Nov. 30, 1937. C. A. SCHMIDT ET AL 2,100,923

FAN WITH COLLAPSIBLE SUPPORT

Filed April 21, 1937

Fig. 1

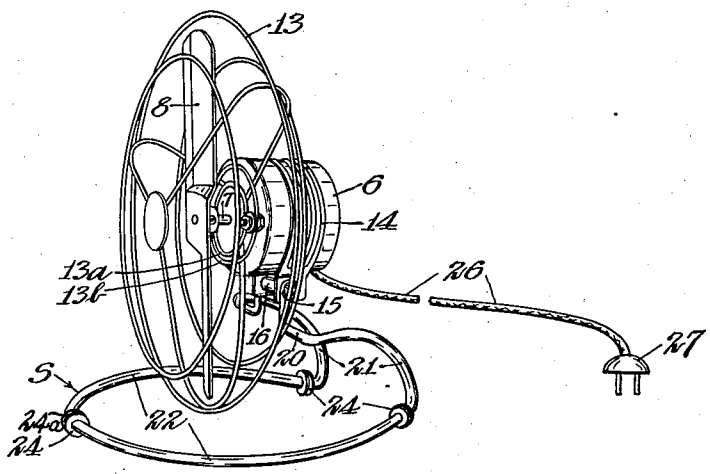


Fig. 2

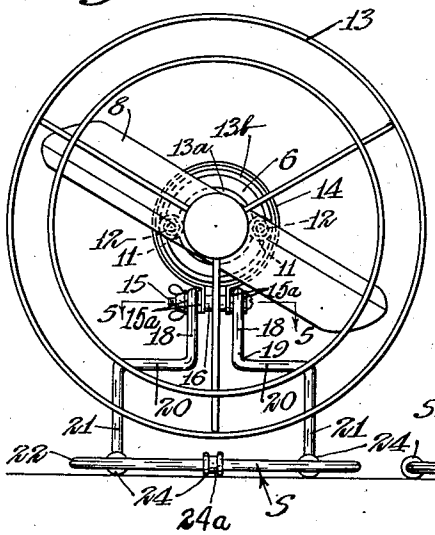


Fig. 3

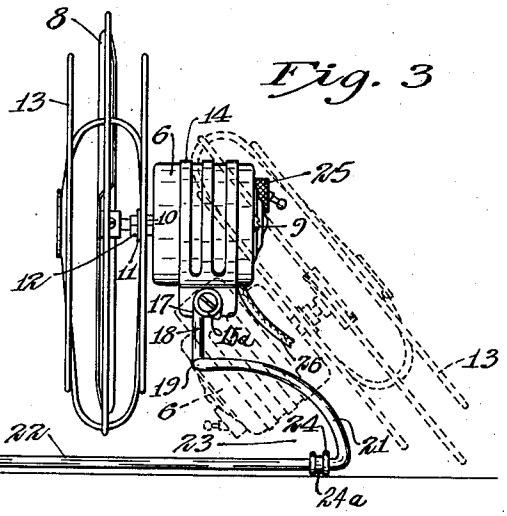


Fig. 4

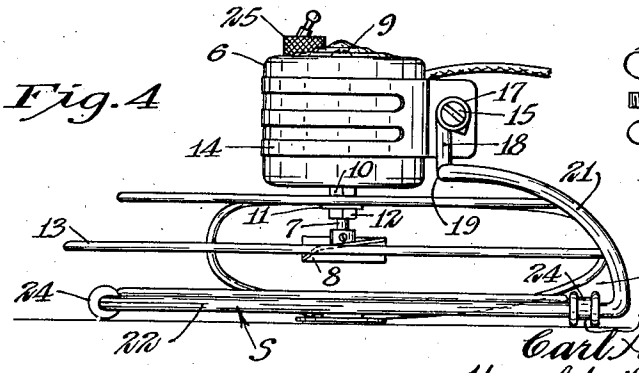
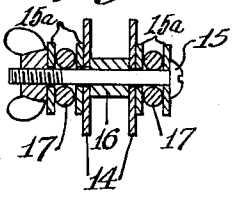


Fig. 5



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FAN WITH COLLAPSIBLE SUPPORT

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7 Claims. (Cl. 230—273)

This invention relates to fans with collapsible supports.

It is the general object of the invention to provide a novel and improved electric fan of cheap and simple construction which can be used either as a pusher or puller fan, can be supported on a flat support with the fan directed at various angles, can be hung or supported in various other manners and the support of which can be collapsed so that the fan with its support may be stowed away in very small compass.

The objects and advantages of the invention will more fully appear in the following description, made in connection with the accompanying drawing, in which like reference characters refer to the same or similar parts throughout the various views, and, in which,

Fig. 1 is a perspective view of the fan as it will appear when the fan blade is substantially vertical and the support is extended to hold the fan in position on a horizontal surface;

Fig. 2 is a view in front elevation of the fan in the condition shown in Fig. 1;

Fig. 3 is a view in side elevation of the fan, the fan being shown in full lines in the same condition as shown in Figs. 1 and 2, and being shown in dotted lines in a different position relative to its support;

Fig. 4 is a view in side elevation showing the fan with its support collapsed; and

Fig. 5 is a horizontal section taken on the line 5—5 of Fig. 2, as indicated by the arrows.

