Nov. 4, 1941. G. H. KOCH 2,261,391

AIR TRANSLATING APPARATUS

Filed Sept. 21, 1939 2 Sheets-Sheet 1

Fig 1.

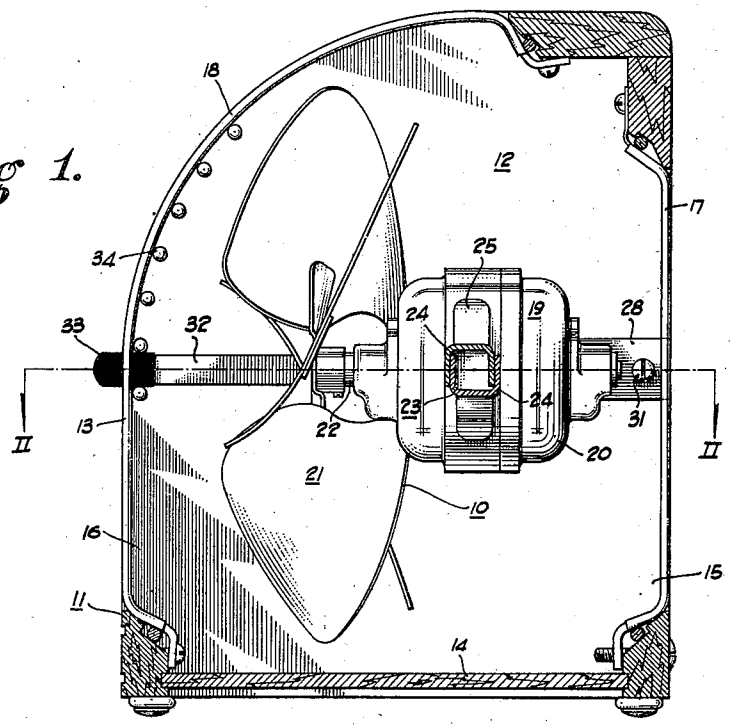
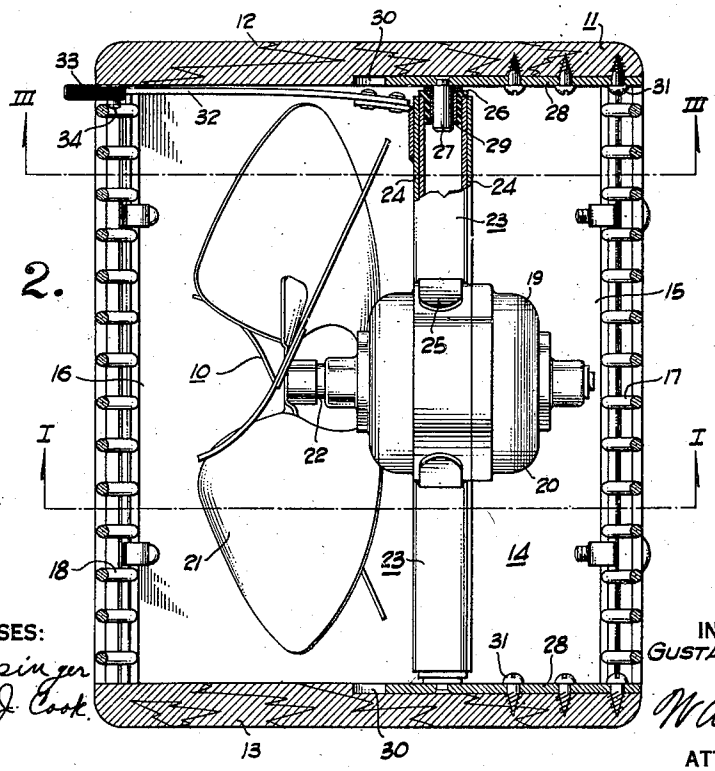


Fig 2.



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Fig 3.

