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D E C I S I O N
of 25 August 1999

Case Number: T 0387/96 - 3.2.2

Application Number: 91910591.6

Publication Number: 0532585

IPC: A61F 2/36

Language of the proceedings: EN

Title of invention:
Metal/Composite Hybrid Orthopedic Implants

Patentee:
E.I. Du Pont De Nemours and Company

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 123(2), 56

Keyword:
"Original disclosure and inventive step (yes) - after amendment"

Decisions cited:
-

Catchword:
-

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Case Number: T 0387/96 - 3.2.2

D E C I S I O N
of the Technical Board of Appeal 3.2.2
of 25 August 1999

Appellant: E. I. Du Pont De Nemours and Company
1007 Market Street
Wilmington
Delaware 19898 (US)

Representative: Jones, Alan John
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 17 November 1995 refusing European patent application No. 91 910 591.6 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: W. D. Weiß
Members: D. Valle
J. C. M. De Preter

Summary of Facts and Submissions

I. The appellant (applicant) filed on 16 January 1996 an appeal against the decision of the examining division of 17 November 1995 to refuse the application and paid the appeal fee on the same date. The statement setting out the grounds for appeal was received on 19 March 1996.

II. The examining division held that the application did not meet the requirements of Articles 123(2) EPC and did not involve an inventive step (Article 56 EPC) having regard to the documents:

(1) WO-A-8 504 323

(2) DE-A-2 933 229

III. In its statement of grounds the appellant requested that the decision under appeal be set aside and a patent be granted on the basis of new claims 1 to 18. A refund of the appeal fee and oral proceedings on a provisional basis were also requested.

Following a communication of the Board, the appellant with letters of 23 April 1999 and 21 May 1999 withdrew the request for a refund of the appeal fee and filed amendments to the description and the drawings.

IV. Claim 1 according to the request filed together with the statement of grounds on 19 March 1996 reads as follows:

"An orthopaedic device (10) adapted for implantation within a body, the device comprising:
an intraosseous metal portion(20); and
an intraosseous composite portion (14) of more than one layer and comprising (i) a first extension (22) having a modulus of elasticity which is received within said metal portion and secured thereto (ii) a second extension (24) positioned outside said metal portion; said composite portion having a length and comprising one or more filaments disposed at an angle to a longitudinal axis as a result of winding or braiding each layer along said length at winding or braiding angles selected to provide the second extension with a modulus of elasticity that is less than the modulus of elasticity of the first extension, the winding or braiding angle in some of the layers of the composite portion being non-linear, said filaments further being disposed within a polymer matrix"

Independent process claims 17 and 18, filed on the same date, concern processes for preparing the intraosseous composite portion of claim 1.

V. The appellant argued as follows.

The variation of the orientation of the filament is disclosed at page 10, lines 22 to 34. "To wind" means: "to put (thread, tape or the like) in coils or convolutions around something as a reel or upon itself" (see Oxford English dictionary). "Filament (singular) winding" is different from the following phrase "braiding filaments (plural)". "To braid" means: "to plait", that is to form a contexture of three or more

interlaced strands of hair, ribbon etc.. Hence "filament winding" means orientating that filament. See page 10, lines 30 to 35 and lines 25 to 30. See also original claims 1, 20, 23, 32, 33, 34.

Guidelines, Part C, Chapter VI, 5.4, require only that the information contained in a later version should be directly and unambiguously derivable from the original disclosure, but not literally.

New claim 1 is derivable from page 4, lines 2 to 5, Figure 2, pages 6 and 7, page 10, line 7 to 21, and from line 22 to page 11, line 3, page 4, line 7; page 9, lines 23, 24, claims 20, 23, 32, Example 2, page 11, lines 25 to 35 (non linear angle).

From page 10, lines 22 to 28 it is clear that "disposed at an angle to a longitudinal axis" is synonymous with: "about a longitudinal axis".

