

UMBRELLA

FIELD OF THE INVENTION

The present invention relates to the field of umbrellas. More particularly, the present invention relates to an umbrella for cooling a user.

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BACKGROUND OF THE INVENTION

Umbrellas have been used and applied in many forms over the years typically for the purposes of sheltering a user from rain in wet environments, and sheltering a user from the heat of the sun in locations of elevated temperature. Umbrellas may be provided for personal use by a user whereby the umbrella is provided in a collapsible arrangement so as to allow the umbrella to be moved from a collapsed configuration to an expanded configuration. Alternatively, umbrellas may be provided in a large format for providing shelter to several people or users simultaneously. Such umbrellas are often used in outdoor settings such as beach environments or for extending over a table to provide shelter from rain and heat to users located beneath. Both personal portable
10 umbrellas and large format umbrellas may be provided in both collapsible and permanent form. Further, such umbrellas may or may not be impervious to water, those not impervious to water typically being applicable for providing shade to a user in a sunny environment.

When located or positioned below both personal umbrellas and large format
20 umbrellas in hot or humid environments, users typically experience discomfort due to either ambient heat or humidity, or due to heating being caused beneath the umbrella due to the material from which the umbrella is formed. Umbrellas may be formed from

materials having reflective properties such that sunlight is reflected from the outer surface of the umbrella so as to at least partly mitigate heating effects underneath the umbrella. However, in hot and humid environments, although a user may be protected from UV rays and heat, discomfort is still experienced.

- 5 The present invention provides an umbrella which at least substantially ameliorates some of the deficiencies exhibited by those of the prior art.

SUMMARY OF THE INVENTION

In a first aspect, the present invention provides a collapsible umbrella for cooling a user, the umbrella comprising:

- 10 • a generally elongate central support member having an distal end, a proximal end and a central portion located therebetween;
- a collapsible cover member for providing shelter to a user, said cover member being engaged with the support member at the distal end and being moveable from a collapsed configuration adjacent said central portion of the
- 15 support member to an expanded configuration extending radially outwardly from said central support member;
- a plurality of fan blades located below the distal end of said support member and radially disposed about said support member, each fan blade of said plurality of fan blades being movable from a non-operable configuration
- 20 adjacent the central portion of said support member when said cover member is in said collapsed configuration and being located radially inwardly from said cover member, each fan blade further being moveable to an operable

configuration and extending radially outwardly from said central support member when said cover member is said expanded configuration; and

drive means for rotating said plurality of fan blades about said central support member when in said operable configuration in a manner so as to move air in a direction so as to cool a user positioned proximal of said cover member wherein the plurality of blades are provided such that upon rotation of the rotor the fan blades are urged radially outward to said operable configuration, and upon rotation of the rotor ceasing the fan blades move radially inwardly and distally so as to be substantially parallel to the support member when in said non-operable configuration.

10 Preferably, the plurality of fan blades is structurally rigid and hingedly engaged relative to the drive means. Alternatively, said plurality of fan blades may be formed from a structurally flexible material.

Preferably the cover member comprises a plurality of elongate stays hingedly engaged with and radially disposed about the distal end of said support member and a deformable cover membrane engaged with and carried by said plurality of stays.

The umbrella preferably further comprises a plurality of elongate struts disposed radially about said support member, each strut of said plurality of struts having a first end hingedly engaged with a corresponding stay and a second end slidably engaged with the middle portion of said support member; wherein upon urging of the second ends of said plurality of strut in a distal direction, the strut members urge the stays radially outwardly and distally, and the strut members form a brace between the stays of said cover member.

The plurality of fan blades is preferably disposed between the plurality of struts and the distal end of said support member such that the plurality of struts form a guard between the fan blades and the user.

5 The umbrella preferably further comprises a collapsible shield member which is carried by said plurality of struts, wherein said plurality of struts is generally parallel to said support member when said cover member is in said collapsed configuration.

Preferably the drive means is located adjacent said plurality of fan blades. Preferably the drive means is provided as a direct current electric motor.

10 The electric motor preferably comprises a stator disposed radially inward of the rotor and being fixedly engaged relative to the support member, the rotor extending at least partly around the stator and being rotatably engaged with the stator; and wherein a first end of fan blades is engaged relative to the rotor such that upon rotation of said rotor the plurality of fan blades is rotated about the support member. The motor may further comprise a coil is disposed radially outward of the stator and is fixedly engaged
15 relative to the stator, and a magnet configuration disposed radially between the coil and the rotor and being fixedly engaged relative to the rotor.

