Feb. 4, 1958 G. HATCH 2,822,457

HEATING ELEMENT AND REFLECTOR MOUNTING METHOD

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Fig. 1

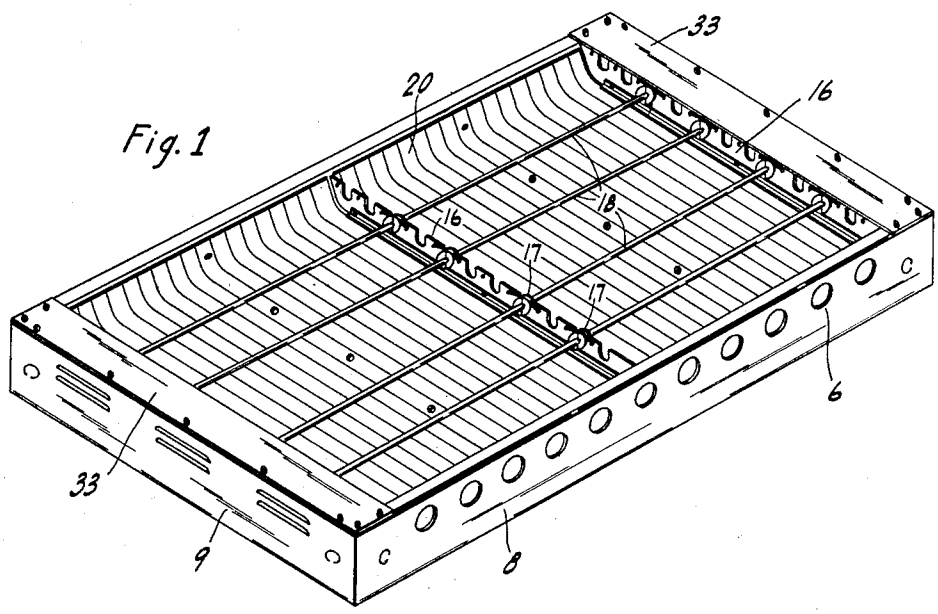
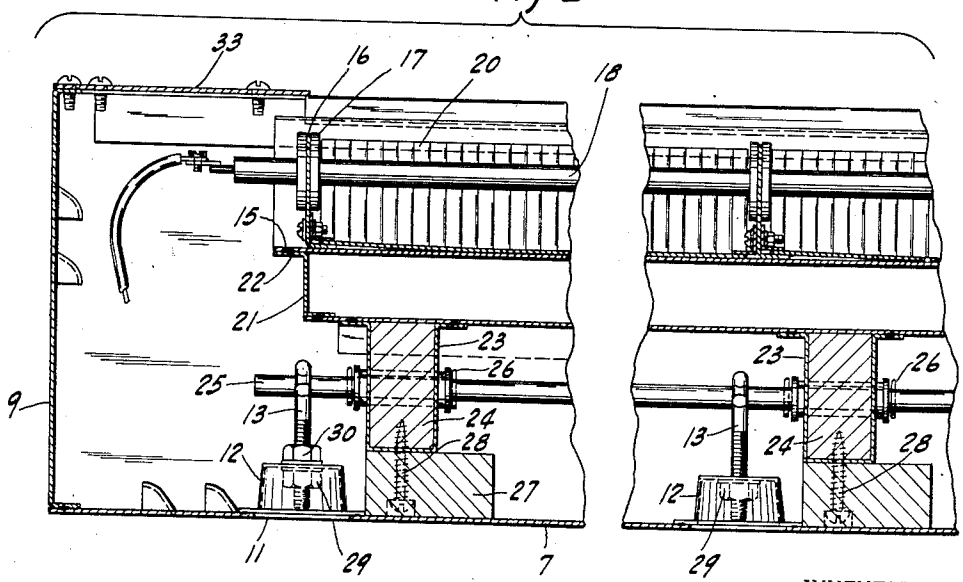


