

Internal distribution code:

- (A) [-] Publication in OJ
(B) [-] To Chairmen and Members
(C) [-] To Chairmen
(D) [X] No distribution

**Datasheet for the decision
of 25 June 2018**

Case Number: T 0092/16 - 3.3.09
Application Number: 10846306.8
Publication Number: 2578389
IPC: B32B7/02, B32B3/30, B32B25/08,
B32B27/08, B32B27/36, B32B27/30
Language of the proceedings: EN

Title of invention:

WATER-REPELLENT FILM AND AUTOMOTIVE PART EQUIPPED WITH SAME

Applicant:

NISSAN MOTOR CO., LTD.

Headword:

Relevant legal provisions:

EPC Art. 84, 123(2), 111(1)

Keyword:

Main, 1st, 3rd auxiliary request - clarity (no - unclear definition of parameter)
2nd auxiliary request - added matter (yes - deletion of essential feature)
4th auxiliary request - clarity (yes); added matter (no); remittal for further prosecution

Decisions cited:

T 0908/04

Catchword:



Beschwerdekammern
Boards of Appeal
Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 0092/16 - 3.3.09

D E C I S I O N
of Technical Board of Appeal 3.3.09
of 25 June 2018

Appellant: NISSAN MOTOR CO., LTD.
(Applicant) 2 Takara-cho
Kanagawa-ku
Yokohama-shi, Kanagawa 221-0023 (JP)

Representative: Grünecker Patent- und Rechtsanwälte
PartG mbB
Leopoldstraße 4
80802 München (DE)

Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 10 August 2015
refusing European patent application No.
10846306.8 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman W. Sieber
Members: A. Veronese
E. Kossonakou

Summary of Facts and Submissions

- I. The appeal lies from the decision of the examining division refusing European patent application No. 10 846 306.8.
- II. The decision of the examining division was based on three sets of claims, namely a main, a first and a second auxiliary request. The examining division held that claim 1 of the main request lacked clarity having regard to the definition/measurement of the modulus of elasticity referred to therein, whereas the first and the second auxiliary request contained subject-matter which extended beyond the content of the application as filed.

- III. Claims 1 and 7 of the main request read:

*"1. A water repellent film, comprising:
a first layer (10) having a plurality of fine protrusions (100) on a surface thereof;
a second layer (20) covering the fine protrusions (100) and having a water repellent property; and
a third layer (30) provided on a surface of the first layer (10) on an opposite side of the fine protrusions (100),
characterized in that a modulus of elasticity of the first layer (10) is defined as E_1 , a modulus of elasticity of the second layer (20) is defined as E_2 , and a modulus of elasticity of the third layer (30) is defined as E_3 , a definition of $E_2 > E_1 > E_3$ is fulfilled, a pitch (A) of the fine protrusions (100) is 380 nm or less, and a height (H) of the fine protrusions (100) is 100 nm or more".*

"7. A water repellent film according to any one of claims 1 to 6, characterised in that the modulus of elasticity (E_1) of the first layer (10) is between 0.1 GPa and 5 GPa, and the modulus of elasticity (E_2) of the second layer (20) is between 50 GPa and 210 GPa".

IV. Claim 1 of the first auxiliary request reads:

"1. A water repellent film, comprising:
a first layer (10) having a plurality of fine protrusions (100) on a surface thereof; a second layer (20) covering the fine protrusions (100) and having a water repellent property; and
a third layer (30) provided on a surface of the first layer (10) on an opposite side of the fine protrusions (100),
characterized in that a modulus of elasticity of the material of the first layer (10) is defined as E_1 , a modulus of elasticity of the material of the second layer (20) is defined as E_2 , and a modulus of elasticity of the material of the third layer (30) is defined as E_3 , each modulus of elasticity were measured according to the method described in JIS K 6911 of Japanese Industrial Standard, a definition of $E_2 > E_1 > E_3$ is fulfilled, a pitch (A) of the fine protrusions (100) is 380 nm or less, and a height (H) of the fine protrusions (100) is 100 nm or more."

