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Datasheet for the decision of 3 September 2013

Case Number: T 0693/09 - 3.2.02

Application Number: 98951904.6

Publication Number: 1030622

IPC: A61C 8/00

Language of the proceedings: EN

Title of invention:
Threaded implant for obtaining reliable anchoring in bone

Patent Proprietor:
Nobel Biocare Services AG

Opponents:
Astra Tech AB
NEOSS LIMITED

Headword:
-

Relevant legal provisions:
EPC Art. 56, 100(a), 123(2), 123(3), 84, 107

Keyword:
"Added subject-matter (no)"
"Extension of protection (no)"
"Clarity (yes)"
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0693/09 - 3.2.02

D E C I S I O N
of the Technical Board of Appeal 3.2.02
of 3 September 2013

Appellant I: (Patent Proprietor)
Nobel Biocare Services AG
Balz Zimmermann-Strasse 7
Kloten (CH)

Representative:
HOFFMANN EITLE
Patent- und Rechtsanwälte
Arabellastrasse 4
D-81925 München (DE)

Appellant II: (Opponent 1)
Astra Tech AB
Aminogatan 1
P.O. Box 14
S-431 21 Mölndal (SE)

Representative:
Somlo, Tommy
Awapatent AB
Södra Hamngatan 37-41
P.O. Box 11394
S-404 28 Göteborg (SE)

Appellant III: (Opponent 2)
NEOSS LIMITED
Windsor House
Cornwall Road
Harrogate
HG1 2PW (GB)

Representative:
Stainthorpe, Vanessa Juliet
Harrison Goddard Foote LLP
Fountain Precinct
Balm Green
Sheffield S1 2JA (GB)

Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office posted 13 January 2009 concerning maintenance of European patent No. 1030622 in amended form.**

Composition of the Board:

Chairman: E. Dufrasne
Members: P. L. P. Weber
M. Stern

Summary of Facts and Submissions

I. The appeals are against the decision of the Opposition Division posted on 13 January 2009 that the patent and the invention to which it relates according to auxiliary request 1 in the opposition proceedings meet the requirements of the EPC.

II. Appellant/opponent 1 electronically filed a notice of appeal on 20 March 2009 and paid the appeal fee on the same day. It requested that the decision under appeal be set aside and that the patent be revoked.

On 20 May 2009 appellant/opponent 1 filed the statement setting out the grounds of appeal.

With communication dated 14 September 2009 the registry of the Board requested appellant/opponent 1 to sign the notice of appeal.

With letter dated 17 September 2009 and received on 21 September 2009 appellant/opponent 1 returned a signed copy (by registered mail).

III. On 20 March 2009 appellant/opponent 2 filed a notice of appeal and paid the appeal fee on the same day. It requested that the decision be set aside and that the patent be revoked.

With communication of 29 June 2009 the Board informed appellant/opponent 2 that the appeal would be declared inadmissible since no statement setting out the grounds of appeal had been filed.

IV. On 23 March 2009 the appellant/patent proprietor filed a notice of appeal and paid the appeal fee on the same day. It requested that the decision be set aside and that the oppositions be rejected.

On 25 May 2009 the appellant/patent proprietor filed the statement setting out the grounds of appeal and requested that the decision be set aside and that the patent be maintained on the basis of the attached main request or on the basis of one of attached auxiliary requests 1 to 5.

V. The different versions of claim 1 of relevance for the decision read as follows:

Claim 1 of the patent as granted reads as follows:

"*1. Threaded implant (3) for obtaining reliable anchoring in bone substance (1) in the human body, where the external threading on the implant can cooperate with the side wall (2b) of a hole (2) in the bone substance for reliable anchoring and healing-in of the implant particularly in soft bone substance characterized in that*
the implant threading (3d, 3d') has a slight conicity which extends along most of the length (L) of the implant (3) to force the bone substance out in essentially radial directions (R) as a function of the extent to which the implant is screwed into the hole (2) in the bone and that the conical implant threading (3d, 3d') comprises two or more thread entries which provide a tight threading on the implant."

