

March 1, 1949.

M. WEBER
AIR CIRCULATOR

2,463,337

Filed Dec. 9, 1944

2 Sheets-Sheet 1

Fig. 1

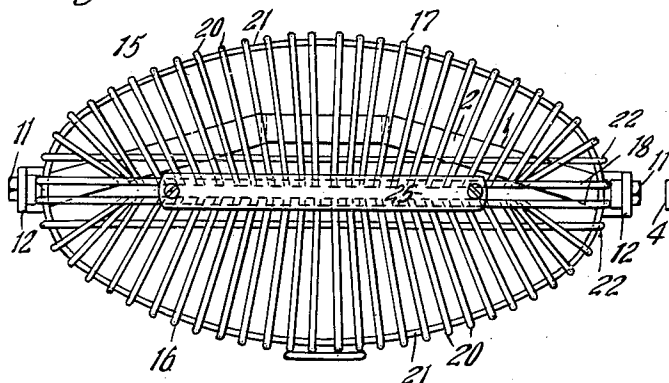


Fig. 11

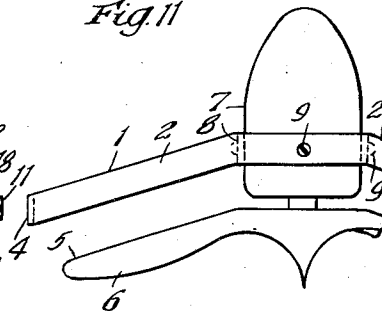


Fig. 2

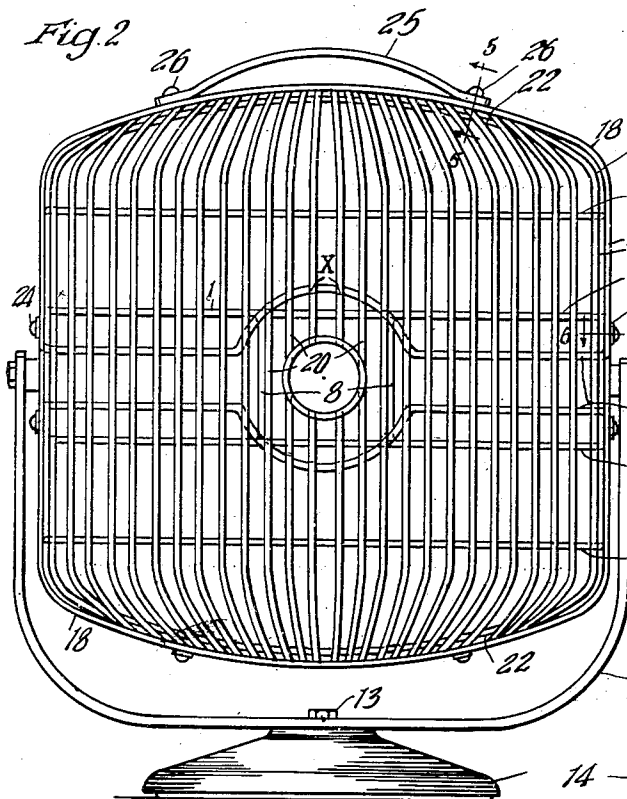
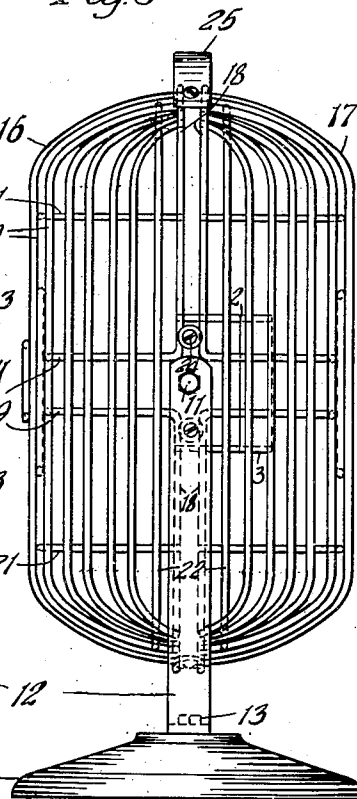


