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(54) **MULTI-FUNCTIONAL OUTDOOR SUN-SHADING APPARATUS, MULTI-FUNCTIONAL OUTDOOR SUN-SHADING UMBRELLA, AND MULTI-FUNCTIONAL RECREATIONAL PAVILION**

(57) The present disclosure discloses a multi-functional outdoor sun-shading apparatus, characterized in that an umbrella awning body adopts a two-layered or three-layered design, wherein an upper layer is for blocking out direct irradiation of sunlight, and a lower layer is for absorbing an external cool liquid to make a user feel cool and refreshed; the sun-shading apparatus may be fixedly mounted or non-fixedly placed, and thus may be used as a sun-shading umbrella or a recreational pavilion; a roof of the sun-shading apparatus is provided with a solar panel to absorb sunlight as an energy source for illuminating at night or for landscaping; by further providing adjusting means, not only the vertical height of the umbrella awning body may be adjusted, but also its lateral angle may be adjusted; in this way, it is suitable for any sunlight angle to achieve an optimal effect.

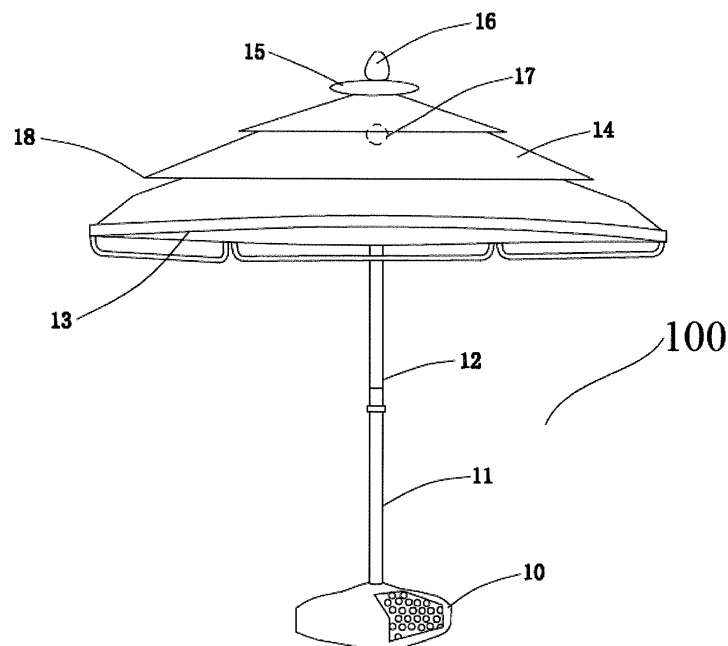


Fig. 1A

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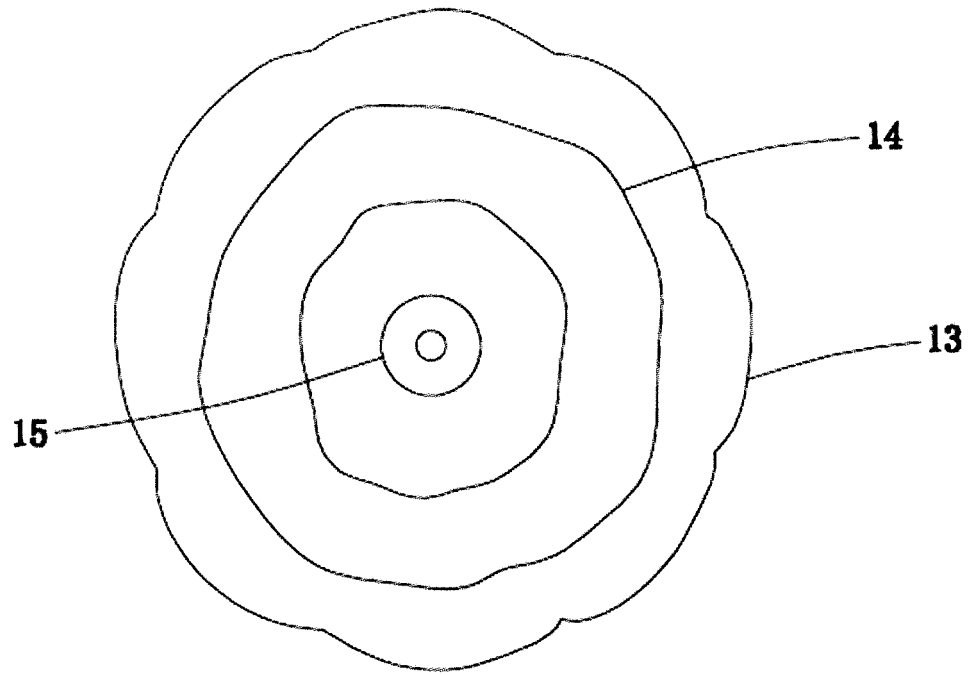


Fig. 1B

## Description

### FIELD OF THE INVENTION

[0001] The present disclosure relates to a multi-functional outdoor sun-shading apparatus that may be used as an outdoor sun-shading umbrella or a recreational pavilion, and more particularly to a multi-functional outdoor sun-shading apparatus, a multi-functional outdoor sun-shading umbrella, and a multi-functional recreational pavilion, which may block out outdoor sunlight at daytime and keep a cool temperature by absorbing a cool liquid and may illuminate or beautify the surroundings at night through a solar installation.

