

Diffused light lighting device

This invention relates to a light diffusing lighting device comprising a fitting having an aperture for receiving therein an end section of at least one optical wave guide serving as a light source; a first reflecting member connected to said fitting and having a central opening for allowing the light rays issuing from said optical wave guide to pass therethrough, said first reflecting member having a downwardly curved wall defining a concave inner surface, at least part of said inner surface adjacent said central opening being reflective, and a second reflecting member spaced from and aligned with said opening in said first reflecting member, said second reflecting member having a convex outer reflecting surface facing the concave inner reflecting surface of said first member.

More particularly, this invention relates to a novel lighting device wherein light rays, especially solar beams, propagating through and issuing from optical wave guides are used as a light source.

This invention may be advantageously used for lighting the interior of human occupancies such as rooms of a building, underground bomb shelters, underwater enclosures, and so on, with the natural solar beams or light rays collected on the earth's surface.

A light diffusing lighting device of the above type is shown and disclosed in US-A-3 536 908. The known lighting device according to the cited patent is part of a fiber optic lighting system including an electric bulb serving as a source of artificial light for the several optic fibers of the system.

It is a disadvantage of the known lighting device that the second reflecting member produces a shadow and a zone which is poorly illuminated, respectively, on its side opposite to the optical wave guide.

Further, various attempts have been made for utilization of the solar energy reaching the earth's surface. However, most of the prior art solar energy systems involve the transformation of the captured solar energy into electric or thermal energy and, as far as the inventor is aware, there are very few that directly utilize the solar beams themselves as a source of optical energy. It is obvious that, in lighting applications, the use of solar energy in the form of optical energy is advantageous since transformation loss is obviated.

With a view to provide a solar system which employs solar radiation as a light source, the inventor has previously developed an apparatus for collecting solar beams that is capable of condensing the solar beams so that they are introduced into a bundle of optical wave guides. With this apparatus, the light rays or solar beams, being reflected at the boundary surface of the optical wave guides, propagate there-

along and then issue out of the wave guides from their exit end. The angle of emission of the light rays as they issue out of the exit end of the optical wave guides depends on the critical angle of incidence of the material forming the optical wave guides and, normally, is not greater than 48° for an optical fiber made from pure silicate. When the light rays are allowed to issue from such optical wave guides for the purpose of illumination of the interior of a room, illumination takes place in a spotlight-like fashion. Thus, it is not possible to illuminate a sufficiently wide area with soft or subdued light rays or solar beams.

The object of the invention is to ensure that the beams of light rays propagating through and issuing out of an end of optical wave guides are effectively diffused so that an extended area of a room is illuminated with appropriately subdued light rays and to avoid a poorly illuminated region behind the second reflecting member.

According to the invention this object is met with a lighting device of the type described above and being characterized in that either said second reflecting member has a central opening aligned with said opening in said first member and that a diverging lens is provided in alignment with said central opening on the side of the second reflecting member directed away from the first reflecting member; or in that a second light source is mounted on the side of the second reflecting member directed away from the first reflecting member, said second light source preferably being an incandescent bulb.

It is an advantage of both solutions that the area below the second reflecting member that would otherwise be shaded by the latter may be illuminated with light rays of sufficient intensity. Moreover, it is a specific advantage of the second solution that illumination may be performed with solar beams alone when during the day-time the solar beams are available at the solar beam collecting apparatus and when at the same time it is not necessary to avoid a shaded area, while the second light source may be activated when the solar beams are not available or when a shaded area has to be avoided.

Regarding the first mentioned solution preferably, the part of the first reflecting member other than that provided with the reflecting surface may be made translucent to ensure that a portion of the light rays reflecting towards the first member transmit there-through to thereby illuminate the area above the level of the lighting device.

Further, regarding the second solution it is possible to arrange a daylight filter adjacent the lower part of the mirrored incandescent bulb so

that a daylight hue is obtained during electric powered operation of the lighting device.

