US 20040069296A1

(19) United States
(12) Patent Application Publication
(10) Pub. No.: US 2004/0069296 A1
Cheng et al.
(43) Pub. Date: Apr. 15, 2004

(54) **HEAT TRANSFER CONTROLLER**

(75) Inventors: **Matthew M. Y. Cheng**, Burnaby (CA); **Doug E. Hills**, Cloverdale (CA); **George H. K. Lau**, Vancouver (CA)

Correspondence Address:
SNELL & WILMER
ONE ARIZONA CENTER
400 EAST VAN BUREN
PHOENIX, AZ 850040001

(73) Assignee: **FPI Fireplace Products International, Ltd.**, Delta (CA)

(21) Appl. No.: **10/653,396**

(22) Filed: **Aug. 28, 2003**

Related U.S. Application Data

(60) Provisional application No. 60/406,601, filed on Aug. 28, 2002.

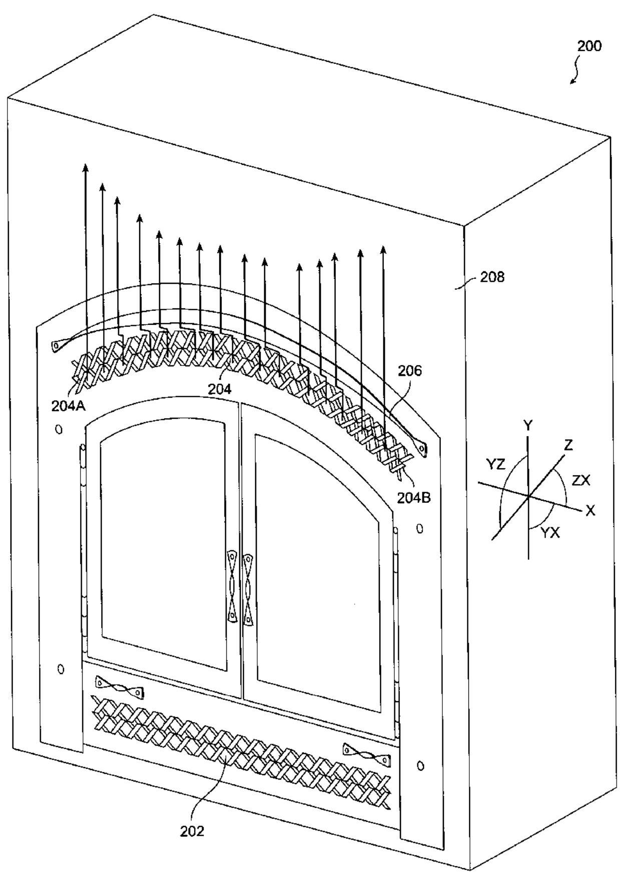
Publication Classification

(51) Int. Cl.[7] **F24C 15/04**

(52) U.S. Cl. **126/193**; 126/198

(57) **ABSTRACT**

A heat transfer controller is configured to control the heat distribution and transfer of a heating system. An exemplary heating system comprises an air intake, an exhaust mechanism, and a heat transfer controller. The heat transfer controller is configured to control the distribution and transfer of heat exhausted from the exhaust mechanism to the heating area, and can comprise a heat deflector having a width, length and height that can be suitably configured to provide variable heat transfer control characteristics. In addition, the heat transfer controller can comprise an arch-like configuration. For example, the width of the heat transfer controller can be configured to direct and/or transfer heat from an area most likely to have heat restricted or increased. In addition, the height of the heat transfer controller can be configured to generate a convection effect to pull heat outwards from the area with the greatest heat restrictions. The heat transfer controller can also suitably comprise any other configurations, such as triangular, trapezoidal or other like configurations that may be configured to direct and/or transfer heat and/or provide heat convention functions.



