Aug. 13, 1957 J. R. G. COVERT 2,802,927

SURFACE HEATING UNIT

Filed Sept. 29, 1955

FIG. 1

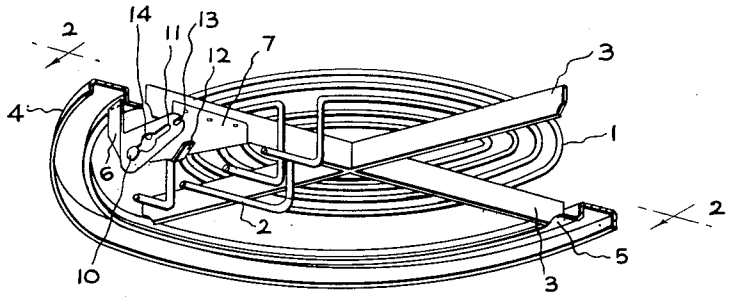
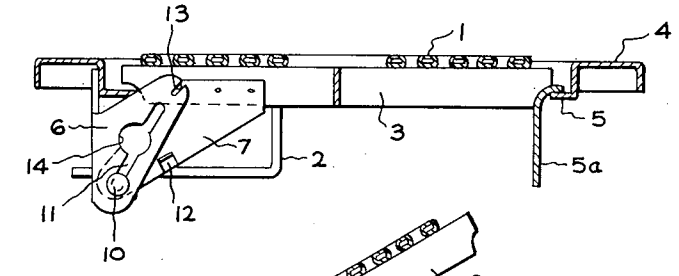


FIG. 2



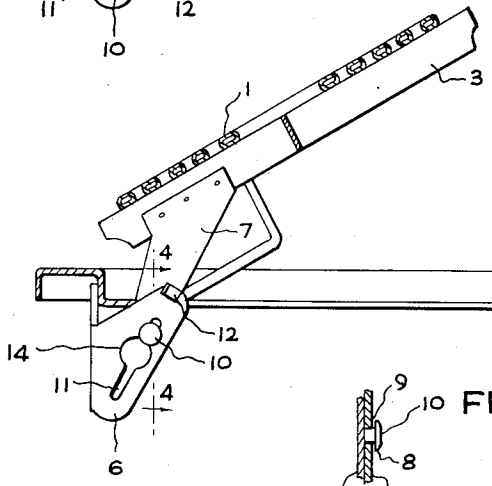


FIG. 3

FIG. 4

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SURFACE HEATING UNIT

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4 Claims. (Cl. 219—37)

My invention relates to surface type heating units such as are commonly used with electric ranges, wherein the heating unit comprises a heating element assembly of one or more resistance elements enclosed in and insulated from a tubular metal sheath which is wound in flat spiral form or some similar configuration and mounted on a frame, and a support structure for mounting the heating element assembly in a range surface.

Such support structures usually take the form of a support ring which may be integral with the top surface of the range, or may be merely attached thereto in some manner such as by engagement with a flange circumscribing an opening in the range surface such that the heating element assembly is supported in a horizontal position substantially flush with the range surface. A combined reflector bowl and drip pan is usually suspended from the supporting ring below the heating element assembly to make up the complete heating unit.

It is desirable that the heating element assembly or the combined heating element assembly and support ring be hinged so that the unit can be tilted up and raised out of the range surface opening to enable the reflector to be removed for cleaning. Some heating units on the market are so designed. Another type available on the market is adapted to be completely removable thus enabling both the reflector and the underside of the element to be conveniently cleaned. This type is not equipped with hinges for tilting the unit.

Many of the prior art arrangements are cumbersome and awkward to handle. Some of them utilize complex hinging arrangements which increase the cost of the heating unit. Furthermore, there is often no means of fastening the heating element assembly in place after it has been tilted up for cleaning and it is apt to drop back into its horizontal position due to the spring action caused by bending of the thick lead-in wires when the assembly is tilted up. Thus it may be necessary to hold the assembly in its tilted position with one hand while cleaning it with the other. In addition to having a hinged mounting it may be desirable to have the heating element readily removable should a more thorough cleaning be required.

