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(71) Applicant:  
 HITACHI EUROPE LIMITED  
 Maidenhead, Berkshire, SL6 8YA (GB)

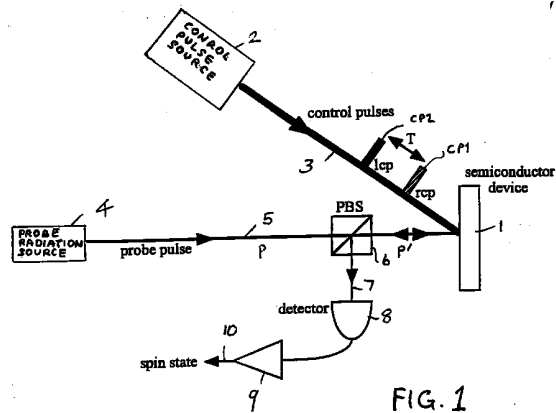
(72) Inventors:  
 • Baumberg, Jeremy John  
 Cambridge, CB2 1LR (GB)

• Heberle, Albert P.  
 Cambridge CB4 1YE (GB)

(74) Representative:  
 Read, Matthew Charles et al  
 Venner Shipley & Co.  
 20 Little Britain  
 London EC1A 7DH (GB)

(54) Optical switch

(57) An all-optical switch comprises an optical switching medium (1) that includes a periodic quantum well structure. A first pulse (CP1) of optical radiation that is circularly polarised in a first direction is directed into the switching medium so as to stimulate electrons with a predetermined spin, so as to produce a first spin state condition. Thereafter, a second pulse (CP2) of optical radiation which is circularly polarised in an opposite direction to the first pulse, is directed to the switching medium so as to produce charge carriers with a different spin, thereby producing a second, different spin state condition. The spin state of the switching medium can be detected using probe radiation (P). The polarisation direction of the probe radiation is rotated depending upon the spin state condition of the optical medium. The switch according to the invention can be operated between the two spin state conditions at a rate much faster than the relaxation time of the spin states. Embodiments operable as a phase sensitive detector, pulse train correlator and an optical data transmission system are described.



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