V. Claim 1 of the second auxiliary request reads:

"1. A water repellent film, comprising:
a first layer (10) having a plurality of fine protrusions (100) on a surface thereof; a second layer (20) covering the fine protrusions (100) and having a water repellent property; and

a third layer (30) provided on a surface of the first layer (10) on an opposite side of the fine protrusions (100), characterized in that the material of the first layer is a thermoplastic resin or elastomer and the material of the second layer is a transparent inorganic material or ceramic material and a material of the third layer is a resin film or a plastic film and wherein the thickness (T1) of the first layer (10) is between 1 μm and 30 μm , and a thickness (T2) of the second layer (20) is between 1 nm and 30 nm, and wherein a thickness (T3) of the third layer (30) is larger than a thickness (T1) of the first layer (10)".

VI. In the course of the examination proceedings reference was made, *inter alia*, to the following documents:

D4: Translation of the Japanese Industrial Standard "JIS K 6911-1995", 2006, Japanese Standards Association

D5: Christoph Jaroschek: "Das Ende des Biegemoduls", Zeitschrift Kunststofftechnik, vol. 8, no. 5, 1 January 2012, pages 515-524, XP055139198

D6: Millow, Sieghard: "Elastizitätsmodul", Rômpp Online, Version 3.37, August 2010

D7: Carlowitz, Bodo: "Kunststofftabellen", 3., völlig überarbeitete und erweiterte Auflage, 1986, Carl Hanser Verlag, München ISBN: 3-446-13208-2

VII. In the statement setting out the grounds of appeal the applicant (hereinafter the appellant) requested that the decision of the examining division be set aside and that a patent be granted on the basis of the main

request, or alternatively on the basis of the first or the second auxiliary requests underlying the appealed decision.

- VIII. In a communication issued in preparation to the oral proceedings, the Board expressed a preliminary opinion that the subject-matter of the claims of the main and of the first auxiliary request lacked clarity and that the subject-matter of the second auxiliary request contained subject-matter which extended beyond the content of the application as filed.
- IX. With a letter dated 25 May 2018 the appellant filed three new sets of claims as third, fourth and fifth auxiliary request, respectively.
- X. On 25 June 2018 oral proceedings took place before the Board. In the course of the oral proceedings the appellant withdrew the fourth and fifth auxiliary requests and replaced them with a new fourth auxiliary request.
- XI. Claim 1 of the third auxiliary request reads:
- "1. A water repellent film, comprising:
a first layer (10) having a plurality of fine protrusions (100) on a surface thereof; a second layer (20) covering the fine protrusions (100) and having a water repellent property; and
a third layer (30) provided on a surface of the first layer (10) on an opposite side of the fine protrusions (100),
wherein when a modulus of elasticity of the first layer (10), measured according to the method described in JIS K 6911 of Japanese Industrial Standard, is defined as E_1 and a modulus of elasticity of the second layer*

(20), measured according to the method described in JIS K 6911 of Japanese Industrial Standard, is defined as E_2 , and a modulus of elasticity of the third layer, measured according to the method described in JIS K 6911 of Japanese Industrial Standard, is defined as E_3 , a definition of $E_2 > E_1 > E_3$ is fulfilled, wherein a pitch (A) of the fine protrusions (100) is 380 nm or less, and wherein a height (H) of the fine protrusions (100) is 100 nm or more."

XII. Claim 1 of the fourth auxiliary request reads:

"1. A water repellent film, comprising:
a first layer (10) having a plurality of fine protrusions (100) on a surface thereof; a second layer (20) covering the fine protrusions (100) and having a water repellent property; and
a third layer (30) provided on a surface of the first layer (10) on an opposite side of the fine protrusions (100),
wherein when a modulus of elasticity of the first layer (10), measured according to the method described in JIS K 6911 of Japanese Industrial Standard, is defined as E_1 and a modulus of elasticity of the second layer (20) is defined as E_2 , and a modulus of elasticity of the third layer, measured according to the method described in JIS K 6911 of Japanese Industrial Standard, is defined as E_3 , a definition of $E_2 > E_1 > E_3$ is fulfilled, wherein a pitch (A) of the fine protrusions (100) is 380 nm or less, wherein a height (H) of the fine protrusions (100) is 100 nm or more, wherein the modulus of elasticity (E_1) of the first layer (10) is between 0.1 GPa and 5 GPa, and
wherein the material of the second layer (20) is a ceramic material."

