United States Patent

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[54] **CERAMIC TOP INFRARED COOKING ASSEMBLY**
7 Claims, 7 Drawing Figs.

[52] **U.S. Cl.** **219/464,** 219/460, 219/461, 219/463, 219/553
[51] **Int. Cl.** **H05b 3/68**
[50] **Field of Search** 219/460–461, 463–464, 467, 553; 338/280, 285

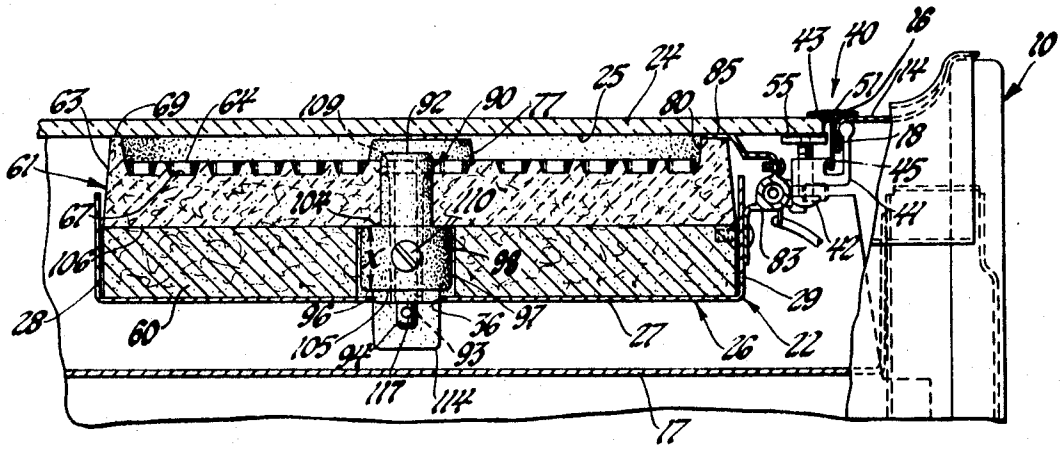
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ABSTRACT: An infrared radiant cooking assembly supported in a range top opening including a frangible glass-ceramic cover plate and an underlying housing for supporting resistance-element heated blocks of inorganic refractor-fiber material in heat-sealed cushioned contact with the undersurface of the cover plate. Resistance element terminal members are provided with the assembly for achieving ready electrical connection with a power source without exceeding the load-bearing capacity of the heater blocks.



