

(No Model.)

R. LUNDELL.
ROTARY FAN.

No. 511,442.

Patented Dec. 26, 1893.

Fig. 1,

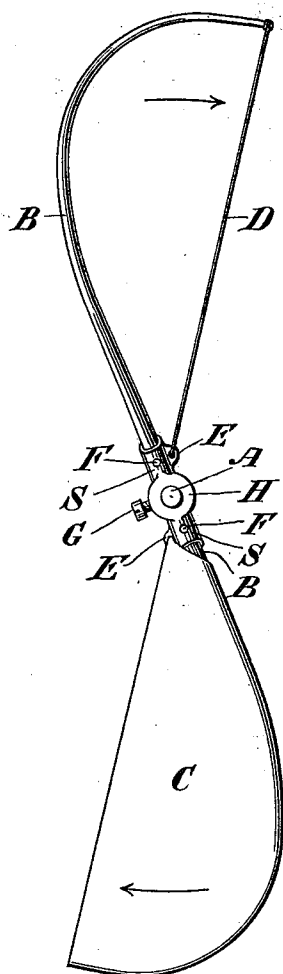
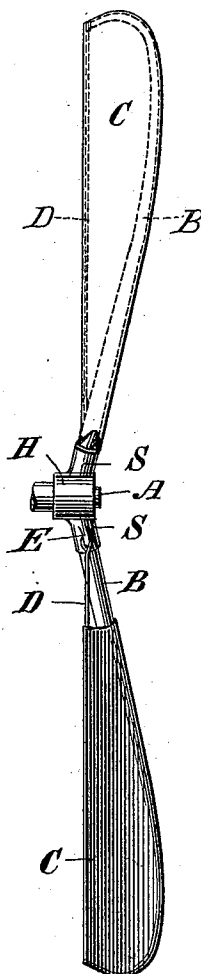


Fig. 2,



Witnesses
C. E. Ashley
John P. Nordstrom

Inventor
Robert Lundell
By his Attorney
Charles J. Kintner

UNITED STATES PATENT OFFICE.

ROBERT LUNDELL, OF BROOKLYN, ASSIGNOR OF TWO-THIRDS TO EDWARD H. JOHNSON, OF NEW YORK, N. Y.

ROTARY FAN.

SPECIFICATION forming part of Letters Patent No. 511,442, dated December 26, 1893.

Application filed January 4, 1893. Serial No. 457,261. (No model.)

To all whom it may concern:

Be it known that I, ROBERT LUNDELL, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have made a new and useful Invention in Rotary Fans, of which the following is a specification.

My invention is directed particularly to that type of rotary fans having inclined vanes or blades, such for instance as are now largely in public use in connection with electric motors for creating drafts of air, and its objects are, first, the construction of a fan which shall be as light as possible and therefore offer to the journal bearings of the motive power a minimum amount of friction: second, to avoid as far as possible the unnecessary vibrations and annoying humming noises which exist with such fans when running at high speeds: third, to avoid the necessity of the balancing of such a fan: fourth, to produce a fan which will by virtue of its lightness and peculiar construction be free from the dangers due to centrifugal force with such fans when running at high speeds, and fifth, to produce a rotary fan which when running will not injure a person coming in contact with its vanes or blades. These several results are effected by the novel fan hereinafter described, the essential features of novelty of my invention being particularly pointed out in the claims at the end of this specification.

Rotary fans that have heretofore been devised have been made wholly of metal or wood and the vanes or blades thereof attached directly to their hubs by rivets, said hubs being secured to the axles of the propelling motors in well known ways. Metal fans have also been devised in which the vanes or blades were cast solid with the hubs but in all such instances the fans were of such weight as to materially decrease their efficiency when being driven and also endanger the user either by throwing off the vanes when running at high speeds or by being too closely approached. My invention avoids all of these objections and will be fully understood by referring to the accompanying drawings, in which—

Figure 1 is a front elevational view of my improved fan with the cloth or other equiva-

lent material which constitutes the surface of the vanes or blades in position on the lower vane and removed therefrom on the upper vane of a two-bladed fan. Fig. 2 is a side elevational view of the same, part of the cloth being broken away, the better to show the structure.

Referring to the drawings in detail: A is the axis of the driving motor, preferably an electric motor not shown, and H the hub of the fan secured thereto in the usual manner by a set screw G, said hub having two or more short hollow radial arms S S.

B B are supporting arms of tapered construction for the vanes or blades as shown secured in the hollow arms S S of the hub by pins or screws F F, said arms being made preferably of some strong, light, elastic material as wood. To the outer ends of each of these arms is attached a strong, thin cord or wire D which cords in turn are drawn taut, as clearly shown, through eyes E E integral with the arms S S, said cords or wires being located on opposite sides and the entire arrangement of the drawn cords and arms B under tension constituting a frame work to which is secured by thread, glue or in any preferred manner, light strong vanes or blades C of oiled silk, thin leather, or any preferred material of such a pliable nature. I prefer to use oiled silk and to stretch the same as tightly as possible over the framework so as to make a neat and comparatively strong structure. It will be understood of course that there may be any number of vanes or blades C and that the pitch of said vanes or blades may be arranged to suit the user by simply withdrawing the pins or screws F F from the arms B B and turning said arms into any desired position after which the pins or screws may again be inserted. I prefer to rotate the fan when in use in such way that the cords or wires D D cut the air as they advance as shown by the arrows in Fig. 1.

It will be understood that any desired tension may be put upon the arms B by drawing the cords D through the eyes E and fastening them by tying or in any preferred manner. I find that a rotary fan of such structure is almost absolutely noiseless when run at high speeds and that there is a minimum

amount of vibration upon the shaft thereby greatly increasing the efficiency of apparatus of this nature.

I do not limit my claims to the specific structure herein shown and described as I believe it is broadly new with me to devise a rotary fan in which the vanes or blades are made of a pliable material such as cloth, silk, skin, paper, parchment or equivalent material held under tension by a sustaining support or frame and my claims are generic in this particular.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is--

1. A rotary fan having vanes or blades made of pliable material sustained by elastic or yielding arms and cords which put the arms under tension at their outer ends substantially as described.

2. A rotary fan having vanes or blades made of pliable material attached to radial arms adjustably secured in a hub at their inner

ends and to cords at their outer ends which cords are in turn secured to the hub substantially as described.

3. A rotary fan having two or more vanes or blades made of pliable material stretched upon frames or supports consisting of curved radial arms attached to a common hub and cords which unite the outer ends of the arms with the hub substantially as described.

4. A rotary fan having two or more vanes or blades C of oiled silk attached to elastic arms B, B, and cords D D; said arms being adjustably secured to a hub H and bent as shown and described under stress of the cords affixed at their outer ends to the arms and at their inner ends to the hub.

In testimony whereof I have hereunto subscribed my name this 31st day of December, 1892.

ROBERT LUNDELL.

Witnesses:

CHAS. J. KINTNER,
M. M. ROBINSON.