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2,734,441

VENTILATING FAN FOR TELEVISION SETS

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2 Sheets-Sheet 1

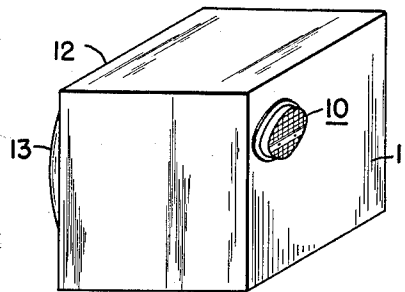


Fig. 1

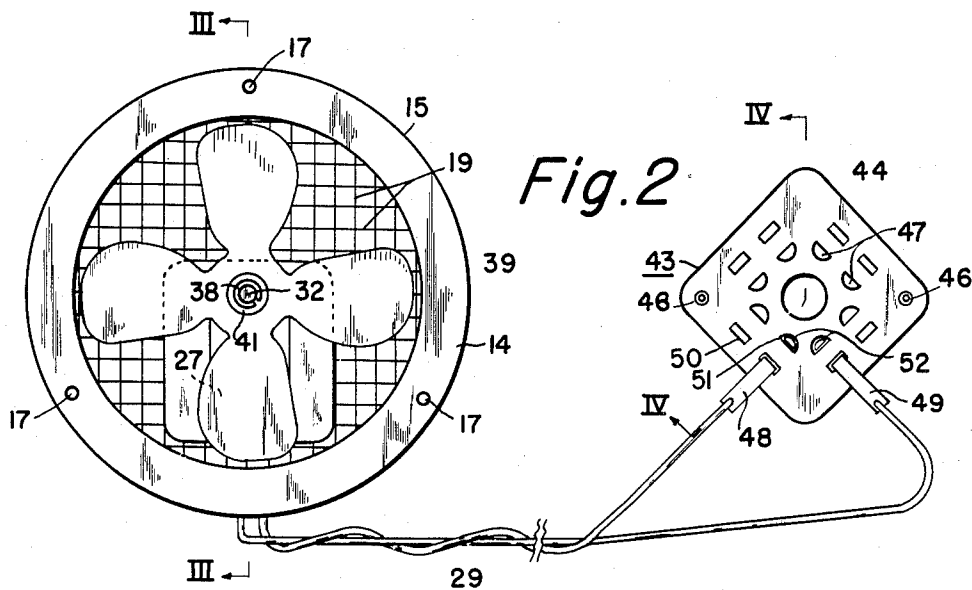


Fig. 2

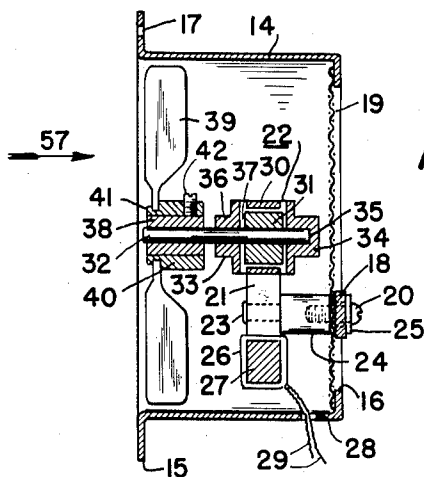


Fig. 3

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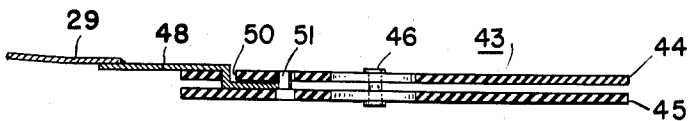


Fig. 4

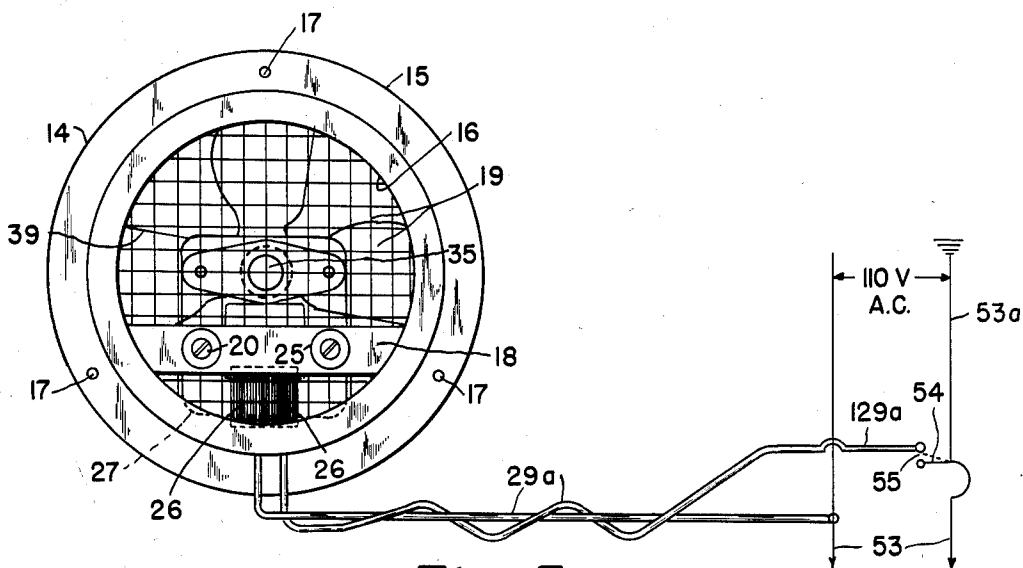


Fig. 5

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VENTILATING FAN FOR TELEVISION SETS

