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BUILT-IN RADIO REFRIGERATOR DOORS

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1 Claim. (Cl. 174—52)

This invention relates to new and useful improvements for mounting a radio in the door of an electric refrigerator, or on a gas refrigerator.

More specifically, the present invention proposes a novel arrangement for mounting a small radio receiving set into the front of a refrigerator door where it will be conveniently available for entertaining the housewife while she is about her chores in the kitchen.

As a further object, the present invention proposes mounting a small open fronted box within a recess in the front of a refrigerator door and to provide a removable panel for closing the open front of the box and upon the inner face of which the radio receiver is mounted in a manner to extend into the box with all operating controls of the receiver exposed on the front face of the panel.

Another object of the present invention proposes constructing the radio receiver to be somewhat smaller than the interior space of the box and to support the receiver in a position raised off the floor wall of the box leaving air spaces all about the receiver and further proposes forming the front panel with air vent slots above and below the receiver for dissipating the heat generated by the receiver when in operation.

As a still further object, the present invention proposes connecting the radio receiver in parallel with the circuit which supplies electricity to the motor of the refrigerator in a manner so that the mere act of inserting one plug into an outlet receptacle will supply the required electric current for both the refrigerator and the radio receiver.

The present invention further proposes a novel arrangement for connecting the radio receiver to its source of electric current so that when the panel is removed the radio can be quickly disconnected from its source to be removed from the refrigerator as a unit with the panel so as to facilitate servicing of the same.

A further object of the present invention proposes a novel means for conveying the electric wires from the main body of the refrigerator into the door to supply the radio receiver with the required electric current without in any way affecting the normal opening and closing of the refrigerator door.

It is a further object of the present invention to construct a refrigerator having a radio receiver mounted in its door which is simple and durable and which can be manufactured and sold at a reasonable cost.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawing, and to the appended claims in which the various novel features of the invention are more particularly set forth.

On the accompanying drawing forming a material part of the present disclosure:

Fig. 1 is a front elevational view of a refrigerator having a radio mounted in the front of its door in accordance with the present invention.

Fig. 2 is a partial enlarged vertical sectional view of the door taken substantially on the line 2—2 of Fig. 1.

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Fig. 3 is a partial horizontal sectional view of the door taken substantially on the line 3—3 of Fig. 2.

Fig. 4 is a partial enlarged horizontal sectional view taken on the line 4—4 of Fig. 1.

Fig. 5 is a schematic wiring diagram of the electric circuit.

The radio receiver, in accordance with the present invention, is mounted in the front of a door 10 which closes the usual front opening of the main body 11 of a refrigerator. The door 10 is pivotally attached to the main body 11 to swing open and closed about a vertical axis by the usual hinges 12. The usual latch means 14 is provided for holding the door 10 closed.

The door 10, as is generally known in the art of refrigerators has the usual inner plate 15 and outer plate 16 between which the usual insulation material 17 is packed, as best shown in Figs. 2 to 4. The body 11 is of similar construction having the usual inner plate 18 and outer plate 19 between which the usual insulation material 20 is packed, see Fig. 4. Further constructional details of the refrigerator will not be given in this specification as they are generally known in the art and form no part of the present invention.

To accommodate the radio, the front of the door 10 is formed with a recess 21 which opens through the front plate 16 of the door. Fitted into the recess 21 there is a box 22 formed of dielectric material and preferably of a synthetic resinous material. The box 22 has an open front side which is bounded on all sides by an outwardly directed flange 23. The flange 23 abuts against the outer face of the front plate 16 of the door 10 and is secured thereto by small screws 24, see Fig. 2, at the four corners of the box. Thus, the box 22 is fixedly mounted in position with the insulation material 17 of the door packed therearound as shown in Figs. 2 and 3. The position of the box 22 within the recess 21 can be reinforced, if desired, by the inclusion of braces between the bottom of the box and the inner face of the front plate 16, if that should be found necessary or desirable.

The open front of the box 22 is closed by a panel 25 which has a recess 26 in its rear face to fit snugly about the flange 23 and with its rear face, about the periphery of the flange, abutted against the front face of the front plate 16 of the door 10. The panel 25, formed of metal or a synthetic resinous material, is removably secured to the front plate 16 by means of screws 25^a in the four corners of the panel.

Mounted on the inner face of the panel 25 to be an integral part thereof, there is the radio receiver 27. The radio receiver 27 includes the usual chassis 28 attached to the inner face of the panel 25 and which mounts the usual tubes, condensers, coils and the like so common to the operation of such a receiver. The speaker 29 for the receiver 27 is mounted on the inner face of the panel 25 in alignment with slots 30 see Fig. 1, formed in the panel for the passage of sounds emanating from the speaker. Supported in brackets 31 attached to the inner face of the panel 25, there is an antenna 32 consisting of a long fiber rod upon which a wire is coiled and which has its end connected to the receiver circuit, as is generally known in the art.

In place of the rod-like antenna shown on the drawing, the radio receiver 27 could have an antenna which consists of a cardboard upon which an antenna wire is wound. The cardboard could be mounted in the refrigerator door 10 below the box 22 with the end of the antenna wire passing into the box 22 and being removably connected to the chassis 28 of the receiver 27.

The bottom of the chassis 28 of the receiver 27 is raised off the bottom wall 22^a of the box 22 and has its weight supported on the bottom wall 22^a by four small

rubber feet 33 attached to the four corners of the bottom of the chassis.