Claim 1 as found to meet the requirements of the EPC by the Opposition Division reads as follows:

"*1. Threaded implant (3) for obtaining reliable anchoring in bone substance (1) in the human body, where*
- the external threading on the implant can cooperate with the side wall (2b) of a hole (2) in the bone substance for reliable anchoring and healing-in of the implant particularly in soft bone substance;
- the implant threading has a slight conicity, and the implant threading (3d, 3d', 3e) and the slight conicity extend along most of the length of the implant (3) to force the bone substance out in essentially radial directions (R) as a function of the extent to which the implant is screwed into the hole (2) in the bone,
- the conical implant threading (3d, 3d') comprises two or more thread spirals which provide a tight threading on the implant, and
- the threaded implant (3) comprises a tip part (3a, 3a') merging into a remaining part (3b),
wherein the implant threading (3d, 3d', 3e) has a stronger conicity at the tip part (3a, 3a') than at the remaining part (3b), and
wherein the tip part (3a, 3a) [sic] has a length (h) which is 10 to 30% of the length of the total implant threading."

Claim 1 according to the main request reads as follows (with feature identification letters as proposed by appellant/opponent 1):

"*A. Threaded implant (3) for obtaining reliable anchoring in bone substance (1) in the human body, where*
B.- the external threading on the implant can cooperate with the side wall (2b) of a hole (2) in the bone substance for reliable anchoring and healing-in of the implant particularly in soft bone substance;
C.- the implant threading has a slight conicity, and the implant threading (3d, 3d', 3e) and the slight conicity extend along most of the length of the implant (3) to force the bone substance out in essentially radial directions (R) as a function of the extent to which the implant is screwed into the hole (2) in the bone,
D.- the conical implant threading (3d, 3d') comprises two or more thread spirals which provide a tight threading on the implant, and
E.- the threaded implant (3) comprises a tip part (3a, 3a') merging into a remaining part (3b),
F.- wherein the implant threading (3d, 3d', 3e) has a stronger conicity at the tip part (3a, 3a') than at the remaining part (3b)."

VI. The following documents are cited in the present decision:

O1: US-A-5427527
O2: EP-A-0641549
O3: WO-A-94/07428
O4: WO-A-97/25933
O5: US-A-5064425
O6: US-Des-296362
O7: EP-A-0530160
O14: W0-A-83/02555

Filed by appellant/opponent 1 together with its statement setting out the grounds of appeal:

Annex 1: Zur Formgebung enossaler Dentalimplantate Johannes Randzio, Orale Implantologie, Deutsche Gesellschaft für zahnärztliche Implantologie, Nr4, Jahrgang 3, Juni 1976, pages 9-11 and 48-53

Annex 2: The effect of a second thread spiral on initial stability (6 pages)

Filed by appellant/opponent 1 with letter of 9 November 2009:

O15A: US-A-3752030.
O16: US2002/0182560.

Filed by the appellant/patent proprietor on 11 January 2010:

Annex 3: "On The Clinical Measurement of Implant Stability and Osseointegration" by Neil Meredith, Göteborg University and Bristol Dental Hospital 1997

Annex 4: "Resonance frequency analysis of implants subjected to immediate or early functional occlusal loading", Roland Glauser et al., Clin. Oral Impl. Res. 15, 2004, 428-434

Annex 5: Comments on Test Methods and on an Increase of Initial Stability by means of Conicity

VII. The Board summoned the parties to oral proceedings with letter posted on 19 June 2013.

VIII. With letter dated 31 July 2013, appellant/opponent 1 informed the Board that it would not attend the oral proceedings, but that it maintained its requests.

IX. Oral proceedings were held on 3 September 2013.

The appellant/patent proprietor requested that the decision under appeal be set aside, that the patent be maintained on the basis of the main request filed with letter dated 25 May 2009 and that the appeals of opponents 1 and 2 be rejected as inadmissible or, in the alternative, dismissed.

Although duly summoned by communication dated 19 June 2013, appellant/opponent 1 and appellant/opponent 2 were not present, as announced for appellant/opponent 1 by letter dated 31 July 2013.

