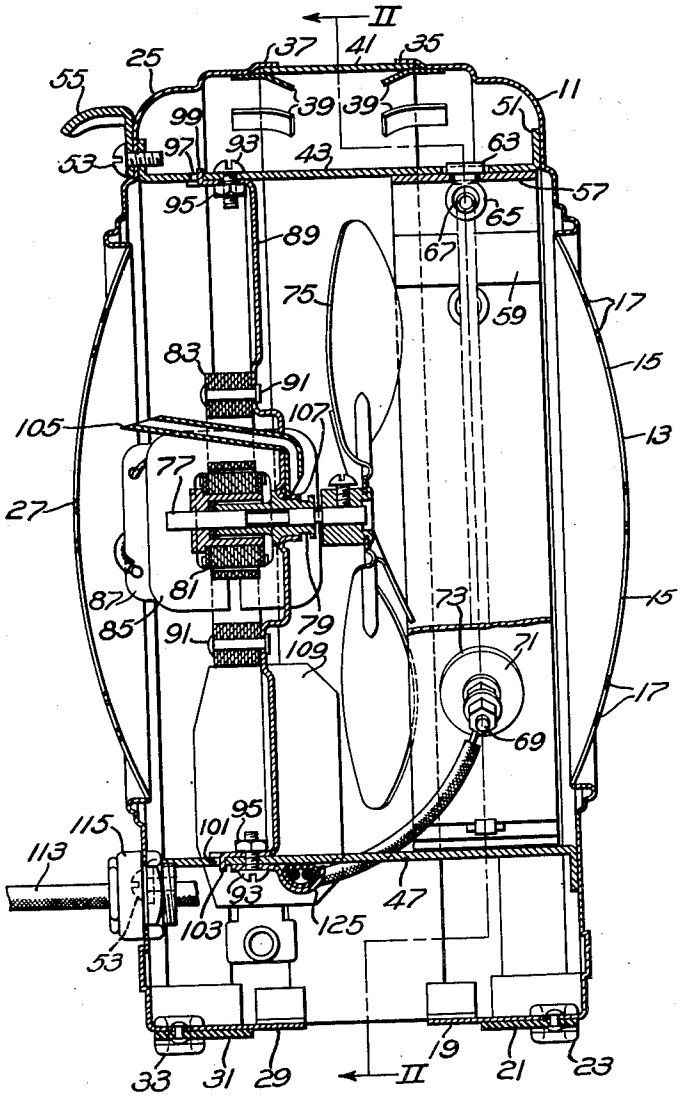
Aug. 11, 1936. R. H. JORDAN 2,050,333

ROOM HEATER

Filed April 24, 1935 2 Sheets-Sheet 1

Fig. 1.



WITNESSES:

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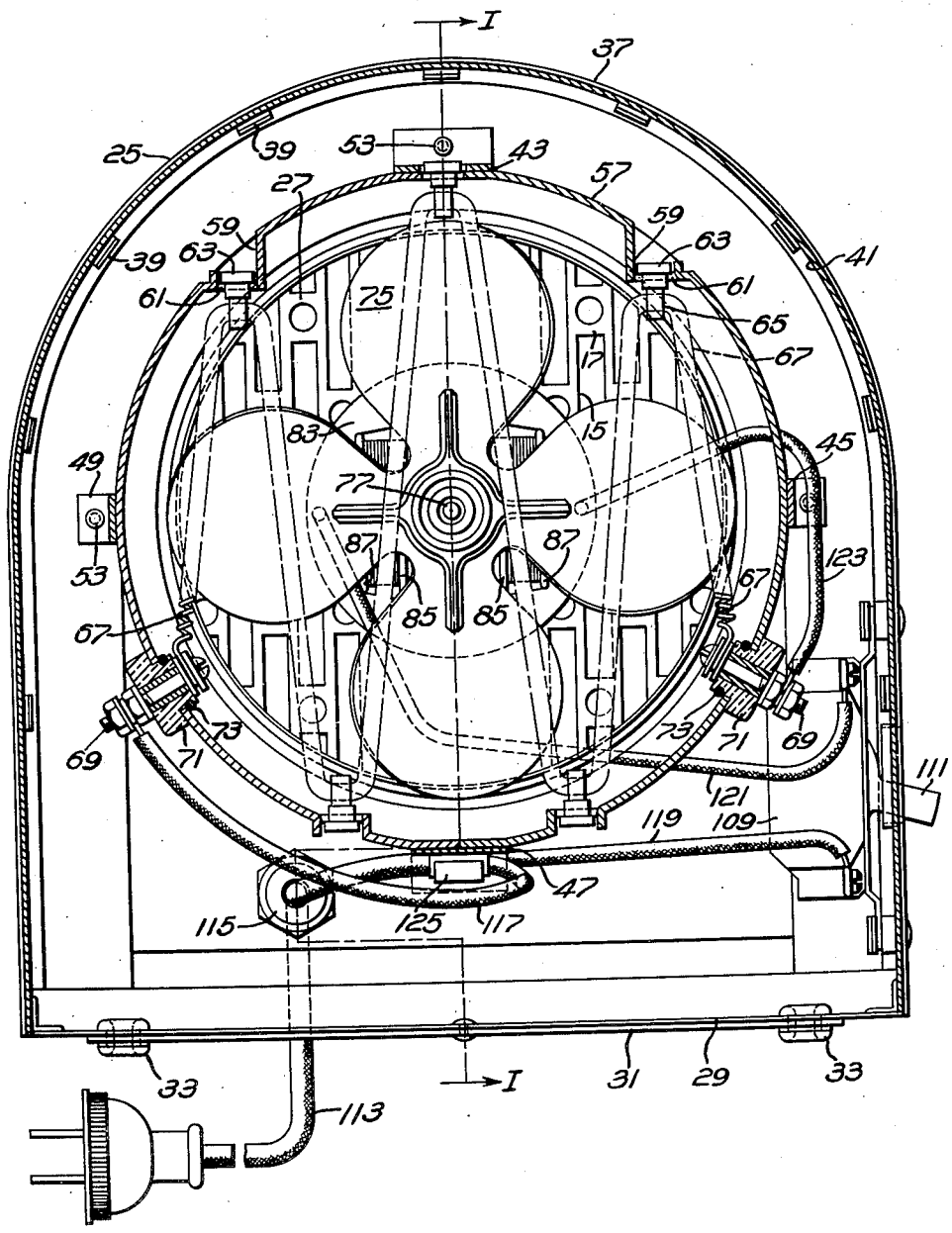
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Fig. 2.



