

[54] **RECESS MOUNTED ELECTRIC AIR HEATER**

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 [22] Filed: **May 26, 1970**
 [21] Appl. No.: **40,494**

- [52] U.S. Cl. **219/367, 165/57, 165/122, 174/52 R, 219/342, 219/368, 237/79**
 [51] Int. Cl. **H05b 3/02, F24h 3/04**
 [58] Field of Search **219/359, 360, 363-371, 219/373-377, 339-358, 342, 347; 165/121, 122, 52-57; 237/79; 174/52 R**

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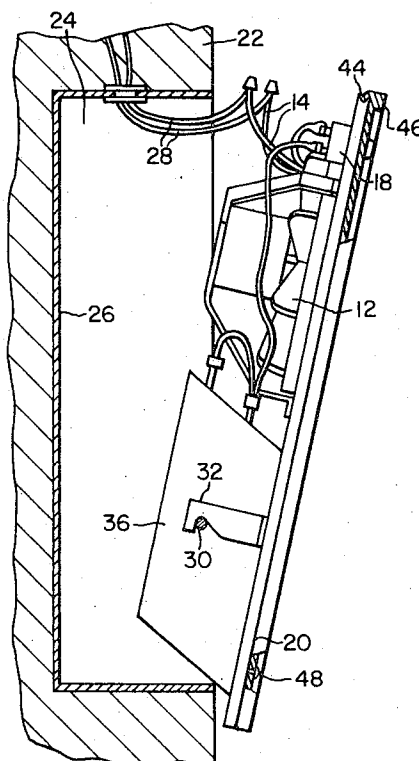
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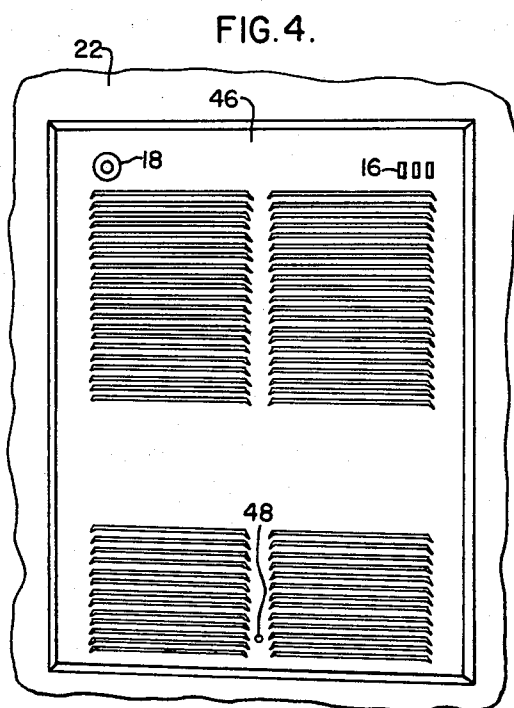
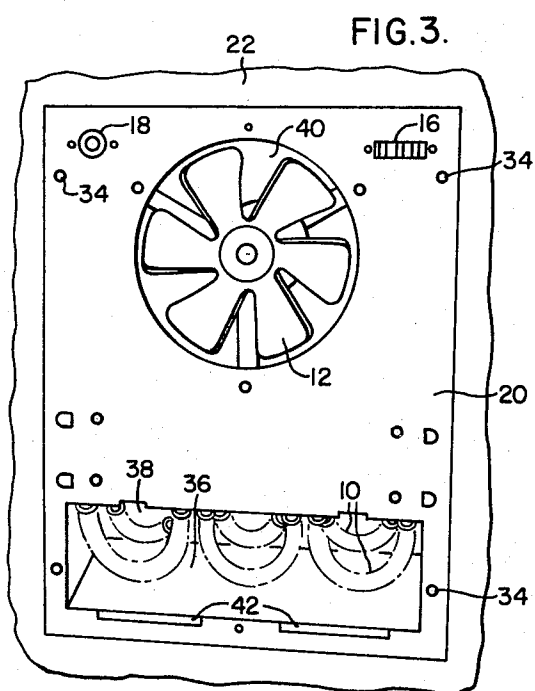
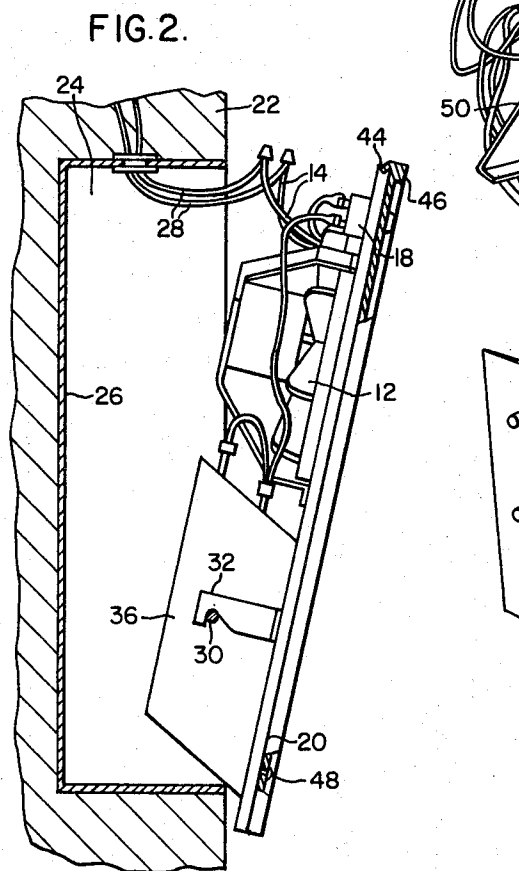
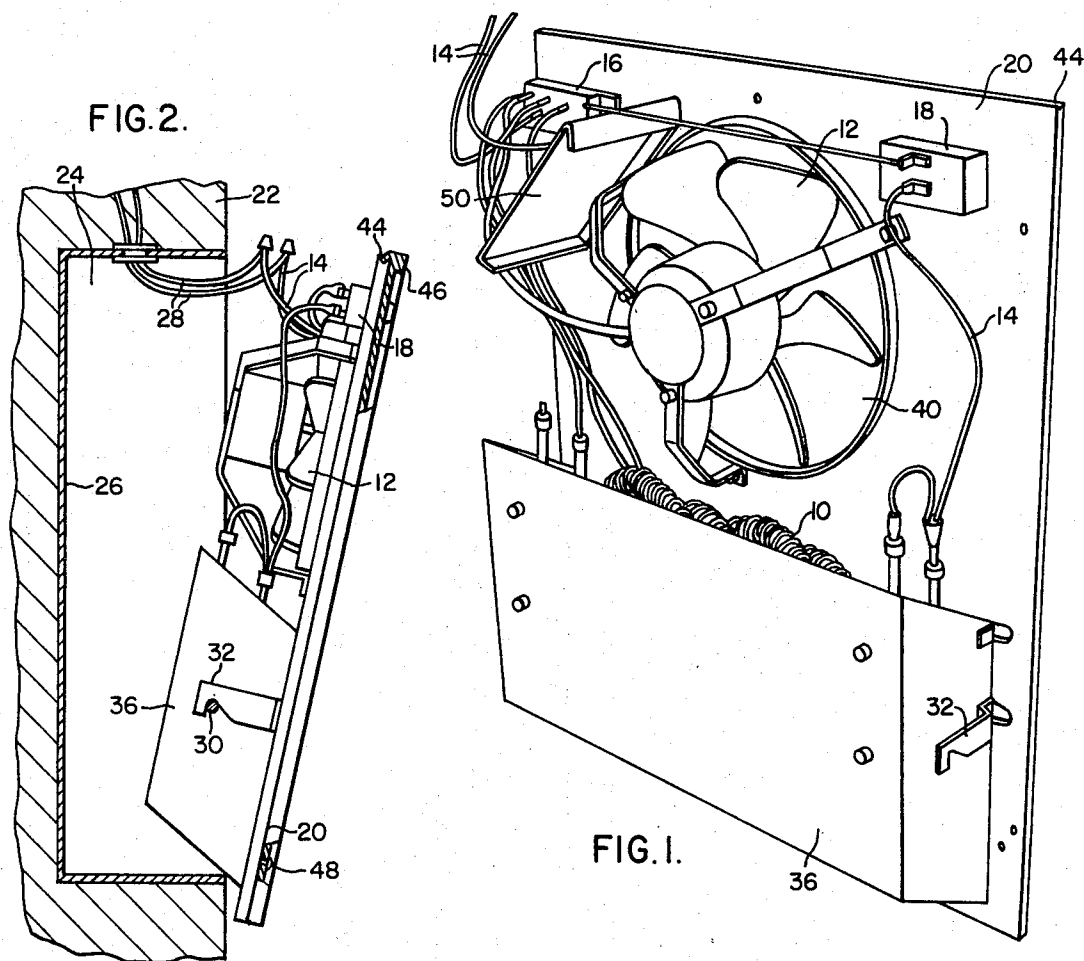
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[57] **ABSTRACT**

