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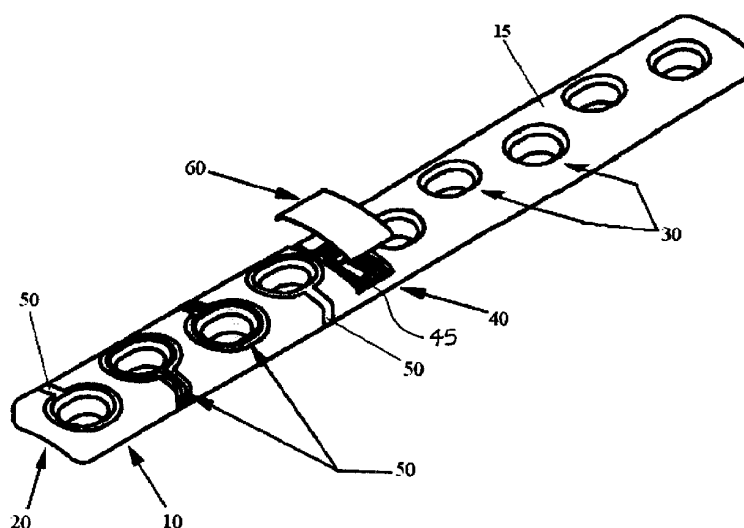
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(54) Title: ORTHOPAEDIC IMPLANT WITH SENSORS



(57) Abstract: The present invention relates to an orthopaedic implant, such as a bone plate, for the fixation of bone where the implant also has at least one microchip and at least one sensor connected to the microchip. The sensor or sensors are configured to receive physical stimulus from a portion of the implant or the patient's tissue such as temperature, pressure, and strain. The information received from the sensor or sensors is gathered by the microchip and transmitted to a receiver, such as a personal computer, outside the patient. This information enables doctors to diagnose the useful life of the implant, the load sharing of the bone plate, and possible complications typically associated with orthopaedic implants such as infection, fracture non-union, and fatigue. The implant may also have one or more electrodes located on its surface which emit an electric current to stimulate healing of the broken or fractured bone.

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ORTHOPAEDIC IMPLANT WITH SENSORS**RELATED APPLICATION DATA**

[0001] The present application claims priority to U.S. Provisional Patent Application Serial No. 60/578,107, filed June 7, 2004.

FIELD OF THE INVENTION

[0002] The present invention relates to orthopaedic implants, such as bone plates, for use in repairing fractured bones or for addressing other orthopedic conditions. More particularly, the present invention relates to an orthopaedic implant having sensors and/or a microchip for measuring and transmitting data concerning the implant and/or the surrounding tissue to doctors and/or patients.

BACKGROUND OF THE INVENTION

[0003] Bone plates have been used for many years in the field of orthopedics for the repair of broken bones and are well known in the art. One example of such a bone plate is shown and described in U.S. Patent 6,623,486 to Weaver, et al. which is hereby incorporated by reference. Such bone plates function well in most instances, and fracture healing occurs more predictably than if no plate were used. In some instances, however, improper installation, implant failure, infection or other conditions such as patient non-compliance with prescribed post-operative treatment may contribute to compromised healing of the fracture, as well as increased risk to the health of the patient. Health care professionals currently use non-invasive methods such as x-rays to examine fracture healing progress and assess condition of implanted bone plates. However, x-rays may be inadequate for accurate diagnoses. They are costly, and repeated x-rays may be detrimental to the patient's and health care workers' health. In some cases, non-unions of fractures may go clinically

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摘要(译)

本发明涉及一种用于固定骨的整形外科植入物，例如骨板，其中植入物还具有至少一个微芯片和连接到微芯片的至少一个传感器。一个或多个传感器被配置成从植入物或患者组织的一部分接收物理刺激，例如温度，压力和应变。从一个或多个传感器接收的信息由微芯片收集并传送到患者外部的接收器，例如个人计算机。该信息使医生能够诊断植入物的使用寿命，骨板的负荷分配以及通常与整形外科植入物相关的可能的并发症，例如感染，骨折不愈合和疲劳。植入物还可以具有位于其表面上的一个或多个电极，其发射电流以刺激断裂或骨折的骨的愈合。