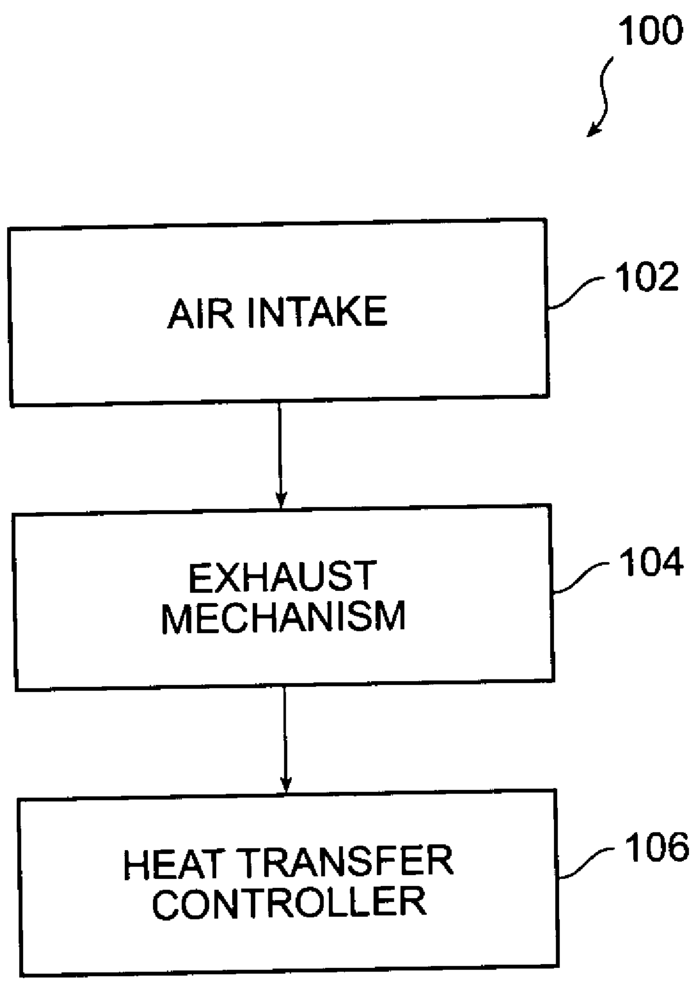

100
AIR INTAKE
102
EXHAUST MECHANISM
104
HEAT TRANSFER CONTROLLER
106

FIG. 1

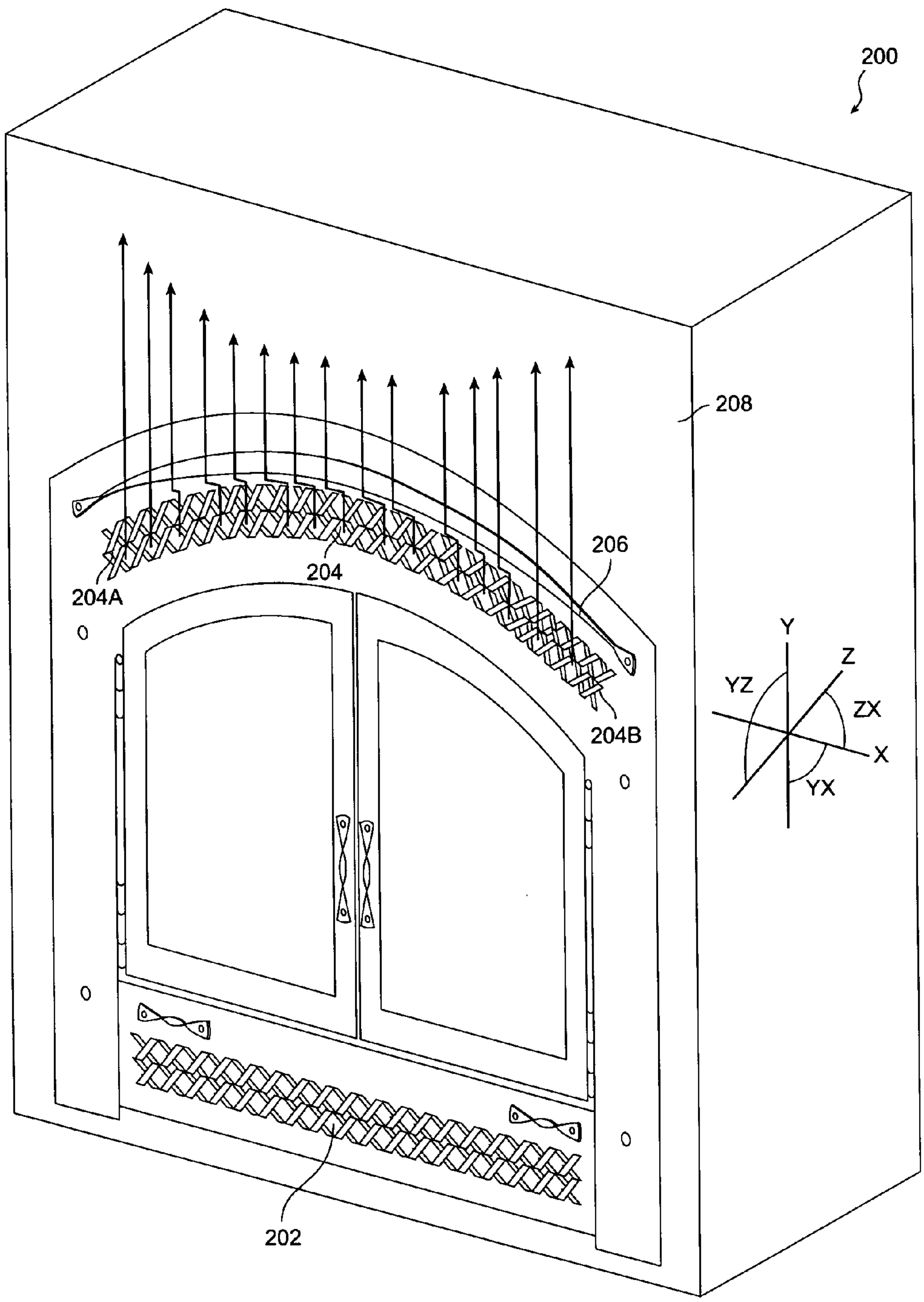


FIG. 2

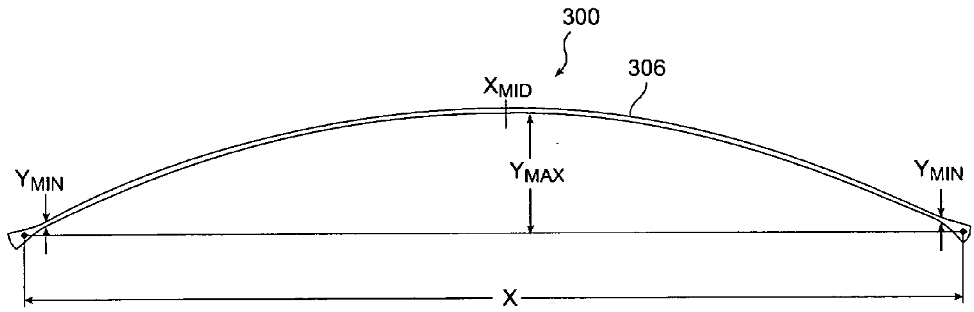


FIG. 3A

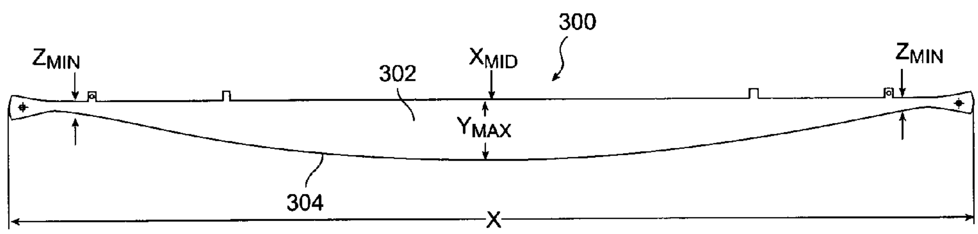


FIG. 3B

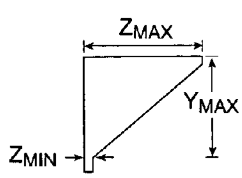


FIG. 3C

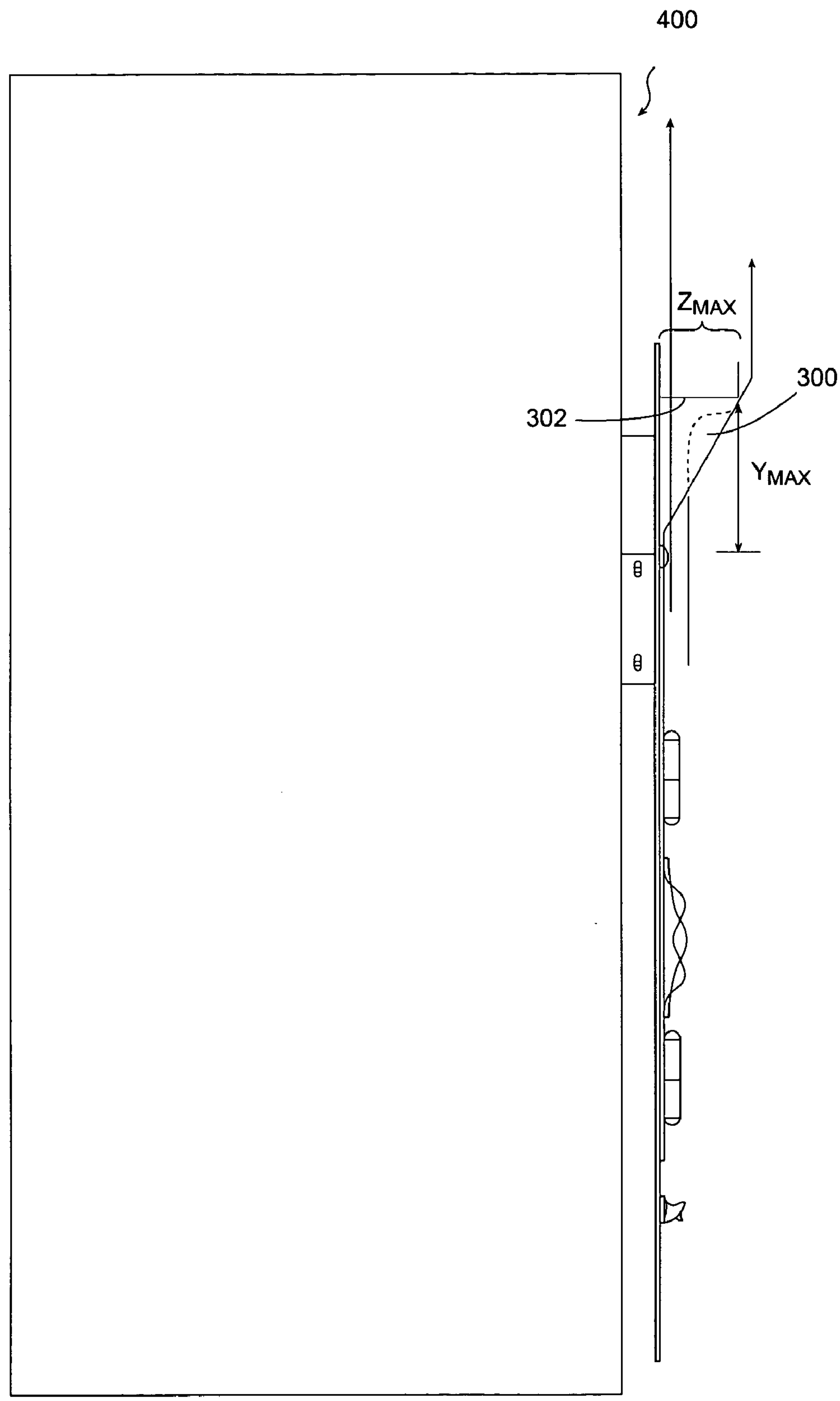


FIG. 4

HEAT TRANSFER CONTROLLER

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to U.S. Provisional Application No. 60/406,601, entitled "Heat Transfer Controller" and filed Aug. 28, 2002.

TECHNICAL FILED

[0002] The present invention relates, generally, to heating systems, and in particular to an improved heat transfer controller for providing control of the heat distribution from such heating systems.

BACKGROUND OF THE INVENTION

[0003] Various heating systems, including fireplaces and furnaces for home installations, have been made available to consumers in recent years with improved venting systems. Despite improvements to the ventilation systems, such heating systems are limited in the ability to control the heat transfer and distribution from the heating system to the area to be heated. Further, such heating systems have limited ability, if any, to control the surface temperature of the heating systems.

[0004] For example, while current heating systems have frequently utilized venting techniques to separate the combustion air from the room air, such as direct air venting systems, very little has been done to improve heat transfer and distribution. Some heating systems, such as fireplaces, have utilized a screen in an attempt to control the heat transfer and distribution, as well as surface temperature. Other heating systems have attempted to include a horizontal deflector of a fixed width and length across the surface of the heating system, just above the area that heat is distributed.

[0005] Unfortunately, other than providing some shielding of the heating system from the heat being generated, these screening and horizontal deflector configurations inadequately control the heat transfer and distribution within the heating area of the room, and provide minimal to no control of the surface temperature of the heating system. Instead, for example, the horizontal deflector configuration tends to collect heat, as opposed to transferring the heat from the heating system, and/or tends to force the heat around the sides of the deflector.

