H. MEREDITH-JONES.

ROTARY FAN.

APPLICATION FILED DEC. 16, 1913.

1,214,812.

Patented Feb. 6, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

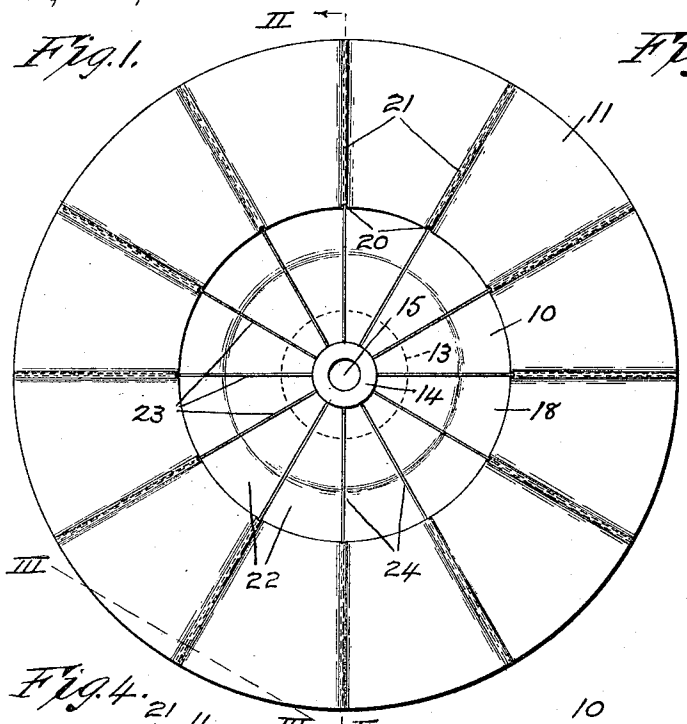


Fig. 3.

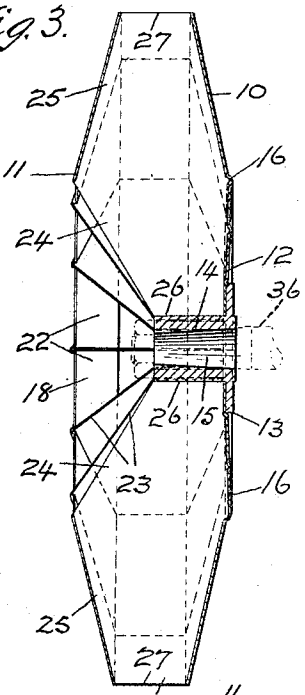


Fig. 4.

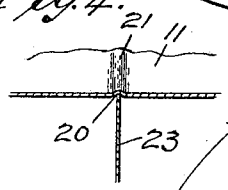


Fig. 5.

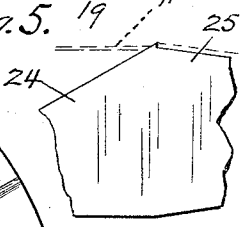


Fig. 2.

Witnesses:
Charles C. Abbe
W. Dumody.

Inventor
Hubert Meredith-Jones.
By his Attorney
W. T. Riswell.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

H. MEREDITH-JONES.

ROTARY FAN.

APPLICATION FILED DEC. 16, 1913.

1,214,812.

Patented Feb. 6, 1917.

2 SHEETS—SHEET 2.

Fig. 6.