In accordance with Rule 115(2) EPC and Article 15(3) RPBA, the proceedings were continued without these parties.

Appellant/opponent 1 and appellant/opponent 2 have both requested in writing that the decision under appeal be set aside and that the patent be revoked.

X. The arguments of appellant/opponent 1 can be summarised as follows:

Main request

Added subject-matter - Article 123(2) EPC

The use of the very general preposition "at" in the term "at the tip part" in feature F implies that the stronger conicity could be at only a part of the tip part, which was not disclosed in the originally filed application.

The feature of the stronger conicity at the tip part in feature F is not disclosed in isolation from the 10-30% range feature in the embodiment described in the originally filed application. Therefore it cannot be claimed alone.

Extension of protection - Article 123(3) EPC

In claim 1 of the patent as granted the term “two or more thread entries” was used, whereas in claim 1 of the present main request the term “two or more thread spirals” is used. However, thread spirals do not necessarily have thread entries, as can be seen from Annex 1, and therefore present claim 1 contravenes Article 123(3) EPC.

Clarity - Article 84 EPC

The expression "stronger conicity" is not clear. If conicity is present somewhere, the angle of taper may change but the conicity cannot change. This word means

nothing else than that there is a conical shape. Such a conical shape is either present or not, it cannot be slight, strong or stronger.

Additionally, as already mentioned, the use of the preposition "at" in the term "at the tip part" means that only a part of the tip could have the stronger conicity. However, such wording is not clear since it is not understandable how the threading should be conceived if only a part of the tip has a stronger conicity.

Moreover claim 1 lacks essential features, since in order for the tip part to allow threads to be taken more easily there must be some element of the implant which cuts into the bone. This is not dependent on the presence of a stronger conicity at the tip part. Claim 1 thus lacks essential features.

For the same reason it must be the external diameters which exhibit the slight and stronger conicity and not only the core of the implant. The starting properties cannot be improved if the external diameter remains cylindrical.

Finally the wording "tight threading" is unclear because it does not have any generally accepted meaning in the art.

Lack of inventive step - Article 56 EPC

The subject-matter of claim 1 is not inventive starting from O1 in combination with any of O2, O3, O14 and any of O4, O5, O6, O7, O15A.

The only differentiating features over O1 are (i) that the implant threading comprises two or more thread spirals and (ii) that the implant threading has a stronger conicity at the tip part than at the remaining part.

Technically, feature (ii) contributes to better alignment of the implant with the hole in the bone, and feature (i) contributes to shortening the time for screwing the implant into the hole. In fact, neither of these two features contributes to initial stability. It is specifically demonstrated in Annex 2 that multiple threadings or tighter threadings do not contribute to initial stability.

That two or more threads improve the insertion time is common general knowledge, as can be seen from documents O2, O3 and O14. The person skilled in the art would consider applying this teaching to the implant according to O1. The fact that these documents show cylindrical implants would not hinder the person skilled in the art from applying this general teaching to the conical implant of O1.

As regards the second feature, it is also well known that a conical tip would facilitate the introduction of a screw into a hole of smaller diameter than the screw, as can be seen from O4, O5, O6 or O7.

Also O15A shows a screw exhibiting a stronger conicity at the tip part than at the remaining part. This additional evidence should therefore be introduced into the proceedings.

The subject-matter of claim 1 not being limited to dental implants, it is also not inventive when starting from O14 and common knowledge or combined with any of the documents teaching a tapered tip portion.

Therefore, the subject-matter of claim 1 is not inventive.

XI. Appellant/opponent 2 has not submitted any arguments in the appeal proceedings.

XII. The arguments of the appellant/patent proprietor can be summarised as follows:

Added subject-matter - Article 123(2) EPC

The word "at" was also already present in originally filed claim 5.

The feature of the stronger conicity for the tip part is disclosed, in particular, on page 7 of the originally filed application where it is stated that the front portion or tip of the implant can be designed with a conical thread which has a stronger conicity than the other thread or thread parts of the implant, so that feature is disclosed without the feature of the length of the tip part.

