April 3, 1951 W. W. WELCH, SR 2,547,189

WINDOW VENTILATOR

Filed Sept. 29, 1947 3 Sheets-Sheet 1

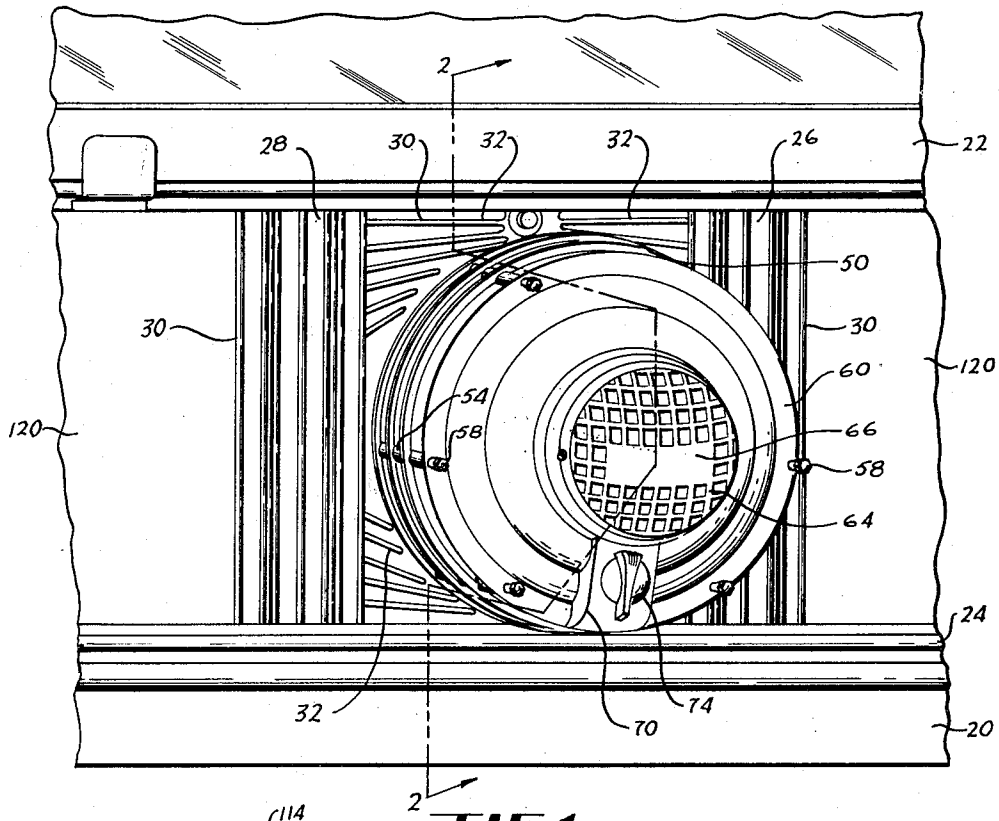


FIG. 1

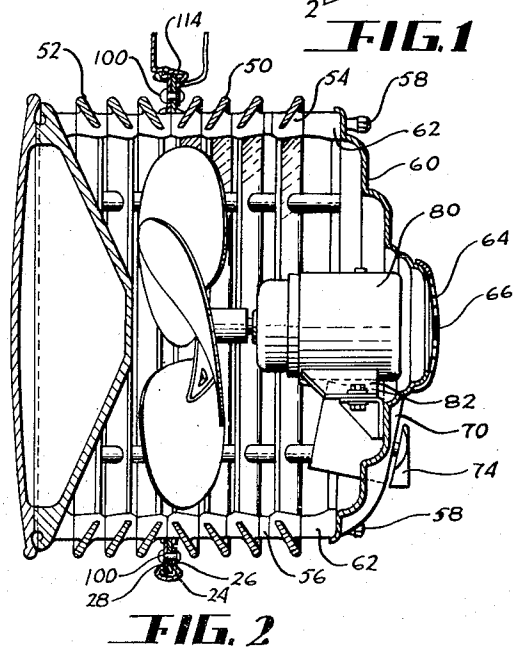


FIG. 2

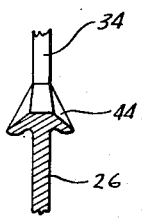


FIG. 12

