Sept. 9, 1952 E. A. RUTENBER ET AL 2,610,281

ELECTRIC RANGE HEATING ELEMENT SUPPORTING STRUCTURE

Filed May 27, 1949 2 SHEETS—SHEET 1

Fig. 1

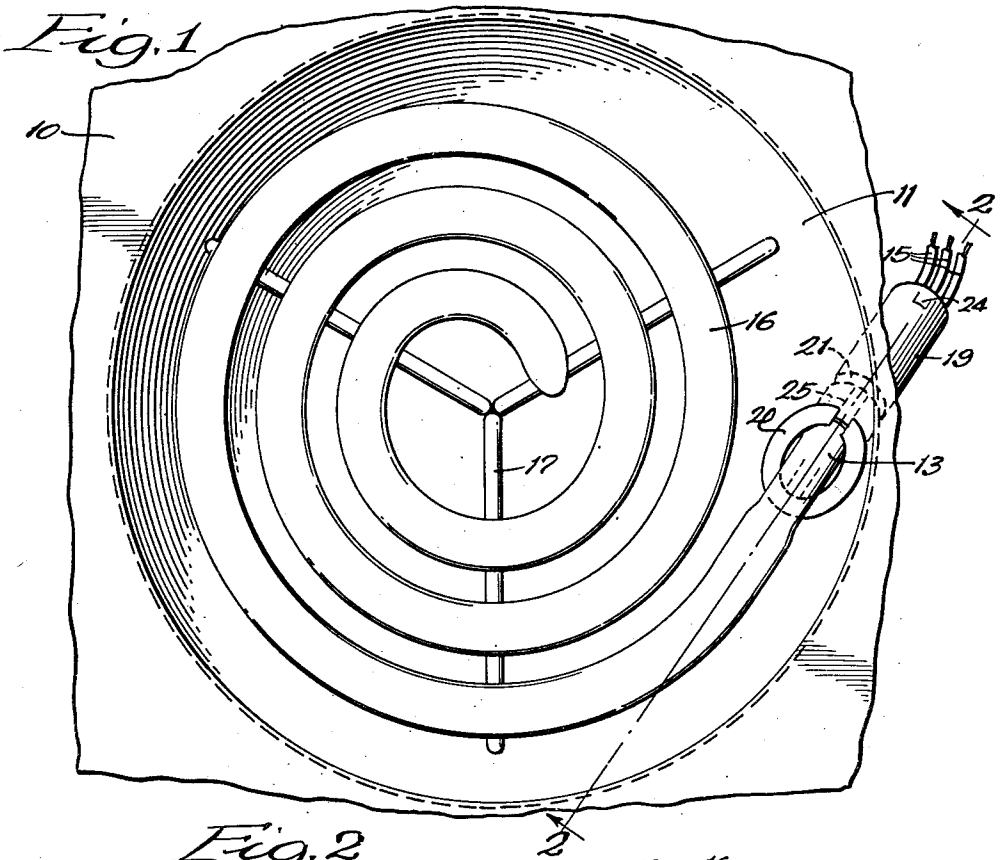


Fig. 2

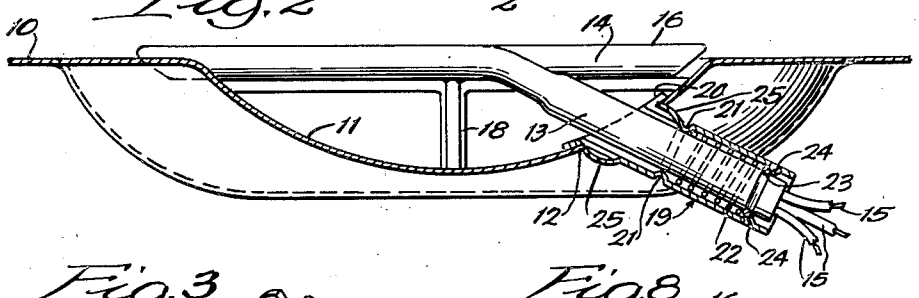


Fig. 3

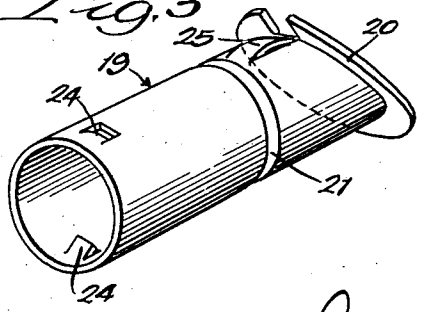
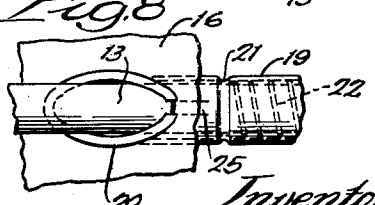