Extension of protection - Article 123(3) EPC

The claim is about a threaded implant which is different from a spiral implant having no core, as shown in Annex 1. The thread of a threaded implant must

have an entry, and therefore there cannot be any extension of scope of protection.

Clarity - Article 84 EPC

In the claim, the preposition "at" has to be understood as in the rest of the patent specification. In claim 1 itself the same preposition is used in relation to the remaining part, since it is mentioned that the conicity at the tip part is stronger than the conicity at the remaining part.

It is common use in engineering to talk about conicities, strong conicity or slight conicity. The description of the patent (paragraph 22) clearly gives an indication of what kind of conicities are meant. Moreover the slight conicity was already present in claim 1 of the granted patent and therefore not to be objected to under Article 84 EPC.

The cutting edges are not essential for the taking of threads. The cutting edges are presented as a "further" feature (see page 8 line 18 or page 12 line 13) and only present in claim 14 of the originally filed application.

Likewise the external envelope does not have to be conical. If only the core of the implant is conical this will nevertheless improve the taking of threads because the tip of the implant, being conical, enters more easily into a hole in the bone which is smaller than the core of the implant.

The wording "tight threading" was present in claim 1 of the patent as granted and therefore not to be objected to under Article 84 EPC.

Late-filed documents

Documents O15A and O16 should not be admitted into the proceedings, the first because it concerns a screw which is not for medical use and the second because it was published too late.

Inventive step - Article 56 EPC

Contrary to the opinion of the opponent, features (i) and (ii) both contribute to the initial stability of the implant, particularly in soft bone. The conical tip part allows for introduction into smaller holes and therefore more bone can be compressed by the implant, and the multiple threads allow for quicker insertion and less friction on a single bone thread, which will avoid wearing the bone thread as much as with a single thread and hence improve the initial stability because the bone thread is in a better state.

While it is agreed that features (i) and (ii) are both not disclosed in O1, none of the other prior art documents hint at the solution adopted on the implant according to claim 1. The documents disclosing a conical tip do so on cylindrical implants and the tips are not threaded, and the same is true for the documents showing multiple threads. In any case no document at all discloses multiple threads and a conical tip in combination, and there was no hint for the person skilled in the art to combine the

corresponding documents in order to solve the problem solved by the invention.

Finally the appellant/patent proprietor considered that the appeals of the appellants/opponents should be declared inadmissible.

Reasons for the Decision

1. The appeal of the appellant/patent proprietor is admissible.

2. Added subject-matter (Article 123(2) EPC)

2.1 Appellant/opponent 1 submitted that the use of the rather general preposition "at" in feature F (*the implant threading (3d, 3d', 3e) has a stronger conicity at the tip part (3a, 3a') than at the remaining part (3b)(emphasis added)*) implied that the stronger conicity could only be a part of the tip part, which was not originally disclosed.

In the opinion of the Board this wording has to be read as elsewhere in the originally filed application where the same language is used to designate the whole tip part or remaining part. In the whole of the patent application the tip part is the conical part, at the tip of the implant, with the stronger conicity, and its primary function is to facilitate introduction or "threading in" of the implant. Hence there is no basis in the application as a whole for interpreting this feature as meaning that the conicity exists only on a part of the tip part.

2.2 Appellant/opponent 1 further submitted that the feature of the stronger conicity at the tip part could not be isolated from the 10-30% range for the length and from the angles defined in the originally filed application.

In the opinion of the Board the paragraph on page 7, in which the word "can" is used several times between the different features mentioned by appellant/opponent 1, clearly allows their separation. In particular it is mentioned in lines 6 to 9 that "*the front portion or tip of the implant can be designed with a conical thread which has a stronger conicity than the other thread or thread parts of the implant*", and only in lines 16 and 17 is it mentioned that "*The tip can have a length which is 10 - 30% of the length of the total thread of the implant*" (emphasis added).

