M. M. KOHN.

VENTILATOR FAN.

APPLICATION FILED MAY 5, 1917.

1,322,582.

Patented Nov. 25, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

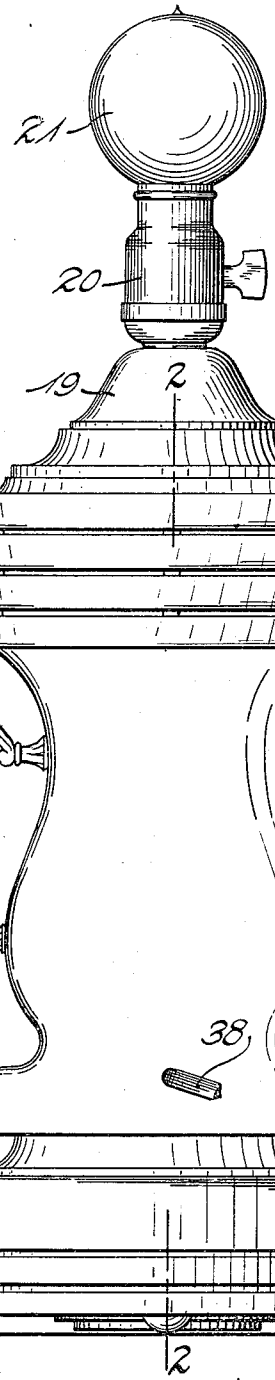


Fig. 4.

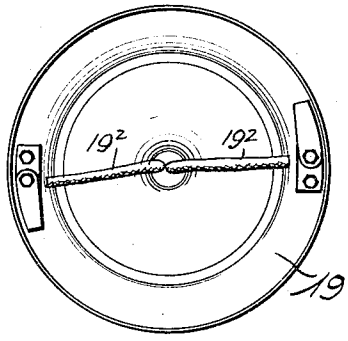


Fig. 5.

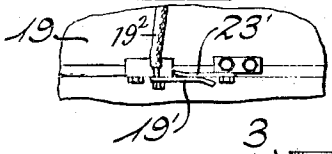
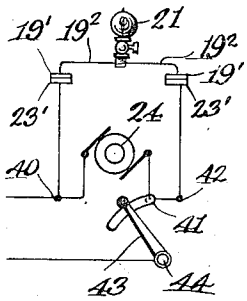


Fig. 6.



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2 SHEETS—SHEET 2.

Fig. 3.