Fig. 3



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Fig. 4

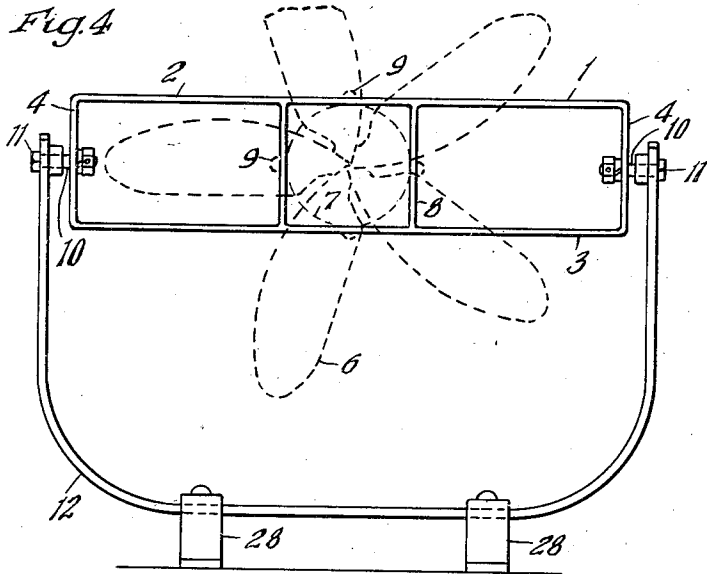


Fig. 7

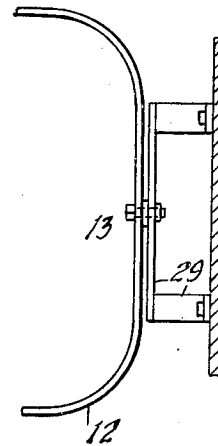


Fig. 5

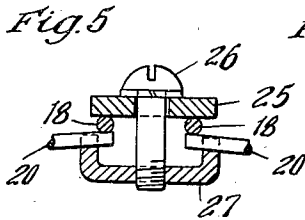


Fig. 6

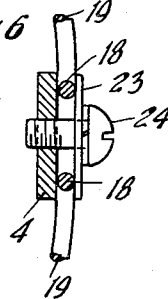


Fig. 8

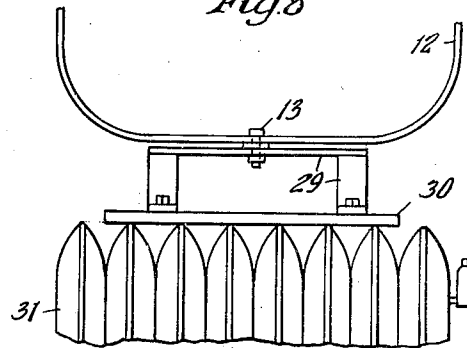


Fig. 9

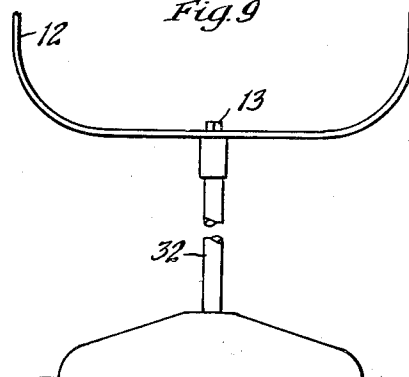
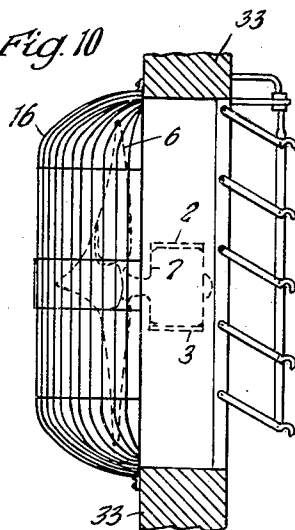


Fig. 10



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UNITED STATES PATENT OFFICE

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AIR CIRCULATOR

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8 Claims. (Cl. 230-273)

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This invention relates to air circulators, and more particularly to air circulators designed for general use in ventilating and circulating air in homes, offices, and other places.

Specifically, the invention relates to a guard for the fan of the air circulator and to a mounting for its motor.

One of the objects of the invention is to provide new and improved means for directing the air to the fan and for reducing rotary motion of the air prior to its being acted upon by the fan, whereby the velocity of the air stream created by the fan is increased.

Another object of the invention is to provide a new and improved guard and mounting constructed so as to reduce vibrations and noise emanating from the fan and the drive motor.

An additional object of the invention is to provide a guard and mounting so constructed that it is universally adaptable and simply converted to a great number of air circulator adaptations.