### BACKGROUND OF THE INVENTION

[0002] With the constant improvement of living standards and the enhancement of health awareness, people become more and more favored in engaging in outdoor activities in their leisure time. Particularly, an outdoor sun-shading umbrella for blocking out high-temperature irradiation of sunlight in the hot summer becomes one of indispensable outdoor gears. As shown in Fig. 4, a common sun-shading umbrella in the prior art is substantially comprised of three parts: a base 1, a telescopic prop 2, and an umbrella awning body 3, wherein the base 1 is for steadily supporting the sun-shading umbrella, the telescopic prop 2 is for adjusting a height of the sun-shading umbrella, and the umbrella awning body 3 is for sheltering from direct irradiation of sunlight, a material of which mostly adopts a single-layered design.

[0003] Generally, under irradiation of strong sunlight, the common sun-shading umbrella shown in Fig. 4 can only block out a small part of sunlight, while the temperature under the umbrella is still intolerably high, which may bring about adverse impacts to people physically and mentally, such as causing serious damages to the health of human body or causing intangible psychological pressures. Therefore, there is a desire for a sun-shading apparatus that may not only block out most of high temperature, radiation and UV light, which are generated by irradiation of sunlight, but also may maintain a cool temperature under the umbrella. Besides, with constant increase of populations in major cities throughout the world, much indoor and outdoor furniture will be designed with multiple functions so as to save as much space as possible, and more smart elements will be incorporated. Therefore, it is desired that the prior art sun-shading umbrellas can be adapted to this multi-functional design trend so as to meet a variety of people's demands as much as possible.

### SUMMARY OF THE INVENTION

[0004] To solve the various problems existing in the prior sun-shading umbrellas mentioned above, an objective of the present disclosure is to provide an outdoor

sun-shading apparatus as an outdoor sun-shading umbrella or pavilion, the outdoor sun-shading apparatus having a base that accommodates a cool liquid, from which base the cool liquid is suctioned to maintain a cool temperature, the outdoor sun-shading apparatus being designed with a two-layered or multi-layered umbrella awning such that it may not only block out most of high temperature, radiation and UV light which are generated by high-temperature irradiation of sunlight, but also may avoid hotness caused by blazing sunlight while maintaining a cool temperature.

[0005] A technical solution according to the present disclosure provides a multi-functional outdoor sun-shading apparatus, comprising: a base part that accommodates a cool liquid for cooling; an umbrella awning part having a multi-layered design; and a delivery tube that is communicative with the base part so as to supply the cool liquid to the umbrella awning part, wherein the umbrella awning part comprises a heat blocking layer for blocking out sunlight and a moisture absorbing layer that realizes cooling by evaporating the cool liquid.

[0006] Preferably, the multi-functional outdoor sun-shading apparatus according to the technical solution above further comprises: a telescopic prop that may adjust a height of the umbrella awning along a vertical direction; and an adjusting part that may adjust an inclination of the umbrella awning along a transverse direction, wherein the delivery tube is disposed inside the telescopic prop.

[0007] Preferably, the multi-functional outdoor sun-shading apparatus according to the technical solution above further comprises: energy storage means that converts solar energy to electrical energy; and a first light-emitting part for night illumination and a second light-emitting part for landscaping, both of which utilize the electrical power supplied by the energy storage means.

[0008] Preferably, in the multi-functional outdoor sun-shading apparatus according to the technical solution above, the first light-emitting part, the second light-emitting part, and the umbrella awning part together form a flower appearance that may be appreciated at both daytime and night.

[0009] Preferably, the multi-functional outdoor sun-shading apparatus according to the technical solution above further comprises: a solar fan disposed below the umbrella awning part and powered by the solar energy.

[0010] Another technical solution of the present disclosure provides a multi-functional outdoor sun-shading umbrella, which uses the multi-functional outdoor sun-shading apparatus according to the technical solution above, wherein the base part is placed on the ground in a non-fixed manner.

[0011] A further technical solution of the present disclosure provides a multi-functional recreational pavilion, which uses the multi-functional outdoor sun-shading apparatus according to the technical solution above, wherein the base part is placed under the ground in a non-fixed manner.

**[0012]** The multi-functional outdoor sun-shading apparatus according to the present embodiment overcomes unnecessary disturbance to physical and mental health of human beings and deterioration of the hygiene of human body caused by strong sunlight irradiation. The multi-functional outdoor sun-shading umbrella provided by the present disclosure may not only block out blazing sunlight, but also may illuminate at night where there is no light source; therefore, it has a usage of absorbing solar energy to illuminate at night.

**[0013]** The multi-functional outdoor sun-shading umbrella provided by the present utility model for solving its technical problem may has a round, a square or an irregular shape; the sun-shading umbrella made of fiber, plastic, metal or any environment-friendly material adopts a laminated umbrella awning. A material is loaded inside the umbrella awning to absorb a liquid for cooling, and a water suction tube is provided in connection with the water absorption material inside a main skeleton of the sun-shading umbrella; while a bottom of the sun-shading umbrella is a base carrying a liquid, which supplies a cool liquid to the water absorption material of the umbrella awning. The multi-functional outdoor sun-shading apparatus does not have a fixed height; instead, the height may be adjusted in a vertical direction, and an angle of the umbrella awning body may also be adjusted in a transverse direction; in this way, sunlight-blocking adjustment is enabled according to any sunlight irradiation angle at daytime as demanded by any person; the height may be raised to 3 or 4 meters or even higher from 2 meters; the base is fixed by any material with an appropriate weight, and the inside of the base may carry a liquid-state material available for the umbrella awning to cool. The multi-functional outdoor sun-shading apparatus may be fixedly installed or non-fixedly placed.

