United States Patent

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Continuation-in-part of application Ser. No. 640,874, May 24, 1967, now abandoned.

[54] **COMBINED DECORATIVE PICTURE AND ELECTRIC ROOM-HEATING DEVICE**
2 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **219/345,** 219/377, 248/498, 338/255
[51] **Int. Cl.** **H05b 3/30**
[50] **Field of Search** 219/345, 377, 506; 248/490, 493, 497, 498; 338/255

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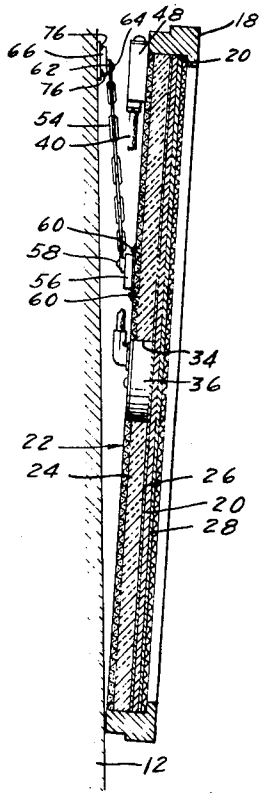
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ABSTRACT: A portable device that presents the appearance of a decorative picture which may be mounted at a desired position on the wall of a room, and when so positioned may be electrically energized to warm objects in the room by radiated heat, as well as to cause the warm air in the room to circulate slowly, with the cooler portion of the circulating air being reheated as it rises in the room adjacent the device. There are hanger elements that keep the device from tilting sidewise. A temperature control is incorporated and there is an indicator light to show when the device is operating.



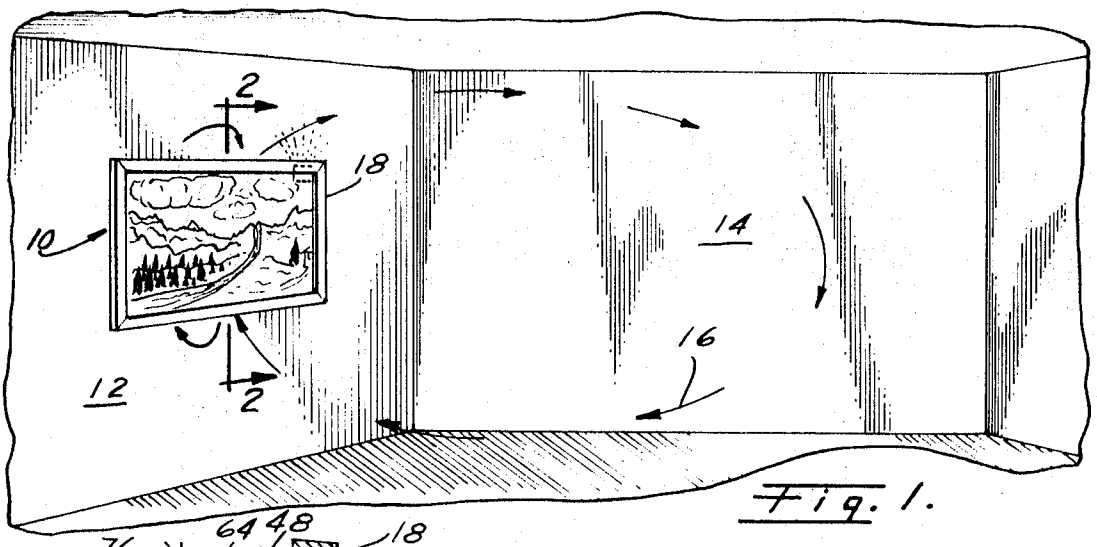


Fig. 1.

