United States Patent

Mouat

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[45] **Aug. 22, 1972**

[54] FIREPLACE HOOD HEAT SAVER

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[52] **U.S. Cl.** **126/121**

[51] **Int. Cl.** **F24b 7/04**

[58] **Field of Search** 126/121, 120, 62, 63

[56] **References Cited**

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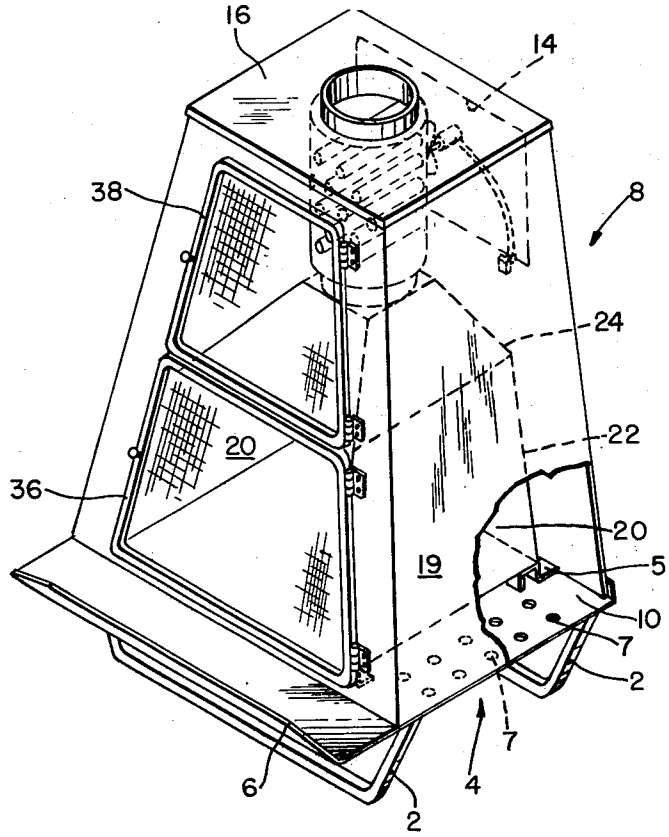
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[57] **ABSTRACT**

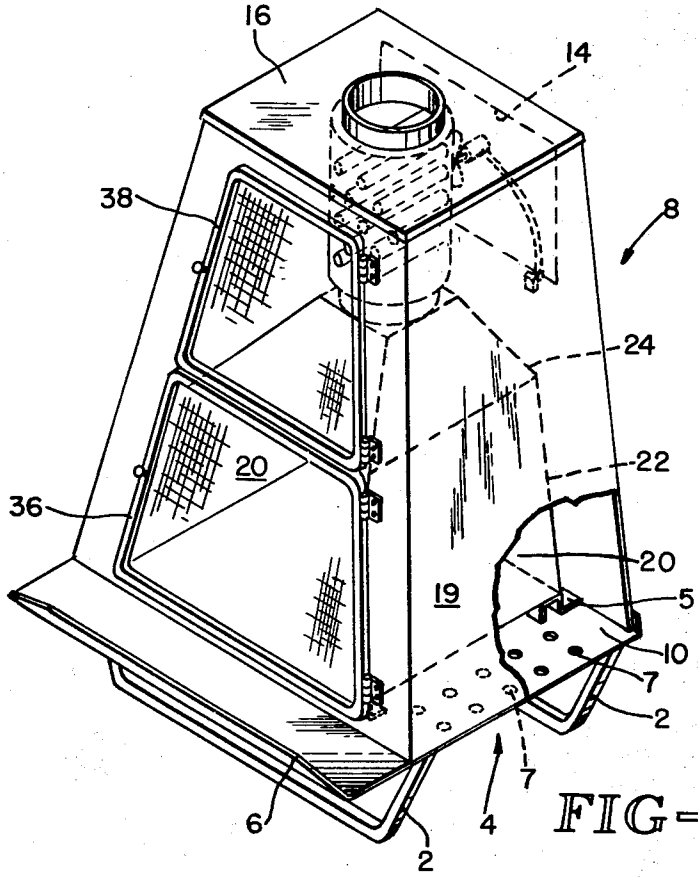
A fireplace hood comprising an inner shell having a bottom opening to receive the gaseous products of combustion, a top opening to pass the combustion products out to the atmosphere, a chimney section attached to the upper portion of the shell and having located therein a plurality of horizontal tubes passing through the chimney section, sealed to the combustion products, but open at the ends to the atmosphere, a fan disposed adjacent to the open-ended tubes to circulate air through the tubes and an exterior shell surrounding the inner shell whereby the exterior surface is maintained at a temperature safe to touch. The exterior shell includes air passages corresponding to the tubes whereby the air heated in the tubes in the chimney as well as the air heated between the shells is exhausted into the room.