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5 Claims. (Cl. 98—1)

This invention relates to ventilating apparatus for a container having current-consuming equipment whereby heat is generated, and, more particularly, to apparatus for a television or radio.

The heat generated by a television set and like current-consuming articles is very well known. It is also known that this heat is objectionable because it shortens the useful life of the electronic equipment. This problem is especially acute in television sets because of the increased number of tubes employed. To date, no television set is adequately ventilated.

The present invention provides ventilating apparatus for such current-consuming equipment and particularly for television sets. The apparatus sufficiently cools the parts of the set to insure longer useful life of the electronic components. This apparatus is characterized by automatic, synchronized operation with the set and by its simple construction, ease of installation, neat appearance, and inexpensiveness. The apparatus cools the set by causing air to pass continuously through the container or cabinet, and thereby lower the temperature in the cabinet. In one form, the apparatus comprises a housing open at both ends and adapted to have one end fit over an opening in a wall of the set. The housing contains a fan propelled by electrical means which is operated from the current supplied to the set. Novel features and advantages of the apparatus are shown in the accompanying drawings which illustrate a presently preferred embodiment wherein:

Figure 1 is a perspective view of a television set having ventilating apparatus of the present invention;

Figure 2 is a front elevation of the ventilating apparatus of Figure 1 and illustrates one manner of connecting the apparatus with current supplied to the set;

Figure 3 is a section on the line III—III of Figure 2;

Figure 4 is a section on the line IV—IV of Figure 2, and

Figure 5 is a rear elevation of the ventilating apparatus of Figure 1 and illustrates another manner by which the apparatus can be connected with current supplied to the set.

Referring to the drawings, the ventilating apparatus generally shown at 10 is ordinarily placed over an opening cut in a rear wall 11 of a television set 12 having a screen 13. The apparatus comprises a cylindrical, spun metal housing 14, open at both ends, and having a radially outwardly turned flange 15 at one of the ends and a radially inwardly turned flange 16 at the other. Flange 15 has openings 17 to accommodate fasteners whereby the housing is readily fixed to the wall 11.

A cross bar 18 (Figure 5) extends across the other end of the housing and is fixed to the flange 16 as by spot welding. A screen 19 is simply laid within the housing and against the cross bar 18 and the inner side of the flange 16. Bolts 20 pass through the screen 19 and openings in the cross bar 18 and screw into threaded holes in rigid concentric sleeves 24 which are fixed to a

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stationary ring magnet 21 of an electric motor generally shown at 22. One method of so fixing the sleeves is to pass a stud thereof through an opening in the magnet and allow a small portion of the stud to project beyond the other side. The projected portion is then flattened or spiked as at 23 to prevent withdrawal of the sleeve and bolt. In this manner, the rigid sleeves 24 bear against the magnet 21 at the shoulder around the stud and against the screen 19 and cross bar 18 at the other end. Accordingly, the sleeves 24 in cooperation with the bolts and cross bar hold the assembled parts in a fixed spaced relation. Rubber or cork or other non-conducting washers 25 insulate the bolts and sleeves from the screen and housing to safeguard against electric shock.

The motor is conventional. A copper coil 26 winds about the bottom leg 27 of the ring magnet 21 and passes its ends through an opening 28 in the side of the housing. The ends join conductors 29 which are associated with the current supplied to the set as hereafter explained. The upper leg 30 of the ring magnet has an annular opening to receive an armature 31 fixed to a drive shaft 32. The armature has inlaid conductors in accordance with standard practice and is also conventionally excited. Since these features are well known in the art, they are not here illustrated or described in detail. Brackets 33 and 34 straddle the armature 31 and are fixed as by riveting to the side legs of the stationary ring magnet to prevent excessive axial thrust of the shaft 32. Bracket 34 has a bearing socket 35 which limits backward thrust, while bracket 33 has a collar 36 provided with a bearing ring 37 to limit forward thrust.

The drive shaft 32 is concentric with the housing 14 and has a split sleeve 38 at its free end. A fan 39 fits over the sleeve and is held in position by a shoulder 40 having an integral, axially-projecting sheet which passes between the fan 39 and sleeve 38 to terminate in a flange 41. The latter urges the fan back against the shoulder. A set screw 42 secures the shoulder and fan to the shaft.