In accordance with the invention there is provided an electric motor 6 of substantially cylindrical shape from the forward end of which the motor shaft 7 projects. Attached to the forward part of the shaft 7 is a fan blade 8. This blade in the illustrated embodiment has two arms and in order that the fan may have a good suction action as well as a good propulsion action the arms of the blade 8 are made of uniform width from adjacent the tips of the arms to a central non-pitched portion of the blade. The two screws or studs 9 holding the parts of the stator of the motor 6 in assembled relation project forwardly somewhat from the front of the motor and are equipped with the usual nuts 10 bearing against the front of the motor and they are also equipped with washers 11 and nuts 12 outwardly from the nuts 10. A guard cage 13 made up chiefly of wire surrounds the fan blade 8 and the rear central part of this guard cage is equipped with two circular wires 13*a* and 13*b* respectively arranged in concentric relation in the same plane. The spacing between the two circular wires 13*a* and 13*b* is less than the width of the nuts 10 and washers 11 and the forward ends of the screws 9 are received between the wires 13*a* and 13*b* and the nuts 12 and washers 11 are used for securely clamping these wires against the nuts 10. This affords an extremely simple and inexpensive construction for attaching the cage 13 to the motor 6 and at the same time it permits of rotative adjustment of the cage 13 relative to the motor 6 during assembly to permit the parts of the cage to be symmetrically arranged.

A clamping band 14 fits about the circular wall of the motor 6 and is provided with normally downwardly extending apertured ears through which a wing nut equipped bolt 15 extends. A fiber sleeve 16, best shown in Fig. 5, fits about the bolt 15 between the ears of the clamping collar 14 for the purpose of producing a frictional pivot joint as will presently appear.

The support for the fan is designated as an entirety by the letter S and it consists of a single oppositely reversely curved bail-like member formed of heavy wire. The two ends of the support S form eyes 17 through which the bolt 15 extends. One of the eyes 17 is located at the outer side of each of the ears of the clamping collar 14 and washers 15*a*, through which the bolt 15 extends, are located between the ears of the clamping collar 14 and the eyes 17 and between the eyes 17 and the head and nut of the bolt 15. This peculiar construction of pivot joint including the fiber sleeve 16 produces a simple type of frictional pivotal joint, permitting the support to be readily swung on the bolt 15 as its axis to various positions relative to the motor 6, blade 8 and cage 13 but at the same time exerting sufficient frictional resistance to the swinging movement to cause the support S and the motor 6, blade 8 and cage 7 to retain their relative positions when the desired positioning has been obtained.

From the eyes 17 the wire forming the support S is extended downwardly for a short distance to form short downwardly extending portions 18 whereupon the wire is bent outwardly from the portions 18 to form stop shoulders 19 and outwardly extending portions 20. From the outwardly extending portions 20 the wire is curved rearwardly and downwardly to form the rearwardly and downwardly extending portions 21. Portions 18, 20 and 21 may be considered to form arms. The rearwardly and downwardly extending portions 21 join the ends of a horse-shoe shaped or loop-like supporting foot 22 which runs forwardly a considerable distance. As viewed in

side elevation as shown in Figs. 3 and 4, a space 23 is afforded between the downwardly and rearwardly extending portions 21 and the foot 22 for reception of portions of the cage 13. Mounted on the foot 22 is a forward and two lateral grooved sleeves 24 composed of rubber or other resilient and frictional material, these sleeves being provided for the triple purpose of preventing the fan, due to its vibrations, from creeping when it is being supported upon a surface such as a table or the like, preventing the fan from transmitting vibrations to its supporting surface and protecting the surface from marring or scratching by reason of the supporting foot 22 resting thereon. The grooves of these sleeves are designated by the numeral 24a.

It will be seen that when the support S is extended from the cage 13 of the fan, the fan may be supported stably upon a suitable supporting surface and that the fan blade 8 can be set at almost any desired inclination relative to the horizontal to direct air in almost any desired direction or to cause air to be sucked into the fan from almost any desired direction. In Figs. 1, 2 and 3 in full lines the fan blade 8 is shown located in a vertical plane while in dotted lines Fig. 3, the motor 6, cage 13 and blade 8 have been swung rearwardly and downwardly to an inclined position relative to the support S. In this latter dotted position the shoulders 19 act as stops against the motor 6 to prevent further downward swinging movement. While in the drawing the fan is shown as being supported upon a supporting surface, such as a table or the like, it will be readily seen that the fan can be readily hung as from a nail, hook, bracket or the like mounted on a vertical or other wall so as to be suspended from what is the forwardmost portion of the foot 24 as viewed in Fig. 3 with the foot bearing against the wall.