5 Claims, 4 Drawing Figures

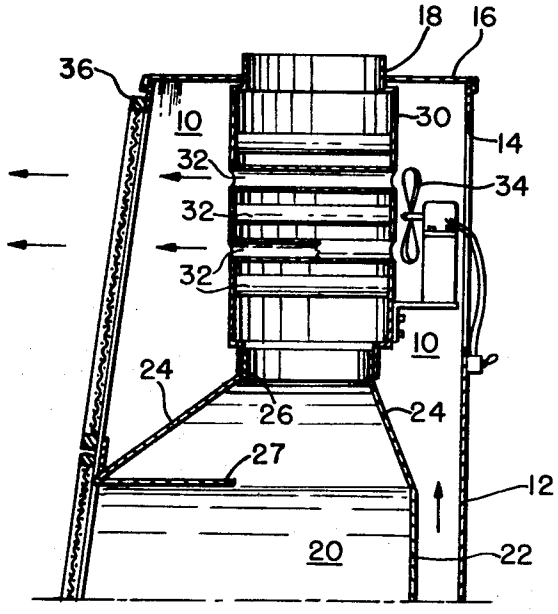


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2 Sheets-Sheet 1



FIG—1



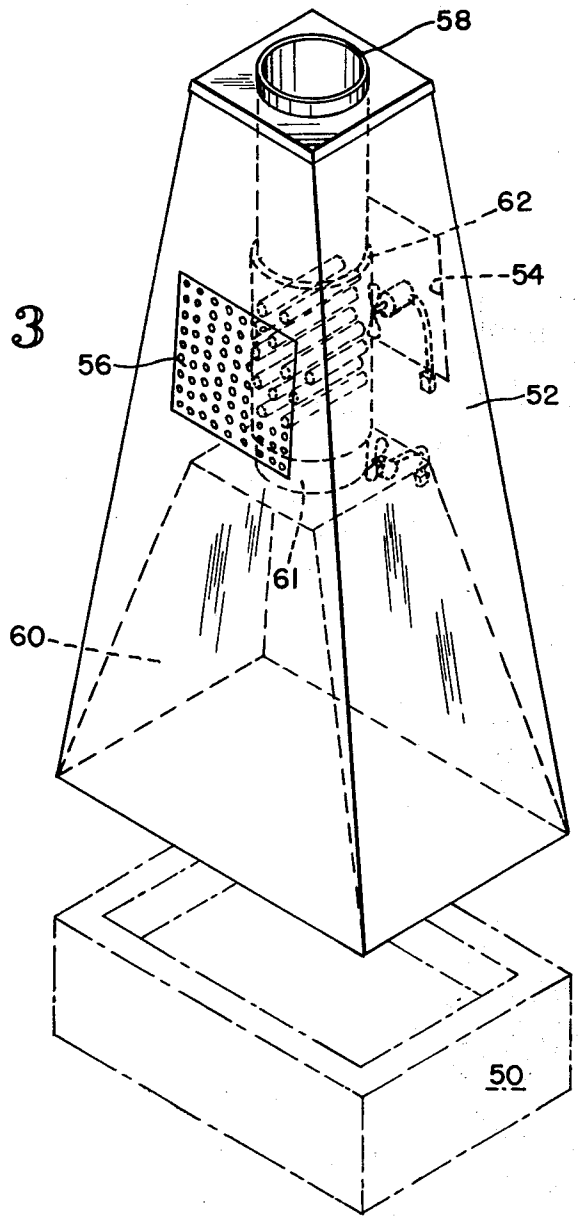
FIG—2

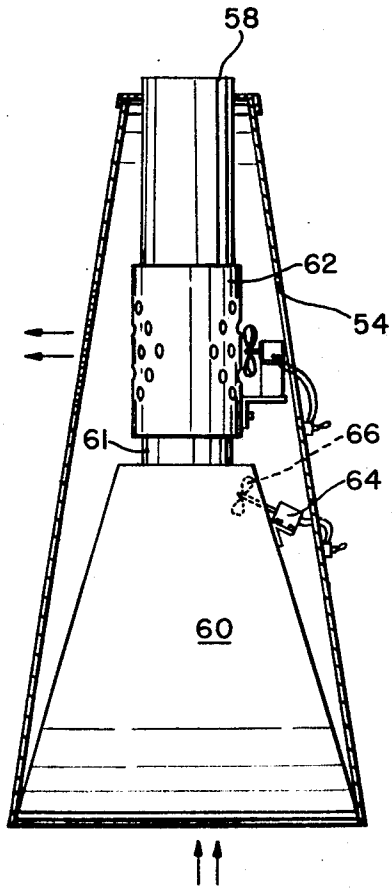
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FIG—3





FIG—4

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FIREPLACE HOOD HEAT SAVER

BACKGROUND OF THE INVENTION

It is well known that although fireplaces are desirable for atmosphere and for setting the mood of a room they are extremely inefficient when it comes to the amount of heat produced for the amount of fuel consumed. In the past, efforts have been made to capitalize on the heat by making built-in double wall fireplaces including a blower to circulate the heat accumulated between the inside wall and the outside wall out into the living area. Another possible source of heat from a fireplace but not capitalized upon is the heat lost up the chimney by the exhaust gases.