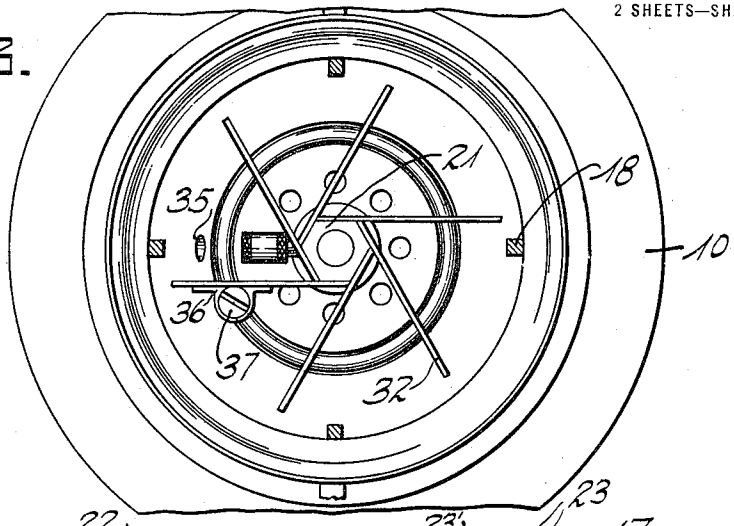
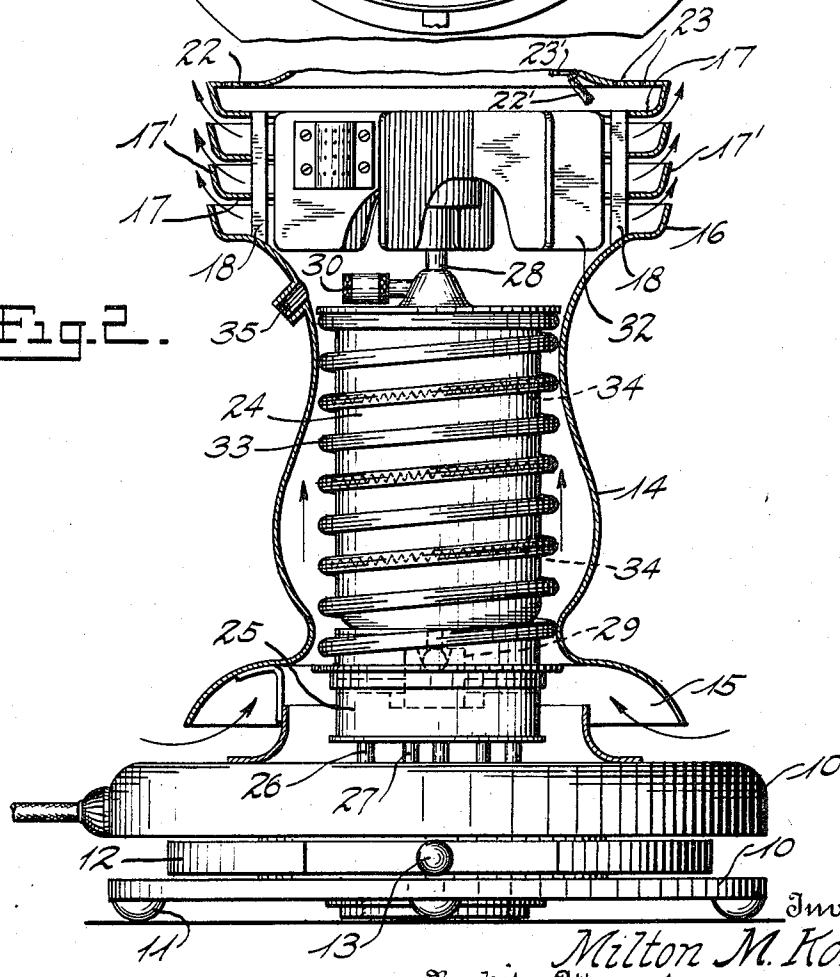


Fig. 2.



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UNITED STATES PATENT OFFICE.

MILTON M. KOHN, OF NEW YORK, N. Y., ASSIGNOR TO THE VENTILATOR FAN CO., INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

VENTILATOR-FAN.

1,322,582. Specification of Letters Patent. Patented Nov. 25, 1919.

Application filed May 5, 1917. Serial No. 166,604.

To all whom it may concern:

Be it known that I, MILTON M. KOHN, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented an Improvement in Ventilator-Fans, of which the following is a specification.

My invention relates to a ventilator fan and the object thereof is the provision of a ventilator fan so constructed as to be used without any change either as a desk fan, a table fan, or a wall or ceiling fan, and is distinguisned from the ordinary type of fan which merely agitates or stirs up the air and does not create a positive circulation as is done by my improved ventilator fan. Among other objects of my invention is to combine in the ventilator fan structure special combination ornamental and decorative features, as for example, a table lamp and fan, a candelabra and fan, a jardinière and fan, or a piano lamp and fan, and in the larger types of wall and ceiling devices to combine in a single apparatus lighting and ventilating features.

In carrying out my invention I employ a base, a casing of any ornamental or decorative configuration and within which are contained a fan wheel and motor for driving the same. The fan wheel may be made of any desired type such as propeller blades, draw through fans, disk fans, or multivane wheels or the like, and in all instances the fan wheel, of whatever type employed, as well as the motor, is entirely within the casing so that no moving part projects beyond the body of the apparatus thereby differing from various forms with so called deflectors. In the casing adjacent the fan wheel there is an air discharge section so constructed that the air delivered by the fan wheel is guided and directed in any desired manner as will be hereinafter more particularly described. The end of the casing opposite the base is preferably a separate and removable member so that several interchangeable ends, each embodying distinct ornamental features, may be employed, one end may embody a lamp and shade support, another end may embody a jardinière, and still another a candelabra, and so on in an unlimited fashion. I also employ suitable means for affecting a change in the condition of air circulated by my improved ventilator fan, for example by heating, cooling, disinfecting, ozonizing, drying, moistening, perfuming or otherwise treating the air. The means for thus effecting a change in the condition of air are preferably located within the casing, particularly is this desirable in the smaller types of ventilator fans, although as will be understood the ventilator fans and particularly the larger types thereof, may be provided with external means for this purpose when employed in theaters, halls, and other public places.