**[0014]** The multi-functional outdoor sun-shading umbrella according to the present disclosure is a necessity for outdoor recreation, which may provide a cool temperature in hot summer; it enables people to enjoy an outdoor sunshine while maintaining a refreshed spirit; besides, it avoids heavily sweating due to the summer heat. The functions and advantages of the multi-functional outdoor sun-shading umbrella are summarized below:

- a solar panel on the roof of the multi-functional outdoor sun-shading umbrella enables the umbrella to provide a small amount of illumination when there is no light source at night; because the umbrella is designed as a flower and the edges of the petals and flower leaves adopt an electrically conductive cable, the umbrella may emit light.
- the multi-functional outdoor sun-shading umbrella may be subjected to height or angle adjustment vertically or transversely; its height may be 2 meters or raised to 3 or 4 meters or even higher, at the user's convenience.

- the multi-functional outdoor sun-shading umbrella makes a comfortable, cool, and refreshing environment for an outdoor space on the ground surface, so as to enlighten one's spirit and soothe their temper.

- the multi-functional outdoor sun-shading umbrella may effectively block direct irradiation of sunlight, because it is a two-layered or multi-layered design; therefore, a cool and comfortable temperature is kept under the umbrella, which may also keep a good hygiene of a human body.

**[0015]** In view of the above, the multi-functional outdoor sun-shading apparatus according to the present disclosure may effectively block out blazing sunlight so as to avoid the directly irradiating sunlight from radiating and penetrating through the main umbrella. The principle is to adopt a two-layered or multi-layered umbrella awning design, where the upper layer blocks out heat, radiation, and UV light from the sunlight, while the lower layer has a moisture absorption cotton to absorb a cool liquid from the base, available for the umbrella awning to cool; in this way, the user may feel cooler and more refreshed under the umbrella. Therefore, the multi-functional outdoor sun-shading apparatus is made of fiber, plastic, metal, or any appropriate material, overlapped and combined. The upper layer is mainly for blocking out sunlight, while the lower layer has a cotton-like material that absorbs the cool liquid or any material that absorbs moisture, available for the umbrella awning to maintain cool, such that the user may enjoy a comfortable and refreshing temperature under the umbrella.

**[0016]** Further, the multi-functional outdoor sun-shading apparatus according to the present disclosure uses optical fiber as the contour edge line of the umbrella; after the solar installation absorbs sunlight at daytime, it may power night illumination and landscaping. Therefore, the present utility model with a noctilucent equipment may also be seen without illumination of light. In this way, its aesthetic profile may be appreciated at both daytime and at night.

**[0017]** The features, technical effects and other advantages of the present disclosure will become obvious through further illustration of the accompanying drawings.

#### **BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS**

**[0018]** Hereinafter, the present utility model will be described through examples with reference to the accompanying drawings, wherein:

Fig. 1A shows a local sectional structural view of a multi-functional outdoor sun-shading umbrella according to a first embodiment of the present disclosure, and Fig. 1B is a top view thereof.

Fig. 2A shows a local sectional structural view of a multi-functional recreational pavilion according to a second embodiment of the present disclosure, and Fig. 2B is a top view thereof.

Fig. 3 shows a stereoscopic appearance diagram of the multi-functional recreational pavilion according to the second embodiment of the present disclosure.

Fig. 4 shows a structural schematic diagram of an outdoor sun-shading umbrella according to the prior art.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0019] Hereinafter, the technical solution of the present disclosure will be described clearly and completely with reference to the accompanying drawings. Apparently, the embodiments as described are only part of the embodiments of the present disclosure, not all of them. Based on the embodiments in the present disclosure, all other embodiments obtained by those of normal skill in the art without exercising inventive work fall within the protection scope of the present disclosure.

[0020] In the description of the present disclosure, unless otherwise indicated and limited, the terms "mount," "connect," and "connection" should be construed broadly. For example, they may refer to a fixed connection, a detachable connection or an integral connection; they may refer to a mechanical connection or an electrical connection; they may refer to a direct connection or may refer to an indirect connection via an intermediate medium; and they may refer to communication inside two elements. Those of normal skill in the art may construe the specific meanings of the terms in the present disclosure according to specific situations.

[0021] The multi-functional outdoor sun-shading apparatus according to the present disclosure differs from a conventional sun-shading umbrella in the prior art in that: 1) the umbrella awning body of the present disclosure adopts a two-layered or multi-layered design, wherein the upper layer is for blocking out direct irradiation of sunlight, while the lower layer is for absorbing an external cool liquid such that the user feels cool and refreshed under the umbrella; 2) the sun-shading apparatus of the present disclosure may be fixedly installed or a non-fixedly placed, which may be used as a sun-shading umbrella or a recreational pavilion as needed; 3) a roof of the sun-shading apparatus is provided with a solar panel to absorb sunlight as an energy source for illuminating or landscaping at night; 4) by further providing adjusting means, the umbrella awning body may not only be subjected to height adjustment in a vertical direction but also may be subjected to angle adjustment in a transverse direction, and thus may be suitable for any irradiation angle in the daytime so as to achieve an optimal sun-shading effect. Hereinafter, the structural details, working

principles, and technical effects will be illustrated in detail with reference to the accompanying drawings.

