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Contact lens

Abstract

An oxygen permeable contact lens has a convex arc-shaped outer surface and a concave arc-shaped inner surface located on an opposite side of the outer surface; wherein the contact lens is processed by a laser straight line penetrating the outer surface and the inner surface to provide at least one oxygen permeable hole.

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Background/Summary

BACKGROUND OF THE INVENTION

Field of Invention

(1) The present invention relates to a contact lens, and more particularly to an oxygen permeable contact lens.

Description of the Related Art

(2) Typical contact lens is prone to problems such as poor air permeability, oxygen permeability, and lack of hydrophilicity, which not only affects the self-lubricating mechanism of the eyes, but also leading to eye dryness, burning sensations, fatigue and other discomforts. Since the cornea has no blood vessels, its oxygen supply mainly relies on oxygen in the air. If the contact lens has poor oxygen permeability, the contact lens will prevent oxygen from reaching the eyes, which increases the risk of eyeball infection with bacterial keratitis. In severe cases, it can even cause corneal keratitis, and lack of oxygen can cause problems such as red eyes, blurred vision, and even corneal damage.

(3) Therefore, it is desirable to provide oxygen permeable contact lens for a grinding machine to mitigate and/or obviate the aforementioned problems.

SUMMARY OF THE INVENTION

(4) An objective of present invention is to provide oxygen permeable contact lens, which is capable of improving the above-mention problems.

(5) In order to achieve the above-mentioned objective, an oxygen permeable contact lens has a convex arc-shaped outer surface and a concave arc-shaped inner surface located on an opposite side of the outer surface; wherein the contact lens is processed by a laser straight line penetrating the outer surface and the inner surface to provide at least one oxygen permeable hole.

(6) Other objects, advantages, and novel features of invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

(1) FIG. 1 is a perspective view of a preferred embodiment according to the present invention.

(2) FIG. 2 is a partially enlarged cross-sectional view of the plan view of the preferred embodiment according to the present invention.

(3) FIG. 3 is a molding flow chart of the preferred embodiment according to the present invention.

(4) FIG. 4 is a schematic diagram of the laser drilling operation of the preferred embodiment

according to the present invention.

(5) FIG. 5 is a schematic diagram of another embodiment according to the present invention.

(6) FIG. 6 is a schematic diagram of wearing the contact lens according to the present invention.

(7) FIG. 7 is a schematic diagram of the use state of the eye drops or artificial tears according to the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

(8) First, please refer to FIGS. 1 and 2. A contact lens **10** comprises a convex arc-shaped outer surface **11** and a concave arc-shaped inner surface **12** located on an opposite side of the outer surface **11**. The contact lens **10** is processed by a laser straight line penetrating the outer surface **11** and the inner surface **12** to provide at least one oxygen permeable hole **13**. The oxygen permeable hole **13** has a diameter size from 0.1 mm to 0.01 mm, and the oxygen permeable hole **13** increases the air permeability and oxygen permeability of the contact lens **10**, improving the wearing comfort of the contact lens **10**.

(9) Furthermore, as shown in FIGS. 3 and 4, the contact lens **10** is formed by an upper mold **20** and a lower mold **21**. The upper mold **20** has a first bowl portion **201**, and an outer wall of the bowl portion **201** forms a convex arc surface **202**; the lower mold **21** has a second bowl portion **211**, and an inner wall of the second bowl portion **211** forms a concave arc surface **212**. When the upper mold **20** and the lower mold **21** are closed, a forming chamber **22** can be created through the space between the first bowl portion **201** and the second bowl portion **211**, a polymer material **30** is injected into the forming chamber **22**, and then the polymer material in the forming chamber is heated or illuminated for curing. After the molding and curing, the contact lens **10** can be removed and taken out of the forming chamber **22**. The contact lens **10** includes an optical zone **101**, a non-optical zone **102** and an outer edge **103**. Then the contact lens **10** is processed through a laser equipment **40** to be perforated, and a laser is used to penetrate the outer surface **11** and the inner surface **12** of the contact lens **10** to form at least one oxygen permeable hole **13**. As shown in FIG. 1, in this embodiment, there are plurality of the oxygen permeable holes **13** provided through the outer and inner surfaces **11** and **12** of the contact lens **10**, wherein the oxygen permeable holes **13** are at least formed in the non-optical zone **102**. In addition, as shown in FIG. 5, the oxygen permeable holes **13** can also be formed equidistantly in the optical zone **101** and the non-optical zone **102**.

(10) With the structure of the above specific embodiment, the following benefits can be obtained: the contact lens **10** utilizes a laser to penetrate the outer surface **11** and the inner surface **12** to form at least one the oxygen permeable hole **13**, such that the contact lens **10** is capable of having the oxygen permeable hole **13** in an instant, which helps to improve product yield by avoiding multi-layer and multi-processing, and allows the oxygen permeable hole **13** to have extremely small diameter and smooth cutting edges. The oxygen permeable hole **13** is very subtle and does not cause invasive discomfort to the eyeballs.

(11) In addition, the oxygen permeable hole **13** on the outer and inner surfaces **11** and **12** can greatly increase the oxygen permeability of the contact lens **10**, so that the eyeball can obtain oxygen through the oxygen permeable hole **13** in a timely manner (as shown in FIG. 6), and increase the circulation effect of tears and moisture, greatly reducing discomfort symptoms such as dryness, stinging or foreign body sensation in the eyes, further improving the comfort of wearing, and effectively reducing the risk of eye infection. Moreover, the use of eye drops or artificial tears can also achieve the moistening effect of the eyeballs through the oxygen permeable hole **13** (as shown in FIG. 7), and it has the convenience of soothing the eyeballs.

(12) Although the present invention has been explained in relation to its preferred embodiment, it is to be understood that many other possible modifications and variations can be made without departing from the spirit and scope of invention as hereinafter claimed.

Claims

1. An oxygen permeable contact lens comprising a convex arc-shaped outer surface and a concave arc-shaped inner surface located on an opposite side of the outer surface; wherein the contact lens is processed by a laser straight line penetrating the outer surface and the inner surface to provide at least one oxygen permeable hole; and wherein the oxygen permeable contact lens is formed by utilizing an upper mold and a lower mold, the upper mold having a first bowl portion, an outer wall of the first bowl portion forming a smooth convex arc surface, the lower mold having a second bowl portion, an inner wall of the second bowl portion forming a smooth concave arc surface, the upper mold and the lower mold defining a cavity therebetween configured to accept a polymer material, the polymer material in the cavity solidifying by heat or light to form the contact lens that has a smooth convex arc-shaped outer surface and a smooth concave arc-shaped inner surface located on an opposite side of the smooth outer surface and that is processed by the laser to form the at least one oxygen permeable hole that is configured to increase air permeability and oxygen permeability of the contact lens.
 2. The oxygen permeable contact lens as claimed in claim 1, wherein the oxygen permeable hole has a diameter size from 0.1 mm to 0.01 mm.
 3. The oxygen permeable contact lens as claimed in claim 1, wherein the contact lens has a plurality of oxygen permeable holes penetrating the outer surface and the inner surface.
 4. The oxygen permeable contact lens as claimed in claim 3, wherein the contact lens includes an optical zone, a non-optical zone, an outer edge, and a plurality of oxygen permeable holes are formed in at least the non-optical zone.
 5. The oxygen permeable contact lens as claimed in claim 4, wherein the plurality of oxygen permeable holes are equidistantly formed in the optical zone and the non-optical zone.
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