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UNITED STATES PATENT OFFICE

2,050,333

ROOM HEATER

Richard H. Jordan, Springfield, Mass., assignor to Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., a corporation of Pennsylvania

Application April 24, 1935, Serial No. 17,918

9 Claims. (Cl. 219—39)

My invention relates to electrically heated devices and more particularly to electric air heaters.

It is an object of my invention to provide a relatively simple, compact and easily assembled air heater of the portable type.

Another object of my invention is to provide a portable air or room heater that shall include an extended heating element and a fan for causing air to move through the device and past the electric heating element.

Other objects of my invention will either be apparent from the following description of one form of device embodying my invention or will be pointed out specifically hereinafter.

In practicing my invention I provide a three-part casing structure including front and rear cover members, and a plurality of axially extending bars secured to the respective front and rear covers to hold them in proper operative positions relatively to each other. The front and rear covers are provided with integral perforated central portions through which air may be moved to be caused to circulate in a room. The extended electric heating element is supported by refractory electric insulating members interlocked with an annular strip supported by the spacing and cover securing strips, while an electric-motor-driven fan is supported by certain of said spacing strips in spaced relation relative to and back of the electric heating element.

In the accompanying drawings:

Figure 1 is a view in vertical diametral section of a room heater embodying my invention and taken on the line I—I of Fig. 2, and

Fig. 2 is a view in vertical section therethrough taken on the line II—II of Fig. 1.

Referring to the drawings, I provide a front cover member 11 which includes a sheet metal member whose upper contour is shown in the right-hand upper portion of Fig. 1 of the drawings to provide an imperforate outer peripheral portion and includes also a perforated central portion or grid 13 of any suitable or desired shape but which is shown more particularly in Fig. 2 of the drawings as including a plurality of relatively narrow spaced portions 15 connected by bridging members 17. I do not desire to be limited to the particular details of the central grid since any other open portion may be used. The lower part of the front cover member 11 is made relatively flat or straight and includes an integral in-turned portion 19 which may be provided with a strip 21 of heat insulating material as well as with relatively short supporting members or legs 23, to permit of supporting the assembly on a convenient horizontally extending table or other supporting means.

A rear cover member 25 is of substantially the same general construction and contour as has hereinbefore been described for front cover member 11 and includes a central grid 27 as well as an in-turned bottom portion or strip 29 having a strip of heat insulating material 31 secured thereto at its bottom surface and having also a pair of supporting members or legs 33 secured thereto adjacent the lateral ends thereof.

