

METHOD OF ENABLING CONTACT LENS TO RELEASE FAR-INFRARED RAYS, CONTACT LENS CONTAINER AND CONTACT LENS

FIELD OF THE INVENTION

[0001] The present invention relates to a method of enabling a contact lens to release far-infrared rays, a contact lens container and a contact lens. A far-infrared material is coated on a container body of a contact lens container for a contact lens to absorb the far-infrared rays radiated from the far-infrared material. When the contact lens is worn and attached to the user's eyeball, it is able to release far-infrared rays with a wavelength between 4 μm and 14 μm .

BACKGROUND OF THE INVENTION

[0002] In these days, people pay more attention to health. People not only supplement the nutrition needed by the body with health food but also purchases medical products that are beneficial to the human body. It has been confirmed by medical research that far-infrared rays with a wavelength ranging from 4 μm to 14 μm resonate with the molecules of the human body, which facilitates blood circulation, aids metabolism and enhance immunity. Therefore, the far-infrared ray of this wavelength is known as "growth light" or "growth ray".

[0003] Taiwan Patent Publication No. I293287 discloses a lens that releases far-infrared rays for the eyes and enhance the health of the eyeballs and the eyes. This invention uses a material having a far-infrared radiation function, such as a ceramic powder. Plastics, plastic ester granules and other plastic high-molecular polymers are added to the material and stirred evenly. After a mixing and kneading process, the material is fed to an injection machine for mold filling, pressurizing, ejection and demoulding, and then the finished lens having a far-infrared radiation function is produced. The mixing and kneading process enables the ceramic powder to be in the lens more uniformly, so that the lens presents a high perspective state.

[0004] However, after the ceramic powder capable of releasing far-infrared energy is mixed with the raw material of the lens and then injection-molded, if the step of the mixing and kneading process is not performed or the proportion of the ceramic powder is not precisely adjusted, the light transmittance of the lens having the far-infrared radiation function will decrease. This will cause poor vision after the user wears the lens. The process steps and lens structure are relatively complex. Besides, a certain distance is kept between the lens and the eyeball, so the health care effect of far infrared rays on the eyes is relatively reduced.

SUMMARY OF THE INVENTION

[0005] The primary object of the present invention is to provide a method of enabling a contact lens to release far-infrared rays, a contact lens container and a contact lens, so as to improve the eye care effect and reduce the complexity of the manufacturing process and structure.

[0006] According to one aspect of the present invention, a method of enabling a contact lens to release far-infrared rays is provided. The method comprises the steps of: providing a container body coated with a far-infrared material; placing a soaking solution and a contact lens in an accommodating space of the container body; and releasing far-infrared rays with a wavelength between 4 μm and 14 μm to the accommodating space through the far-infrared material. After the contact lens absorbs the far-infrared rays and is removed from the accommodating space, the contact lens is able to release the far-infrared rays with the wavelength between 4 μm and 14 μm , and an emissivity of the far-infrared rays from the contact lens is between 0.70 and 0.91.

[0007] Wherein, the far-infrared material is coated on an inner surface and/or an outer surface of the container body.

[0008] Furthermore, the far-infrared material includes 5 to 30 parts by weight of a far-infrared powder and 70 to 95 parts by weight of an adhesive.

[0009] Wherein, the far-infrared powder is one of a ceramic powder, bamboo charcoal powder, tourmaline powder, germanium powder, titanium powder, graphene powder, nano-copper powder, cordierite powder and mullite powder or a combination thereof.

[0010] Wherein, the adhesive is a natural resin, an artificial resin, or a combination of the natural resin and the artificial resin.

[0011] Wherein, the contact lens is placed in the accommodating space for 4 to 24 hours.

[0012] Furthermore, when the contact lens is placed in the accommodating space, the container body is kept at a preset temperature of between 40°C and 80°C.

[0013] Furthermore, before or after the container body is coated with the far-infrared material, the container body and an energy material are placed in a heating space with a temperature between 35°C and 90°C for 2 to 24 hours.

