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Hanna et al.

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- (54) **SIMULTANEOUS SIGNAL ATTENUATION MEASUREMENTS UTILIZING CODE DIVISION MULTIPLEXING**
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- (52) U.S. Cl. **702/74; 702/79**
- (58) Field of Search 702/10, 69, 74, 702/79, 108, 110, 122, 124-126, 176-178, 783, 189, 193, 194, 196, 197; 600/309, 386, 310; 370/320, 535, 536, 203, 206; 375/316, 322, 329, 332, 346

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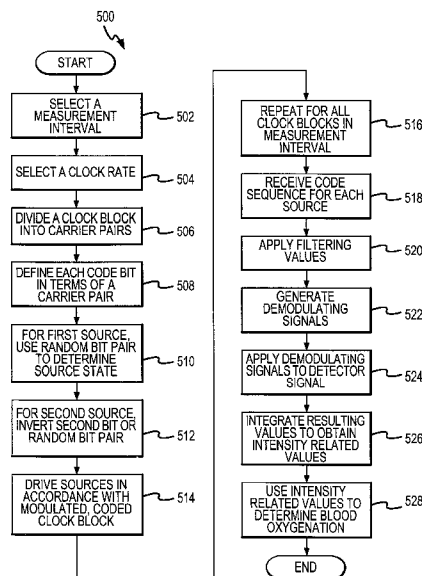
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(57) ABSTRACT

A pulse oximeter (100) includes two or more light sources (102) for transmitting optical signals through an appendage (103) of patient. The sources (102) are operated to transmit code division multiplexed (CDM) signals. That is, the sources (102) are driven by drives (104) in response to signals from a digital processing unit (116) such that the sources (102) are modulated using different code sequences. The code sequences are preferably non-periodic and may be orthogonal to one another. The use of such CDM signals provides certain advantages related to noise reduction.

