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(54) **HEATER FOR HEATING A SPACE**

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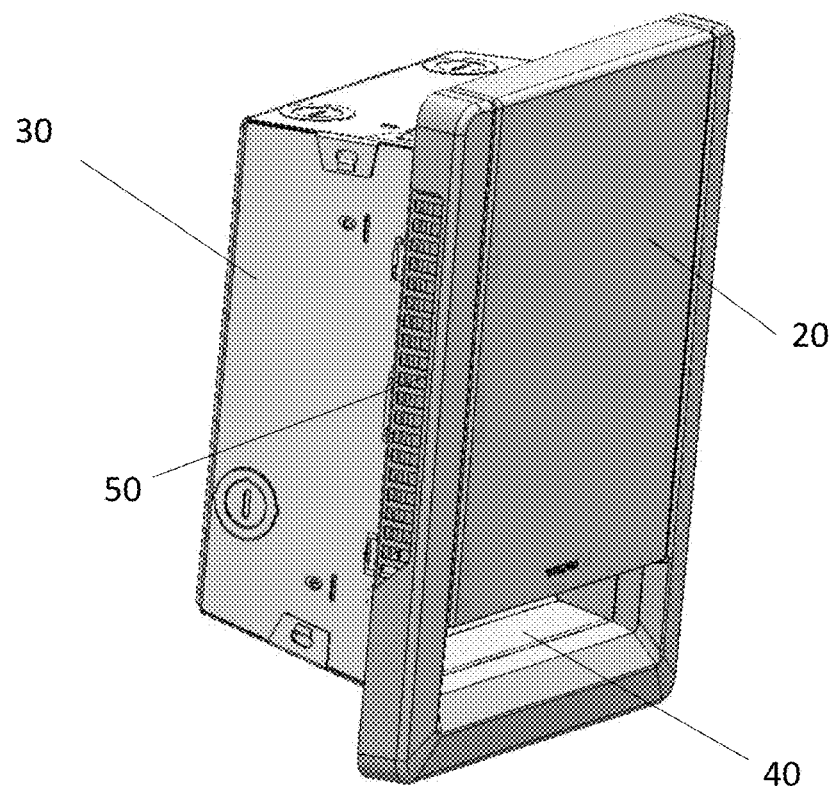
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(57) **ABSTRACT**

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A heater having a cover with an exhaust port and border a intake port allowing air to enter the heater. The heated air is then dissipated through an exhaust port on the cover of the heater. The border intake and cover of the heater have a perpendicular relationship whereas the exhaust port and cover have a parallel relationship.

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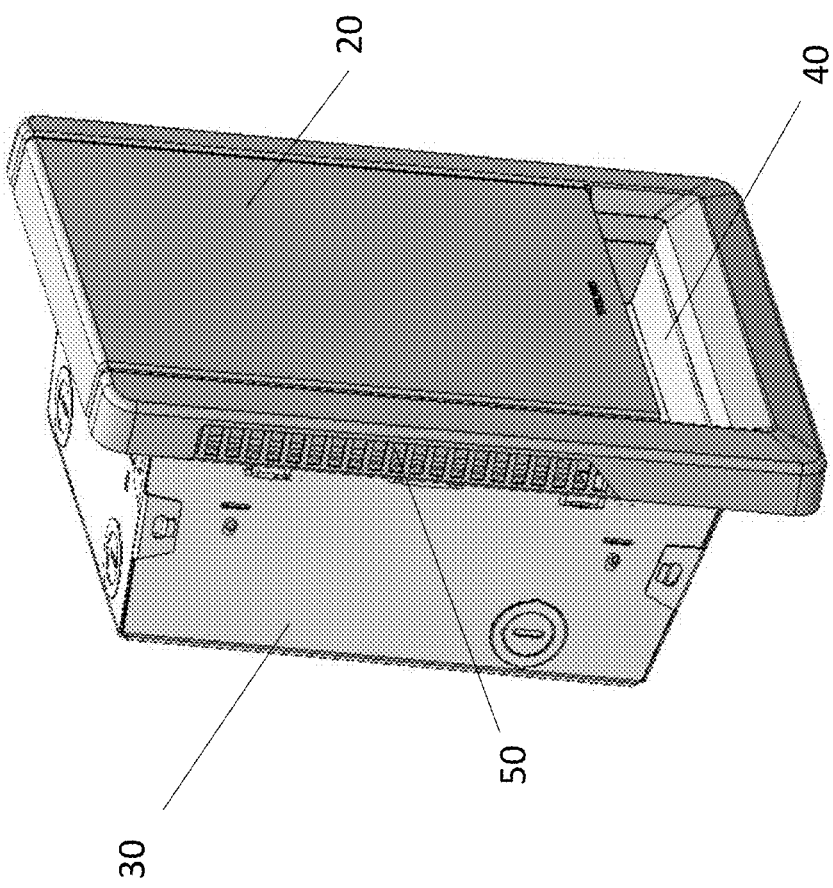