XIII. The relevant arguments presented by the appellant may be summarised as follows:

The claimed invention related to a water repellent film comprising three layers having a modulus of elasticity E_1 , E_2 and E_3 , whereby the definition $E_2 > E_1 > E_3$ is fulfilled. Although claim 1 of the main request referred to a modulus of elasticity of the first (second or third) layer, the skilled person would have immediately recognised, taking into account the nature of the invention, that said modulus of elasticity was a property of the materials of the layers rather than the layers. Thus, it was independent from the dimension, thickness or shape of said layers. The skilled person would also have recognised that the modulus of elasticity had to be assessed using a bending test. The application as filed provided guidance for carrying out this test by reference to the method described in the Japanese Industrial Standard JIS K 6911. The appellant conceded that this standard was not meant for measuring the modulus of elasticity of inorganic materials, such as those mentioned in the application for preparing the second layer. However, as far as these materials were concerned, the necessary modifications of the experimental settings were within the normal capabilities of the skilled person. Furthermore, what counted were not the absolute values of the modulus, relating to the specific layers, but rather the ratio between them. Thus, although other testing methods existed, which could possibly yield slightly different results, the condition $E_2 > E_1 > E_3$ was verifiable. It would also have been clear to the skilled person, that the same method had to be applied for testing all three layers. Finally, the clarity of the claims was not to be assessed referring to particular embodiments of the invention exemplified in the description.

The amendments of the claims of the different requests did not contain subject-matter extending beyond the content of the application as filed. The introduction of the term "material" did not create new subject-matter, being implicitly disclosed to the skilled reader in the original application. The standard JIS K 6911 was disclosed in paragraph [0061] of the description as filed and the specific materials used for preparing the different layers, including ceramic, in paragraphs [0026], [0027], [0033]. A first layer having an elasticity modulus within the range of 0.1 GPa to 5 GPa was disclosed in paragraph [0023]. The omission from the claims of references to an elasticity modulus and their replacement by specific definitions of the materials used to prepare the layers did not create new subject-matter either. The condition $E2 > E1 > E3$ was necessarily fulfilled, taking into account the nature of the specified materials.

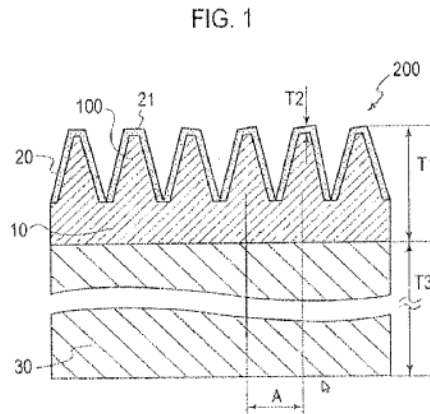
- XIV. The appellant requested that the decision of the examining division be set aside and that a patent be granted on the basis of the main request or of one of auxiliary requests 1 to 4.

Reasons for the Decision

Main request

1. *Clarity (Article 84 EPC)*
 - 1.1 Claim 1 of the main request defines a water repellent film comprising three different layers, namely a first layer (10) having a plurality of fine protrusions (100) on a surface thereof; a second layer (20) covering the fine protrusions (100) and having a water repellent

property; and a third layer (30) provided on a surface of the first layer (10) on an opposite side of the fine protrusions (100). Figure 1 from the application as filed is a partial cross-sectional view showing one example of a water repellent film according to claim 1.