24 Claims, 5 Drawing Sheets



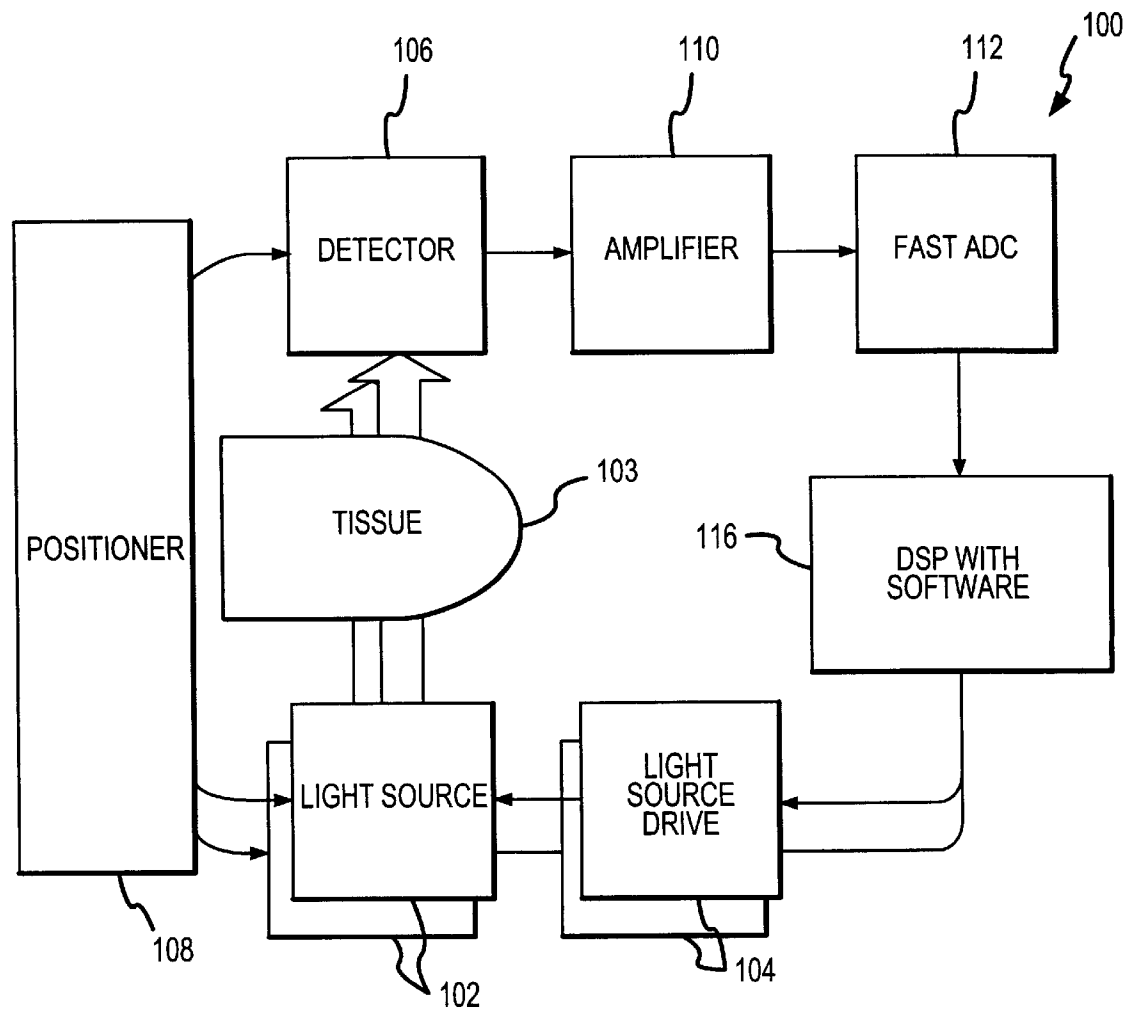


FIG. 1