I wish here to call attention to the title I have given the apparatus comprising this invention. I prefer to call it a ventilator fan for two reasons; the one because it creates a positive suction at the inlet end, whether this be at the bottom or the top or in any intermediate position, and the other because the inlet end may be readily connected to an outside source of fresh pure air, thereby providing ventilating features which so far as I am aware has never been accomplished in any type of fans with which this invention may be compared.

The ventilator fan made in accordance with this invention will be hereinafter more particularly described in connection with the accompanying drawings in which:

Figure 1 is an elevation embodying one form of the ventilator fan.

Fig. 2 is an elevation and partial cross-section of the same taken at right angles to the position as shown in Fig. 1.

Fig. 3 is a sectional plan on line 3—3 Fig. 1.

Fig. 4 is an inverted plan of the removable cap member.

Fig. 5 is an elevation illustrating the clamp contacts for securing the removable cap in position in making electrical connections to the clamps or other devices that may be associated with the cap, and Fig. 6 is a diagrammatic view showing the electrical connections.

As will be seen by reference to the drawing, in carrying out this invention I employ a base 10 provided with suitable supports 11 upon which the apparatus may rest when placed on a flat surface and which as will be understood, may be changed to brackets or other means of support when the apparatus is connected to a wall or ceiling. In the base 10 there is fitted a switch member 12 having a handle or lever 13 by means of which the switch may be turned to make and

break the electrical connections supplying the necessary current employed for driving the motor and controlling the speed of the same.

Suitably mounted on the base 10 I employ a casing 14. This as will be understood may be in the configuration illustrated or in any other desired shape so as to be sufficiently ornamental to be used for decorative purposes. At the end of the casing adjacent the base, the same is provided with an air-inlet or inlets 15 and at the opposite end is provided with an out-turned flange 16. At this end of the casing I employ a plurality of rings each comprising an annular portion 17 and an outwardly and preferably upwardly extending flange 17′. The portions 17 of these rings are preferably placed parallel to one another and to the corresponding part of the outer end of the casing, and also in line with the normal direction in which the air is delivered from the fan so as to act as guides in directing the initial flow of the current of air. The upturned portions being curved will gradually change the direction of the flow of the air so as to direct it in a predetermined path either upwardly as shown when the fan, as illustrated, is placed on a table or other similar support, or downwardly when the fan for example, is supported from the ceiling. It will be understood however, that other means may be employed for directing the path of the air without departing from the nature and spirit of this invention. The rings as hereinbefore described, are secured together in their spaced positions and to the casing of the ventilator fan by means of posts or pillars indicated at 18 or otherwise. At this end of the casing and beyond the outermost ring member, I employ a removable decorative cap member 19. This is suitably connected to the adjacent part of the casing in any suitable manner so as to be interchangeable with other caps to vary if desirable, the ornamental effect of the apparatus. As shown in Fig. 1, the cap 19 may be provided with a socket 20 for an electric lamp bulb 21, and as hereinbefore intimated, the cap member instead of being so fitted, may include a jardinière, candelabra, or any other ornamental device, and any of these may be suitably equipped with electric lamps. Also as illustrated, the cap member is provided with clamp contacts 19′ to which the circuit wires 19^2 connected to the socket 20, or any other illuminating devices employed are led, and these contacts also act as clamp members for securing the cover in position by passing under and engaging similar contacts 23′ secured in the outer end of the casing, these contacts 23′ being connected by circuit wires 22′ to suitable terminals which are in multiple with the lead wires to the motor terminals hereinafter described.

That portion of the casing adjacent the place of attachment of the cap 19 is also preferably provided with a series of apertures or openings 23 providing air-inlets to which reference will hereinafter be made. From the form of the invention as illustrated and as will be understood, the light may be provided with a suitable shade to enhance the decorative features of the apparatus.

Within the casing 14 I employ an electric motor shown diagrammatically at 24 and mounted upon a motor base 25 preferably by support pins 26 which are adapted to be received in sockets provided therefor in the base 10. As shown in Fig. 2, I also employ a series of circuit connecting pins 27 depending from the motor base 25 and adapted to engage contacts provided therefor in the base 10 in order to complete the electric circuit to the motor. The motor shaft 28 is mounted at one end in this construction in a ball-thrust bearing 29, and in order to properly lubricate the same I may employ a grease or oil-cup 30.