A recess mountable electrical appliance is provided with a cover supporting on its inner surface the working elements of the appliance and also means for temporarily securing the cover in a tilted open position for access to the inner surface upon placement in a recess. The invention is particularly applicable to electrical heaters for wall mounting in which the cover is placed within the recess and temporarily secured in a tilted open position for the completion of electrical connection. A tilt and alignment mechanism is provided, such as by brackets extending from the cover engaging pins within the recess, for permitting the cover to be placed in the tilted open position. Upon closing of the cover, while the brackets on the cover side on the pins, there is preferably provided direct alignment of apertures for fasteners to permanently secure the cover to an underlying support. Other features include a deflector partially enclosing a heater element to define a primary air path over the heater element while also permitting a secondary air path to the rear of the deflector. Also, a front grill is provided that is secured to the cover by an overhanging edge disposed in a groove in the upper edge of the cover and a single fastener secures the grill and cover proximate the lower edge thereof.

6 Claims, 4 Drawing Figures





RECESS MOUNTED ELECTRIC AIR HEATER

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates generally to electrical appliances particularly suitable for mounting in a recess in a vertical partition, such as electrical heaters mounted in a wall recess.

2. Description of the Prior Art

Various types of wall mounted electrical heaters are known. Generally these are characterized by a plurality of items that have to be assembled at the job site. Effort has been made to provide a convenient one-piece heater construction in which the working parts are supported on the inside of the cover. There has however been difficulty in providing means in such a combination that permits ease in mechanically mounting the structure as well as ease and safety in making electrical connections. It has heretofore been the case that the unit would be mechanically secured within the wall and then a panel would have to be opened for access to the interior to permit making electrical connections after which the panel would then have to be closed. Such an arrangement presents difficulties in installation and also in inspection of the completed installation.

SUMMARY OF THE INVENTION

This invention provides a recess mountable electrical appliance, such as an electric heater suitable for mounting in a vertical partition, with greater ease of installation (by a single workman) and inspection. In accordance with this invention, the appliance includes a cover for a recess in which working elements of the appliance are to be contained. The cover has an inner surface on which the working elements are supported with means for temporarily securing the cover in a tilted open position upon placement over a recess to permit partial access to the inner surface for the completion of electrical connections. After connection and inspection, the cover may be fully closed and maintained in a position at which apertures are aligned between the cover and the underlying structure for permanent securing of the cover over the recess.