SUMMARY OF THE INVENTION

[0006] In accordance with various aspects of the present invention, a heat transfer controller is configured to control the heat distribution and transfer for a heating system. In accordance with an exemplary embodiment, an exemplary heating system comprises an air intake, an exhaust mechanism, and a heat transfer controller. The heating system can comprise various types of heating configurations, such as fireplaces, stoves, furnaces or other like heating systems. The air intake is configured to receive external air into the heating system, while the exhaust mechanism is configured to exhaust heat from within heating system. Both the air intake and exhaust mechanism can be configured in various manners, shapes and sizes for providing the respective air intake and heat exhaust functions.

[0007] In accordance with one aspect of the present invention, the heat transfer controller is configured to control the distribution and transfer of heat exhausted from the exhaust mechanism to the heating area. In accordance with an exemplary embodiment, the heat transfer controller comprises a heat deflector having width, length and height configurations of various dimensions that can be suitably configured to provide variable heat transfer control characteristics. In addition, the width, length and height of the heat deflector can suitably define planes that can be configured in a conventional X, Y and Z plane, or at various angles in between.

[0008] In accordance with an exemplary embodiment, the heat transfer controller comprises a heat deflector configured to control the heat transfer and distribution where the greatest heat accumulation or generation can occur within the heating system. For example, the width of the heat transfer controller can be configured to direct and/or transfer heat from an area most likely to have heat accumulated, restricted or increased. In addition, the height of the heat transfer controller can be configured to generate a convection effect to pull heat outwards from the area with the greatest heat accumulation. In accordance with an exemplary embodiment, the heat transfer controller comprises a heat deflector having an arch-like configuration. However, the heat transfer controller is not limited to an arch-like configuration, and can suitably comprise any other configurations, such as triangular, trapezoidal or other like configurations that may be configured to direct and/or transfer heat and/or provide heat convention functions.

[0009] In accordance with another aspect of the present invention, the heat transfer controller can be configured for control of the surface temperature of the heating system. Through operation of the heat transfer controller, heat is transferred from the heating system, and away from the heating system, preventing the collection and accumulation of heat.

BRIEF DESCRIPTION OF THE DRAWINGS FIGURES

[0010] The exemplary embodiments of the present invention will be described in conjunction with the appended drawing figures in which like numerals denote like elements and:

[0011] **FIG. 1** illustrates a block diagram of an exemplary heating system in accordance with an exemplary embodiment of the present invention;

[0012] **FIG. 2** illustrates a perspective view of an exemplary heating system in accordance with an exemplary embodiment of the present invention;

[0013] FIGS. **3A-3C** illustrate front, top and side views of an exemplary heat transfer controller in accordance with an exemplary embodiment of the present invention; and

[0014] **FIG. 4** illustrates a side view of an exemplary heating system having a heat transfer controller in accordance with an exemplary embodiment of the present invention.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0015] The present invention may be described herein in terms of various functional components. It should be appreciated that such functional components may be realized by any number of hardware components, electrical and mechanical, configured to perform the specified functions. In addition, the present invention may be practiced in any number of heating system contexts and that the fireplace systems described herein are merely one exemplary application for the invention. Further, it should be noted that the present invention may employ any number of conventional techniques for heat combustion and for transmission and exhaustion of heat from the heating systems, and such general techniques that may be known to those skilled in the art are not described in detail herein.

[0016] In accordance with various aspects of the present invention, a heat transfer controller is configured to control the distribution and transfer of heat for a heating system.

[0017] In accordance with an exemplary embodiment, with reference to a block diagram illustrated in **FIG. 1**, an exemplary heating system **100** comprises an air intake **102**; an exhaust mechanism **104**, and a heat transfer controller **106**. Heating system **100** can comprise various types of heating configurations. For example, with momentary reference to an exemplary embodiment illustrated in **FIG. 2**, an exemplary heating system **200** can comprise a fireplace configuration having an air intake **202**, an exhaust mechanism **204**, and a heat transfer controller **206**. However, an exemplary heating system is not limited to fireplaces, such as air-tight or open air fireplace units with and without doors, and can comprise any type of stove, furnace or any other like heating systems configured for generating heat.

[0018] Air intake **102** is configured to receive external air into heating system **100** for conversion into heating room air. Air intake **102** can comprise various types of configurations for providing an air intake function. For example, with momentary reference again to **FIG. 2**, air intake **202** can comprise one or more intakes or openings, e.g., a single horizontal opening configured, within a bottom portion of heating system **200**, to receive external air. Air intake **202** can be configured in a horizontal manner, or any other orientations and shapes, such as rectangular, vertical or any other configuration. In addition, in accordance with an exemplary embodiment, air intake **202** can also suitably include a grating configuration to restrict and/or regulate the intake of air. For example, air intake **202** can comprise an exemplary grating configuration having a plurality of rectangular openings; in addition, numerous other grating configurations can be realized, such as only horizontal members, vertical members, cross-members, angled members, circular members, or any other shape and configuration, and any combination thereof configured to permit air to be received, but to provide some restriction of entry into the opening. However, no grating configuration is necessary.

[0019] While an exemplary air intake **202** is configured at a bottom portion of heating system **200**, e.g., in the front proximate to a fuel or heat source, an exemplary air intake **202** can be suitably positioned in other manners within heating system **200**. For example, an exemplary air intake **202** can also be configured on either or both sides of a front surface area **208**, the sides of heating system **200**, the top and/or back of heating system **200**, or any other locations configured to receive internal air into heating system **200**. In addition, an exemplary air intake **202** can comprise horizontal, vertical and/or curvilinear structures having various lengths, shapes and sizes. In addition, rather than a dedicated structural opening, air intake **202** can simply comprise crevices, piping, vents or other openings that allow or air to be received within heating system **200**. Accordingly, an air intake **202** can comprise any configuration or manner for receiving air into heating system **200**.