The umbrella preferably further comprises a power supply carried by said support member. The power supply may be disposed adjacent the distal end of the support member and distal the cover member. A housing may be disposed adjacent the distal
20 end of the support member and distal the cover member, wherein the power supply is located within the housing.

Alternatively the power supply may be disposed at or adjacent the proximal end of the support member. The power supply may be disposed internal of the support member.

5 The umbrella may further comprise a handle portion disposed adjacent the proximal end of said support member, wherein the power supply is located within the handle portion.

The power supply is provided in the form of battery cells, and the battery cells may be rechargeable battery cells.

10 Preferably the drive means is activated upon the cover member being moved to said expanded configuration. The umbrella may further comprise a switch mechanism operable upon the cover member moving to said expanded configuration so as to active said drive means.

Alternatively the umbrella may further comprise a user operable switch located at or adjacent the proximal end of said support member for activation of said drive means.

15 In a second aspect, the present invention provides an umbrella for cooling a user, the umbrella comprising:

- a generally elongate central support member having an distal end, a proximal end and a central portion located therebetween;
 - a cover member for providing shelter to a user, said cover member being engaged with the support member at the distal end and extending radially outwardly from said central support member;
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- a plurality of fan blades located below the distal end of said support member and radially disposed about said support member, each fan blade of said plurality of fan blades extending radially outwardly from said central support member; and
- 5 • drive means for rotating said plurality of fan blades about said central support member manner so as to move air in a direction so as to cool a user positioned proximal of said cover member.

In an embodiment of the second aspect, the cover member may be moveable from a collapsed configuration adjacent said central portion of the support member to an
10 erect configuration.

In another embodiment of the second aspect, each fan blade of said plurality of fan blades may be movable from a non-operable configuration adjacent the central portion of said support member when said cover member is in said collapsed configuration and further being moveable to an operable configuration and extending
15 radially outwardly from said central support member when said cover member is said erect configuration.

In a third aspect, the present invention provides an umbrella for cooling a user, the umbrella comprising:

- a generally elongate central support member having an distal end, a proximal
20 end and a central portion located therebetween;

- a cover member for providing shelter to a user, said cover member being engaged with the support member at the distal end and extending radially outwardly from said central support member;
- 5 • a plurality of fan blades located below the distal end of said support member and radially disposed about said support member, each fan blade of said plurality of fan blades extending radially outwardly from said central support member, said plurality of fan blades being engaged with said cover member; and
- 10 • drive means for rotating said cover member and said plurality of fan blades about said central support member manner so as to move air in a direction so as to cool a user positioned proximal of said cover member.

In an embodiment of the third aspect, the cover member may be moveable from a collapsed configuration adjacent said central portion of the support member to an erect configuration.

- 15 In another embodiment of the third aspect, each fan blade of said plurality of fan blades may be movable from a non-operable configuration adjacent the central portion of said support member when said cover member is in said collapsed configuration and further being moveable to an operable configuration and extending radially outwardly from said central support member when said cover member is said erect configuration.

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BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the present invention will now be described by way of non-limiting example only with reference to the accompanying drawings in which:

Fig. 1 shows a perspective view of a first embodiment of an umbrella according
5 to the present invention;

Fig. 2 shows an enlarged part sectional perspective view of the embodiment as depicted in Fig. 1;

Fig. 3 shows an enlarged sectional perspective view of a drive means of the umbrella according to the present invention;

10 Fig. 4 shows a first embodiment of a fan assembly of the umbrella according to the present invention;

Fig. 5 shows a second embodiment of a fan assembly of the umbrella according to the present invention;

15 Fig. 6 shows an enlarged sectional perspective view of a power supply of an umbrella according to the present invention;

Fig. 7 shows a second embodiment of a power supply of an umbrella according to the present invention;

Fig. 8 shows a first embodiment of a switch mechanism of an umbrella according to the present invention;

Fig. 9 shows a second embodiment of a switch mechanism of an umbrella according to the present invention;

Fig. 10 shows an enlarged view of the switch assembly as depicted in Fig. 9.

Fig. 11 shows a further embodiment of an umbrella according to the present
5 invention;

Fig. 12 shows a third embodiment of a switch mechanism of the umbrella as depicted in Fig. 11;

Figure 13 shows an enlarged sectional view of further embodiment of a drive means of the umbrella according to the present invention; and

10 Figure 14 shows a perspective exploded view of the drive means as depicted in Figure 13.

DETAILED DESCRIPTION OF THE INVENTION

The following description refers to preferred embodiments of the umbrella
15 according to the present invention. To facilitate an understanding of the invention, reference is made in the description to the accompanying drawings whereby the system is illustrated in preferred embodiments. Similar components between the embodiments are identified by the same reference numerals.

