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(54) **Title:** CHARACTERISING EYE-RELATED OPTICAL SYSTEMS

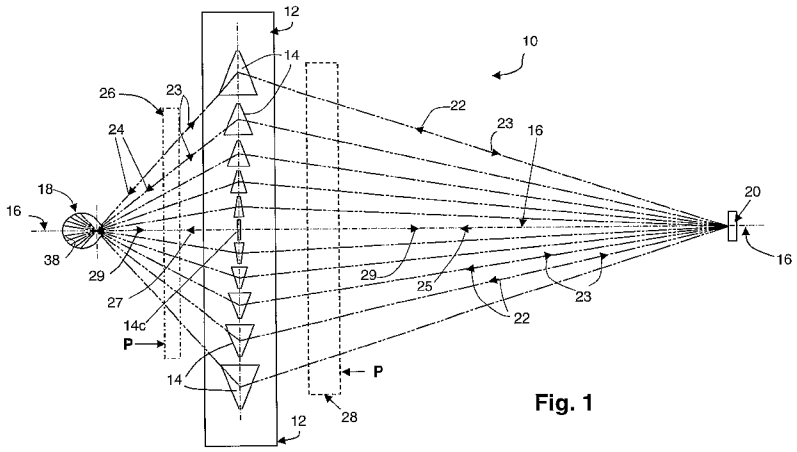


Fig. 1

(57) **Abstract:** An instrument and method for characterising eye-related optical systems, including the live human eye (18) involves scanning an illuminating light beam (22) from a light source and light detector unit (20) from element to element of a beam deflector array (12) of elements (14) arranged laterally across the optical axis (16) of eye (18). At each successive element (14) the illuminating beam (22) is deflected to form an interrogating beam (24) that is directed into the eye (18) at a peripheral angle that depends upon the lateral location of the deflector element. A return beam (23) is reflected or back-scattered from the cornea (38) and returned via the same deflector element to the light source and detector unit (20). This allows the interrogating beams to be scanned sufficiently rapidly into the eye to greatly reduce the variation of eye fixation and gaze that accompany other methods of measuring peripheral refraction or aberration of a natural eye. In addition to or instead of scanning the illuminating beam (22) over each element (14) of the array (12), all or multiple elements (14) of the array (12) can be illuminated simultaneously and the multiple interrogating rays (24) thus generated can be gated by the use of an LCD aperture plate (26). Alternatively, an LCD aperture plate (28) can be interposed between a wide illuminating beam (22) and operated to selectively illuminate the beam deflector.

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