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WINDOW VENTILATOR

Filed Sept. 29, 1947 3 Sheets-Sheet 2

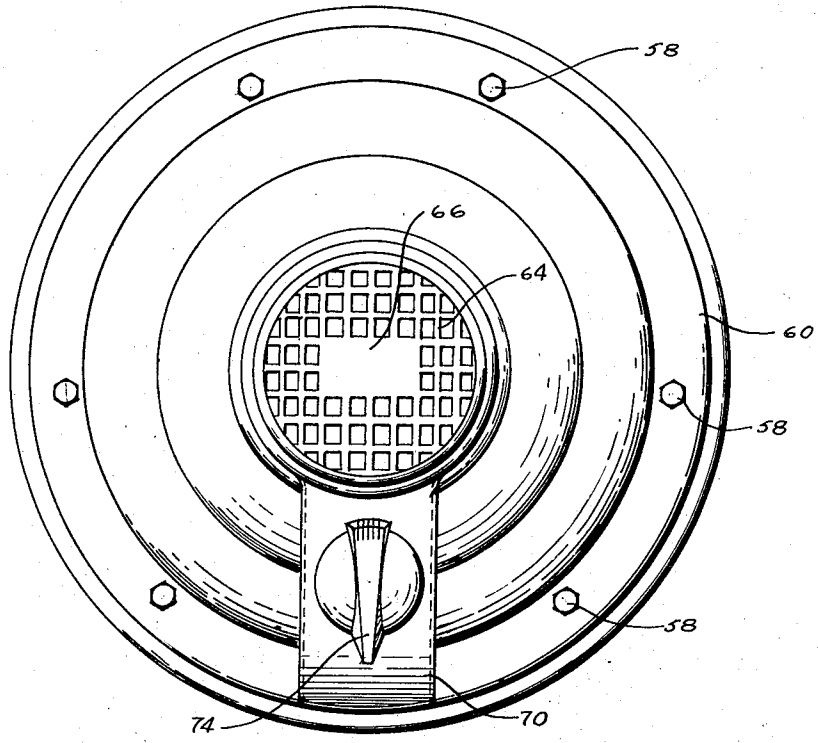


FIG. 3

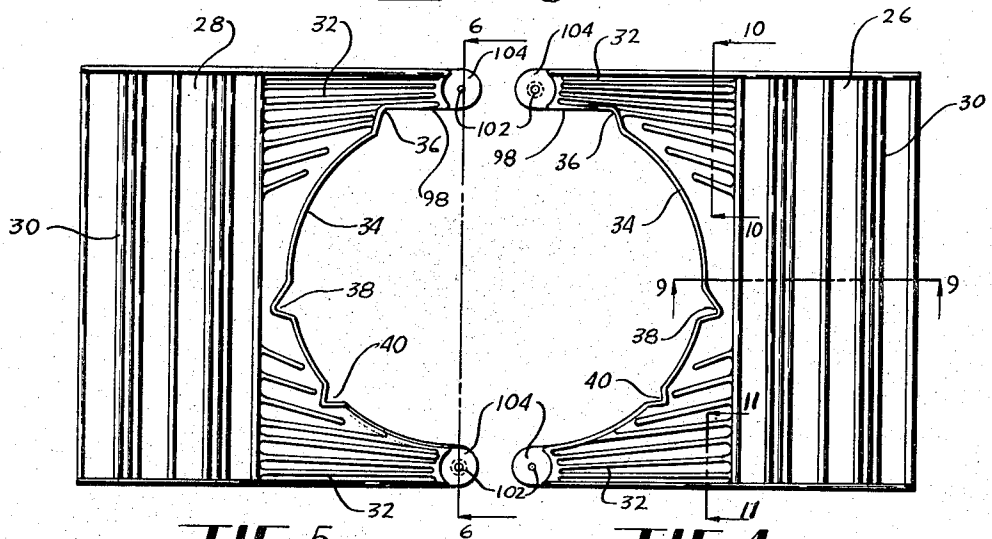


FIG. 5 FIG. 4

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April 3, 1951 W. W. WELCH, SR 2,547,189

