

"COVERING APPARATUS FOR A FAN BLADE AND A FAN BLADE ASSEMBLY"

This invention relates to a covering apparatus for a fan blade and to a fan blade assembly.

This invention has particular but not exclusive
5 application to a fan blade cover for ceiling fans and fan blade assemblies for ceiling fans, and for illustrative purposes reference will be made to such application. However, it is to be understood that this invention could also be applied to fan blades for other types of fans
10 including table, desk, floor or wall fans as well as exhaust, window and roof fans. In addition, the invention may also be used in other applications including improvements to existing air conditioning units as well as propeller blades/rotors for windmills, aircraft and the like.

15 It has been observed that over an extended period of time dust and other particulate matter, including dead insects and the like, tend to settle on the upper surfaces of ceiling fans including the fan blades, particularly during extended periods of non-use. Due to the close proximity of
20 the fans to the ceiling and, in some instances the prolonged effects of high humidity, the unsightly dust and particulate matter is often quite difficult to remove. Furthermore, subsequent operation of the ceiling fan, in some instances, may foster the distribution of dust and particulate matter
25 around the room. This of course is a particular problem associated with the use of ceiling fans in rooms in which food is prepared and in rooms dedicated for medical purposes.

It has also been observed that the leading edges of many

fan blades exhibit a high degree of corrosion. This is believed to be due to the deposit and subsequent concentration thereon of corrosive elements present in the air resulting from the initial separation of the air by the leading edges.

It has also been observed that most fan blades are manufactured from pressed metals or plastics materials and that the resulting shape is aerodynamically very inefficient.

The present invention aims to substantially alleviate at least one of the above disadvantages and to provide a covering apparatus for a fan blade and a fan blade assembly which will be reliable and efficient in use. Other objects and advantages of this invention will hereinafter become apparent.

With the foregoing and other objects in view, this invention in one aspect resides broadly in a covering apparatus adapted to cover at least a portion of a fan blade, said covering apparatus including:

a cover, and
retaining means for retaining said cover on the fan blade.

In another aspect, this invention relates to a fan blade assembly including:

a fan blade, and
a covering apparatus covering at least a portion of said fan blade. Preferably the covering apparatus includes a cover and retaining means for retaining the cover on the fan blade. Preferably, the nature of the cover and/or the

retaining means is such that the cover may be selectively removed from the fan blade.

Fan blades are generally rectangular in shape and often include side edges which converge towards the distal end of the fan blade, i.e. the fixed end is generally wider than the free or distal end. In addition, most fan blades manufactured from pressed metals and plastics materials have an arcuate transverse cross-section.

The cover may be coloured a particular colour such as for decorative purposes and/or selected artworks or other patterns may be applied thereto.

The cover may be constructed from a variety of materials including paper, cardboard, textiles and plastics materials. Furthermore, the cover may include a plurality of openings which in use may trap and hold dust and other particulate material therein. For example, the cover may be constructed from a textile material having an open weave which is large enough that at least some of the dust and particulate material deposited on the cover is trapped within said openings.

The cover may be specifically adapted to overlies a selected portion of the fan blade such as the upper surface of the fan blade and/or the leading edge of the blade. For example, the cover may comprise a sheet of material which may be draped over the portion of the fan blade to be covered and retained in position by retaining means such as hooks, clips, straps or ties.

Alternatively, the cover may be sleeve like and may be

adapted to envelop a portion of the fan blade. The sleeve like cover may include a closed end and wherein the general shape of the cover may closely replicate the shape of the fan blade, i.e. the cover may be substantially rectangular in shape and may include converging side edges. In addition, the sleeve like cover may be adapted to close about the edges of the fan blade adjacent it's fixed end and/or any mounting attached thereto.

As mentioned above, the retaining means may include one or more hooks, clips, straps or ties. However, it will be appreciated that there are other means by which the cover may be fastened to the fan blade. For example, a plurality of press studs may be used to releasably secure the cover to the fan blade. Alternatively, the cover may be provided with one or more adhesive strips. In yet another embodiment, the cover may be manufactured from an elastic material, or due to its construction may exhibit elastic qualities, and wherein the cover may be retained in a preferred position relative to the fan blade due to the action of elastic forces inherent in the deformed cover.

In addition the covering apparatus may also include an image carrier which may be retained in a desired position on or adjacent to the surface of the fan blade by the cover or the retaining means used to secure the cover to the fan blade.

The image carrier may comprise a sheet of paper, cardboard, textile, wood, metal or plastics material to which artwork such as a decorative pattern has been applied

thereto. In addition, the cover may include a transparent or translucent portion and wherein the image carrier may be positioned intermediate the transparent or translucent portion and the fan blade.

5 In a further aspect, this invention relates to a method of protecting a fan blade from excessive soiling, said method including:

providing a covering apparatus as herein described, and
securing said covering apparatus about the portion of
10 the fan blade to be protected. The method may further include the removal of the soiled covering apparatus.

Preferably the covering apparatus includes a cover which is specifically adapted for attachment to a fan blade and includes retaining means which will inhibit the removal of
15 the cover during normal operation of the fan.

In yet another aspect, this invention relates to a method of decorating a fan blade, said method including:

providing a coloured and/or decorated image carrier as herein described;

20 providing a covering apparatus as herein described, said covering apparatus being adapted to retain said image carrier in a preferred position relative to the fan blade;

securing said covering apparatus about the fan blade,
and

25 mounting said image carrier on the fan blade using said covering apparatus.

In still yet another aspect, this invention relates to a fan blade assembly including:

a fan blade, the underside of which is not substantially planar, and

a cover covering at least a portion of the underside of said fan blade, said cover providing a substantially planar surface intermediate opposing edges of said fan blade.