Document (1) does not disclose an intraosseous composite portion received within an intraosseous metal portion. For the metal head disclosed on page 14, line 10, it is not specified how it is fixed to the stem 12. From Figure 9 it appears that a portion of the head is received within the stem. The cited document is also silent about the fact that the winding or braiding angle can be non-linear, i.e. variable. On the contrary it states that the orientation of the filaments is the same, see page 9, lines 25 to 30, page 14, line 18 to 22, claim 1, 18, 23. In claim 6, where two directions for the two groups of carbon fibers are disclosed, the body only consists of one layer and not: "more than one

layer", as specified in claim 1 of the application. The non-linear winding or braiding is not disclosed.

The kind of relationship between the application and document (1) has been treated in T 390/88. Like there, also here there was no reason to depart from the satisfactory solution given in document (1) for the orthopaedic device.

Document (2), page 7, last paragraph, does not disclose a composite portion comprising one or more filaments disposed at an angle to a longitudinal axis as a result of winding or braiding each layer along the length at selected angles. The different moduli of the first and second extension and the non linear angles are not disclosed either.

Reasons for the Decision

1. The appeal is admissible.

2. *Amendments*

Claim 1 is derivable from the original claims 1, 3, 20, 23, 24, 32, 33, 34 and from page 10, lines 7 to 34 of the description (more than one layer; disposed an angle to a longitudinal axis as a result of winding or braiding; non-linear);

Claims 2 to 18 are derivable from the original claims 4, 5, 6, 7, 30, 8, 9, 15, 16, 26, 31, 32, 17, 18, 19, 33, 34 respectively.

Accordingly the amendments comply with Article 123(2) EPC.

3. *Inventive step*

Document (1) discloses an orthopaedic device adapted for implantation within a body, the device comprising:

an intraosseous metal portion (page 10, lines 30, 31; page 14, lines 9 to 12) and an intraosseous composite portion (page 10, lines 27 to 32) of more than one layer (page 13, 2nd and 3rd paragraph) and comprising (i) a first extension, (16) having a modulus of elasticity, which is secured to said metal portion (ii) and a second extension (12) positioned outside said metal portion; said composite portion having a length and comprising one or more filaments disposed at an angle to a longitudinal axis, said filaments further being disposed within a polymer matrix (page 4, lines 6, 7).

The device according to claim 1 differs from the one disclosed in document (1) in that:

(a) the first extension is received within said metal portion;

(b) the angle of the filament along the longitudinal axis is the result of winding each layer (that is each filament which will form a layer) along said length at winding angles;

(c) the winding angle in some of the layers of the

composite portion being non-linear (that is the angle of winding changes along the axis);

(d) the angles are selected to provide the second extension with a modulus of elasticity that is less than the modulus of elasticity of the first extension.

The device disclosed by document (1), page 14, is produced in the following way. A sheet of parallel carbon fiber, held together by a coating, is cut in patterns of specific shape and fiber orientation. These patterns are then tightly rolled in into a cylinder and molded to form the composite portion. This method does not allow to vary the modulus of elasticity within one layer as the invention.

Document (2) discloses further the feature (a).

The problem underlying the invention is to improve the device according to document (1) by bringing the stresses in the surrounding bone nearer to their normal physiological level. This is done by varying the elasticity modulus of the prosthesis along its length. See page 3, lines 21 to 31.

The problem of the invention is known from document (1). See page 4, lines 28 to 35. The solution given by the distinguishing features (b) to (d) of claim 1 is more effective than that disclosed by document (1) and not hinted at by document (2) or by any other document of the available prior art.

Independent process claims 17 and 18 refer to the process for preparing the intraosseous composite portion according to claim 1 and are also allowable.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside

2. The case is remitted to the first instance with the order to grant a patent with the following version:

Claims: No. 1 to 18 filed with letter of 18 March 1996

Description: pages 1, 9, 20 as originally filed,
page 2 filed with letter of 22 December 1993,
pages 3, 10, 17 filed with letter of 31 May 1995
pages 4 to 7, 11 to 16, 21 filed with letter of 23 April 1999,
page 8 filed with letter of 21 May 1999,
pages 18, 19 filed with letter of 26 October 1994

Drawings: sheets 1/4 to 4/4 filed with letter of 23 April 1999

The Registrar: The Chairman:

U. Bultmann W. D. Weiß