[0014] Wherein, the energy material is one of a medical stone, spar, granite, tourmaline, serpentine, dolomite, bamboo charcoal ore and titanium hertz energy stone or a combination thereof.

[0015] Wherein, the soaking solution is a contact lens care solution or a contact lens medicinal liquid.

[0016] According to another aspect of the present invention, a contact lens container for performing the foregoing method is provided. The contact lens container comprises the container body and the far-infrared material. The container body has the accommodating space. The far-infrared material is coated on the container body. The far-infrared material releases the far-infrared rays with the wavelength between 4 μm and 14 μm to the accommodating space.

[0017] Wherein, the container body is a personal contact lens storage box or a contact lens sealing box.

[0018] According to a further aspect of the present invention, a contact lens capable of releasing far-infrared rays made by the foregoing method is provided.

[0019] Wherein, an ultraviolet absorber is added to the contact lens for the contact lens to resist ultraviolet radiation.

[0020] Wherein, a blue light absorber is added to the contact lens for the contact lens to resist blue light radiation.

[0021] Wherein, the contact lens has a light transmittance of more than 90%.

[0022] Wherein, the contact lens is a colored or transparent contact lens.

[0023] Wherein, the contact lens is a daily, monthly, quarterly or yearly disposable contact lens.

[0024] According to the above-mentioned technical features, the following effects can be achieved:

[0025] 1. The container body is coated with the far-infrared material which can radiate far-infrared rays. Thus, after the contact lens placed in the container body is removed from the container body, it can release the far-infrared rays with a wavelength between 4 μm and 14 μm that are beneficial to the human body. The average emissivity of the far-infrared rays from the contact lens is 0.86, and the maximum emissivity reaches 0.91.

[0026] 2. When the contact lens is not worn, it can be placed in the container body containing the soaking solution. The container body is coated with the far-infrared material, which has the

moisturizing effect and resistance to bacteria and enables the contact lens to release the far-infrared rays. The implementation process is simple and time-saving, suitable for the daily use habits of users.

[0027] 3. When the user wears the contact lens capable of releasing far-infrared rays, the contact lens attached to the eyeball will improve the health care effect of the eye and enhance the oxygen supply and blood circulation around the eye, so as to improve and prevent eye diseases effectively.

[0028] 4. The energy material and the container body are placed in the heating space for a certain period of time, which can enhance the release of far-infrared rays from the container body and improve the effectiveness of the contact lens in absorbing far-infrared rays.

[0029] 5. An ultraviolet absorber and a blue light absorber are added to the contact lens, which can protect the eyeball from ultraviolet rays and blue light when in use. The contact lens can block more than 95% of ultraviolet rays with a wavelength between 280nm and 315nm.

[0030] 6. There is no far-infrared material mixed into the contact lens capable of releasing far-infrared rays, so the user's vision won't be affected. The light transmittance reaches more than 90%.

[0031] 7. The contact lens may be a colored or transparent contact lens. The contact lens is a daily, monthly, quarterly or yearly disposable contact lens. The container body coated with the far-infrared material enables any type of contact lens to release far-infrared rays.

BRIEF DESCRIPTION OF THE DRAWINGS

[0032] FIG. 1 is a perspective view of the container body of the present invention;

[0033] FIG. 2 is a flowchart showing the production of the present invention;

[0034] FIG. 3 is a schematic view of the energy material and the container body of the present invention in the heating space;

[0035] FIG. 4 is a flowchart of the steps of a first embodiment of the present invention;

[0036] FIG. 5 is a flowchart of the steps of a second embodiment of the present invention;

[0037] FIG. 6 is a diagram showing the relationship between the emissivity and wavelength of the far-infrared rays from the contact lens capable of releasing far-infrared rays of the present invention; and

[0038] FIG. 7 is a diagram showing the relationship between the emissivity and wavelength of the far-infrared rays from a conventional contact lens.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0039] Embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings.