Preferred means for temporarily securing the cover in a tilted open position and providing alignment for the permanent securing of the cover includes a bracket, preferably a pair of brackets, extending from the inner surface of the cover and each having a notch therein on its lower surface so that it may be retained upon catching an element provided within the recess, such as a pin extending horizontally from a lateral surface of a box within the recess. When the cover is placed within the recess it is merely necessary that the bracket rest on the pins to secure the cover in its tilted open position that permits the completion of electrical connections, preferably located near the upper edge of the cover, and the inspection of such connections prior to permanently securing the cover in closed position. The bracket and pin configuration also provides a means for alignment of fastener apertures in the cover and underlying support elements.

Other features of the preferred embodiments of the invention include a barrier extending from the cover inner surface and located between locations in which electrical inner connections are made and the electrical power consuming elements of the appliance, such barrier also acting as a wire guide for maintaining electrical conductors in a position in which they are kept from interfering with the working parts of the appliance.

In accordance with another feature of the invention, in an embodiment in which the appliance is an electrical heater that includes a blower for directing air into the recess and over the heater element, there is provided a deflector that partially encloses the electrical heating element itself but permits air flow past the heating element (and incidentally provides a support for the cover in its tilted open position so as to avoid marring exterior wall surfaces). A plurality of openings are provided in the outside face of the cover member including at least openings for the entrance and exit of the primary air flow

through the space enclosed by the deflector so that it passes over the electrical heating element. Additionally, there is an opening in the cover member that permits flow of air within the recess behind the deflector that partially encloses the heating element in order to maintain surfaces of the enclosure to the rear of the heating element relatively cool.

A grill may be disposed over the cover member and, for example, provide louvered vents for entrance and exit of the primary and secondary air flow. Such grill may be conveniently mounted merely by hanging on the upper edge of the referred to cover member and securing it near its bottom by a single fastener.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of an electrical appliance in accordance with one embodiment of the present invention, before installation;

FIG. 2 is an elevation view of a partly assembled appliance in accordance with an embodiment of this invention;

FIG. 3 is a front elevation view of an electrical appliance in accordance with this invention; and

FIG. 4 is a front elevation view of a completely installed electrical appliance in accordance with one embodiment of this invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The invention will be described for purposes of example in connection with an electrical heater for mounting within a wall recess. As shown in FIG. 1, the principal working elements of the appliance include an electrical resistance heating element 10, an electric motor driven fan 12 and associated conductors 14, switch 16 and a thermostat 18. Such working elements are mounted on the inner surface of a cover member 20 by any suitable fastener means so as to provide a unitary structure that may be preassembled, that is, does not require assembly at the job site.

FIG. 2 shows a vertical partition or wall 22 in which there is located a recess 24. The recess preferably has in it a box 26 that is open toward the room in which the appliance is to be operated.

The box 26 is provided with an access means to permit conductors 28 connected to a power supply to enter into the enclosed space. The box 26 also has within it some cover retaining means which in this example comprise pins 30 extending laterally from each vertical side surface of the box 26. Upon placement of the cover and its assemblage of elements therein, so that notched brackets 32 catch on the pins 30, there is provided means for securing the cover in a temporarily tilted open position which permits completion of electrical interconnections between conductors 14 and 28.

Following the completion of electrical interconnections, and any inspection of those interconnections, the cover 20 may be fully closed in which case the brackets 32 slide up and over the pins 30 by which arrangement there is provided alignment of openings for fasteners 34 between the cover and the box so as to provide means for securing the two in permanent position, as illustrated in FIG. 3.

Thus by the bracket and pin arrangement there is provided means for very easy installation, by a single workman, of the heater with convenience in completing electrical connections and also inspection thereof because the unit may be conveniently kept in the position illustrated in FIG. 2 until it has been approved for closing. A continuous electrical ground connection is easily provided between the cover and box also.