[0020] Moreover, an exemplary air intake **202** can also be configured for providing a combustion air source to the fuel source, in addition to provide a source of air for heating. For example, air intake **202** could comprise the front opening of a fireplace configured without doors, wherein air can be received within the open area in the front of the fireplace can be used not only for a source for heating, but also for a source for combustion. However, air intake **202** can also be suitably separated from the combustion air source, and only provide a source of air for heating.

[0021] Exhaust mechanism **104** is configured to exhaust heated air from within heating system **100**, such as air received from air intake **102** and heated by heating system **100**. Exhaust mechanism **104** can comprise various types of configurations for providing an exhaust function. For example, with momentary reference again to **FIG. 2**, an exemplary exhaust mechanism **204** can comprise a vent or opening configured within an upper portion of heating system **200**, e.g., above a heating region, and configured to exhaust heated air. However, exhaust mechanism **204** can also be configured along the sides, top, bottom and/or back of heating system **200** in any manner to exhaust heated air. In addition, exhaust mechanism **204** can also comprise an exemplary grating configuration having a plurality of circular openings; in addition, numerous other grating configurations can be realized, such as only horizontal members, vertical members, cross-members, angled members, and any combination thereof configured to permit air to be exhausted, but to provide some restriction of entry into the opening. However, no grating configuration is necessary.

[0022] Further, rather than a vent or dedicated opening, exhaust mechanism **204** can comprise other manners for exhaustion of heated air from heating system **200**. For example, for an air-tight system, exhaust mechanism **204** can comprise the exhaustion of air through cracks, crevices or other smaller and/or incidental openings. Further, for example for an air-tight system, exhaust mechanism **204** can comprise the exhaustion, permeation or other transfer of air through the doors, e.g., glass or metal, or other structure of heating system **200**. Moreover, for an open air system, e.g., for a fireplace without doors, exhaust mechanism **204** can comprise the open front area of the fireplace.

[0023] An exemplary exhaust **204** can also comprise various lengths, shapes and sizes. For example, in accordance with an exemplary embodiment, exhaust mechanism **204** is configured in a curvilinear or arch-like manner. Such an arch-like configuration can facilitate the exhausting of heated air in an area where the heated air is more concentrated or accumulated within heating system **200**, i.e., within the area proximate the center of an arch of exhaust mechanism **204**. In addition, such an arch-like configuration can comprise various radiuses of curvature. In accordance with an exemplary embodiment, exhaust mechanism **204** comprises a radius of curvature between approximately 25 inches and 40 inches in length, such as, for example, approximately 30 to 34 inches in length. While an exemplary exhaust mechanism **204** comprises an arch-like configuration, exhaust mechanism **204** is not limited to such arch-like configurations, and can comprise other configurations, such as a substantially horizontal configuration, or a triangular, trapezoidal, or other multi-sided configuration. Accordingly, exhaust mechanism **204** can comprise any configuration for exhaustion of heated air from heating system **200**.

[**0024**] With reference again to **FIG. 1**, heat transfer controller **106** is configured to control the distribution and transfer of heat exhausted from exhaust mechanism **104** to the heating area. In accordance with an exemplary embodiment, heat transfer controller **106** comprises a heat deflector having a width, length and height that can be suitably configured to provide variable heat transfer control characteristics. For example, with momentary reference again to **FIG. 2**, heat transfer controller **206** can comprise a heat deflector suitably configured above exhaust mechanism **204** to direct and transfer heated air exhausted from exhaust mechanism **204**.

[**0025**] Heat transfer controller **206** can be configured with variable width Z, length X and height Y dimensions to provide a plurality of heat distribution performance characteristics for heating system **200**. In addition, the width, length and height of the heat deflector suitably define planes that can be configured in a conventional X, Y and Z plane, or at various angles in between.

[**0026**] In accordance with an exemplary embodiment, heat transfer controller **206** comprises a heat deflector having a width Z comprising an arch-like configuration to direct and/or transfer heat from an area most likely to have heat restricted or increased. For example, with additional reference to **FIGS. 3B and 3C**, a heat transfer controller **300** can comprise a top surface **302** having a maximum width Z_{MAX} and a minimum width Z_{MIN}. In the exemplary embodiment, heat transfer controller **300** is configured with minimum widths Z_{MIN} located at the ends of the heat deflector, e.g., adjacent to connection or mounting components at the ends of heat transfer controller **300**, and a maximum width Z_{MAX} configured approximately the center of a length X of heat deflector, e.g. proximate to X_{MID} to suitably provide an arch-like configuration **304**.

[**0027**] Arch-like configuration **304** can be configured in various manners to direct and/or transfer heat from an area most likely to have heat restricted, accumulated and/or increased. For example, arch-like configuration **304** can comprise a smooth arc configuration having a substantially constant radius of curvature, or an arch having a varying radius of curvature, e.g., a larger radius proximate the ends heat deflector **300** and a smaller radius of curvature proximate the center of heat deflector **300**, or vice versa. In other words, arch-like configuration **304** can comprise any arc, semi-circle, semi-oval or other like configuration that allows for maximum width Z_{MAX} to be positioned proximate to the area where the greatest amount of heat that needs to be directed outwards from exhaust mechanism **204** to the heating area.

[**0028**] Heat transfer controller **300** can also be configured in other orientations and shapes for the width Z. For example, heat transfer controller **300** can comprise a curvilinear configuration with maximum widths Z_{MAX} located away from the center and towards one or both ends of the heat deflector, and with minimum width Z_{MIN} located approximately the center of the length of the heat deflector, or at various locations in between. Further, the configuration of width Z can be symmetrical about the center point of length X, or non-symmetrical in manner, e.g., configured with maximum width Z_{MAX} on one end and minimum width Z_{MIN} on the other end, or any other non-symmetrical configuration. In addition, other shapes and configurations can be realized.