Figure 1

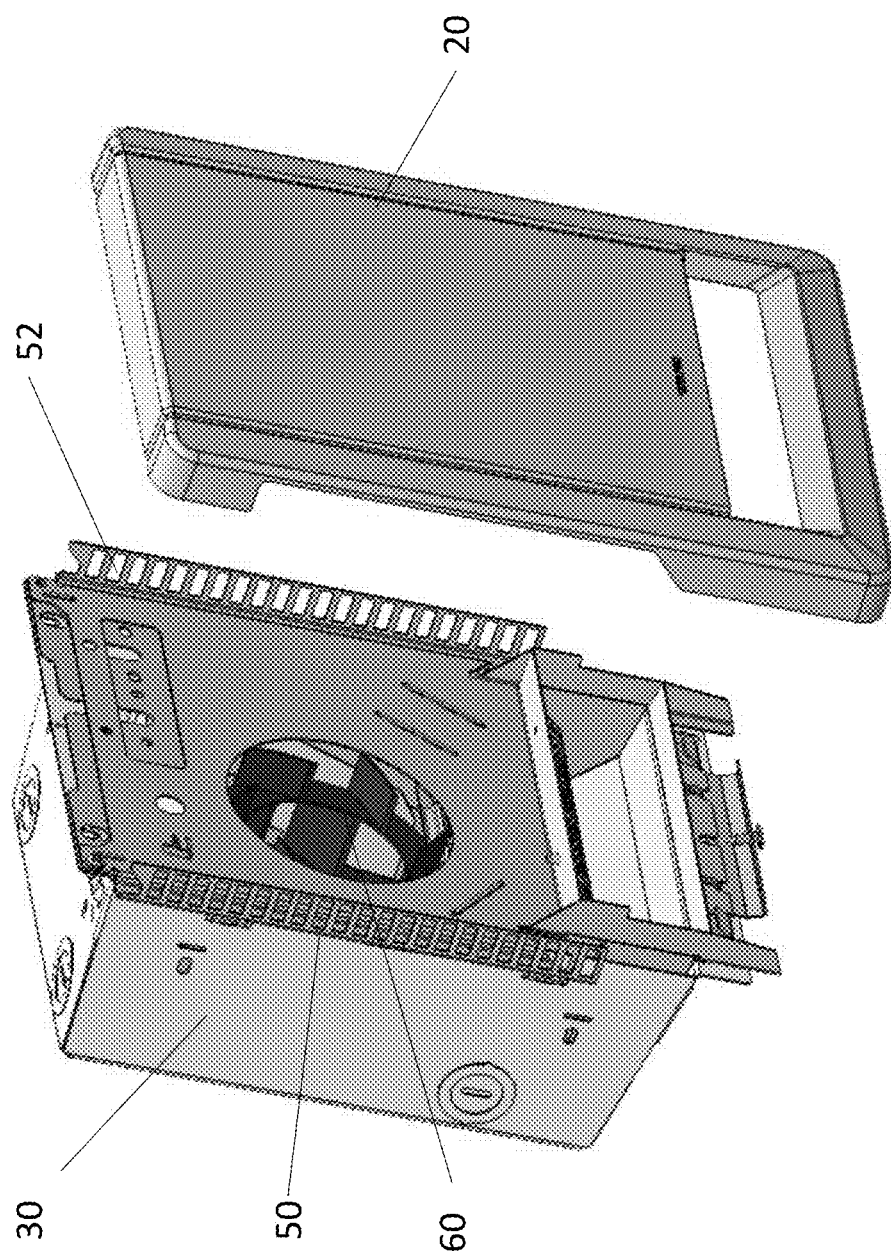


Figure 2

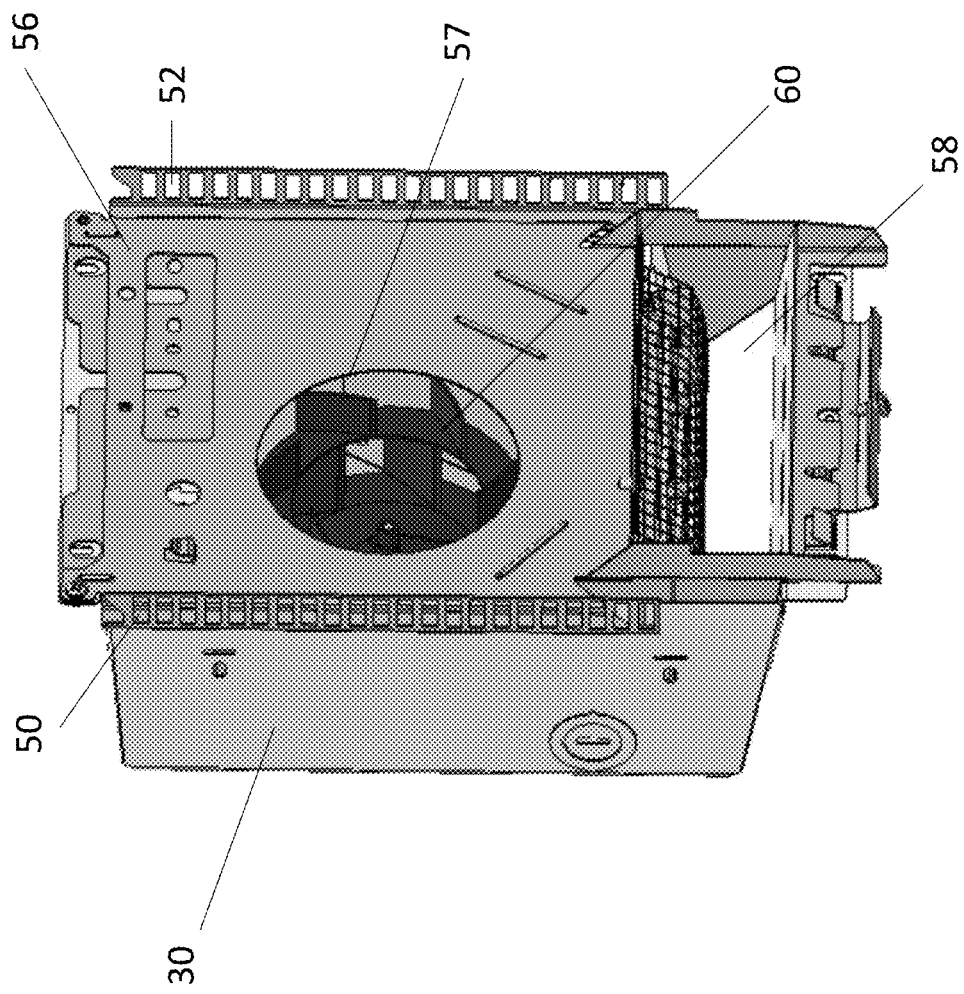


Figure 3

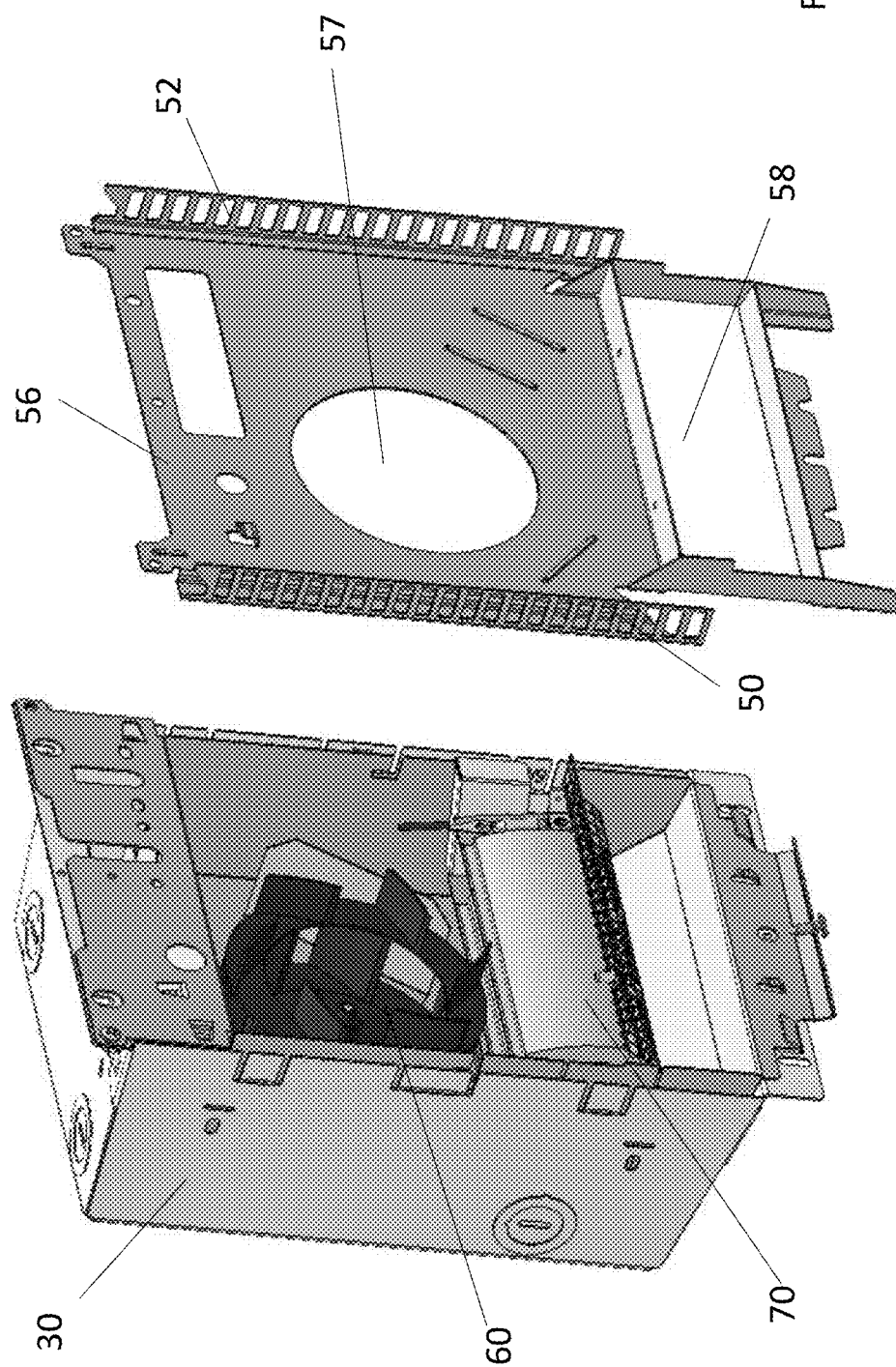


Figure 4

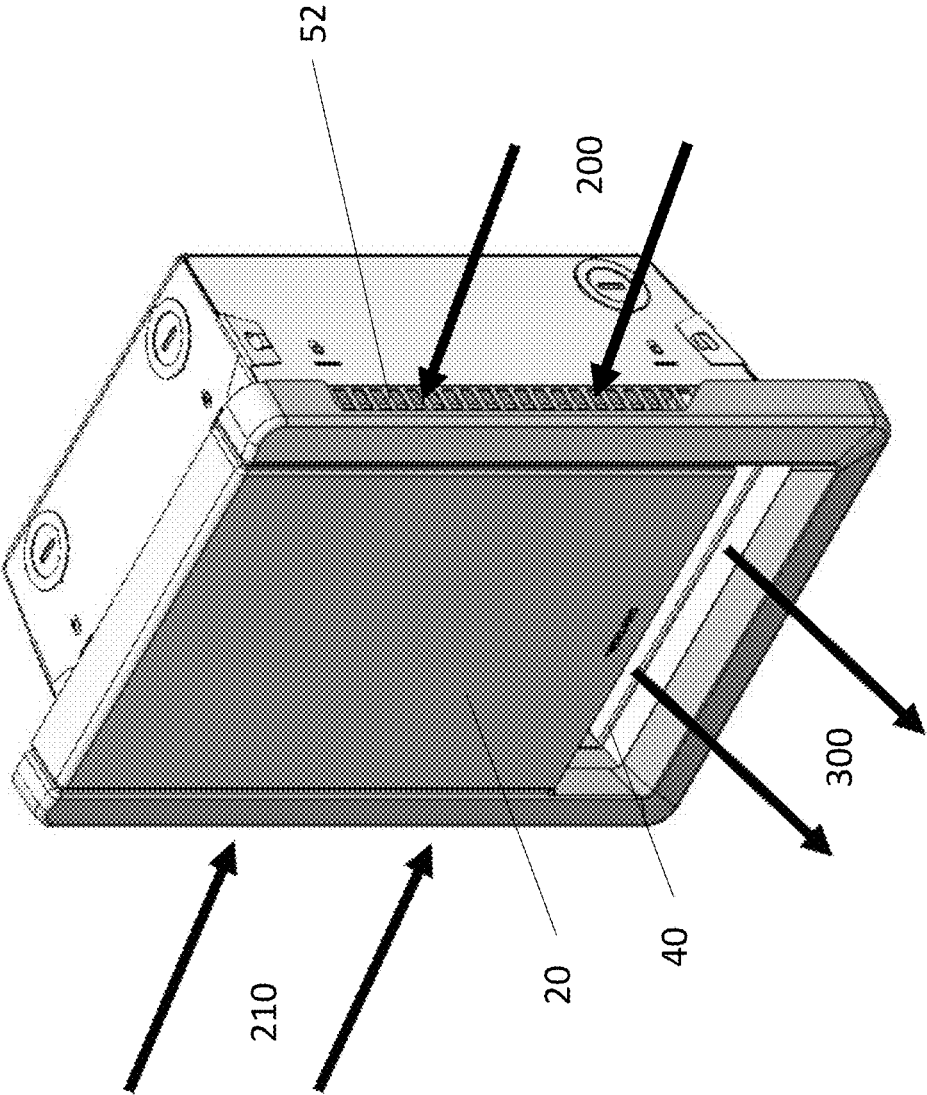


Figure 5

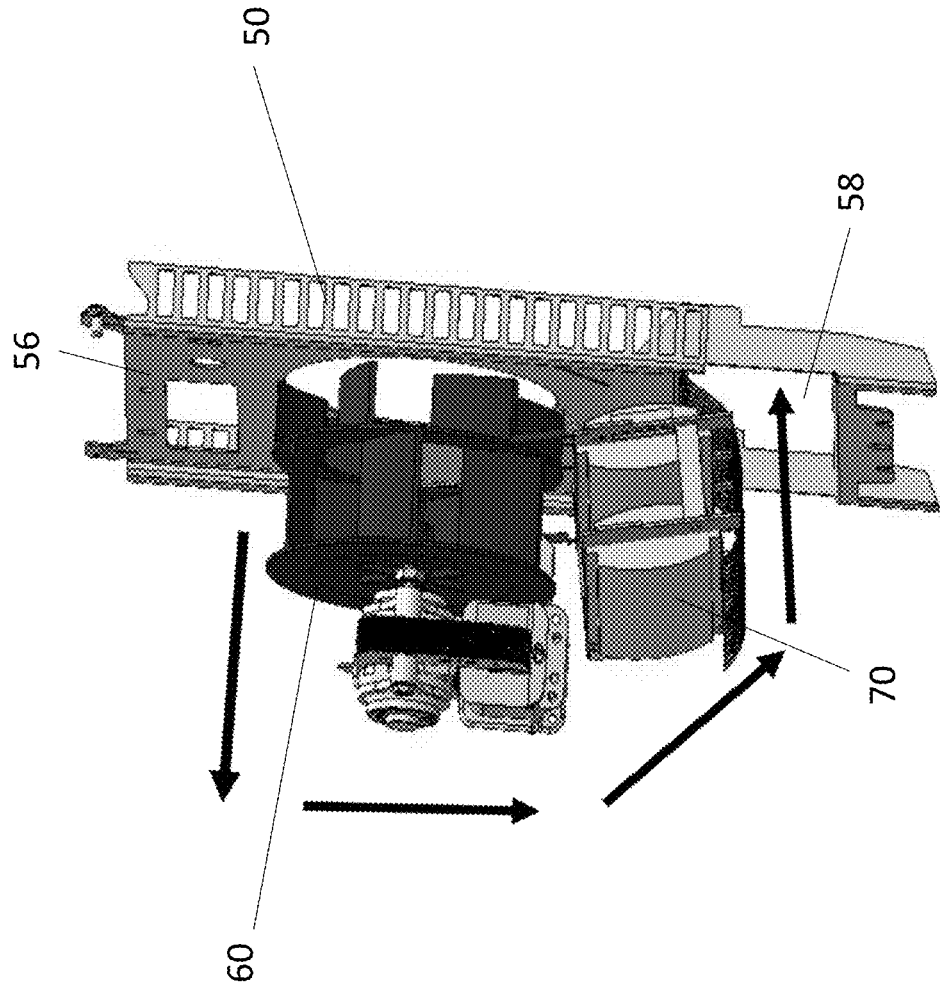


Figure 6

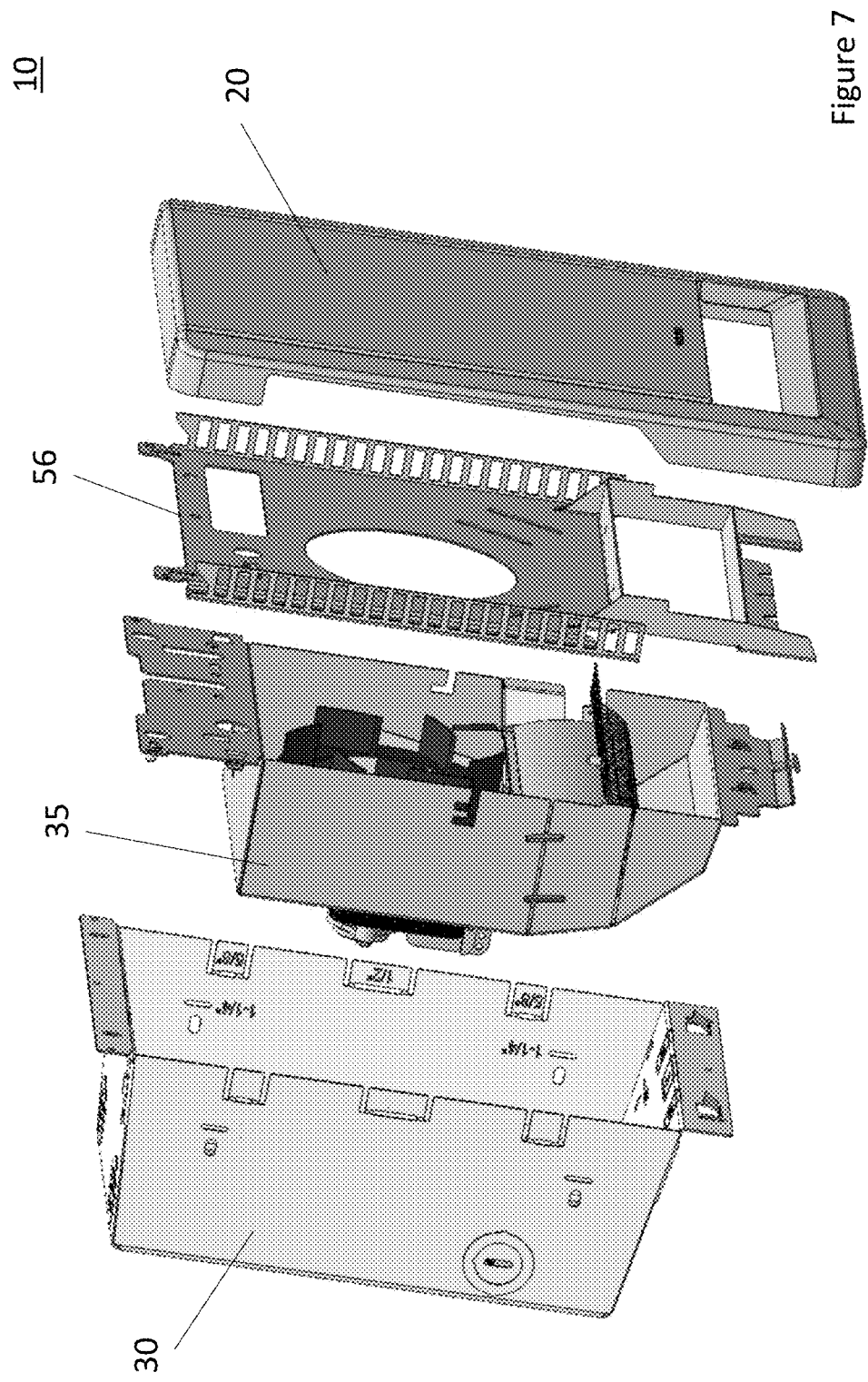


Figure 7

HEATER FOR HEATING A SPACE

FIELD OF THE INVENTION

[0001] The present invention provides a heater for heating a space and more specifically a heater having at least one border intake port.

BACKGROUND OF THE INVENTION

[0002] Heaters are common place in commercial buildings with such heaters providing heated air in entrances for example. The majority of such