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**Datasheet for the decision
of 30 November 2017**

Case Number: T 1369/14 - 3.2.08

Application Number: 07011197.6

Publication Number: 2000109

IPC: A61C5/10, A61C13/00, A61C13/083

Language of the proceedings: EN

Title of invention:
A method of producing a dental product

Patent Proprietor:
Nobel Biocare Services AG

Opponent:
Ivoclar Vivadent AG

Headword:

Relevant legal provisions:

EPC Art. 56, 84, 100(a), 101(1)
EPC R. 76(2)(d), 41(2)(c), 77(2)
RPBA Art. 12(2), 12(4)

Keyword:

Admissibility of opposition - (yes)

Inventive step - (no) - MR, aux req. 1, 1.1, 4, 4.1, 6 and 7

Claims - clarity after amendment (no) -aux req. 2, 3, 3.1, 5
and 5.1

Decisions cited:

G 0003/14

Catchword:



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Case Number: T 1369/14 - 3.2.08

D E C I S I O N
of Technical Board of Appeal 3.2.08
of 30 November 2017

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
24 April 2014 concerning maintenance of the
European Patent No. 2000109 in amended form.**

Composition of the Board:

Chairman M. Alvazzi Delfrate
Members: C. Herberhold
I. Beckedorf
M. Foulger
Y. Podbielski

Summary of Facts and Submissions

- I. By decision posted on 24 April 2014 the Opposition Division decided that European patent No. 2 000 109 according to the first auxiliary request then on file, and the invention to which it related, met the requirements of the EPC.
- II. The appellant (opponent) lodged an appeal against this decision in the prescribed form and within the prescribed time limit.
- III. Oral proceedings before the Board took place on 30 November 2017. For a more detailed account thereof, in particular the issues discussed with the parties and the parties' initial requests, reference is made to the minutes of the oral proceedings.
- IV. At the end of the oral proceedings the requests of the parties were as follows:

The appellant requested that the decision under appeal be set aside and that European patent No. 2 000 109 be revoked.

The respondent requested that the appeal be dismissed (i.e. that the patent be maintained in amended form as upheld by the opposition division in the decision under appeal - main request), or, alternatively, that the patent be maintained in amended form on the basis of one of the sets of claims filed as auxiliary requests 1 to 5 with letter of 19 February 2015, as auxiliary requests 1.1, 3.1, 4.1 and 5.1 with letter of 28 November 2017, and as auxiliary requests 6 and 7 with letter of 30 October 2017.

V. Main request

Claim 1:

"A method of producing a dental product, the method comprising the steps of providing a pre-sintered blank made from a green body of ceramic material, performing a machining operation on the blank and subsequently sintering the blank to its final density in a sintering operation performed at a temperature from 1300°C to 1650°C, wherein the pre-sintered blank that is provided has a strength of 53-107MPa, and wherein, during the machining operation, the blank is transformed into a shape comprising a bridge structure shaped to form an arch

and a support body comprising a common hub that is located in the support body and is linked to the bridge structure by several retaining sections that extend as spokes from the hub to the bridge structure and during the subsequent sintering step the blank stands on the support body."

VI. Auxiliary request 1

Claim 1 of auxiliary request 1 differs from claim 1 of the main request in the addition of the following feature:

"wherein the blank has been made of a green body of zirconium oxide that has been **isostatically** pressed and wherein the pre-sintering of the green body is performed at a temperature in the range of **from 1000°C to 1070°C**".

VII. Auxiliary request 2

Claim 1 of auxiliary request 2 differs from claim 1 of the main request in the addition of the following feature:

"wherein the blank has been made of a green body of zirconium oxide that has been isostatically pressed and subjected to a pre-sintering heating operation in a sintering furnace at a **rate of 0.1 to 1°C/minute** to vaporize organic binder material, the pre-sintering of the green body is performed at a temperature in the range **of 970°C - 1150°C**".

