

The foregoing description of embodiments of the invention has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise form disclosed and modifications and variations are possible in light of the above teachings or may be acquired from practice of the invention. The embodiments were chosen and described in order to explain the principles of the invention and its practical application to enable one skilled in the art to utilize the invention in various embodiments and with various modifications as are suited to the particular use contemplated. It is intended that the scope of the invention be defined by the claims appended hereto and their equivalents.

We claim:

1. An outdoor apparatus adapted to be free standing comprising a cooling assembly for cooling an outdoor area.

2. The apparatus of claim 1 wherein the cooling assembly includes at least one tube for delivering water and a nozzle attached to the tube for dispersing the water as a mist to the outdoor area.

3. The apparatus of claim 1 further comprising a heating assembly for heating the outdoor area.

4. An apparatus for selectively heating and cooling an area, the apparatus comprising:
   a heating assembly for heating an area; and
   a cooling assembly for cooling the area.

5. The apparatus of claim 4 wherein the cooling assembly includes at least one tube for delivering water and a nozzle attached to the tube for dispersing the water as a mist to the area.

6. The apparatus of claim 5 wherein the cooling assembly includes a supply tube attached to the delivery tube for supplying water to the delivery tube.

7. The apparatus of claim 6 further comprising a column, a portion of the supply tube extending within the column along its length.

8. The apparatus of claim 4 further including at least one bracket engaging the heating assembly and extending outwardly away from the column for supporting the delivery tube.

9. The apparatus of claim 4 wherein the cooling assembly includes a plurality of tubes for delivering water and a plurality of nozzles attached to the plurality of tubes respectively for dispersing the water as a mist to the area.

10. The apparatus of claim 8 further including a plurality of brackets engaging the heating assembly, the plurality of brackets supporting the plurality of tubes for delivering water, respectively.

11. The apparatus of claim 9 wherein the plurality of tubes include three leads for misting.

12. The apparatus of claim 4 wherein the heating assembly includes a cone for emitting heat to warm the area.

13. The apparatus of claim 12 wherein the heating assembly includes a plate for heating the cone and an energy source for providing energy to the plate.

14. The apparatus of claim 4 wherein the apparatus is movable.

15. An apparatus for selectively heating and cooling an outdoor area, the apparatus comprising:
   a heating assembly for heating an outdoor area; and
   a cooling assembly for cooling the outdoor area.

16. The apparatus of claim 15 wherein the cooling assembly includes a supply tube attached to the delivery tube for supplying water to the delivery tube.

17. The apparatus of claim 16 further comprising a column, a portion of the supply tube extending within the column along its length.

18. The apparatus of claim 17 further including at least one bracket engaging the heating assembly and extending outwardly away from the column for supporting the delivery tube.

19. The apparatus of claim 15 wherein the cooling assembly includes a second tube for delivering water and a second nozzle attached to the second tube for dispersing the water as a mist to the outdoor area.

20. The apparatus of claim 19 further including a second bracket engaging the heating assembly, the second bracket supporting the plurality of tubes for delivering water.

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