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**Szu et al.**

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(54) **NONLINEAR BLIND DEMIXING OF SINGLE PIXEL UNDERLYING RADIATION SOURCES AND DIGITAL SPECTRUM LOCAL THERMOMETER**

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WO WO99/66638 12/1999

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 707 days.

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(Continued)

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(65) **Prior Publication Data**  
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(57) **ABSTRACT**

**Related U.S. Application Data**

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Changes, increase or decrease, in the body fluid flow are passively detected by using a single pixel, non-linear blind de-mixing procedure, which can be extended to general biomedical measurement and diagnoses instruments. More specifically the single pixel, non-linear blind de-mixing procedure is applied on the hot spots of rheumatic arthritis or breast cancer detection problem using passive two-color infrared imaging as well as to passively detect blockages in the body fluid circulatory system that might be of importance for coronary artery bypass surgery, diabetes and deep vein thrombosis. Other applications of the mentioned algorithm include a pair of cameras for video, a pair of antennas for cell phones, and in situ data gathering or imaging using multiple mode fiberoptical sensing as well as selective amplification hearing aids through two-ear binaural processing for de-noise echo cancellation and signal classification.

(51) **Int. Cl.**  
**A61B 6/00** (2006.01)

(52) **U.S. Cl.** ..... **600/473; 600/474**

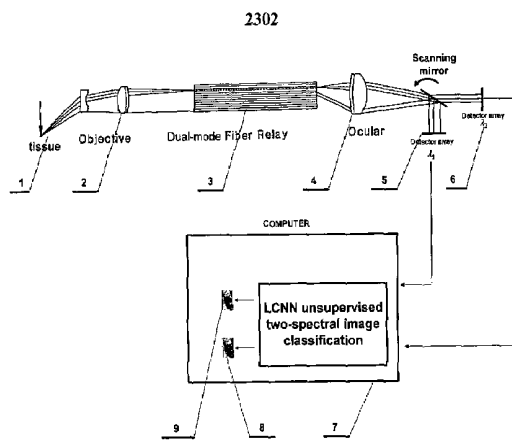
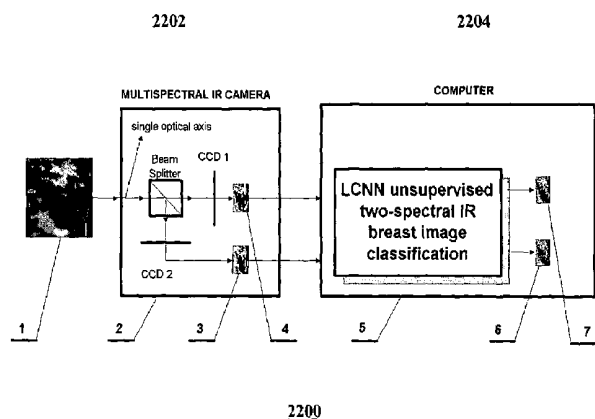
(58) **Field of Classification Search** ..... **600/473, 600/479, 309-344, 407, 480**  
See application file for complete search history.

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**10 Claims, 30 Drawing Sheets**



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