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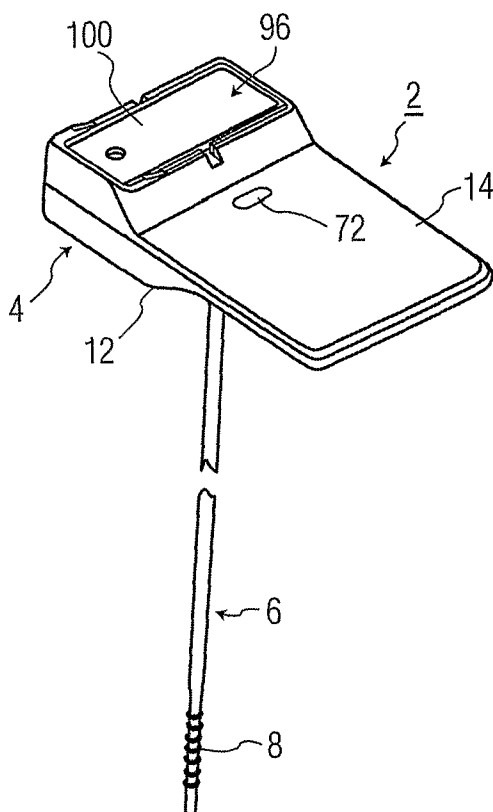
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(54) Title: ELECTRONIC TAMPER EVIDENT SEAL



(57) Abstract: Disclosed is a reusable locking unit and a one time use electrically conductive molded thermoplastic shackle loaded with carbon black particles and having a linear resistance that is periodically monitored. The locking unit includes an integrated circuit for measuring shackle impedance through terminals capacitively coupled to the shackle. The terminals allow for adjustment of the length of the seal shackle in the locked secured state. The terminals and shackle form an RC network having a complex impedance that manifests the locked adjusted shackle length. Two AC signals at two different frequencies are used to measure impedance, which is compared with an initially determined or continually generated reference impedance to determine a tampered state of the shackle. Temperature compensation is also disclosed. A time stamp is stored for noting the tampering time of occurrence. A battery may be used to operate the circuit internal components and power from the remote transceiver may operate the circuit communication portion. Monitoring may be automatically periodic or activated only upon an external command. LEDs provide visual indication of the seal tamper status.

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