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AIR TRANSLATING APPARATUS

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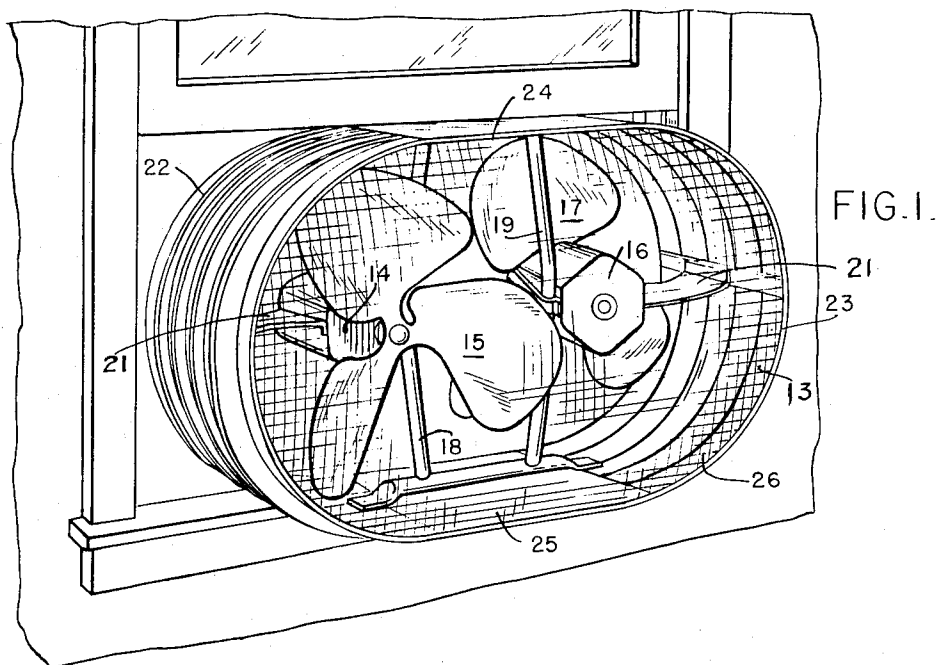


FIG. 1.

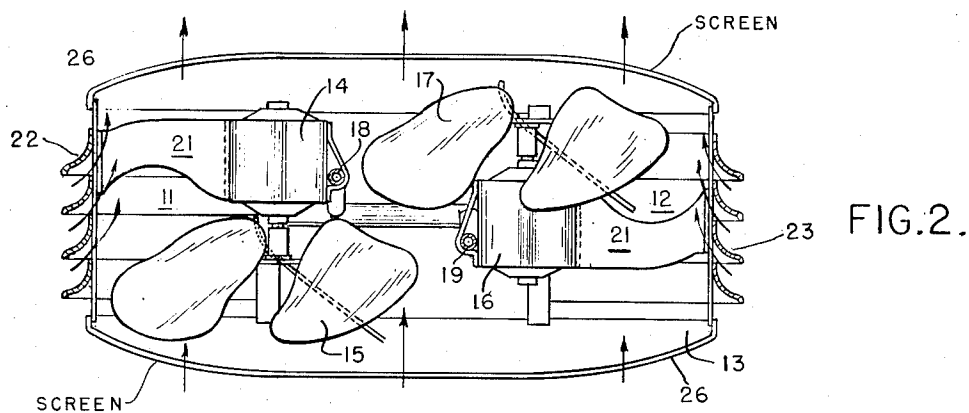


FIG. 2.

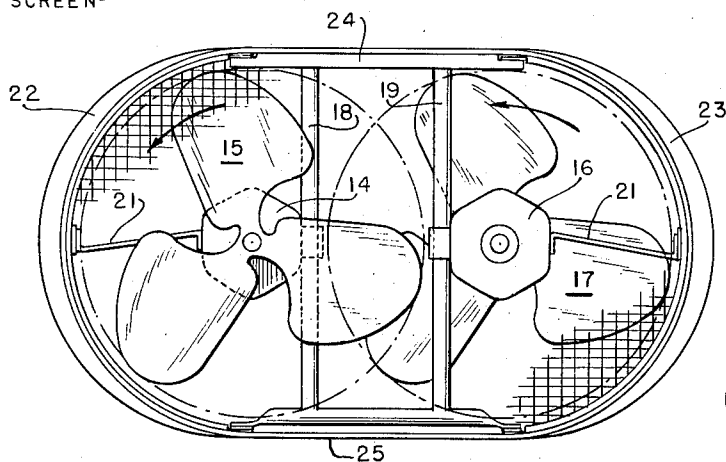


FIG. 3.

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AIR TRANSLATING APPARATUS

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4 Claims. (Cl. 230—259)

My invention relates to air translating apparatus, more particularly to a fan device comprising a plurality of propeller fan units mounted side by side and operable to move air in the same direction.

An object of my invention is to provide a compact arrangement of a plurality of propeller fan units, each comprising a fan and a motor for driving the same, whereby the device is particularly suited for mounting in a window opening.