[**0029**] Because the maximum amount of heat is generated and accumulated in the center of exhaust mechanism **204**, with the least amount of heat being realized proximate ends **204**A and **204**B of exhaust mechanism **204**, to provide greater control of the heat transfer, heat transfer controller **300** is configured with maximum width Z_{MAX} configured approximately the center of the heat deflector. In other words, while other variations of the location of maximum widths Z_{MAX} and a minimum widths Z_{MIN} can be implemented, having maximum width Z_{MAX} configured approximately the center of the heat deflector at a midpoint in length X, i.e., at location X_{MID}, facilitates the greatest control of the heat transfer forward and away from heating system **200**. Accordingly, with arch-like configuration **304** for heat transfer controller **300** having minimum widths Z_{MIN} located at the ends and maximum width Z_{MAX} configured approximately the center, greater direction and control of the heat from exhaust mechanism **204** where the heat is most likely to build or accumulate.

[**0030**] In accordance with another aspect of the present invention, heat transfer controller **300** can be configured for control of the surface temperature of heating system **200**, i.e., control of the temperature of surface area **208**. In particular, a correlation exists between width Z and/or the radius of curvature and the amount of heat dissipated from exhaust mechanism **204**. For example, increasing, the radius of curvature, e.g., increasing maximum width Z_{MAX}, can affect the transfer of heat from exhaust **104**. In the event that maximum width Z_{MAX} is increased too large in width, a negative effect can result, wherein heat can actually be trapped underneath top surface **302**, instead of being transferred out to the heating area; on the other hand, in the event maximum width Z_{MAX} is too small in width, the heat transfer from exhaust mechanism **204** will tend to flow directly upwards, or be forced towards the sides, heating a surface area **208** as opposed to heating the room area. Accordingly, to provide effective heat transfer and distribution, maximum width Z is suitably configured to facilitate heat transfer instead of accumulating or trapping heated air underneath top surface **302** or allowing heat to travel directly upwards to front surface area **208** and/or the sides of heat transfer controller **300**.

[**0031**] As a result, arc configuration **304** can include various radiuses of curvature that correspond to different widths Z_{MAX} to facilitate efficient heat transfer, depending on the amount of heat generated and exhausted. In accordance with exemplary embodiments, heat transfer controller **300** can be configured with minimum widths Z_{MIN} varying between approximately 0.05" and 1.50", preferably between approximately 0.20" and 0.50", while maximum width Z_{MAX} varies between approximately 1.50" and 4.00", preferably between approximately 2.00" and 3.00", such as approximately 2.5" in width.

[0032] Although heat transfer controller **300** can include an arc-like configuration **304** in the exemplary embodiment, other variations can be realized, such as a triangle, trapezoidal or other multiple sided deflector configurations, i.e., heat transfer controller **302** can comprise other configurations having minimum widths Z_{MIN} located at the ends and maximum width Z_{MAX} suitably configured approximately the center to direct the greatest flow of heat being exhausted from exhaust mechanism **204**. In other words, heat transfer controller **300** can be configured with a width Z in any arrangement that allows for maximum width Z_{MAX} to correspond to the amount of heat that needs to be directed outwards from exhaust mechanism **204** to the heating area.

[0033] Heat transfer controller **300** can also be configured in various lengths X to control the heat distribution surface along the length of exhaust mechanism **204**. For example, heat transfer controller **300** can be configured with a length X extending past sides **204**A and/or **204**B of exhaust mechanism **204**, extending equal in length to exhaust mechanism **204**, or shorter in length than exhaust mechanism **204**. In addition, length X can be positioned at various locations above exhaust mechanism **204**, e.g., closer to side **204**A or closer to side **204**B, if desired. In any event, length X is configured to at least extend over the area where the greatest flow of heat is being generated and/or exhausted from exhaust mechanism **204**.

[0034] Accordingly, for heat transfer controller **300** having maximum width Z_{MAX} configured approximately the center of the heat deflector at a midpoint location X_{MID}, it is desirable, for length X to be centered relative to sides **204**A and **204**B of exhaust mechanism **204**. In accordance with the exemplary embodiment illustrated in **FIG. 2**, heat transfer controller **206** is configured with a length X extending past sides **204**A and/or **204**B of exhaust mechanism **204**. For example, in the exemplary embodiment, length X comprises a length between approximately 30" and 40", such as approximately 33" to 45" in length; however, heat transfer controller **300** can comprise any other suitable length depending on the length of exhaust mechanism **204**.

[0035] Heat transfer controller **300** can also be configured in various heights Y to control the heat distribution from top to bottom for surface area **208** above exhaust mechanism **204**. For example, heat transfer controller **300** can comprise a maximum height Y_{MAX} and a minimum height Y_{MIN} configured in an arch-like arrangement **306**. In the exemplary embodiment, heat transfer controller **300** is configured with minimum heights Y_{MIN} located at the ends of the heat deflector, and a maximum height Y_{MAX} configured approximately the center of the length of the heat deflector, i.e., proximate to maximum width Z_{MAX} and, location X_{MID}. Maximum height Y_{MAX} can be configured at various dimensions to control the surface temperature of heating system **200**. In addition, heat transfer controller **300** can be configured in other manners, e.g., with maximum height Y_{MAX} at one end and minimum height Y_{MIN} in the middle and/or at the other end; heat transfer controller can have a symmetrical or non-symmetrical height Y configuration.

[0036] In accordance with another aspect of the present invention, the height Y of heat transfer controller **300** can be configured to generate a convection effect to pull heat outwards from the area with the greatest heat accumulations, e.g., with maximum height Y_{MAX} configured proximate midpoint X_{MID}. In the exemplary embodiment, heat transfer controller **300** provides an arch-type configuration **306**, such as that illustrated in **FIG. 3A**. Providing an arch configuration **306** generates a convection effect to pull heat outwards from the center of exhaust **104** and out to the heating area.