As shown and described, the motor may be controlled by a suitable rheostat fixed in the base and operated by the handle 13 in operating the switch 12. At the opposite end of the motor shaft the same is fitted with a fan wheel comprising a hub 31 to which are connected suitable fan blades 32. As illustrated in the drawing and as shown particularly in Fig. 3, these fan blades are connected in positions tangential to the motor shaft, but as will be understood, they may be placed radially or in any other suitable manner without departing from the nature and spirit of my invention. These fan blades and the hub to which they are connected are secured on the motor shaft in such a position as to lie within the air discharge section of the casing, and as will be apparent the outlets of this discharge section are so constructed as hereinbefore described, as to guide and direct the air delivered by the fan in an upward direction as indicated by the arrows, the air being drawn through the casing 14 from the inlet openings 15, at one side of the fan, and this portion of the air passes through the casing and around the motor. The air is also drawn through the openings 23 at the opposite end of the casing and at the other side of the fan. It is also to be understood that the air discharge section of the casing may be so constructed as to direct the air delivered by the fan in any desired direction.

As illustrated in the drawing, and as shown particularly in Fig. 2, I have provided means for heating the air as currents of the same pass through the casing. This may comprise a coil 33 surrounding the motor casing and containing a resistance wire 34 through which an electric current from

any source of supply may be passed and controlled from and by a separate switch. Also as indicated in this figure and also as shown in Fig. 3 the casing 14 in a suitable position may be provided with a cup or pocket 35 adapted to receive a disinfecting or perfuming device in order to perfume, or disinfect the air as the same passes through the casing and before it is delivered by the fan from the same. For the same purpose, and as also illustrated in these figures, one or more of the fan blades 32 may be provided with a receptacle 36 fitted with a cover 37 and having apertures in its sides so as to receive and contain a suitable disinfectant or perfume and permit the escape of the same to the air as the same is delivered from the fan. Instead of these devices for affecting the condition of the air as the same passes through the casing, one end of the coil may extend through the casing as indicated at 38 Fig. 1 and for example may be supplied with a suitable refrigerating mixture in order to cool the air, or means other than those described may be employed for heating the air and obviously the air may be dried or moistened or ozonized by a suitable apparatus or otherwise treated while passing through the casing without departing from the nature and spirit of this invention.

It will also be understood that the air-inlet openings 15 at the end of the casing adjacent the base, or otherwise placed, may be connected by a pipe or other conduit with the outdoor atmosphere, for example, in order to supply entirely fresh air to the place to be ventilated, this being particularly applicable to the larger types of my improved ventilator fans which are used in ventilating theaters, halls, public buildings and other similar places and structures.

It is to be distinctly understood that my invention is not limited to the form of motor support shown in the drawing, as this may be modified in many ways; for example, by employing a flange supporting the motor and forming part of the casing, or supporting the motor in a spider attached to the body of the casing at any suitable place or in any other manner so that the friction and vibration may be reduced to a minimum. Neither is this invention to be limited to the manner shown and described for controlling the motor speed by a rheostat inasmuch as the speed of the motor may be regulated by the field control or similar means. Furthermore it is to be understood that the invention is not limited to the casing shown and described in which the air-inlets are at the bottom, because in certain types of fan it may be advisable to have the air-inlets at other places or in other positions.

Referring to Fig. 6 of the drawing, the terminals of the motor 24 are connected to contacts 40, 41 through the connecting pins 27, the contact 40 being connected to one of the lead wires. The contact 40 is also connected to one of the contacts 23′ which is engaged by the contact 19′ when the cap is in position so that the electric light or other devices are connected by the leads 19^2. The other contact 23′ is connected to another contact 42 in the base 10. A switch arm 43 operated by the lever 13 is adapted to engage either one or both of the contacts 41, 42 so that the motor may be employed without the light or other devices or motor, and the light may be simultaneously employed, or the light may be employed alone, it being understood that the pivotal point of the switch arm 43 as indicated at 44 is connected to the other lead wire. Furthermore, as will be understood and as hereinbefore indicated, the speed of the motor may be controlled by any suitable devices which are not included in this diagrammatic Fig. 6.

I claim as my invention:

1. In a ventilator fan, a fan wheel having a radial discharge, and means for diffusing the discharge from the fan wheel in substantially parallel paths.