[0022] Fig. 1A is a local sectional structural diagram of a multi-functional outdoor sun-shading umbrella 100 according to a first embodiment of the present utility model, and Fig. 1B is a top view thereof. As shown in Fig. 1A, the multi-functional outdoor sun-shading umbrella 100 according to the first embodiment is preferably placed on an outdoor ground in a non-fixed manner; although it is similar to the conventional sun-shading umbrella shown in Fig. 4 in terms of the overall appearance, their structures differ greatly. Specifically, the multi-functional outdoor sun-shading umbrella 100 according to the first embodiment of the present utility model comprises: a cool liquid-containing base 10 for accommodating a cool liquid and also used as an umbrella base; a hollow water suction tube 11 for suctioning the liquid from the cool liquid-containing base 10; a telescopic prop 12 for adjusting a height of an umbrella awning and having the water suction tube 11 provided therein; a moisture absorbing part 13 as a lower layer of the umbrella awning; a heat blocking part 14 as an upper layer of the umbrella awning; a round solar panel 15 provided at a top of the umbrella awning; a light-emitting part 16 having a pistil-like appearance; an adjusting part 17 for adjusting an inclination angle of the umbrella awning along a transverse direction, and an optical fiber lace line 18 that partially encloses a contour edge of the umbrella awning for landscaping/decoration. It needs to be particularly noted that the moisture absorption part 13 as the lower layer of the umbrella awning and the heat blocking part 14 as the upper layer of the umbrella awning together form an upper-lower two-layered umbrella awning design, wherein the upper layer adopts a material that may block out direct irradiation of the sunlight and reduce UV radiation, while the lower layer adopts a material such as a moisture absorption cotton which may absorb the cool liquid, the cool liquid reaching the moisture absorption part 13 via the water suction tube 11; because evaporation of the cool liquid will absorb the surrounding heat, the user under the umbrella will be sheltered from the blazing sun and thus feel cool and comfortable. Generally, considering the limited volume of the cool liquid-containing base of the multi-function outdoor sun-shading umbrella 100, the cool liquid is preferably selected to be a liquid substance that has a relatively large specific heat capacity and does no harm to a human body and the environment.

[0023] Additionally, the user may not only adjust the height of the sun-shading umbrella through the telescopic prop 12, but also may adjust the inclination of the sun-shading umbrella through the adjusting part 17 according to the sunlight angle, thereby satisfying the user's demands in different periods of time, i.e., daytime and night. Preferably, the height adjustment scope of the sun-shading umbrella is 2-4m or higher, and the inclination adjustment scope is 45° or higher transversely. Further, the solar panel 15 may convert the solar energy into a power source so as to power the light-emitting part 16 and the

optical fiber lace line 18, thereby causing them to illuminate at night. As shown in the top view of Fig. 1B, the laminated umbrella awning body, the pistil-like light-emitting part 16, and the decorative optical fiber lace line 18 together form a beautiful flower-shape design, such that the user may appreciate the beautiful appearance of the sun-shading umbrella at both daytime and night. Preferably, a solar fan (not shown) powered by solar energy may be further provided below the multi-functional outdoor umbrella awning 100. The solar fan may not only facilitate air circulation, but also may facilitate evaporation of the cool liquid, such that the user obtains a cooler experience.

**[0024]** In addition, those skilled in the art may easily understand that the shape of the multi-functional outdoor sun-shading umbrella 100 is not particularly limited, which may assume a round, square, or irregular shape, and its material may be made of fiber, cloth, plastic, metal or any environment-friendly material. The laminated design of the umbrella awning according to the present embodiment is not limited to a two-layered design. A multi-layered design may also be flexibly adopted, as long as it simultaneously has a moisture absorption layer and a sunlight blocking layer. Further, considering that the weight of the umbrella awning in a moisture absorbed state will increase a little, a base of the multi-functional outdoor sun-shading umbrella 100 needs to be fixed using a heavy enough material to maintain balance, so as to prevent an accidental tilting.

**[0025]** Based on the multi-functional outdoor sun-shading umbrella 100 according to the first embodiment of the present utility model, the multi-functional recreational pavilion 200 as a transformed example of the present disclosure may be achieved through further improvement. Fig. 2A shows a local sectional structural schematic diagram of the multi-functional recreational pavilion 200 according to the second embodiment of the present disclosure; and Fig. 2B is a top view thereof. Fig. 3 is a stereoscopic appearance diagram of the multi-functional recreational pavilion 200 according to a second embodiment of the present disclosure.

**[0026]** In a working state, the multi-functional recreational pavilion 200 as shown in Fig. 2A comprises a pavilion base under the ground and a pavilion body above the ground. The components having the same functions as the multi-functional outdoor sun-shading umbrella 100 shown in Fig. 1A are represented by the same reference numerals, and detailed explanations thereof are thus omitted. In addition, Fig. 2A also omits the adjusting part for adjusting an inclination and the optical fiber lace line for landscaping. It may be seen from Fig. 2A that the multi-functional recreational pavilion 200 is fixedly connected with the ground, and the pavilion base 20 under the ground may accommodate inside a large amount of cooling liquid which is supplied to the moisture absorption part 23 mounted on the upper portion of the pavilion via a water suction pipe 21. Further, it may be seen from the top view shown in Fig. 2B that a leaf-shaped water ab-

sorption part 23, a petal-shaped light blocking part 24, a round solar panel 25, and a pistil-shaped light emitting part 26 together form another kind of beautiful flower appearance. In addition, although not shown in the figure, those skilled in the art may contemplate that the pavilion base 20 under the ground may be connected to other liquid source by pipeline or other approaches, such that supply of the cool liquid is not restricted as much as the multi-functional outdoor sun-shading umbrella 100 shown in Fig. 1A. Likewise, a solar fan (not shown) powered by solar energy may be further provided below the multi-functional recreational pavilion 200. The solar fan may not only facilitate air circulation, but also facilitate the user to obtain a cooler experience. In addition, considering that the cool liquid-containing base 20 of the multi-functional recreational pavilion 200 may accommodate or provide a large amount of cool liquid, the cool liquid may be selected as an easily accessible cool water.