[0037] Arch-like configuration **306** can be configured in various manners to generate a convection effect to pull heat outwards from the center of exhaust **104** and out to the heating area. For example, arch-like configuration **306** can comprise a smooth-arc configuration having a substantially constant radius of curvature, or an arch having a varying radius of curvature, e.g., a larger radius proximate the ends heat transfer controller **300** and a smaller radius of curvature proximate the center of heat transfer controller **300**, or vice versa. In other words, arch-like configuration **306** can comprise any arc, semi-circle, semi-oval or other like configuration that can be configured for facilitating control of heat distribution and/or a convection effect to pull heat outwards from the center of exhaust mechanism **204** and to the heating area.

[0038] Arch configuration **306** can also be configured with various radiuses of curvature. In accordance with various exemplary embodiments, heat transfer controller **300** can be configured with minimum heights Y_{MIN} varying between approximately 0.01" and 1.00", preferably between approximately 0.05" and 0.25", while maximum height Y_{MAX} varies between approximately 1" and 10", preferably between approximately 3" and 5". In the exemplary embodiment illustrated in **FIG. 3**A, maximum height Y_{MAX} comprises approximately 4" in height.

[0039] In accordance with other exemplary embodiments, maximum height Y_{MAX} and a minimum height Y_{MIN} can be suitably adjusted, such as by sliding the ends of the heat deflector upwards and downwards in a track configured at the ends of the heat deflector, to a desired heat control position. In other words, heat transfer controller **300** can be readily positioned at various heights above exhaust mechanism **204** depending on the amount of heat exhausted and the amount of heat that is to be transferred.

[0040] While heat transfer controller **300** can comprise an arch-type configuration **306** for the height Y to provide control the heat distribution and/or generate a convection effect to pull heat outwards from the area with the greatest heat accumulations, heat transfer controller **300** is not limited to an arch-type configuration for the height Y. For example, other variations can be realized, such as a triangle, trapezoidal or other multiple sided deflector configurations having minimum heights Y_{MIN} located proximate the ends and maximum height Y_{MAX} configured proximate the center of length X of the heat deflector. Accordingly, heat transfer controller **300** can be configured with any height Y for facilitating control of heat distribution and/or a convection effect to pull heat outwards from the center of exhaust mechanism **204** and to the heating area.

[0041] While an exemplary embodiment of heat transfer controller **102** illustrated in **FIG. 3** provides for both arch-like configuration **304** and arc-like configuration **306**, an exemplary heat transfer controller **300** can comprise one or both of these features, i.e., a heat transfer controller **102** can comprise either arch-like configuration **304** or arc-like configuration **306**; or both arch configuration **304** and arc-like configuration **306**. In addition heat transfer controller **300** can comprise other width Z and height Y configurations, e.g., a triangular configuration for width Z and arch-like for height Y, an arch-like configuration for width Z and a various multiple-sided configuration for width Y, a configuration with one of width Z or height Y having a substantially constant dimension across the length, or any other combinations. In other words, heat transfer controller **300** can be configured in any manner with at least one of maximum width Z_{MAX} and maximum height Y_{MAX} configured proximate to midpoint X_{MID}.

[**0042**] Heat transfer controller **300** can also comprise various thickness, either uniform or non-uniform in nature. For example, heat transfer controller **300** can comprise a first thickness proximate to midpoint X_{MID}, and then tapering down to a smaller thickness, or expanding to a larger thickness, at one or both ends. In addition, heat transfer controller **300** can have a first thickness along the-edge coupled to heating system **200**, and then tapering down to a smaller thickness, or expanding to a larger thickness, at the outer edges away from heating system **200**. Accordingly, heat transfer controller **300** can comprise any thickness configured to allow transfer and distribution of heat from heating system **200**.

[**0043**] In accordance with another aspect of the present invention, heat transfer controller **300** can be configured to further provide variable control of the heat transfer rate. For example, with specific reference to **FIG. 2**, the angles ZX, YX and YZ between the various X, Y and Z axis of heat transfer controller **200** can be suitably varied to control the heat transfer rate. In accordance with an exemplary embodiment, with reference to **FIG. 4, a** heating system **400** can comprise a heat transfer controller **300** having a width Z configured with an approximate 90 degree angle relative to the height Y, i.e., the Z axis is perpendicular to the Y axis.

[**0044**] However, in accordance with other exemplary embodiments, rather than a 90 degree angle between the Y and Z axis, other variations can exist. For example, instead of having top surface **302** configured with an approximately horizontal arrangement in **FIG. 4**, and an angle YZ of approximately 90 degrees, top surface **302** can be suitably configured in other orientations, such as being angled downwards or upwards. Such an adjustment of the angle YZ can control the distribution of heat to the heating area, as well as the amount of heat of the surface area of heating system **400**. For example, angling top surface **302** upwards will reduce the amount of heat flow restriction, and hence will increase the heat transfer rate, while angling top surface **302** downwards will increase the amount of heat flow restriction and/or accumulation, and hence will decrease the heat transfer rate.

[**0045**] In addition, any of the width, length, and height of heat transfer controller **300** can be configured in parallel or non-parallel to the X, Y and Z axis, e.g., length X can be slanted slightly upwards to one side or the other of exhaust mechanism **204**. Still further, heat transfer controller **300** can have the XY plane suitably shifted, e.g., heat transfer controller **300** can be suitably shifted outwards away from front surface area **208**.

[**0046**] The present invention sets forth a heat transfer controller that is applicable to various heating system applications. It will be understood that the foregoing description is of exemplary embodiments of the invention, and that the invention is not limited to the specific forms shown. Various modifications may be made in the design and arrangement of the elements set forth herein without departing from the scope of the invention. For example, the heat transfer controller can comprise various metal alloys, a single part or multiple components, can be firmly attached to the heating system, variably adjusted and/or rotated, or can be permanently attached to the heating system by any manner available for connecting a heat deflector to a heating system, such as brackets, connectors, welding, forging and the like, or suitably molded or otherwise integrally configured within the heating system. Still further, the width and height configurations can comprise substantially planar or straight arrangements, and/or a curved, beveled, wavy or other configurations. These and other changes or modifications are intended to be included within the scope of the present invention, as set forth in the following claims.

