

March 16, 1937.

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2,073,868

PORTABLE ELECTRIC FAN

Filed Sept. 22, 1934

Fig. 1.

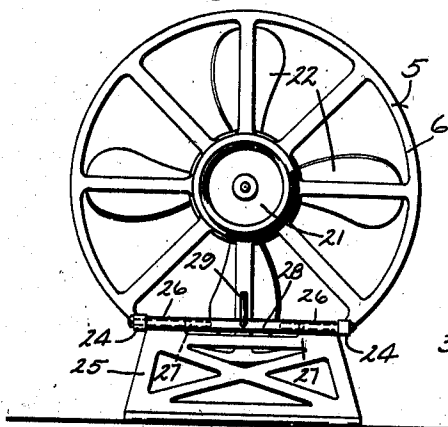


Fig. 2.

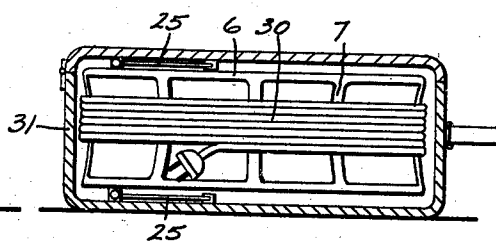


Fig. 3.

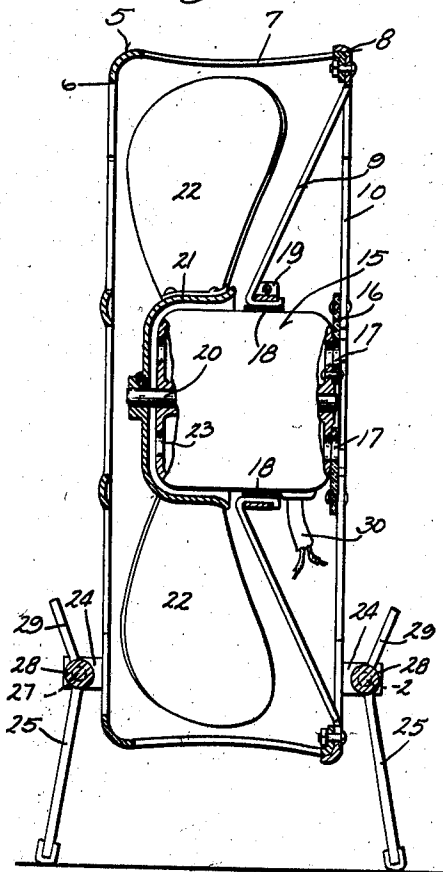


Fig. 4.

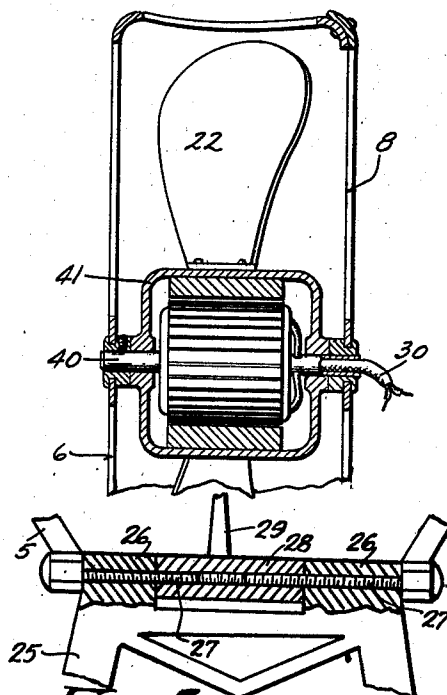


Fig. 5.

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2,073,868

PORTABLE ELECTRIC FAN

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Application September 22, 1934, Serial No. 745,086

7 Claims. (Cl. 230-273)

This invention relates to improvements in portable electric fans.