Accordingly, it is an object of this invention to provide a range surface heating unit of simple and economical construction in which the heating element assembly can be tilted up out of its horizontal position in the range surface and raised out of the range surface opening and latched in its new position. It is a further object of this invention to provide a hinged range surface heating unit in which the heating element assembly can be tilted and moved away from the range surface opening and either latched in its raised position, or removed completely from the range surface if desired.

A range surface heating unit incorporating this invention is illustrated in the accompanying drawings to which reference should be made for a complete explanation of the invention.

In the drawings:

Fig. 1 is a perspective view of the underside of the hinged surface type range heating unit of my invention showing the heating element assembly in its normal horizontal position.

Fig. 2 is a vertical section of the heating unit taken at the position of line 2—2 and on a larger scale than Fig. 1.

Fig. 3 is similar to Fig. 2 but the heating element is shown in its tilted position.

Fig. 4 is a section taken along 4—4.

Referring now to Fig. 1 of the drawings there is illustrated the usual surface type range heating unit in which is mounted a sheathed wire type electrical resistance heating element 1, wound in a flat spiral or similar configuration. Connection of the heating element to a terminal block (not shown), in the range is made by terminals (not shown) secured to lead-in wires 2 located beneath the heating element. The heating element 1 is permanently fixed to a support frame comprising a number of arms 3. A mounting ring 4 is adapted to be mounted in the range surface and is provided with a flange 5, which carries the supporting frame arms 3. A drip pan or reflector 5a shown in part in Fig. 2 is supported from the flange 5 beneath the heating elements.

My invention is directed to the provision of a separable hinge member comprising brackets 6 and 7. Bracket 6 is provided with a slot 11 and is permanently fixed to the mounting ring 4 at the rear of the range surface opening such that the slot 11 extends at an angle to the horizontal. Bracket 7 is mounted at the rear of the heating element assembly by similar means, preferably by attachment to one of the frame arms 3.

A projecting member 8 such as a stud or rivet as illustrated in Fig. 4 is secured to the bracket 7 and comprises a reduced or shank portion 9 of less diameter than a head portion 10. The shank portion 9 engages in the slot 11 provided in the bracket 6 and forms the connecting member or hinge relationship between the brackets 6 and 7. The shank 9 is proportioned so as to slide freely along the length of the slot 11, the diameter of head 10 being such that shank 9 cannot slip out of the slot. The heating element assembly comprising the heating element 1 and frame arms 3 can be tilted from the horizontal by lifting the front end of the heating element to cause the stud shank 9 to act as a pivot in slot 11. By the continued lifting action, the stud shank is moved upwardly along the slot 11 to raise the heating element assembly out of the range surface opening.

In order to permit the heating element assembly to be maintained in its raised position a projecting detent 12 is provided on bracket 7 for engagement in a notch 13 in the bracket 6. When the stud 8 has reached the upper end of the slot 11 during the lifting operation, the heating element assembly may be further pivoted about the stud 8 so that detent 12 engages the notch 13 as shown in Fig. 3, to prevent further movement of the stud 8 in the slot 11. In this position the reflector pan can be removed from beneath the heating element for cleaning purposes.

Since a thorough cleaning of the heating element itself is sometimes required it is also desirable to be able to remove the heating element. For this purpose there is provided an enlarged portion 14 part way along the slot 11. This enlarged portion 14 in the slot is so dimensioned that the stud head 10 can be readily passed through it if desired thereby permitting the disengagement of the stud 8 from the slot 11. It is desirable to form the enlarged portion 14 by indenting one side of the slot 11 to a greater extent than the other side. Thus the head 10 of the stud 8 may be readily inserted or removed from the slot but at the same time will not be permitted to slip through without a deliberate movement to remove it. In addition the head 10 of the stud may be provided with a steep sloping or hemispherical surface to facilitate its passage through the enlarged portion 14 of the slot. Heat-

ing element 1 and its supporting frame can thus be lifted clear of the mounting ring 4. In order to completely remove the heating element it is of course necessary to disconnect the lead-in wires 2 from the terminal block in the range. This is a simple matter since it is common practice to provide plug-in type terminals on the lead-in wires for insertion in receptacles in the terminal block.