heaters have an intake and exhaust port positioned on the front surface of the heater. The positioning of both ports on the front surface of the heater results in an increase of noise emitted by the heater when in operation.

[0003] There is therefore a need for a heater which does not emit as much noise when in operation.

SUMMARY OF THE INVENTION

[0004] The present invention provides a heater for heating a space comprising an enclosure for enclosing a fan to displace air within the heater and a heating element positioned within the enclosure to supply heat to the displaced air within the housing. The heater also has a cover enclosing the fan and the heating element within the enclosure and at least one border intake port positioned in a perpendicular relationship to the cover, said intake port allowing for air to be in fluid communication with the fan. The heater also has an exhaust port positioned in a parallel relationship to the cover allowing for air heated by the heating element to exit the heater.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] The embodiments of the present invention will now be described by reference to the following figures, in which identical reference numerals in different figures indicate identical elements and in which:

[0006] FIG. 1 is a side perspective view of a heater according to one embodiment of the present invention;

[0007] FIG. 2 is a perspective view of a heater with the cover displaced from the heater according to one embodiment of the present invention;

[0008] FIG. 3 is a perspective view of a heater with the cover removed from the heater in order to illustrate the border plate and fan according to one embodiment of the present invention;

[0009] FIG. 4 is a perspective view of the border plate displaced from the housing according to one embodiment of the present invention;

[0010] FIG. 5 is a view of the air flow being drawn into the heater through the border intake ports and then expelled through the exhaust port according to one embodiment of the present invention;

[0011] FIG. 6 is a view of the air flow within the housing of a heater according to one embodiment of the present invention; and

[0012] FIG. 7 is an exploded view of the components present in a heater according to one embodiment of the present invention.

[0013] The Figures are not to scale and some features may be exaggerated or minimized to show details of particular elements while related elements may have been eliminated to prevent obscuring novel aspects. Therefore, specific struc-

tural and functional details disclosed herein are not to be interpreted as limiting but merely as a basis for the claims and as a representative basis for teaching one skilled in the art to variously employ the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0014] The terms “coupled” and “connected”, along with their derivatives, may be used herein. It should be understood that these terms are not intended as synonyms for each other. Rather, in particular embodiments, “connected” may be used to indicate that two or more elements are in direct physical or electrical contact with each other. “Coupled” may be used to indicate that two or more elements are in either direct or indirect (with other intervening elements between them) physical or electrical contact with each other, or that the two or more elements co-operate or interact with each other (e.g. as in a cause and effect relationship).