- 1.2 These layers must fulfil, *inter alia*, the condition $E2 > E1 > E3$, wherein $E1$, $E2$, $E3$ represent the modulus of elasticity of the first, second and third layer, respectively. Claim 1 does not specify the chemical and physical nature of these layers. The test used for measuring the elasticity modulus is also not mentioned.
- 1.3 Claim 1 of the main request (as well as claim 1 and the other parts of the application as filed) explicitly refers to a modulus of elasticity of the first, second and third **layer**. The examining division did not accept the appellant's argument that the modulus of elasticity relates to the material constituting the layer.
- 1.4 However, the Board agrees with the appellant that the term "modulus of elasticity" has a normal meaning within the art, describing the way a material strains in response to an applied stress. It is distinct from stiffness, which describes the way a body deforms in response to an applied load. A modulus of elasticity is

a property of a material; stiffness is a property of a body. Thus, the person skilled in the art would realise that where the claim or the application as filed refer to a modulus of elasticity of a layer, it is referring to the modulus of elasticity of the material constituting the layer. This is indeed confirmed by D6, which defines the modulus of elasticity as a "Materialkonstante", *i.e.* as a characteristic of the material.

- 1.5 In order to decide whether claim 1 fulfils the requirements of clarity, it must be established whether the skilled person would be in a position to determine whether the condition $E_2 > E_1 > E_3$ is fulfilled for a given film containing three layers. To make this assessment, the skilled person needs to know which method has to be used for testing the modulus of elasticity of the materials forming the layers and the technical details for conducting the tests. As set out in decision T 908/04, the unambiguous characterisation in a claim of a product by a parameter requires that said parameter can be clearly and reliably determined. Furthermore, the claims must be clear in themselves when being read with the normal skills and not by reference to knowledge derived from the description. The indication of the methodology used for determining a parameter only becomes superfluous if it can be shown that the skilled person would know from the outset which method and conditions to employ, because, for instance, this methodology was the methodology commonly used in the technical field, or that all the methodologies known in said field for determining this parameter would yield the same result, within the appropriate limit of measurement accuracy.

- 1.6 It is well known that different methods exist for assessing the modulus of elasticity of a material, including among others a tension test and a bending test. Documents D4-D7 cited in the course of the proceedings mention such tests. The appellant argued that the skilled person reading the application would immediately recognize that a bending test has to be applied in the present case, this being the most suitable for assessing the effects of the shear, tension and compression forces to which the film is subjected. To perform this test the skilled person would rely on the methodology outlined in the Japanese Industrial Standard JIS K 6911, mentioned in paragraph [0061] of the description. Accordingly, the skilled person would be able to assess the modulus of elasticity of the materials used to make the different layers.
- 1.7 The Board cannot agree with this view. Even assuming that the skilled person would apply a bending test in the present case, he or she would still need instructions as to the apparatus and the experimental settings needed for conducting said test. The appellant has neither provided evidence that one specific methodology is typically used in the field nor that, if more methodologies exist, that they all yield the same result. The fact that paragraph [0061] of the description mentions JIS K 6911 is irrelevant, because as indicated above, if a product is defined by reference to a parameter, this parameter and the method for measuring it must be specified in the claims.
- 1.8 The appellant also argued that, for measuring the modulus of elasticity of the different layers, the skilled person would apply the same methodology. By

doing this, he would obtain the same ratio $E_2 > E_1 > E_3$, irrespectively of the method used.

1.9 This argument cannot be followed. The claims do in fact not require the use of the same testing methodology. In this context, it is noted that the materials used for preparing the layers of the claimed films can be of very different nature in terms of chemical and physical properties, in particular the materials used for the second layer. Different experimental settings may well be required for testing and the materials are likely to respond differently, depending on the operating conditions used for the tests. This can affect the results and lead to different outcomes when the condition $E_2 > E_1 > E_3$ is verified.

1.10 Finally, claim 7 requires the modulus of elasticity of the first and of the second layer to fall within a specific range, namely from 0.1 GPa to 5 GPa for the first layer and from 50 GPa to 210 GPa for the second layer. In the absence of an unambiguous reference to the methodology used for assessing these values, the scope of this claim is also unclear.

1.11 For these reasons, the claimed subject-matter lacks clarity and contravenes the requirements of Article 84 EPC.

First auxiliary request

2. Clarity (Article 84 EPC)

2.1 Claim 1 of the first auxiliary request was amended so as to refer to the modulus of elasticity of the **material** of the respective layers. However, as set out in point 1.4 above, the skilled person would anyway

understand that a reference to the modulus of elasticity of a layer is nothing else than a reference to the modulus of elasticity of the material of that layer.