VIII. Auxiliary request 3

Claim 1 of auxiliary request 3 differs from claim 1 of the main request in the addition of the following feature:

"wherein the blank has been made of a green body of zirconium oxide that has been isostatically pressed and subjected to a pre-sintering heating operation in a sintering furnace at a rate of **0.1 to 1°C/minute** to vaporize organic binder material, the pre-sintering of the green body is performed at a temperature in the range of from **1000°C to 1070°C**".

IX. Auxiliary request 4

Claim 1 of auxiliary request 4 essentially corresponds to claim 1 of **auxiliary request 1** with the following amendment:

"wherein the pre-sintered blank that is provided has a strength of 53 to **10774** MPa".

X. Auxiliary request 5

Claim 1 of auxiliary request 5 corresponds to claim 1 of **auxiliary request 3** with the analogous amendment as in point IX above:

"wherein the pre-sintered blank that is provided has a strength of 53 to ~~107~~74 MPa".

XI. Auxiliary requests 1.1, 3.1, 4.1 and 5.1

Auxiliary requests 1.1, 3.1, 4.1 and 5.1 differ from corresponding requests 1, 3, 4 and 5 in the following modification:

"..., wherein the pre-sintering of the green body is performed at a temperature in the range of ~~from~~ 1000°C to below 1070 °C,..."

XII. Auxiliary request 6

Claim 1 of auxiliary request 6 corresponds to claim 1 of the main request with the strength of the pre-sintered blank being restricted as follows:

"..., wherein the pre-sintered blank that is provided has a strength of ~~53~~56-~~107~~74 MPa, ..."

XIII. Auxiliary request 7

Claim 1 of auxiliary request 7 corresponds to claim 1 of the main request with the strength of the pre-sintered blank being restricted as follows:

"..., wherein the pre-sintered blank that is provided has a strength of ~~5356-107~~65 MPa, ..."

XIV. The following documents are relevant for the present decision:

D1: X. Balmes, "From dream to reality", Spectrum Dialogue, Vol. 6, No. 1, pages 52-66;
D4: EP 0 943 295 A1;
D5: US 2004/0119180 A1;
D9: Y. Mahiat, "La zircone: cette méconnue", Stratégie prothétique, février 2006, vol. 6, no. 1, pages 55-65;
D10: Y. and Y. Probst, "Le fraisage manuel de la zircone", Stratégie prothétique, septembre 2006, vol. 6, no. 4, pages 263-271.

XV. The essential arguments of the appellant can be summarised as follows:

Admissibility of the opposition

The respondent objected to the admissibility of the opposition for the first time in appeal proceedings only at the very end of the oral proceedings after the substantive discussion of all requests. This had to be considered an extremely late amendment to the respondent's case which should not be admitted.

Furthermore, for the reasons given in the impugned decision, page 6, points 1 to 3, the requirements of Rule 76(1) and (2) EPC were fulfilled.

Even if, for the sake of the argument, a deficiency according to Rule 76(2) (a) in conjunction with Rule 41(2) (c) EPC was present, Rule 77(2) EPC required the opposition division to invite the opponent to remedy

the deficiency noted within a period to be specified. Without such an invitation by the opposition division or the Board, a rejection of the opposition in accordance with Rule 77(2) EPC was impossible. Clearly, the required invitation could not be replaced by an objection raised by the patent proprietor. To conclude, the opposition was admissible.

Admissibility of D9 and D10 in the proceedings

As correctly analysed in the Board's communication dated 7 July 2017, in accordance with Articles 12(2) and 12(4) RPBA, documents D9 and D10 were to be taken into account in the appeal proceedings.

Main request - lack of inventive step

Document D10 was a suitable closest prior art. It disclosed at least all the features of independent claim 1 apart from the provided blank being pre-sintered and having the particular strength of 53 to 107 MPa. This allowed fast machining of the bridge structure without breaking, thus solving the problem to provide easier and more efficient manufacture of the dental product. Document D9, which was explicitly referenced in D10, suggested, for easier and faster manufacture of a bridge structure, see page 59, first paragraph and page 59, right column ("L'usage avant frittage"), using pre-sintered blanks made from a green body of ceramic material. Although D9 did not specify the particular strength of the pre-sintered blanks, the criteria according to which the strength was to be chosen were clear: the blanks needed to be sufficiently strong to be machined without falling into small pieces, but soft enough to be easily subjected to a machining operation. With these criteria in mind, the

person skilled in the art would have no difficulty optimising the blank's strength, irrespective of whether a particular pre-published patent, such as D5, mentioned a different strength range.

Therefore, the subject-matter of claim 1 did not involve an inventive step.

Auxiliary requests 1, 1.1, 4, 4.1, 6 and 7 - lack of inventive step

With respect to auxiliary requests 1, 1.1, 4, 4.1, 6 and 7, their subject-matter also did not involve an inventive step.

The pre-sintered blank, which in D9 was suggested as allowing an easier manufacture of a bridge structure, was to be made from an isostatically pressed zirconium oxide, see page 58, right column, with a pre-sintering temperature of 1000°C, see page 59, first paragraph. Therefore, when considering the teaching of D9, the person skilled in the art would arrive at providing a pre-sintered blank having been made of a green body of zirconium oxide that had been isostatically pressed and wherein the pre-sintering of the green body was performed at a temperature in the range from 1000 °C to 1070 °C / in the range of 1000°C to below 1070°C. Nothing more was claimed in claim 1 of auxiliary request 1 and 1.1.

The narrower strength ranges of 53-74 MPa, 56-74 MPa and 56-65 MPa in claim 1 of auxiliary requests 4, 4.1, 6 and 7 respectively, were nothing more than a routine optimization of a single parameter according to obvious criteria. Thus, they could not establish the presence of an inventive step.

Auxiliary requests 2, 3, 3.1, 5 and 5.1 - clarity

Auxiliary requests 2, 3, 3.1, 5 and 5.1 comprised the feature of "...providing a pre-sintered blank, wherein the blank ... has been subjected to a pre-sintering heating operation in the sintering furnace at a rate of 0.1 to 1°C/minute to vaporise organic binder material...". As the claimed method started with the provision of the pre-sintered blank, the steps performed during manufacturing of said blank were not method steps of the claimed method, but only defined the blank in the sense of a product-by-process feature. While it may be correct, that a very high heating rate of the sintering furnace resulted in identifiable "bursts" in the structure of the pre-sintered blank, it was not clear how a differentiation between e.g. a heating rate of 0.1 and a slightly smaller heating rate could be made from the aspect of the provided blank.

The above mentioned product-by-process feature was thus unclear.

XVI. The essential arguments of the respondent can be summarised as follows:

Admissibility of the opposition

Contrary to the requirements of Rule 76(2) (a) in conjunction with Rule 41(2) (c) EPC, the appellant had not indicated in the notice of opposition the nationality of the opposing company. During oral proceedings in opposition, the respondent had brought this deficiency to the attention of the appellant, which was tantamount to an invitation to remedy said deficiency in accordance with Rule 77(2) EPC. As also

prescribed in said rule, because the deficiency was not remedied in due time, the opposition had to be rejected as inadmissible. The contrary decision of the opposition division in this respect was clearly erroneous. As a consequence, the decision taken by the opposition division had to be considered a "non-decision", such that the patent remained as granted.

Admittance of D9 and D10 in the proceedings

The appellant argued in the written proceedings that the decision to admit documents D9 and D10 into the proceedings was not logical and omitted points which would have had to be assessed if the opposition division had properly exercised its discretion. It therefore requested that the Board overturn the decision of the opposition division to admit documents D9 and D10 into the proceedings.

Main request - inventive step

The subject-matter of claim 1 differed from the disclosure of document D10 at least in the provision of a pre-sintered blank having a strength of 53 to 107 MPa. This allowed fast machining of the bridge structure without breaking, the machining operation working surprisingly better at a strength higher than the 31 to 50 MPa recommended in prior art D5, thus contributing to an effective machining operation and improving precision in the manufacturing process. Therefore, the problem to be solved was the provision of a method of producing a dental product with increased efficiency and accuracy.

This problem was not addressed in document D9, such that the person skilled in the art had no reason to consult its disclosure. Nor could the mention of D9

among several literature citations at the end of document D10 provide appropriate motivation for the person skilled in the art to do so. Document D10 alone provided a complete method of producing a dental product starting with green chalk-like blanks, from which the skilled person had no reason to depart. Indeed, they would have to assume that the relatively delicate milling tool used in the D10 method would not be capable of machining the higher strength pre-sintered blanks.

Furthermore, even if the disclosure of D9 were to be taken into account, to arrive within the claimed strength range, the person skilled in the art had to further rely on the common general knowledge, i.e. a second source of information. The necessity to combine two further sources of information was already a pointer towards the presence of an inventive step. Moreover, even if the common knowledge was taken into account for optimisation of the pre-sintered blank's strength, document D5, which suggested a strength value below 50 MPa, clearly taught away from the claimed range.

Thus, starting from prior art D10, the person skilled in the art would not have arrived at the subject-matter of claim 1.

Auxiliary requests 1, 1.1, 4, 4.1, 6 and 7 - inventive step

Claim 1 of auxiliary requests 1, 1.1, 4 and 4.1 further specified that the blank has been made of a green body of zirconium oxide that had been isostatically pressed and wherein the pre-sintering of the green body was performed at a temperature in the range from 1000°C to

1070°C or in the range of 1000°C to below 1070°C. As disclosed in the patent, column 5, line 50-55 and column 6, lines 20-24, this resulted in a uniform density and strength for the blanks. The problem to be solved was thus the provision of a method of producing a dental product from a blank having uniform density and strength. While D9 disclosed isostatically pressing and a pre-sintering temperature of 1000°C, this was not in the context of said problem. There was thus no pointer towards the solution of the problem posed, i.e. the person skilled in the art could have used isostatic pressurisation and a pre-sintering temperature of 1000°C, but would not have done so.

With respect to the further restricted strength ranges claimed in claim 1 of auxiliary requests 4, 4.1, 6 and 7, these contributed to a faster and more accurate production of the dental product having the particular delicate hub and spoke configuration claimed. In this context, it had to be kept in mind that the strength was not an inevitable consequence of an isostatic pressurisation and of a pre-sintering temperature within 1000°C - 1070°C. There were, indeed, several further parameters influencing the strength, such as the surface morphology or roundness of the ceramic powder particles. The interplay of such further parameters resulted in different strength values, which could not be reached by routine experiments. While the person skilled in the art was possibly capable of reaching a certain target pre-sintered strength, the prior art disclosure was void of any such target strength range. In particular in view of document D5 which discouraged use of strength values above 50 MPa, the person skilled in the art would not have sought to work in the specific ranges claimed.

Therefore, the subject-matter claimed in claim 1 of the remaining auxiliary requests involved an inventive step.

Auxiliary requests 2, 3, 3.1, 5 and 5.1 - clarity

The feature "providing a pre-sintered blank, wherein the blank ... has been subjected to a pre-sintering heating operation in the sintering furnace at a rate of 0.1 to 1°C/minute to vaporise organic binder material" had to be considered a specific step to be performed as part of the claimed method. However, even if it defined only something which had been done to the pre-sintered blanks prior to the claimed method, the specific heating rate claimed would have left identifiable characteristics on the pre-sintered blank. As discussed in column 3, lines 30-34 of the patent, the relatively slow heating rate gave the vaporised binder material time to leave the green body without any sudden bursts that could harm or deform the green body. This rate was significantly lower as in the prior art, see e.g. D4, paragraph [0016]. Whether or not the heating rate of a particular pre-sintered green body had been within the order of magnitude claimed could be determined by examination of the blank, the subject-matter was thus clearly defined.

Reasons for the Decision

1. Objection to the admissibility of the opposition

Admissibility of the opposition has been questioned by the respondent extremely late in the appeal proceedings. The point was raised for the first time at

the very end of the oral proceedings after all requests had been discussed in substance.

Moreover, the Board has reviewed the allegedly incorrect decision regarding admissibility of the opposition (points 1-3 of the impugned decision) without identifying a mistake from the opposition division's side.

With respect to the respondent's argument that the allegedly incorrect decision by the opposition division had to be considered a "non-decision", none of the conditions under which (exceptionally) a decision has to be considered non-existent (such as e.g. a decision taken by a non-appointed person) can be identified. When questioned by the Board, the only reason invoked by the respondent as leading to non-existence of the impugned decision, was the alleged substantive error by the opposition division regarding admissibility of the opposition according to Rule 76(2)(a) in conjunction with Rule 41(2)(c) EPC. However, even if the decision were incorrect in this respect, this would not make the decision *per se* "non-existent".

Finally, as discussed during the oral proceedings, an invitation by the opposition division (or the Board) in accordance with Rule 77(2) EPC is a (in the present case non-fulfilled) precondition for finding the opposition inadmissible under the above rule. This invitation cannot be replaced by an objection raised by the patent proprietor (now the respondent).

Hence, the objection of the respondent concerning the admissibility of the opposition must be dismissed, and the opposition remains to be considered admissible as

correctly held by the opposition division in the decision under appeal.

2. Admittance of D9 and D10 in the proceedings

D9 and D10 have been admitted into the proceedings by the opposition division in view of their *prima facie* relevance, as explained in point 18 of the decision. The Opposition Division took its decision taking into account the right principles and in a reasonable way.

Since the documents were again filed with the statement of grounds of appeal, in accordance with Articles 12(2) and 12(4) RPBA, they shall be taken into account by the Board. Hence, the respondent's request to overturn the decision of the opposition division to admit documents D9 and D10 into the proceedings has to be dismissed.

3. Main request - lack of inventive step

3.1 It is common ground that document D10 forms the closest prior art and discloses:

A method of producing a dental product ("bridge zircon", see Figures 27, 28), the method comprising the steps of providing a blank made from a green body of ceramic material (page 264, first sentence, "bloc de zircon TZP", and page 267, left column, 3d paragraph "zircon crue") performing a machining operation on the blank (page 267 "fraisage du bloc de zircon") and subsequently sintering the blank to its final density in a sintering operation performed at a temperature from 1300°C to 1650°C (page 264, left column, penultimate sentence: "frittage à 1500°C), wherein during the machining operation, the blank is transformed into a shape comprising a bridge structure

shaped to form an arch and a support body comprising a common hub that is located in the support body and is linked to the bridge structure by several retaining sections that extend as spokes from the hub to the bridge structure (page 270, Figure 27-29) and during the subsequent sintering step the blank stands on the support body (page 267, right column, penultimate sentence).

- 3.2 Consequently, the subject-matter of claim 1 differs from the disclosure of D10 in that the provided blank is pre-sintered and has a strength of 53-107 MPa.
- 3.3 According to the patent, pre-sintering results in the blank being sufficiently strong to be machined without falling into small pieces but yet being so soft that it can easily be subjected to a machining operation (patent, paragraph [0010]). Furthermore, blanks having a strength higher than 31-50 MPa and above were surprisingly found to "work better" (patent, paragraph [0012], lines 47-50) than the prior art blanks disclosed e.g. in D5. They are sufficiently solid to permit fast machining without breaking (patent, paragraph [0012], the sentence bridging columns 4 and 5), also improving precision in the manufacturing process (paragraph [0017], lines 17-20).
- 3.4 Thus, the problem to be solved may be formulated - as suggested by the respondent - as providing a method of producing a dental product with increased efficiency and accuracy.
- 3.5 Document D9 is an article dealing with the material zirconium oxide in general and in particular with its application for producing dental products, such as dental bridges. It is thus from the same field as D10.

The document is furthermore explicitly listed together with only two other citations as "suggested reading" at the end of D10. Therefore, the person skilled in the art would consult D9 when looking for a solution to the above defined problem.

Contrary to the respondent's view, D9 addresses the problem posed. On page 59, right column second paragraph ("L'usinage avant frittage"), it is mentioned that machining of the (pre-sintered) blank before the (final) sintering operation is cheaper ("moins onéreux") and much faster, with less tool wear and machine fatigue. Furthermore, page 59, first column, first paragraph ("permettant un usinage aisé") discloses that pre-sintering gives the blank sufficient solidity (i.e. no breaking away of parts of the structure and thus increased accuracy with respect to machining of green blanks) and allows easier machining. Consequently, for solving the problem of more efficient and accurate dental product manufacture, the person skilled in the art would be motivated to consult the disclosure of D9.

It is further noted that the skilled person is constantly seeking to improve efficiency even in an already satisfactory process. The fact that D10 discloses a complete, well-functioning method would thus not prevent the person skilled in the art from striving for higher efficiency. As D10 does not teach away from the use of pre-sintered blanks there is no reason not to consider methods using such blanks. Indeed, the technical problem to increase efficiency alone prompts the consultation and implementation of the teaching of D9, which explicitly promises faster and easier manufacturing (D9, the passages on page 59,

first column, first paragraph and second column, second paragraph).

3.6 The respondent has argued that the person skilled in the art would consider the D10 milling tool (the Zirkonzahn pantograph) as being not sufficiently robust to machine the stronger pre-sintered blanks and thus would disregard the respective teaching of D9. The Board sees no basis for this assertion, partly because the witness Mr. Tratter (page 15, middle paragraph of the witness testimony) in the opposition proceedings had confirmed that the apparatus was in fact used with pre-sintered blanks, and partly because the respondent explicitly emphasized during the oral proceedings that he had not said that the milling tool was *de facto* not suitable, but only that the skilled person would assume it to be unsuitable.

3.7 As a solution to the problem, D9 suggests the use of blanks having been pre-sintered at around 1000°C (page 59, first column first complete sentence).

D9 is, however, silent on the particular strength of the blank. The Board agrees with the respondent and the opposition division, that because of further parameters having an influence on the strength of a pre-sintered blank, the pre-sintering disclosed in D9, while at a temperature within the claimed range, does not implicitly result in a strength value within the claimed range.

3.8 Still, the blank pre-sintered according to D9 will have a certain strength. The criteria according to which the strength is to be selected, i.e. sufficient strength for machining but not too much to allow faster and easier manufacturing, are well-known to the person

skilled in the art and explicitly mentioned in D9 (page 59, first column, first paragraph and second column, second paragraph). They are the very same as in the patent (see paragraph [0010], first sentence).

As the bridge structure of D10 requires machining of a dental product comprising the same hub, spoke and bridge configuration as claimed, optimization (i.e. increasing or decreasing the strength as needed) of the pre-sintered blank's strength for this very same machining task, according to the same criteria (quick machining, sufficient strength, suitable for milling retaining sections of sufficient strength) will lead the skilled person in an obvious way, by using routine experiments, to select the same target strength, even the most preferred range, as claimed.

It is further noted that - contrary to the respondent's belief - the common general knowledge is not a separate second disclosure, which needs to be consulted by the skilled person in an additional step, but something of which the skilled person is aware when trying to solve a particular problem posed, just as e.g. the skilled person is able to perform routine experimentation.

Moreover, the mentioning of a preferred strength range in a single patent document (as D5) does not plausibly justify an alleged technical prejudice in the art against experimenting in the claimed strength ranges.

As also accepted by the respondent during the oral proceedings, it is within the skilled person's common general knowledge to provide the pre-sintered blanks with an increased or decreased strength in order to reach a certain target strength if needed. Indeed, if

that were not the case, sufficiency of disclosure of the patent itself would be jeopardised.

Hence, the person skilled in the art would not only select the claimed target strength in an obvious way but also be able to realise a pre-sintered blank with said strength.

Thus, the subject-matter of claim 1 of the main request does not involve an inventive step.

4. Auxiliary requests 1, 1.1, 4, 4.1, 6 and 7 - lack of inventive step

4.1 Auxiliary requests 1 and 1.1 specify the blank being isostatically pressed and wherein pre-sintering of the green body is performed at a temperature in the range of from 1000 °C to 1070°C (auxiliary request 1) or in the range of 1000°C to below 1070°C (auxiliary request 1.1).

These features uncontestedly are not disclosed in D10. Their effect is, according to paragraph [0017], lines 20-27, to obtain a more uniform density and strength for the blanks. While the uniform density makes it easier to calculate shrinking in advance, uniform strength allows for reliable properties of the blank upon machining the delicate structures of the hub/spokes/bridge containing structure. Whereas the second effect essentially contributes to the solution of the problem defined in point 3.4 above, the first effect (i.e. easier calculation of shrinking in advance) might be considered a further advantageous effect.

However, in order to solve the technical problem defined in point 3.4 (which, in view of the still present differentiating features identified before -

see point 3.2 - and in view of the second effect just mentioned, is still a valid technical problem), the person skilled in the art is already taught by D9 to use blanks made of a green body of zirconium oxide that has been isostatically pressed and wherein the pre-sintering of the green body is performed at a temperature in the range of (from) 1000°C to (below) 1070°C (D9, page 58, right column and page 59, left column, lines 2-7). Thus, in solving the problem defined in point 3.4, the person skilled in the art would already have used a pre-sintered blank with more uniform density and easier calculable shrinking properties in the production method. As said additional advantageous effect - even if by itself being possibly unexpected - arises in an obvious way when combining prior art disclosures D10 and D9, it cannot establish an inventive step ("bonus effect").

Thus claim 1 of auxiliary requests 1 and 1.1 does not involve an inventive step.

- 4.2 Auxiliary requests 4, 4.1, 6 and 7: the narrower strength ranges of 53-74 MPa, 56-74 MPa and 56-65 MPa

The respective arguments have been discussed in the context of the main request, see in particular point 3.8 above, where it has been explained that a selection of even the most preferred ranges was obvious.

Hence, they do not involve an inventive step either.

5. Auxiliary requests 2, 3, 3.1, 5 and 5.1 - clarity

Claim 1 of these requests defines the method step as "providing a pre-sintered blank, ... wherein the blank has been made of a green body of zirconium oxide that

has been isostatically pressed and subjected to a pre-sintering heating operation in the sintering furnace at a rate of 0.1 to 1°C/minute to vaporize organic binder material, ...".

As this amendment is not based on a granted dependent claim, but taken from the description, its clarity has to be examined in accordance with G 3/14 (OJ 2015, 102).

The use of the present perfect passive in the claim wording ("has been subjected to") establishes that the pre-sintering is something which has been done to the green body before the start of the claimed method, i.e. before the claimed step of "providing a pre-sintered blank". In other words, the amendment to be considered does not define an activity but a "product-by-process" feature of the blank provided at the beginning of the claimed method.

In order to decide whether the method step of providing such a pre-sintered blank was present or not, the skilled person would have to decide whether the blank provided could be obtained by pre-sintering in the sintering furnace at a rate of 0.1 to 1°C/minute or not. In this context, the patent teaches in column 3, lines 30-34, that the relatively slow heating rate leaves the green body without any sudden bursts that could harm or deform the green body. While it may thus be possible to recognize a considerably higher heating rate from several bursts in the blank's structure, the Board is not persuaded that a differentiation between a heating rate of e.g. 0.9 and 1.1, or 0.04 and 0.1 could be made by examination of the pre-sintered blank. Contrary to the respondent's view, the claim does not define an order of magnitude, but a range with sharp

cut-off values, for which it has not been shown that they correspond to sharp transitions in the pre-sintered blanks structure. Therefore, the amended feature does not allow the subject-matter claimed to be clearly defined.

Therefore, claim 1 of auxiliary requests 2, 3, 3.1, 5 and 5.1 does not fulfil the requirements of Article 84 EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:



C. Moser

M. Alvazzi Delfrate

Decision electronically authenticated