It is the primary object of the invention to improve the portability and utility of an electric fan by providing a light-weight assembly of fan, motor, guard, and base; wherein the motor is supported, preferably resiliently, by the guard; and the guard is so made as to comprise a reel upon which the electric conductor cord may be wound; and the base comprises legs foldable upon the guard, both for adjustment of the position of the fan and to facilitate a reduction in size thereof for transportation purposes.

In the drawing:

Figure 1 is a front elevation of a fan embodying the present invention.

Figure 2 is a side elevation of such a fan folded and encased for transportation.

Figure 3 is an enlarged detail of the fan in cross section.

Figure 4 is a view similar to Figure 3 showing a modified embodiment of the invention.

Figure 5 is an enlarged view of the pintle shown in Fig. 2.

Like parts are identified by the same reference characters throughout the several views.

The guard 5 may be of any conventional construction. For convenience, strength, and economy of manufacture it may be stamped from sheet metal, as shown, to comprise a front spider 6 having integral arms 7 connecting it with a rear spider 8 which provides a support for the fan motor. Alternate spokes of the rear spider 8 may conveniently be formed obliquely inwardly, as shown at 9, while the intermediate spokes 10 are in the same plane as the outer ring portion of spider 8.

To the back of the motor casing 15 may be secured a vibration dampening disk 16 of fiber or the like, having apertures 17 registering with the apertures in the motor casing to admit air thereto for cooling. To the outer periphery of the fiber disk 16 the spokes 10 of the spider 8 are connected.

About the intermediate portion of motor casing 15 is a ring 18 of rubber or the like, upon which the inner end portions of the spokes 9 are held by an encircling clamp 19. This arrangement provides a comparatively rigid support for the motor from the guard, while minimizing the transmission of motor vibration to the guard.

To promote compactness the fan is preferably so made that its blades revolve directly about the motor casing instead of being offset in a plane forwardly thereof. The armature shaft shown

at 20 in Figure 3 carries the cup-shaped fan hub 21 upon which the blades 22 are mounted to rotate about the motor.

During the rotation of the cup-shaped fan hub 21 the air confined between the fan hub and the motor casing will be frictionally set into motion and centrifugally ejected from said space, whereby to induce a flow of cooling air through the motor casing and into said space through the openings at 23.

In corresponding locations on the front and rear guard spiders 6 and 8 are ears 24 for the hinged connection to the guard of the individually adjustable legs 25 comprising the fan base. These legs are preferably made of stampings for lightness and strength, and have ears 26 aligned with the ears 24 of the guard. As a convenient means of clamping each leg 25 in any desired position of adjustment, contiguous ears 24 and 26 are preferably connected in pairs by oppositely threaded pintle pins 27 which are threadably engaged with an intermediate barrel 28 like that of a turnbuckle. A lever 29 projects from the barrel for its convenient manipulation, and the arrangement is such that by a fraction of one turn of the barrel the ears 24 and 26 may be clampingly engaged against each other or released from such engagement, as desired.

It will be obvious that if the legs are set at substantially the same angle the fan will stand erect to deliver a substantially horizontal blast from its blades 22.

If, on the other hand, either leg is angularly adjusted to a position which will lower the side of the guard to which it is connected, the fan blast may be directed upwardly or downwardly, as desired. For transportation purposes both of the legs 25 may be folded flat against the front and rear spider portions of the guard, as shown in Figure 2.

The guard is preferably so designed as to serve the purpose of a reel upon which the electric conductor cord may be wound when the fan is folded for transportation. To this end the arms 7 of the guard may be bent concavely toward the center of the guard, as clearly shown in Figures 2 and 3, to enable the cord 30 to be wound thereon. With the legs and the guard thus disposed, the fan may be conveniently enclosed in a case 31, as shown in Figure 2.

Because this is a portable fan, and because alternating current is not everywhere available, the fan motor will ordinarily be universal. For alternating current, however, it is possible to use a brushless induction motor, and this type of

motor may be designed with a stationary shaft 40 rigidly connecting the front and rear spiders of the guard, as shown in Figure 4, thereby greatly contributing to its strength and enabling it to be made of lighter materials.