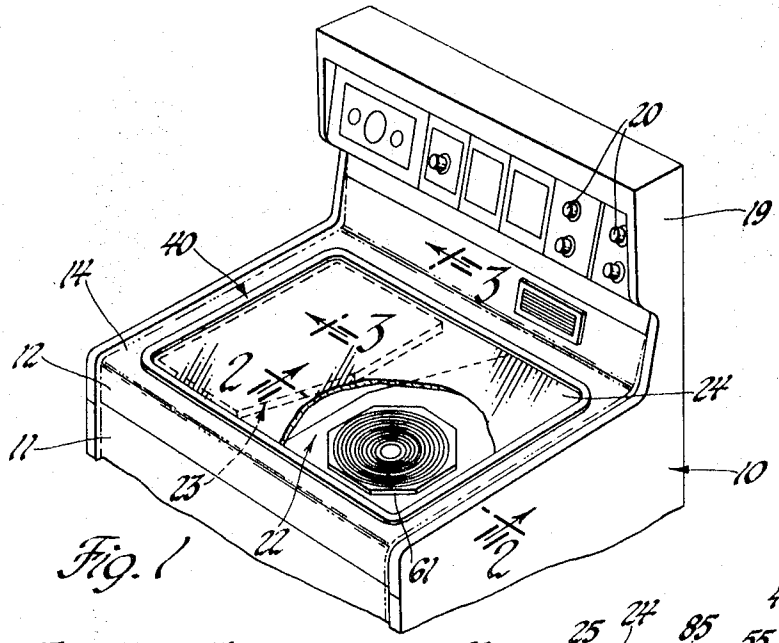


Fig. 1

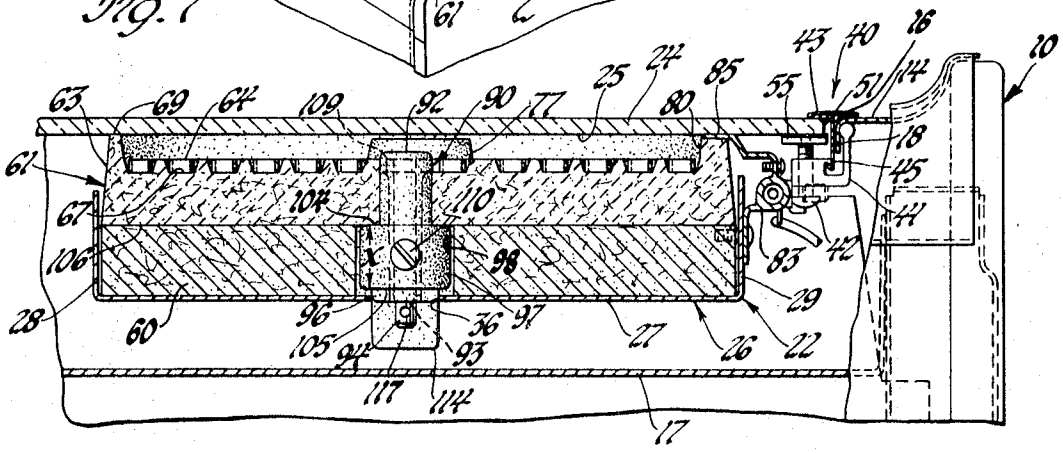


Fig. 2

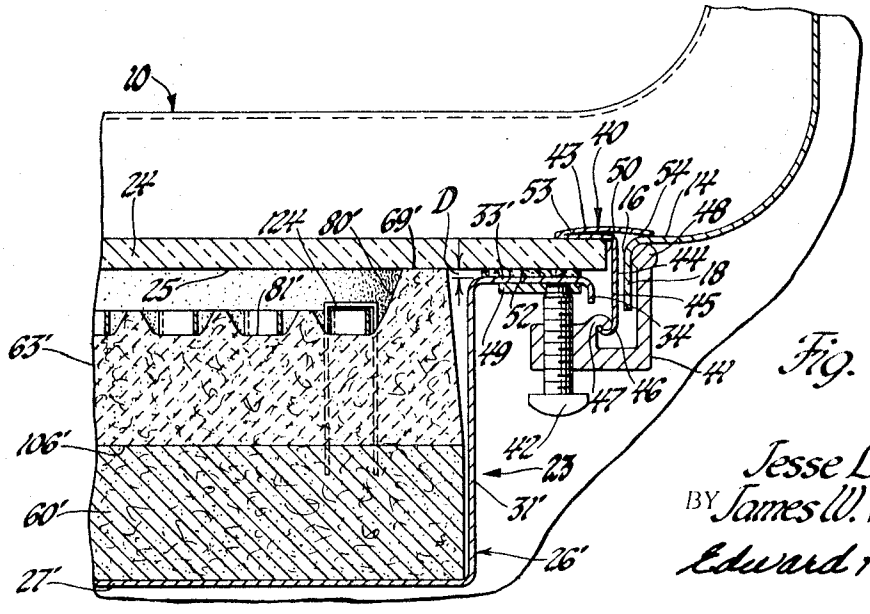


Fig. 3

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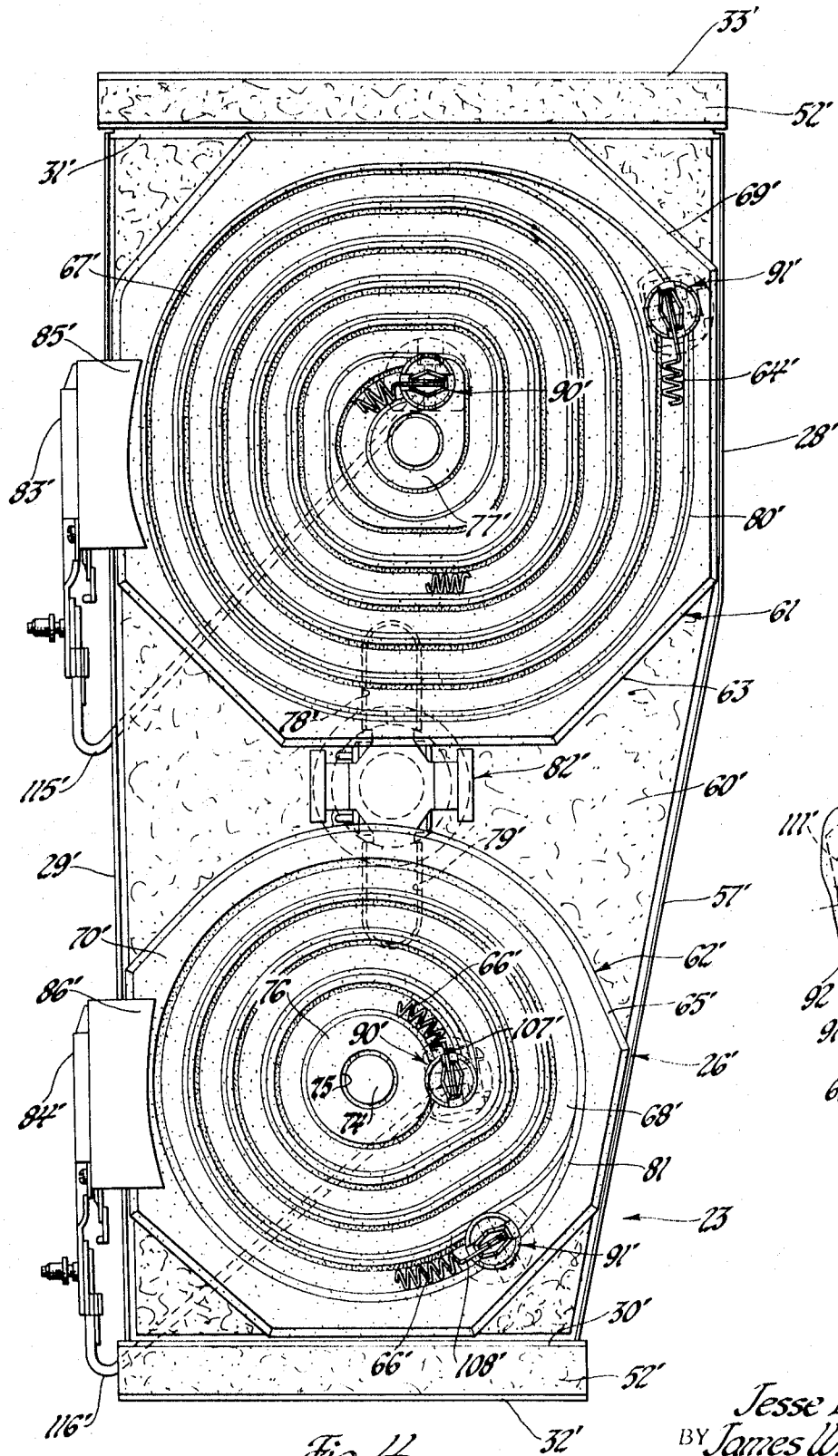