[0015] The present invention includes a heater for heating a space comprising at least one border intake port and a frontal exhaust port.

[0016] With reference to FIG. 1 and according to one embodiment of the present invention, a heater 10 is shown. Heater 10 has a cover 20 and a housing 30 enclosing a fan and a heating element both not shown. Exhaust port 40 is positioned on cover 20 providing a frontal exhaust of heated air and creating a parallel relationship between exhaust port 40 and cover 20. Border intake port 50 is positioned along the sides of heater 10 in order to draw air into heater 10 for heating a space.

[0017] With reference to FIG. 2 and according to one embodiment of the present invention, heater 10 has cover 20 displaced from housing 30 allowing to illustrate fan 60 and two border intake ports 50 and 52 which in a perpendicular relationship with cover 20. Fan 60 will draw air into border intake ports 50 and 52 as well as into housing 30 for heating by the heating element (not shown) and providing a fluid communication of the air to fan 60. In another embodiment, heater 10 could only have one border intake either 50 or 52 on either border of the heater.

[0018] With reference to FIGS. 3 and 4 and according to one embodiment of the present invention, the heater has a border plate 56 enclosing housing 30. Border plate 56 has aperture 57 allowing air to be drawn in housing 30 by fan 60. Once the air travels into housing 30, the air is heated by heating element 70. Fan 60 will also push air through exhaust 58 of border plate 56 and eventually through the exhaust port of the heater.

[0019] With reference to FIG. 5 and according to one embodiment of the present invention, the air flow into and out of the heater is shown. Air is drawn into border intake port 52 and shown through arrows 200. Another border intake port can be positioned on the opposite side of border intake 52 allowing the fan (not shown) to draw air into heater 10 through two intake ports as shown by arrows 210. Once the air has traveled through the heating element (not shown), the heated air is exhausted through exhaust port 40 positioned on cover 20 and in a perpendicular relationship in respect of border intake port 52 as shown by arrows 300.

[0020] With specific reference to FIG. 6 and according to one embodiment of the present invention, the air travels into fan 60 which then redirects the air through heating element 70 which consist of two heating bars placed in parallel to one another. Once the air travels through heating element 70,

heated air is projected through border plate **56** and exhaust port **58** which connects to the exhaust port of the heater positioned on the cover (not shown).

[0021] With specific reference to FIG. 7 and according to one embodiment of the present invention, the components of a heater **10** are shown. A cover **20** is installed on border plate **56** with cover plate **56** being installed on fan box **35** which encloses the fan and the heater. Fan box **35** is positioned within housing **30** which housing **30** allows for the heater to be installed on a wall for example. Under this embodiment, heater **10** has two enclosures consisting of fan box **35** and housing **30** which have different functions. Fan box **35** encloses the fan and heating element present in the heater and housing **30** encloses fan box **35**. Housing **30** can also enclose the motor of the fan while being separated from the fan which is housed in the fan box **35**. A worker skilled in the relevant art would be familiar with the use of two enclosures as shown in FIG. 7. In another embodiment, a heater could consist of a single enclosure such as fan box **35** with fan box **35** allowing to secure the heater to a wall eliminating the need for another housing such as housing **30** shown in the drawings. Under such an embodiment, the fan box would also need a separate wiring enclosure within the fan box allowing to isolate the electrical connections from

the heating element and the fan. The fan box or housing can be defined as both being an enclosure which is different than the wiring enclosure.

[0022] A worker skilled in the relevant art understanding this invention may now conceive of alternative structures and embodiments or variations of the above all of which are intended to fall within the scope of the invention as defined in the claims that follow.

We claim:

1. A heater for heating a space comprising:

- a) an enclosure for enclosing a fan to displace air within the heater;
- b) a heating element positioned within the enclosure to supply heat to the displaced air within the housing;
- c) a cover enclosing the fan and the heating element within the enclosure;
- d) at least one border intake port positioned in a perpendicular relationship to the cover, said intake port allowing for air to be in fluid communication with the fan; and
- e) an exhaust port positioned in a parallel relationship to the cover allowing for air heated by the heating element to exit the heater.

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