A deterrent to the installation of a fireplace is the expense of constructing one during the erection of the house and in the instance where the house is completed without a fireplace the almost prohibitory problem and cost of installing a standard fireplace in such a completed structure.

It is therefore desirable to provide a fireplace which is readily installed in the already completed home without the necessity of removing walls and the like.

The prior art provides free-standing fireplaces which have a single wall construction and which can be installed within a house without major structural change. These prior art structures are unsafe around small children because of the temperature of the wall and the inherent possibility of painful, if not serious burns.

It is therefore desirable to provide a free-standing fireplace which may be easily installed without the need for structural modification of the building and yet will have the advantage of having the cool outer surface making it relatively safe for children or others liable to accidentally contact the exterior surface, as well as greatly reducing the danger of fire caused by contact with the exterior surface by flammable material. Further, it is desirable to have a fireplace which capitalizes on the heat generated by the fire to a far greater extent than has heretofore been possible.

With the above noted problems in mind it is the object of the present invention to provide a free-standing fireplace which has a double wall construction keeping the exterior surface of the fireplace at a much lower temperature than would normally be possible in a single wall fireplace.

It is another object of the present invention to provide a free-standing fireplace wherein the fireplace includes a means for capturing the heat generally lost through the exhaust stack and forcing the heat into the living quarters surrounding the fireplace.

Yet another object of the present invention is to provide a fireplace hood which has a double wall construction and a hollow area between the walls to accumulate heat which may be blown into the surrounding area and further having a section of the exhaust stack having horizontal tubes therethrough which accumulate the heat of the gases passing thereby and this heat being readily exhaustable into the surrounding area.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic view of a free-standing fireplace in accordance with the present invention.

FIG. 2 is a sectional view taken upon a vertical plane through the center of the exhaust stack of the fireplace of FIG. 1.

FIG. 3 is a schematic view of a fireplace hood in accordance with the present invention.

FIG. 4 is a vertical sectional view of fireplace hood of FIG. 3.

DETAILED DESCRIPTION OF THE DRAWINGS

As can be seen in FIG. 1 the fireplace comprises a pair of legs 2 which in the preferred embodiment have substantially the shape of U's. The legs could equally well be of any desired configuration for stability or esthetics. Mounted on top of the legs and extending forwardly therefrom is a substantially flat plate 4 serving as the bottom member of the fireplace and terminating in an up-turned lip 6 which serves as the hearth of said fireplace. Mounted on top of plate 4 is a pair of reinforcing members 5 which serve to both reinforce plate 4 and to serve as a spacing member and support for the firebox hereinafter described. Located along the outside edge of plate 4 are a plurality of openings 7 for reasons hereinafter described.

Mounted on top of the plate 4 and extending upwardly from the edge thereof is a truncated pyramidal shaped outer shell 8 having imperforate side walls 10 and a generally imperforate back wall 12. The rear panel includes an air intake 14 for reasons hereinafter described. It is to be understood that the particular shape or location of the intake is not critical and all that is necessary is a provision for air flow. The top of the pyramid is closed by an imperforate top wall 16 having a generally centrally located circular part 18.

Likewise mounted upon, but spaced from, the base 4 is an inner shell having a bottom 19 secured to reinforcing members 5, imperforate side walls 20, an imperforate back wall 22 and a tapered top portion 24 adapted to funnel the exhaust gas to an exhaust port 26. Secured to or forming a part of the inner shell is a smoke shelf 27 for standard purposes.

Mounted between the exhaust port 26 on the inner shell and exhaust port 18 in the outer shell is a heat capturing unit 30 which provides a conduit for the exhaust gases from the combustion within the air chamber. The heat capturing unit 30 has a plurality of hollow open-ended tubes 32 which extend completely through the exhaust transmittal unit and are open at both ends. The tubes 32 while being sealed from the exhaust gases are spaced to allow fluid flow therebetween. Mounted to the heat capturing unit 30 is fan 34 and its appropriate motor to force air through the tubes and out a screened opening 36 at the frontal unit into the surrounding living area.