Fig. 8



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ELECTRIC RANGE HEATING ELEMENT SUPPORTING STRUCTURE

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Fig. 4

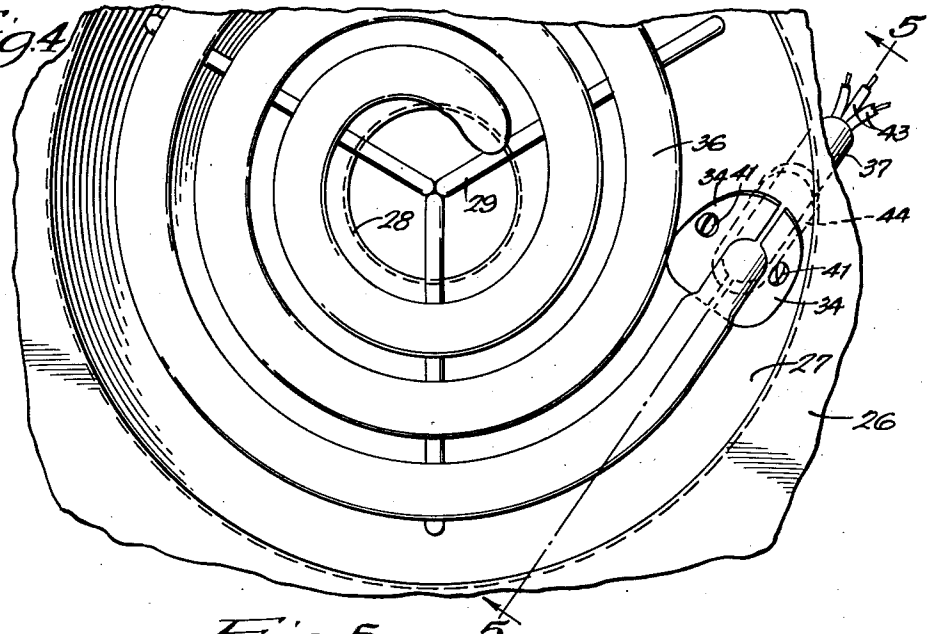


Fig. 5

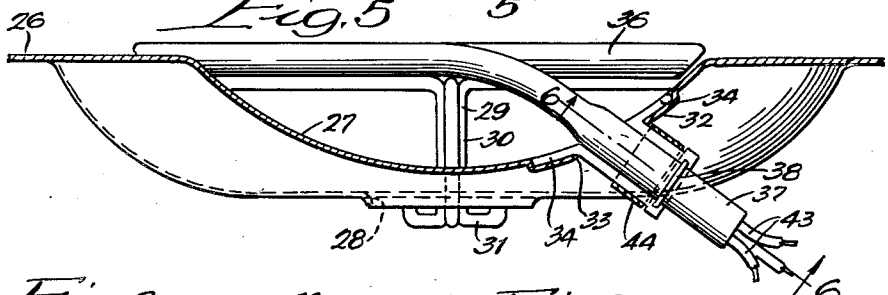


Fig. 6

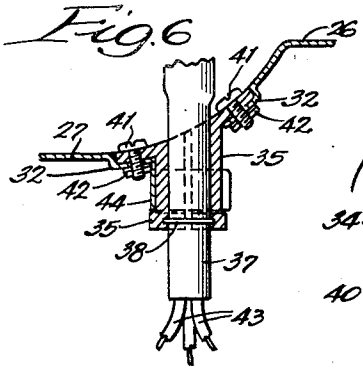


Fig. 7

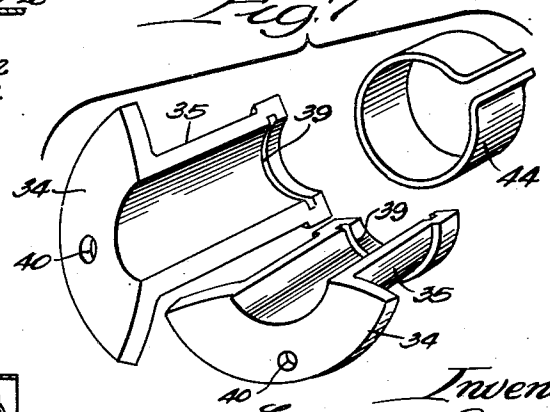
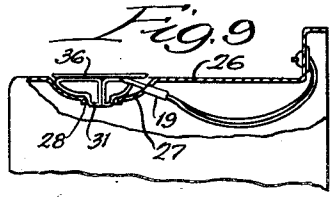


Fig. 9



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UNITED STATES PATENT OFFICE

2,610,281

ELECTRIC RANGE HEATING ELEMENT SUPPORTING STRUCTURE

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Application May 27, 1949, Serial No. 95,856

2 Claims. (Cl. 219—37)

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This invention relates to an electric range heating element supporting structure. The invention is particularly useful in connection with a reflector pan formed integrally with the range top and providing a sleeve for rotatably supporting the post or sheath of the heating or cooking element.