FIGS. 1 to 3 also illustrate a deflector member 36 (secured to cover 20) that encloses the electric heating element 10 to the rear, sides and bottom. The deflector 36, as shown in FIG. 2, provides a rest for the unit when it is in the tilted open position so that the cover 20 does not bear against and possibly mar the surface of wall 22. Principally the deflector 36 is to define the major airflow path caused by fan 12 directing air in through opening 40, down over the electrical resistance heat-

ing element 10 and out through opening 38 in the cover. Also, there are provided additional openings 42 in the cover that extend to the rear of the deflector 36 so as to permit room air by a secondary airflow path, to keep the rear surface of the box 26 relatively cool.

The side elevation view of FIG. 2 illustrates that the top edge surface of the cover 20 has a groove 44 therein. This groove is particularly to facilitate the mounting on the assembled cover of a front grill 46 that is primarily for safety and decorative purposes. This grill 46 can be mounted simply by having an overhanging edge fitted within the groove 44 in the cover 20 and securing it at the bottom to the cover member by a single fastener 48 as illustrated in FIG. 4 and partly shown in FIG. 2.

Another feature is illustrated in FIGS. 1 and 2 wherein the electrical connections are made within a corner of the structure that is separated from the working parts by a barrier member 50 so that upon closing of the cover 20 there is effectively a wiring compartment in that corner, yet without requiring any additional structural elements in the box 26. This barrier 50 also provides a wire guide in that conductors 14 extending between the various elements are guided over it or around it which effectively serves to prevent those conductors from interfering with the fan blade.

I claim:

1. An electrical appliance, particularly suitable for mounting in a recess in a vertical partition comprising: a box for positioning within said recess and defining a space to be occupied by said appliance upon installation; a cover for said box, said cover having a rear surface facing toward said space; at least one electrical power consuming device mounted on said rear surface; at least a first pair of conductors connected to said device and extendable proximate to the upper edge of said rear surface at which can be located electrical connections between said conductors and other conductors for supplying electrical power to said device; a tilt and alignment mechanism for permitting location of said cover in relation to said box in a tilted and partially open position at the upper edge thereof to provide access for making electrical connections between conductors extending from said at least one power consuming device and conductors entering said space to energize said device, said mechanism comprising at least a first member extending from said cover rear surface and at least a second member extending from an interior surface of said box, said first and second members having means for mutual engagement by placement of said cover in said box

whereby said cover tilts outwardly from said vertical partition with a stop means proximate the lower edge of said cover resting proximate the lower edge of said box; said tilt and alignment mechanism also permitting location of said cover in relation to said box in fully closed position upon pushing the exterior surface of said cover to cause said first member to ride upon said second member until said cover is vertical and fastener receiving apertures provided in juxtaposed portions of said box and said cover are aligned for securing said cover to said box.

2. The subject matter of claim 1 wherein: said at least a first member of said mechanism comprises a pair of brackets extending from said rear surface, said pair of brackets each having an edge oriented toward the bottom of said box and having a notch therein, said at least a second member comprises a pair of pins each extending horizontally from surfaces of said box into said space, and said pins are located so as to be received in said notches upon placement of said cover on said box.

3. The subject matter of claim 1 wherein: said at least one electrical power consuming device comprises an electrical resistance heating element and an electric motor driven fan mounted on said rear surface of said cover; said cover has openings therein for the entrance and exit of air in a path passing directly over said electrical resistance heating element; a deflector member secured to said cover partially encloses said electrical resistance heating element to the rear thereof to define said air path; and said cover has an additional opening for a secondary path of air flowing to the rear of said deflector member.

4. The subject matter of claim 3 wherein: said deflector member has a portion proximate the lower edge of said cover that provides said stop means and rests on the lower front edge of said box while maintaining the lower edge of said cover in spaced relation from the surface of the vertical partition.

5. The subject matter of claim 3 further comprising: a wiring compartment barrier extending from said cover rear surface and located between the location of said electrical connections and said electric motor driven fan.

6. The subject matter of claim 1 further comprising: a front grill disposed over said cover and secured thereto by said grill having an overhanging edge disposed over an upper edge of said cover and in a groove within said upper edge and a single fastener means securing said front grill and said cover proximate a lower edge thereof.

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