Fig. 4

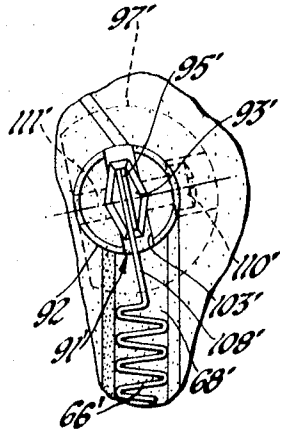


Fig. 5

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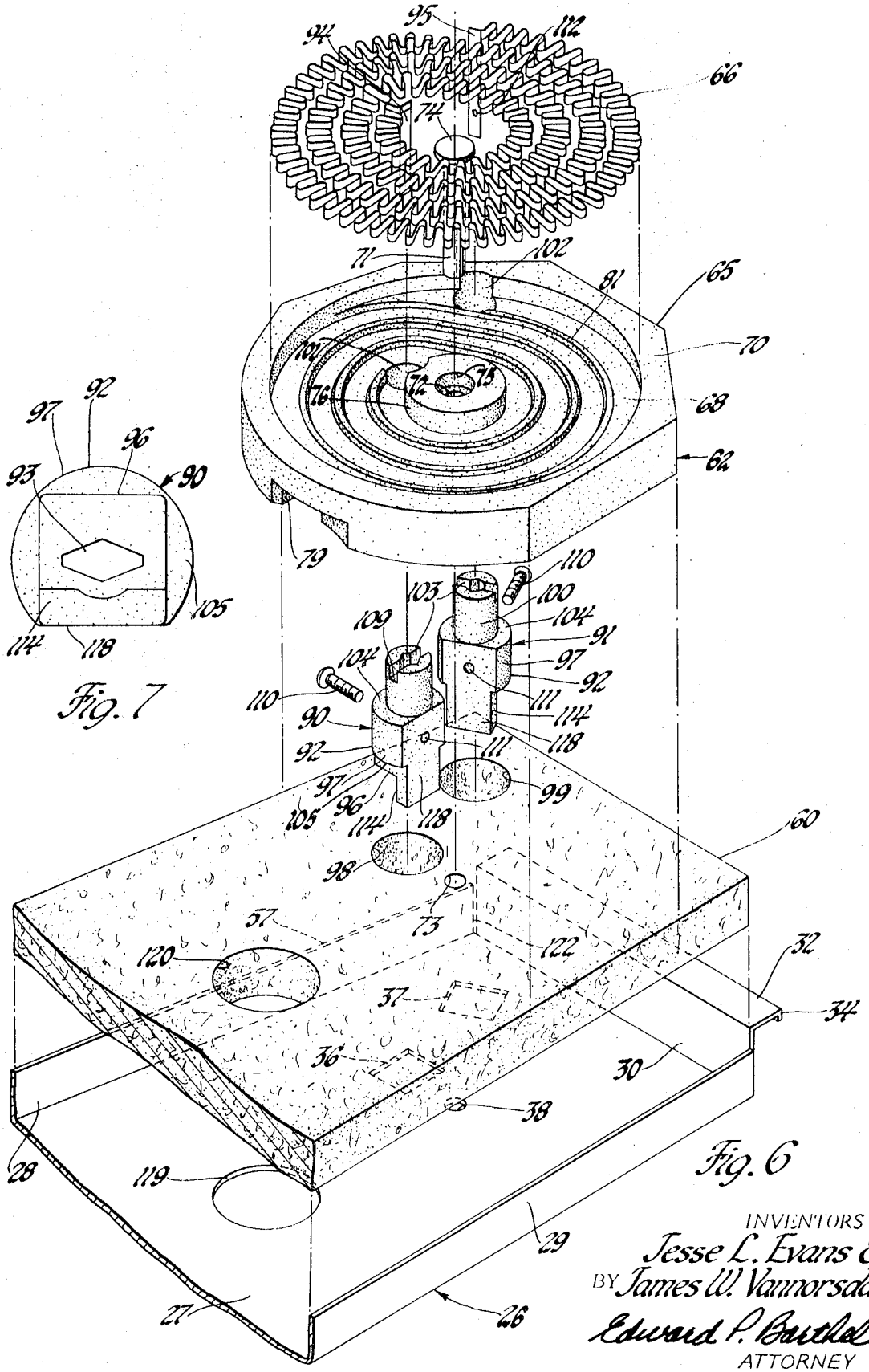


Fig. 6

Fig. 7

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CERAMIC TOP INFRARED COOKING ASSEMBLY

This invention relates to ceramic-top domestic ranges and more particularly to an infrared radiant cooking assembly mounted in cooperation with a free-standing or counter top range.

Infrared radiant heating units for ceramic top ranges incorporating uninsulated electrical resistance elements operated in an unsealed atmosphere, generally referred to as "open coil" type units, require that the elements be located close to the underside of the infrared transmissive glass-ceramic cover plate to minimize radiation loss to the cooking utensil. Furthermore, the elements must be supported in a manner to prevent the support structure from attaining excessive heat buildup and overheating of the range components also producing a heat sink or thermal lag condition resulting in slow arrival at operating temperature and slow cooldown time for the cooking units.