Regarding the second solution, an optical sensor or photo-sensor may be provided on the first reflecting member at the vicinity of the opening thereof. The optical sensor issues a signal when the intensity of the solar beams propagating through the optical wave guides is decreased beyond a predetermined level and then actuates a relay to turn on to supply electric current to the incandescent bulb. Thus, the lighting device according to the invention can be switched over automatically from a mode wherein the solar beams are used as a light source to a mode wherein the electric bulb is operated, and *vice versa*.

The sealed space formed between the first reflecting member and the bottom plate may be filled in with an inert gas to prevent any deterioration of the elements housed therein.

The invention will now be described in more detail with reference to the embodiments thereof illustrated in the accompanying drawings, in which:

Fig. 1 is a cross-sectional view of a half of a lighting device according to the invention, as divided by a plane including the axis of symmetry Y—Y, and;

Fig. 2 is a cross-sectional view of another embodiment.

Referring to Fig. 1, the lighting device according to the invention includes a generally tubular fitting 1 in which an end section of a cable 2 of the optical wave guides is grippingly inserted. A commercially available cable of optical wave guides comprises a bundle of optical fibers covered with a common protective sheath. The optical cable 2 is retained in the fitting 1 in such a manner that its light ray emitting end is positioned as at 3. The other end of the cable may be connected optically to a solar beam collecting apparatus (not shown) installed at a suitable outdoor location such as building top, earth's surface, sea surface, and the like, where the solar beams arrive.

The tubular fitting 1 is connected to a first reflecting member 4 by any suitable fastening means such as adhesives and screws in such a manner that the cylindrical aperture in the tubular member 1 is brought into alignment with the opening 5 in the reflecting member 4. Alternatively, the fitting 1 may be screwed into the opening 5 with its externally threaded lower end threadingly engaging the internal threads of the opening.

The first reflecting member 4 is made from a board of plastics such as acrylic resins. In the illustrated embodiment, the first reflecting member comprises a downwardly curved central portion 6 with its lower surface coated with or covered by a mirror forming material such as a thin layer of metal deposited by a conventional evaporation technique, an adjacent translucent portion 7 with its flange 8 connected to a flange 9 of the central portion 6

by means of bolt/nut assemblies. A transparent bottom plate 10 is bonded or fastened to the lower periphery of the translucent portion 7 to form a substantially hermetically sealed cavity therein. An inert gas may be filled in the cavity. Alternatively, the bottom plate 10 may be made from a translucent plate having on its surface a plurality of minute projections and depressions capable of diffusing the light rays in random directions. For this purpose, a plate of cathedral glass may be used.

A second reflecting member 11 is placed in the cavity in an aligned relation with respect to the axis of symmetry Y—Y of the lighting device. This second reflecting member 11 has a convex mirror surface facing the lower surface of the first reflecting member and is held in place by a plurality of supports (not shown) pending from the central portion 6 or up-standing from the bottom plate 10. The central area of the second reflecting member 11 may be made transparent or provided with an opening 12 to permit the light rays to transmit there-through. A diverging lens 13 such as a concave Fresnel lens is provided at the center of the bottom plate 10.

In use, the light rays such as solar beams propagating via the optical wave guides emit from the exit end 3 of the cable. Those light rays that passed the opening 12 in the second reflecting member 11 go through the diverging lens 13 and, on doing so, are diverged outwardly as shown by an arrow A. Those light rays that have an intermediate angle of emission as measured at the exit end 3 of the optical fibers are reflected backwards by the second reflecting member 11 towards the mirrored portion 6 of the first reflecting member 4 and then reflected by the latter downwards, as shown by arrows B. The outermost light rays are reflected similarly by the second reflecting member 11 but a portion of them transmit the translucent wall of the adjacent portion 7 as they impinge thereon while a portion thereof are reflected downwards, as shown by arrows C and C'.

It will be noted that legs or posts for supporting the second reflecting member 11 on the bottom plate 10 may be advantageously located in the region D which is immediately below the second member 11 and is shaded by the latter, thereby avoiding their shadows to be projected on the floor.