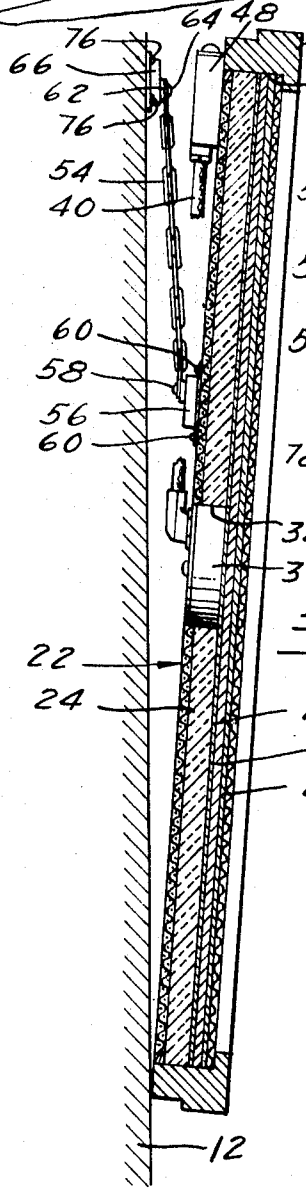


Fig. 2.

Fig. 3.

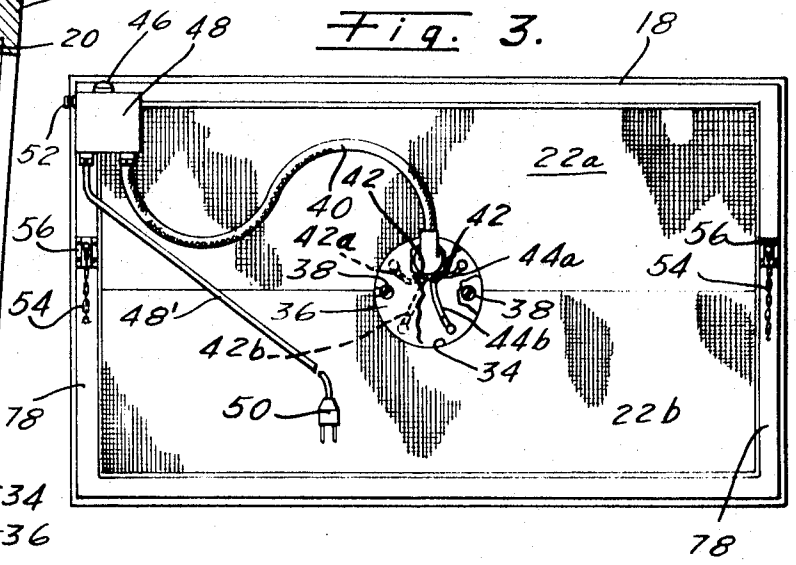


Fig. 4.

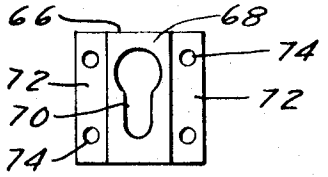
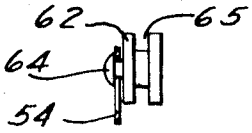


Fig. 5.



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COMBINED DECORATIVE PICTURE AND ELECTRIC ROOM-HEATING DEVICE

CROSS-REFERENCES TO RELATED APPLICATIONS

This is a continuation-in-part of applicant' s copending application for Combined Decorative Picture and Room Heating Device, Ser. No. 640,874, now abandoned filed May 24, 1967

BACKGROUND OF THE INVENTION

1. Field of the Invention

A portable decorative device for heating a room both by radiation and convection.

2. Description of the Prior Art

In the past various types of equipment have been devised and used for heating a restricted area or room in a building. While electric heaters have been commonly used for such purposes, they serve to warm but a small, localized area in a room and are expensive to operate. Forced air heating is another common heating expedient used in heating all or a number of rooms in a building, but the operational disadvantage thereof is that the equipment is noisy in operation. Radiant heating in recent years has come into greater use in the heating of homes and office buildings, but the disadvantage of such equipment heretofore has been that it is expensive to install unless initially included as a part of the building structure.

The present invention is electrically operated, portable, efficient, attractive in appearance, and in use, substantially overcomes the disadvantages of prior heating devices of the types mentioned.

SUMMARY OF THE INVENTION

The present invention includes a frame that supports an assembly of flat elements within the confines thereof, which when electrically energized, heat the room in which it is installed, with the foremost surface of the assembly also serving as a base for heated decorative film.

In operation, the device causes the air within the enclosed space in which it is installed to circulate slowly and continuously, with the cooler air moving upwardly over the film of the device and being thereby heated. Objects in the room are warmed by heat radiated from the film.