An object of the invention is to provide a structure in which the reflector pan of the range top provides a sleeve for rotatably supporting the heating or cooking element. Another object is to facilitate assembly line production of ranges by providing a mounting for an electric cooker element which may be assembled with the element and its appended wires by insertion from above into an aperture in the range top, the mounting being frictionally held in said aperture. A further object is to provide a structure in which a reflector pan is formed integrally with the range top and which provides an attachable sleeve for supporting the heating element in its position above the reflector pan and in a tilted position away from the reflector pan while the pan is being cleaned.

Another object is to provide a mounting structure for the burner which can be assembled to the recessed portion of the range by push-in engagement from the upper side of the range top. Still another object is to provide a sleeve mounting for a burner, the complete bearing for which is imposed upon the integrally recessed portion of an electric range top.

A still further object is to provide novel means whereby a post forming a rigid extension of the heating element is extended through an opening in the reflector pan and assembled with a sleeve which is attached to the pan about said opening. Still another object is to provide a range top having an integral reflector pan with depressed portions formed therein and receiving the flanges of a supporting sleeve for receiving the rigid post of a heating element, the inner surfaces of said flanges lying flush with the inner face of said reflector pan.

Another object is to provide an improved range top, reflector pan and heating element support, in which the heating element and reflector pan parts are rotatably supported with respect to each other while utilizing a minimum of structure and parts which enable a rapid assembly to be accomplished. A still further object is to provide a reflector pan and heating element structure in which a rigid portion of the heating element is passed through a sleeve carried by the reflector pan, the element being urged inwardly by spring

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pressure but being extensible against the force of said spring, and thus providing a virtual universal joint bearing which permits slight vertical burner adjustment laterally of the bearing and above the recess. Other specific objects and advantages will appear as the specification proceeds.

The invention is shown in illustrated embodiments by the accompanying drawings, in which—

Figure 1 is a broken top plan view of a reflector pan and heating or cooking element embodying our invention; Fig. 2, a sectional detailed view, the section being taken, as indicated, at line 2—2 of Fig. 1; Fig. 3, a perspective view of the sleeve which is attached to the reflector pan; Fig. 4, a broken top plan view of a modified form of reflector pan and heating element supporting structure embodying our invention; Fig. 5, a sectional detailed view, the section being taken, as indicated, at line 5—5 of Fig. 4; Fig. 6, a sectional detailed view, the section being taken, as indicated, at line 6—6 of Fig. 5; Fig. 7, a perspective view of the sleeve parts and clamping ring, such parts being shown in spaced-apart relation; Fig. 8, a fragmentary plan view of a part of the apparatus of Fig. 1; and Fig. 9, a diagrammatic showing of the manner in which our invention permits the wiring connections of an electric range to be made at the rear portion thereof, rather than under the range top.

In the illustration given in Figs. 1 to 3, inclusive, 10 designates the top of an electric range and 11 designates a reflector pan integrally formed with the top 10. It will be understood that the top 10 may be provided with a number of reflector pans, and the single reflector pan is set out merely as an illustration. The range top and the reflector pan or pans may be formed of steel or other suitable material and may be covered with enamel, if desired. Special rust-resisting metals, such as stainless steel, Monel steel, etc. may be employed.

The reflector pan 11 is provided on one side with an opening 12 adapted to receive a rigid post 13 forming an extension of the heating element 14. The heating element 14 may be of any suitable construction. In the specific illustration given, the heating element 14 is in the form of a coil formed of a rigid sheath enclosing electric resistance elements to which current is supplied by the electric wires 15. Resistance elements are carried within the sheath, and the sheath provides a rigid supporting structure for the resistance elements. The top of the coil portion of the sheath is preferably flat, as indicated

at 16. Since the sheath type heating element described is of well-known construction, a detailed description herein is believed unnecessary. We prefer to extend the sheath of the heating element 14 to provide the downwardly extending post 13, the sheath being thus integral with the element 14 and being preferably circular in cross section.

