

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
5 July 2007 (05.07.2007)

PCT

(10) International Publication Number
WO 2007/074498 A3

(51) International Patent Classification:
A61B 17/86 (2006.01)

(21) International Application Number:
PCT/IT2007/000159

(22) International Filing Date: 5 March 2007 (05.03.2007)

(25) Filing Language: Italian

(26) Publication Language: English

(30) Priority Data:
BL2006A000010 6 March 2006 (06.03.2006) IT
BL2006A000013 23 March 2006 (23.03.2006) IT

(71) Applicants and

(72) Inventors: **DEOLA, Sonia** [IT/IT]; Via Cime d'Auta, 5, I-32020 Falcade (IT). **SCARDANZAN, Mauro** [IT/IT]; Via Cime d'Auto, 5, I-32020 Falcade (IT). **NANETTI, Luca** [IT/NL]; Albrondaheerd, 37, NL-9737 RC-Groningen (NL).

(74) Agents: **IANNONE, Carlo Luigi** et al.; Barzano' & Zanardo Roma S.p.A., Via Piemonte, 26, I-00187 Roma (IT).

(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, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, 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, LV, MC, MT, 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:

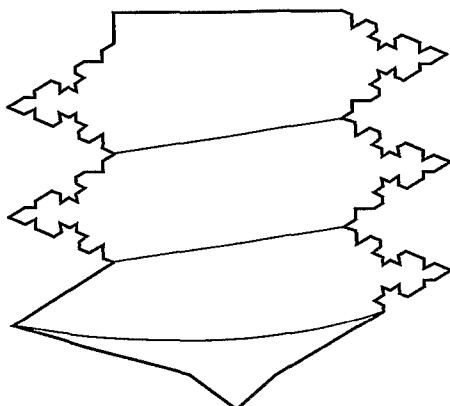
- with international search report
- with amended claims and statement
- upon request of the applicant, before the expiration of the time limit referred to in Article 21(2)(a)

(88) Date of publication of the international search report:
22 November 2007

Date of publication of the amended claims and statement:
10 January 2008

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.

(54) Title: BONE IMPLANT SCREW WITH INCREASED BONE-IMPLANT INTERFACE



(57) Abstract: The present invention relates to a bone implant screw with increased bone-implant interface, characterised in that it has at least a side of the thread profiled.

WO 2007/074498 A3

AMENDED CLAIMS**[received by the International Bureau on 05 November 2007(05.11.2007)]****+ Statement**

5

1) Bone implant screw with increased bone-implant surface, characterized in that some part or the whole surface of the screw is profiled with a fractal shape, and that the screw produces incisions in the surrounding bone by means of protruding cutting grooves which create behind them trailing, empty spaces in the bone when the screw itself is put in place.

10

2) Bone implant screw according to claim 1, characterized in that the fractal shape is a Koch's curve or one of its variants and approximations.

15

3) Bone implant screw according to claim 1, characterized in that in one implementation the protruding cutting grooves are obtained from the surface of the screw.

20

4) Bone implant screw according to claim 1, characterized in that in another implementation the protruding cutting grooves are applied on the surface of the screw itself.

25

5) Bone implant screw according to one or more of the previous claims, characterized in that each one of the profiling elements can assume the form of an isolated indent of any section, profile or depth.

30

6) Bone implant screw according to one or more of the previous claims, characterized in that each one of the profiling elements can also assume the form of isolated indents of any section, protruding profile or height from the flat part of the thread or the shaft or any other part of the screw.

35

7) Bone implant screw according to one or more of the previous claims, characterized in that the fractal surface is machined, turned, treated and/or treated with all know types of chemical-physical processes.

- 8) Bone implant screw according to one or more of the previous claims, characterized in that the fractal surface is treated with nanostructure.

Statement under Article 19**Disclosure (Article 34(2)(b) PCT)**

New claims have been limited bearing in mind the observations set forth by the Examiner concerning Novelty and Inventive step of the original claims 1 – 26. Independent claim 1 is rephrased in order to make more evident the features of the screw of having a fractal surface and the capability to create voids in the surrounding bone.

Novelty (Article 33(2) PCT) - Inventive step (Article 33(3) PCT)

According to the Written Opinion dated March 5, 2007, original claims 1-6, 8-13, 16-23, 26 have been considered novel and inventive. Therefore, new claims including the subject matter of the above original claims, have to be considered novel and inventive.