

A CEILING FAN

FIELD OF INVENTION

5 The invention generally relates to a ceiling fan. More particularly, the present invention relates to a ceiling fan with improved air flow performance.

BACKGROUND OF THE INVENTION

10 Nowadays, ceiling fans are still well known as an efficient means for circulating air within home or buildings. In commercial and industrial applications, the operational requirements of the fan are high in order to carry away the produced high heat amount. Therefore, it is necessary to improve air flow produced by the fan to maintain satisfactory cooling effect.

15 Currently, those skilled in the art have attempted to improve air flow of the fan in a numbers of ways, one of which is to increase the rotational speed of the fan, or to manipulate the blade structure of the fan. However, an increase in rotational speed would result in consumption of more power and accordingly waste of more energy. For
20 the way of changing the blade structure, one of such example is found in US 20070154315 which disclosed a ceiling fan with a plurality fan blades, each fan blade having a planar or curvilinear elongated configuration which can increase air flow. However, the elongated design of the blade faces conflicting challenges of requiring strength but not excessive weight in the blades. A longer blade provides a larger sweep
25 area, but the blade is also heavier and thus will tend to deform due to greater stress.

 Accordingly, the present invention provides a solution to overcome the aforementioned inadequacies of the prior art.

30 An object of the present invention is to provide a ceiling fan with improved air flow by having an increased effective length of the fan blade without the need of replacing or producing a new fan blade. A plurality of support members is provided, in which fan

blades are attached thereto, so that the effective length of the fan blade can be increased. Therefore, the fan blade is less likely to deform.

Another object of the present invention is to provide a ceiling fan with a support member shaped to generate air flow with a fan blade. Such member may provide an effect on fan efficiency similar to the effect provided by an elongated fan blade.

SUMMARY OF THE INVENTION

This invention provides a ceiling fan comprising a plurality of fan blades driven by a driving assembly enclosed in a housing, the driving assembly having a motor in connection with a rotatable unit, characterised in that each of the fan blades is attached to a support member that extends from the rotatable unit beyond the housing and wherein the fan blades are at least the same length as the support members, whereby the support members increases the effective length of the fan blade and enhances airflow provided by the ceiling fan.

Preferably, the support members are integral with the rotatable unit which can be a rotor.

Preferably, the support members taper from the rotatable unit towards the fan blade. The support members are preferably aerodynamically shaped to supplement the air flow of the fan blade.

Preferably, the fan blade is made of resin while the support member and/or the rotatable unit is made of metal.

The present invention consists of features and a combination of parts hereinafter fully described and illustrated in the accompanying drawings, it being understood that various changes in the details may be made without departing from the scope of the invention or sacrificing any of the advantages of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

To further clarify various aspects of some embodiments of the present invention, a more particular description of the invention will be rendered by references to specific
5 embodiments thereof, which are illustrated in the appended drawings. It is appreciated that these drawings depict only typical embodiments of the invention and are therefore not to be considered limiting of its scope. The invention will be described and explained with additional specificity and detail through the accompanying drawings in which:

10 Figure 1 shows a side view of a ceiling fan according to present invention; and

Figure 2 shows an exploded view of the ceiling fan.

DETAILED DESCRIPTION OF THE INVENTION

15 Hereinafter, the invention shall be described according to the preferred embodiments of the present invention and by referring to the accompanying description and drawings. However, it is to be understood that limiting the description to the preferred
20 embodiments of the invention and to the drawings is merely to facilitate discussion of the present invention and it is envisioned that those skilled in the art may devise various modifications without departing from the scope of the appended claim.

The invention generally relates to a ceiling fan. More particularly, the present invention relates to a ceiling fan with improved air flow performance.

25 The invention discloses a ceiling fan comprising a plurality of fan blades (4) driven by a driving assembly enclosed within a housing (5), the driving assembly having a motor for driving a rotatable unit (2), characterised in that each of the fan blades (4) is attached to a support member (3) that extends from the rotatable unit (2) beyond the housing (5)
30 and wherein the fan blades (4) are at least the same length as the support members (3), whereby the support members (3) increases the effective length of the fan blade and enhance airflow provided by the ceiling fan.

According to the preferred embodiment of the invention, the ceiling fan comprises a motor assembly having a motor for driving a rotatable unit (2). The motor assembly is enclosed within the housing (5) which is supported by a coupling portion (1) having one end attached to a ceiling. The housing (5) can be of any shape and size capable of enclosing the motor assembly and any other necessary electrical components of the ceiling fan, but preferably, the housing (5) is generally bowl-shaped as shown in the drawings. The housing (5) can be made from resin, plastics, or any other suitable material providing the required strength for supporting the motor assembly. Although it is not shown in any of the accompanying drawings, the motor assembly also includes a stator assembly (not shown). Any conventional driving mechanism for a ceiling fan could be employed and shall include possible future invented driving mechanism. Preferably, the rotatable unit (2) is a rotor.