Any suitable support within the reflector pan for carrying the heating element 14 in the horizontal position illustrated may be employed. In the illustration given, however, we provide a wire support 17 formed of three wire legs having abutting downwardly-turned central post portions 18 united by welding or other suitable means. The bottoms of the posts 18 rest against the bottom of the reflector pan 11, while the outer ends of the horizontal portions of the support 17 bear against the upper surfaces of the reflector pan 11. This wire support or spider 17 supports most of the weight of element 14 and of cooking utensils resting thereon. It is disclosed in the pending U. S. patent application, Serial No. 83,481, of Charles J. Gibson.

We now wish to describe the sleeve structure by which the post 13 of the heating element 14 is rotatably carried upon the reflector pan 11. In the illustration given, we provide a tube 19 having annular flanges 20 adapted to rest against the inner surface of the pan 11. As shown best in Figs. 3 and 8, the flange 20 is curved in an arcuate shape conforming to the surface of pan 11. If desired, the pan 11 may be recessed to receive the flanges 20. Also, the flanges 20 may be of slightly flexible or resilient material or may have slightly flexible connection with the tube 19 for the purpose of permitting small variations in the lateral position of the tube 19 so as to eliminate stresses upon the burner in operation. The sleeve or tube 19 is preferably indented at 21 to provide a bearing for receiving the post 13 and also for providing an abutment for the upper end of the spring 22. The lower end of spring 22 is supported by a ring 23 secured to and received within a recess of the post 13.

The ring 23 and the post 13 are held within the sleeve 19 by the inwardly-turned fingers 24. In order to lock the sleeve 19 firmly within the recess opening 12 of the reflector pan 11, we provide the sleeve 19 with an outwardly-turned spring band 25, as shown more clearly in Figs. 2 and 3. When the sleeve 19 is forced downwardly through the opening 12, the resilient band 25 yields and then springs back into position to form the catch or lock, which is shown more clearly in Fig. 2. As may be seen from Fig. 8, the shape of the aperture in pan 11 which receives sleeve 19 is elliptical and the co-operating action of the elliptical aperture, the arcuate flange 20 and the spring band 25 is to hold the sleeve 19 securely in place without necessity for an elongated bearing or other supporting means on the under side of pan 11.

Operation

In the operation shown more clearly in Figs. 1 to 3, inclusive, the parts may be assembled as follows: Initially, the fingers 24 are left in a straight position and in alignment with the body of sleeve 19, and the electric wires 15 and post 13 are extended through the sleeve 19 and preferably with the post extending beyond the lower end of the sleeve. The sleeve 19 is equipped with the retainer ring 23 and with the spring 22 mounted thereon. The sleeve 19 is pressed downwardly to bring the spring catch 25 below the lower edge of the reflector pan 11, as shown in Fig. 2, so that the sleeve is thus securely assembled upon the reflector pan. The flanges 20 bear against the inner surface of the reflector pan over a wide area and thus provide a stabilized support for the sleeve upon the reflector pan. The post 13 is next drawn upwardly to the position shown in Fig. 2 so as to compress slightly the spring 22 against the indentation or shoulder 21. The fingers 24 are then pressed inwardly to the position illustrated in Figs. 2 and 3 so as to lock the post 13 against downward movement, while at the same time permitting rotation of the post.

In use, the heating element 14 may be swung to a tilted position at one side of the reflector pan so as to facilitate cleaning of the pan. Since the post 13 extends generally in a tangential direction with respect to the coiled heater 14, the rotation of post 13 brings the heater coil 14 to a tilted position along one side of the reflector pan. The wire support 17 may be lifted out and the interior of the pan readily cleaned. In the latter rotational movement, the tilting of the heating element can be facilitated by drawing the heating element slightly outwardly against the force of spring 22. When the heater coil is returned to its horizontal position, the spring 22 draws it tightly against the support 17. The spring 22 not only seats the heating element 14 in its horizontal position, but also tends to maintain the heating element 14 in its vertical or tilted position when the post 13 has been rotated, as above described.

Although the seating of sleeve 19 is secure, it is not rigidly immovable in the lateral direction, since spring band 25 can yield under pressure. As a result, if some small irregularity in manufacture or other distortion causes spider 17 to fail to seat firmly on three points in the pan with the burner in its normal position, the burner can move slightly when loaded with a utensil without placing any great stress on the burner sheath itself, since the burner shifts enough to seat the spider firmly on pan 11 and spring band 25 gives enough to let sleeve 19 move with post 13, thus avoiding stress on the burner element.