A major object of the present invention is to provide a device having the appearance of a picture which is portable, can be mounted at a desired position on the wall of a room to ornament the same, and when energized by domestic electrical power, heats the air in the room to cause it to circulate slowly.

Another object of the invention is to provide a device that heats objects in the room in which it is disposed by radiation, is silent in operation, requires a minumum of maintenance attention, and may be used for heating purposes at a cost comparable to that of other conventional present-day heating equipment.

A further object of the invention is to provide a decorative device which can provide the advantages of radiant heating without the necessity of being installed as an integral part of a building structure.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of a preferred form of the device supported on the wall of a room for both decorative and heating purposes;

FIG. 2 is a transverse cross-sectional view of the device, taken on line 2—2 of FIG. 1;

FIG. 3 is a rear view of the device in which the heating assembly is defined by a number of abutting subassemblies connected in series;

FIG. 4 is a front elevational view of the key hole slot part of the supporting means of the device; and

FIG. 5 is an end view of the lug of the supporting means for the device.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The combined decorative picture and heating device, indicated generally at **10**, may be mounted at any desired location on a wall **12** of a room **14** that is to be heated. When the device **10** is so disposed and electrically energized, the air in the room **14** is caused to circulate slowly through a path **16**, and in so circulating is heated by conduction as it flows past the device. The device **10** emits heat, and also radiantly warms objects (not shown) located in the room.

As may be seen in the drawings, the device **10** includes a rectangular frame **18**, preferably decorative in character, in which a continuous recess **20** is formed in the rear portion thereof. Recess **20** serves to support an assembly of elements, indicated generally at **22**, forming a part of the invention.

The assembly **22** includes a rearwardly disposed rectangular first sheet **24** of heat insulating material, preferably fiberglass, of such dimensions as to be adapted to be at least partially insertable within the confines of recess **20**. A second sheet **26** of an electrical conducting material, such as aluminum, is adhered by conventional means to the forward face of first sheet **24**. A layer **28** of a material having a high electrical resistance, such as powdered carbon or the like, abuts against the forward face of second sheet **26** and is bonded thereto. The layer **28** is also in abutting contact with the rear face of a third sheet **30** of an electrical conducting material, such as aluminum, and bonded thereto.

At least part of the forward face of sheet **30** is covered with a film **32** of heat resistant material that defines a decorative motif on the forward face of the device **10**. The film **32** may be an acrylic plastic, or the like.

A single assembly **22** may be used but, if the device **10** is relatively large, it may be desirable to fabricate the assembly **22** from a plurality of subassemblies. For example, there may be two subassemblies **22*a*** and **22*b***, as shown in FIG. **3**. The subassemblies **22*a*** and **22*b*** have the same structure as assembly **22**. These subassemblies are rectangular and the adjacent longitudinal edges thereof are in abutting contact, as shown in FIG. **3**.

There is a central hole **34** in which is disposed a junction box **36** secured to the subassemblies by screws **38**. This junction box is well known and need not be described in detail. There is an electric cord **40** with electric wires therein. One of the wires, indicated at **42**, branches at **42*a*** and **42*b***, said branches being secured to corresponding electric-conducting sheets of the subassemblies, while the other branch is connected to corresponding electric-conducting sheets of the subassemblies. The other wire, indicated at **44**, branches at **44*a*** and **44*b***, the branch wires being similarly connected to the other conducting sheets of the subassemblies.

The wires **42** and **44** are connected to a thermostat having a temperature control knob **46**, said thermostat being disposed in a thermostat housing **48** on the back of the device **10**. Housing **48** is secured to the frame **18**, preferably at the top of the device and at one end, so there will be sufficient space for the housing between the device and the adjacent wall **12** on which the device is hung, as will be described hereinafter. There are electric wires in an electric cord **48'** leading into the housing and suitably connected to the thermostat and wires **42** and **44**, said wires being also connected to a pronged plug **50** which is adapted to be plugged into a suitable electric outlet for supplying current to the device.

There is also an electric bulb or light **52** carried by the housing **48**, said light being connected into the electric circuit so that when the device is energized the light will also be energized to provide a visual indicator that the device is energized and operating. The light may be exposed so as to be directly visible from the room **14**, or it may be behind the device and light therefrom reflected from the wall, such reflected light being visible by occupants of the room.

