accelerated, and that the lawn grass does not grow only in areas irradiated with the reflected light.

As the latter method, various techniques using organic pigment layers are disclosed (see, e.g., Japanese Unexamined Patent Application Publication No. 06-299139, No. 09-316115, and No. 2001-89492). However, when the pigment layer is affixed to a window glass, light absorbed at the window surface is converted to heat and part of the heat is conducted as radiant heat to the indoor. This raises the problems that the shield ability of the pigment layer is insufficient, and that the glass may be cracked due to thermal stress. Further, there is another problem that the pigment layer is poor in weatherbility and is less convenient when used in high-rise buildings in which frequent replacement of the pigment layer is difficult.

Disclosure of Invention

Technical Problem

Embodiments~~Accordingly, an object~~ of the present invention ~~is to~~ provide an optical body, a window member, a fitting, a solar shading device, and a building, the optical body selectively directionally reflecting light in a particular wavelength band while allowing passage of light other than the particular wavelength band therethrough.

Technical Solution

The inventors have conducted intensive studies with

predetermined relationship, in a one-dimensional pattern to form a concave-convex surface, and forming the wavelength selective reflecting layer on the concave-convex surface.

Embodiments of t~~T~~he present invention are~~has been~~ made on the basis of the above-described studies.

~~To solve the above-described problems, a first invention provides an optical body comprising:~~

~~a first optical layer having a concave-convex surface;~~

~~a wavelength selective reflecting layer formed on the concave-convex surface; and~~

~~a second optical layer formed on the wavelength selective reflecting layer and embedding the concave-convex surface,~~

~~wherein the wavelength selective reflecting layer selectively directionally reflects light in a particular wavelength band while transmitting light other than the particular wavelength band therethrough,~~

~~the concave-convex surface is made up of a plurality of triangular pillars arrayed in a one-dimensional pattern, and~~

~~the triangular pillar has an apex angle α and a slope angle β, the apex angle α and the slope angle β satisfying a formula (1) or (2) given below:~~

~~$-3.6\alpha + 396 \leq \beta \leq 80 \quad (85 \leq \alpha \leq 90)$ ...(1)~~

~~$\alpha - 30 \leq \beta \leq -\alpha + 170 \quad (90 \leq \alpha \leq 100)$ ...(2)~~

According to a first aspect, there is provided an optical body comprising: a first optical layer having a concave-convex surface; a wavelength selective reflecting layer formed on the concave-convex surface; and a second optical layer formed on the wavelength selective reflecting layer and embedding the concave-convex surface, wherein the wavelength selective reflecting layer selectively directionally reflects light in a particular wavelength band while transmitting light other than the particular wavelength band therethrough; the concave-convex surface is made up of a plurality of triangular pillars arrayed in a one-dimensional pattern, and the triangular pillar has an apex angle α and a slope angle β, the apex angle α and the slope angle β satisfying a formula (1) or (2) given below: $-3.6\alpha + 396 \leq \beta \leq 80 \quad (85 \leq \alpha \leq 90)$ ...(1)

$\alpha - 30 \leq \beta \leq -\alpha + 170 \quad (90 \leq \alpha \leq 100)$ ...(2)

~~A second invention provides an optical body comprising:~~

~~a first optical layer having a concave-convex surface;~~

~~a wavelength selective reflecting layer formed on the concave-convex surface; and~~

~~a second optical layer formed on the wavelength selective reflecting layer and embedding the concave-convex surface,~~

~~wherein the wavelength selective reflecting layer selectively directionally reflects light in a particular wavelength band while transmitting light other than the particular wavelength band therethrough,~~

~~the concave-convex surface is made up of a plurality of triangular pillars arrayed in a one-dimensional pattern, and~~

~~the triangular pillar has an apex angle α and a slope angle β, the apex angle α and the slope angle β satisfying a formula (3) or (4) given below:~~

~~$30 \leq \beta \leq \alpha - 50 \ (80 \leq \alpha \leq 90)$ ...(3)~~

~~$30 \leq \beta \leq -\alpha + 130 \ (90 \leq \alpha \leq 100)$ ...(4)~~

According to a second aspect, there is provided an optical body comprising: a first optical layer having a concave-convex surface; a wavelength selective reflecting layer formed on the concave-convex surface; and a second optical layer formed on the wavelength selective reflecting layer and embedding the concave-convex surface, wherein the wavelength selective reflecting layer selectively directionally reflects light in a particular wavelength band while transmitting light other than the particular wavelength band therethrough, the concave-convex surface is made up of a plurality of triangular pillars arrayed in a one-dimensional

pattern, and the triangular pillar has an apex angle α and a slope angle β, the apex angle α and the slope angle β satisfying a formula (3) or (4) given below:

$$30 \leq \beta \leq \alpha - 50 \quad (80 \leq \alpha \leq 90) \qquad \ldots(3)$$

$$30 \leq \beta \leq -\alpha + 130 \quad (90 \leq \alpha \leq 100) \qquad \ldots(4)$$

According to a third aspect, there is provided a window member including the above optical body.

According to a fourth aspect, there is provided a fitting including the above optical body in a lighting portion thereof.

According to a fifth aspect, there is provided a solar shading device comprising one or plural solar shading members which cut off sunlight, wherein the solar shading member includes the above optical body.

According to a sixth aspect, there is provided a building including the above optical body, wherein the optical body is arranged such that, in each of the triangular pillars, the slope angle β is positioned above the apex angle α.

In the optical body of embodiments of the present invention, the concave-convex surface is formed by arraying asymmetrical triangular pillars in a one-dimensional pattern, and the wavelength selective reflecting layer is formed on the concave-convex surface. Accordingly, when the optical body of the present invention is applied to an adherend such as a window member, it can reflect the light in the particular wavelength band upward while transmitting light other than

the particular wavelength band therethrough. Also, when the optical body of the present invention is applied to, e.g., a window member of a building, it can directionally reflect the light in the particular wavelength band to be kept from entering a predetermined space inside the building, for example, while allowing the light other than the particular wavelength band to be taken into the predetermined space.

Further, with the optical body of embodiments of the present invention, since the apex angle α and the slope angle β of the triangular pillar satisfy the predetermined relationship, a high upward reflectance can be obtained when the optical body of the present invention is applied to an adherend such as a window member.

Advantageous Effects

According to embodiments of the present invention, as described above, in the optical body capable of reflecting the light in the particular wavelength band while transmitting the light other than the particular wavelength band therethrough, an improvement in safety and energy saving can be realized by reducing heat generation attributable to absorption of the light. Further, a high upward reflectance can be obtained.

Brief Description of Drawings

Fig. 1A is a sectional view illustrating one example of construction of an optical film according to a first embodiment. Fig. 1B is a sectional view illustrating an