Fig. 2



INVENTOR.
GORDON HATCH
BY
Wheeler, Wheeler & Wheeler
ATTORNEYS

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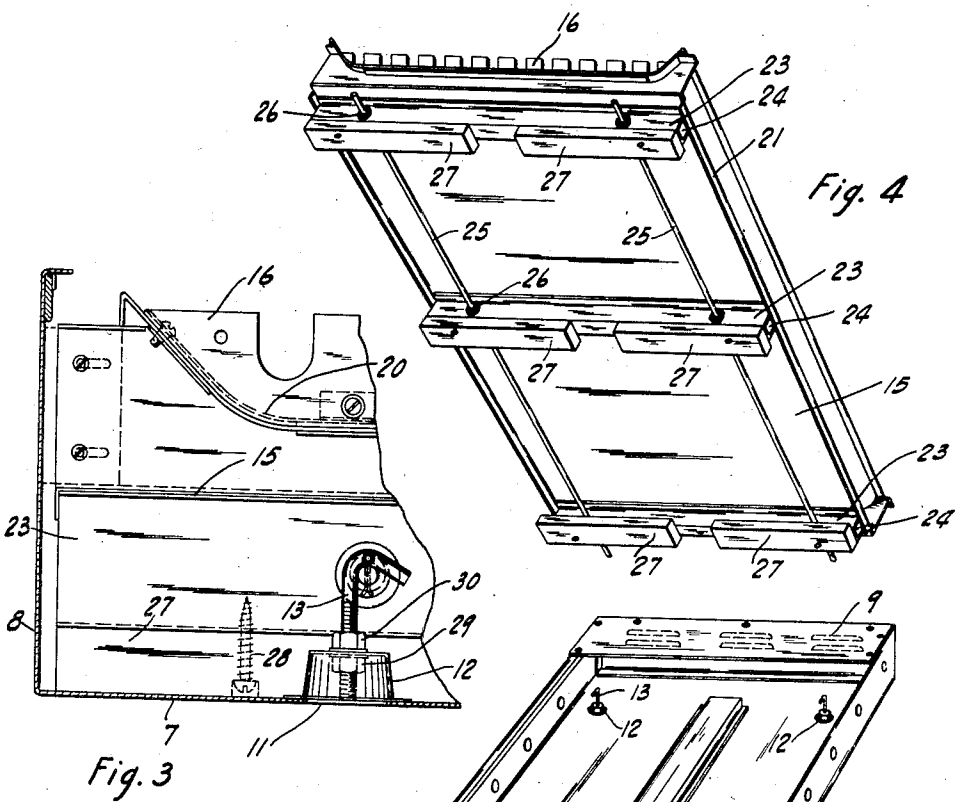


Fig. 4

Fig. 3

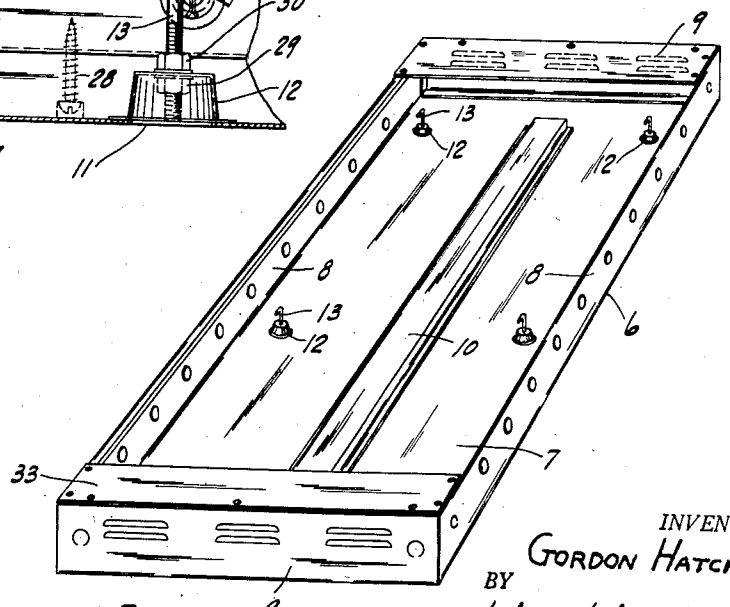


Fig. 5

INVENTOR.
GORDON HATCH
BY
Wheeler, Wheeler, & Wheeler
ATTORNEYS

United States Patent Office 2,822,457
Patented Feb. 4, 1958

2,822,457

HEATING ELEMENT AND REFLECTOR MOUNTING METHOD

Gordon Hatch, Milwaukee, Wis.