Referring to Fig. 2 there is shown another embodiment of the invention. The lighting device in this embodiment includes a fitting 20 receiving and retaining an optical fiber cable or wave guide 21, and a first reflecting member 22 with its transparent bottom plate 23. An inert gas such as nitrogen gas may be filled-in in the space defined between the member 22 and bottom plate 23. The inner surface of the reflecting member 22 is provided with a specular mirror surface as in the preceding embodiment. The bottom plate 23 has an aperture in

which is mounted a socket 24 connected to an electric power source by means of wires 25.

A mirrored incandescent bulb 26 serving as a second light source is screwed into the socket 24. The mirrored bulb 26 has a generally spherical glass bulb, the inner surface of which opposite its filament is coated through an angle with a layer of reflecting material 27 to form a second reflecting member. Thus, when the incandescent bulb is lighted, the light rays L_1 emitted from the filament and directed upwardly as viewed in the drawing are reflected downwardly by the mirror surface 27 while the light rays directed towards the region of the bulb not provided with the reflecting material transmit therethrough. When the solar beam collector placed in a sun-lit location is operating, the solar beams issuing from the exit end 28 of the optical cable 21 with a relatively small angle of emission hit upon the mirror surface 27 of the bulb and are then reflected thereby towards the first reflecting member which in turn reflects the solar beams downwardly, as shown by arrows L_2 .

It will be noted that instead of the incandescent bulb 26, another type of lamp such as, for example, arc lamp and fluorescent lamp may be employed as a second light source. In that case, a second reflecting member may be provided at the top of or above the second light source.

When a daylight illumination is desired, a daylight filter 29 may be mounted adjacent the lower part of the bulb 26. This filter, being made for example of a bluish glass, will eliminate the reddish component in the light rays emitted from the bulb 26 so that illumination takes place with light rays of daylight hue.

Indicated at 30 is a photo sensor for detecting the luminous intensity of the light rays issued from the optical wave guides 21. The photo-sensor is positioned at the vicinity of the fitting 20 where the density of the reflected light rays are relatively enhanced. Alternatively, the photo-sensor may be provided at any such location that is capable of detecting the light rays issuing from the optical fiber or reflected by the mirrored bulb but is not affected by the light rays from the lamp. Examples of such photo-sensor are photo-cell, photo-transistor and photo-diode. A lead wire 31 from the photo-sensor 30 is connected to a remote relay (not shown). When the luminous intensity of the solar beams emitting from the optical cable are decreased below a predetermined value, the photo-sensor issues a signal to the relay which, in turn, closes its contacts to supply electric power to the bulb 26. Thus, the electric bulb is automatically lighted during the transition period from the daytime to the evening, without resorting to a manual switching operation. However, the photo-sensor is not an essential element and, thus, may be omitted.

It will be apparent that in both embodiments illustrated, the lighting device may be sus-

pended from the ceiling by any suitable suspending means such as pendant fittings.

Claims

1. A light diffusing lighting device comprising:

- a fitting (1) having an aperture for receiving therein an end section of at least one optical wave guide (2) serving as a light source;
- a first reflecting member (4) connected to said fitting and having a central opening (5) for allowing the light rays issuing from said optical wave guide to pass there-through, said first reflecting member having a downwardly curved wall (6, 7) defining a concave inner surface, at least part of said inner surface adjacent said central opening being reflective, and
- a second reflecting member (11) spaced from and aligned with said opening in said first reflecting member, said second reflecting member having a convex outer reflecting surface facing the concave inner reflecting surface of said first member,

characterized in that said second reflecting member (11) has a central opening (12) aligned with said opening (5) in said first member (4) and that a diverging lens (13) is provided in alignment with said central opening (12) on the side of the second reflecting member (11) directed away from the first reflecting member (4).

2. A lighting device as claimed in claim 1, characterized in that a light emitting opening defined by the outer rim of the curved wall (6, 7) of the first member (4) is closed with flat light-permeable plate (10) to form a substantially hermetically sealed space.

