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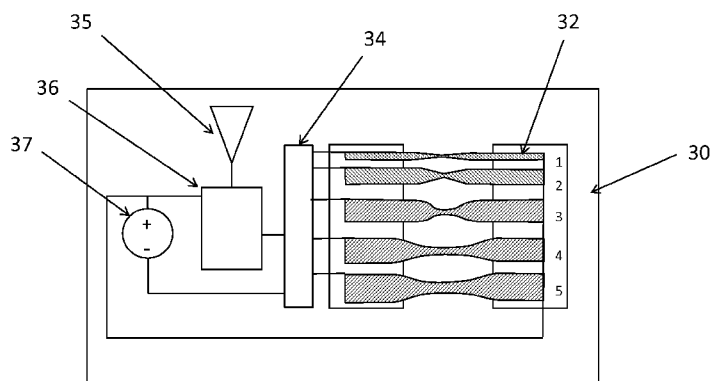


Figure 3.

(57) Abstract: A fatigue sensor for monitoring the health state of structural members is disclosed. The sensor has multiple parallel beams, each sensitive to different levels of fatigue, that are designed to fail prematurely but progressively as the sensor goes through the same fatigue cycles as the structural member it is attached to. Whenever fatigue levels on a particular beam of the sensor exceed the engineered number of fatigue cycles, that particular beam fails and sensor electronics can detect that failure and transmit this information wirelessly when interrogated by an external interrogator. Having multiple beams that fail after different numbers of fatigue cycles enables the health state of the structural member to be monitored, in that unlike normal fracture sensors that sense failure of the structural members after the actual fracture event, the present invention is capable of sensing imminent failure of the structural member before the actual failure occurs.

