

ABSTRACT

An object of the invention is to provide an optical fiber magnetic sensor which has good frequency response and sensitivity, excellent resistance to environments such as temperature and vibration, and high reliability. A metal-clad optical fiber 13 in its curved portion has much larger stress than the linear portion. The curved portion in the metal-clad optical fiber 13 resonates upon exposure to longitudinal waves of a sound wave which propagates through a medium of the optical fiber per se regarded substantially as a rigid body. Therefore, as compared with the conventional linear sensor, a much higher resonance frequency can be provided even when the dimension is substantially the same as that of the conventional linear sensor. Therefore, the measuring range can be broadened. This can realize by allowing an alternating current having a high frequency according to the measuring range to flow into a closed circuit comprised of an alternating-current power supply 15, a lead 16, and a metal-clad optical fiber 13. The resonance frequency is determined by the magnitude of the stress. Therefore, when an identical optical fiber is used, decreasing the bend radius increases the resonance frequency and thus can improve the frequency response.