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(71) Solicitante *(para todos los Estados designados salvo US)*: **UNIVERSIDAD DE MURCIA** [ES/ES]; Avenida Teniente Flomesta, Edificio de la Convalecencia, Murcia (ES).

(72) Inventores; e

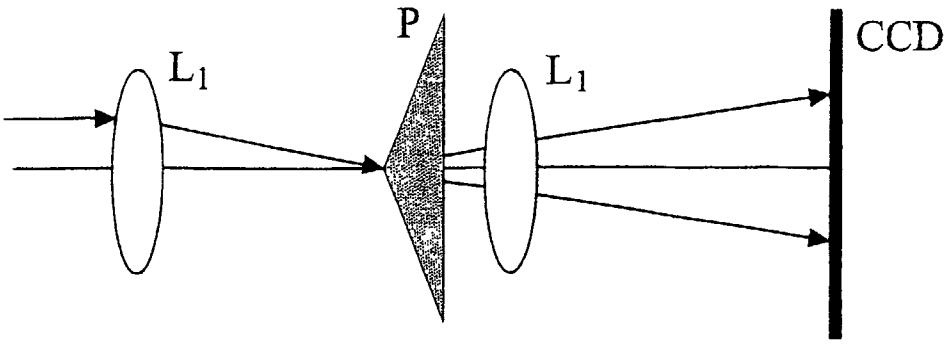
(75) Inventores/Solicitantes *(para US solamente)*: **IGLESIAS CASARRUBIOS, Ignacio,** [ES/ES]; UNIVERSIDAD DE MURCIA, Dpto. Física, Laboratorio de Óptica, Campus de Espínardo, Murcia (ES). **RAGAZZONI, Roberto** [IT/IT]; INAF - OSSERVATORIO ASTROFISICO DI ARCETRI, Largo Enrico Fermi 5,ncia, 50125 Firenze (IT). **ARTAL SORIANO, Pablo** [ES/ES]; UNIVERSIDAD DE MURCIA, Dpto. Física, Laboratorio d, e Optica, Campus de Espinardo, 30071 Murcia (ES).

(74) Mandatario: **ASTIZ SUAREZ, José, Enrique**; C/ Columela, 5, E-28001 Madrid (ES).

[Continúa en la página siguiente]

(54) Title: PYRAMID SENSOR FOR DETERMINING THE WAVE ABERRATION OF THE HUMAN EYE

(54) Título: SENSOR PIRAMIDAL PARA LA DETERMINACÓN DE LA ABERRACIÓN DE ONDA DEL OJO HUMANO



(57) **Abstract:** The invention relates to a sensor for determining the frontal wave aberration of the human eye, which uses a static crystal pyramid P as a nucleus. The invention is particularly suitable for use in the field of ophthalmology. The aforementioned pyramid P comprises four faces P' which divide the light beam into four parts, the intensity of which is recorded with a CCD camera or a similar intensity detector. The measurements are taken in a plane of the optical system (Fourier plane) and both the dynamic range and the sampling can be adjusted as required, such that the wave aberration function can be measured in multiple different conditions. The structure of the sensor can comprise a lens L1 which is used to form the Fourier transformation of the pupil function, a crystal pyramid P comprising four faces or facets P' which are used to divide and separate the electric field angularly into four parts and a second lens L2 which is used to join the output plane to a new plane in which the intensity sensor or CCD camera is positioned. While the measurements are being taken, the crystal pyramid P is maintained static and the field is made to oscillate around same.

(57) **Resumen:** Se trata de un sensor para determinar la aberración de onda frontal del ojo humano, que utiliza como núcleo una pirámide de cristal estática P, encontrando especial aplicación en el campo de la oftalmología. La pirámide P tiene cuatro caras P' que dividen el haz de luz en cuatro partes cuya intensidad se registra con una cámara de CCD o detector de intensidad similar. Las medidas son tomadas en un plano del sistema óptico (plano de Fourier), siendo ajustables a voluntad tanto el rango dinámico como el muestreo, pudiendo medir la función aberración de onda en múltiples circunstancias. Estructuralmente, puede comprender una lente L1 para formar la transformación Fourier de la función de la pupila; una pirámide de cristal P de cuatro caras o facetas P', para dividir y separar angularmente el

[Continúa en la página siguiente]

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INTERNATIONAL SEARCH REPORT

International application No.
PCT / ES 03 / 00461

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 : B 26 / 10, A 61 B 3 / 10

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)

IPC 7 : G 02 B, A 61 B

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)

EPODOC, PAJ, WPIL, MISTRAL

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	IGLESIAS I. et al."Extended source pyramid wave-front sensor for the human eye". OPTICS EXPRESS, Vol. 10, N° 9; 6 May 2002 (06.05.02); pages 419 - 428; the whole document	1 - 13
A	US2002047992 A (GRAVES et al.) 25 April 2002 (25.04.02) [0002] - [0048]; figures 1 - 4; abstract	1,2,4,8
A	CAGIGAL M. et al. "Statistical description of wave-front aberration in the human eye ". OPTICS LETTERS, Vol. 27, N° 1; 1 January 2002 (01.01.02); pages 37 - 39	-

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
Name and mailing address of the ISA/ S.P.T.O.	Authorized officer
Facsimile No.	Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)

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International application No.

PCT / ES 03 / 00461

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6382795 A (LAI) 7 May 2002 (07.05.02).	