2.3 For the reasons set out above, the requirements of Article 123(2) EPC are met.

3. Extension of protection (Article 123(3) EPC)

Claim 1 of the patent as granted included the wording thread entries, and the claim as considered allowable by the Opposition Division now includes the wording thread spirals (in feature D). Appellant/opponent 1 considered that there was an extension of protection because thread spirals existed without proper entries, Annex 1 being evidence for that.

However, Annex 1 does not show any threaded implants as claimed in claim 1 of the main request but spiral implants in the shape of a spiral thread without any core. The thread in the sense of the patent in suit,

namely on a threaded implant, must in any case have a thread entry. Thus, in the opinion of the Board, the requirement in the claim that two or more thread spirals must be present is a restriction of scope compared to the scope of claim 1 of the patent as granted. In fact, claim 1 of the patent as granted only required the presence of two or more thread entries (nothing was said about the presence or absence of threading following the thread entries), whereas present claim 1 clearly requires the presence of two or more threadings or thread spirals.

Therefore, the requirements of Article 123(3) EPC are met.

4. Clarity (Article 84 EPC)

4.1 Appellant/opponent 1 considered that the expression "stronger conicity" was unclear. It considered that "conicity" could not be slight, strong or stronger; if anything, the angle of taper had to be defined.

The Board cannot agree with appellant/opponent 1. This expression has to be read in the context of the claim as a whole. Feature C of the claim specifies that "*the implant threading has a slight conicity, and the implant threading (3d, 3d', 3e) and the slight conicity extends along most of the length of the implant (3) to...*". Feature E specifies that "*the threaded implant (3) comprises a tip part (3a, 3a') merging into a remaining part (3b)*". Finally feature F specifies that "*the implant threading (3d, 3d', 3e) has a stronger conicity at the tip part (3a, 3a') than at the remaining part (3b)*".

In other words, it is specified in the claim that the implant has a first part with a given (slight) conicity and a second part (the tip) with a stronger conicity. The Board cannot see anything unclear in such a definition, which means nothing else than that the angle of taper of the first conical part is different (and smaller) than the angle of taper for the tip part. This link between the conical part and the angle of taper is also clear from the specific embodiment described in the description, in which the two different angles of taper are specified for the two different conicities.

4.2 Appellant/opponent 1 also considered that feature F, "*the implant threading (3d, 3d', 3e) has a stronger conicity at the tip part (3a, 3a') than at the remaining part (3b)*", was unclear because at the tip part could mean only at a part of the tip part which rendered the claim unclear, because it was unclear how only a part of the tip part could have a stronger conicity.

The Board considers that the wording of feature F read as a whole, namely that the conicity should be stronger at the tip part than at the remaining part, can only mean that the conicity of the whole of the tip part should be stronger than that of the remaining part. There is no room for interpreting this feature as meaning that only a part of the tip should be conical (see also point 2.1 above).

4.3 Appellant/opponent 1 further considered that essential features were missing because there were no cutting threads mentioned in the claim to improve the starting

properties (taking of threads), and because it was not mentioned in the claim that it was the external diameter of the tip part which had to be conical.

In the opinion of the Board, technically, there is no doubt that even a stronger conicity of only the core at the tip part will improve starting properties. In fact, the implant is intended to be used in a hole having a diameter smaller than that of the core of the implant in order for the implant to compress surrounding bone when being screwed into it and thereby improving initial stability. If the core of the implant can be introduced more easily into the hole in the bone, this will necessarily improve the starting properties.

This is also why it is the shape of the core which is decisive for the starting properties, not so much the shape of the external envelope or the presence of cutting edges. Moreover the cutting threads are only qualified as "further features" on page 8, lines 18 onwards, and claimed in dependent claim 14 of the application as published, and will only be necessary depending on bone hardness.

4.4 The last point of appellant/opponent 1 with respect to clarity is not admissible because it concerns a wording (tight threading) which was already in claim 1 of the patent as granted.

For the reasons set out above, the Board considers that the requirements of Article 84 EPC are met.

