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(54) Title: IMAGING SYSTEMS AND METHODS TO IMPROVE BACKSCATTERING IMAGING USING CIRCULAR POLARIZATION MEMORY

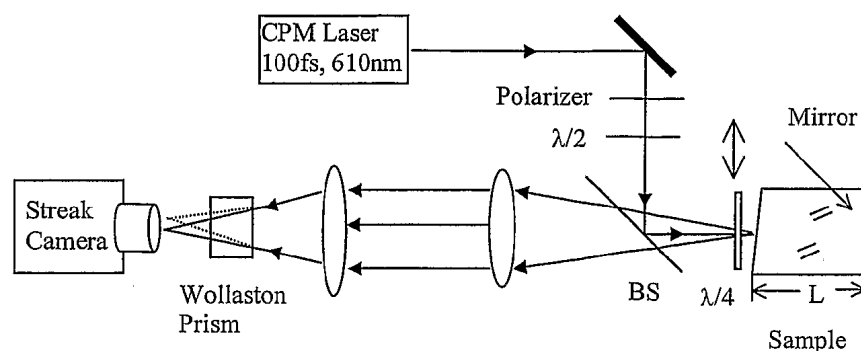


FIG. 1.

(57) Abstract: An optical technique improving the imaging of a target inside suspensions of scattering particles includes the illumination of the scattering particles with circularly polarized light. The backscattered light from the host medium preserves the helicity of incident light, while the backscattered light reflected from the target is predominated with light of opposite helicity. Based on the observed helicity difference in the emerging light that originated at the target and that backscattered from the medium, the present optical technique improves the image contrast using circular polarization. This approach utilizes polarization memory which leads to the reflected light from the target accompanied by weak diffusive backscattered light. Using the present technique, improved imaging of the artery wall is achieved and plaque composition can be assessed through a blood field associated with the artery. The scattering from the particles, such as red blood cells, in the blood is reduced due to polarization memory.



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A. CLASSIFICATION OF SUBJECT MATTER

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USPC - 356/369

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(8) - G01J 4/00 (2007.01)

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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)

MicroPatent, PatBase

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,011,626 A (HIELSCHER et al) 04 January 2000 (04.01.2000) entire document	1-3, 5-7, 9, 12-14, and 19
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Y		4,8,10,11,15-18,20-30,31
Y	US 5,990,996 A (SHARP) 23 November 1999 (23.11.1999) entire document	4,16,20-29
Y	US 6,005,916 A (JOHNSON et al) 21 December 1999 (21.12.1999) entire document	8
Y	US 5,219,345 A (POTTER) 15 June 1993 (15.06.1993) entire document	15,17,18,31
Y	US 4,717,252 A (HALLDORSSON et al) 05 January 1988 (05.01.1988) entire document	10, 11
Y	US 2004/0151626 A1 (CUNNINGHAM et al) 05 August 2004 (05.08.2004) paragraph 102	30

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