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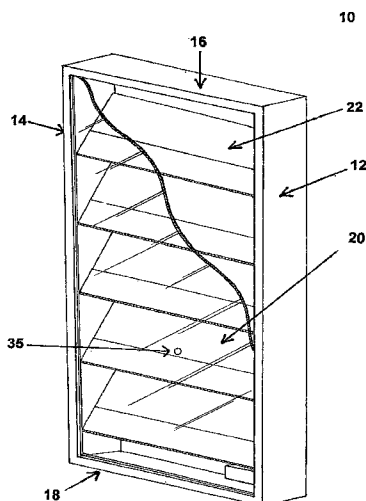
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(54) Title: SOLAR AIR HEATER



(57) Abstract: This invention provides novel devices and methods for the heating of air with solar radiant energy. The devices of the present invention feature a housing partitioned into essentially isolated sections wherein the sections are in fluid communication with each other through a plurality of channels located within the partitions. The two unique features of the invention, essentially isolated sections and partitions comprising a plurality of channels, increase the temperature achieved by the solar heater by 1) creating multiple, sequential sections that function independently of each other providing a higher starting temperature in each section and, therefore, a higher final temperature, 2) providing second means of heating the air within the channels located within the partitions and, 3) by virtually eliminating the mixing of incoming cold air with the heated air of the solar air heater.

WO 2007/100819 A3

AMENDED CLAIMS

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1. A solar air heater providing heating of air in a step-wise manner, comprising:
 - a. a housing, said housing comprising a front panel of light-transmitting material, one or more air inlets and one or more air outlets for establishing a flow path for the air to be heated, two or more partitions, said partitions being essentially parallel to each other creating essentially isolated sections between said partitions within said housing, wherein each partition comprises a plurality of parallel channels within said partitions permitting adjacent sections to be in fluid communication, and;
 - b. one or more fans for moving air through said housing by way of said air inlets and said air outlets.
 - c. a temperature controller for turning said fans on and off at preset temperatures.
2. The solar air heater of Claim 1, wherein said housing further comprises:
 - a. a back panel, a top panel and two side panels and a bottom panel;
 - b. wherein said light-transmitting front panel and said back panel are connected to each other by said top, bottom and side panels to create a box-like housing.
3. The solar air heater of Claim 2, wherein said back, top, bottom and side panels comprise a material suitable for solar radiant energy absorbance.
4. The solar air heater of Claim 2, wherein said partitions contact said front and back panels at a non-perpendicular angle and contact side panels perpendicularly.

5. The solar air heater of Claim 4, wherein said partitions comprise material suitable for solar radiant energy absorbance.
6. The solar air heater of Claim 5, wherein said material suitable for solar radiant energy absorbance is selected from a group consisting of one or more of metal, surfacing said partitions with metal or a metal-based paint, coloring the surfaces of said partitions a dark color (*e.g.*, black).
7. The solar air heater of Claim 6, wherein said enclosure is sized to fit into a window frame of a building.
8. The solar air heater of Claim 7, wherein said back panel is made of a light-transmitting material.
9. The solar air heater of Claim 1, wherein said solar heater additionally comprises a temperature controller for turning said fans on and off at preset temperatures.
10. The solar air heater of Claim 1, wherein said temperature controller comprises one or more temperature sensors and a recording means.
11. The solar heater of Claim 10, wherein said temperature controller comprises a computer.
12. The solar heater of Claim 1, wherein said one or more air inlets are orientated to draw air from the interior of a building into said solar heater housing for heating by said solar heater and said one or more air outlets are orientated to expel heated air out of said solar heater housing into the interior of said building and wherein said one or more air inlets and said one or more air outlets are located in two different said essentially isolated sections at opposing ends of said housing.
13. The solar heater of Claim 2, wherein components of said solar heater are selected from one or more of a group consisting of plastic, metal, glass, wood, fiberglass, pressboard and fiberboard.
14. A method of heating air with a solar air heater, said method comprising:

- a. providing: a housing, said housing comprising at least one light-transmitting panel to permit the capture of solar radiant energy, one or more air inlets and one or more air outlets to create a flow path for the air to be heated, two or more partitions, said partitions being parallel to each other and creating essentially isolated sections between said partitions within said housing, wherein each partition comprises a plurality of channels within said partitions permitting adjacent sections to be in fluid communication and wherein one edge of said partition meets said light-transmitting panel at a non-perpendicular angle; one or more fans for moving air through said housing by way of said air inlets and said air outlets, and a temperature controller for turning said fans on and off at preset temperatures;
 - b. drawing air with said one or more fans from the interior of a building into said housing via said one or more air inlets in said housing, heating the air with solar radiant energy by drawing said air sequentially through the essentially isolated sections of said housing and through the plurality of channels in said partitions into the next section and expelling the air from the housing into the interior of said building via said one or more air outlets and by having said fans turn on when a first preset temperature inside the housing is detected by said temperature controller and turned off when a second preset temperature inside the housing is detected by said temperature controller.
15. The method of Claim 14, wherein said temperature controller device comprises one or more temperature sensors and a data recorder device and wherein said temperature sensors relay data to said data recorder device, the data is analyzed and a signal is sent to turn said fans on or off.
 16. The method of Claim 15, wherein said temperature controller means comprises a computer.

STATEMENT UNDER ARTICLE 19 (1)

Applicant has elected to amend Independent Claims 1 and 14 of the subject application to include better distinguish over the cited art. Applicant has elected to amend dependent Claims 2 and 11 to correct typographical errors.

In Claim 1, step (a) and Claim 14, step (a) Applicant has 1) replaced the word “one” with the word “two”; 2) inserted the “between said partitions” between the terms “sections” and “within”; 3) inserted the term “parallel” between the terms “plurality of” and “channels”; and 4) inserted the term “within said partitions” between the terms “channels” and “permitting.” Support for these modification exists within the Specification at least at Figures 2, 3 and 4.

In Claim 2, step (a) Applicant has added the term “and a bottom panel” after the term “a back panel, a top panel and two side panels” to provide proper antecedent basis for the term “bottom and side panels” in step (b).

In Claim 11 Applicant has replaced the term “11” with “10” to provide proper antecedent basis.

With regard to the references cited in the International Search Report and Written Opinion, Applicant respectfully submits that Independent Claims 1 and 14 as currently amended and dependent Claims 2 through 13, which include all limitations of Independent Claim 1, and dependent Claims 15 and 16 disclose a invention having the requisite inventive step. Applicant respectfully submits that Claims 1 through 16 are in condition for allowance. A replacement sheet for Claims 1 through 16 accompanies this paper per PCT Rule 46.