WINDOW VENTILATOR

Filed Sept. 29, 1947 3 Sheets-Sheet 3

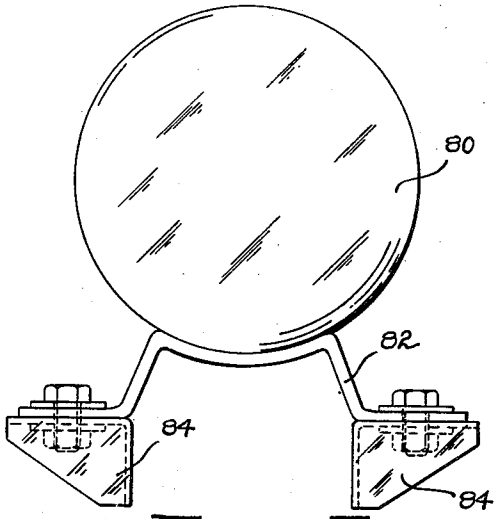


FIG. 7

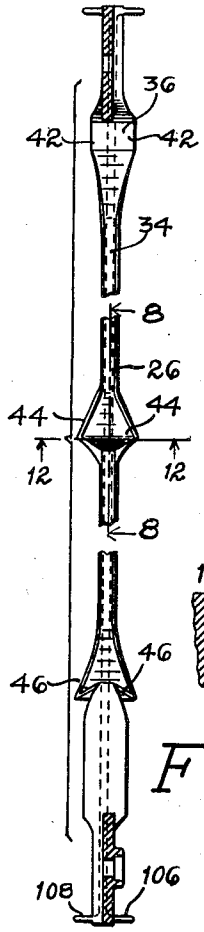


FIG. 6

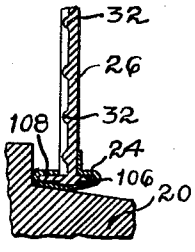


FIG. 11

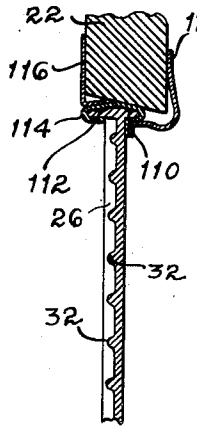


FIG. 10

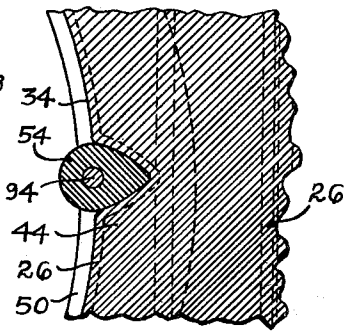


FIG. 8

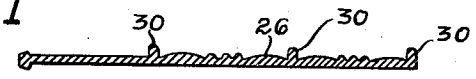


FIG. 9

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2,547,189

UNITED STATES PATENT OFFICE

2,547,189

WINDOW VENTILATOR

William W. Welch, Sr., Cincinnati, Ohio

Application September 29, 1947, Serial No. 776,650

13 Claims. (Cl. 98—94)

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This invention relates to a window ventilator and more particularly to a window ventilator that may be removably mounted in a window opening, although not necessarily so limited.

The disclosure herein is an improvement upon the disclosure in my application Serial No. 516,858, filed January 3, 1944 for Plastic Ventilator Fan, now Patent 2,441,737.

An object of this invention is to provide a window ventilator having a plurality of planetary hoops functioning as a guard and as a housing, some of the hoops being located on the inside of the window opening and other hoops on the outside of the window opening, the hoops being so designed that air may readily enter on one side of the opening and escape with ease on the opposite side of the opening, the air stream being drawn in through the window opening converging from all directions towards the center of the opening and the air escaping through the opening diverging in all directions, thereby eliminating undesirable air currents.

Another object of this invention is to provide a sectional baffle such that upon assembling the baffle and the housing for the window ventilating unit, the two form a composite unit interlocking each other, so as to eliminate the use of fastening means other than the parts per se.

Another object of this invention is to provide transparent baffle sections so designed that the baffle sections simulate ornamental glass, although made from a plastic molding material.

Another object of this invention is to provide a removably mounted ventilating unit so designed that the unit may be mounted in position either below or above the sliding sash of a double hung type window, without permanently securing the ventilating unit in position.

Another object of this invention is to provide a removably mounted air circulator in a window opening for withdrawing air from the room to be cooled.