Supporting the chassis 28 in the raised position within the box 22 provides space all about the radio receiver for the circulation of air to cool the receiver. The front panel 25 along its bottom edge, beneath the chassis 28, has four end aligned horizontally spaced air vent slots 34. Likewise, the top edge of the panel 25, above the radio receiver 27, has four end aligned horizontally spaced air vent slots 35. When the radio receiver 27 is in operation, heat generated thereby will rise within the box 22 and pass out of the vent slots 35 and at the same time cool air will enter the box through the bottom slots 34 to always cool the interior of the box 22.

Exposed at the front of the panel 25 there is a dial 36 for indicating the station selected. The dial 36, as shown on Fig. 1, is of the slide rule type, but it is appreciated that the dial may take any form. At one end of the dial 36 there is the usual manually operable station selector knob 37. At the other end of the dial 36, there is the usual knob 38 for turning the radio receiver 27 on and off and for controlling the volume.

On Fig. 5, there is illustrated the circuit connections for connecting the radio receiver 27 in parallel with the circuit that supplies the required electric current to the motor 39 of the refrigerator. The refrigerator motor circuit consists of a wire 40 embodying parallel leads 41 and 42. Connected to adjacent ends of the leads 41 and 42, there is a plug 43 for insertion into the usual electric outlet receptacle 44, see Fig. 1. The other ends of the leads 41 and 42 are connected to the refrigerator motor 39. Connected in series with the leads 41 and 42 between the plug 43 and the motor 39 there is a condenser 45 for suppressing the noises of the motor when in operation and which would interfere with good radio reception.

Extended from the chassis 28 of the radio receiver 27, there is an electric input wire 46 having leads 47 and 48, see Fig. 5. The ends of the leads 47 and 48 remote from the receiver 27 are connected to a plug 49. The plug 49 is provided for removable insertion into an outlet receptacle 50 mounted through an end wall of the box 22. Extended from the receptacle 50, there is a wire 51 embodying leads 52 and 53. The outer ends of the leads 52 and 53 are connected, respectively, to the leads 41 and 42 between the plug 43 and the condenser 45. Thus, by the mere act of inserting the plug 43 into the outlet receptacle 44 current is supplied for operating both the motor 39 of the refrigerator and the radio receiver 27.

Means is provided for passing the wire 51 from the main body 11 of the refrigerator into the door 10 to permit opening and closing of the door without interference from that wire. That means is best shown in Fig. 4 and consists of a small hollow receptacle 54 mounted within the door 10 about a hole 55 formed in the side thereof. A flexible rubber tube 56 has one end extended slidably into the receptacle 54 through the hole 55. The other end of the tube 56 enters the main body 11 through a hole 57 formed in the material of the main body concentric with the hole 55. Within the main body 11, the other end of the tube 56 has a flange 58 secured to the material of the main body 11 by rivets 59. The wire 51 from its point of connection with the wire 40 is extended along within the main body 11 to the tube 56. The wire 51 is then extended through the tube which has an interior bore of a size so that the tube frictionally grips the wire 51 where it passes through the tube. From the end of the tube 56, the wire 51 passes through a hole 60 in the end wall of the receptacle to rise in passage means within the door 10 to be connected to the receptacle 50.

Immediately adjacent the inner and outer faces of the end wall of the hollow receptacle 54 where the wire 51

passes through the hole 60, knots 61 are formed in the wire to prevent it from being pulled through the hole 60. The wire 51 has sufficient slack within the hollow receptacle to permit opening and closing of the door.

Thus, when the door 10 is opened, the tube 56 moves out of the receptacle 54 through the hole 55 and bends concentric with the pivot axis of the door. The slack in the wire 51 within the hollow receptacle 54 permits the relative movement between the door 10 and the main body 11. When the door 10 is again closed, the tube 56 merely slides back into the hollow receptacle 54 through the hole 55. The tube 56 is, of course, long enough so that its free end is not pulled from the hole 55 in the fully open position of the door 10.

From the foregoing description, it is apparent that the present invention provides a novel means for mounting a radio in the door of a refrigerator where it will be conveniently available for use by the housewife while busy about the kitchen. At the same time, removal of the four screws 25a releases the front panel 25 to be removed from the door 10 with the radio receiver 27 as a unit while at the same time pulling the plug 49 from the receptacle 50 so that the receiver can be quickly and easily removed for servicing when necessary. To remount the radio in position, following servicing, the plug 49 is re-inserted into the receptacle 50 and the screws 25a are returned mounting the panel 25 back in position.

It is to be understood that the radio receiving set 27 may be of any type and size and may include additional equipments such as a radio clock, phonograph connections, etc. This radio door may be installed on all type of refrigerators, freezers and the like, of the electric or gas type. The electric connections from the radio set to the electric source of supply may be connected with or without the electric motor of the refrigerator.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as set forth in the appended claim.

Having thus described my invention, what I claim as new and desire to secure by United States Letters Patent is:

A wire housing in a radio-refrigerator, said housing comprising a hollow receptacle within the refrigerator door frame, a main body, electrical wires in said refrigerator adapted to connect to an electrical outlet and to a radio, aligned apertures in said door frame receptacle and main body when in closed position, insulation means secured in said main body and slidably received in the apertures in said door frame and said receptacle, said insulation means comprising a flexible tube extended into said receptacle and secured in the apertures in said main body, said wires extending axially through said tube.

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