3. A lighting device as claimed in claim 2, characterized in that said plate (10) is transparent.

4. A lighting device as claimed in claim 2, characterized in that said plate (10) is a translucent plate having on its surface a plurality of minute projections and depressions.

5. A lighting device as claimed in claim 4, characterized in that said plate (10) is made from cathedral glass.

6. A lighting device as claimed in any one of the preceding claims, characterized in that a portion (7) of said first reflecting member (4) is translucent.

7. A light diffusing lighting device comprising:

- a fitting (20) having an aperture for receiving therein an end section of at least one optical wave guide (21) serving as a light source;
- a first reflecting member (22) connected to said fitting and having a central opening (28) for allowing the light rays issuing from said optical wave guide to pass there-through,

which is mounted a socket 24 connected to an electric power source by means of wires 25.

A mirrored incandescent bulb 26 serving as a second light source is screwed into the socket 24. The mirrored bulb 26 has a generally spherical glass bulb, the inner surface of which opposite its filament is coated through an angle with a layer of reflecting material 27 to form a second reflecting member. Thus, when the incandescent bulb is lighted, the light rays L_1 emitted from the filament and directed upwardly as viewed in the drawing are reflected downwards by the mirror surface 27 while the light rays directed towards the region of the bulb not provided with the reflecting material transmit therethrough. When the solar beam collector placed in a sun-lit location is operating, the solar beams issuing from the exit end 28 of the optical cable 21 with a relatively small angle of emission hit upon the mirror surface 27 of the bulb and are then reflected thereby towards the first reflecting member which in turn reflects the solar beams downwardly, as shown by arrows L_2 .

It will be noted that instead of the incandescent bulb 26, another type of lamp such as, for example, arc lamp and fluorescent lamp may be employed as a second light source. In that case, a second reflecting member may be provided at the top of or above the second light source.

When a daylight illumination is desired, a daylight filter 29 may be mounted adjacent the lower part of the bulb 26. This filter, being made for example of a bluish glass, will eliminate the reddish component in the light rays emitted from the bulb 26 so that illumination takes place with light rays of daylight hue.

Indicated at 30 is a photo sensor for detecting the luminous intensity of the light rays issued from the optical wave guides 21. The photo-sensor is positioned at the vicinity of the fitting 20 where the density of the reflected light rays are relatively enhanced. Alternatively, the photo-sensor may be provided at any such location that is capable of detecting the light rays issuing from the optical fiber or reflected by the mirrored bulb but is not affected by the light rays from the lamp. Examples of such photo-sensor are photo-cell, photo-transistor and photo-diode. A lead wire 31 from the photo-sensor 30 is connected to a remote relay (not shown). When the luminous intensity of the solar beams emitting from the optical cable are decreased below a predetermined value, the photo-sensor issues a signal to the relay which, in turn, closes its contacts to supply electric power to the bulb 26. Thus, the electric bulb is automatically lighted during the transition period from the daytime to the evening, without resorting to a manual switching operation. However, the photo-sensor is not an essential element and, thus, may be omitted.

It will be apparent that in both embodiments illustrated, the lighting device may be sus-

pended from the ceiling by any suitable suspending means such as pendant fittings.

Claims

1. A light diffusing lighting device comprising:

- a fitting (1) having an aperture for receiving therein an end section of at least one optical wave guide (2) serving as a light source;
- a first reflecting member (4) connected to said fitting and having a central opening (5) for allowing the light rays issuing from said optical wave guide to pass there-through, said first reflecting member having a downwardly curved wall (6, 7) defining a concave inner surface, at least part of said inner surface adjacent said central opening being reflective, and
- a second reflecting member (11) spaced from and aligned with said opening in said first reflecting member, said second reflecting member having a convex outer reflecting surface facing the concave inner reflecting surface of said first member,

characterized in that said second reflecting member (11) has a central opening (12) aligned with said opening (5) in said first member (4) and that a diverging lens (13) is provided in alignment with said central opening (12) on the side of the second reflecting member (11) directed away from the first reflecting member (4).