Other objects and advantages reside in the construction of parts, the combination thereof and the mode of operation, as will become more apparent from the following description.

In the drawings,

Figure 1 is a perspective view of the ventilating unit mounted in position in a window opening, only a portion of the window being shown.

Figure 2 is a vertical cross sectional view taken substantially on the line 2—2 of Figure 1.

Figure 3 is an inside end elevational view of the housing for the ventilating unit.

Figure 4 is an inside view of the right panel bracket.

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Figure 5 is an inside view of the left panel bracket.

Figure 6 is a cross sectional view taken substantially on the line 6—6 of Figure 5, with parts broken away.

Figure 7 is an end view of the motor housing and the bracket for supporting the same.

Figure 8 is a cross sectional view taken substantially on the line 8—8 of Figure 6, which cross sectional view includes a portion of the ventilating unit that has not been shown in Figure 6.

Figure 9 is a cross sectional view taken substantially on the line 9—9 of Figure 4.

Figure 10 is a cross sectional view taken substantially on the line 10—10 of Figure 4.

Figure 11 is a cross sectional view taken substantially on the line 11—11 of Figure 4.

Figure 12 is a fragmentary cross sectional view taken substantially on the line 12—12 of Figure 6.

Figures 3 and 6 to 12 have been drawn to a larger scale than the other figures.

The reference character 20 indicates a sill of a window frame having a sliding window 22, which may be of the double hung type, although not necessarily the double hung type. A metallic channel member 24 may be mounted upon the sill 20. Although this channel member has been referred to as a metallic channel member, it may be made of any other suitable material. For some installations, channel member 24 may be loosely positioned upon the sill. In other installations it may be held in position by suitable clips or screws or in any other suitable manner, depending upon the type of installation and depending in part upon whether the installation is to be permanently secured in position or removably mounted.

The channel member 24 supports a pair of bracket-like baffle members 26 and 28. Each of these baffle members is provided with vertically disposed ribs 30 used in reinforcing the baffle members and at the same time used in enhancing the appearance of the margins of the baffle members. These ribs may be grouped in any suitable manner so as to simulate molding. In addition to the ribs 30, the baffle members have been provided with transversely disposed rib portions 32. Each of the bracket-like baffle members is provided with an arcuate portion 34 interrupted at spaced intervals by notches 36, 38 and 40. The distance between the notches 38 and 40 is less than the distance between the notches 36 and 38, as will appear more fully later. The notches 36, 38 and 40 are bounded

by outwardly flared triangular portions or pockets 42, 44 and 46, cooperating to form pocket-like recesses that will be described more fully later in connection with the fan housing.

The bracket-like baffle members 26 and 28 are preferably made from transparent molding material, such as Lucite or styrene. For some purposes these bracket-like baffle members may be made from opaque molding material, from sheet metal or any other suitable material. When made from transparent material, these bracket-like members 26 and 28 have the appearance of glass and at the same time have the characteristics of the molding material, which may be flexible and less fragile than glass and more easily molded. For some installations, such as installations of a permanent type, the bracket-like baffle members may be made from glass. The type of material used is a matter of choice, depending upon the particular installation.

The fan housing includes a plurality of hoops or rings 50 and a plurality of hoops or rings 52, forming two groups of hoops or rings. The hoops 50 are tear-drop in cross sectional area and so constructed to form an airfoil for the air currents being drawn into the housing by the fan, which will be described more fully later. The hoops or rings 50 are preferably located on the inside of the window, so as to be located within the room to be ventilated. The hoops or rings 52 are identical in shape to those used on the inside; but the direction of inclination is reversed.

Each of the rings 50 and 52 is provided with suitable projections or extensions 54, there being three pairs of such projections on each side of each ring. The projections of each pair are preferably more closely spaced than the adjacent projections of adjoining pairs. These projections are hollow, the apertures through the projections being aligned with each other. Although the projections have been shown as integral with the hoops, these may be separate spacing members. Furthermore, in order to provide additional air passage, spacers 56 may be positioned between two or more pairs of rings so as to provide adequate space for air to enter the housing. The hoops are retained in fixed spaced relation by suitable retaining members or rods 94, shown in Figure 8, extending through the apertures in the projections 54 and secured in position by suitable nuts 58.