**[0027]** Further, in the actual use state shown in Fig. 3, the multi-functional recreational pavilion 200 as shown in Fig. 2A preferably may be used in conjunction with a plurality of recreational pavilion seats 300, granting the user a better product experience. In an actual application environment, the multi-functional recreational pavilion 200 according to the second embodiment of the present disclosure is preferably disposed at an appropriate location in a residential community as required, which may not only be used at daytime for outdoor recreation, but also may be used at night as an alternative to a road lamp. In particular, it is powered by solar energy to illuminate, wasting no electrical energy.

**[0028]** Those skilled in the art should understand that the various embodiments above are only used for illustrating, not for limiting, the technical solution of the present disclosure; although the present disclosure has been illustrated in detail with reference to various embodiments above, a person of normal skill in the art should be understood that the technical solutions as disclosed in the various embodiments may be modified, or equivalently replaced, while such modifications or replacements will not cause an essence of the corresponding technical solution to depart from the scope of the technical solutions in the various embodiments of the present disclosure. Various technical solutions of the embodiments above may be combined arbitrarily. For the sake of brevity, not all possible combinations of various technical features in the embodiments above are described. However, as long as the combinations of these technical features are not contradictory, they should be regarded as falling into the scope of the disclosure of the present description.

## Claims

1. A multi-functional outdoor sun-shading apparatus, comprising:

- a base part that accommodates a cool liquid for cooling;  
 an umbrella awning part having a multi-layered design; and  
 a delivery tube that is communicative with the base part so as to supply the cool liquid to the umbrella awning part, wherein the umbrella awning part comprises a heat blocking layer for blocking out sunlight and a moisture absorbing layer that realizes cooling by evaporating the cool liquid. 5 10
2. The multi-functional outdoor sun-shading apparatus according to claim 1, further comprising: 15
- a telescopic prop that may adjust a height of the umbrella awning along a vertical direction; and  
 an adjusting part that may adjust an inclination of the umbrella awning along a transverse direction, wherein the delivery tube is disposed inside the telescopic prop. 20
3. The multi-functional outdoor sun-shading apparatus according to claim 2, further comprising: 25
- energy storage means that converts solar energy to electrical energy; and  
 a first light-emitting part for night illumination and  
 a second light-emitting part for landscaping, both of which utilize the electrical power supplied by the energy storage means. 30
4. The multi-functional outdoor sun-shading apparatus according to claim 3, **characterized in that** the first light-emitting part, the second light-emitting part, and the umbrella awning part together form a flower appearance that may be appreciated at both daytime and night. 35
5. The multi-functional outdoor sun-shading apparatus according to claim 2, further comprising: 40
- a solar fan disposed below the umbrella awning part and powered by a solar energy. 45
6. A multi-functional outdoor sun-shading umbrella, using the multi-functional outdoor sun-shading apparatus according to any one of claims 1-5, wherein the base part is placed on the ground in a non-fixed manner. 50
7. A multi-functional recreational pavilion, using the multi-functional outdoor sun-shading apparatus according to any one of claims 1-5, wherein the base part is placed under the ground in a non-fixed manner. 55