Referring to Fig. 1, there is shown a collapsible umbrella **10** for cooling a user
20 according to the present invention. The umbrella **10** comprises a generally elongate central support member **20** having a distal end **22**, a proximal end **24** and a central

portion **26** located between the distal end **22** and the proximal end **24**. The umbrella **10** further comprises a collapsible cover member **30** which is adapted to provide shelter to a user located underneath the umbrella **10** when in use. The cover member **30** is engaged with the support member **22** at the distal end **22** of the support member **20** and
5 is movable from a collapsed configuration whereby it is adjacent the central portion **26** of the cover member **30** to an expanded configuration as depicted in Fig. 1 whereby the cover member **30** extends radially outwardly from the central support member **20**. A plurality of fan blades **40** is provided for cooling a user when located below the cover member **30** when the umbrella **10** is in use. The fan blades **40** are located below the
10 distal end **22** of the support member **20** and are radially disposed about the support member **20**. A drive means **50** for rotating the fan blades **40** about the support member **20** when the cover member **30** is in an expanded and operable configuration as depicted in Fig. 1 so as to move air in a direction so as to cool a user when using the umbrella **10**.

The cover member **30** comprises a plurality of elongate stays **32** which are
15 hingedly engaged with and radially disposed about the distal end **22** of the support member **20**. The cover member **30** further comprises a plurality of elongate struts **34** radially disposed about the support member **20** and having a first end hingedly engaged with a corresponding stay **32** and the second end slidably engaged with the middle portion **24** of the support member **20**. Upon urging of the second ends of the plurality of
20 struts **34** in a distal direction, the struts **34** urge the stays **32** radially outwardly and distally such that the struts form a brace between the stays **32** of the cover member **30**. Each fan blade **40** is adapted to move from a non-operable configuration whereby the umbrella **10** is in a collapsed configuration so as to extend substantially parallel to the support member **20** and being movable to an operable configuration as depicted in Fig.

1 so as to extend radially outwardly from the support member **20** when the cover member **30** is in the expanded or erect configuration. The fan blades **40** are disposed between the struts **34** and the distal end **22** of the support member such that the struts **34** form a guard between the fan blades **40** and the user. It will be appreciated that in
5 other or alternate embodiments that the fan blades **40** may be located beneath the struts **34** without departing from the scope of the invention. In other or alternate embodiments, the umbrella **10** may further comprise a collapsible shield member which is carried by the struts **34** whilst allowing air to pass there through, so as to provide further protection to a user whilst still cooling the user.

10 Referring to Fig. 2 and Fig. 3, as shown the drive means **50** is located adjacent the plurality of fan blades **40**. In the present embodiment, the drive means is provided as a DC electric motor and comprises a stator **52** disposed radially inward of a rotor, the stator **52** being fixedly engaged relative to the support member **20**, the rotor **54** extending at least partly circumferentially around the stator **52** and being rotatably
15 engaged with the stator **52** by a bearing assembly **56**. A first end of the fan blades **54** is engaged relative to the rotor **54** such that upon rotation of the rotor **54**, the fan blades **40** are rotated about the support member **20** so as to cool a user when in use.

The drive means **50** further comprises a coil, although not depicted in the present drawings, the coil being radially outward of the stator **52** and being fixedly engaged
20 relative to the stator **52**, and a magnet configuration **58** which is disposed radially between the coil and the rotor **54** and being flexibly engaged relative to the rotor **54**.

Referring to Fig. 4, the fan blades **40** are structurally rigid and hingedly engaged relative to the rotor **54** by hinged joints **42** such that when the umbrella **10** is in an

operable configuration as depicted in Fig. 1, upon rotation of the drive means **50** the fan blades **40** urged radially outward to the operable configuration and such that upon rotation of the rotor **54** ceasing, the fan blades **40** move radially inwardly and distally so as to be substantially parallel to the support member **20** when in the non-operable configuration.

Referring to Fig. 5, an alternate embodiment of fan blades **40a** is shown whereby the fan blades **40a** are formed from a structurally flexible material such that upon rotation of the rotor **54** the fan blades are urged radially outward toward the operable configuration. Upon rotation of the rotor **54** ceasing, the fan blades move radially inwardly and distally again so as to be substantially parallel to the support member **20** when in the non-operable configuration. It will be appreciated, that other or alternate embodiments of fan blades may be provided without departing from the scope of the invention.