The copending U.S. Pat. application Ser. No. 48,390, filed June 22, 1970, assigned to the assignee of this application for Infrared Radiant Heating Units describes and claims the basic radiant heating unit, and the present invention contemplates the provision of a mounting structure for heating units of this kind. Because of the frangible nature of the glass-ceramic material used for the cover plate, a rigid mounting could cause thermal shock breakage of the plate resulting from excessive stress because of differential expansion between the glass-ceramic plate and the range top into which it is mounted. Furthermore, a cushioned mounting is necessitated to enable the cover plate to withstand high impact blows which may be delivered to the cover plate during normal use.

Accordingly, it is an object of the present invention to provide a cushioned mounting for a ceramic top range structure having an infrared radiant cooking assembly with a frangible glass-ceramic cover plate.

It is another object of this invention to provide a mounting arrangement for a ceramic top range to prevent excessive heat buildup to avoid overheating of the range top and prevent a large thermal heat sink mass to thereby increase heat response time and efficiency for the heating units.

Another object of the invention is to provide a mounting arrangement in a ceramic-top range for a pair of identical cooking assemblies wherein each assembly has unequal sized open-coil radiant heating units and which allows the cooking assemblies to be reversed to provide alternate large and small heating areas at the front and back of the range top.

It is still another object of the invention to provide insulated terminal members for an open coil radiant heating unit supported in fibrous-ceramic heater blocks of a ceramic top cooking assembly whereby the resistance element is readily connected and disconnected with a power source to the terminals without exceeding the load-bearing capacity of the blocks.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein a preferred embodiment of the present invention is clearly shown. FIG. 1 is a fragmentary perspective view of a domestic range with parts broken away to show the location of the heating terminals of the present invention;

FIG. 2 is an enlarged view in section taken along the line 2—2 of FIG. 1;

FIG. 3 is an enlarged view in vertical section taken along the lines 3—3 of FIG. 1;

FIG. 4 is a view in plan of one of the heating assemblies removed from the range;

FIG. 5 is an enlarged plan view of a terminal connector shown in FIG. 4;

FIG. 6 is an exploded view of a portion of one of the heating units; and

FIG. 7 is a bottom elevational view of the insulator portion of the terminal connector.

Referring now to the drawings, in FIG. 1, a domestic range 10 is illustrated having a metal body 11 supporting an upper casing 12 which includes a collar 14 around the top edge thereof forming a top opening 16. As seen in FIG. 2 the top opening 16 is located above upper insulation retainer wall 17 of the range body defined by a continuous depending flange 18 located therearound. The collar 14 merges with the rearwardly located control panel 19 having a plurality of temperature controllers 10 thereon for selectively energizing infrared radiant heating units as described.

A pair of heating or cooking assemblies generally indicated at 22, 23 in FIG. 1 are especially adapted to be installed in spaced side-by-side relationship in the upper casing 12 of the range and located in spaced relation above the upper wall 17 of the range body. As seen by the left-hand heating assembly 23 in FIG. 4, the heating assemblies are generally rectangular in shape for location below the opening 16 with each assembly having its longitudinal axis oriented parallel to the sides of the range. As the heating assemblies 22, 23 are identical in construction, so as to occupy either the left-hand or right-hand operative position, they are shown with the same elements identified with the same reference numerals; the exception being that each reference numeral for the left-hand assembly is primed. Within the top opening 16 is an upper utensil supporting cover plate 24 that defines the complete surface cooking area of the range 10. The cover plate 24 extends throughout the planar extent of the opening 16 and has a continuous planar undersurface 25 that engages the upper faces of a pair of underlying heating units positioned in each of the assemblies 22, 23 in a manner to be described.

It should be shown in conjunction with a free standing range, it is to be understood that the present invention is not intended to be so limited and the assemblies could be used, for example, with a ceramic-top kitchen counter cooking arrangement without departing from the scope of the invention. Furthermore, the invention contemplates a single heating assembly being used with a ceramic-top range or counter providing one or more utensil cooking areas.

The utensil supporting cover plate 24 is preferable formed of high-strength infrared transmissive material such as recrystallized glass-ceramic sold under the trade name Cer-Vit by Owens-Illinois or Hercurit by Pittsburgh Plate Glass. It is to be understood however that other infrared transmissive material such as high-silica glass, for example, could be used in the assembly without departing from the scope of the invention. The cover plate 24 is preferably shown having a rectangular configuration with a length of approximately 25 inches and width of approximately 20 inches providing a smooth-top cooking surface that will accommodate four radiant-heating areas in a manner similar to a conventional range-top having convolute-shaped conduction surface heating units.

Turning now to FIGS. 2, 3 and 4, the heating assemblies 22, 23 each having a housing or pan member generally indicated at 26 comprising a bottom wall 27 provided with marginal sidewalls 28, 29 and end walls 30, 31 upstanding from the bottom wall 27. Each end wall 30, 31 terminates in a substantially horizontal flexible end wall flange 32, 33 outstanding from the top of the end walls 30, 31, respectively, and having downwardly directed lip portions represented at 34' in FIG. 3 for flange 33'. In the preferred form the housings 22, 23 are generally rectangular in plan such that their overall length including the end wall flanges 32, 33 is approximately twice their width.

As indicated above, the cover plate 24 together with the underlying heating assemblies 22, 23 are mounted in the opening 16 substantially flush with the upper surface of collar 14 by a clamping or trim ring assembly comprising a continuous trim ring indicated generally at 40 cooperating with a plurality of L-shaped clips 41 having individual threaded pressure screws 42 extending through tapped holes in the horizontal leg of the clips. As best seen in FIG. 3 the trim ring 40 is substantially T-shaped in cross section and includes a head 43 spanning the gap 44 formed between the range collar 14 and the longitudinal and transverse edges of the cover plate 24, together with a depending stem 45 disposed in the gap. The stem 45 has formed along its lower end a hook portion 46 which provides

shoulder means for interlocking engagement with a cooperating hook portion 47 on the clip members 41.