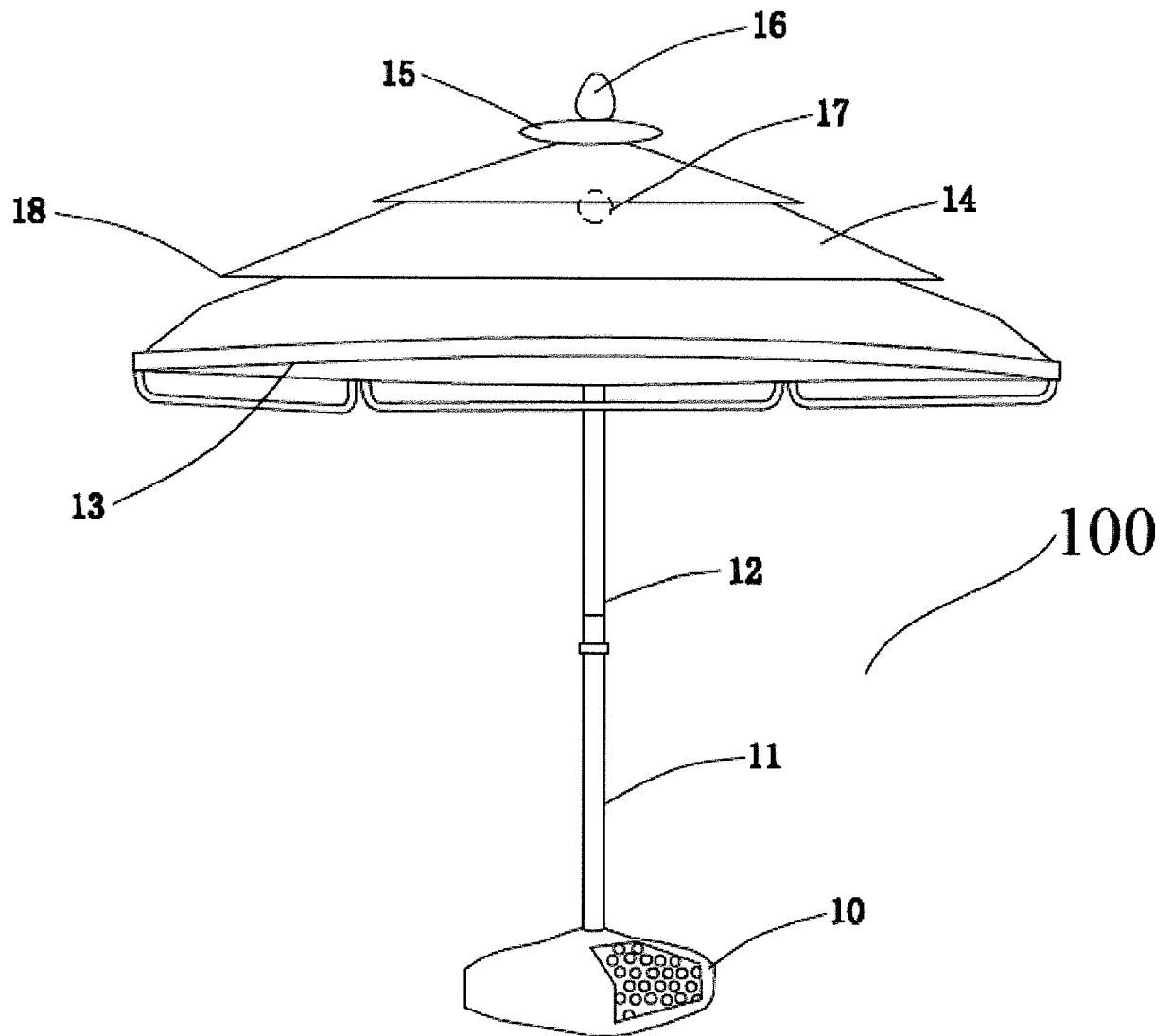


Fig. 1A



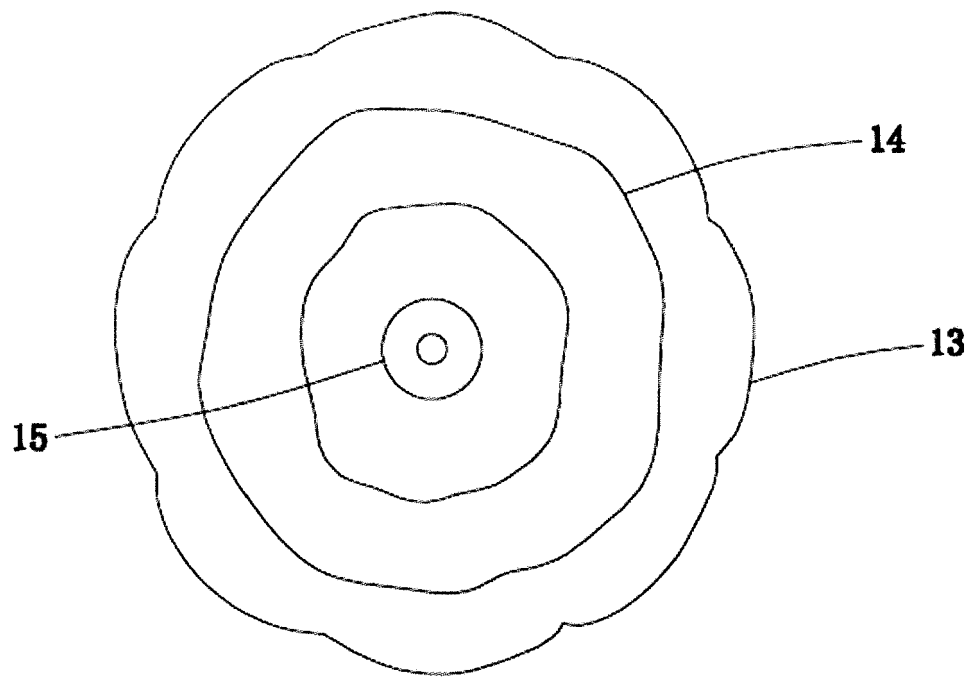


Fig. 1B

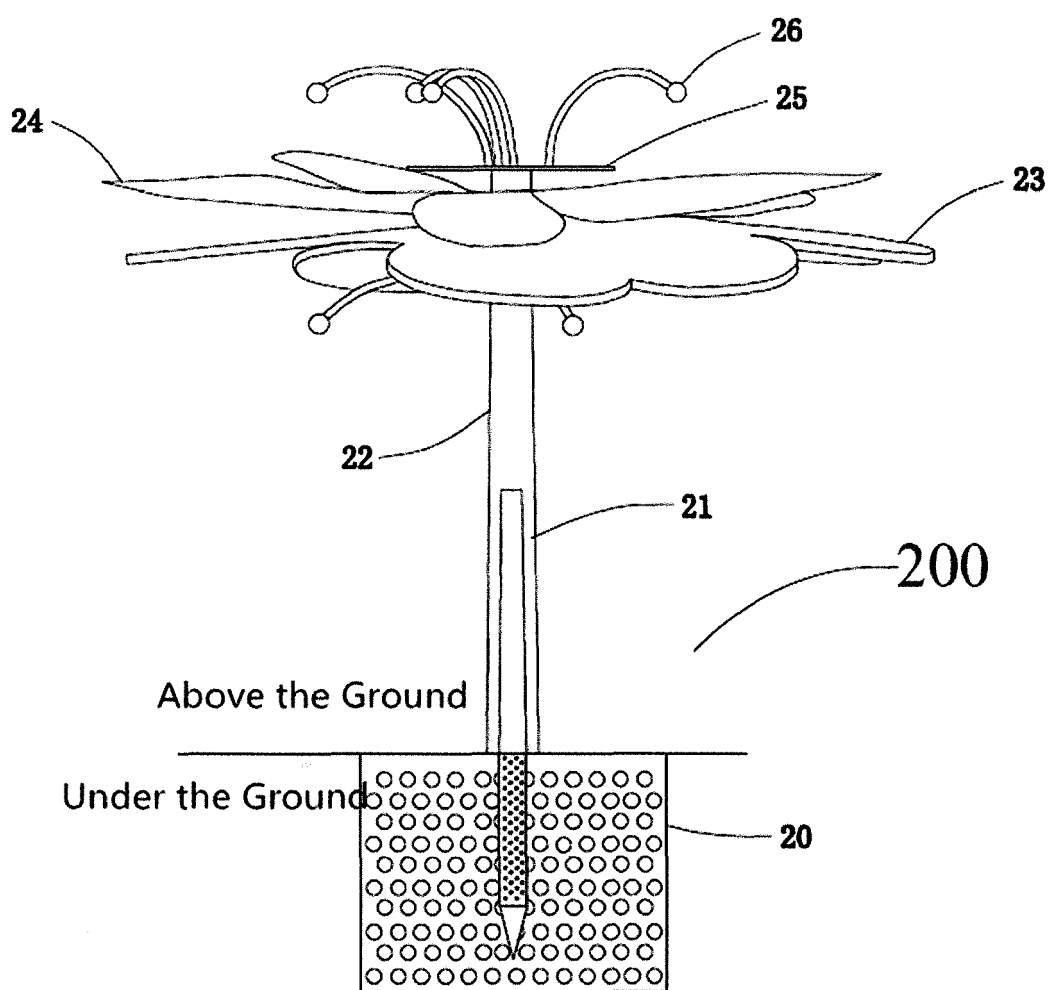


Fig. 2A

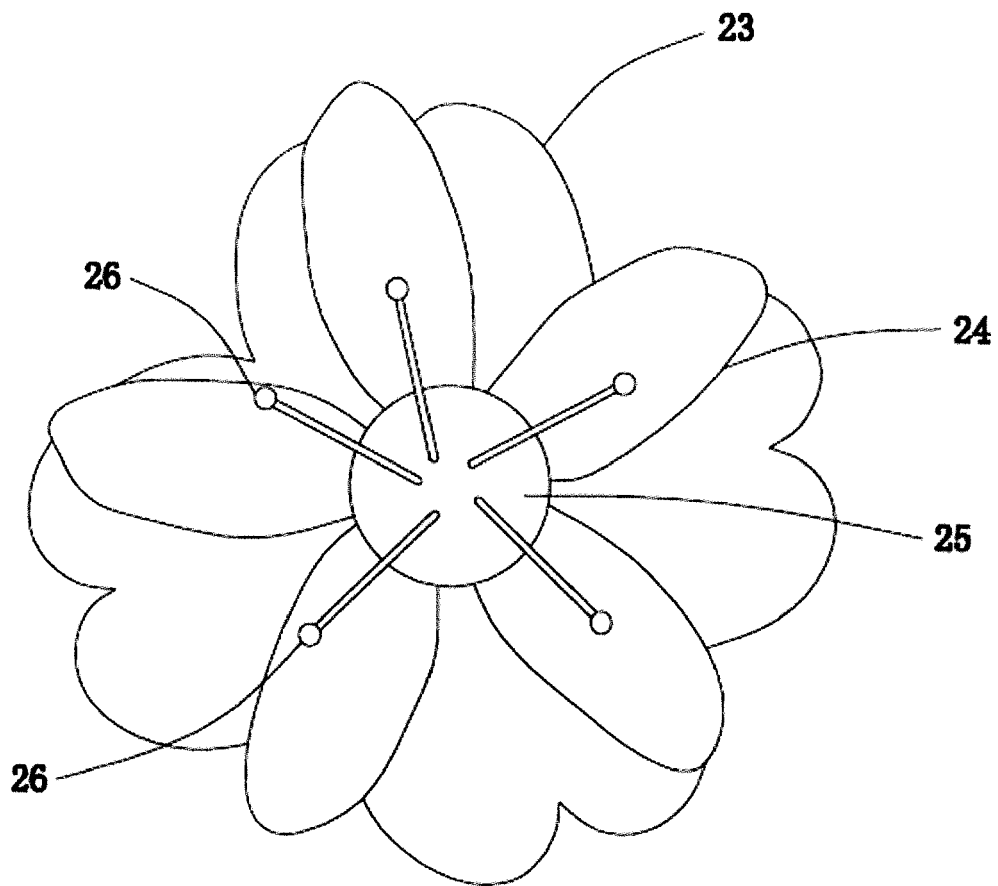


Fig. 2B