Means is provided for supporting the device on wall **12**, said means comprising a flexible inextensible element such as, for example, a chain **54** at each end of the device, one end of each chain being secured to a bracket **56** by means of a rivet **58**.

The brackets are secured to the end parts **78** of the frame **18** by any suitable means such as, for example, screws **60**. The opposite end of the chain **54** is provided with a lug **62** to which the chain is secured by means of a rivet **64**, said lug being of well-known character and having a pair of parallel, laterally spaced grooves **65** therein. Lug **62** is removably secured to a keyhole bracket **66** which has a wall **68** with a keyhole opening **70** therein. Keyhole bracket **66** has oppositely arranged flanges **72**, with openings **74** therein, for reception of screws **76**, whereby the keyhole bracket **66** is secured to the room wall **12**. The keyhole bracket, when attached to the wall **12**, has the enlarged part at the top so that the lug **62** may be inserted into the slot and then moved downwardly into the narrower part of said slot whereat said lug is securedly held, the grooves of said lug receiving side edge portions of wall **68**, defining the narrower part of said keyhole slot. Such lug and key hole arrangement is well known. With this support means for the device, said device is held in exact position and cannot tilt and get out of proper horizontal alignment. In other words, the device is securely kept in position relative to the horizontal which is important esthetically, as well as functionally. It is important that this horizontal position be maintained so the air will circulate properly in its symmetrical path **16** and not be deflected into a distorted or asymmetrical path. Also, the device is held at an upwardly and outwardly inclined position, with the top spaced sufficiently from the adjacent wall **12** to provide room for the housing **48** and provide projection of the device from the wall **12** into the room, so there is effective and efficient contact of the rising air with the outer surface or film for warming the passing air and directing it into the room when the device is energized.

If desired, the support means for the device may be reversed with the brackets **66** secured to the frame of the device and the brackets **56** secured to the wall of the room. Because the device is portable, it may be moved to various locations in a room according to the particular need for heat. Should it be desired to move the device from one location to another, the reverse arrangement of the brackets of the supporting means may be used, in which case the keyhole brackets **66** may be left secured to the wall in various places so that the device may be easily and quickly removed from one set of keyhole brackets and attached to another set at a different location.

A suitable electric switch may be used to control the supply of electric current to the device. When the device is electrically energized, the second and third sheets **26** and **28** are heated due to the flow of electricity through the layer **24**. Because of its heat-insulating qualities, first sheet **24** prevents transfer of heat to the wall **12** from the second sheet **26**.

The heated third sheet **30** in turn heats the film **32**, and air adjacent the film in room **14** is also heated. This heated air rises in room **14** to be replaced with cooler air that is also heated due to its proximity to the film **32**. This sequential heating of air in room **14** adjacent to film **32** results in a slow circulation of heated air through the path **16**, as illustrated in FIG. **1**.

The resistance of the layer **28** is so chosen relative to the voltage of the domestic electrical current flowing therethrough that the third sheet **30** and film **32** are heated to a maximum of Fahrenheit. The heated film **32** also radiates heat to objects (not shown) located in the room and warm the same. The third sheet **30** serves not only as an electrical conductor and medium to transfer heat to the film **32**, but also a supporting base for the film.

As shown and described above, the subassemblies **22***a* and **22***b* are in parallel relationship when the device is supplied with a domestic current of 110 volts. Should only a single assembly **22** be used, the resistance of the layer **28** is so chosen relative to the domestic current supply that a maximum temperature of approximately 150° Fahrenheit is achieved.

Should the electrical supply be 220 volts, the two subassemblies may be connected in series.

Operation of the device **10** with the subassemblies **22***a* and **22***b* is the same as when it includes one assembly **22**.