The clips 41 are dispersed at spaced intervals about the opening 16 to engage the underside of the collar 14 by seating circular bead portion 48 on the vertical leg of the L-shaped clips 41 in the radiused area formed by depending flange 18 of the top opening. The clip pressure screws 42 are taken up to retain the cover plate 24 and the heating assemblies 22, 23 in the opening 16 by means of pressure plates 49 located on the ends of the screws 42 for pressure contact with the underside of the housing end wall flanges 32, 33. The trim ring 40 is utilized to retain and secure the cover plate 24 in its final position by continuously engaging the cover plate border areas adjacent its longitudinal and transverse edges 50, 51 so as to be in continuous contact with the inner and outer bands 53, 54 of the trim ring to provide a sealed ceramic-top range having a pleasing appearance. The resilient support provided by the flexible end wall flanges 32, 33, together with the trim ring assembly, are operative to bias the heating assembly into contact with the cover plate, as will be described.

It is important to have not only a cushioned or impact-absorbing range mounting for the cover plate 24 but also to minimize the transfer of heat from the heating assemblies to provide a low-thermal mass support. Thus, thermal gaskets 52 of suitable resilient-insulating material, such as asbestos or fiberglass, are sandwiched between the undersurface 25 of the cover plate and the upper surfaces of the end wall flanges 32, 33. In the preferred form the thermal gaskets 52 have a thickness of about one-sixteenth inch and are suitably fixed in place on the flange walls 32, 33 such as by high-temperature cement.

Appropriate sealing material, located between underside of the inner 53 and outer 54 band portions of trim ring head 43 and the upper perimeteral borders of the plate 24 and collar 14 provide a liquidtight seal therebetween. In the disclosed form of the invention a material, manufactured by Dow Corning under the trade name RTV Silicone, is used which cures to form a high-temperature rubberlike seal to prevent spillage on either the cover plate 24 or range collar 14 from reaching the underlying heating assemblies 22, 23 via the marginal gap 44.

It will be noted that the heating assemblies 22, 23 are secured to the range collar 14 and cover plate 24 solely at their flexible end wall flanges 32, 33 along the longitudinal edges 50 of the cover plate. As seen in FIG. 2 the transverse borders of the cover plate 24 adjacent edges 51 are retained only to the range collar 14 by means of the trim ring assembly. Annular washer-type pressure members 55, located on the threaded screws 42 spaced along the transverse cover plate edges 51, have a resilient layer on their upper surfaces formed from suitable material such as heat-resistant asbestos to avoid metal-to-glass contact with the cover plate 24.

In the illustrated form of the invention each housing 26 provides a boxlike receptacle defined by its side, end and bottom walls for receiving a resilient or flexible insulation mat 60 of substantial thickness formed from an inorganic fibrous material such as rockwool, glasswool, asbestos fibers or the like. The mat 60 in the preferred embodiment has a compressed thickness of approximately 1 inch and a density of approximately 6 lbs. per cu. ft. As indicated in the plan view of FIG. 4 the mat 60 extends throughout the bottom of the housing 26 conforming to the shape of its bottom wall 27. It will be noted that in the disclosed form the housing 26 has an oblique wall portion 57 forming part of the sidewall 28, to accommodate a smaller size heating unit to be described such that the housing is asymmetrical in configuration about its principal or longitudinal axis.

FIG. 4 shows a plan view of the left-hand oriented heating assembly 23 removed from the range 10 which, as stated earlier, is identical to the right-hand heating assembly 22 so that one set of tools can be used for making both assemblies while also simplifying the inventory problem for replacement parts.

The insulation mat 60 of assembly 23 has located thereon a pair of heating units indicated at 61, 62. Each of the units 61, 62 comprises an electrical and thermal insulating heater block and a resistance element supported thereon with the heating unit 61 having its heater block shown at 63 supporting a convoluted ribbon element 64 while the unit 62 has a heater block 65 supporting a convoluted ribbon element 66. In the disclosed form the continuous ribbon 64 is located within a convolute-shaped groove 67 formed to define an annular heater area approximately 8 inches in diameter while the continuous ribbon 66 is positioned within a convolute-shaped groove 68 to define a heater area approximately 6 inches in diameter.

In the case of the right-hand heating assembly 22 (FIG. 2) it is shown oriented with the larger heating unit 61 at the front of the range while the left-hand assembly 23 has been turned end-for-end to locate the smaller heating unit 62 in a frontal position in the range top. In this way the common assemblies 22, 23 are able to provide alternate small and large surface-heating areas at both the front and rear of the cover plate. It will be observed in FIG. 4 that the larger heater block 63 has a generally octagon shape when viewed in plan locating three of its sides, respectively, adjacent to and parallel with the end wall 31 and sidewalls 28, 29 of the housing member 26. The smaller or 6-inch heater block has an irregular shape in plan to conform to the oblique wall portion 57 of the housing 26, along with the walls 29 and 30.

As seen in FIG. 3 the heater blocks have an overall thickness which when combined with the thickness of supporting mat 60 locates their upper peripheral faces a defined minimal dimension "D" above the housing end wall flanges 32, 33 such that when the clip screws 42 engaging the end wall flanges 32, 33 are tightened, the block peripheral faces 69, 70 are brought into flush pressure contact with the undersurface 25 of the cover plate 24. In the disclosed form the minimal dimension "D" is designed to equal or slightly exceed one-sixteenth inch. The peripheral faces 69, 70 of the heater blocks are thus biased into cushioned substantially heat-sealed pressure contact with the undersurface 25 of the cover plate by means of the clamping forces exerted by the trim ring assembly in concert with the resiliency provided by the flanges 32, 33 combining with the resilient insulation mat 60. It is important to not only establish a cushioned support for the glass-ceramic cover plate to withstand mechanical impacts but also to provide a good heat seal between the heater blocks and the cover plate to minimize the outward flow of heated air from the recessed areas 80, 81 of the blocks to avoid overheating adjacent areas of the range top or other range components.