As shown in the drawings, a plurality of support member (3) is provided and extends from the rotatable unit (2) and beyond the housing. It shall not be confused with the support member of the conventional ceiling fan where the support member is confined within the housing (5). Each support member (3) is attached with a fan blade (4) which has a length at least similar as the support member (3). It shall be noted that the length of the support member (3) herein refers to the length of the support member (3) that extends beyond the housing (5). It is more preferable that the fan blade (4) is longer the length of the support member (3).

Any suitable fastenings can be used to attach the fan blade (4) to the support member (3), for example, a screw. Preferably, the support member (3) is integral with the rotatable unit (2). The rotatable unit (2) and the support members (3) are in one component integrally moulded by a die so that it becomes easier to do adjustment of a weight balance of the ceiling fan as compared with the case for the rotatable unit (2) and the support members (3) are separate components. When in use, the support member (3) move in unison with the rotatable unit (2). The support member (3) can be of any shape which may improve the aerodynamic characteristics of the ceiling fan as well as serve as a decorative element. Preferably, the support member (3) tapers from the rotatable unit (2) towards the fan blade (4).

In accordance to the preferred embodiment of the invention, the fan blade (4) can be of any shape but is aerodynamically shaped to improve and supplement the air flow produced by fan blade (4). It is preferable that the fan blade (4) has an inclined surface relative to its moving path. Such configuration could produce an improved air flow driven by the fan blade (4) such that air is substantially “pushed” away from the fan blade (4), thereby creating an improved air flow. However, the present ceiling fan shall not limit to the use of fan blade (4) with other configuration, such as a fan blade with a straight surface or a curved surface, or other the direction of the inclined surface of the fan blade. The support member (3) and the rotatable unit (2) can be made from any material providing the required strength and durability. Preferably, metal such as die cast aluminium is used. Further, the fan blades can be made from resin, plastics, or any other suitable material.

By attaching the fan blade (4) on the support member (3) which extends beyond the housing (5), the effective length of the fan blade (4) is increased. The effective length of the fan blade (4) herein refers to the combined length of the support member (3) and the fan blade (4) itself. Therefore, improved air flow can be produced with the increase in the effective length of the fan blade (4). Upon rotation of the ceiling fan, the support members (3) allow the fan blades (4) to sweep a larger area to generate more air flow. Typically, a support member (3) may contribute approximately an additional of 10 (25.4 cm) to 30 inch (76.2 cm) length to the effective length of the fan blade (4).

It is advantageous to increase the effective length of the fan blade (4) by attaching any fan blade on the support member (3). This is because the support member (3) allows flexibility in variation of the effective length of the fan blade (4) without the need of replacing or producing a new fan blade with the desired length. The support member (3) shall not be limited on the use of the fan blade (4) described in the present invention, the support member (3) also able to be universally used on other fan blade of any conventional fan ceiling. The material required to produce the support member (3) is less than the material required to produce the fan blade (4) with the desired length. Hence, the cost of production is reduced. The support member (3) employ a minimal construction of material in its structure, a minimal number of components and therefore economical to manufacture.

The present invention may be embodied in other specific forms without departing from its essential characteristics. The described embodiments are to be considered in all respects only as illustrative and not restrictive. The scope of the invention is, therefore
5 indicated by the appended claims rather than by the foregoing description. All changes, which come within the meaning and range of equivalency of the claims, are to be embraced within their scope.

CLAIMS

- 5 1. A ceiling fan comprising a plurality of fan blades (4) driven by a driving assembly enclosed in a housing (5), the driving assembly having a motor for driving a rotatable unit (2), characterised in that each of the fan blades (4) is attached to a support member (3) that extends from the rotatable unit (2) beyond the housing (5) and wherein the fan blades (4) are at least the same length as the support members (3), whereby the support members (3) increase the effective length of the fan blade and enhance airflow provided by the ceiling fan.
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2. A ceiling fan according to claim 1, wherein the support members (3) are integral with the rotatable unit (2).
3. A ceiling fan according to claim 1 or 2, wherein the rotatable unit (2) is a rotor.
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4. A ceiling fan according to any one of claim 1 to 3, wherein the support members (3) taper from the rotatable unit (2) towards the fan blade (4).
5. A ceiling fan according to any one of claim 1 to 4, wherein the rotatable unit (2) and/or the support unit (3) is made of metal.
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6. A ceiling fan according to any one of claim 1 to 5, wherein the fan blade (4) is made of resin.
- 25 7. A ceiling fan according to any one of claim 1 to 6, wherein the support members (3) are aerodynamically shaped to supplement the air flow of the fan blade (4).