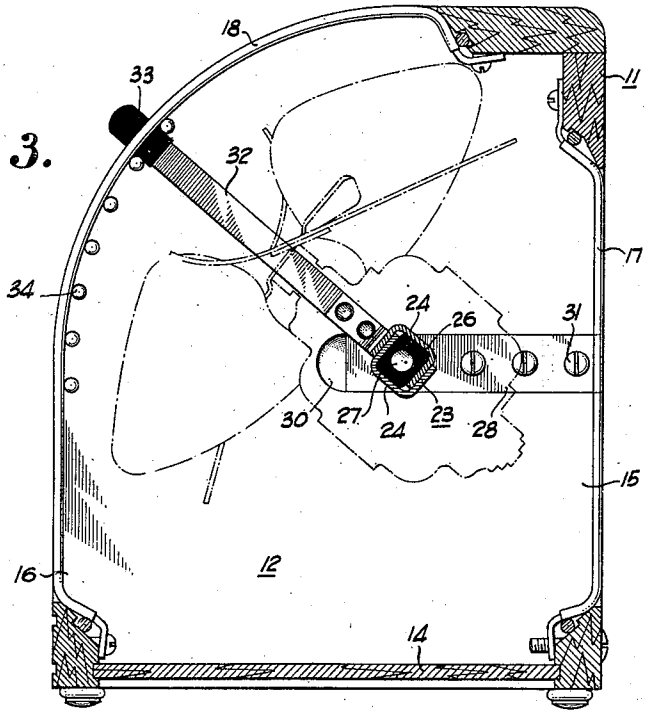
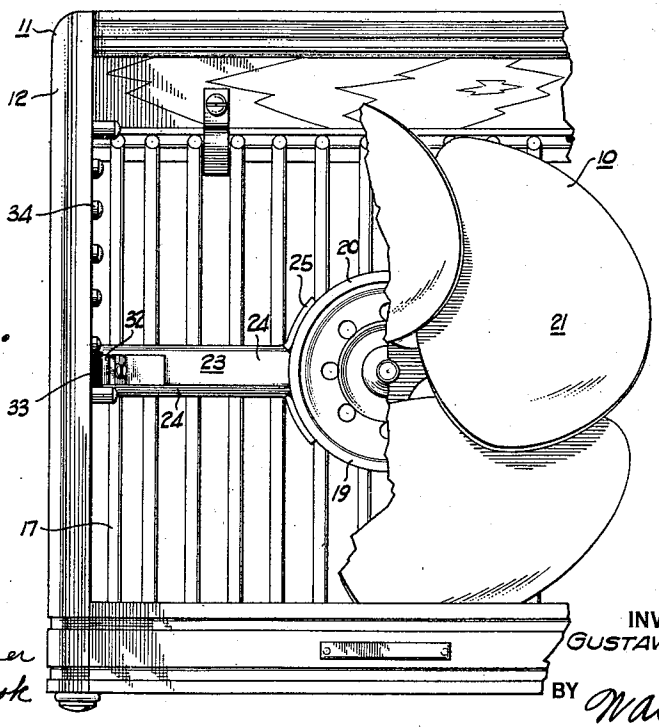


Fig 4.



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UNITED STATES PATENT OFFICE

2,261,391

AIR TRANSLATING APPARATUS

Gustav H. Koch, Springfield, Mass., assignor to Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., a corporation of Pennsylvania

Application September 21, 1939, Serial No. 295,924

9 Claims. (Cl. 230—259)

My invention relates to air translating apparatus, more particularly to a fan mounted in a cabinet and angularly movable therein, and it has for an object to provide improved apparatus of the character set forth.

Another object is to provide a simple and inexpensive construction for mounting the fan in the cabinet so that it is angularly movable therein; a more particular object being to provide a construction which facilitates assembly and disassembly thereof.

A further object is to provide improved means for adjusting the angular position of the fan in the cabinet.

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

Fig. 1 is a vertical section taken on the line I—I of Fig. 2;

Fig. 2 is a horizontal section taken on the line II—II of Fig. 1;

Fig. 3 is a vertical section taken on the line III—III of Fig. 2; and

Fig. 4 is a front elevation with parts removed and others broken away.

Referring to the drawings in detail, I show a cabinet fan including a fan motor unit 10, and a cabinet 11 in which the unit is enclosed. The cabinet fan shown on the drawings is adapted to be mounted on the floor, on a table or any other suitable supporting surface. Accordingly, the fan motor unit is adapted to be tilted in order that the air may be directed in an upwardly-inclined direction when the cabinet fan is placed on the floor and discharged in a horizontal direction when it is placed on a table or the like.

The body of the cabinet is made of wood and includes opposite side walls 12 and 13, a bottom wall 14 and other wall portions as shown on the drawings. It has an inlet opening 15 at the rear and an outlet opening 16 at the front and top. Wire grilles 17 and 18 are positioned across the inlet and outlet openings, respectively. They may be of any suitable construction, and fastened to the cabinet body in any suitable manner, for example, as shown on the drawings and as more fully described and claimed in the application of Lawrence S. Riendeau, Serial No. 296,538, filed September 26, 1939.