I claim:

1. A portable combined decorative picture and heating device that may be hung on a wall partially defining a room to heat said room including:

a. a picture frame;

b. a first sheet of heat-insulating fiberglass material disposed rearwardly of said frame;

c. a second sheet of electrical conducting aluminum material disposed forwardly of said first sheet and bonded thereto;

d. a layer of electrical resistance material bonded to the forward face of said second sheet;

e. a third sheet of electrical conducting aluminum material bonded to the forward face of said layer;

f. means for holding said first, second and third sheets and said layer in a fixed position relative to the rear portion of said frame, said means comprising a continuous recess formed in the rear portion of said frame in which said first, second and third sheets and said layers are at least partially disposed;

g. means for supplying electrical current to said second and third sheets to flow through said layer and heat said second and third sheets;

h. a film of heat-resistant acrylic resin material which defines a decorative design that covers at least a portion of the forward face of said third sheet, and is at substantially the same temperature as said third sheet;

i. means for supporting said frame, sheets, layer and film as a unit at such elevation on said wall that air in contact with said film is heated thereby to provide a low velocity current of air in said room to cause cool air below said picture to constantly rise and be sequentially heated by said film, with objects in said room being heated by radiation from said film, said means comprising a flexible inextensible chain, one end of which is secured to the frame of the device, the other end of said chain having a lug secured thereto, said lug having a pair of parallel, laterally spaced grooves therein, and a keyhole bracket for attachment to a wall, said keyhole bracket having a wall with a keyhole slot therein for reception of the lug, said lug being inserted in the large part of the keyhole slot and slidable into the narrower part with the edge portions of said narrower part received in the parallel grooves of the lug, wherein the device is upwardly and forwardly inclined to provide efficient and effective contact with the film by rising air to cause air heated by contact with the film to be directed into the room according to the inclination of the outer face of the device, and wherein the top of the device is spaced from the wall and the thermostat means is secured to the backside of the device adjacent the top, the spacing of the top of the device from the wall being sufficient to provide room for the thermostat means between the device and the wall; and

j. thermostat means for controlling the supply of electric current to said second and third sheets and said layer of resistant material; and

k. an indicator light on the device, said indicator light being connected with the electric current supply and energized thereby when the device is energized.

2. A portable combined picture having decorative paint affixed thereto and a heating device that may be hung on a wall partially defining a room to heat said room including:

a. a picture frame;

b. a first sheet of heat-insulating fiberglass material disposed rearwardly of said frame;

c. a second sheet of electrical conducting aluminum material disposed forwardly of said first sheet and bonded thereto;

d. an electrical resistance layer of powdered carbon bonded to the forward face of said second sheet;

e. a third sheet of electrical conducting aluminum material bonded to the forward face of said layer;

f. means for holding said first, second an third sheets and said layer in a fixed position relative to the rear portion of said frame, said means comprising a continuous recess

formed in the rear portion of said frame in which said first, second and third sheets and said layer are at least partially disposed;

g. means for supplying electrical current to said second and third sheets to flow through said layer and heat said second and third sheets;

h. a surface-hardened material which defines the area having said decorative paint affixed thereto and covers at least a portion of the forward face of said third sheet, and is at substantially the same temperature as said third sheet;

i. means for supporting said frame, sheets, layer and film as a unit at such elevation on said wall that air in contact with said film is heated thereby to provide a low velocity current of air in said room to cause cool air below said picture to constantly rise and be sequentially heated by said film, with objects in said room being heated by radiation from said film, said means comprising a flexible inextensible chain, one end of which is secured to the frame of the device, the other end of said chain having a lug secured thereto, said lug having a pair of parallel, laterally spaced grooves therein, and a keyhole bracket for attachment to a wall, said keyhole bracket having a wall with a keyhole slot therein for reception of the lug, said lug being inserted in the large part of the keyhole slot and slidable into the narrower part with the edge portions of said narrower part received in the parallel grooves of the lug, wherein the device is upwardly and forwardly inclined to provide efficient and effective contact with the film by rising air to cause air heated by contact with the film to be directed into the room according to the inclination of the outer face of the device, and wherein the top of the device is spaced from the wall and the thermostat means is secured to the back side of the device adjacent the top, the spacing of the top of the device from the wall being sufficient to provide room for the thermostat means between the device and the wall; and

j. a thermostat means for controlling the supply of electric current to said second and third sheets and said surface-hardened material, said means having a temperature control knob and a housing secured to the back of said device along the top edge of said frame, whereby said control is not seen when said device is hung on a wall; and

k. an indicator light carried by said housing, said indicator light being connected with the electric current supply and energized thereby to be visible within said room as an indication said device is operating.