1. A heating system configured for optimizing heat distribution to a heating area, said heating system comprising:

an air intake configured to receive external air into said heating system;

a heating region configured to generate heated air from the external air;

an outer surface area;

an exhaust mechanism configured to exhaust the heated air from said heating system, said exhaust mechanism configured above said heating region and beneath said outer surface area; and

a heat transfer controller configured to control distribution and transfer of the heated air to the heating area, said heat transfer controller configured above said exhaust mechanism and below said outer surface area, said heat transfer controller comprising a heat deflector having a length, a width configuration and a height configuration, and wherein said heat transfer controller having at least one of said width configuration for controlling transfer of the heated air from said heated region having an increased accumulation of heated air and said height configuration for controlling distribution of the heated air away from said outer surface area.

2. The heating system according to claim 1, wherein said width configuration comprises a maximum width proximate a midpoint of said heat deflector, and minimum widths proximate ends of said heat deflector.

3. The heating system according to claim 2, wherein said width configuration comprises an arch-like configuration.

4. The heating system according to claim 2, wherein said width configuration comprises one of a triangular, trapezoidal and a multiple sided configuration.

5. The heating system according to claim 2, wherein said maximum width comprises a width between approximately 1.50" and 4.00" and said minimum widths comprises widths between approximately 0.01" and 1.50".

6. The heating system according to claim 5, wherein said maximum width comprises a width between approximately 2.00" and 3.00" and said minimum widths comprises widths between approximately 0.05" and 0.50".

7. The heating system according to claim 1, wherein said height configuration comprises a maximum height proximate a midpoint of said heat deflector, and minimum heights proximate ends of said heat deflector.

8. The heating, system according to claim 7, wherein said height configuration comprises an arch-like configuration.

9. The heating system according to claim 7, wherein said width configuration comprises one of a triangular, trapezoidal and a multiple-sided configuration.

10. The heating system according to claim 7, wherein said maximum height comprises a height between approximately 1.00" and 10.00" and said minimum heights comprises heights between approximately 0.01" and 1.00".

11. The heating system according to claim 10, wherein said maximum height comprises a height between approximately 3.00 and 5.00" and said minimum heights comprises heights between approximately 0.05 and 0.25"

12. The heating system according to claim 1, wherein said length is configured to extend longer than a length of said exhaust mechanism.

13. The heating system according to claim 1, wherein said air intake is configured beneath said heating region.

14. The heating system according to claim 1, wherein said exhaust mechanism comprises an arch-type configuration.

15. The heating system according to claim 1, wherein said width configuration and said height configuration comprise an approximate 90 degree angle in between.

16. A heat transfer controller for controlling the distribution and transfer of heat from a heating system, said heat transfer controller comprising a heat deflector having:

a length configured for alignment above an exhaust mechanism of the heating system, said length having a midpoint, a first end and a second end;

a maximum width and at least one minimum width; and

a maximum height and at least one minimum height, wherein at least one of said maximum width and said maximum height are configured proximate to said midpoint.

17. The heat transfer controller according to claim 16, wherein said maximum width is configured proximate to said midpoint, and said at least one minimum width is configured proximate said first end.

18. The heat transfer controller according to claim 16, wherein said maximum height is configured proximate to said midpoint, and said at least one minimum height is configured proximate said first end.

19. The heat transfer controller according to claim 16, wherein said at least one of said maximum width and said maximum height comprise an arch-type configuration.

20. The heat transfer controller according to claim 16, wherein said maximum width comprises a width between approximately 2.00" and 3.00" and said at least one of said minimum widths comprises a width between approximately 0.05" and 0.50".

21. The heat transfer controller according to claim 16, wherein said maximum height comprises a height between approximately 3.00 and 5.00" and said minimum heights comprises heights between approximately 0.05 and 0.25".

22. A fireplace system configured for improved heat distribution to a heating area, said fireplace system comprising:

an air intake configured to receive external air into said fireplace system;

an exhaust mechanism configured to exhaust heated air produced from within said fireplace system; and

a heat transfer controller configured to control distribution and transfer of the heated air to the heating area, said heat transfer controller configured above said exhaust mechanism and comprising a heat deflector having:

a length configured for alignment above said exhaust mechanism, said length having a midpoint and a pair of ends;

a width configuration comprising a maximum width and at least one minimum width, said maximum width configured proximate to said midpoint; and

a height configuration comprising a maximum height and at least one minimum height, said maximum height configured proximate to said midpoint.

23. The fireplace system according to claim 22, wherein said width configuration and said height configuration comprise arch-like configurations.

24. The fireplace system according to claim 22, wherein said maximum width comprises a width between approximately 2.00" and 3.00" and said at least one of said minimum widths comprises a width between approximately 0.05" and 0.50", and said maximum height comprises a height between approximately 3.00 and 5.00" and said minimum heights comprises heights between approximately 0.05 and 0.25".

25. A heat transfer controller for controlling the distribution and transfer of heat from a heating system, said heat transfer controller comprising a heat deflector having:

a length having a first end and a second end defining a midpoint;

a width configured to facilitate transfer of heated air away from the heating system without significant accumulation; and

a maximum height and at least one minimum height, wherein said maximum height is configured proximate to said midpoint.

26. The heat transfer controller according to claim 25, wherein said heat transfer controller further comprises a maximum width configured proximate to said midpoint, and said at least one minimum width configured proximate said first end.

27. The heat transfer controller according to claim 26, wherein said at least one of said maximum width and said maximum height are arranged within an arch-type configuration.

* * * * *