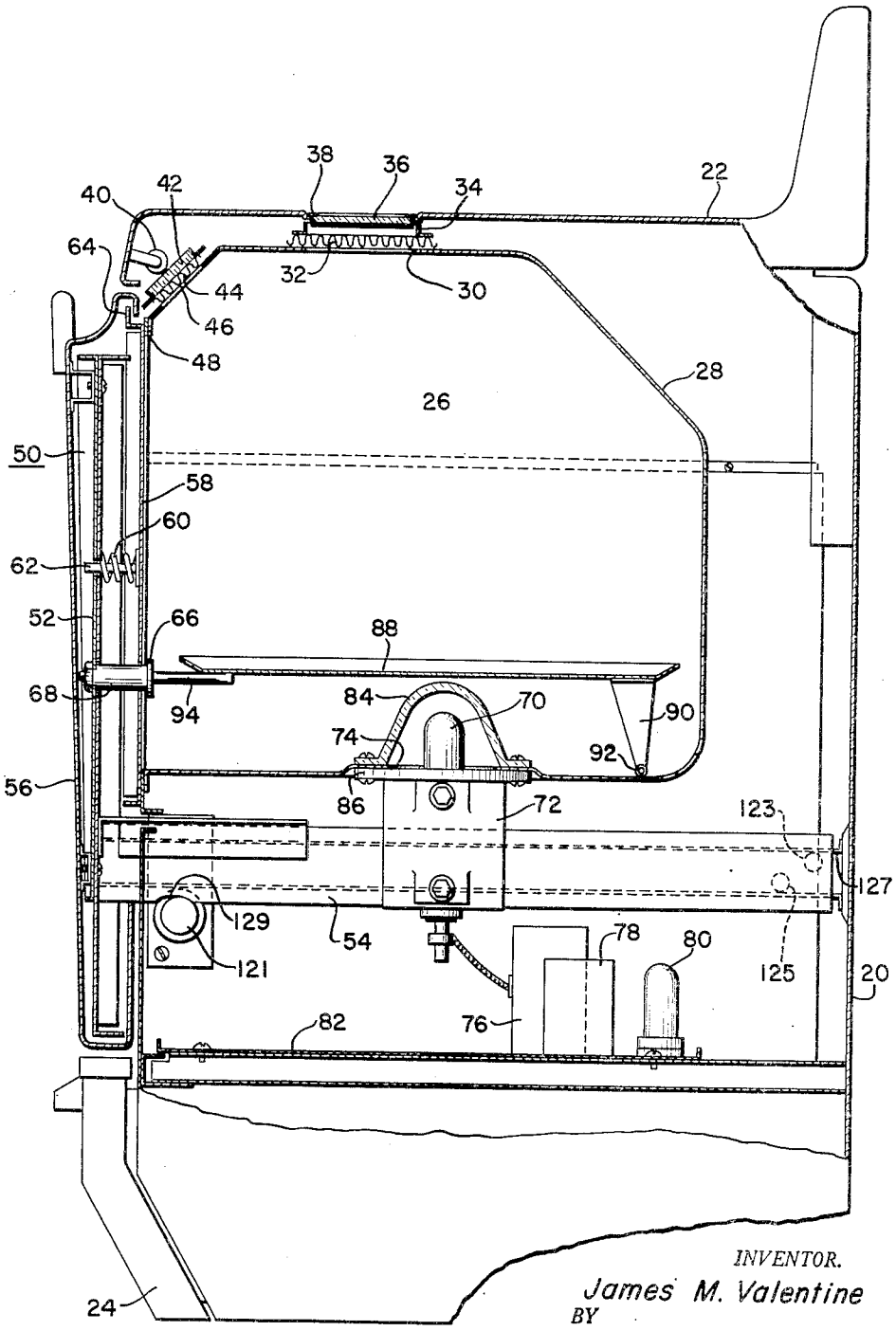
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DOMESTIC APPLIANCE

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DOMESTIC APPLIANCE

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This invention relates to a domestic appliance and more particularly to electronic ovens.

