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Ferguson

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(54) **LINE-SCAN LASER OPHTHALMOSCOPE**

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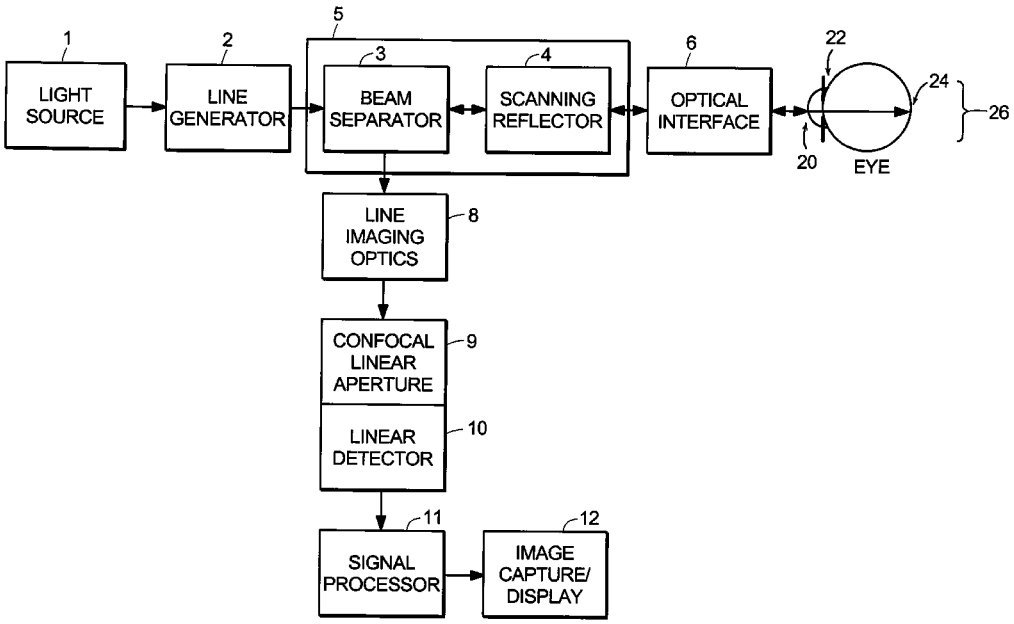
(57) **ABSTRACT**

Systems and methods for providing a line-scanning laser ophthalmoscope (LSLO) are disclosed. The LSLO uses a substantially point source of light, such as an infrared laser or a super-luminescent diode. The point source is expanded to a line. The LSLO scans the line of light in a direction perpendicular to the line across a region of an eye having an undilated pupil The reflected light is received confocally, using monostatic beam geometry. A beam separator, such as a turning prism or mirror, diverts one of the incoming light and the reflected light to separate the light. An optical stop prevents non-confocally received light from reaching a one-dimensional detector, such as a linear CCD array. An electrical signal responsive to the output light at each of a plurality of locations along the line of output light is processed to provide images of the scanned portion of the eye.

24 Claims, 10 Drawing Sheets