[0040] The present invention discloses a method of enabling a contact lens to release far-infrared rays, a contact lens container and a contact lens. As shown in FIG. 1 and FIG. 2, an embodiment of the present invention comprises a container body 1, a far-infrared material 2, a soaking solution 3, and a contact lens 4. The container body 1 has an accommodating space 11, an inner surface 12, and an outer surface 13. The far-infrared material 2 includes an adhesive 21 and a far-infrared powder 22. The inner surface 12 and/or the outer surface 13 of the container body 1 is coated with the far-infrared material 2. After the soaking solution 3 is poured into the accommodating space 11, the contact lens 4 is placed in the accommodating space 11. In this embodiment, both the inner surface 12 and the outer surface 13 are coated with the far-infrared material 2.

[0041] Specifically, the container body 1 is a personal contact lens storage box or a contact lens sealing box. The far-infrared material 2 includes 70-95 parts by weight of the adhesive 21 and 5-30 parts by weight of the far-infrared powder 22. The adhesive 21 is a natural resin of semi-solid or solid organic colloid secreted by animals or plants, or an artificial resin produced by artificial synthesis. The far-infrared powder 22 is a powder with far-infrared radiant energy or powder ground from a material, such as one of ceramic powder, bamboo charcoal powder, tourmaline powder, germanium powder, titanium powder, graphene powder, nano-copper powder, cordierite powder and mullite powder or a combination thereof, but not limited thereto. The soaking solution 3 is a contact lens care solution or a contact lens medicinal liquid, used for moisturizing, cleaning and sterilizing contact lenses. The contact lens 4 may be a colored or transparent contact lens. The contact lens 4 may be a daily, monthly, quarterly or yearly disposable contact lens. The light transmittance of the contact lens 4 is more than 90%. Furthermore, an ultraviolet absorber and a blue light absorber are added to the contact lens 4 to resist ultraviolet radiation and blue light radiation. The effect of blocking ultraviolet rays with a wavelength between 315nm and 380nm is up to 50%, and the effect of blocking ultraviolet rays with a wavelength between 280nm and 315nm is more than 95%.

[0042] FIG. 2, FIG. 3 and FIG. 4 illustrate a first embodiment of the present invention. In the first embodiment, an energy material 5 and the container body 1 are placed in a heating space 6 with a temperature between 35°C and 90°C for 2 to 24 hours. Then, the far-infrared powder 22 is coated

on the inner surface 12 and the outer surface 13 of the container body 1 through the adhesive 21. The energy material 5 is an ore or energy stone with far-infrared radiation energy, such as one of medical stone, spar, granite, tourmaline, serpentine, dolomite, bamboo charcoal ore and titanium hertz energy stone or a combination thereof, but not limited thereto.

[0043] FIG. 2, FIG. 3 and FIG. 5 illustrate a second embodiment of the present invention. In the second embodiment, after the far-infrared powder 22 is coated on the inner surface 12 and the outer surface 13 of the container body 1 through the adhesive 21, the container body 1 coated with the far-infrared material 2 and the energy material 5 are placed in the heating space 6 with a temperature between 35°C and 90°C for 2 to 24 hours. The energy material 5, same as the first embodiment, is an ore or energy stone with far-infrared radiation energy, such as one of medical stone, spar, granite, tourmaline, serpentine, dolomite, bamboo charcoal ore and titanium hertz energy stone or a combination thereof, but not limited thereto.

[0044] After one of the first embodiment and the second embodiment is performed, the soaking solution 3 is first poured into accommodating space 11 of the container body 1, and then the contact lens 4 is placed in the accommodating space 11. At the same time, the far-infrared material 2 coated on the container body 1 radiates far-infrared rays with a wavelength between 4 μm and 14 μm to the accommodating space 11. The contact lens 4 is immersed in the container body 1 coated with the far-infrared material 2 and heated at a preset temperature between 40°C to 80°C for 4 to 24 hours. The contact lens 4 absorbs the far-infrared rays. When the contact lens 4 is removed from the accommodating space 11, the contact lens 4 itself releases the far-infrared rays with a wavelength between 4 μm and 14 μm .