With reference to Fig. 5 and Fig 6., those skilled in the art will appreciate blades are urged radially outwardly to the operable configuration due to the centrifugal force provided by the drive means. Of importance, as will be understood, is that the blades are suitably sized and formed accordingly so that at an operational speed, appropriate force is provided to maintain the blades in the operable configuration. Thus, the blades may require little or no assistance in rectification to the requisite operable position other than predominantly the force provided by the drive means, which drives the blades radially outwardly. Such an arrangement, without the requirement of complex or additional mechanisms or effort to move the blades to an operable position, provides advantages including simplicity and ease of construction, reduction in maintenance, ease of use and reduction in weight.

Referring to Fig. 6, a power supply **60** is provided for supplying power to the drive means **50** so as to rotate the fan blades **40**. In the present embodiment, the power supply is located adjacent the distal end **22** of the support member **24** and comprises a housing **64** in which battery cells **62** are housed. The battery cells may typically be dry cell type batteries and may further be rechargeable whilst still being located within the housing **64**. Alternatively, the battery cells **62** may be single use type cells and replaced upon expiration by rotatably disengaging the housing **64** from the distal end **22** of the support member **20**.

Referring to Fig. 7, an alternate embodiment of a power supply **60a** is shown, whereby the housing is provided at the distal end **24** of the support member **20** in the form of a handle and the battery cells **62** located within the handle **64a**. Again, the battery cells **62** may be single use type battery cells or alternatively be rechargeable either by removal from the handle **62a** or by a direct charging unit, although not depicted in the present embodiment.

Referring to Fig. 8, a switch mechanism **70** is further provided for supplying power from the power supply **60** to the drive means **50** for rotating the fan blades **40** when in the operable configuration. In the present embodiment, a sleeve member **80** is provided for urging the struts **34** radially outward upon sliding in the distal direction, the sleeve member **80** being adapted to urge an operation button **72** in contact with a switch component **74** when the sleeve member **80** is appropriately disposed. As will be appreciated, other or alternate switch mechanisms **70** may be provided in other forms so as to supply power to the drive means, without departing from the scope of the invention.

Referring to Fig. 9 and Fig. 10, an alternate embodiment of a switch mechanism **70a** is provided at the distal end **24** of the support member **20** the switch mechanism **70a** comprises a user operable button **72a** and a contact switch **74a** which is operable upon being urged by the button **72a** when depressed by a user. Again, it will be appreciated that other or alternate switch mechanisms **70a** may be provided without departing from the scope or spirit of the invention.

Referring to Fig. 11 and Fig. 12, a further embodiment of a switch mechanism **70b** is shown in another embodiment of an umbrella **10a** according to the present invention. In the present embodiment, the switch mechanism **70b** is located between the fan blades **40a** and sleeve member **80a** and comprises an operation button **72b** which is adapted to active switch **74b**. A further sleeve **84b** is provided which, when urged distally by sleeve **80a**, urges operation button **72b** to activate switch **74b** thus providing power to the motor and rotating the fan blades **40a**.

Referring to Figure 13 and Figure 14 there is shown a further embodiment of a drive means **50a** according to the present invention. In the further embodiment, the stator **52a** is positioned below the rotor **54a**, as opposed to the embodiment of the drive means **50** as depicted in Figure 3. In some implementations of the present embodiment, ease of closing of the umbrella may be provided

In other and alternate embodiments of the present invention, an umbrella may be provide whereby the cover member is maintained in a fixed and open arrangement, whereby the fan blades are rotated by a drive means similar or same to that as depicted in the first embodiment, without departing from the scope of the invention. Such umbrellas may be applicable in a fixed arrangement rather than a portable arrangement

as described in reference to the first embodiment. Alternatively, in other embodiments the cover member and fan blades may be fixedly engaged integrally formed, such that upon rotation of either the cover member or the fan blades by the drive means, both the cover member and the fan blades are caused to rotate so as to cool a user when in use.

- 5 In such embodiments, the umbrella may or may not be collapsible, or may or may not be a portable type umbrella as described with reference to the first embodiment.

Those skilled in the art will appreciate that other drive means or configuration for opening or closing the umbrella may be also provided without departing from the scope or spirit of the invention. Further, those skilled in the art will appreciate that depending
10 upon a particular application of an umbrella according to the present invention, suitable materials from which the material is formed may be provided, such as light refractive material being used to form the cover member or the cover member being impervious to water in wet environments.

It will be appreciated that the above described embodiments may take alternate
15 forms and include additional features which, when used with the present invention, remain within the scope and spirit of the invention as described and claimed.

It will be understood that the invention disclosed and defined in this specification extends to all alternative combinations of two or more of the individual features mentioned or evident from the text or drawings. All of these different combinations
20 constitute various alternative aspects of the invention.

