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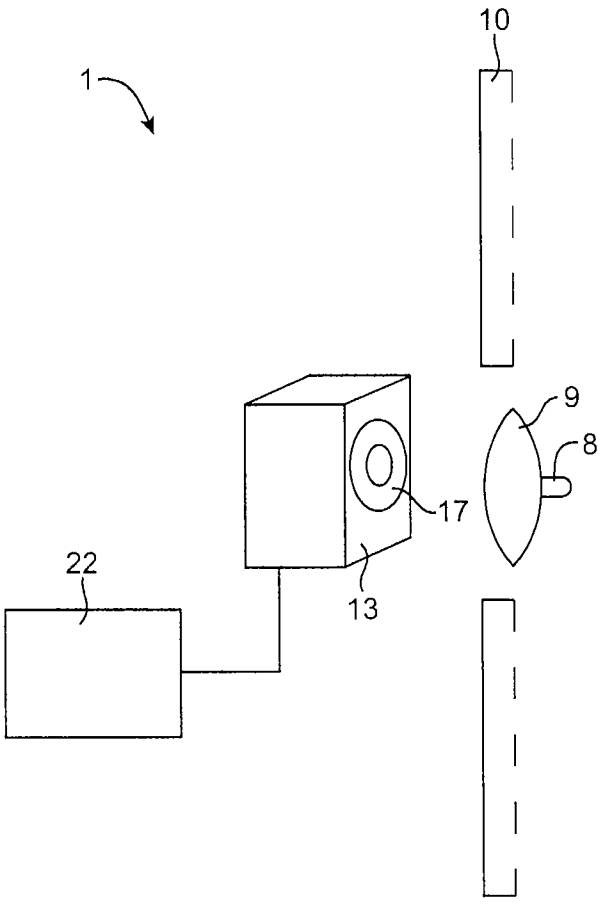
(54) Title: NON-INVASIVE MEASUREMENT OF TEAR VOLUME SYSTEMS AND METHODS



(57) Abstract: Devices systems, and methods can measure, diagnose and/or characterize an eye of a patient, including physiologic and optical properties, such as hydration and tear volume in relation to an optical surface of the eye, including topography of a corneal surface of the eye and/or a wavefront elevation map of the eye. The system forms an image of a tear meniscus along an eyelid. The eye can be illuminated so that the meniscus appears as a dark band in the image. Tear volume can be determined by measuring a height across the tear meniscus. The tear volume can be used to determine the optical properties of the tear of the eye and to diagnose conditions of the eye. The patient can be screened for treatment of the eye with refractive surgery using a measured pupil size, hydration and topography and/or wavefront.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
IPC: **A61B 3/00**(2006.01)

USPC: 351/200,246
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 351/200, 246

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 6, 447, 119 B1 (Stewart et al.) 10 September 2002, Col. 1, lines 20-22, Col. 1, lines 33-40, Col. 1, lines 50-54, Col. 5, lines 19-27, Col. 15, lines 37-51, Col. 16, lines 26-30, Col. 16, lines 64-66	1-5, 9-11, 15-22, 24, 27, 29-30, 32 --- 28, 31
Y --- A	US 4, 747, 683 (Doane) 31 May 1988, Col. 2, lines 27-29, 51-54, Col. 3, lines 8-11, 65-68,	7-8, 23 --- 6
Y --- A	US 5, 963, 300 (Horwitz) 5 October 1999, Col. 1, lines 30-39, Col. 3, lines 27-31, Col. 4, lines 4-5	12-14, 25 --- 6

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y --- A	US 6, 659, 613 (Applegate et al.) 9 December 2003, Col. 1, lines 20-22, Col. 5, lines 19-27, 37-51, Col. 16, lines 64-66	26