2. In a ventilator fan, a casing, a fan wheel having a radial discharge, and means for diffusing the discharge from the fan wheel in substantially parallel paths circumferentially of the casing.

3. In a ventilator fan, a casing, a fan wheel having a radial discharge, means for diffusing the discharge from the fan wheel in substantially parallel paths circumferentially of the casing, and means for changing the condition of the fan discharge as it passes through the casing.

4. In a ventilator fan, a fan wheel having a radial discharge, and devices for diffusing the discharge of the fan wheel in substantially parallel paths as it leaves the blades of the fan and then directing it in other predetermined paths.

5. In a ventilator fan and in combination, a casing, a fan wheel within the casing for causing a current of air to flow through the casing, a motor for driving the fan wheel, and means for diffusing the discharge of the fan wheel in substantially parallel paths as it leaves the blades of the fan and then directing it in a predetermined path as it leaves the casing circumferentially thereof.

6. In a ventilator fan and in combination, a casing, a fan wheel within the casing for causing a current of air to flow through the casing, a motor for driving the fan wheel, means for diffusing the discharge of the fan wheel in substantially parallel paths as it leaves the blades of the fan and then directing it in a predetermined path as it leaves the casing circumferentially thereof, and means for changing the condition of the

air currents as the same pass through the casing.

7. In a ventilator fan and in combination, a casing having an air inlet at one end thereof and an air outlet at the other end thereof, a fan wheel within the casing adjacent the air outlet end thereof, a motor for driving the fan wheel, and a plurality of parallel rings in the air outlet end of the casing having outturned flanged peripheries for initially diffusing the air in parallel paths as the same leaves the blades of the fan wheel and then deflecting it in a predetermined direction as it leaves the casing circumferentially thereof.

8. In a ventilator fan and in combination, a casing having an air inlet at one end thereof and an air outlet at the other end thereof, a fan wheel within the casing adjacent the air outlet end thereof, a motor for driving the fan wheel, a plurality of parallel rings in the air outlet end of the casing having outturned flanged peripheries for initially diffusing the air in parallel paths as the same leaves the blades of the fan wheel and then deflecting it in a predetermined direction as it leaves the casing circumferentially thereof, and means for changing the condition of the air currents as the same pass through the casing.

9. In a ventilator fan and in combination, a casing, a fan wheel within the casing, a motor also within the casing for driving the fan wheel, and means for diffusing the discharge of the fan wheel in parallel planes at right angles to the axis of the motor as it leaves the blades of the fan wheel.

10. In a ventilator fan and in combination, a casing, a fan wheel within the casing, a motor also within the casing for driving the fan wheel, and means for diffusing the discharge of the fan wheel in parallel planes at right angles to the axis of the motor as it leaves the blades of the fan wheel, and then directing it in a predetermined path as it leaves the casing circumferentially thereof.

11. In a ventilator fan and in combination, a base, an ornamental casing connected at one end to the said base, a cap, means including electrical connections for securing the cap in position at the opposite end of the base, electric lighting devices secured in the cap, and means within the casing for creating a current of air therein.

12. In a ventilator fan and in combination, a base, an ornamental casing connected at one end to the said base, a motor mounted within the said casing, a fan wheel driven by the motor for creating a current of air in the casing and discharging the same therefrom, electrical connections to the motor and controlled in the said base, a cap at the opposite end of the said casing, clamp members forming electrical contacts secured in the said cap, similar clamp members also forming electrical contacts secured in the said opposite end of the casing and adapted to be engaged by the clamp members on the said cap, and electrical connections from the said clamp members to the electrical connections for supplying the motor.

13. In a ventilator fan and in combination, a base, a casing secured at one end to said base and having air-inlets at the end thereof adjacent the said base, a plurality of parallel rings with out-turned flanged peripheries secured to the opposite end of the casing and forming an air discharge section therein, a fan wheel within the air discharge section of the casing, a motor for driving the said fan wheel, and means for effecting a change in the condition of the air as it passes through the casing.

14. In a ventilator fan, a fan wheel having a radial discharge, a casing, means for dividing the discharge from the fan wheel initially into substantially parallel paths, and then directing the discharge into other paths of predetermined direction, and means for conditioning the fan wheel discharge.

Signed by me this 3rd day of May, 1917.

MILTON M. KOHN.