[0045] FIG. 6 is a diagram showing the relationship between the emissivity and wavelength of the far-infrared rays from the contact lens capable of releasing far-infrared rays of the present invention. FIG. 7 is a diagram showing the relationship between the emissivity and wavelength of the far-infrared rays from a conventional contact lens. Referring to FIG. 2, in the present invention, the container body 1 is coated with the far-infrared material 2, and the soaking solution 3 is placed in the accommodating space 11 of the container body 1 to form a contact lens container capable of loading the contact lens 4 and allowing the contact lens 4 to absorb the far-infrared rays. Thereby, after the contact lens 4 is removed from the accommodating space 11, it can release the far-infrared rays with a wavelength between 4 μm and 14 μm . At a temperature of 40°C, the emissivity of the far-infrared rays from the contact lens 4 is between 0.70 and 0.91. The average emissivity reaches 0.86. A conventional contact lens that does not implement the method of the present invention only releases the far-infrared rays with a wavelength between 6 μm and 14 μm . At the same temperature of 40°C,

the emissivity of the far-infrared rays from the conventional contact lens is only between 0.76 and 0.79. The average emissivity is 0.78. It has been proved by experiments that the present invention enables an ordinary contact lens to become a contact lens capable of releasing far-infrared rays. The highest emissivity of the far-infrared rays of the contact lens 4 reaches 0.91, which improves the eye health care effect after being worn to the eyeball. Besides, the implementation steps are easy and suitable for any user to perform operations.

[0046] Although particular embodiments of the present invention have been described in detail for purposes of illustration, various modifications and enhancements may be made without departing from the spirit and scope of the present invention. Accordingly, the present invention is not to be limited except as by the appended claims.

WHAT IS CLAIMED IS:

1. A method of enabling a contact lens to release far-infrared rays, comprising the steps of:

providing a container body coated with a far-infrared material, wherein the far-infrared material is coated on an inner surface of the container body;

placing a soaking solution and a contact lens in an accommodating space of the container body;

releasing far-infrared rays with a wavelength between 4 μm and 14 μm to the accommodating space through the far-infrared material;

wherein after the contact lens absorbs the far-infrared rays and is removed from the accommodating space, the contact lens is able to release the far-infrared rays with the wavelength between 4 μm and 14 μm , and an emissivity of the far-infrared rays from the contact lens is between 0.70 and 0.91.
2. The method as claimed in claim 1, wherein the far-infrared material is coated on an outer surface of the container body.
3. The method as claimed in claim 1, wherein the far-infrared material includes 5 to 30 parts by weight of a far-infrared powder and 70 to 95 parts by weight of an adhesive.
4. The method as claimed in claim 3, wherein the far-infrared powder is one of a ceramic powder, bamboo charcoal powder, tourmaline powder, germanium powder, titanium powder, graphene powder, nano-copper powder, cordierite powder and mullite powder or a combination thereof.
5. The method as claimed in claim 3, wherein the adhesive is a natural resin, an artificial resin, or a combination of the natural resin and the artificial resin.
6. The method as claimed in claim 1, wherein the contact lens is placed in the accommodating space for 4 to 24 hours.
7. The method as claimed in claim 1, wherein when the contact lens is placed in the accommodating space, the container body is kept at a preset temperature of between 40°C and 80°C.
8. The method as claimed in claim 1, wherein before or after the container body is coated with the far-infrared material, the container body and an energy material are placed in a heating space with a temperature between 35°C and 90°C for 2 to 24 hours.

9. The method as claimed in claim 8, wherein the energy material is one of a medical stone, spar, granite, tourmaline, serpentine, dolomite, bamboo charcoal ore and titanium hertz energy stone or a combination thereof.

10. The method as claimed in claim 1, wherein the soaking solution is a contact lens care solution or a contact lens medicinal liquid.

11. A contact lens container for performing the method as claimed in any one of claims 1 to 10, comprising:

the container body, having the accommodating space;

the far-infrared material, coated on an inner surface of the container body;

wherein the far-infrared material releases the far-infrared rays with the wavelength between 4 μm and 14 μm to the accommodating space.

12. The contact lens container as claimed in claim 11, wherein the container body is a personal contact lens storage box or a contact lens sealing box.