Application November 12, 1954, Serial No. 468,322

8 Claims. (Cl. 219—34)

This invention relates to a radiant heating panel. The panel is used in various commercial ovens and heating tunnels. It is an improvement upon the panel disclosed in my Patent 2,756,319 granted July 24, 1956, and entitled A Radiant Unit and Oven.

Each panel unit comprises an outer shell and a tray carrying the heating elements and serving as a reflector. In order to insulate the outer shell more adequately from the heat, the invention contemplates that the tray which supports the reflector and the heating elements shall have an insulating box attached to its rear face, this box providing an air space and having mounting blocks or insulation material interposed between its rear wall and the shell, certain of said blocks having means engaged by anchoring hooks connected with the shell so that there is no direct metal path of heat conductivity from the reflector to the shell and the thermal-insulation is more effective than has heretofore been deemed possible.

In the drawings:

Fig. 1 is a view in perspective showing a complete panel unit embodying the invention.

Fig. 2 is a fragmentary view in longitudinal section on an enlarged scale showing details of the tray mounting.

Fig. 3 is a fragmentary detail view in transverse section.

Fig. 4 is a detail view showing the tray and associated insulating blocks in bottom perspective.

Fig. 5 is a view of the shell in top perspective.

The shell **6** comprises a sheet metal box having a back wall **7**, side walls **8** and end walls **9**. In practice an electrical conduit may be provided longitudinally of the back wall **7** as shown at **10**, but this is an optional feature unrelated to the present invention.

At suitable points, the back wall has apertures **11** (Fig. 3) which are covered by cup shaped mounts **12** having central openings for the hooked mounting bolts **13** hereinafter to be described.

The open-ended tray **15** is provided near each end, and ordinarily transversely of its intermediate portion, with notched bracket members **16** which receive the dielectric spools **17** for supporting the heating bars **18** as described in the co-pending application above identified. The trough shaped reflector **20** lies in the tray **15** and is desirably somewhat convoluted for better distribution of the radiant heat reflected thereby.

According to the present invention, the tray **15** is desirably provided along its back with a box-like projection **21** as best shown in Fig. 2. The margins of walls are flanged and welded to the back of the tray as indicated at **22**. This box-like rearward extension of the tray provides a dead-air space therewithin for the improved thermal-insulation of shell **7** from the tray **15** and reflector **20**. The box-like extension **21** further provides at each end flanged channels **23** which may be welded transversely to the rear wall of the tray extension **21** as best shown in Figs. 2 and 4. In each such channel is confined a bar **24** of "Marinite" or the like, "Marinite" being the trademark for a well known asbestos composition material.

Desirably there are at least three such transversely extending channels each confining a bar **24** of the thermal insulating material, three being sufficient for panels of seven feet or thereabouts in length. Projecting from the respective bars and channels are anchorage means which may take the form of rods **25** extending successively through all of the transverse channels and bars for substantially the length of the tray. Each such rod may be provided with a mounting sleeve or grommet **26** protecting it from contact with margins of the sheet metal channels where the rod passes therethrough, reference being made to Fig. 2. I have also shown in Fig. 2 each of the hook bolts **13** engaged over one of the rods **25** in reasonably close proximity to one of the channels **23** and the re-enforcing bar **24** of thermal insulation therein contained.

Additional insulating supports are provided by the bars **27**, likewise made of some suitable thermal insulating material such as the asbestos composition known as "Marinite." These bars **27** are connected by screws or the like at **28** through the back walls of the channels **23** to the contained bars **24**. Since the screw heads are countersunk in bars **27** in the manner clearly shown in Figs. 2 and 3 they do not provide any heat conductive path to the shell **7**.