The blower unit is preferably thermostatically controlled such that it is actuated at the time the temperature within the exhaust stack reaches a predetermined level. It is to be understood that the blower likewise could include a manual switch for using the fan then as a circulating means when the fireplace is not being used as a heat producing source. Access to the interior of the inner shell or fire box where the fire will be maintained is achieved through a hinged door 36 mounted to the front of the outer shell 8. Similarly secured to the outer shell 8 and located above door 36 is a second hinged door 38 providing access to the heat capturing unit as well as an exhaust port for the heated air. It is to be noted that the front of the inner shell is closed by door 36, the top 24 of the inner shell extending forwardly to the front of the outer shell.

The fact that the firebox is completely separated from the outer shell of the fireplace maintains the outer shell at a temperature significantly below the temperature of the fire box. Both the heating ability of the fireplace and the maintaining of a cool outer surface of the fireplace unit are assisted by the provision of parts **7** which permit a continuous convective flow of air between the walls of the unit. Keeping the outer wall at a low temperature is assisted since the heat is continuously removed and the heating capability is improved since the heated air is forced by fan **34** through tubes **32** in to the room.

As can be seen in FIG. **3** and **4** a similar heat saving device could equally well be used wherein a firebox **50** is located upon the supporting surface or floor and is open from all sides. This configuration provides the fireplace atmosphere from a variety of positions within adjoining rooms or within the same room but is subject to smoking caused by cross drafts. The hood in this embodiment would comprise an outer shell **52** having appropriate openings **54, 56** for ingress and egress of the air. The remainder of the exterior is primarily decorative and shown generally as a truncated pyramid shape having a smoke exhaust port **58** in the upper portion thereof. It is to be understood that the truncated pyramidal shape is not definitive but the exterior shell could equally well be semi-circular, triangular, or any desired configuration although the surface should be generally impermeable. It is again to be pointed out that the particular shape or location of the inlet or exhaust ports is limited only in that they must serve the purpose of providing air for circulation and an exit for the air heated in the apparatus hereinafter described.

Within the exterior shell is a complementarily shaped interior shell **60** having appropriate smoke exhaust port **61** and a heat saver unit **62** hereinabove described including a fan and thermostat interconnecting the exhaust port of the inner shell and the outer shell. As was the case in the hereinbefore described embodiment, the two shells are spaced serving to insulate the outer shell and an area in which the air can be heated to be exhausted into the air.

Because of the problems of draft within a firebox which is open on four sides it is contemplated that there could be an additional fan having a motor **64** and blade **66** mounted within the inner shell. The motor is outside the interior shell but the blade is inside creating an upward air flow.

In conclusion, it can be seen that a fireplace hood constructed in accordance with the present invention provides a unit which is not only inherently safer but also substantially more efficient.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A fireplace hood comprising; an open bottomed inner enclosure converging as it extends upwardly substantially overlying the fire location, said hood being imperforate with the exception of an exhaust port in the upper portion of the enclosure;

an outer open bottomed enclosure surrounding the first enclosure being secured thereto, about the periphery of their bottom edges spaced therefrom except at the joint and terminating substantially above the inner enclosure, said enclosure having a first opening for passage of the air between the enclosures out into the surrounding room, and a second opening for introducing fresh air between the enclosures, and

a section of straight hollow pipe extending from the exhaust port of the inner enclosure to the exhaust port of the outer enclosure, for transmittal of the hot exhaust gases to the atmosphere whereby continual movement of the heated air keeps the exterior surface of the outer enclosure at a relatively cool temperature and the heat absorbed by the air between the enclosures is exhausted into the area immediately surrounding the fireplace.

2. A hood as in claim **1** wherein the hollow pipe extending between the respective exhaust ports of the two sections has a plurality of straight parallel hollow imperforate open-ended tubes extending horizontally therethrough whereby the heat normally passing up the exhaust stack will be absorbed by air within the tubes and transmitted into the surrounding area.

3. A hood as in claim **1** and further including a thermostatically controlled blower for forcing air through the tubes.

4. A free standing fireplace having a base for supporting the fire;

a first enclosure, open on one side overlying and sealed to the base, said enclosure having an exhaust port in the upper portion thereof,

a second enclosure having an opening on one side coinciding with the opening in the first enclosure, said second enclosure substantially surrounding the first enclosure and spaced therefrom except immediately adjacent the opening, having an exhaust port in the upper portion thereof substantially vertically aligned with the exhaust port of the first enclosure,

a second opening in the second enclosure allowing escape of the heat air generated between the two enclosures, and

an exhaust pipe extending between the exhaust port of the first enclosure and the exhaust port of the second enclosure for passage of gasses therethrough said hollow pipe having a plurality of straight hollow imperforate open-ended substantially horizontal parallel tubes extending therethrough whereby the heat normally passing up the exhaust stack will be capitalized upon and transmitted into the surrounding area.

5. A fireplace as in claim **4** and further including a thermostatically controlled blower for forcing air through the tubes.

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