CLAIMS

1. A collapsible umbrella for cooling a user, the umbrella comprising:

- a generally elongate central support member having an distal end, a proximal end and a central portion located therebetween;

5 • a collapsible cover member for providing shelter to a user, said cover member being engaged with the support member at the distal end and being moveable from a collapsed configuration adjacent said central portion of the support member to an expanded configuration extending radially outwardly from said central support member;

10 • a plurality of fan blades located below the distal end of said support member and radially disposed about said support member, each fan blade of said plurality of fan blades being movable from a non-operable configuration adjacent the central portion of said support member when said cover member is in said collapsed configuration and being located radially inwardly from said cover member, each fan blade further being moveable to an operable configuration and extending radially outwardly from said central support member when said cover member is said expanded configuration; and

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20 • drive means for rotating said plurality of fan blades about said central support member when in said operable configuration in a manner so as to move air in a direction so as to cool a user positioned proximal of said cover member;

wherein the plurality of blades are provided such that upon rotation of the rotor the fan blades are urged radially outward to said operable configuration, and upon rotation of

the rotor ceasing the fan blades move radially inwardly and distally so as to be substantially parallel to the support member when in said non-operable configuration.

2. An umbrella according to claim 1, wherein said plurality of fan blades is structurally rigid and hingedly engaged relative to the drive means.

5 3. An umbrella according to claim 1, wherein said plurality of fan blades is formed from a structurally flexible material.

4. A collapsible umbrella according to claim 1, wherein said cover member comprises a plurality of elongate stays hingedly engaged with and radially disposed about the distal end of said support member, and a deformable cover membrane
10 engaged with and carried by said plurality of stays.

5. A collapsible umbrella according to claim 4, further comprising a plurality of elongate struts disposed radially about said support member, each strut of said plurality of struts having a first end hingedly engaged with a corresponding stay and a second end slidably engaged with the middle portion of said support member;

15 wherein upon urging of the second ends of said plurality of strut in a distal direction, the strut members urge the stays radially outwardly and distally, and the strut members form a brace between the stays of said cover member.

6. A collapsible umbrella according to claim 4, wherein said plurality of fan blades is disposed between the plurality of struts and the distal end of said support member such
20 that the plurality of struts form a guard between the fan blades and the user.

7. An umbrella according to claim 6, further comprising a collapsible shield member which is carried by said plurality of struts, wherein said plurality of struts is generally

parallel to said support member when said cover member is in said collapsed configuration.

8. An umbrella according to any one of the preceding claims, wherein said drive means is located adjacent said plurality of fan blades.

5 9. An umbrella according to claim 8, wherein said drive means is provided as a direct current electric motor.

10. An umbrella according to claim 9, wherein said electric motor comprises a stator disposed radially inward of a rotor and being fixedly engaged relative to the support member, the rotor extending at least partly around the stator and being rotatably
10 engaged with the stator; and

wherein a first end of fan blades is engaged relative to the rotor such that upon rotation of said rotor the plurality of fan blades is rotated about the support member.

11. An umbrella according to claim 9, wherein the motor further comprises a coil disposed radially outward of the stator and is fixedly engaged relative to the stator, and a
15 magnet configuration disposed radially between the coil and the rotor and being fixedly engaged relative to the rotor.

12. An umbrella according to any one of the preceding claims, further comprising a power supply carried by said support member.

13. An umbrella according to claim 12, wherein said power supply is disposed
20 adjacent the distal end of the support member and distal the cover member.

14. An umbrella according to claim 13, further comprising a housing disposed adjacent the distal end of the support member and distal the cover member, wherein the power supply is located within the housing.
15. An umbrella according to claim 12, wherein the power supply is disposed at or
5 adjacent the proximal end of the support member.
16. An umbrella according to claim 15, wherein the power supply is disposed internal of the support member.
17. An umbrella according claim 12, further comprising a handle portion disposed adjacent the proximal end of said support member, wherein the power supply is located
10 within the handle portion.
18. An umbrella according to any one of claims 12 to 17, wherein the power supply is provided in the form of battery cells.
19. An umbrella according to claim 18, wherein the battery cells are rechargeable battery cells.
- 15 20. An umbrella according to any one of the preceding claims, wherein the drive means is activated upon the cover member being moved to said expanded configuration.
21. An umbrella according to claim 20, further comprising a switch mechanism operable upon the cover member moving to said expanded configuration so as to active
20 said drive means.

22. An umbrella according to any one of claims 1 to 19, further comprising a user operable switch located at or adjacent the proximal end of said support member for activation of said drive means.