In accordance with my invention, I mount the fan units side by side with their axes parallel, and with the propeller fans mounted on opposite ends of the respective motor shafts. The orbits of the fan tips overlap when projected on a plane normal to the fan axes, and the axial extent of each propeller fan overlaps the axial extent of the electric motor of the other unit. Thus, the fan and motor units interfit to provide a compact fan device.

These and other objects are effected by my invention as will be apparent from the following description taken in connection with the accompanying drawings, forming a part of this application, in which:

Fig. 1 is a perspective view of a fan device in accordance with my invention;

Fig. 2 is a plan view, partially in section, showing the interfitting relation of the fan units; and

Fig. 3 is an elevational view showing the fan units.

Referring now to the drawing in detail, the fan device comprises fan units 11 and 12 mounted in a housing or guard structure 13. The unit 11 comprises an electric motor 14 and a propeller fan 15 mounted on an extended portion of the shaft of the motor 14. The unit 12 comprises an electric motor 16 and a propeller fan 17 mounted on an extended portion of the shaft of the motor 16.

The fan units 11 and 12 are mounted side by side with their axes parallel, and with the radial extent of each fan overlapping the radial extent of the other fan; that is, the orbits of the blade tips overlap each other when projected on a plane normal to the fan axes, as shown in elevation in Fig. 3. As shown in Fig. 2, the fans are mounted on opposite ends of the respective motor shafts, the fan 15 being mounted at the end toward the suction side of the fan device and the fan 17 being mounted at the end of its motor shaft toward the discharge side of the fan device. It will be noted that each fan is disposed alongside the motor of the other unit; that is, the axial extent of each fan overlaps the axial extent of the motor of the other unit. The term "axial extent" as used herein means the distance projected on the axis of rotation; in other words, the distance between the two planes, normal to the axis of rotation, between which a fan or a motor extends.

The fan units may be mounted in the housing in any

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suitable manner. In the illustrated embodiment, the motors are attached by straps to vertical posts 18 and 19 which are attached in any suitable manner to the housing. The motors may be further connected to the housing by means of connecting straps or webs 21.

As shown on the drawing, the housing comprises two semi-cylindrical end portions 22 and 23 and flat top and bottom portions 24 and 25 connecting the semi-cylindrical portions. The semi-cylindrical portions may comprise, as in the illustrated embodiment, shroud rings which are curved in cross section from a direction generally radially inwardly to axially forwardly, as shown in Fig. 2. Air is drawn inwardly through the passages between adjacent shrouds and is caused to move forwardly.

The radial dimensions of the shroud rings and the openings between adjacent shroud rings gradually decrease toward the top and the bottom. Large mesh screens 26 preferably extend across the inlet and outlet sides of the guard structure 13. These screens preferably are of a form bulging outwardly as shown in Fig. 2.

The fans are rotated in directions to propel air in the same direction, for example, as indicated by the arrows in Fig. 2. Preferably the fan blades are identical and the fans rotate in the same direction when viewed in the assembly. For example, in the illustrated embodiment when viewed as seen in Fig. 3, the fans rotate in counterclockwise direction and move air rearwardly.

I have found that the action of the two fans on the air in the overlapping portion of the two blade areas does not set up noise to any objectionable degree.

Provision is made for mounting the fan device in a window. Such provision comprises expedients well known in the art and which are, therefore, not shown. The fan device is preferably mounted, as shown in Fig. 1, with the discharge side of the fan disposed substantially in the plane of the window sash.

It will thus be seen that I have provided a compact fan device which is particularly well suited to be mounted and to operate in a window opening. The large volume of the stream of air propelled by the fans has an ejector action which induces flow of air through that portion of the window opening which is outside or beyond the fan, so that it is not necessary to provide a panel to close such portion of the window opening.

While the invention has been shown in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof.

What I claim is:

1. A fan device comprising a plurality of fan units, each unit comprising an electric motor and a propeller fan mounted on the motor shaft, a fan supporting structure, said units being mounted on said supporting structure and disposed side by side with their axes parallel, the paths of the fan tips, when projected on a plane normal to the axes, overlapping each other, each fan being disposed at the end of its associated motor shaft which is opposite of the end of the other motor shaft on which the other fan is disposed, and each fan overlapping the motor of the other unit in axial extent, said fans being operable in directions to move air in the same direction.

2. A fan device as set forth in claim 1 which further comprises a guard structure enclosing the fan units, said guard structure comprising semi-cylindrical portions generally concentric with the respective units and flat portions connecting the semi-cylindrical portions.

3. A fan device as set forth in claim 2 wherein the semi-cylindrical portions have openings therein for admission of air therethrough.

4. A fan device as set forth in claim 2 wherein the semi-cylindrical portions comprise shroud ring portions which, in cross section, are curved from generally radially inwardly to axially forwardly to provide passages therebetween through which air enters and is directed axially forwardly.

References Cited in the file of this patent

UNITED STATES PATENTS

532,789	Ketcher	Jan. 22, 1895
1,482,047	Steinbach	Jan. 29, 1924
2,164,608	Cornelius	July 4, 1939
2,620,126	Lyne	Dec. 2, 1952
2,628,019	Koch	Feb. 10, 1953
2,628,020	Koch	Feb. 10, 1953