2.2 Claim 1 further specifies that the modulus of elasticity of the materials of each of the three layers making up the claimed film is measured according to the method described in JIS K 6911 of the Japanese Industrial standard. This is the method which, according to paragraph [0061] of the application, was used for measuring the modulus of elasticity of the layers of the films prepared according to the examples set out in paragraphs [0052-0058].

2.3 The Board is of the opinion that, despite the fact that the method according to JIS K 6911 has been specified in claim 1, the skilled person would not be able to unambiguously assess whether the condition $E_2 > E_1 > E_3$ is fulfilled by a given candidate film and that for the following reasons the scope of the claims remains unclear.

2.4 Although the incorporation of a reference to JIS K 6911 at first glance appears reasonable and straightforward, the Board considers that its applicability in the circumstances of the present case is problematic. The difficulties arise in particular when the properties of the material of the second layer need to be assessed. For the aforementioned approach to be relied upon and for the claims to be clear, two conditions would have to be fulfilled: 1) it should be possible to prepare a sample suitable for testing which is representative of the material making up the second layer and 2) it should be proven that JIS K 6911 is suitable for testing the elasticity of this sample.

2.5 Document D4 is a translation of the Japanese Industrial Standard JIS K 6911. As indicated on the first page, this standard describes methods for testing thermosetting plastics. The test used for measuring the elasticity modulus is the "bending modulus", which is carried out on moulded pieces of plastic material (see section 5.17). The tested pieces have a size of not less than 80 mm length, 4 mm height and 10 mm width (see paragraph 5.17.1 (2) "Test piece"). Variants of the test are described in paragraphs 5.17.2 and 5.17.3 for measuring the elasticity modulus of laminated sheets and laminated rods. However, no tests are described for measuring the elasticity of the individual layers of a laminate, nor for testing an inorganic material.

2.6 Paragraph [0027] of the application lists numerous materials which can be used for preparing the second layer. All of them are inorganic materials. Inorganic materials are also used to prepare the second layer of all films used to carry out the tests reported in the experimental section (see paragraphs [0052-0061] and table 1). The thickness of the second layer is preferably between 1 nm and 30 nm (see paragraph [0025] and claim 9), *i.e.* several orders of magnitude smaller than the minimum thickness prescribed in JIS K 6911 for carrying out the bending test. According to paragraph [0040], these very thin layers can be prepared using techniques such as the Langmuir-Blodgett method, physical vapor deposition, chemical vapor deposition, vapour polymerisation. Sputter deposition is used in all examples (see paragraphs [0052]-[0054] and the tables). These methods are typically employed to coat a surface with a monolayer or with a layer having a thickness of a few nanometers, but not for preparing

moulded materials having the minimum size required for performing the elasticity tests described in JIS K 6911.

2.7 Table 1 reports the values of elasticity modulus of materials of the second layer of the films exemplified in the application measured according to JIS K 6911. When asked how the reported values were actually determined, the appellant clarified that samples of the inorganic materials used as target for the sputter deposition were tested. He also conceded that, due to the inorganic nature of these material, the apparatus and the experimental settings described in JIS K 6911 had to be modified, to apply *inter alia* a different loading rate. The appellant has however not provided any evidence that, relying on common knowledge, the skilled person would have envisaged the modifications in the experimental settings which are necessary to carry out the tests. Furthermore, he has not shown that the material used as target in the sputtering process is representative of the material making up the second layer, in terms of structural and physical properties. There is further no evidence on file proving that the physical properties of an inorganic layer having a thickness of a few nanometers, which is created on the surface of another pre-existing layer, e.g. during sputter deposition, are the same as those of a monolithic sample having a thickness of several millimeters, which is prepared using the same chemical ingredients but a totally different manufacturing technique.

2.8 In this context, the following should also be noted. As shown in table 1, different values of the modulus of elasticity were obtained for one and the same chemical compound used to prepare the second layer, e.g. 50, 60

and 70 GPa for silicon dioxide. According to the appellant, this variability is to be ascribed to differences in the doping of the tested sample. If this explanation of the results is correct, it is even less plausible that the properties of the doped material used as target corresponds to those of the material formed after the vaporisation and deposition steps during the sputtering process. This confirms, that the sample used for testing is not necessarily representative of the material which is effectively present in the second layer.