As may be noted particularly by reference to Fig. 1 of the drawings, the inner edges of covers 11 and 25 are bent radially outwardly at the top, as indicated at 35 and 37, respectively, to provide a relatively small shoulder for a purpose to be hereinafter described. A plurality of small clips 39, each of the shape shown by the uppermost one of such clips in Fig. 1 of the drawings, are suitably secured adjacent one end thereof to the inside surface of the cover members to cooperate with the bent out edge portions 35 and 37 to provide seating means or jaws for an intermediate spacing band 41 which is of such width as will space the two cover members apart a suitable distance to provide an enclosing structure for other elements of my device to be hereinafter described. It will be noted that the respective edges of strip 41, which does not extend entirely around the periphery of the assembly, but is omitted at the bottom portion thereof are adapted to fit snugly in the receiving portions constituted by the bent out portions 35 and 37 and the adjacent clips 39 constituted by small pieces of metal.

Means for holding the two cover members in tightly adjacent relation relatively to and on each side of the spacing band 41 may comprise a plurality of spacing strips 43, 45, 47 and 49 which may be made of strips of metal having their end portions extending at right angles relatively to the main portion thereof, as will be noted more particularly by reference to Fig. 1 of the drawings. The bent over or flange portion 51 of the topmost strip 43 may be secured against the inside face of front cover 11, as by being spot welded thereagainst. The end flange portions of the other members 45, 47 and 49 engaging the front cover 11 may also be similarly welded thereagainst. The corresponding end flanges on the spacing strips in engagement with the rear cover member 25 are not welded thereto but are held by removable screws 53 extending through suitable openings in the rear cover member 25 and having screw-

threaded engagement with the respective bent-out portions of the spacing strips. A handle 55 may be provided at the top of the casing in engagement with the rear cover member 25 to permit of carrying the device.

Means for supporting an extended or spread out electric heating element adjacent to and within the front cover 11 may include a substantially annular strip 57 which may be spot welded to the respective spacing strips 43 to 49, inclusive, where it is in engagement therewith, and which includes also a plurality of recessed or shoulder portions 59, the shape of which is apparent from Fig. 2 of the drawings. The substantially horizontally extending portions of the shoulder portions 59 are provided with rectangular openings 61 to receive a refractory resistor-supporting element which includes in addition to a substantially circular head 63 (see Fig. 2) a perforated portion 65 which is substantially flat, as will be noted by reference to Fig. 2 of the drawings. The dimensions of openings 61 are such that the refractory resistor-supporting members are of the interlocking type; that is, they must be turned through substantially 90° after having been inserted flatwise through the opening 61 in order to permit of receiving and supporting an extended electric heating element 67 which may comprise a length of helically wound resistor wire of the proper dimension and length to provide the desired amount of heat when traversed by an electric current. It may be noted here that the uppermost spacing strip 43 is also perforated to cooperate with an opening in the upper most part of annular member 57 to receive one of the refractory electric insulating resistor supporting members.

Terminal members 69 are provided at each side of the annular strip 57 and are supported in electric insulating bushings 71 which extend through suitable openings in band or strip 57 and are held in proper operative position by a spring ring 73 fitting into a peripheral groove in the reduced rear end portion of bushing 71. The respective ends of the resistor wire 67 are connected to terminals 69 which extend through bushings 71 and are held therein by a plurality of nuts in a manner well known in the art.

Means for forcing air through the structure includes a small motor driven fan blade assembly 75 which is mounted on a rotor shaft 77 which is, in turn, rotatably mounted in a bearing structure 79, the shaft 77 supporting also a rotor 81 which may be of any suitable or desired type for operation on either a direct current circuit or an alternating current circuit and which is here shown as a squirrel cage rotor. A co-acting stator structure includes a set of stator laminations 83 and a field coil properly supported thereon, which field coil is illustrated generally only by front and rear field spool walls 85 and 87 within which are wound a suitable number of turns of relatively heavy wire, in accordance with a familiar practice. I have illustrated a bipolar stator structure and I may here point out that in the present embodiment shown in the drawings the stator energizing winding is connected in series circuit relation relatively to the heating element 67.

The bearing structure 79 as well as the stator structure 83 is operatively supported by a diametrically extending strip 89 having an opening in its central portion into which the bearing structure 79 is forced, as will be seen by reference to Fig. 1 of the drawings. The stator structure 83 is supported in proper operative position relatively to the rotor structure as by being secured against the supporting strip 89 by top and bottom rivets 91 extending not only through the stator laminations but also through the strip 89.