5. Late-filed documents

O15A discloses a screw which is not for medical use, but a self-tapping screw for insertion into metal sheets. In addition, although the screw is conical on the main part and has a tip to facilitate introduction into metal sheets, the document teaches to have a straight (and not conical) entry section (Figures 1 and 2 and the corresponding description part: "*The screw there illustrated includes a head 11, a threaded tapered shank portion, as bracketed at 12, and a straight entry section, bracketed at 13, including a lead-in point 13a which may or may not also be threaded.*" (emphasis added)). In other words, this document prima facie teaches to have a cylindrical part directly before the conical tip, which is different from what is claimed in claim 1 of the main request.

Document O16 was published after the priority date of the patent in suit.

For these reasons, the Board decides not to admit O15A and O16 into the proceedings.

6. Inventive step (Articles 100(a) and 56 EPC)

6.1 Starting from O1

Appellant/opponent 1 submitted that starting from O1 the differentiating features solved two independent problems, i.e. controlling the insertion time and facilitating alignment with the bore hole. It considered that both problems had obvious solutions in O2, O3, O14 (multiple threading) and in O4, O5, O6, O7

(conical tip) respectively, so that the subject-matter of claim 1 was not inventive.

6.1.1 Document O1 discloses an implant for insertion into the thin residual alveolar ridge (column 1, lines 57 to 64, column 2, lines 31 to 35, column 3, lines 15 to 28). In one embodiment (Figure 2) it has a conical shape. The conicity is rather a slight conicity (column 3, lines 43 to 48: between 1° and 10°, preferably between 1° and 3°) and extends over at least about 50% of the length, the rest being cylindrical (column 3, lines 48 to 52).

6.1.2 Differentiating features

This document does not disclose the following features:

"D. the conical implant threading (3d, 3d') comprises two or more thread spirals which provide a tight threading on the implant, and

E. the threaded implant (3) comprises a tip part (3a, 3a') merging into a remaining part (3b),

F. wherein the implant threading (3d, 3d', 3e) has a stronger conicity at the tip part (3a, 3a') than at the remaining part (3b)."

6.1.3 Effects and objective problem

In the context of the patent in suit, the initial stability is meant to be the starting stability of the implant immediately after insertion (e.g. paragraph [0011] of the patent). This better initial stability is primarily obtained by the conicity of the

screw as in O1, since during insertion into a cylindrical hole, due to this conicity of the implant, the parts of the bone surrounding the hole are compressed. This is of particular interest in soft bone because a zone of higher bone density is created.

The conical tip contributes to the improvement of this initial stability because it allows a better starting of the insertion of the implant into a smaller hole and so allows for an increase in the amount of surrounding bone being compressed. Also, multiple threads participate in the improvement of the initial stability because when multiple threads are used instead of a single thread, the pitch of each single thread is increased so that for any rotation of the implant, it penetrates the bone a greater distance than it would with a single thread. Consequently, the individual threads created in the bone are in gliding contact with the threads of the implant for less time during the insertion process. In other words, wear is reduced, less bone material is lost, which in turn maintains their strength and eventually improves the initial stability.

The Board can therefore not accept the argument of appellant/opponent 1 that there are two separate problems with two separate obvious solutions, without synergetic effect.

Hence, the objective problem is considered to be to improve the initial stability of the implant.

6.1.4 The other patent documents

Documents O2, O3, O14 disclosing multi-threads

O2 discloses very short cylindrical implants for installation in distal jaw regions where a normal implant could interfere with the mandibular nerve. In relation to the embodiment of Figure 22, it is mentioned that: "*The double, triple or quadruple lead thread allows for quick and solid engagement into a tapped bone site.*" (column 20, lines 25-27).

O3 discloses an implant which should be a combination of the features of a prior art threaded implant and a prior art rough surface implant. The implant proposed is a cylindrical implant with micro-threads, so that it can be tapped into the hole and then if necessary screwed further into it. In this context of very small threads (0.1 mm high), it is mentioned that three threads can be superposed to reduce the time needed for screwing the implant into the bore.