A capping or end ring 60, held in spaced relation from the outer ring 50 by means of the spacer 62, cooperates with a grid 64 to provide an end for the housing located on the inside of the room. The end ring 60 has a suitable contour so as to present a neat appearance within the room. The end rings 60 may be made from stainless steel, or any other suitable material. The grid 64 may be molded from plastic material or formed from any other suitable material. By using molding material, very desirable color schemes may be produced. The grid 64 has a blank space 66 that may be used for supporting a name plate that has not been shown.

In the portion of the end ring 60 located directly below the grid 64 there is formed a projection, extension or internal pocket 70 that is adapted to receive a speed control box 72, the details of which have not been shown for the reason that these are well known to those skilled in the art. This control box 72 is preferably controlled by a knob or dial 74 mounted on the outside of the projection or extension 70.

An electric motor 80, supported upon a supporting member 82, as best seen in Figure 7, is secured to the end ring 60 by means of a pair of brackets 84. The supporting member 82 straddles the internal pocket 70, so that the brackets 84 may be secured to the end ring 60 on either side of the pocket 70. The electric motor 80 is used in driving the propeller blades 86 mounted within the housing and preferably so positioned that the blades are located substantially within the opening formed by the two baffle members 26 and 28.

Directly in front of the fan blades is mounted an air deflecting cone 90. This air deflecting cone 90 is subtended by a concave capping member 92. This capping member 92 is preferably provided with threaded inserts aligned with the retaining rods or members 94, one of which has been shown in Figure 8, used in holding the hoops 50 and 52, the spacers 54, the spacers 62, the capping member 60, the cone 90 and the capping member 92 together as a unitary structure.

The housing, together with the electric motor and the fan, may be assembled at the factory and shipped to the destination as a composite unit in readiness to be installed. Due to the dimensions of the bracket-like baffle members 26 and 28, when assembled as shown in Figure 1, it results in an awkward, inconvenient assembly when packed for shipping. The bracket-like baffle members 26 and 28 are therefore preferably shipped disassembled, in that these baffle members may be nestled together and shipped in a comparatively flat, rectangular carton. This results in a convenient mode of shipping the ventilator.

When the ventilator is to be assembled in readiness to be mounted in a window opening, the baffle members 26 and 28 are inserted substantially diametrically between the hoops 50 and 52. The projections 54 are seated in the pockets 42, 44 and 46, the pockets being so designed that the pockets are snugly seated upon the projections, as clearly shown in Figure 8. In order to facilitate the insertion of the baffle members, the notches 36 have been provided with a horizontal wall portion 98, so as to provide clearance for the two top projections. This permits the brackets to be inserted radially from the opposite sides of the housing.

Upon the baffle members 26 and 28 being inserted into position, suitable bolts 100 are inserted through suitable apertures 102 in the overlapping ends 104 of the baffle members 26 and 28. Thus, it is seen that as far as the housing and the baffle members are concerned, these may be assembled and attached together by the use of only two bolts 100. This results in a ventilating unit that is easily assembled. After the baffle members 26 and 28 have been secured in position upon the housing, the channel member 24 is preferably inserted upon the flanges 106 and 108 extending along the bottom of the baffle members 26 and 28, as best seen in Figures 6 and 11. The baffle members 26 and 28 have also been provided with flanges 110 and 112 extending along the top thereof. A suitable channel member 114 is preferably inserted over the flanges 110 and 112 and may be provided with suitable brackets 116 and 118 engaging opposite sides of the lower member of the sash or window 22.

The baffle members 26 and 28 are preferably so dimensioned that they may be positioned in most window openings. However, the window openings are usually wider than the maximum width across the baffle members 26 and 28. Suitable

transparent panel members 120 are mounted on either side of the baffle members 26 and 28. Members 120 may be cut to order for some installations. However, for universal adaptability, the channel members 24 and 114 are preferably provided with a guide for the edges of the transparent members 120, so that the transparent members 120 may overlap any suitable portion of the bracket-like baffle members 26 and 28, the amount of the overlap depending upon the width of the window. By this arrangement, it is possible to select members 120 from a plurality of such members of varying width, so that members 120 will approximately cover the spaces left vacant on the other side of the baffle members 26 and 28. For example, if the space on either side of the baffle members 26 and 27 is 11", then the panel members 120 may be 12" in width, so as to overlap 1". On the other hand, if the space on either side of the baffle members 26 and 28 is 15¾", members 120 are preferably selected having a width greater than 15¾". This may be 16", 17", 18" or any other suitable width, so as to provide an overlap, rather than to attempt to attain a precision fit.