In electronic ovens it has been customary to use some form of wave guide to carry the electromatic wave energy from the dipole radiator of the microwave generator tube into the oven. The wave guide has been constructed in such a way as to obtain proper impedance matching.

It is an object of my invention to provide a more simple arrangement in which the wave guide is substantially eliminated and yet the arrangement provides proper impedance matching.

It is another object of my invention to locate the dipole radiator of the microwave generator tube directly in the oven and to properly match the impedance of the apparatus and to evenly distribute the electromatic wave energy throughout the oven.

It is another object of my invention to place a solid metal food holding tray over a microwave power tube in an oven in such a way as to match the impedance and evenly distribute the wave energy within the oven.

It is another object of my invention to provide a tray in the oven over the dipole radiator of the microwave generator tube and to connect the tray to the door in such a way that the tray is pulled out of the oven when the door is opened.

As shown in the drawing, these objects are attained by providing the electronic apparatus beneath the oven and having the dipole radiator of the microwave magnetron generator tube extend through the bottom wall of the oven into the oven compartment. Over the dipole radiator there is provided a metal food holding tray which has its edges spaced from the side and rear walls of the oven and from the door at the front of the oven a proper distance so as to make the tray combine with the bottom wall and the adjacent vertical metal walls of the oven to form a parallel plate transmission system which accomplishes the impedance match and distributes the energy from the dipole radiator evenly within the oven. The oven door pulls out like a drawer and the metal food holding tray pulls out with it. The rear end of the tray is provided with a support having rollers which roll on the bottom of the oven to support the rear end of the tray.

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 form of the invention is clearly shown.

In the drawing:

The figure is a vertical sectional view partly diagrammatic of an electronic oven embodying one form of my invention.

Referring now to the drawing there is shown a range shell 20 provided with a range top 22 and a drawer 24 at the bottom. Directly beneath the range top 22 there is provided an oven compartment 26 which is enclosed on the top, bottom, rear and sides by the metal oven liner 28. The top of the oven liner 28 is provided with an opening 30. Extending over this opening is a metal

screen 32 which rests upon the edges of the opening 30. This metal screen prevents the escape of radiant energy from the compartment 26 through the opening 30. A flanged ring 34 rests on top of the screen 32 and clamps the screen tightly into engagement with the portion of the oven liner 28 immediately surrounding the opening 30. Above the screen 32 is a sight-glass or window 36 supported by a flanged ring 38 within an aperture in the range top 22 concentric with the flange ring 34. The glass 36 and the flange ring 38 may be removed readily by lifting it upwardly directly out from its position in the range top 22 so that it may be washed.

The oven 26 is illuminated by an electric light 40 beneath the front portion of the range top 22. It is protected by a glass window 42. A metal screen 44 extends over the opening 46 through which the light is transmitted into the oven compartment 26. The screen 44 prevents the escape of radiant energy through the opening 46 in the liner 28.

The front opening 48 of the liner 28 is closed by a door 50. This door 50 includes an inner frame 52. To this frame is connected a roller drawer type support 54 located beneath the oven compartment 26. The supports 54 ride upon two rollers 121 below the oven liner 28 near the front of the range. Each of the supports 54 is provided with an upper roller 123 and a lower roller 125. These rollers ride in channels 127 on opposite sides beneath the liner 28. The supports 54 have shallow notches 129 on their lower surface located as shown in the drawing so that the inclined rear surface of the notch resting upon the roller will hold the door 50 in closed position with sufficient force to hold the plate 58 tightly in engagement with the perimeter of the door opening in the liner 28. This drawer type support makes it possible to open the door 50 in a manner like a drawer. An outer ornamental panel 56 is fastened to the framework 52 to provide an ornamental front for the range. The door 50 includes a floating inner plate 58 which is normally urged outwardly by two compression type coil springs which extend between the plate 58 and the frame 52 and each surrounds a pin 62. The pins 62 each have one end fastened to the plate 58 while the other end projects through an aperture in the frame 52.