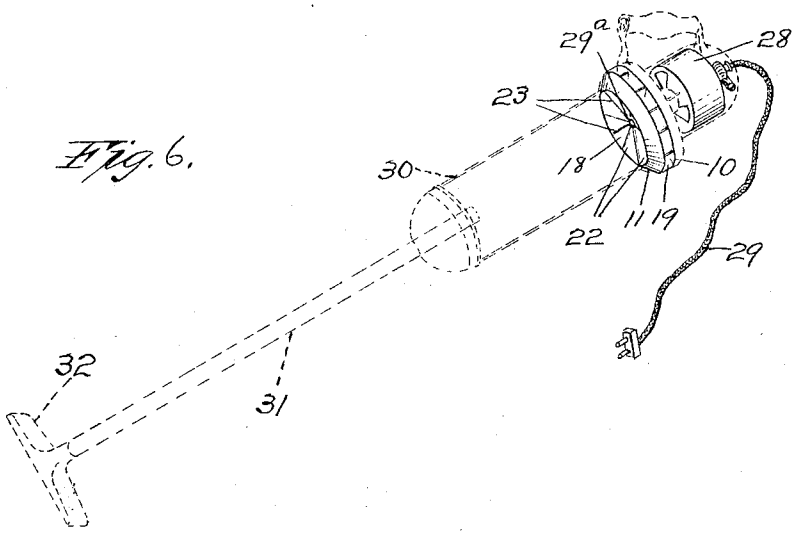
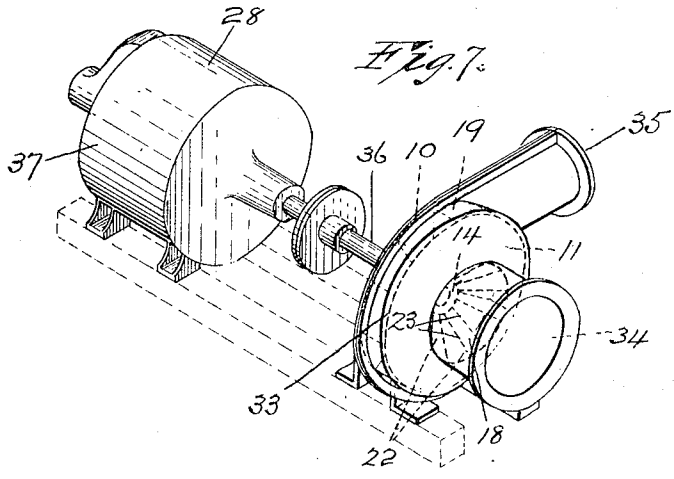


Fig. 7.



Witnesses:
Charles C. Abbe
W. Dumody.

Inventor.
Hubert Meredith-Jones.
By his Attorney
W. T. Piswell

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HUBERT MEREDITH-JONES, OF NEW YORK, N. Y., ASSIGNOR TO THE ROTOR VACUUM CLEANER COMPANY, INC., A CORPORATION OF NEW YORK.

ROTARY FAN.

1,214,812. Specification of Letters Patent. Patented Feb. 6, 1917.

Application filed December 16, 1913. Serial No. 807,039.

To all whom it may concern:

Be it known that I, HUBERT MEREDITH-JONES, a subject of the King of England, and a resident of New York, county and State of New York, have invented a certain new and useful Improvement in Rotary Fans, of which the following is a full, clear, and exact specification.

This invention relates to a class of devices adapted to be used as either a suction fan, or a blower fan.

My invention has for its object primarily to provide a rotary fan adapted to be driven by a motor, or other suitable power, and which is designed to be employed in conjunction with any desired type of apparatus for producing air pressure by suction, or for producing air pressure for blowing purposes. This is accomplished mainly by providing two substantially concaved plates which are disposed in spaced relation so that the concavities of the plates are opposed to each other, and centrally of one of the plates is an opening which serves as an inlet, while the space between the marginal edges of said plates provides an outlet. The space between the plates is divided into a number of radially disposed air passages, one end of each of which communicates with the inlet, and the other end of each passage communicates with the outlet of said plates. The air passages are provided by a plurality of spaced approximately elliptic, or elongated hexagonal blades which are arranged crosswise between the plates in spoke fashion relatively to the axial centers of these plates, and these blades as well as the plates are so constructed that when assembled the exit of each of said air passages is preferably one-half the extreme depth of the mouth thereof. Air under great pressure may thereby be obtained by the consumption of minimum power for rotating the fan.