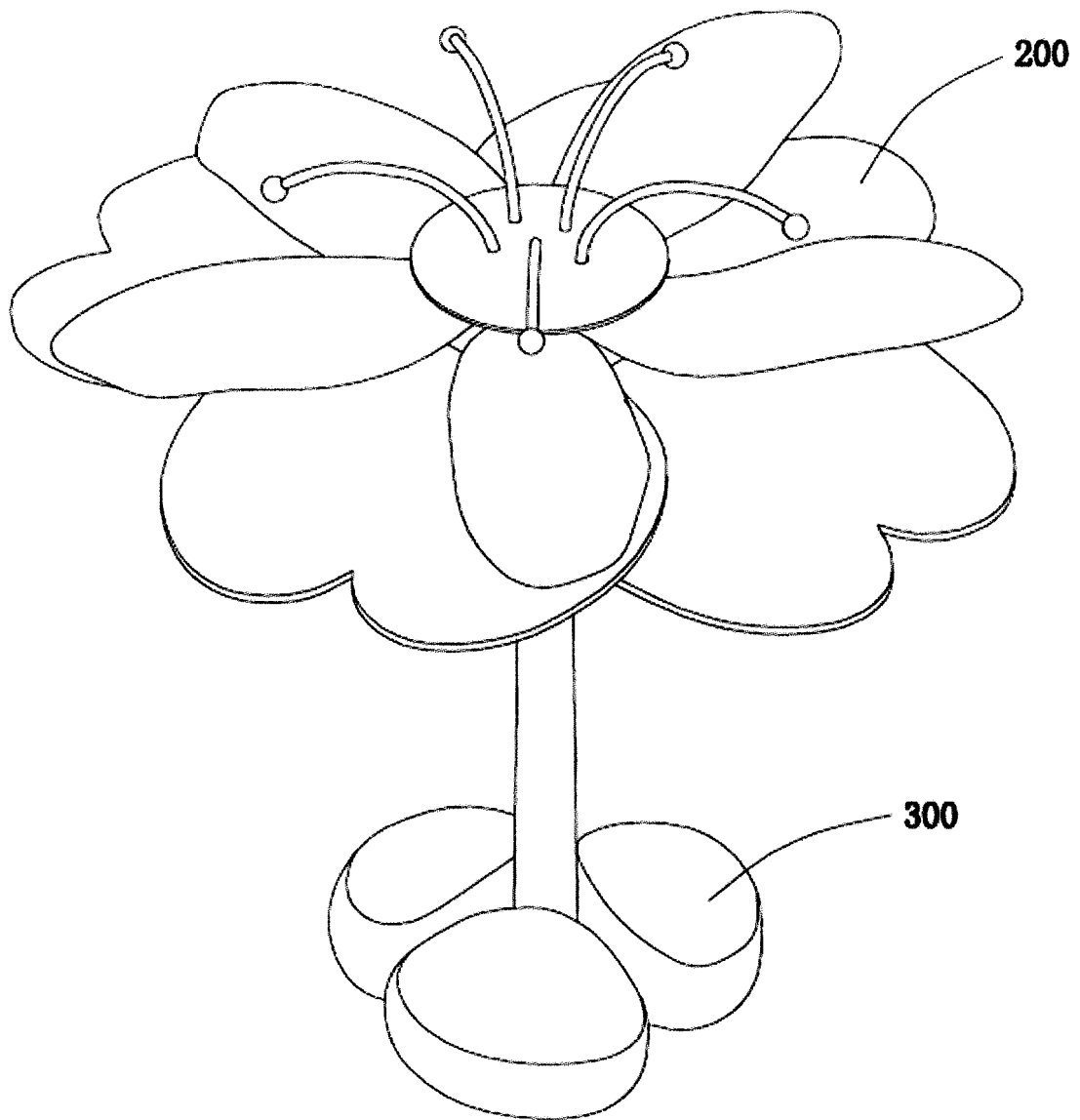
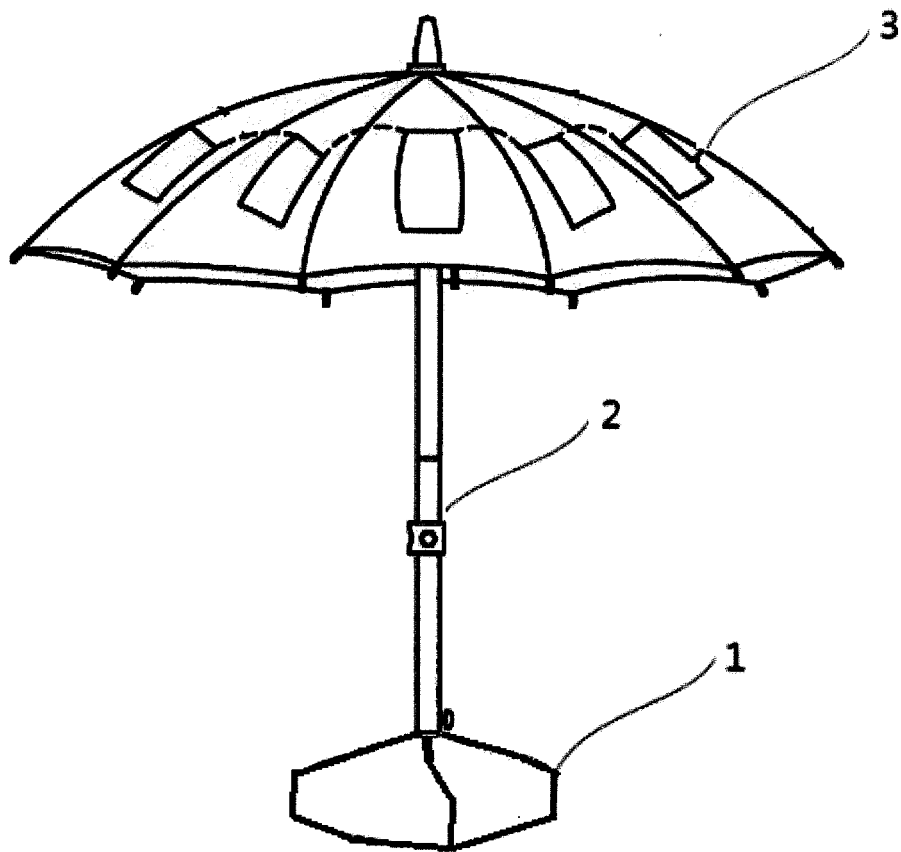


Fig. 3



(Prior Art)

Fig. 4



## EUROPEAN SEARCH REPORT

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Place of search <b>The Hague</b>		Date of completion of the search <b>9 November 2017</b>	Examiner <b>van de Beek-Duijker</b>
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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