In the modification shown in Figs. 4 to 7, inclusive, the range top 26 is shown provided with an integral reflector pan 27, having a flanged opening 28. The wire support 29 is similar to support 17, except that the lower ends of the vertical post 30 are turned outwardly and upwardly to provide guides 31 which lock the support within the flanged opening 28 and tend to maintain the support 29 in the desired horizontal position illustrated in Fig. 5.

The reflector pan 27 is provided with a depression 32 about an opening 33, the depression being adapted to receive the flanges 34 of a two-part sleeve 35.

The heating element 36 is similar to the heating element 14 and is similarly provided with a post portion 37, which is preferably rounded in cross section. The post 37 is also preferably provided with a ring or circular flange 38 rigidly secured thereto.

The two-part sleeve 35, as shown more clearly in Fig. 7, is provided, at its bottom, with circular recessions 39 adapted to receive the flange 38 of post 37. Each of the flanges 34 is provided with an aperture 40 through which may be extended a bolt 41, having its inner surface threaded and receiving a nut 42, as shown more clearly in Fig. 6.

In the assembly of the parts shown in Figs. 4 to 7, inclusive, the sleeve parts **35** may be placed loosely in position, as illustrated in Fig. 4, and the electric wires and the post **37** extended through the sleeve parts. The ring or flange **38** of the post **37** may be inserted within the slots or recessions **39** of the lower portions of parts of sleeve **35** while these parts are drawn slightly apart, and then the sleeve portions may be pressed together and locked by any suitable means. In the illustration given, we provide a clamping spring **44**, which may be pressed about the sleeve halves **35** when they are assembled so as to receive the flange or ring **38** of post **37**. The bolts **41** may then be extended through the openings **40** of the flanges **34** and secured by nuts **42**, as shown more clearly in Fig. 6.

The heating element **36** is similar to the heating element **14**, which has already been described, and the post **37** thereof similarly extends in a tangential direction with respect to the circular or coiled element **36**. Upon rotation of the post **37**, the heating element **36** is swung to a tilted position lying across one edge portion of the reflector pan **27**. While in this vertical position, the wire support **29** may be lifted out of the reflector pan and the pan may be readily cleaned. It will be noted that the recessing of the pan at **32** to receive the flanges **34** of the sleeve parts **35**, brings the top surfaces of the flanges **34** into a line flush with the inner surface of reflector pan **27**, so that the interior surface of the reflector pan can be thus cleaned effectively in a minimum of time. At the same time, the inner surfaces of the sleeve parts **35** snugly engage the circular post **37**, so that the opening through the pan **27** is thus closed by the sleeve and the post.

Disassembly of the sleeve may be accomplished by removing the clamping spring **44** and, after removal of the bolts **41**, spreading the lower ends of the sleeve parts **35** to free the flange **38** of the post **37** from engagement thereat. The post **37** may be then drawn upwardly to separate it from the sleeve.

In the structure described, it will be understood that the electric wires **43** and **15** may be extended, as shown in Fig. 9, through the open end of sleeve **19** or **35** and thence to make connection with contacts in a junction box mounted at the rear of the range. In any event the wires will be sufficiently loose to permit the turning movements above described, as well as the extension of the post **13** as described in connection with Figs. 1 to 3, inclusive.

In the foregoing structures, the integral reflector pans are utilized to provide a sturdy support for the heating elements for movement to the tilted and horizontal positions illustrated, while at the same time the sleeves, for permitting such rotational or longitudinal movements of the posts, are readily assembled with the reflector pan and posts for the effective support described.

While, in the foregoing specification, we have set forth specific structures in considerable detail for the purpose of illustrating the invention, it will be understood that such details of structure may be varied widely by those skilled in the art without departing from the spirit of our invention.

We claim:

1. In an electric range, a top equipped with an integral reflector pan depressed below the line of said top and having an opening extending through one side thereof, a support in said pan, an electric heating element carried by said support and having a peripheral edge portion thereof equipped with a rigid post extending through said opening in the side of the reflector pan, and a sleeve rotatably receiving and connected to said post, said sleeve having flanges engaging the inner surface of said reflector pan, and said reflector pan being recessed to receive said flanges whereby the inner surface of the flanges lies flush with the adjacent portions of the inner surface of the reflector pan.

2. In a structure of the character set forth, a reflector pan forming a depression in a range top and provided with an opening extending laterally therethrough, said pan having a depression about said opening, a sleeve equipped with flanges received within said depression and having their upper surfaces flush with the adjacent portions of said reflector pan, a heating element, a removable support within said reflector pan for supporting said heating element, said heating element having a rigid post portion extending downwardly and at an inclination therefrom and through said sleeve, and cooperating flange and groove members carried by said sleeve and post and rotatably supporting said post upon said sleeve.

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HARLEY TILLAPAUGH.

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