The heater blocks 63, 65 are retained in the housings 26 prior to the fabrication of the heating assemblies 22, 23 and cover plate 24 within the range top structure by suitable means such as holddown pins 71 (FIG. 6) extending through a central bore 72 in the heater blocks, with aligned bores 73 in the insulation mat 60 and 38 in housing bottom wall 27. A suitable push nut (not shown) is located on the free end of the pin 71 for retention of the heating units in the cooking assembly. The head portion 74 of the pin 71 is retained in a counterbore 75 formed in central upstanding hub portions 76 of the block 65 with the hub 77 of block 63 having a similar structure. The upper faces of the hubs 76, 77 are located to provide a clearance between the bottom surface 25 of the plate and the hub faces which is of the order of 0.03 inch in the instant embodiment.

The heater blocks 63, 65 are preferably cast or molded of low thermal mass fibrous-ceramic refractory material as disclosed in the aforementioned patent application (A–12,299) to provide dish-shaped hollows defining recessed circular areas 80, 81 in the block upper faces 69, 70, respectively. In the preferred form the blocks 63, 65 have substantially identical thicknesses, within casting tolerances, of approximately 1.25 inches. It should be noted that the heater blocks are cast or molded such that tolerances for the block will be on the plus side, i.e., the blocks will actually be of the order of 1.25 inches or more to provide the minimal dimension "D" of one-sixteenth inch referred to above to insure a resiliently biased pressure contact between the cover plate and the peripheral faces 69, 70 of the heater blocks.

To complete the description of the heating assembly of FIG. 4 it will be observed that each of the blocks **63, 65** are formed with opposed cavities **78', 79'**, respectively, to receive one end of central heat-sensing device, indicated generally at **82'**, for operation with a surface-temperature indicator light circuit described and claimed in copending U.S. Pat. application Ser. No. 55,816 filed July 17, 1970, and assigned to the assignee of the present invention. In addition, each heating unit has cover plate temperature cutoff control means indicated at **83, 84**. The control means **83, 84** form no part of the instant invention and are described and claimed in copending U.S. Pat. application No. (A–13,708) assigned to the assignee of the present invention. It should be mentioned that each of the control means **83, 84** has a heat-sensing flange **85, 86**, respectively, that overlies the upper peripheral faces **69, 70** of their associated heater blocks **63, 65**. Because of the low compressive strength of the fibrous-ceramic heater blocks the flanges **85, 86** become embedded in the block faces so as to be substantially flush with the block faces **69, 70** when the clamping force of the trim ring assembly **40** is applied. Thus, the heat-sensing flanges **85, 86** do not interfere with the thermal seal provided between the block faces **69, 70** and the undersurface **25** of the cover plate.

The heater block convolute grooves **67, 68** provide a path for locating the continuous resistance element ribbons **64, 66** such that one end thereof is positioned for electrical connection to an inner terminal member **90** and its opposite end located for connection to an outer terminal member **91**. The terminal members **90, 91** are identical so as to be interchangeable with each other and may be used with either heating unit **61** or **62**, and, where appropriate, like reference numerals will designate like parts of the terminals in all the views of the heating units.

FIG. **2** together with the exploded view of FIG. **6** each shows the terminals **90, 91** comprising an insulating column **92** formed of electrical porcelain or the like provided with an axial chamber **93** for receiving an associated one of the resistance elements vertically extending terminal blades **94, 95** therein. Each insulating column **92** has a generally rectangular base **96** which extends through one of the conforming aperture **36, 37** in the bottom wall **27** of the housing **26**, a central pedestal **97** which is received in one of the circular bores **98, 99** in the insulation mat **60** and an upper reduced annular post **100**. The post **100** extends through heater block bores, as indicated, for example, by the bores **101, 102** for the block **65**, allowing the post to protrude slightly into the recessed areas **80, 81** above the heater block convolute grooves **67, 68**. The insulating column base **96** is preferably square in shape, and when inserted in its associated square aperture **36, 37**, the terminal insulating columns **92** are held against rotational movement while positioning their cross slot **103**, formed in the upper end of posts **100**, in relatively fixed alignment with the inner and outer terminus of convolute grooves **67, 68**. As seen in FIG. **2** the pedestal **97** provides upper **104** and lower **105** shoulders which abut the undersurfaces of the heater blocks, such as undersurface **106** of the block **63**, and the housing bottom wall **27**, respectively, to vertically retain the insulation columns **92** within the heating units **61** and **62** while permitting limited vertical movement of the columns **92** relative to the heater blocks.

The ends of the continuous ribbon-shaped resistance elements terminate in linear portions, indicated at **107'** and **108'** for element **66'** for example (FIG. **4**), and are suitably connected as by welding to the upper end of the blades **94, 95**, respectively, whereby a suitable power source can be connected to the resistance elements for energizing the elements to the desired operating temperature under the setting of the range panel controllers **20**. As seen in FIG. **2** the insulator column **92** positions the bottom surface **109** of the cross slots **103** in substantial alignment with the bottom wall **87** of the heater block convolute grooves **67, 68**.