In still yet another aspect, this invention relates to a blade assembly for collection means, said blades assembly including:

a fan blade, and
covering means covering at least a portion of said fan blade, said covering means being adapted to retain samples deposited thereon.

The collection means may be used to collect contaminants present in the air and wherein the collection means may comprise a plurality of rotating blade assemblies upon which said contaminants are deposited. The covering means may include a cover made of an absorbent material and/or a cover which includes a plurality of apertures or cavities formed therein in which samples, such as various contaminants present in the air, may collect.

In order that this invention may be more readily understood and put into practical effect, reference will now be made to the accompanying drawings which illustrate a preferred embodiment of the invention and wherein:

FIG. 1 is a plan view of a covering apparatus constructed in accordance with the present invention, said covering apparatus being shown in an unstretched state;

FIG. 2 is a plan view of the covering apparatus illustrated in figure 1, said covering apparatus being shown stretched over a fan blade, and

FIG. 3 is plan view of a ceiling fan having three fan blades.

Figure 3 shows a typical ceiling fan 10 comprising three fan blades 11 each extending outwardly from a central drive shaft 12 and wherein the fixed end 13 of each fan blade 11 is attached to the drive shaft 12 by way of a mounting 14.

Figures 1 and 2 show a covering apparatus 15 comprising a rectangularly shaped sleeve like cover 16, constructed from an elastic fabric such as woven nylon, having a closed end 17 and an opposing open end 18. The open end 18 includes a throat portion 20 defining an expandable opening 19. The width 21 of the unstretched reinforced elastic throat portion 20 is significantly smaller than the width 22 of the fan blade 11. It is also noted that the width 23 of the unstretched cover 16 is also significantly smaller than the width 22 of the fan blade.

In use, the throat portion 20 is stretched so as to expand the opening 19 in order to allow the insertion therein of the distal or free end of the fan blade 11. The throat portion 20 and the stretched body 26 of the cover 16 are then drawn along the length of the fan blade 11 towards the fixed end 13.

The cover 16 is retained in place about the fan blade 11 due to the elastic forces exerted on the mounting 14 by the partially stretched throat portion 20 surrounding same and by

the partial closure of the tapered body portion 26a about the fixed end 13 of the fan blade 11.

It is also noted that the cover 16 is retained in place by the elastic forces exerted on the fan blade 11 due to the deformation of the body 26.

Furthermore, it is also noted that the stretched portion of the cover 16 which overlies the topside of the fan blade 11 clings to said topside and that the stretched portion of the cover which overlies the underside of the fan blade provides a planar surface extending between the leading and trailing edges as illustrated in figure 4.

In use, dust and particulate matter will be deposited on the cover 16 which when soiled may be stripped from the fan blade 11 by expanding the opening 19 sufficient to allow the deformed throat portion 20 to pass over the shoulders 28 of the fan blade and by drawing the throat and body portions towards the distal end. It will also be appreciated that the use of the cover obviates the need to regularly clean the fan blades and the need to use potentially harmful cleaning agents.

It will be appreciated that a decorative image carrier 29 such as a coloured piece of paper card may be positioned intermediate the fan blade 11 and the deformed body portion 26 of the cover 16 as illustrated in figure 4. Furthermore, it will be appreciated that a cap, not shown, having a matching image to that applied to the image carrier, may be secured to the hub 30 if desired.

In the case of windmills and the like, it will be

appreciated that the covering means may protect the windmill blades from excessive surface damage typically caused by sand and the like entrained in the air striking the surfaces of the blades.

5 It will of course be realised that while the above has been given by way of illustrative example of this invention, all such and other modifications and variations thereto as would be apparent to persons skilled in the art are deemed to fall within the broad scope and ambit of this invention as
10 herein defined in the appended claims.



THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. A covering apparatus adapted to cover at least a portion of a fan blade, said covering apparatus including:
a cover, and
5 retaining means for retaining said cover on the fan blade.
2. A covering apparatus as claimed in claim 1, wherein said cover is adapted to overly a selected portion of the fan blade.
- 10 3. A covering apparatus as claimed in claim 1 or claim 2, wherein said cover is adapted to overly the upper surface of the fan blade.
4. A covering apparatus as claimed in any one of the preceding claims, wherein said cover is sleeve like and is
15 adapted to envelop a selected portion of the fan blade.
5. A covering apparatus as claimed in claim 4, wherein said cover is generally shaped like the fan blade.
6. A covering apparatus as claimed in claim 4 or claim 5, wherein said cover is adapted to close about the fixed end
20 portion of the fan blade.



7. A covering apparatus as claimed in any one of the preceding claims, wherein said cover is constructed from a woven elastic material.

8. A covering apparatus as claimed in any one of the preceding claims, wherein said apparatus also includes a decorative image carrier locatable intermediate said cover and the fan blade.

9. A fan blade assembly including:
a fan blade, and
a covering apparatus covering at least a portion of said fan blade.

10. A fan blade assembly as claimed in claim 9, wherein said covering apparatus includes a cover adapted to overly a selected portion of said fan blade and retaining means for retaining said cover on said fan blade.

11. A fan blade assembly as claimed in claim 10, wherein said cover is adapted to overly the underside of the fan blade and provides a planar surface between opposing side edges of said fan blade.

12. A method of protecting a fan blade from excessive soiling, said method including:
providing a covering apparatus as herein defined in claims 1 to 8, and



WO 97/03325

PCT/AU96/00433

12

using said retaining means to secure said cover to the fan blade.

13. A method of protecting a fan blade as claimed in claim 12, including:

5 replacing said cover when soiled with a clean cover.