

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
22 December 2005 (22.12.2005)

PCT

(10) International Publication Number  
**WO 2005/120203 A3**

(51) International Patent Classification:  
**A61B 17/58** (2006.01)

(21) International Application Number:

PCT/US2005/020247

(22) International Filing Date: 7 June 2005 (07.06.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/578,107 7 June 2004 (07.06.2004) US

(71) Applicant (for CA only): **SYNTHES (U.S.A.)** [US/US];  
1302 Wrights Lane East, West Chester, PA 19380 (US).

(71) Applicant (for all designated States except CA, US): **SYNTHES GMBH** [CH/CH]; Eimatstrasse 3, CH-4436 Oberdorf (CH).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **MORGAN, Chad** [US/US]; 6 Dingee Road, West Grove, PA 19390 (US). **HALL, Harry, T., IV** [US/US]; 648 Pancoast Lane, Downingtown, PA 19335 (US). **GREEN, James, M.** [US/US]; 2275 S.W. Benz Farm Court, Portland, OR 97225 (US). **FLEXNER, Geoffrey** [US/US]; 1405 Saddle

Lane, Chester Springs, PA 19425 (US). **GELTZ, Charles, E.** [US/US]; 523 Turner Avenue, Drexell Hill, PA 19425 (US).

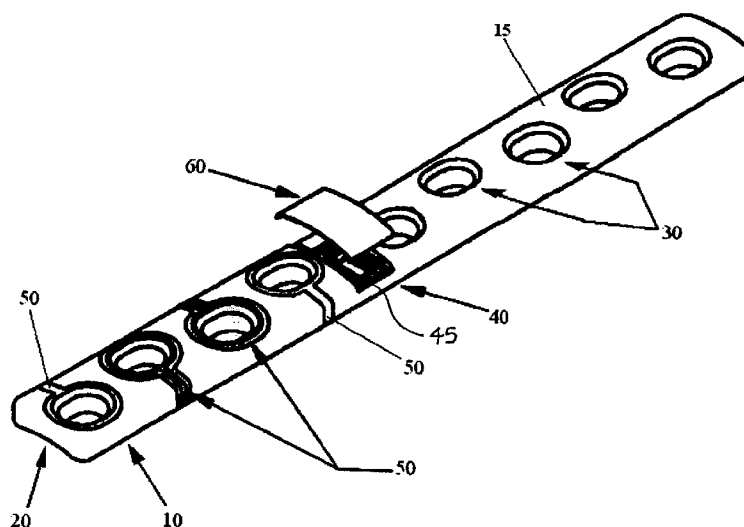
(74) Agents: **ROTHERY, Brian, M.** et al.; Jones Day, 222 East 41st Street, New York, NY 10017-6702 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(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.

WO 2005/120203 A3



**Published:**

— with international search report

**(88) Date of publication of the international search report:**

8 February 2007

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/20247

## A. CLASSIFICATION OF SUBJECT MATTER

IPC: **A61B 17/58**( 2006.01)

USPC: 606/69

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 606/69, 61, 70, 71, 72, 73

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,330,477 (CROOK) 19 July 1994 (19.07.1994), see whole document.	1-43
X	US 2002/0099359 A1 (SANTINI et al) 25 July 2002 (25.07.2002), see whole document.	1-43
X	US 2004/0073221 A1 (BISCUP) 15 April 2004 (15.04.2004), see whole document.	1-43

☐

Further documents are listed in the continuation of Box C.

☐

See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

21 July 2006 (21.07.2006)

Date of mailing of the international search report

08 SEP 2006

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Facsimile No. (571) 273-3201

Authorized officer

Eduardo Robert

Telephone No. 000-0000