Each of the hook bolts **13** is provided with a tension nut **29** disposed within one of the cup shaped brackets **12** and accessible through one of the openings **11** of the rear wall **7** of the shell **6**. By tightening the nuts **29**, tension is exerted on the rods **25** to draw the blocks **27** tightly against the rear wall **7** of shell **6** and thereby to hold the tray **15** securely fastened within the shell. Because the channels **23** are not directly engaged with the tray **15**, but are mounted on the rear wall of the rearwardly extending box **21**, the path for metallic conduction of heat from the reflector **20** and the shell **15** is considerably elongated even before the heat reaches channels **23**. These channels have no metallic contact directly or indirectly with the shell. Direct pressure of the channels is transmitted through the asbestos blocks **27**. Tension is communicated through the grommets **26**, rods **25**, hook bolts **13**, and the cup-shaped mounting brackets **12**.

Obviously a principal reason for using the heat insulating bars at **24** is to stiffen the channels **23** and to provide non-metallic support for the grommets **26** and the screws **28**. Thus the use of the insulating material at **24** eliminates several potential lines of metallic heat conductivity and also makes possible the use of relatively lighter metal in the channels **23**.

If desired, lock-nuts **30** may be used on those hook bolts **13** which are accessible at the end of the unit as shown at the left in Fig. 2. As shown at the right of Fig. 2, lock-nuts may be omitted from intermediate hook bolts.

The space provided for wiring at the ends of the units may conveniently be covered, following assembling of the trays and shells, with the cover plates **33**.

I claim:

1. In a heating panel of the type employing a reflector tray and a shell, a mounting which comprises a thermal-insulating block connected to the rear of the tray, a rod extending laterally through the block and providing anchorage means projecting from such block, and an adjustable tension element connected with the shell and engaged with said anchorage means in a position laterally offset from the block and comprising means for drawing the tray toward the shell and engaging the insulating blocks under compression with the shell for supporting the tray therefrom.

2. In a heating panel of the type comprising a shell and a tray-like mounting for heating elements, the combination with said tray-like mounting, of a box connected at the rear thereof and extending toward the shell, a first set of insulating blocks connected to the rear of the box, a second set of insulating blocks connected respectively to the blocks of the first set and engaging the shell, anchorage means projecting laterally from the blocks of the first set, and tension elements connecting the anchorage means with the shell and subjecting to compression the blocks of the second set.

3. In a heating panel of the type which includes an outer shell and a tray provided with heating elements, thermal insulating means for connecting the tray with the shell and including transverse channel means connected with the tray and extending rearwardly therefrom, insulating blocks disposed under compression between the respective channel means and the shell, and tension elements connecting respective channel means with the shell.

4. The device of claim 3 in which the respective channel means are provided internally with thermal insulating bars substantially filling and re-enforcing the channel means, and anchorage means for the respective tension elements extending through said bars and projecting from said channel means and engaged by said tension elements.

5. The device of claim 3 in which said tray is provided with a box-like rearward extension constituting a dead air space and having a rear wall with which the respective channel means are connected.

6. In a device of the character described, the combination with a shell having side, end and rear walls, of a shallow tray substantially spanning the shell between the side walls thereof and comprising heating element brackets and heating elements mounted therein, channel means disposed transversely of the tray at longitudinal spaced points and connected with the tray, thermal insulating bars in the respective channel means, grommets mounted in said bars, rods extending through alined grommets of the several bars and projecting from the channel means, a second set of thermal insulating bars engaged with the several channel means and with rear wall portions of the shell, and hook bolts having connection with the rods and with the shell and drawing the first mentioned insulating bars toward the shell whereby to compress the second mentioned insulated bars against the shell and thereby to position said tray and heating elements.

7. The device of claim 6 in which the rear wall portions of the shell have apertures registering with the hook bolts and provided with cup-shaped mountings disposed within the tray and spanning the apertures and through which the hook bolts extend, each hook bolt having a nut disposed within its cup-shaped mounting means and accessible through the shell wall opening spanned by such mounting means.

8. The device of claim 6 in which the tray has a box-like rearward extension having a wall portion spaced from the tray and with which the respective channels are connected.

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