2. A lighting device as claimed in claim 1, characterized in that a light emitting opening defined by the outer rim of the curved wall (6, 7) of the first member (4) is closed with flat light-permeable plate (10) to form a substantially hermetically sealed space.

3. A lighting device as claimed in claim 2, characterized in that said plate (10) is transparent.

4. A lighting device as claimed in claim 2, characterized in that said plate (10) is a translucent plate having on its surface a plurality of minute projections and depressions.

5. A lighting device as claimed in claim 4, characterized in that said plate (10) is made from cathedral glass.

6. A lighting device as claimed in any one of the preceding claims, characterized in that a portion (7) of said first reflecting member (4) is translucent.

7. A light diffusing lighting device comprising:

- a fitting (20) having an aperture for receiving therein an end section of at least one optical wave guide (21) serving as a light source;
- a first reflecting member (22) connected to said fitting and having a central opening (28) for allowing the light rays issuing from said optical wave guide to pass there-through,



said first reflecting member having a downwardly curved wall defining a concave inner surface, at least part of said inner surface adjacent said central opening being reflective, and
 a second reflecting member (27) spaced from and aligned with said opening in said first reflecting member, said second reflecting member having a convex outer reflecting surface facing the concave inner reflecting surface of said first member,

characterized in that a second light source (26) is mounted on the side of the second reflecting member (27) directed away from the first reflecting member (22).

8. A lighting device as claimed in claim 7, characterized in that a light emitting opening defined by the outer rim of the first reflective member (22) is closed with a flat light-permeable plate (23) to form a substantially hermetically sealed space and that said second light source (26) is mounted on said plate (23).

9. A lighting device as claimed in claim 8, characterized in that said second light source (26) is a mirrored electric bulb having a mirror surface which constitutes said second reflecting (27) member.

10. A lighting device as claimed in claim 9, characterized in that a day light filter (29) is provided adjacent the lower part of the bulb (26).

11. A lighting device as claimed in claim 9, characterized in that a photosensor (30) is provided for detecting the intensity of solar beams issuing from the optical wave guide (21).

12. A lighting device as claimed in claim 11, characterized in that an inert gas is filled in the space between the first reflecting member (22) and the bottom plate (23).

Patentansprüche

1. Diffundiertes Licht erzeugende Leuchte, umfassend:

Eine Fassung (1) mit einer Öffnung zum Aufnehmen eines Endbereichs mindestens eines als Lichtquelle dienenden optischen Wellenleiters (2);

ein erstes, mit der Fassung verbundenes, reflektierendes Element (4) mit einer Mittelöffnung (5), durch welche die von dem optischen Wellenleiter ausgehenden Lichtstrahlen hindurchtreten können, wobei das erste reflektierende Element eine nach unten gekrümmte Wand (6, 7) aufweist, die eine konkave Innenfläche definiert und wobei zumindest ein an die Mittelöffnung angrenzender Teil der Innenfläche reflektierend ist; und

ein zweites reflektierendes Element (11) im Abstand von und fluchtend mit der Öffnung in dem ersten reflektierenden Element, wobei das zweite reflektierende Element eine kon-

vexe reflektierende Außenfläche aufweist, welche der konkaven Innenfläche des ersten Elements zugewandt ist,

dadurch gekennzeichnet, daß das zweite reflektierende Element (11) eine Mittelöffnung (12) aufweist, die mit der Öffnung (5) in dem ersten Element (4) fluchtet, und daß auf der von dem ersten reflektierenden Element (4) abgewandten Seite des zweiten reflektierenden Elements (11) eine mit der Mittelöffnung (12) desselben fluchtende Zerstreuungslinse (13) vorgesehen ist.

2. Leuchte, wie sie im Anspruch 1 beansprucht ist, dadurch gekennzeichnet, daß eine Lichtauslaßöffnung, welche durch den äußeren Rand der gekrümmten Wand (6, 7) des ersten Elementes (4) definiert ist, mit einer flachen, lichtdurchlässigen Platte (10) verschlossen ist, um einen im wesentlichen hermetisch abgedichteten Raum zu bilden.