The plate 58 at its upper edge is provided with an outwardly extending offset 64 which is prevented from free outward movement by the inturned upper flange of the outer panel 56 of the door 50. The lower portion of the panel 58 is limited in its outward movement by two nuts 66 threaded upon two studs 68. The studs 68 are fastened to the frame 52 of the door 50 and each extends through an aperture in the plate 58. The springs 60 normally urge the plate 58 firmly into contact with the edges of the oven liner 28 surrounding the front opening 43 so as to prevent the escape of wave energy when the door 50 is in the closed position.

In accordance with my invention, the dipole radiator 70 of the microwave magnetron generator tube 72 is located directly in the bottom of the oven compartment. The bottom of the liner 28 is provided with an opening 74 for this purpose. The microwave magnetron generator tube 72 is connected to the remaining portions of the electronic oscillator apparatus which may include a plate transformer 76, a filament transformer 78 and rectifier tubes 80 which may be supported upon a bottom shelf 82 within the range shell 20 above the bottom drawer 24. To prevent damage to the dipole radiator, it is covered by a cover 84 of some suitable plastic material which can be readily removed to remove the dipole radiator 70 from within the oven. The magnetron generating tube 72 has its flange 86 connected to the portion of the oven liner 28 immediately surrounding the

opening 74. The flange of the cover 84 is also connected to the same portion of the liner 28 immediately surrounding the opening 74.

To form a parallel plate transmission system in the most simple and efficient manner possible, there is provided a solid metal tray 88 supported parallel to the bottom of the over liner 28 within the compartment 26 over the dipole radiator 70 and its transparent glass or quartz cover 84. This metal food holding tray 88 has its edges spaced from the side and rear walls of the oven liner 28 and from the plate 58 a proper distance so that there is a proper impedance match. The wave energy is transmitted from the dipole radiator 70 around the edges of the tray 88 onto the food in the tray 88 and other portions of the oven compartment to cook the food by microwave energy. In this way an even distribution of energy is obtained so that the food will be cooked evenly.

The rear end of the tray is provided with brackets 90 adjacent each corner. At the bottom of each of these brackets is provided a roller 92 which rolls upon the bottom of the oven liner 28. The front edge of the tray 88 is connected by a bar 94 to the stud 68 upon the door 50 so that the front edge of the tray 88 is firmly supported. By this arrangement the tray 88 is supported parallel to the bottom of the liner 28. Since the door 50 pulls out like a drawer, the tray 88 will remain parallel when the tray 88 is pulled out by the opening of the door 50. This makes the food on the tray readily accessible at all times. This arrangement also makes it possible for a cook without any electrical experience to replace the microwave generator tube 72 in case the tube fails.

While the form of embodiment of the invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted as may come within the scope of the claims which follow.

What is claimed is as follows:

1. An electronic oven including metal walls enclosing an oven compartment, said metal walls including a door having a metal wall portion for completing the enclosure of the compartment, a combined horizontal metal shield and food supporting tray spaced above the bottom of the oven and having its edges spaced from the metal walls of the oven compartment, the central portion of the bottom wall having an opening therein, and an electromatic wave generating apparatus including a microwave power tube having a portion extending through said opening into the space above the bottom of the oven compartment beneath said metal shield for discharging wave energy into the oven compartment.

2. An electronic oven including metal walls enclosing an oven compartment, said metal walls including a door having a metal wall portion for completing the enclosure of the compartment, a combined horizontal metal shield and food supporting tray spaced above the bottom of the oven and having its edges spaced from the metal walls of the oven compartment, the central portion of the bottom wall having an opening therein, and an electromatic wave generating apparatus including a microwave power tube having a portion extending through said opening into the space above the bottom of the oven compartment beneath said metal shield for discharging wave energy into the oven compartment, and a cover of glass extending over said opening and covering said tube.

3. An electronic oven including metal walls enclosing an oven compartment, said metal walls including a door having a metal wall portion for completing the enclosure of the compartment, horizontal guide means for guiding the door laterally to its open position, a combined horizontal metal shield and food supporting tray spaced above the bottom of the oven and having its edges spaced from the metal walls of the oven compartment and the door, said shield being connected to the door to move outwardly with it, and an electromatic wave generating apparatus including a microwave power tube having a portion located above the bottom of the oven compartment beneath said metal shield for discharging wave energy into the oven compartment.

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