To collapse the support S, it is merely necessary to swing the parts to the position shown in Fig. 4 whereupon a portion of the cage 13 will be received within the space 23 and the foot 22 will lie closely against the normally forward side of the cage. In this position the fan with its support takes up but small space and it can be stowed away readily as in a suit case or the like. Of course when the stand is in a collapsed position, it can be hung as from a nail or other support attached to a wall, window or the like in such relation that the fan may be used either as a suction fan or a propeller type fan. For example, the fan may be supported as from a nail in an open window by hooking either the foot 22 or the cage 13 onto the nail and if it is desired to draw fresh air into the room the fan may be faced inwardly, while if it is desired to suck air out of the room the fan may be faced outwardly.

Attention should be called to the fact that the downwardly and rearwardly extending portions 21 form a convenient handle which can be grasped for moving the fan from one position to another. The portions 21 and the foot 24 form a hook which permits the support S to be hooked as over a chair back or the like for proper support of the fan.

The motor 6 is preferably equipped with an electric switch 25 and an electrical conduit 26 and a socket plug 27 for connection with a source of electrical supply.

It will be seen that an extremely simple and efficient fan has been provided which is capable of being effectively used to direct air in practically any direction or draw air from practically any direction.

It will be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departure from the scope of the present invention, which generally stated consists in the matter shown and described and set forth in the appended claims.

What is claimed is:—

1. A fan with collapsible support comprising an electric motor having a motor shaft, a fan blade attached to an end portion of said shaft, a guard cage attached to said motor and surrounding said blade and on oppositely reversely curved bail-like support swingably connected to said motor, said support having a foot and an arm extending therefrom to said motor, said arm and foot as viewed in side elevation cooperating to form a space within which the lower portion of the cage may be closely received with the foot lying adjacent the forward side of the cage when the support is swung to one position and said foot acting to stably support said motor, blade and cage on a supporting surface at various inclinations when the support has been swung to other positions.

2. A fan with collapsible support comprising an electric motor having a motor shaft projecting from its forward end, a fan blade attached to said motor shaft, a guard cage attached to the forward end of the motor and surrounding said blade, and an oppositely reversely curved bail-like support swingably connected with said motor, said support as viewed in side elevation comprising a flat foot portion adapted to rest on a supporting surface and a pair of arms connecting said foot portion to said motor, said arms curving downwardly and rearwardly from the motor when said fan is disposed in vertical relation and said arms cooperating with said foot to form a space within which the lower portion of said cage can be closely received as said support is swung to a position with said foot portion closely disposed against the forward side of said cage.

3. The structure defined in claim 2, and a plurality of grooved cylindrical members formed of rubber through which said foot portion extends.

4. A collapsible fan comprising an electric motor having a motor shaft, a fan blade attached to one end of said shaft, a guard cage attached to said motor and surrounding said fan blade and an oppositely reversely curved loop-like support frictionally pivoted to said motor, said support as viewed in side elevation when said blade and cage are in upright position having a downwardly and rearwardly extending portion and a flat foot portion, there being a space formed between the downwardly and rearwardly extending portion and said foot portion to closely receive said cage in such relation that said foot portion lies against the forward side of said cage when said support is swung against the cage.

5. A fan with collapsible support comprising an electric motor having a motor shaft, a fan blade attached to an end portion of said shaft, a guard cage attached to said motor and surrounding said blade and an oppositely reversely curved bail-like support having frictional pivotal connection with said motor, said support having a portion forming a supporting foot and arms joining the ends of said foot and forming reverse curves relative thereto and connected to said motor so constructed and arranged that spaces are formed between portions of said arms and said foot with-

in which said cage may be closely received with said foot lying closely against the front of said cage when said support has been swung to one position and when said support is swung to other positions it will stably support the motor, blade and cage on the supporting surface with the blade set at various angles relative to the horizontal.

6. A fan with collapsible support comprising an electric motor having a motor shaft, a fan blade attached to an end portion of said shaft, and an oppositely reversely curved bail-like support swingably connected to said motor, said support having a foot and an arm extending therefrom to said motor, said arm and foot as viewed in side elevation cooperating to form a space within which the lower portion of the blade may work with the foot lying adjacent the forward side of the blade when the support is swung to one position, and said foot acting to stably support said motor and blade on a supporting surface at various inclinations when the support has been swung to other positions.

7. A fan with collapsible support comprising an electric motor having a motor shaft projecting from its forward end, a fan blade attached to said motor shaft and an oppositely reversely curved bail-like support swingably connected to said motor, said support as viewed in side elevation comprising a flat foot portion adapted to rest on a supporting surface and a pair of arms connecting said foot portion to said motor, said arms curving downwardly and rearwardly from the motor when said fan is disposed in vertical relation and said arms cooperating with said foot portion to form a space within which the lower portion of said blade may work as said support is swung to a position with said foot portion closely adjacent the forward side of said blade.

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