This assembly is readily mounted in any suitable window opening. By connecting the fan to a suitable electric circuit, the fan may be used to withdraw air from a room, such as a bedroom. Fresh air may then enter the room through suitable openings, such as other windows, to ventilate the room without drafts.

Although the preferred embodiment of the device has been described, it will be understood that within the purview of this invention various changes may be made in the form, details, proportion and arrangement of parts, the combination thereof and mode of operation, which generally stated consist in a device capable of carrying out the objects set forth, as disclosed and defined in the appended claims.

Having thus described my invention, I claim:

1. A ventilating fan assembly having a fan driven by an electric motor, the combination including a vertically disposed baffle having an air circulating opening therein, a plurality of identical hoops arranged side by side, some of the hoops being mounted on one side of the baffle and other hoops on the opposite side of the baffle so that the hoops surround the fan and the motor, the opening through the hoops registering with the opening in the baffle, means for clamping the hoops and the baffle into a rigid structure, and means for supporting the motor within the hoops, said means including a ring extending over the opening in the end of the hoops, said ring being provided with a motor supporting bracket, so that the fan circulates air through the opening in the baffle.

2. A ventilating fan assembly having a fan driven by an electric motor, the combination including a vertically disposed baffle assembly including a center portion having an air circulating opening therein, and adjustable portions engaging the center portion for adjusting the size of the baffle, a plurality of identical hoops arranged side by side, the opening through the hoops registering with the opening in the baffle, said hoops surrounding the fan and the motor, means for clamping the hoops and the baffle into a rigid structure, means for supporting the motor within the hoops, said means including a ring provided with a motor supporting bracket upon which the motor is mounted so that the fan circulates air through the opening in the baffle,

and a conical member extending across the opening in the hoops with the apex directed towards the fan.

3. A ventilating fan assembly having a fan driven by an electric motor, the combination including a plurality of identical hoops arranged side by side, a baffle having an air circulating opening therein, said baffle including sections, two of said sections cooperating to form said opening, means for holding the sections together, some of the hoops being mounted on one side of the baffle and other hoops on the opposite side of the baffle so that the hoops surround the fan and the motor, the opening through the hoops registering with the opening in the baffle, means for clamping the hoops into a rigid structure, and means for supporting the motor within the hoops so that the fan circulates air through the opening in the baffle.

4. A ventilating fan assembly having a fan driven by an electric motor, the combination including a plurality of identical hoops arranged side by side, a baffle having an air circulating opening therein, said baffle including sections, two of said sections cooperating to form said opening, means for holding the sections together, the body of the hoops being inclined, some of the hoops being mounted on one side of the baffle and other hoops on the opposite side of the baffle so that the hoops surround the fan and the motor, the opening through the hoops registering with the opening in the baffle, means for clamping the hoops into a rigid structure, and means for supporting the motor within the hoops so that the fan circulates air through the opening in the baffle.

5. A ventilating fan assembly having a fan driven by an electric motor, the combination including a plurality of identical hoops arranged side by side, a baffle having an air circulating opening therein, said baffle including sections, means for holding the sections together, spacer members positioned between the hoops, said sections being provided with notches in which the spacer members are positioned, some of the hoops being mounted on one side of the baffle and other hoops on the opposite side of the baffle so that the hoops surround the fan and the motor, the opening through the hoops registering with the opening in the baffle, means for clamping the hoops into a rigid structure, and means for supporting the motor within the hoops so that the fan circulates air through the opening in the baffle.

6. A ventilating fan assembly having a fan driven by an electric motor, the combination including a plurality of identical hoops arranged side by side, a baffle having an air circulating opening therein, said baffle including sections, two of said sections cooperating to form said opening, means for holding the sections together, some of the hoops being mounted on one side of the baffle and other hoops on the opposite side of the baffle so that the hoops surround the fan and the motor, the main body of the hoops having a tear-shaped cross sectional area and being inclined in a direction towards the center of the opening in the baffle, spacer members positioned between the hoops, means for clamping the hoops and the spacer members into a rigid structure, and means for supporting the motor within the hoops so that the fan circulates air through the opening in the baffle.