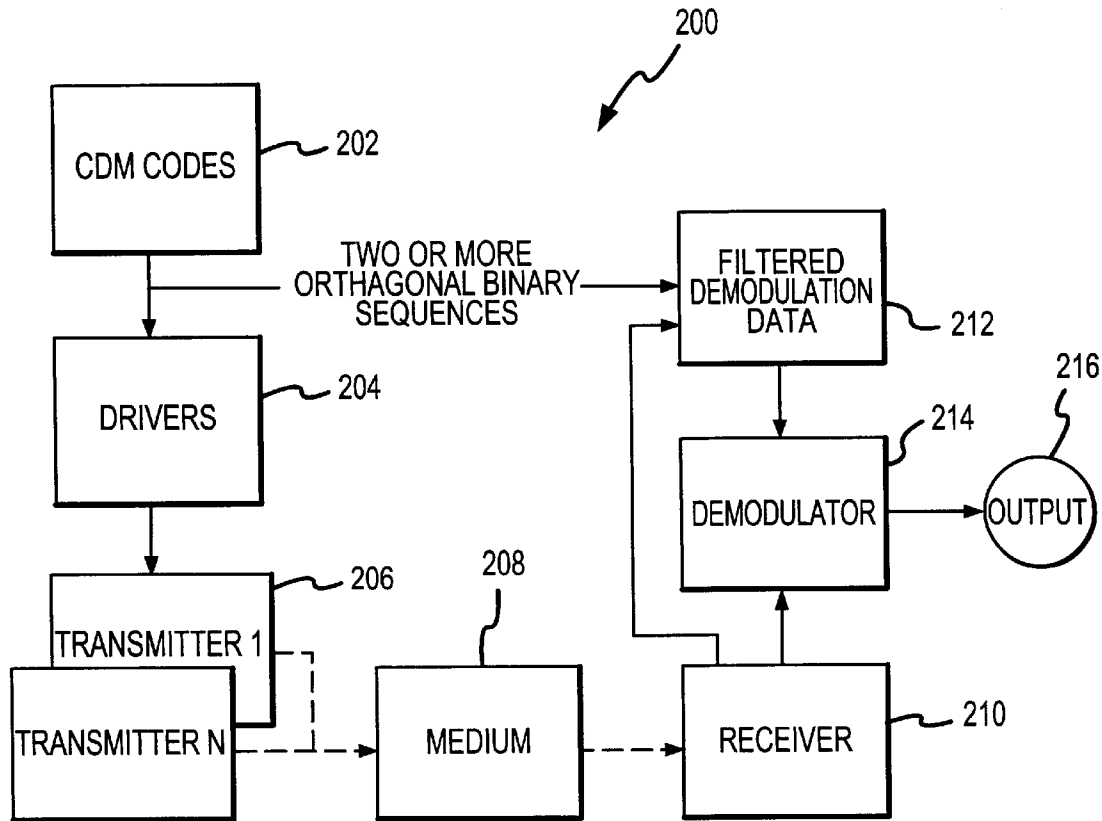


FIG.2

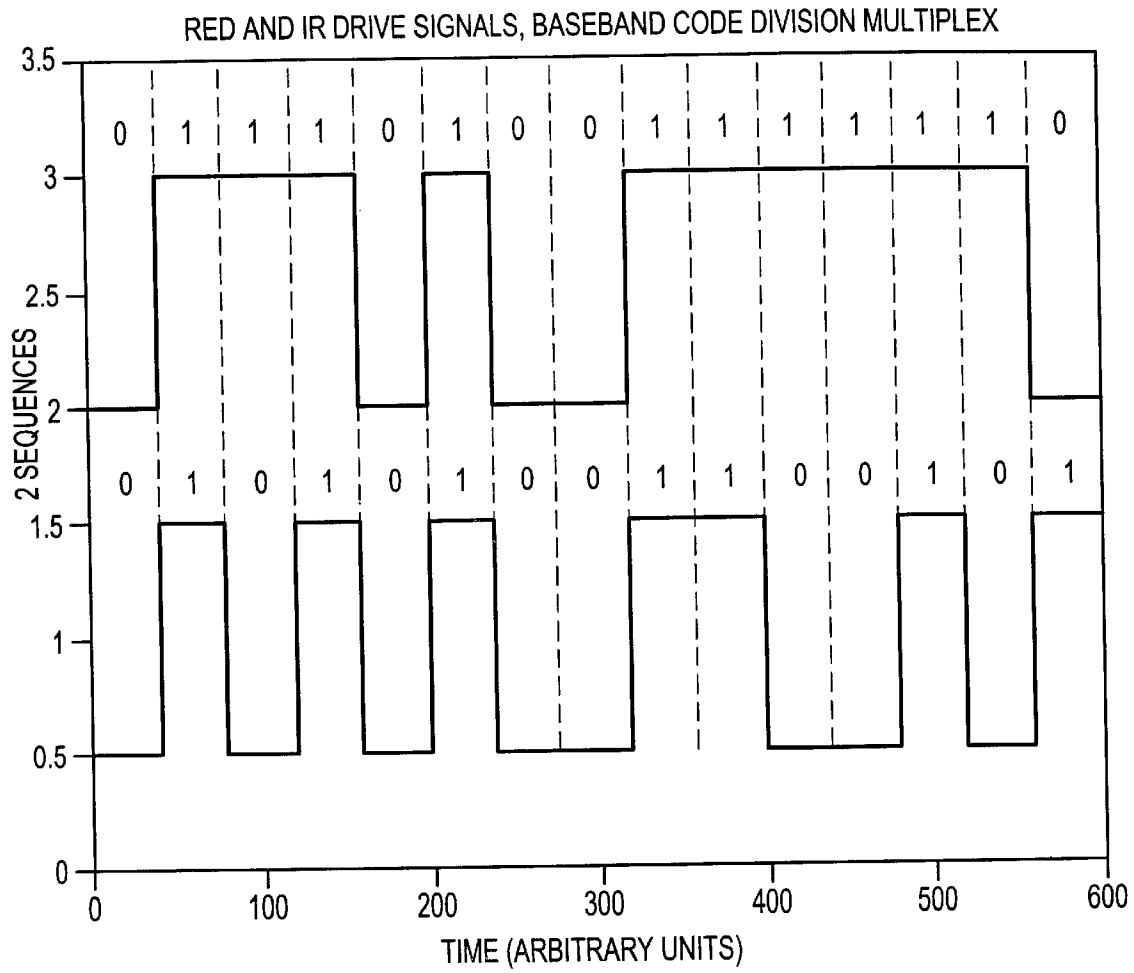


FIG.3