Other objects of the invention will become apparent throughout the progress of the specification and claims in which

Fig. 1 is a top plan view of an air circulator embodying the present invention;

Fig. 2 is a front elevational view;

Fig. 3 is a side elevational view;

Fig. 4 is a front elevational view of the framework per se, showing an alternative form of mounting for the framework;

Fig. 5 is a detail of one of the fan guard mounting means on the line 5-5 of Fig. 2;

Fig. 6 is a detail of another of the fan guard mounting means on the line 6-6 of Fig. 2;

Fig. 7 is a front elevational view of a part of the framework, showing another alternative form of mounting;

Fig. 8 is a front elevational view of a part of the framework, showing another alternative form of mounting;

Fig. 9 is a front elevational view of a part of the framework, showing another alternative form of mounting;

Fig. 10 is a detail sectional view, showing the adaptability of the invention for use as an intake fan; and

Fig. 11 is a detail showing a plan view of the frame, motor and fan blade of the air circulator.

In the selected embodiment of applicant's in-

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vention, there is provided a rectangular frame 1. The frame 1 comprises a top member 2, a bottom member 3, and side members 4, all composed of flat strips whose planes are perpendicular to the plane of the rectangular frame 1. In addition, the plane of the rectangular frame 1 is distorted so that it is substantially parallel to the plane of the trailing edges 5 of the fan blade 6 (see Fig. 11).

The top member 2 and the bottom member 3 are so spaced apart that they embrace the body of the fan motor 7. Two side struts 8 embrace the sides of the fan motor 7 and interconnect the top member 2 with the bottom member 3, so as to center the fan motor in the framework and to impart rigidity to the entire structure. The fan motor 7 is maintained between the top member 2, the bottom member 3, and the side struts 8 by any suitable means such as the screws 9 which are fed through the side struts into tapped holes in the body of the fan motor.

With this construction, the top member 2 and the bottom member 3 of the frame 1 lie in the same plane as that of the normal flow of air currents through the air circulator and, as a result, they impede or tend to prevent rotary motion of the air prior to its contact with the fan blades. In this way, the velocity of the air is greatly increased over that in a fan not incorporating similar air baffle members.

The top member 2 and the bottom member 3 of the rectangular frame 1 are both considerably longer than the side members 4 and are preferably of a length of at least three inches greater than the diameter of the fan. The rectangular frame 1 is pivoted for full 360° rotation on a horizontal axis as by pivots 10 mounted to the side members 4. The pivots 10 in turn are supported, as at 11, to the upper ends of a U-shaped supporting member 12. This supporting member 12 is pivotally mounted as at 13 to a heavy circular base 14.

This structure forms a very convenient and inexpensive mounting for supporting an air circulator for adjustment to any position. The rectangular frame 1 rotates through 360° on its horizontal axis and the U-shaped supporting member 12 rotates through a full 360° on a vertical axis.

The fan blade and fan motor are entirely

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covered by a guard 15 which serves two purposes. In addition to the normal purpose of guarding the fan blade 6 from accidental contact, the guard 15 serves the further purpose of absorbing sound vibrations arising from the operation of the air circulator. The guard 15 comprises two similar cages, a front cage 16 and a rear cage 17, and is preferably constructed of a No. 10 gauge wire. The top and bottom marginal wires 18 form the margin for each wire cage and also extend across the front of the cage to serve as a portion of the cage's framework as at 19. Vertical wires 20 extend from the upper margin to the lower margin of each guard and are additionally supported by horizontal wires 21.

It has also been desirable to form the outermost of the vertical wires 20 as an inner margin of each cage so as to form an additional support for the extremities of the remainder of the vertical wires 20. This inner margin appears in Fig. 1 as at 22. The wires are secured together at their several junctions by any suitable means, such as spot-welding, soldering, or the like.

The front cage 16 and the rear cage 17 are secured to the side members 4 of the rectangular frame 1. One means for effecting such a fastening is illustrated in Fig. 6, wherein the marginal wires 18 of the front cage 16 and the rear cage 17 are clamped between one of the side members 4 and a washer 23 by means of a screw 24 which is screwed into a tapped hole in the side member 4.

A handle 25 is provided as a convenience in carrying the air circulator from place to place, and may be secured to the front and rear cages by means of screws 26. These screws 26 are threaded into tapped holes in clamp 27, see Fig. 5. The cages may be secured between the clamp 27 and the handle 25 by tightening the screws 26.