It will thus be seen that I have provided a heating unit for mounting in a range surface in which the heating element is simply and economically adapted to be raised out of its normal horizontal position and to be latched in the raised position. In addition this invention permits the simple removal of the heating element from its supporting means when such is desired.

While the stud 8 is shown in the form of a rivet with a reduced or shank portion 9 and an enlarged head 10, the desired objects of the invention would be achieved if the stud 8 was in the form of a short rod, with a circumferential groove in its surface forming the reduced portion 9. Similarly the shape and size of the enlarged portion 14 in the slot 11 may be varied if desired. If desired the stud may be fixed to the bracket 6 with the slot in bracket 7.

While the present invention has been described by reference to a particular embodiment thereof, it will be understood that numerous modifications may be made by those skilled in the art without actually departing from the invention. I therefore, aim in the appended claims to cover all such equivalent variations as come within the true spirit and scope of the foregoing disclosure.

I claim as my invention:

1. A heating unit adapted to be mounted in the top surface of a range and having a heating element assembly comprising a heating element and a frame supporting said heating element, means for supporting the frame in a substantially horizontal position in an opening in the range surface, a separable hinge member at the rear of the range surface opening, said hinge member comprising a first bracket provided with a slot and attached to the frame supporting means such that the slot extends at an angle to the horizontal, a second bracket attached to the heating element assembly, and a stud secured to said second bracket, said stud having a shank portion extending through said sloping slot and a head portion of greater diameter than the slot width, whereby the stud is retained in said slot and whereby the heating element assembly may be pivoted about said stud and thereby tilted out of the range surface opening and the stud shank moved upwardly along the slot to raise the heating element assembly out of the opening in the range surface, and means permitting complete disengagement of said first and second brackets comprising an enlargement of said slot over a portion of its length to allow passage of the head portion of said stud therethrough whereby the heating element assembly may be detached from the range surface.

2. A heating unit of the type defined in claim 1 including a detent on one of said brackets adapted to engage a notch in the other of said brackets upon pivotal movement of the heating element assembly to a tilted position.

3. A heating unit adapted to be mounted in the top surface of a range and having a heating element assembly comprising a heating element and a frame supporting said heating element, means for supporting the frame in a substantially horizontal position in an opening in the range surface, a hinge member at the rear of the range surface opening, said hinge member comprising a first bracket carried by said frame supporting means, a second bracket attached to the heating element assembly, one of said brackets having a slot therein extending at an angle to the horizontal, a projecting member secured to the other of said brackets and extending through said slot whereby the heating element assembly may be pivoted by said projecting member and thereby tilted out of the range surface openings and the projecting member moved upwardly along the slot to raise said heating element assembly out of the opening of the range surface, and a detent on one of said brackets adapted to engage a notch in the other of said brackets upon pivotal movement of said heating element assembly to a tilted position thereby maintaining said heating element assembly in said tilted position.

4. A heating unit adapted to be mounted in the top surface of the range and having a heating element assembly comprising a heating element and a frame supporting said heating element, means for supporting the frame in a substantially horizontal position in an opening in the range surface, a hinge member at the rear of the range surface opening, said hinge member comprising a first bracket provided with a slot attached to the frame supporting means such that the slot extends at an angle to the horizontal, a second bracket attached to the heating element assembly, a stud secured to said second bracket, said stud having a shank portion extending through said slot and slidable therein and a head portion of a greater diameter than the slot width whereby the stud is retained in said slot and whereby the heating element assembly may be pivoted about said stud and thereby tilted out of the range surface opening and the stud shank moved upwardly along the slot to raise the heating element assembly out of the opening in the range surface, and a detent on one of said brackets adapted to engage a notch in the other of said brackets upon pivotal movement of the heating element assembly to a tilted position thereby maintaining said heating element assembly in said tilted position.

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