7. A ventilating fan assembly having a fan driven by an electric motor, the combination in-

cluding a plurality of identical hoops arranged side by side, a baffle having an air circulating opening therein, some of the hoops being mounted on one side of the baffle and other hoops on the opposite side of the baffle so that the hoops surround the fan and the motor, the opening through the hoops registering with the opening in the baffle, spacer members positioned between the hoops, an annular ring overlying one end of the enclosure formed by the hoops, means for clamping the hoops the spacer members and said annular ring into a unitary structure, and means supported upon the annular ring for mounting the motor within the hoops so that the fan circulates air through the opening in the baffle.

8. A ventilating fan assembly having a fan driven by an electric motor, the combination including a plurality of identical hoops arranged side by side, a baffle having an air circulating opening therein, some of the hoops being mounted on one side of the baffle and other hoops on the opposite side of the baffle so that the hoops surround the fan and the motor, the opening through the hoops registering with the opening in the baffle, spacer members positioned between the hoops, an annular ring overlying one end of the enclosure formed by the hoops, a grid overlying the opening in the center of said annular ring, means for clamping the hoops the spacer members and said annular ring into a unitary structure, and means supported upon the annular ring for mounting the motor within the hoops so that the fan circulates air through the opening in the baffle.

9. A ventilating fan assembly having a fan driven by an electric motor, the combination including a plurality of identical hoops arranged side by side, the body of the hoops being inclined, a baffle having an air circulating opening therein, said baffle including sections, two of said sections cooperating to form said air circulating opening, means for holding the sections together, some of the hoops being mounted on one side of the baffle and other hoops on the opposite side of the baffle so that the hoops surround the fan and the motor, the main body of the hoops being inclined in a direction towards the center of the opening in the baffle, the opening through the hoops registering with the opening in the baffle, means for clamping the hoops into a rigid structure, and means for supporting the motor within the hoops so that the fan circulates air through the opening in the baffle.

10. In a ventilating assembly having a fan driven by an electric motor, the combination of a vertically disposed baffle member having an air circulating opening, said baffle member having a plurality of recesses in the periphery of the opening, each of the recesses having two walls forming a dihedral angle, with a plurality of identical hoops having apertured bosses, some of the bosses being seated in the recesses so as to support the hoops upon the baffle member, and retaining rods extending through the apertures for clamping the hoops into a rigid structure, said hoops surrounding the fan and the motor.

11. A ventilating fan assembly having a fan driven by an electric motor, the combination including a vertically disposed baffle having an opening, said baffle having a plurality of recesses in the periphery of the opening, a plurality of identical annular hoops having apertured bosses, said hoops being inclined towards the opening in the baffle, said hoops surrounding the fan and the motor, spacing means for holding the hoops in spaced relation from each other, and retaining rods extending through the apertures for clamping the hoops, some of the hoops having their spacing means nested in the recesses of the baffle so as to rigidly support the hoops with respect to the baffle, the inclination of the hoops causing the air to flow inwardly towards the center of the opening on one side thereof and outwardly upon the opposite side thereof.

12. A ventilating fan assembly having a fan driven by an electric motor, the combination including a vertically disposed baffle having an air circulating opening therein, the periphery of the opening of the baffle being provided with V-shaped portions, a plurality of hoops arranged side by side, there being a plurality of hoops on each side of the baffle, said hoops surrounding the fan and the motor, the opening through the hoops registering with the opening in the baffle, and means for clamping the hoops into a rigid structure, said V-shaped portions of the baffle engaging some of the hoops so as to rigidly support the hoops upon the baffle.

13. A ventilating fan assembly having a fan driven by an electric motor, the combination including a plurality of identical hoops arranged side by side, said hoops forming a peripheral enclosure for the electric fan and the motor, a vertically disposed baffle assembly including a center portion having an air circulating opening therein registering with the opening through the hoops, the margins of the opening through the center portion of the baffle assembly being provided with slot-like portions adapted to engage at least one of the hoops, means for clamping the hoops and the baffle assembly into a rigid structure, and means for supporting the motor within the hoops so that the fan circulates air through the opening in the baffle assembly.

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