3. Leuchte, wie sie in Anspruch 2 beansprucht ist, dadurch gekennzeichnet, daß die Platte (10) transparent ist.

4. Leuchte, wie sie in Anspruch 2 beansprucht ist, dadurch gekennzeichnet, daß die Platte (10) eine durchscheinende Platte ist, welche an ihrer Oberfläche eine Vielzahl von kleinen Vorsprüngen und Vertiefungen aufweist.

5. Leuchte, wie sie in Anspruch 4 beansprucht ist, dadurch gekennzeichnet, daß die Platte (10) aus Kathedralglas hergestellt ist.

6. Leuchte, wie sie in irgend einem der vorangehenden Ansprüche beansprucht ist, dadurch gekennzeichnet, daß ein Teil (7) des ersten reflektierenden Elementes (4) durchscheinend ist.

7. Diffundiertes Licht erzeugende Leuchte, umfassend:

Eine Fassung (20) mit einer Öffnung zum Aufnehmen eines Endbereichs mindestens eines als Lichtquelle dienenden optischen Wellenleiters (21);

ein erstes, mit der Fassung verbundenes, reflektierendes Element (22) mit einer Mittelöffnung (28), durch welche die von dem optischen Wellenleiter ausgehenden Lichtstrahlen hindurchtreten können, wobei das erste reflektierende Element eine nach unten gekrümmte Wand aufweist, die eine konkave Innenfläche definiert, und wobei zumindest ein an die Mittelöffnung angrenzender Teil der Innenfläche reflektierend ist; und

ein zweites reflektierendes Element (27) im Abstand von und fluchtend mit der Öffnung in dem ersten reflektierenden Element, wobei das zweite reflektierende Element eine konvexe reflektierende Außenfläche aufweist, welche der konkaven Innenfläche des ersten Elements zugewandt ist, dadurch gekennzeichnet, daß auf der von dem ersten reflektierenden Element (22) abgewandten Seite



des zweiten reflektierenden Elements (27) eine zweite Lichtquelle (26) montiert ist.

8. Leuchte, wie sie in Anspruch 7 beansprucht ist, dadurch gekennzeichnet, daß eine vom äußeren Rand des ersten reflektierenden Elementes (22) definierte Lichtauslaßöffnung mit einer flachen, lichtdurchlässigen Platte (23) geschlossen ist, um einen im wesentlichen hermetisch abgedichteten Raum zu bilden, und daß die zweite Lichtquelle (26) auf der Platte (23) montiert ist.

9. Leuchte, wie sie in Anspruch 8 beansprucht ist, dadurch gekennzeichnet, daß die zweite Lichtquelle (26) eine verspiegelte elektrische Glühbirne mit einer Spiegelfläche ist, welche das zweite reflektierende Element (27) bildet.

10. Leuchte, wie sie in Anspruch 9 beansprucht ist, dadurch gekennzeichnet, daß angrenzend an den unteren Teil der Glühbirne (26) ein Tageslichtfilter (29) vorgesehen ist.

11. Leuchte, wie sie in Anspruch 9 beansprucht ist, dadurch gekennzeichnet, daß ein Photosensor (30) zum Erfassen der Intensität der aus dem optischen Wellenleiter (21) austretenden Sonnenstrahlen vorgesehen ist.

12. Leuchte, wie sie in Anspruch 11 beansprucht ist, dadurch gekennzeichnet, daß in den Raum zwischen dem ersten reflektierenden Element (22) und der Bodenplatte (23) ein Inertgas eingefüllt ist.

