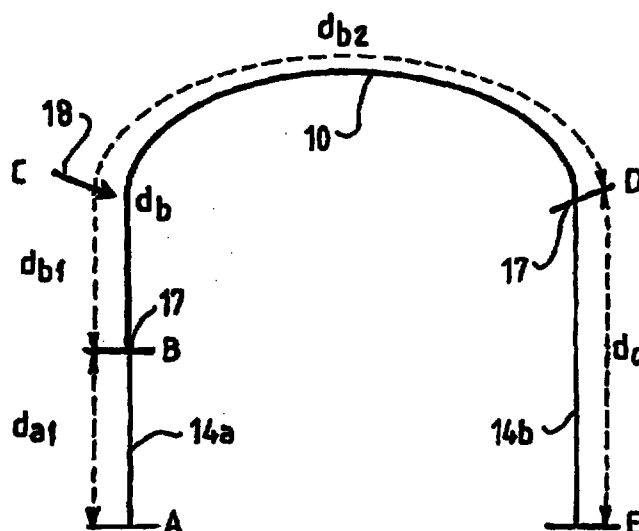




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(54) Title: APPARATUS AND METHOD FOR MONITORING A STRUCTURE USING A COUNTER-PROPAGATING SIGNAL METHOD FOR LOCATING EVENTS

**(57) Abstract**

An apparatus and method for monitoring a structure such as machines, buildings, fibre optic communication links and infra-structure is disclosed which includes a waveguide (10) and a light source (20) for launching light into both ends of the waveguide (10) so that counter-propagating light signals are produced in the waveguide (10). The waveguide (10) is in the form of an optical fibre or fibre bundle formed from silica and in which the characteristic of the light is modified or effected by an external parameter caused by an event. A detector (30) is provided for detecting light from both ends of the waveguide (10) and for determining the time delay or difference between the modified signals which have been effected by the parameter in order to determine the location of the event along the length of the waveguide (10).