O14 essentially discloses a hip joint prosthesis capable of carrying load immediately after implantation and without use of cement. Additionally, Figures 26 to 32 show a two-part cylindrical support for a dental prosthesis. The first part of the implant shown on Figure 27 has a smooth portion 220 facilitating introduction into the bone and a threaded section 218. A second part 230 which will support the prosthesis is introduced into the first part. Multi-start thread is mentioned in relation to the hip joint prosthesis.

Documents O4, O5, O6, O7 disclosing conical tips

O4 discloses a reduced-friction cylindrical screw-type implant. The body of the screw has lobes, which reduces the torque needed for screwing the implant into the bone because of the smaller contact surface during rotation. The screw has a tapered tip part which is threaded (Figure 8, page 8, lines 1 to 3). The function of the taper is not explained.

O5 discloses a cylindrical implant with threading and cutting edges for self-tapping and with a cavity for collecting bone tissue. The implant has a conical part for facilitating insertion in a bored hole. The length of the conical part is only shown in the figures; no length is mentioned in the description. There is no mention of the presence of a thread on the conical part.

O6 is an American design patent. The figures show a cylindrical implant with a conical tip part without thread.

O7 discloses a cylindrical threaded implant with cutting edges. The tip part is tapered to facilitate insertion but not threaded (column 2, lines 31 to 41).

6.1.5 Inventive step

In the opinion of the Board the subject-matter of claim 1 of the main request is inventive.

As mentioned above, in the opinion of the Board the objective problem is to improve the initial stability of the implant.

Also, the implant according to O1 is meant to be introduced into a smaller cylindrical hole (column 3, lines 15 to 21).

However, there is not a single document among those cited suggesting that in order to improve the initial stability of a conical implant (for residual alveolar ridges as in O1) it would be helpful to implement multiple threads and a (third) tip part with stronger conicity threading.

Even if, as suggested by appellant/opponent 1, the person skilled in the art wanted to improve the "taking of thread" of the implant of O1, it seems to the Board that the most logical or most obvious way to do so when the implant is already partly conical at the front part like the implant described in O1 would be to increase the conicity of the existing conical part, and not to add an additional conical tip as required by claim 1.

The Board considers that for this reason alone, the subject-matter of claim 1 is inventive.

Moreover, the documents on file do not hint at the solution. If anything, two documents would be needed, since none of them taken alone shows the combination of a conical tip with multiple threads. Even then, none of the combinations of two documents would lead, in combination with the implant of O1, to all the features

of claim 1 according to the main request and render the subject-matter of claim 1 obvious.

As mentioned above, all cited documents, be it those disclosing a conical tip or those disclosing multiple threads, show cylindrical dental implants, so that they would in any case teach the person skilled in the art to abandon the conical implant of O1 and to take a cylindrical implant instead.

Moreover all the documents disclosing multiple threads do so in very specific situations. O2 discloses very short cylindrical implants for installation in distal jaw regions where a normal implant could interfere with the mandibular nerve, so the Board fails to see why the person skilled in the art, wanting to improve the initial stability of an implant for residual alveolar ridges as in O1, would look at this document. The same is true for O3 which discloses an implant with micro-threads to be tapped into the hole, a different insertion concept, and for O14 disclosing an untypical two-part dental implant structure.

Additionally, the Board considers that nowhere in the cited state of the art is it confirmed in any way that quicker insertion of a conical implant is possible by use of multiple threads. In the opinion of the Board it is also not self-evident that this effect would be obtained. In fact, it seems that multiple threads on a conical implant will lead to a quicker increase of the torque needed to introduce the implant than multiple threads on a cylindrical implant, because the higher pitch combined with the conicity will require quicker compression of the surrounding bone. The influence on

the insertion time is therefore not immediately apparent, because the dentist or surgeon will have more difficulties rotating the implant. In the Board's view, this is an additional reason why it is not considered obvious to provide the conical implant according to O1 with multiple threads, as it is not immediately apparent that the same advantages can be obtained as with a cylindrical implant. In other words, even if it were considered that there was a general teaching that the provision of multiple threads on a cylindrical implant was advantageous for reducing insertion time, this teaching would not necessarily be transposable to conical implants meant for compressing the bone surrounding the insertion hole as is the case for the implant described in O1.