Each terminal blade **94, 95** is retained in its associated axial chamber **93** by means of suitable fasteners such as screws **110** extending through transverse holes **111** in the central pedestal **97** and aligned holes in each of the blades **94, 95** indicated at **112** in FIG. **6**. This arrangement enables the terminal blades to pivot a small amount within axial chambers **93** about the axis of the screw fasteners **110** relative to their associated insulation columns. Because the insulation columns **92** are not permanently fixed or retained to the heating units **62, 63** a small amount of play or movement exists therebetween. Thus, the small amount of pivotal movement permitted of the blades **94, 95** reduces mechanical or thermal stresses on the soldered electrical connections between the resistance element **64, 66** and the terminal blades.

The insulating columns **92** have a shank portion **114** located along one edge of the base **94** which extends through its associated rectangular opening **36, 37** and provides a guard for the plug-out electrical connection of the leads **115, 116** with the lower exposed portion of the terminal blade. The electrical connector (not shown) is preferably of the snap-on type disclosed for example in U.S. Pat. No. 2,814,926 which engages the aperture **117** (FIG. **2**) of the blade. It will be noted that the shank portions **114** are continuous with planar surface **118** on the central pedestal **97** for ease of casting the insulating columns **92**. The aligned holes **119** in the bottom wall **27** and **120** in the mat **60** are to receive the base portion of the heat-sensing device **82** shown in FIG. **4**.

As a force of the order to 20 pounds may be required to connect and disconnect an electrical connector on the terminal blades **94, 95** it is required that the heater blocks **63, 65** be capable to absorb this force without damage to the terminal members or the heater blocks which, as stated, are formed of low compressive strength fibrous-ceramic material. It will be observed in FIG. **2** that by virtue of having the insulating columns **92** unsecured to the heater blocks and thus allowing for limited vertical movement therebetween, the result is that when an upward axial force is applied to the terminal blades **94, 95** the force will be distributed via the fastener screws **110** to the undersurface **106** of the heater block by the upper pedestal shoulder **104** without exceeding the load-bearing capacity of the heater blocks. To increase the load-bearing capacity of the heater blocks a hardening coating may be applied to the block undersurface **106** adjacent the insulation post bores **101, 102** contacted by the pedestal shoulders **104**. In the preferred form the coating material is a high-temperature cement such as the cement sold under the trademark Sauerseisen Cement.

As seen in FIG. **2** the vertical dimension X of the central pedestal is a predetermined amount less than the compressed thickness of the mat **60** when the heating assembly is properly mounted in the range top by the clamping trim ring **40**. Thus, the shoulders **104, 105** of the central pedestal **97** are not placed in compressive contact between the housing bottom wall **27** and the block undersurfaces to prevent exceeding the load-bearing capacity of the relatively fragile heater blocks molded or cast from inorganic refractory fiber. In the instant form the dimension X is of the order of fifteen-sixteenths inch or approximately one-sixteenth inch less than the compressed thickness of the insulation mat **60**.

Preferably the metal housings **26** are formed from sheet metal blends of galvanized steel or the like having a thickness of approximately 0.024 inch and the sidewalls **28, 29** and end walls **30, 31** are folded 90° out of the plane of the bottom wall **27** to form the boxlike housing. By virtue of this construction there are no physical joints or connections used to secure the vertical edges of the side panels **28, 29** to the vertical edges of the end panels **30, 31** resulting in vertical clearances located at the four corner junctures, indicated at **122** in FIG. **6** for example. It will be appreciated that because of this construction the housings **26** have an added degree of flexibility, together with the end wall flanges, in deforming to assure flush pressure engagement between the peripheral faces **69, 70** of the heater blocks and the undersurface **25** of the cover plate to provide a heat-sealed cushioned mounting between the cover plate and the heating assemblies.

It should be noted that wire staplelike tie members indicated at **124** in FIG. **3** are used to retain the resistance element **64, 66** within their associated convolute grooves **67, 68**. The details and location of the members **124** form no part of the instant invention and reference should be had to the aforementioned copending application Ser. No. 48,390 for a discussion of these retaining members.

While the embodiment of the present invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted.

What is claimed is as follows:

1. In a radiant cooking assembly of the character described for mounting in a range structure including a top wall having an opening therein, said assembly comprising a frangible cover plate of infrared transmissive material including an upper utensil supporting surface, said cover plate positioned in said opening whereby a continuous gap is defined between the edges of said plate and said opening, a lower housing positioned below said cover plate having a bottom wall, end walls and sidewalls defining a boxlike receptacle, said end walls terminating in substantially horizontal flexible end wall flanges extending outwardly therefrom, at least one radiant heating unit supported in said housing on a resilient mat formed of thermal insulating material, said heating unit including a refractory heater block having a substantially planar raised peripheral face defining a central recessed area, said recessed area supporting an infrared emissive electrical resistance element thereon in spaced relation below the undersurface of said cover plate, said heater block supported on said resilient mat such that said peripheral face extends a defined minimum distance above said housing end wall flanges, continuous pressure clamping means positioned in said continuous gap embracing the upper peripheral border of said cover plate and engaging the underside of the top wall, said clamping means operative with the underside of said flexible end wall flanges and the top wall thereby biasing said heater block peripheral face into cushioningly supporting thermal sealed contact with said cover plate.

2. The cooking assembly defined in claim **1**, wherein said cover plate being rectangular in configuration having longitudinal and transverse edges, said housing being generally rectangular in configuration whereby its overall length is approximately twice its width such that said housing supports a pair of heating units, said housing being oriented whereby said end wall flanges are aligned with and adjacent to corresponding longitudinal edges of said cover plate.

