

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
20 January 2005 (20.01.2005)

PCT

(10) International Publication Number
WO 2005/004698 A3

(51) International Patent Classification⁷: **H01J 27/00**

(21) International Application Number:
PCT/US2004/014446

(22) International Filing Date: 5 May 2004 (05.05.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/429,491 5 May 2003 (05.05.2003) US

(71) Applicant and

(72) Inventor: **ASCENZI, Maria-Grazia** [US/US]; 1713
Bryn Mawr Avenue, Santa Monica, CA 90405 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **KABO, John,
Michael** [US/US]; 17048 Jeanine Place, Grenada Hills,
CA 91344 (US).

(74) Agents: **SCHAFFER, Robert** et al.; Darby & Darby P.C.,
P.O. Box 5257, New York, NY 10150-5257 (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, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, 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, IT, 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).

Published:

— with international search report

(88) Date of publication of the international search report:
16 February 2006

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.



WO 2005/004698 A3

(54) Title: METHOD AND SYSTEM FOR MODELLING BONE STRUCTURE

(57) Abstract: The present invention discloses a structural and mechanical model and modeling methods for human bone based on bone's hierarchical structure and on its hierarchical mechanical behavior. The model allows for the assessment of bone deformations, computation of strains and stresses due to the specific forces acting on bone during function, and contemplates forces that do or do not cause viscous effects and forces that cause either elastic or plastic bone deformation.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/14446

A. CLASSIFICATION OF SUBJECT MATTER
 IPC(7) : H01J 27/00
 US CL : 250/425
 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. : 250/425

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)
 West

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,414,320 B1 (ISHIKAWA et al) 02 July 2002 (02.07.2002), column 3, lin 55-60	1-16
Y	US 5,728,510 (WHITE et al) 17 March 1998 (17.03.1998), column 2, lin 48-65; col 5, lin 25-28; col 6, lin 40-50.	2-9
Y	US 3,929,971 (ROY et al), abstract, column 2, lin 22-40; col 8, lin 52-66.	2-9

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	"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
"E" earlier application or patent published on or after the international filing date	"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
"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)	"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
"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	"&" document member of the same patent family

Date of the actual completion of the international search
 09 September 2005 (09.09.2005)

Date of mailing of the international search report
15 NOV 2005

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. (703) 305-3230

Authorized officer
 Retford Berko *Samuel Walski for*
 Telephone No. 703-308-1234