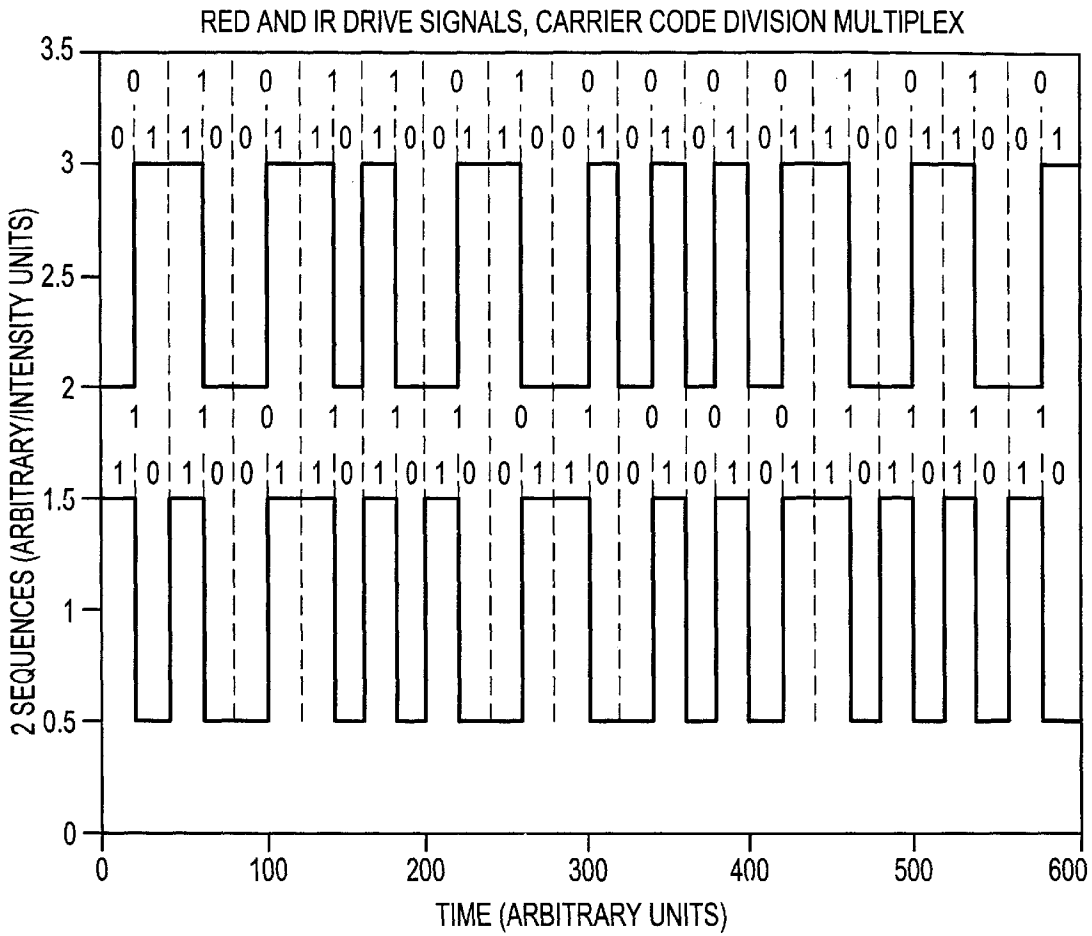


FIG.4

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