A further object of the invention is to provide a rotary fan of simple and durable construction, and which is susceptible of being made in various sizes so as to be adapted for different uses.

With these and other objects in view, the invention will be hereinafter more particularly described with reference to the accompanying drawings, which form a part of this specification, and will then be pointed out in the claims at the end of the description.

In the drawings, Figure 1 is a front elevation of a rotary fan embodying one form of my invention. Fig. 2 is a rear elevation of the fan. Fig. 3 is a section taken on the line II—II of Fig. 1. Fig. 4 is a fragmentary section, partly in detail, taken on the line III—III of Fig. 1. Fig. 5 is a fragmentary view of the central part of one of the blades of the fan. Fig. 6 is a perspective view, showing the fan as used in conjunction with a vacuum cleaner, and Fig. 7 is a perspective view, showing the use of the fan for producing air pressure for blowing purposes.

The rotary fan has a rear plate 10 and a front plate 11, both of which are preferably circular in shape and of similar diameters. The plates 10 and 11 are substantially concave in shapes, and said plates are disposed in spaced relation so that the concavities thereof are opposed to each other. The central part of the convex surface of the rear plate 10 is reduced to provide a flat portion 12, and midway through this flat portion is an opening 13 in which is mounted one end of a hub 14 extending inwardly between this plate and the front plate. The hub 14 is of a length to extend approximately one-half the distance between the centers of these plates, and said hub has a tapered opening 15 therethrough. In the concaved surface of the rear plate 10, and extending from the edge of the opening 13 to the outer periphery of this plate, are provided a number of radially disposed spaced grooves 16. The plate 10 is preferably made of sheet metal, and the grooves 16 are formed by stamping the material by the use of a die. A like number of ridges 17 are provided on the convex surface of the concaved plate 10.

As shown in Fig. 3, the concavity of the plate 11 is somewhat more pronounced than the concavity of the plate 10, and the central part of the plate 11 is cut-out to provide an opening 18 which serves as an inlet for admission of air into the fan, while the space between the marginal edges of both of the plates serves as an outlet 19 for the exit of air admitted into the fan. The inlet 18 is of a diameter substantially one-half the diameter of the plate 11, and the outlet 19 is of a width approximately one-half the dis-

tance between the concavity of the plates 11 at the edge of its inlet and a corresponding part of the concavity of the plate 10. In the concaved surface of the front plate 11, and extending from the edge of the opening, or inlet 18 to the outer periphery of this plate are provided radially disposed spaced grooves 20 which are similar in numbers to the spaced grooves 16 of the plate 10, and each of the grooves 20 is in register with one of the grooves 16. The plate 11 is also preferably made of sheet metal, and the grooves 20 thereof are formed by stamping the material with a die, or the like so as to provide ridges 21.

Between the plates 10 and 11 are a number of air passages 22, one end of each of which communicates with the inlet 18, and the other end of each passage communicates with the outlet 19. The air passages 22 are provided by a plurality of spaced blades 23 which are alike in formation. Each of the blades 23 is elliptic, or of an elongated hexagonal shape to provide two oppositely disposed tapered edge portions 24 and 25, the edge of the free end of each of which is straight, as at 26 and 27. The blades 23 are disposed crosswise between the concaved rear and front plates 10 and 11, and each blade is arranged so that one edge of each of its tapered portions 24 and 25 is seated in one of the grooves 16 of the rear plate, while the opposite edge of only the portion 25 is seated in one of the corresponding grooves 20 of the front plate. The blades 23 may then be soldered, or otherwise secured against displacement in the grooves of the plates, and all of the blades are of sufficient lengths to extend from the hub 14 of the rear plate to the outer peripheries of both of the plates 10 and 11, or in proximity thereto. The blades 23 will thereby be disposed in spoke fashion relatively to the axial centers of the plates, and the straight ends 26 of all the blades are soldered, or otherwise connected to the hub 14. As shown in Figs. 1 and 3, by arranging the blades 23 in this manner between the plates 10 and 11 the edges of the tapered portions 24 of the blades which are opposite to the tapered edges of said blades secured to the rear plate are thereby disposed in corresponding converging, directions toward the hub 14. The spaces between these converging edges of the blades 23 communicate with the inlet 18, and each of said spaces provides a mouth for each of the air passages 22. The inlet 18 is thereby preferably cone-shaped for freely admitting air into the passages 22.