The conductors 29 may be connected with the current supplied to the set in several ways. Figures 2 and 4 illustrate one method embodying a wafer of dielectric material 43 consisting of two plies 44 and 45. The plies are joined together by rivets 46 and have aligned perforations 47 to receive the prongs and center post of an electronic tube used in the television or radio set. Two metal strips 48 and 49 are held in position by slots 50 in the upper ply through which the strips pass to terminate in upstanding arcuate portions 51. These portions have the same configuration as the wall of the perforations 52 into which they fit.

To connect the wafer (and thereby the motor) to a source of power, a tube in the set is pulled from its socket, the wafer is placed over the contact prongs of the tube, and the tube is reinserted in the socket. When the wafer is so interposed between the electronic tube and its socket in the set, the two strips 48 and 49 contact the two prongs of the tube which are inserted in the perforations 52 and which receive a steady, relatively low voltage, for example, a six volt voltage of a circuit designed to heat a filament of the tube. With this circuit, the motor 22 runs only when the television set is turned on.

Figure 5 illustrates another method of connecting the conductors with the current supplied to the set. In this case the conductors 29a are impressed across leads 53 which connect the television set to a source of power, such as a conventional household outlet. A bimetallic element 54 is in series with one of the leads 53a. When the set is first started, current in lead 53a generates heat in the bimetallic element 54 causing it to bend to position 55 as shown by the dotted line and complete a circuit

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with lead 129a which is part of one of the leads 29a. This also completes the circuit needed to operate the motor in the housing of the ventilating apparatus. Conversely, when the set is turned off, the bimetallic element cools and bends in an opposite direction thereby breaking the contact at 55 and interrupting the motor circuit.

In operation, the present ventilating apparatus has automatic, synchronous operation with the television or radio set. While either direction can be used, ordinarily the blades of the fan 39 are shaped to force the air in the direction of the arrow 57 in Figure 3. This has the added advantage of preventing the motor 22 from preheating the air and thereby reducing the efficiency of the apparatus as would be the case if the ventilating air passed over the motor first.

It is emphasized that the equipment of the present apparatus within the housing has substantially only one point of support, namely, at the cross bar 18. The screen is merely laid against the indicated flange and held in place also against the cross bar by the bolts 20 and sleeves 24. All this results in a simply constructed, neat appearing, inexpensive product which may be quickly made and easily installed, and which serves a very useful and needful purpose.

While the foregoing disclosure describes a presently preferred embodiment, it is understood that the invention may be practiced in other forms within the scope of the following claims.

I claim:

1. In a television set including a cabinet containing electronic equipment, ventilating apparatus characterized by automatic, synchronized operation with the set, simple construction, ease of installation, neat appearance, and inexpensiveness, comprising a cylindrical housing having a radially outwardly turned flange at one end and a radially inwardly turned flange at the other, the first-mentioned flange having openings to accommodate fasteners whereby the housing is readily fixed over an opening to a wall of the set, a cross bar secured to the second-mentioned flange and extending across that end of the housing, a screen laid against the inner side of the second-mentioned flange, a motor stationed within the housing, bolt members passing through the cross bar and screen and having their ends fixed to a stationary part of the motor, concentric rigid sleeves on the bolt members to space the screen from the motor and hold it against the flange, non-conducting washers on the bolt members to insulate the members from the cross bar and screen, a drive shaft concentric with the housing extending from the motor, a fan on the shaft, and conductors connecting the motor to a circuit of the set.

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2. Ventilating apparatus as claimed in claim 1 wherein the conductors are connected to an electronic tube contained in the cabinet whereby part of the current supplied to the tube operates the motor.

3. Ventilating apparatus as claimed in claim 1 wherein the conductors are connected across leads supplying an electric potential to the set, one of the leads having a bimetallic element engageable with one of the conductors whereby a passage of current in that lead operates the motor as the bimetallic element opens and closes the circuit formed by the conductors in accordance with the heat generated in the bimetallic element.

4. Ventilating apparatus as claimed in claim 1 wherein the fan is positioned on the shaft to move air outwardly from the set through the screen whereby said air is not preheated by the motor prior to its use for ventilating and cooling the set.

5. In a television set including a cabinet containing electronic equipment, ventilating apparatus characterized by automatic, synchronized operation with the set, simple construction, ease of installation, neat appearance, and inexpensiveness, comprising a housing open at two opposed ends having a radially outwardly turned flange at one open end, a radially inwardly turned flange at the other open end, the outwardly turned flange having openings to accommodate fasteners for securing the housing over an opening in a wall of the set, a bar secured at each end to the inwardly turned flange and extending across the open end bordered by said flange, a motor within the housing and mounted on said bar, shaft on the motor extending axially of the housing towards the open end bordered by the externally turned flange, a fan on the shaft within the housing and means for connecting the motor to the circuit for the television set whereby the motor is energized when the television set is turned on.

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