Revendications

1. Dispositif d'éclairage à lumière diffusée comprenant: une pièce de montage (1) ayant une ouverture pour recevoir une partie extrême d'au moins un guide d'onde optique (2) servant de source lumineuse; un premier organe réfléchissant (4) relié à ladite pièce de montage et ayant une ouverture centrale (5) permettant aux rayons lumineux provenant du guide d'onde optique de passer à travers, ce premier organe réfléchissant ayant une paroi incurvée vers le bas (6, 7) définissant une surface intérieure concave, au moins une partie de cette surface intérieure contiguë à l'ouverture centrale étant réfléchissante, et un second organe réfléchissant (11) espacé de, et aligné avec, l'ouverture du premier organe réfléchissant, le second organe réfléchissant ayant une surface réfléchissante extérieure convexe faisant face à la surface réfléchissante intérieure concave du premier organe, caractérisé en ce que le second organe réfléchissant (11) a une ouverture centrale (12) alignée avec l'ouverture (5) du premier organe (4), et une lentille divergente (13) est située dans l'alignement de l'ouverture centrale (12) du côté du second organe réfléchissant (11) opposé au premier organe réfléchissant (4).

2. Dispositif d'éclairage suivant la reven-

dication 1, caractérisé en ce qu'une ouverture émettrice de lumière définie par le bord extérieur de la paroi incurvée (6, 7) du premier organe (4) est fermée avec une plaque (10) plate perméable à la lumière pour former un espace solidement et hermétiquement étanche.

3. Dispositif d'éclairage suivant la revendication 2, caractérisé en ce que ladite plaque (10) est transparente.

4. Dispositif d'éclairage suivant la revendication 2, caractérisé en ce que ladite plaque (10) est une plaque translucide dont la surface est munie d'un certain nombre de minuscules saillies et dépressions.

5. Dispositif d'éclairage suivant la revendication 4, caractérisé en ce que ladite plaque (10) est faite de verre cathédrale.

6. Dispositif d'éclairage suivant l'une quelconque des revendications précédentes, caractérisé en ce qu'une partie (7) de la première membrane réfléchissante (4) est translucide.

7. Dispositif d'éclairage à lumière diffusée comprenant: une pièce de montage (20) ayant une ouverture pour recevoir une partie extrême d'au moins un guide d'ondes optiques (21) servant de source lumineuse; un premier organe réfléchissant (22) relié à la pièce de montage et ayant une ouverture centrale (28) permettant aux rayons lumineux provenant du guide d'onde optique de passer à travers, ledit premier organe réfléchissant ayant une paroi incurvée vers le bas définissant une surface intérieure concave, au moins une partie de cette surface intérieure contiguë à l'ouverture centrale étant réfléchissante, et un second organe réfléchissant (27) espacé de, et aligné avec, l'ouverture du premier organe réfléchissant, le second organe réfléchissant ayant une surface réfléchissante extérieure convexe faisant face à la surface réfléchissante intérieure concave du premier organe, caractérisé en ce qu'une seconde source lumineuse (26) est montée du côté du second organe réfléchissant (27) opposé au premier organe réfléchissant 22.

8. Dispositif d'éclairage suivant la revendication 7, caractérisé en ce qu'une ouverture émettrice de lumière définie par le bord extérieur du premier organe réfléchissant (22) est fermée avec une plaque (23) plate perméable à la lumière pour former un espace solidement et hermétiquement étanche, et ladite source lumineuse (26) est montée sur la plaque (23).

9. Dispositif d'éclairage suivant la revendication 8, caractérisé en ce que la source lumineuse (26) est une ampoule électrique miroir ayant une surface de miroir qui constitue le second organe réfléchissant (27).

10. Dispositif d'éclairage suivant la revendication 9, caractérisé en ce qu'un filtre de lumière du jour (29) est monté adjacent à la partie basse de l'ampoule (26).

11. Dispositif d'éclairage suivant la revendication 9, caractérisé en ce qu'un photodétecteur (30) est prévu pour détecter l'intensité des



rayons solaires provenant du guide d'onde optique (21).

12. Dispositif d'éclairage suivant la revention 11, caractérisé en ce que l'espace

entre le premier organe réfléchissant (22) et la plaque de fond (23) est occupé par un gaz inerte.

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