The upper and lower end portions of the motor supporting strip 89 extend substantially at right angles to the main portion thereof and engage the inner face of the upper spacing strip 43 and lower spacing strip 47. Short machine screws 93 with cooperating nuts 95 thereon extend through the spacing strips and the end flanges of the strip 89 to properly secure this supporting strip in between the upper and the lower spacing strips. The spacing strip 43 is provided with a small opening 97 therein for receiving a small bent out portion 99 of strip 89 at its upper end and the lower strip 47 is provided with a similar opening 101 therein in which there extends a struckout portion 103 so that the diametrally extending supporting strip 89 is not only supported by the upper and lower spacing strips but is also interlocked therethrough to prevent any turning movement thereon of the spacing strip 89 relatively to the securing and clamping screws 93. Means for oiling the single bearing 79 may comprise an oiling tube 105 which is of substantially L shape in contour and is supported by the supporting strip 89 intermediate its ends. The pipe 105 extends to within a short distance of the rear grid 27, while its inner depending end extends within a small opening 107 in the upper part of the bearing structure 79.

A control switch 109, shown generally only as a toggle switch, and having an actuating handle 111 extending outwardly through the rear cover 25 is secured to the rear cover adjacent the lower portion thereof. A twin conductor cord 113 of the kind now supplied with devices of this kind for connecting them to a suitable contact socket has a portion thereof extending through a bushing 115 of electric insulating material located near the lower edge of the rear cover 25. One conductor 117 thereof is connected to one of the terminals 69 hereinbefore described, while the other conductor 119 extends to a terminal of switch 109. A conductor 121 connects one terminal or one portion of the field or stator winding to the other terminal of switch 109, while a second conductor 123 connects the other terminal of heating element 67 to the other terminal of the stator energizing winding. The connections are such, as has already been hereinbefore noted, that the energizing winding of the motor and the heating winding 67 are connected in series circuit relation with each other. A metal clip 125 may be provided adjacent to the lower spacing strip 47 and held by one of the screws 93 to hold the inner end of the twin conductor cord 113.

The device embodying my invention thus provides an electric air heater comprising an extended heating element and a motor-driven fan, both of which are supported from spacing strips secured to the front and rear cover members, which spacing strips not only support the heating element and the motor-driven fan, but also hold the front and rear cover members in proper operative tight engagement with a spacing band located between the inner edge portions of the front and rear cover members. The device embodying my invention further provides interlocking resistor or heating-element supporting members as well as a motor-supporting means interlocked with the spacing strips which hold the front and rear cover members in their proper operative positions.

Various modifications may be made in the device embodying my invention without departing from the spirit and scope thereof, and I desire, therefore, that only such limitations shall be placed thereon as are imposed by the prior art or are set forth in the appended claims.

I claim as my invention:

1. An electrical device comprising in combination, a front cover and a rear cover, each having substantially parallel outer portions and inner portions inclined toward each other, a spacing band whose edges interfit with the inner edges of said inclined portions of the respective covers, spacing strips secured to said parallel portions of the covers and holding them in said interfitting relation with the spacing band, and a current-conducting element operatively supported by the spacing strips.

2. An electrical heating device comprising in combination, an extended heating element, a motor-driven fan, a front cover and a rear cover, each having substantially parallel outer portions and inner portions inclined toward each other, a spacing band between said inclined portions of the covers, and means extending between said parallel portions of the covers for holding them in proper operative positions against the spacing band and for supporting the heating element and the motor-driven fan.

3. An electrical heating device comprising in combination, an extended heating element, a motor-driven fan, a front cover and a rear cover each having spaced bifurcated portions, a spacing band fitting in said bifurcated portions of the covers, a plurality of spacing strips extending between the covers and secured thereto to hold them against the edges of the spacing band, an annular strip supported by the spacing strips, and a plurality of refractory members supported by the annular strip and supporting the extended heating element.

4. An electrical heating device comprising in combination, front and rear cover members of dished shape, a plurality of clips secured to the respective covers adjacent the inner edges thereof and cooperating therewith to provide a plurality of jaws, a spacing band located between the covers and having its edges fitting in said jaws, an extended plane heating element inside the front cover and a plurality of spacing strips extending between the front and rear covers and secured thereto to hold them tightly against the spacing band and operatively supporting the heating element.

5. A device as set forth in claim 4 and including a motor-driven fan spaced from the heating element and means supporting it from certain of the spacing strips.

6. A device as set forth in claim 4 and including a motor-driven fan spaced from the heating element and a diametrally-extending bar secured to certain of said spacing strips and supporting the motor-driven fan.

7. A device as set forth in claim 4 and including a motor-driven fan spaced from the heating element and a diametrally-extending bar having interfitting engagement with certain of said spacing bars and supporting the motor-driven fan.

8. A device as set forth in claim 3 in which the refractory members are held in interlocking engagement with the annular strip by the heating element.

9. A device as set forth in claim 3 in which the annular strip has apertures with one lateral dimension longer than the other and the refractory members embody a plurality of heating-element-supporting portions inserted through the respective apertures and having one lateral dimension longer than the other, the normal working position of each of said heating-element-supporting portions being such that its longer dimension is transverse to the longer dimension of the cooperating aperture.

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