The fan motor unit 10 includes an electric motor 19 of any suitable construction, preferably enclosed in a steel casing 20. It further includes propeller blades 21 secured together to form a fan or blade wheel which is overhung on the motor shaft 22 and retained thereon by means of a set screw.

One feature of the present invention resides in the construction for pivotally mounting the fan motor unit in the cabinet on a horizontal axis extending between the side walls 12 and 13. This construction includes, first, a pair of arms 23 extending horizontally in opposite directions from the motor casing 20 and forming therewith a horizontal rock shaft or supporting structure for tilting the fan motor unit. Each arm 23 comprises two channel elements 24, each of which is U-shaped in cross-section, as shown in Figs. 1 and 3. The sides of the U of each channel element are disposed in overlapping relation to and welded to those of the other channel element to provide a tubular arm of rectangular cross-section. The intermediate portion of each channel element is provided at one end with an ear or tab 25 formed to lie flat against the motor casing 20 and spot welded thereto. As will be noted from the drawings, the four channel elements 24 are of the same form, thereby simplifying the manufacturing and assembling operations.

The tubular arms are open at their outer ends. Into each of these open ends there is inserted a rubber bushing having a rectangular outer surface, as shown in Fig. 3, to fit the inside of the tubular arm. Trunnions 27, fastened to plates 28 in any suitable manner, as by riveting, are inserted in the openings in the bushings 26. The rubber bushings 26 may be formed with inserts or liners 29 for direct contact with the trunnions.

The side walls 12 and 13 are formed on their inner surfaces with grooves 30 disposed in aligned or opposed relation. These grooves extend from substantially the center of the side walls horizontally to the rear or inlet edge. The plates 28 are adapted to fit and slide horizontally in the grooves 30. The plates 28 are adapted to be secured to the side walls 12 and 13 in any suitable manner, as by means of screws 31.

It will be seen that this construction greatly facilitates the assembly of the parts and the mounting of the fan motor unit in the cabinet. The rubber bushings 26 are inserted in the ends of the arms 23, and the trunnions 27 are inserted in the bushings. The assembly is then mounted by inserting the plates 28 in the grooves 30 and sliding the same horizontally therein to the operative position shown on the drawings. Inasmuch as the parts are brought into interlocking relation by movement lengthwise of the arms 23, it will be seen that the several parts of

the assembly are held in assembled relation as soon as the plates 28 are inserted in the grooves 30. Accordingly, the possibility of the parts becoming separated or moving out of their proper relative position is eliminated once the plates enter the grooves. Also, it will be noted that the parts are held and supported in proper assembled relation while the screws 31 are inserted to fasten the plates 28 in proper position.

The blade wheel is preferably removed from the motor shaft 22 while the assembly is being mounted in or removed from the cabinet, in order to avoid possibility of bending the blades. However, the assembly may be mounted or removed with the blade wheel mounted on the motor shaft by tilting the motor at a suitable angle.

A lever 32 is provided to adjust the angle of tilt or angular position of the fan motor unit. Its outer end, which is covered by a rubber cap 33, projects through the outlet opening between the inner side of the wall 12 and the wire grille 18. That portion of the edge of the wall 12 along which the lever is movable, and the adjacent portion of the grille 18, are formed on an arc concentric with the axis on which the fan motor unit is pivoted. Accordingly, the projection of the lever 32 from the cabinet is substantially uniform. The lever is made of spring steel and is secured to the arm 23 adjacent the side wall 12 in the manner shown in Fig. 2, that is, at an angle such that, if it were not deflected, it would extend into the side wall 12. However, the outer end of the lever is bent or flexed toward the interior of the cabinet by contact of its rubber cap 33 with the inner surface of the side wall 12. This spring effect biases the fan motor unit and the arms 23 toward the opposite side wall 13 thereby eliminating end play and reducing possible noise. It also reduces possible rattling of the lever against the side wall 12.

In order to position the lever 32, pins 34 having enlarged heads are attached to the inner side of the wall 12 adjacent the edge thereof, as clearly shown on the drawings. These pins are disposed so that the lever may be located in any one of six positions between adjacent pin heads. The uppermost and lowermost pin heads are of greater length to limit the angular movement of the lever. The intermediate pin heads are relatively short in order that the outer end of the lever may be flexed toward the interior of the cabinet and moved over the pin heads from one position to another. As will be apparent from Figs. 1 and 3, the lever may be adjusted from a horizontal position upwardly through intermediate positions varying 8° to an uppermost position which is 40° above horizontal. Obviously, any desired extent of angular adjustment may be provided.