In order to effectuate and take advantage of the sound-absorbing qualities of the applicant's guard, it is essential that the mid portions of the vertical wires 20 be arranged in parallelism with the side members 4, and that the plane in which said mid portions lie be curved. In this way, the maximum sound-absorbing qualities may be obtained.

If the applicant's mounting and guard be used for a long-bodied fan motor, certain of the central ones of the vertical wires 20 may be cut as at X in Fig. 2, to thereby form a circular opening through which the fan body may extend.

The applicant's mounting and guard is susceptible to a great many different types of installation; for example, it may be used with a heavy cast circular base 14, illustrated in Figs. 2 and 3, as a portable table fan. If desired, the pivotal mounting 13 and the base 14 may be removed from the supporting member 12 and a pair of angle members 28, see Fig. 4, may be substituted for a fixed wall, floor, or ceiling mounting.

As an alternative, the base 14 may be removed and a bracket member 29, see Fig. 7, may be substituted to serve as a pivotal mounting upon a wall, floor, or ceiling.

Another adaptation is to mount the bracket member 29 upon a plate 30 supported upon a heating element 31 so that warm air may be readily circulated as it rises from the heating element.

An additional alternative installation may be had by removing the base 14 and substituting a tall pedestal 32 so as to form a floor model air circulator.

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If desired, the rear cage 17, the entire U-shaped supporting member, and the pivots 10 may be removed from the side members 4, and the resulting assembly may then be installed in proximity with an opening in a wall 33, see Fig. 10, to form an intake fan. Similarly, instead of removing the rear cage 17, the installer may remove the front cage 16 and use the air circulator as an exhaust fan.

As a further alternative installation, both the front and rear cages 16 and 17 may be removed and the rectangular frame 1 with the attached fan motor and fan blade may be mounted within a conduit.

Changes and modifications within the scope of the appended claims may be made without departing from the spirit and the scope of the applicant's invention.

I claim:

1. In an air circulator having a motor and fan blades, means for mounting the motor, comprising four flat members arranged in a rectangle, the planes of said flat members being perpendicular to the plane of the rectangle and parallel to the normal flow of air through the circulator, and the plane of said rectangle being distorted so as to be parallel with the plane of the trailing edges of the fan blades.

2. An air circulator having a motor, an elongated frame supporting said motor, a guard secured to the short ends of said elongated frame, said guard being constructed of a plurality of wire members, portions of said wire members being arranged in a convex curved plane and in parallelism with said short ends of said frame said curved plane being perpendicular to the axis of said motor.

3. In an air circulator having a motor and fan blades, means for mounting the motor comprising four flat members arranged in an elongated rectangle having long and short members, the planes of said flat members being perpendicular to the plane of the rectangle and parallel to the normal flow of air through the circulator and the plane of said rectangle being distorted so as to be parallel with the trailing edges of the fan blades, and a guard secured to the short members of said framework, said guard being constructed of a plurality of wire members, portions of said wire members being arranged in a convex curved plane and in parallelism with the short members of said frame.

4. In an air circulator, a fan motor, an elongated rectangular frame having long and short members arranged for supporting said fan motor, a front guard detachably secured to the short end members of said rectangular frame, a rear guard detachably secured to the short ends of said rectangular frame, a mounting member pivotally and detachably secured to the short ends of said rectangular frame, and detachable means for supporting said mounting frame and member.

5. In an air circulator, a fan motor, an elongated rectangular frame having long and short members arranged for supporting said fan motor, a front guard detachably secured to the short end members of said rectangular frame, and a rear guard detachably secured to the short end members of said rectangular frame.

6. In an air circulator, a motor, a motor mounting having an element having maximum vibration, a guard, said guard comprising wire members parallel with each other and with said element having maximum vibration whereby sound and vibration waves emanating from said element

having maximum vibration tend to be absorbed.

7. In an air circulator, a motor, a motor mounting having an element having maximum vibration, a guard, said guard comprising straight members arranged in a curved plane and parallel with each other and with said element having maximum vibration whereby sound and vibration waves emanating from said element having maximum vibration tend to be absorbed.

8. In an air circulator an elongated frame having long and short flat members, a fan motor supported by said long members, a front guard and a rear guard, both guards being detachably secured to the short members of said elongated frame and the flat plane of said long members being parallel to the normal flow of air through the circulator.

MAX WEBER.

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