



(12) **United States Patent**
Bille

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(54) **SYSTEM FOR CHARACTERIZING A CORNEA AND OBTAINING AN OPHTHALMIC LENS**

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(58) **Field of Classification Search** **351/210, 351/246**

See application file for complete search history.

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(57) **ABSTRACT**

A system for determining the shape of a cornea of an eye illuminates at least one of the interior surface, the posterior surface, and the interior region of the eye with infrared light of a wavelength that can generate fluorescent light from the portion of the cornea illuminated. The generated fluorescent light is then detected. A step of illuminating can comprise focusing the infrared light in a plurality of different planes substantially perpendicular to the optical axis of the eye. From the detected light it is possible to create a map of at least a portion of the interior surface, at least a portion of the posterior surface, and/or portion of the interior region of the cornea. Clarity of vision can be determined by generating fluorescence from proteins in the pigment epithelial cells of the retina.

18 Claims, 11 Drawing Sheets