3. The cooking assembly as defined in claim **1**, wherein said resilient mat having a thickness of approximately one-half the vertical height of said housing end walls, and said heater block having an overall thickness greater than the thickness of said mat such that said heater block peripheral face is located said defined minimum distance above said housing end wall flanges in said assembly.

4. The cooking assembly as defined in claim **2**, wherein a pair of identical housings are supported in side-by-side relationship below said cover plate, each said housing supporting a pair of heating units therein of dissimilar size, said housings being reversible to occupy either one of the two operative positions for disposing said heating units so as to provide alternate small and large cover plate heating areas at the front and rear of said cover plate.

5. In a radiant cooking assembly of the character described, a range structure including a top wall having a generally rectangular opening therein, said top wall opening defined by a flange depending from said top wall, a generally rectangular cover plate of infrared transmissive material including an upper utensil supporting surface positioned in said opening with said supporting surface located substantially coplanar with said top wall, a continuous marginal gap defined between the longitudinal and transverse edges of said plate and said depending flange, a pair of generally rectangular sheet metallic housings positioned in side-by-side relationship below said cover plate such that the longitudinal axis of said housings are oriented substantially parallel to the transverse edges of said cover plate, each said housing having a bottom wall, end walls and sidewalls defining a boxlike receptacle, said housing overall length being approximately twice its width, said end walls having their upper portions formed into substantially horizontal flexible end wall flanges extending outwardly from said housing, a pair of infrared radiant heating units of dissimilar size supported in each said housing receptacle on a resilient mat formed of thermal insulating material, said mat having a thickness of approximately one-half the vertical height of said housing end walls, each said heating unit including a rigid fibrous-ceramic heater block having a substantially planar raised peripheral face defining a central recessed area, said recessed area supporting an infrared emissive electrical resistance element thereon in spaced relation below said peripheral face, each said heater block having a defined overall thickness exceeding said resilient mat thickness such that said heater block peripheral faces are located a defined minimum distance above said housing end wall flanges, continuous pressure clamping means cooperating with said housing end wall flanges, said cover plate and said top wall for retaining said cooking assemblies in the structure opening, said securing means including a substantially rectangular continuous metal trim ring having a generally T-shaped cross section, said trim ring having a head portion spanning said marginal gap providing an outer horizontal band overlying and sealed to the adjacent perimeteral borders of said top wall and an inner horizontal band overlying and sealed to the adjacent perimeteral borders of said cover plate, said T-shaped trim ring having a vertical stem portion disposed in said marginal gap and having hook means adjacent the lower edge of said stem portion, a plurality of L-shaped clips dispersed beneath said gap along both the longitudinal and transverse edges of said cover plate, said clips having a vertical arm extending upwardly on the outward side of said depending flange engaging the underside of said top wall, each said clip having a generally horizontal body provided with complementary hook means engaging said stem hook means, and pressure screws threaded in said clip bodies having pressure plates thereon engaging, respectively, the underside of said flexible end wall flanges along the longitudinal edges of said cover plate and the undersurface of said cover plate along the transverse edges thereof whereby said cover plate undersurface is biased into impact cushioned heat sealed contact with said heater block peripheral faces.

6. A radiant cooking assembly of the character described, a range structure including a top wall having an opening therein, a frangible cover plate of infrared transmissive material positioned in said top wall opening, a lower housing positioned below said cover plate having a bottom wall, end walls and sidewalls defining a boxlike receptacle, at least one radiant heating unit supported in said housing receptacle on a resilient mat formed of thermal insulating material, said heating unit including a rigid fibrous-ceramic heater block having a substantially planar raised peripheral face defining a central recessed area, said recessed area supporting a continuous infrared emissive electrical resistance element thereon in spaced relation below the bottom surface of said cover plate, said heater block supported on said resilient mat such that its peripheral face extends a defined distance above the housing end flanges, continuous clamping means for biasing said cover plate and said housing receptacle in pressure contact in said top wall opening whereby the thickness of said resilient mat is compressed therebetween, a pair of terminal members electrically connected, respectively, to the free ends of said resistance element, said terminal members each comprising an outer insulation column having an axial chamber receiving a terminal blade therein, said insulation column having a central pedestal portion, a reduced upper annular-shaped post portion and a rectangular-shaped base portion, each said post extending through a bore in said heater block, said base portion positioned in a conforming rectangular aperture in said housing bottom wall such that each said insulation column is

retained against rotational movement, said pedestal portion providing upper and lower shoulders for abutting the underside of said heater block and said housing bottom wall, respectively, to permit limited vertical movement of said insulation column relative to said heater block, and means for pivotally mounting said connector blade in fixed vertical relation in said insulation column chamber whereby axial forces applied to said terminal blade are resisted alternatively by said pedestal shoulders to allow ready electrical connection and disconnection from said blade without exceeding the load-bearing capacity of said heater block.

7. The radiant cooking assembly as defined in claim 6, wherein said pedestal portion having a vertical height slightly less than the compressed thickness of said resilient mat whereby forces exerted by said continuous clamping means will not be applied to said upper and lower pedestal shoulders.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,612,829 Dated October 12, 1971

Inventor(s) Jesse L. Evans and James W. Vannorsdall

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, line 12, "the" should be -- their --;
line 57, "terminals" should be -- assemblies --.

Column 2, line 6, "10" should be -- 20 --;
line 28, after "be" insert -- noted that while the heating assemblies 22, 23 are --;
line 36, "preferable" should be -- preferably --
line 39, "Hercurit" should be -- Hercuvit --;

Column 6, line 25, "to" (first occurrence) should be -- of --.

Signed and sealed this 27th day of June 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents