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

Case Number: T 0351/12 - 3.2.05

Application Number: 05017981.1

Publication Number: 1630463

IPC: F16J15/34, F04D29/12

Language of the proceedings: EN

Title of invention:
Mechanical seal device

Patent Proprietor:
Eagle Industry Co., Ltd.

Opponents:
Kaco GmbH & Co. KG
3M Deutschland GmbH

Headword:

Relevant legal provisions:
EPC 1973 Art. 54(1), 54(2), 84
EPC Art. 123(2)
EPC R. 116
RPBA Art. 12(4), 13(1)

Keyword:

Auxiliary requests - submitted with the statement of grounds of appeal - auxiliary requests I, II, IV, V (admitted)
Auxiliary requests - amendments after arrangement of oral proceedings - auxiliary requests Va, VII (admitted)
Auxiliary requests - amendments during oral proceedings - auxiliary request III (not admitted)
Novelty - main request (no)
Novelty - auxiliary request VII (no)
Amendments - added subject-matter - auxiliary requests I, II (yes)
Amendments - undisclosed disclaimer - added subject-matter - auxiliary request IV (yes)
Claims - clarity - auxiliary requests V, Va (no)

Decisions cited:

G 0007/93, G 0001/03, G 0002/10, T 0971/11, T 0556/13,
T 0437/14

Catchword:



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Case Number: T 0351/12 - 3.2.05

D E C I S I O N
of Technical Board of Appeal 3.2.05
of 30 May 2017

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Decision under appeal:

**Decision of the Opposition Division of the
European Patent Office posted on 13 December
2011 revoking European patent No. 1630463
pursuant to Article 101(3) (b) EPC.**

Composition of the Board:

Chairman	M. Pooock
Members:	P. Lanz
	J. Geschwind

Summary of Facts and Submissions

- I. The appeal by the patent proprietor is against the decision of the opposition division to revoke European patent EP-B-1 603 463 since the subject-matter of the claims lacked novelty.
- II. During the opposition proceedings, the opponents had raised the grounds for opposition according to Article 100(a) (lack of novelty and lack of inventive step) and (b) EPC 1973.
- III. Oral proceedings were held before the board of appeal on 30 May 2017.
- IV. The appellant (patent proprietor) requested that the decision under appeal be set aside and that the patent be maintained as granted (main request) or, in the alternative, on the basis of any of the sets of claims filed as auxiliary requests I, II, IV or V with letter of 17 April 2012, or as auxiliary request III filed during the oral proceedings, or as auxiliary requests Va or VII filed with letter of 17 May 2017.
- V. Respondents I and II (opponents 1 and 2) requested that the appeal be dismissed.
- VI. The following document was, *inter alia*, referred to during the appeal proceedings:

D1: US 5 707 065

VII. Independent claim 1 as granted (main request) has the following wording:

"A mechanical seal device for sealing a fluid by bringing a first seal sliding element (2) and a second seal sliding element (4) into abutment, wherein said first seal sliding element (2) is a seal sliding element having silicon carbide as a substrate and containing carbon and said second seal sliding element (4) is a seal sliding element containing silicon carbide as its main ingredient and having 5 to 200 μm size pores independently dispersed in it, characterised in that said carbon is contained in said first seal sliding element (2) in a state dispersed in said silicon carbide substrate."

VIII. Compared with the main request, independent claim 1 of auxiliary request I contains the following additional feature:

"the second seal sliding element (4) being made of a material different from that of the first seal sliding element (2)"

IX. Compared with the main request, independent claim 1 of auxiliary request II contains following addition (underlined):

"said second seal sliding element (4) is a seal sliding element containing silicon carbide as its main ingredient, and only said second seal sliding element ~~has~~ ~~having~~ 5 to 200 μm size pores independently dispersed in it"

- X. Compared with auxiliary request II, the characterising portion of independent claim 1 of auxiliary request III is amended as follows (underlined):

"characterised in that said carbon is contained in said first seal sliding element (2) in a state dispersed in said silicon carbide substrate, and only said first seal sliding element (2) contains carbon."

- XI. Compared with the main request, independent claim 1 of auxiliary request IV contains the following additional features:

"said first seal sliding element (2) has a Vicker's hardness of 300 to 3000 and an apparent specific gravity of 2.0 to 3.2, said second seal sliding element (4) has a Vicker's hardness of 2000 to 3000 and an apparent specific gravity of 2.7 to 3.2, and combinations in which said first and second seal sliding elements have the same material composition are excluded."

- XII. Compared with the main request, independent claim 1 of auxiliary request V contains the following additional features:

"said first seal sliding element (2) has a Vicker's hardness of 300 to 3000 and an apparent specific gravity of 2.0 to 3.2, said second seal sliding element (4) has a Vicker's hardness of 2000 to 3000 and an apparent specific gravity of 2.7 to 3.2, said first seal sliding element is an element obtained by mixing silicon carbide crystal powder, carbon powder, various binder resins, and, in accordance with need, a sintering aid with a water-soluble solvent using a ball mill and the like, then forming the obtained mixture

into granules using a spray dryer and the like, forming the obtained granules into a desired shape, and firing the obtained shaped article, said second seal sliding element is an element obtained by mixing silicon carbide crystal powder and various binder resins and, in accordance with need, other compounds using a water-based solvent, forming this mixed solution into granules using a spray dryer and the like, mixing these granules with a predetermined amount of resin granules having an average grain size of 40 to 60 μm or so, forming this mixed powder into a desired shape, and firing that shaped article in vacuum or an inert atmosphere to carburize the binder resin and at the same time thermally break up and disperse the 40 to 60 μm or so resin granules to form pores, and after this, continuing to fire the shaped article at a predetermined temperature."

XIII. Compared with auxiliary request V, independent claim 1 of auxiliary request Va is amended as follows:

"[...] using a ball mill~~and the like~~, then forming the obtained mixture into granules using a spray dryer~~and the like~~, [...], forming this mixed solution into granules using a spray dryer~~and the like~~, mixing these granules with a predetermined amount of resin granules having an average grain size of 40 to 60 μm ~~or so~~, forming this mixed powder into a ~~desired shape~~ shaped article, and firing that shaped article in vacuum or an inert atmosphere to carburize the binder resin and at the same time thermally break up and disperse the 40 to 60 μm ~~or so~~ resin granules to form pores, and after this, continuing to fire the shaped article at a predetermined temperature."

XIV. Compared with the main request, independent claim 1 of auxiliary request VII contains the following additional features:

"said carbon being artificial or natural graphite, other graphitic carbon, carbon black, a phenolic resin, epoxy resin carburized to obtain resin charcoal, charcoal, or other carbonaceous materials or a combination of two or more of these types of carbon, said first seal sliding element (2) has an area ratio of carbon of 0.4 to 80%, said first seal sliding element (2) has a content of carbon of 0.1 to 30 wt% with respect to said first seal sliding element (2) as a whole, said first seal sliding element (2) has a Vicker's hardness of 300 to 3000 and an apparent specific gravity of 2.0 to 3.2, said second seal sliding element (4) has a porosity of said pores of 3 to 20 vol%, and said second seal sliding element (4) has a Vicker's hardness of 2000 to 3000 and an apparent specific gravity of 2.7 to 3.2."

XV. The appellant's submissions may be summarised as follows:

Main request - novelty

The wording of claim 1 defined different properties for the first and second seal sliding elements (the first seal sliding element containing carbon, the second seal sliding element having pores), which implied that the first and second seal sliding elements were different from each other. Since this implicit feature was not present in document D1, the subject-matter of claim 1 as granted was novel.

Auxiliary requests - admissibility

Auxiliary requests I and II had already been presented during the first-instance proceedings. Hence, they did not constitute new submissions. In view of that, the respondents were familiar with their content. Auxiliary request III was filed in reaction to the discussions during the oral proceedings before the board of appeal. The contested feature in auxiliary request III should be read as meaning that only the first seal sliding element contained dispersed carbon. Regarding the admissibility of the further auxiliary requests, no objections were raised, so that it was justified to admit all auxiliary requests on file into the appeal proceedings.

Auxiliary request I - added subject-matter

Regarding the materials of the first and second seal sliding elements, the original independent claim covered the two possibilities that the materials of both elements were identical or not. Claim 1 of auxiliary request I was limited to the first possibility and defined that the first and second seal sliding elements were made of materials different from each other. This was in accordance with the teaching in the application as filed, where all the examples according to the invention were realised with first and second seal sliding elements made of materials different from each other, while seals with seal sliding elements made of identical materials were only disclosed in the comparative examples. The requirements of Article 123(2) EPC were thus met.

Auxiliary request II - added subject-matter

The subject-matter of claim 1 of auxiliary request II was covered by original claim 1 as originally filed. Moreover, the fact that there was no information in the application as filed that the first seal sliding element had pores necessarily meant that only the second seal sliding element contained pores. This understanding was supported by the fact that in comparative example 2, which was not according to the invention, the first seal sliding element had pores. Hence, the requirements of Article 123(2) EPC were fulfilled.

Auxiliary request IV - added subject-matter

Original claims 6 and 8 and the (comparative) examples of Tables 1 to 3 and 6 of the application as filed provided a sufficient basis for the amendment of claim 1. Moreover, the reasons provided in view of Article 123(2) EPC in the context of auxiliary request I equally applied to claim 1 of auxiliary request IV. Even if the last feature of the claim were to be considered an undisclosed disclaimer, claim 1 would be allowable according to decision G 1/03, since the addition of the disclaimer served to restore novelty over the accidental disclosure of document D1. A stay of the opposition proceedings in view of the pending referral G 1/16 was not necessary.

Auxiliary requests V and Va - clarity

The process steps of a product-by-process claim were required to imply structural features which could clearly define the claimed product. This criterion was

met since the use of a ball mill implied that the cited components were mixed and crushed. Whether this was achieved with a ball mill or a similar apparatus was not relevant for defining the claimed product. The same reasoning applied to the use of a water-soluble solvent.

Auxiliary request VII - novelty

Compared with the main request, claim 1 of auxiliary request VII was limited by further specifying the material properties of the seal sliding elements. In particular, the claimed Vickers hardness and the area ratio of carbon were not known from document D1.

XVI. The respondents argued essentially as follows:

Main request - novelty

The subject-matter of claim 1 as granted was not novel over document D1, which disclosed a seal sliding element comprising a ring having silicon carbide as a substrate (cf. D1, column 1, lines 59 to 62) and containing carbon (cf. D1, column 2, lines 1 to 4) in a state dispersed in said silicon carbide substrate (implied by the manufacturing method of the ring of document D1). The same ring also contained silicon carbide as its main ingredient (see D1, column 1, lines 59 to 62) and had pores with a size of 5 to 200 μm independently dispersed in it (see D1, column 2, lines 17 to 25). Finally, document D1 suggested (cf. column 3, lines 43 to 45) that it was possible to use a packing in which the two rings each comprised the sintered shaped body, thereby obtaining a mechanical seal device for sealing a fluid formed by bringing a first and a second identical seal sliding element into

abutment. The wording of claim 1 as granted did not require the first and second seal sliding elements to have a different composition. Consequently, its subject-matter was not novel over document D1.

Auxiliary requests - admissibility

It had to be borne in mind that auxiliary requests I and II were presented for the first time during the oral proceedings before the opposition division and then only after the main request had been considered unallowable. Due to their late filing, the opposition division correctly decided not to admit these requests. In fact, the patent proprietor should have filed these auxiliary requests, which it had already prepared in advance, at the beginning of the first-instance oral proceedings at the latest. In view of this course of action, the opposition division's decision on the inadmissibility of auxiliary requests I and II was justified. It should not be overturned by the board. Auxiliary request III, which was filed during the oral proceedings before the board, lacked clarity and introduced further problems of added subject-matter, in particular in view of the feature that only the first seal sliding element contains carbon. Moreover, this request was filed at the latest possible point in time and diverged from the previously filed requests. It should therefore not be admitted. The admissibility of the further auxiliary requests on file was not objected to.

Auxiliary request I - added subject-matter

The application as filed was directed to a specific material pairing (i.e. silicon carbide containing carbon combined with silicon carbide containing pores).

In view of that, the subject-matter of claim 1 referring to the materials as being merely "different" was an unallowable generalisation. The requirements of Article 123(2) EPC were thus not met.

Auxiliary request II - added subject-matter

The claim wording that only the second seal sliding element contained pores was not originally disclosed. This amendment constituted an unallowable generalisation of the examples in the application as filed, in view of which the provisions of Article 123(2) EPC were not fulfilled.

Auxiliary request IV - added subject-matter

The wording of the disclaimer had no basis in the application as filed. It therefore had to be qualified as an undisclosed disclaimer. Moreover, the restriction caused by the disclaimer corresponded to the limitation added in auxiliary request I. Consequently, the remaining subject-matter of claim 1 was not originally disclosed. Document D1 did not constitute an accidental disclosure since it belonged to the same technical field as the invention. The disclaimer was also relevant for inventive step and therefore not allowable. A stay of the opposition proceedings in view of the pending referral G 1/16 was not necessary since the criteria of none of the decisions G 1/03 and G 2/10 were met.

Auxiliary request V and Va - added subject-matter

The claimed process steps did not imply clear structural features for defining the subject-matter claimed. Claim 1 contained intermediate process steps,

which were not reflected in structural features of the seal forming the object of the claim (e.g. using a ball mill in a mixing step, water-soluble solvent being contained in a sintering aid, spray-drying the granules, etc.). Furthermore, the claimed sealing device could and should be defined by its structural product features. Claim 1 according to auxiliary requests V and Va was therefore not clear.

Auxiliary request VII - novelty

The subject-matter of claim 1 was not novel over document D1. Regarding the carbon, the list added to the claim contained all possible kinds of carbon. Moreover, document D1 mentioned elemental carbon (claim 12) including graphite (examples 1 and 2) with the now-claimed content. The fact that the carbon was dispersed was a result of the production process, which did not differ from the one known from document D1. Since the types of carbon, its dispersed state and the carbon content were the same as in document D1, also the claimed area ratio was inherently present in document D1. The same was true for the hardness, which was an inherent property of the material composition. The apparent specific gravity of both seal sliding elements was mentioned in the table in column 4, lines 30 to 40 of document D1. Finally, the porosity was disclosed in document D1, column 1, line 49 and claim 1 of document D1. The subject-matter of claim 1 of auxiliary request VII thus lacked novelty.

Reasons for the Decision

1. Main request - novelty

1.1 Claim interpretation

Regarding the issue of novelty of the subject-matter of claim 1, the parties are in dispute on whether or not the claim requires that the first and second sliding elements have compositions different from each other.

The board notes that the contested passage of claim 1

"... said first seal sliding element (2) is a seal sliding element having silicon carbide as a substrate and containing carbon and said second seal sliding element (4) is a seal sliding element containing silicon carbide as its main ingredient and having 5 to 200 μm size pores independently dispersed in it, characterised in that said carbon is contained in said first seal sliding element (2) in a state dispersed in said silicon carbide substrate."

defines characteristics of the first and second seal sliding elements respectively. However, since these characteristics are not mutually exclusive, the present claim wording does not necessarily imply that the first and second seal sliding elements are different from each other.

The board therefore concludes that the wording of claim 1 as granted does not require that the first and second sliding elements have a different composition.

1.2 Novelty in view of document D1

1.2.1 It is generally undisputed that document D1 discloses a seal sliding element comprising a ring having silicon carbide as a substrate (cf. D1, column 1, lines 59 to 62) and containing carbon (cf. D1, column 2, lines 1 to 4) in a state dispersed in said silicon carbide substrate (implied by the manufacturing method of the ring of document D1). The same ring also contains silicon carbide as its main ingredient (see D1, column 1, lines 59 to 62) and has pores with a size of 5 to 200 μm independently dispersed in it (see D1, column 2, lines 17 to 25). Finally, document D1 suggests (cf. column 3, lines 43 to 45) that it is possible to use a packing in which the two rings each comprise the sintered shaped body, thereby obtaining a mechanical seal device for sealing a fluid formed by bringing a first and a second identical seal sliding elements into abutment.

1.2.2 While the appellant does not challenge the above assessment of the content of document D1, it stresses that the wording of the contested claim implied that the first and second seal sliding elements were different from each other and that this implicit feature was not present in document D1.

1.2.3 As stated in point 1.1, the board does not share the appellant's view that the wording of the claim implied that the first and second seal sliding element were necessarily different from each other. Hence, this aspect cannot distinguish the subject-matter of claim 1 from the content of document D1.

It has to be concluded that the subject-matter of claim 1 of the main request lacks novelty (Article 54(1) and (2) EPC 1973).

2. *Auxiliary requests - admissibility*

2.1 General

The admissibility of submissions filed at appeal stage is governed by the Rules of Procedure of the Boards of Appeal (RPBA). These provisions distinguish between, on the one hand, submissions (re-)filed at the outset of the appeal proceedings in the statement of grounds of appeal or the respondent's reply to the appeal (cf. Article 12(1), (2) and (4) RPBA) and, on the other hand, amendments to a party's appeal case filed at a later stage (cf. Article 13(1) and (3) RPBA).

2.2 Auxiliary requests I and II

2.2.1 Auxiliary request I and II were filed for the first time during the oral proceedings before the opposition division but not admitted then. The appellant re-filed these requests together with the statement setting out the grounds of appeal; their admissibility under Article 12(4) RPBA is disputed by the parties.

2.2.2 Turning to the first-instance proceedings, it is indisputably at the opposition division's discretion under Rule 116 EPC not to admit late-filed amended claim requests presented for the first time during the oral proceedings. Such discretionary power necessarily implies that the EPO department of first instance has a certain degree of freedom in exercising its power (cf. G 7/93, OJ EPO 1994, 775). In general, a board of appeal should only overrule the way in which a

department of first instance has exercised its discretion when deciding on a particular case if it concludes that it has done so according to the wrong principles or without taking into account the right principles or in an unreasonable way. This principle also applies to first-instance decisions on the admission of late-filed claim amendments. It is generally not the function of a board of appeal to review all the facts and circumstances of the case as if it were in the place of the department of first instance, in order to decide whether or not it would have exercised such discretion in the same way.

2.2.3 In the present case, the patent proprietor/appellant filed auxiliary requests I and II during the oral proceedings before the opposition division. According to the impugned decision (cf. point 14.2 of the Reasons), the opposition division not only took into account that the auxiliary requests were filed "extremely late", but also examined their *prima facie* allowability. It came to the conclusion that auxiliary requests I and II *prima facie* failed to meet the requirements of Article 123(2) EPC and were thus not clearly allowable. Hence, the opposition division based its discretionary decision not to admit auxiliary requests I and II into the proceedings on the established principles and did not act in an unreasonable way. Under these circumstances, the board sees no reason to overrule the way in which the department of first instance exercised its discretion under Rule 116 EPC not to admit auxiliary requests I and II.

2.2.4 Together with its statement setting out the grounds of appeal, the appellant re-submitted auxiliary requests I and II. Under Article 12(4) RPBA, the board had its own

discretionary power to hold auxiliary requests I and II inadmissible (cf. also T 556/13, Reasons 2.1.7).

According to established case law, amendments, including amended requests, filed at the outset of the appeal proceedings are usually admitted into appeal proceedings if they can, under the particular circumstances, be considered an appropriate and immediate reaction of a losing party (cf. cases cited in Case Law of the Boards of Appeal of the European Patent Office, 8th Edition, 2016, IV.E.4.3.2e)). Where an appellant challenges a finding in the impugned decision concerning the non-admission of an amended claim request by bringing forward further related submissions, the board must hence establish whether these submissions can be considered an appropriate and immediate reaction to developments in the first-instance proceedings and to this aspect of the appealed decision. When exercising its discretion under Article 12(4) RPBA, the board has to give due consideration to the appellant's additional submissions. Moreover, in the judgement of the board, a submission which would have been admitted into appeal proceedings if it had been filed for the first time at the outset of those proceedings should not be held inadmissible for the sole reason that it was already filed before the department of first instance (and not admitted) (cf. also T 971/11, Reasons 1.3).

- 2.2.5 Applying these principles to the case at hand, it is noted that in an annex to the summons for oral proceedings dated 29 July 2011, the opposition division provisionally evaluated the case and came to the conclusion that the disclosure of the claimed invention was sufficient, that the subject-matter of claim 1 was novel in view of the documents on file and that it did

not find the opponents' submissions on inventive step convincing. Hence, the opposition division's communication did not give cause for the patent proprietor/appellant to file auxiliary requests I and II in advance of the oral proceedings before the opposition division. It appears from the file that it was only in the light of the discussions during the oral proceedings that the division changed its view and found the subject-matter of claim 1 to lack novelty in view of document D1 (cf. appealed decision, point 13 of the Reasons). The patent proprietor/appellant reacted by submitting present auxiliary requests I and II, which were then not admitted by the opposition division.

Re-submitting these requests at the beginning of the appeal proceedings and at the same time challenging the opposition division's substantive assessment of Article 123(2) EPC, which was detrimental for the non-admission of the contested auxiliary requests, can be considered to be an immediate and appropriate reaction to developments in the last phase of the opposition proceedings and to the appealed decision, and more particularly to be an attempt by the patent proprietor/appellant to fill gaps in its arguments which only became apparent during the oral proceedings before the opposition division. The fact that it did already file present auxiliary requests I and II during the oral proceedings so that they could possibly be considered by the department of first instance, instead of holding them back in order to submit them only at the appeal stage, was neither detrimental to procedural economy nor a disadvantage to the respondents (or the board) and is thus not to be held against the appellant pursuant to Article 12(4) RPBA. Moreover, the board would be in a position to review the contested findings

of the opposition division on added subject-matter only if auxiliary requests I and II were to be taken into account in the appeal proceedings.

In these particular circumstances, the board concludes that auxiliary requests I and II are not to be held inadmissible under Article 12(4) RPBA. Consequently, they are admitted into the proceedings.

2.3 Auxiliary request III

2.3.1 Auxiliary request III was filed during the oral proceedings before the board. It constitutes an amendment to the appellant's case, the admissibility of which has to be judged on the basis of Article 13(1) and (3) RPBA. The criteria listed in Article 13(1) RPBA for the board to exercise its discretion include the complexity of the new subject-matter, the current state of the proceedings and the need for procedural economy.

2.3.2 In that respect, the board observes that auxiliary request III was filed in the course of the second-instance oral proceedings, i.e. at the latest possible moment. As to the substance, the newly introduced feature of claim 1 that *"only said first seal siling element (2) contains carbon"* goes beyond the application as filed, which does not disclose that the second seal siling element is free of carbon. Rather the contrary is the case, since the second seal sliding element is consistently presented as having silicon carbide as its main ingredient, which, in turn, contains carbon. In view of the unambiguous wording of the contested amendment, this *prima facie* assessment is not altered by the appellant's argument that the feature *"only said first seal siling element (2) contains carbon"* should be understood as *"only said*

first seal siling element (2) contains dispersed carbon". In fact, this argument potentially raises additional questions on the clarity of the late-filed claim amendment. The board concludes that auxiliary request III filed during the oral proceedings is not *prima facie* allowable and complicates the proceedings by raising further issues. It is thus not consistent with the need for procedural economy.

In the light of the above, auxiliary request III is not admitted into the proceedings pursuant to Article 13(1) RPBA.

2.4 Auxiliary requests IV and V

Auxiliary requests IV and V were submitted for the first time together with the statement setting out the grounds of appeal. Under Article 12(4) RPBA, the non-admission of these requests is at the board's discretion. In exercising its discretion, the board takes into account that the admissibility of the auxiliary requests IV and V is not controversial between the parties. Moreover, in view of the course of the opposition proceedings as summarised in point 2.2.5 above, the filing of auxiliary requests IV and V at the beginning of the appeal proceedings has to be qualified as an immediate and appropriate reaction by the appellant to developments in the first-instance oral proceedings and to the appealed decision. For these reasons, auxiliary requests IV and V are admitted into the proceedings pursuant to Article 12(4) RPBA.

2.5 Auxiliary requests Va and VII

Auxiliary requests Va and VII were filed in reaction to the board's preliminary assessment of the case in

preparation of the oral proceedings. Hence, Article 13(1) and (3) RPBA is the legal basis for deciding on their admissibility. In this regard, the respondents do not raise any objections. The board agrees that the amendments introduced in auxiliary requests Va and VII are merely formal and without consequence for procedural economy.

For these reasons, auxiliary requests Va and VII are admitted into the proceedings pursuant to Article 13(1) RPBA.

3. *Auxiliary request I - added subject-matter*

3.1 In claim 1 of auxiliary request I the feature that

"the second seal sliding element (4) being made of a material different from that of the first seal sliding element (2)"

is added. It is disputed between the parties whether the addition of this feature extends the subject-matter claimed beyond the content of the originally filed application.

3.2 It is first noted that the added wording is not explicitly disclosed in the application as filed. Hence, it has to be assessed whether or not the contested feature can be implicitly but unambiguously derived from the original application as a whole. In that respect, reference is made to the introductory portion of the application underlying the contested patent (cf. paragraphs [0008] and [0009]), which presents the invention in general terms as follows:

"The present invention was made in consideration of the above problems and has as its object the provision of a mechanical seal device superior in durability and dry running wear resistance, preventing seizing or wear of the seal sliding elements, and effectively suppressing squeaking at the time of sliding.

The inventors discovered that the object can be achieved by using as one seal sliding element a seal sliding element having silicon carbide as a substrate and containing carbon and using as the other (facing) seal sliding element a porous seal sliding element containing silicon carbide as its main ingredient and thereby completed the present invention."

In the specific description (cf. paragraphs [0029] to [0040]) and the only example (cf. paragraphs [0044] to [0047]), more information is given on the composition and material properties for each of the two seal sliding elements. Additionally, paragraphs [0072] and [0073] of the original application documents relate to the selection of materials for the seal sliding elements (emphasis added by the board):

"Further, Comparative Example 3 using as the seal ring and mating ring graphite dispersed silicon carbide was susceptible to squeaking. Note that from the results of Comparative Example 3, it could be confirmed that when using graphite dispersed silicon carbide for both of the seal ring and mating ring, squeaking occurred more easily and the effects of the present invention could not be obtained.

Therefore, from these results, it could be confirmed that by using in combination a graphite (carbon) dispersed silicon carbide seal ring and a porous

silicon carbide mating ring, a mechanical seal device superior in durability and dry running wear resistance, preventing seizing and wear of the seal sliding element, and effectively suppressing squeaking at the time of sliding can be obtained."

Hence, it is the clear and unambiguous teaching of the application as originally filed that the technical contribution by the inventors resides in a specifically chosen material combination in a mechanical sealing device. However, the proposed amendment generally refers to the materials of the first and second seal sliding elements as being different. It does therefore not properly reflect the specific original disclosure as explained above. Regarding the appellant's argument that the originally claimed subject-matter consisted of only two alternatives regarding the materials of the two seal sliding elements (i.e. same or different materials), and that the amendment merely excluded the first alternative, the board observes that any addition of a restricting claim feature has the effect of excluding subject-matter from the scope of the claim. It follows that the question of whether or not an added feature limits the claim is, taken in isolation, not necessarily an appropriate criterion for applying the provisions of Article 123(2) EPC. Moreover, the remaining second alternative, in fact, covers a multitude of possible compositions which go beyond the teaching of the application as filed. It follows from these considerations that, due to the feature of the second seal sliding element being made of a material different from that of the first seal sliding element, amended claim 1 extends beyond the content of the original patent application.

The subject-matter of claim 1 according to auxiliary request I does not meet the requirements of Article 123(2) EPC.

4. *Auxiliary request II - added subject-matter*

4.1 Claim 1 of auxiliary request II specifies that

"only said second seal sliding element has 5 to 200 μm size pores independently dispersed in it".

While the appellant essentially submits that this limitation was covered by the original claims and was therefore allowable, the respondents miss a clear basis for the amendment in the application as filed.

4.2 As explained above in the context of auxiliary request I, the teaching in the original application regarding the choice of materials for the seal sliding elements is specific. Since the restriction introduced in auxiliary request II goes beyond this original disclosure, this auxiliary request violates the requirements of Article 123(2) EPC essentially for the same reasons as set out above for auxiliary request I. In view of the appellant's submission it is additionally observed that the fact that there is no information in the application as filed on the first seal sliding element having pores does not necessarily imply that only the second seal sliding element contains pores. Regarding the appellant's reference to the comparative examples, it is noted that these cannot provide a clear basis for the contested amendment either since they do not define the invention and because they do not provide a positive and consistent disclosure regarding the claimed pores: Comparative example 1 mentions pores only in the context of the

first seal sliding element, in comparative example 2 both seal sliding elements have pores and in comparative example 3 pores are not mentioned at all. Finally, above-cited paragraphs [0072] and [0073] of the original application are equally silent on the presence of pores in the first seal sliding element. Hence, in the original application documents no clear and unambiguous disclosure, be it explicit or implicit, is apparent for amended claim 1 of auxiliary request II.

The provisions of Article 123(2) EPC are therefore not met for auxiliary request II.

5. *Auxiliary request IV*

5.1 The amendment of claim 1 of auxiliary request IV *inter alia* contains the following additional limitation:

"combinations in which said first and second seal sliding elements have the same material composition are excluded."

While the appellant generally refers to the (comparative) examples of originally filed Tables 1 to 3 and 6 as a basis for adding this feature, the respondents consider that the newly introduced feature was drafted as a disclaimer, which was neither originally disclosed nor in conformity with the requirements set out in decision G 1/03 (OJ EPO 2004, 413).

5.2 According to the reasoning of the Enlarged Board of Appeal, the term "disclaimer" means an amendment to a claim resulting in the incorporation therein of a "negative" technical feature, typically excluding from

a general feature specific embodiments or areas (cf. G 1/03, *supra*, point 2 of the Reasons). In the judgement of the board, the additional feature excludes identical material compositions and thus falls under the cited definition of a disclaimer.

5.3 It is undisputed that the wording of the disclaimer is not explicitly disclosed in the application as filed. Regarding a possible implicit disclosure, it is taken into account that the limitation introduced by the disclaimer into claim 1 of auxiliary request IV ("*same material composition [...] excluded*") corresponds, in substance, to the positively worded restriction added to claim 1 according to auxiliary request I ("*being made of a material different from [...]*"), which was not found to implicitly have a clear and unambiguous basis in the original application (cf. point 3.2 above). Consequently, this conclusion also applies to the disclaimer of claim 1 of auxiliary request IV, which is to be qualified as an undisclosed disclaimer. Its compliance with the provisions of Article 123(2) EPC has to be assessed in accordance with the criteria as set out in decision G 1/03 (*supra*, cf. Headnotes).

5.4 In this regard, the appellant argued that document D1 had to be considered an accidental anticipation and that, following decision G 1/03 (*supra*), it was allowable to restore novelty by delimiting the disputed claim with an undisclosed disclaimer.

5.5 The board cannot endorse this point of view. According to point 2.1 of the headnotes of decision G 1/03 (*supra*), "*an anticipation is to be considered accidental if it is so unrelated to and remote from the claimed invention that the person skilled in the art would never have taken it into consideration when*

making the invention". However, as can be derived already from its title ("*Sintered SiC mechanical seals having particular pore volume, shape, and diameter*"), document D1 belongs to the same technical field as the subject-matter of the claimed invention and discloses a mechanical seal device with first and second seal sliding elements (cf. point 1.2 above). Document D1 is neither unrelated to nor remote from the claimed invention. It does, hence, not constitute an accidental disclosure in the sense of decision G 1/03 (*supra*). Moreover, as admitted by the appellant, the disclaimer is of relevance for the assessment of inventive step. Consequently, it has to be concluded that at least the criteria 2.1 and 2.3 for the allowability of an undisclosed disclaimer according to the headnote of decision G 1/03 (*supra*) are not fulfilled.

Claim 1 according to auxiliary request IV therefore contains added subject-matter, contrary to the provisions of Article 123(2) EPC.

- 5.6 For the sake of completeness, it is added that the requirements for the allowability of an undisclosed disclaimer (G 1/03, *supra*) are questioned in pending referral G 1/16 (cf. T 437/14, OJ EPO 2017, A50). This referral essentially hinges on the issue of whether or not the "gold standard" (i.e. the requirement of a direct and unambiguous disclosure of the subject-matter remaining in the claim) referred to in decision G 2/10 (OJ EPO 2012, 376) for the allowability of disclosed disclaimers is also applicable to claims containing undisclosed disclaimers. In view of the fact that claim 1 of present auxiliary request IV meets neither the criteria set out in decision G 1/03 (cf. point 5.5 above) nor the requirement of a direct and unambiguous disclosure of the subject-matter remaining in the claim

according to decision G 2/10 (cf. point 3.2 dealing with corresponding auxiliary request I), the Enlarged Board's decision on referral G 1/16 cannot be expected to have any bearing on the present case. Hence, the board, in agreement with all parties, saw no need to stay the present appeal proceedings in view of the pending referral and decided the case on the basis of the existing jurisprudence of the Enlarged Board of Appeal.

6. *Auxiliary requests V and Va - clarity*

6.1 In auxiliary requests V and Va, amended claim 1 is drafted as a product-by-process claim directed to a mechanical seal device, which is, *inter alia*, defined by the process steps of manufacturing the first and second seal sliding elements.

6.2 According to established case law, a product-by-process claim has to be interpreted in an absolute sense, i.e. as the product as such, which is defined, at least in part, by the structural features implied by the process steps contained in the claim (cf. Case Law of the Boards of Appeal of the European Patent Office, 8th edition, 2016, II.A.7.2). Moreover, product-by-process claims are only permissible if the claimed product cannot be defined other than in terms of a process of manufacture (cf. Case Law of the Boards of Appeal of the European Patent Office, 8th edition, 2016, II.A.7.3).

In auxiliary requests V and Va, claim 1 contains a plurality of intermediate process steps, which are not necessarily reflected in clear structural features of the finished seal presently claimed (e.g. using a ball mill in a mixing step, water-soluble solvent being

contained in a sintering aid, spray-drying the granules, etc.). These steps are therefore not suitable for an implicit but clear structural definition of the subject-matter claimed. Furthermore, it is not apparent that the claimed sealing device could not be defined by its structural product features.

For these reasons, the post-grant amendments of claim 1 of auxiliary requests V and Va do not meet the requirements of Article 84 EPC 1973

7. *Auxiliary request VII - novelty*

7.1 In order to render claim 1 novel (cf. point 1.2.3 for the novelty assessment of the main request), the following features are added to claim 1 of auxiliary request VII:

- (a) said carbon being artificial or natural graphite, other graphitic carbon, carbon black, a phenolic resin, epoxy resin carburized to obtain resin charcoal, charcoal, or other carbonaceous materials or a combination of two or more of these types of carbon,
- (b) said first seal sliding element (2) has an area ratio of carbon of 0.4 to 80%,
- (c) said first seal sliding element (2) has a content of carbon of 0.1 to 30 wt% with respect to said first seal sliding element (2) as a whole,
- (d) said first seal sliding element (2) has a Vickers hardness of 300 to 3000 and an apparent specific gravity of 2.0 to 3.2,

(e) said second seal sliding element (4) has a porosity of said pores of 3 to 20 vol%,

(f) and said second seal sliding element (4) has a Vickers hardness of 2000 to 3000 and an apparent specific gravity of 2.7 to 3.2.

7.2 In the judgement of the board, the above features are not suitable for establishing the novelty of the claimed subject-matter. In particular, with regard to feature (a) it is observed that the list of types of carbon dispersed in the first seal sliding element covers most possible kinds of carbon and includes graphite, which is known from document D1 (cf. column 2, lines 1 to 4). Moreover, document D1 specifically refers to a graphitic carbon content of 3% by weight (cf. example 2 for graphitic carbon), which anticipates features (a) and (c). Since the carbon in document D1 does not differ from the one in claim 1 regarding the type of carbon, its dispersed state (as a result of the production process) and the carbon content, also the claimed area ratio of feature (b) is necessarily inherently present in document D1. The same is true for the hardness, which is an inherent property of the material composition disclosed in document D1. The apparent specific gravity of both seal sliding elements according to features (d) and (f) can be deduced from the table referring to example 1 in column 4, lines 30 to 40 of document D1. Finally, feature (e) directed to the porosity is anticipated by column 1, line 49 and claim 1 of document D1. In view of that, features (a) to (f) are known from document D1 in addition to the features of the main request. Finally, as already stated in the context of the main request, the present claim wording does not necessarily imply that the first

and second seal sliding elements are different from each other.

For these reasons, the subject-matter of claim 1 of auxiliary request VII is not new pursuant to Article 54(1) and (2) EPC 1973.

7.3 The appellant puts particular emphasis on the fact that document D1 was silent on the features of the Vickers hardness of the claimed seal sliding elements and the area ratio of carbon in the first seal sliding element.

7.4 According to the boards' established case law (cf. Case Law of the Boards of Appeal of the European Patent Office, 8th edition, 2016, I.C.4.3), a prior-art document anticipates the claimed subject-matter if the latter is directly and unambiguously derivable from that document, including any features implicit to a person skilled in the art. An alleged disclosure can only be considered "implicit" if it is immediately apparent to the skilled person that the alleged implicit feature forms part of the subject-matter disclosed.

Turning to the case at hand, the Vickers hardness and the area ratio of carbon are material properties, which, in turn, are determined by the material composition and the manufacturing process. In that respect, it has to be taken into account that the manufacturing process of document D1 (cf. column 3, lines 6 to 33) essentially corresponds to the method of producing the seal sliding elements now claimed. The same applies to the material of the seal sliding elements comprising $\geq 90\%$ by weight of silicon carbide and dispersed graphitic carbon. It immediately follows from this concordance that the claimed values for the

Vickers hardness and the area ratio of carbon necessarily are inherently present in document D1. These aspects can therefore not establish a structural difference between the subject-matter claimed and the sealing device known from document D1.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



D. Meyfarth

M. Poock

Decision electronically authenticated