- 2.9 For these reasons, it is concluded that the methodology which is reported in JIS K 6922 is not adequate, as such, for measuring the modulus of elasticity of the second layer. There is further no evidence on file indicating that the skilled person relying on common knowledge would have been able to adapt the testing methodology described in this standard so as to obtain reliable and verifiable results.
- 2.10 The appellant has argued that all materials used for manufacturing the second layer are inherently less elastic than the materials of the other layers. Thus, testing the second layer is actually not even necessary. This argument cannot be followed. Claim 1 of auxiliary request 1 does not define the nature of the material used for the second layer. Thus the Board cannot see how, without any further limitation in the claim, the requirement $E_2 > E_1 > E_3$ is inherently met.
- 2.11 The appellant has also contended that an objection of lack of clarity should not be raised focusing on particular forms of realisation of the second layer which are mentioned in the description of the application.

2.12 Taking into account the specific circumstances of the present case, the Board cannot share this view. It is clear from the nature and the purpose of the claimed invention, that the second layer has to be very thin compared to the other layers, *i.e.* to have a thickness in the nanometer range. It is also apparent that such a thin film has to be made using special techniques (*e.g.* sputtering) and employing inorganic material. This teaching is reiterated consistently in the application and reflected in all examples reported in the description. In this situation, it would be illogical to consider a claim clear, if such claim is not suitable to properly define the scope of the subject-matter relating to the preferred and the only described embodiments. For these reasons, the Board concludes that the skilled person would not be able to assess, for a given film containing three layers, whether the condition $E_2 > E_1 > E_3$ is fulfilled.

2.13 In view of the aforementioned findings, the claimed subject-matter still lacks clarity and contravenes the requirements of Article 84 EPC.

Second auxiliary request

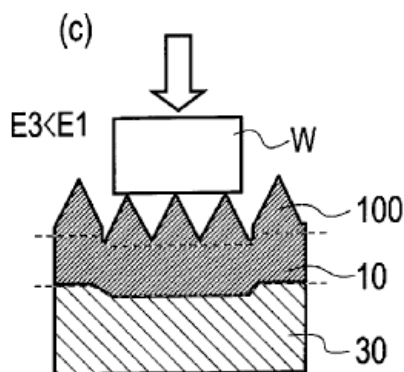
3. *Amendments (Article 123(2) EPC)*

3.1 Claim 1 of the second auxiliary request differs from that of the main request in that the functional requirement as to the modulus of elasticity ($E_2 > E_1 > E_3$) has been deleted and in that the nature of the materials making up the different layers has been defined as being:

- a thermoplastic resin or an elastomer (first layer),
- a transparent inorganic material or a ceramic material (second layer),
- a resin or a plastic film (third layer).

Furthermore, the thickness of the layers has also been defined.

3.2 As indicated in paragraphs [0005, 0017-0021] of the application as filed, the choice of materials having an elasticity modulus satisfying the condition $E2 > E1 > E3$ is essential for preparing films having improved mechanical properties. The second thin layer, applied on the surface of the first layer must be more rigid ($E2 > E1$), in order to protect the protrusions present on the first layer from mechanical damage, in particular when shear forces are applied. Conversely, the third layer (30) on the opposite site of the first layer must be more elastic ($E1 > E3$), in order to absorb the mechanical stress caused by forces in the compressive direction. Figure 4(c) shows how the film will deform upon compression, when this latter condition is satisfied.



3.3 This teaching is reiterated consistently in the different sections of the application as filed. The

appellant argued that the omission of the aforementioned functional requirements, expressed by the condition $E2 > E1 > E3$, does not cause a change in technical teaching, nor result in added subject matter, because the condition $E2 > E1 > E3$ is inevitably fulfilled, due to the inherent properties of the materials used for preparing the three layers. The Board cannot agree with the appellant that this is the case, in particular in view of the nature of the materials making up the first and the third layer.