In practice the fan may be rotated by an electric motor, as 28, of the usual, or any preferred type, which may receive its electric current through wires 29 leading from any suitable source of supply, or the fan may be driven by any other propelling means by being secured upon the shaft 29ª of the motor. When the fan is employed for producing air pressure by suction the fan may be used in conjunction with any desired apparatus, for instance a vacuum cleaner, as indicated at 30 Fig. 6, wherein the fan is arranged so that its inlet 18 will be in opposed relation to one end of a tube 31 having a nozzle 32 on its other end for suctionally admitting air therein. As the air is drawn through the nozzle 32 and tube 31 it is admitted in the inlet 18 of the fan, and the air is forced under pressure through the passages 22 and forced through the outlet 19 of the fan and through an exhaust port provided at a suitable place in the vacuum cleaner.

When the fan is employed for producing air pressure for blowing purposes it may be used in conjunction with a well-known form of blower casing, as 33 Fig. 7, having an inlet port 34 and an outlet port 35. The fan is then rotatably mounted in the casing and secured upon the shaft 36 which may be driven by an electric motor 37, or other suitable power, and the fan is arranged so that its inlet is in register with the inlet port 34 of the casing 33 of the blower. In operation the air will be admitted through the inlet port 34 of the blower casing and into the inlet 18 of the fan when rotated. The air will then be forced through the passages 22 and out of the outlet 19, thence through the outlet 35 of the blower casing. By this manner of employing my rotary fan air pressure of considerable volume may be obtained by the consumption of minimum power for rotating the fan.

In the foregoing description, I have embodied the preferred form of my invention, but I do not wish to be understood as limiting myself thereto, as I am aware that modifications may be made therein without departing from the principle, or sacrificing any of the advantages of this invention; therefore I reserve to myself the right to make such changes as fairly fall within the scope of the appended claims.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. A rotary fan, comprising a hub adapted to be secured to a shaft, a plurality of radial blades secured to the hub, a concave plate with a central convex portion connected to one end of the hub and to the corresponding edges of the radial blades, said plate having radial grooves therein and one of the corresponding edges of the blades being seated in each groove, a second concave plate having a circular opening therethrough, and having on its inner surface radial grooves in which are seated the second edges of the blades, said blades being of a width exceeding the length of the hub and having their

inward edges formed on angles so as to form a diagonal line extending from the inner edge of the opening in the second plate to the end of the hub, thereby providing a conical opening for the admission of air into the fan, substantially as and for the purposes set forth.

2. In a fan of the character described, the combination of a plurality of radial blades with tapered end portions, a central hub to which all of said blades are secured, said hub of a length substantially one-half the width of the blades, said hub being adapted to be secured to a driven shaft, two concaved plates having radial grooves therein serving as seats for the edges of the blades, one of said plates having a central convex surface communicating with and secured to the rear end of the hub, and serving as a deflecting element for the air to contribute to the centrifugal movement of the air passing through the fan, and the opposite plate having a circular opening of substantially the same diameter as the convex portion of the opposed plate for admission of air into the fan, the blades being formed on an angle from the inner edge of the opening to the forward end of the hub whereby a conical opening to the forward end of the hub is provided in the fan for the admission of air, substantially as shown and described.

This specification signed and witnessed this fifteenth day of December, A. D. 1913.

HUBERT MEREDITH-JONES.

Witnesses:
ROBT. B. ABBOTT,
M. DERMODY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."