6.1.6 In the Board's view, the different Annexes filed by appellant/opponent 1 and the appellant/patent proprietor are not relevant in the sense that they cannot change the above evaluation of inventive step. Independently of their individual content, they generally prove that for the person skilled in the art the effects of a change in the implant geometry on the implant-bone interface are difficult to foresee. In the opinion of the Board this is an additional indication for inventive step. In fact these documents confirm the view taken above that even if an effect is obtained with a particular feature in one kind of implant, this does not mean that the same feature on another kind of implant will necessary produce the same effect. There is thus no particular motivation for the person skilled in the art to transpose such features from one implant to the other in the hope of getting the same effect.

6.2 Starting from O14

6.2.1 Appellant/opponent 1 submitted that the subject-matter of claim 1 is also not inventive over the conical implant shown in Figures 22 and 23 of O14 and common knowledge or in combination with any of O4, O5, 06 or O7 showing tapered tip portions.

6.2.2 As already mentioned above, O14 essentially discloses a hip joint prosthesis. This hip joint prosthesis mainly consists of a first tapered sleeve and a femoral prosthesis (e.g. Figures 8, 10, 15, 16) for the femoral side, and a second tapered sleeve and a bearing cup (e.g. Figures 22, 23, 24) for the acetabular side of the prosthesis. In relation to the second tapered sleeve for the acetabular side of the prosthesis a multi-start thread is mentioned (page 39, lines 15 to 17).

6.2.3 However, the Board fails to see any reason why the person skilled in the art would be prompted to add a tip part merging into a remaining part, wherein the implant threading would have a stronger conicity at the tip part than at the remaining part as required by features E and F of claim 1. Appellant/opponent 1 did not mention any reason either.

The tapered sleeve 182 shown in Figures 22, 23 and 24 is meant for receiving the bearing cup 184 and has quite a strong conicity. This sleeve, unlike the implant according to the invention or the implant according to O1, is not meant for insertion in a much smaller hole. It is mentioned for instance on page 39, lines 19 to 21, that "*(a) properly proportioned reamer,*

not shown, is provided to prepare the bony acetabular cavity in the pelvis 186 for implantation of the sleeve 182". There is no reason to doubt that this reamer will create a hole which is close to the shape of the tapered sleeve 182, as is the case for the femoral tapered reamer shown in Figure 18 meant for the femoral tapered sleeve. Consequently, there is no difficulty whatsoever in inserting the sleeve into the hole which has the same conicity. Therefore, the Board cannot see any reason why the person skilled in the art would be led to add a tapered threaded tip to the sleeve, let alone seek for any such tip portion in documents dealing with dental implants.

6.3 For the reasons set out above, the subject-matter of claim 1 according to the main request involves an inventive step.

7. The appellant/patent proprietor requested that the appeals of appellant/opponent 1 and appellant/opponent 2 be rejected as inadmissible.

Since the appellant/patent proprietor appealed the first-instance decision which considered the patent and the invention to which it relates according to the then first auxiliary request to fulfil the requirements of the EPC and since, in the appeal proceedings, it requested the maintenance of the patent according to a broader main request, the Board examined this broader main request first. For the main request appellant/opponent 1 and appellant/opponent 2 were at least parties as of right according to Article 107 EPC, i.e. in the present case respondents. Since the Board concludes that the appellant/proprietor's main request

is to be allowed, it has no reason to decide on the appeals by the opponents, in particular on their admissibility.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to maintain the patent on the basis of:
   - claims 1 to 10 of the main request filed with letter dated 25 May 2009; and
   - description columns 1, 3, 5, 6 and 8 to 10 of the patent specification and columns 2, 4 and 7 filed during the oral proceedings; and
   - figure pages 1/4 to 4/4 of the patent specification.

The Registrar: The Chairman:

D. Hampe E. Dufrasne