While I have shown my invention 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, and I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. In a cabinet fan, the combination of a cabinet having two opposite walls formed with aligned grooves on their inner sides extending to the edge of the wall at one end and terminating at a central portion of the wall at the other end, a fan-supporting structure extending between said walls, a fan carried by said structure, members for supporting said structure, said members and said structure being formed to restrain relative transverse movement upon relative movement longitudinally of the structure, said members being adapted to slide in said grooves, said structure and said members being held in assembled relation while said members are in said grooves, and means for retaining said members in said grooves.

2. In a cabinet fan, the combination of a cabinet including two opposite walls having opposed grooves extending inwardly from the edge of each wall, a fan assembly adapted to be mounted in said grooves and including a rock shaft or supporting structure extending between said opposed walls, a fan motor therefor carried by said structure and adapted to have a fan mounted thereon, support members having trunnions thereon and adapted to fit in and slide in said grooves, bushings carried by said structure at the ends thereof, said trunnions being insertable in said bushings endwise of said structure, and means for securing said support members in said grooves, said assembly being held in assembled relation when said support members are inserted in said grooves and being readily disassembled when they are withdrawn from the grooves.

3. In a cabinet fan, the combination of a cabinet comprising two opposite walls having aligned grooves on their inner or opposed sides extending inwardly from one edge of each wall, a fan assembly adapted to be mounted in said grooves and including a fan motor unit, and support members adapted to fit and slide in said grooves, said unit and said members being formed with complementary interlocking portions providing pivotal connections which permit angular movement of the fan motor unit in the cabinet, said complementary interlocking portions being formed so that said unit and said members are held in assembled relation when said members are inserted in said grooves and may be readily disassembled when they are withdrawn from the grooves.

4. In a cabinet fan, the combination of a cabinet comprising opposite walls having opposed grooves formed therein, a fan motor assembly comprising a motor unit having apertures opening in opposite directions from the unit, bushings insertable in said apertures, and plates fitting in said grooves and having trunnions insertable in said bushings, said assembly being mounted by inserting and sliding said plates in said grooves and being held in assembled relation by the opposite walls when the plates are in the grooves.

5. A fan and motor unit having a pair of support arms extending oppositely therefrom, each arm comprising two channel elements of U-cross-section, the legs of the U of each element overlapping and being secured to those of the other element to form a tubular arm, each element having an ear or tab secured to the unit, and a supporting structure for the unit, the outer ends of said support arms being connected to said supporting structure.

6. A fan motor unit as set forth in claim 5, wherein the four channel elements are of the same form.

7. In a cabinet fan, the combination of a cabinet comprising two opposite walls having aligned track means extending inwardly from one edge of each wall, a motor unit, supporting members adapted for sliding engagement with said track means, said unit and said members being formed with complementary pivot portions providing

pivotal connections which permit angular movement of the motor unit in the cabinet, said complementary pivot portions being formed so that said unit and said members are held in assembled relation when said members are in sliding engagement with said track means and may be readily disassembled when said members are withdrawn from sliding engagement with said track means.

8. A fan motor unit as set forth in claim 5, wherein the outer ends of the support arms are pivoted to the supporting structure on an axis extending longitudinally of said support arms.

9. In a cabinet fan, the combination of a cabinet having opposite walls and air inlet and outlet openings between said opposite walls, a fan motor unit enclosed within said cabinet and pivotally mounted on said opposite walls on an axis extending therebetween and in a position to translate air from said inlet opening to said outlet opening, a lever of spring material for adjusting the angular position of the unit, said lever being attached to said unit adjacent the inner side of one of said opposite walls in such manner that it is sprung and therefore presses against said wall, said lever having a portion projecting through one of said openings to the exterior of the cabinet to provide a handle, said inner side of said one wall being provided with a series of spaced projections located so that the lever may be retained between adjacent projections in any one of a plurality of angular positions, said lever being adapted to be actuated to adjust the angular position of said fan motor unit by flexing said lever away from said wall to clear said projections, and a grill disposed across said one opening through which said lever projects and formed so as to permit the angular movement of said lever.

GUSTAV H. KOCH.