The field coils in this type of motor are mounted directly on the stationary shaft 40, and the motor casing 41 carries armature bars of conventional design and is made to revolve on the stationary shaft.

Thus, the blades 22 in the Figure 4 construction may be mounted directly upon the revoluble motor casing, providing a very strong, light, and compact structure.

I claim:

1. In a fan structure the combination with a fan motor and rotating blades operatively connected to be operated thereby, of a motor support comprising front and rear guard elements, means interconnecting said elements, aligned ears fixed with said elements, pintle means extending through said ears, a support pivotally mounted on said pintle means, said ears and pintle means being positioned for said support pivot to stand substantially within the radius of said blades, and clamping mechanism for holding the support legs in adjustment.

2. In a fan, the combination with fan mechanism and a motor, of a motor support provided with spaced ears, a leg pivoted to said support and comprising complementary ears, oppositely threaded pintles extending through the associated ears of the leg and support, and an oppositely threaded barrel connected with said pintles and interposed between said sets of ears for the clamping thereof in any desired position of pivotal adjustment on said pintles.

3. A portable fan structure comprising the combination with a motor and fan blades operatively connected to be operated thereby, of a motor support comprising guard elements shielding said blades and spaced at opposite sides of said motor, leg members individually in pivotal connection with the respective guard elements for the support thereof and provided with individual clamp means manually operable in various supporting positions of said members for fixing their positions of pivotal adjustment respecting the elements supported by the respective leg members, whereby either of said elements may be raised or lowered with respect to the other by pivotally adjusting the leg member connected therewith and said elements may be clamped in their respective raised or lowered positions.

4. A portable fan structure comprising the combination with a motor and fan blades, of a support for said motor including means for at least partially enclosing said blades, and front and back legs independently collapsible upon said support and movable to positions in which said support is sustained thereby, at least one of said legs being independently adjustable through a plurality of said sustaining positions

in a direction to vary the inclination of said support upon the other of said legs, and means for clampingly maintaining said adjustable leg in adjustment, said means being effective in each of its several sustaining positions.

5. A portable fan structure comprising the combination with an electric motor provided with fan blades and a support for said motor having portions at the front and rear of the path of said blades, of transversely extending leg elements pivotally connected with said front and rear support portions and movable upon their pivotal connections from a position of substantial parallelism at opposite sides of the path of said blades to supporting positions beneath said support, and manually operable means for releasably fixing the angular adjustment of one of said leg elements in a variety of said supporting positions with respect to the support portion with which it is connected, whereby to vary the inclination of said support, said motor, and said blades.

6. A portable fan structure comprising the combination with a motor and blades, of a support having portions at the front and rear of the path of said blades, transversely extending leg elements, means pivotally connecting said leg elements with the front and rear portions of said support for movement between positions of collapse substantially flat upon said support, and extended positions in which said support is carried thereby, a manually adjustable clamp including coacting parts carried by said support and one of said leg elements, and means for releasably subjecting said parts to pressure in a direction to fix the adjustment of said leg element in any of a plurality of said extended positions, whereby said leg element may be set to vary the inclination of said support, motor, and blades.

7. A portable fan structure comprising the combination with a motor and blades, of a support having portions at the front and rear of the path of said blades, transversely extending leg elements, means pivotally connecting said leg elements with the front and rear portions of said support for movement between positions of collapse substantially flat upon said support, and extended positions in which said support is carried thereby, a manually adjustable clamp including coacting parts carried by said support and one of said leg elements, and means for releasably subjecting said parts to pressure in a direction to fix the adjustment of said leg element in any of a plurality of said extended positions, whereby said leg element may be set to vary the inclination of said support, motor, and blades, together with a clamp independently effective upon the other of said leg elements and comprising means for fixing the angular supporting position of said other leg element.

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CERTIFICATE OF CORRECTION.

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Patent No. 2,073,868.

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It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, first column, line 27, claim 1, strike out the word "legs"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 27th day of April, A. D. 1937.

(Seal)

Leslie Frazer
Acting Commissioner of Patents.