3.4 As already pointed out by the examining division, there is an overlapping definition for the materials of the first layer ("thermoplastic resin or elastomer") and the third layer ("resin film or a plastic material"). Accordingly, the elasticity modulus of the thermoplastic resin or elastomer of the first layer is not necessarily higher than that of the resin film or plastic material of the third layer. The properties of these materials will depend on the particular substances used for preparing the layers and the manufacturing technique. Thus, the condition $E1 > E3$ is not inevitably fulfilled.

3.5 For this reason, the omission from claim 1, of the condition $E2 > E1 > E3$, introduces new subject-matter extending beyond the content of the original application, contrary to the requirements of Article 123(2) EPC.

Third auxiliary request

4. *Clarity (Article 84 EPC)*

4.1 Claim 1 of the third auxiliary request differs from that of the first auxiliary request essentially in that

reference is made to the modulus of elasticity of the layers, and not to the modulus of elasticity of the materials of the layers.

- 4.2 However, as set out in point 1.4 above, the skilled person would see no difference in a reference to the modulus of elasticity of the layer and a reference to the modulus of elasticity of the material of the layer. Accordingly, for the reasons given for the first auxiliary request, the subject-matter of claim 1 is unclear. Thus, it is considered that the subject-matter of the third auxiliary request contravenes the requirements of Article 84 EPC.

Fourth auxiliary request

5. *Amendments (Article 123(2) EPC)*

- 5.1 Claim 1 of the fourth auxiliary request specifies that the modulus of elasticity of the first and third layers is measured according to the method described in JIS K 6911 of the Japanese Industrial standard, whereas the second layer is made of a ceramic material. In addition, claim 1 requires the modulus of elasticity of the first layer to be in the range of between 0.1 and 5 GPa.

Furthermore, this set of claims does no longer contain a dependent claim referring to a specific value for E2 (*supra*, point 1.10).

- 5.2 The method described in the standard JIS K 6911 is clearly and unambiguously disclosed in paragraph [0061] of the application as filed; indeed it is the only one mentioned in the application and the one applied to carry out the tests described in the examples. A first

layer having an elasticity value within the range of from 0.1 GPa to 5 GPa is disclosed in paragraph [0023]. In fact, this is the only range disclosed for the modulus of elasticity of the first layer in the application as filed. A second layer made of ceramic is disclosed in paragraph [0027]. The Board considers that the combination of these features does not generate new subject-matter, because the skilled reader would understand that the only disclosed range for the modulus of elasticity for the first layer generally applies to all embodiments of the invention, *i.e.* also to the embodiment where the second layer is made of a ceramic material. By specifying that the material of the second layer is a ceramic material and by specifying the value for E1, it is no longer necessary to indicate the method of measurement for E2. The Board is not aware of the existence of any ceramic material having a modulus of elasticity equal to or lower than 5 GPa. As pointed out by the appellant, even if approximation methods were used to determine E2, these values are magnitudes above the upper limit for E1. Therefore, the Board can accept that any ceramic material inherently has a higher modulus than E1 so that the condition $E2 > E1 > E3$ in claim 1 of the fourth auxiliary request is fulfilled. Thus, the requirements of Article 123(2) EPC are met.

6. *Clarity (Article 84 EPC)*

- 6.1 The Board considers that, by specifying the method for determining the modulus of elasticity of the first and of the third layer and defining in structural terms the nature of the second layer in claim 1, and in view of the absence of a dependent claim requiring a specific value for E2, the clarity objections raised against the main, first and third auxiliary requests are overcome.

Accordingly, the fourth auxiliary request fulfills the requirements of Article 84 EPC.

7. *Remittal*

7.1 The refusal of the application was only based on Articles 84 and 123(2) EPC. The objections raised are overcome by the fourth auxiliary request. Since the examining division has not yet examined and decided upon the other requirements of the European Patent Convention, the Board considers it appropriate to remit the case to the examining division for further prosecution (Article 111(1) EPC).

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the examining division for further prosecution on the basis of claims 1-9 of the fourth auxiliary request as filed during the oral proceedings before the Board on 25 June 2018.

The Registrar:

The Chairman:



M. Cañueto Carbajo

W. Sieber

Decision electronically authenticated