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**Datasheet for the decision
of 23 April 2021**

Case Number: T 2058/18 - 3.5.07

Application Number: 03775909.9

Publication Number: 1570387

IPC: G06F17/50

Language of the proceedings: EN

Title of invention:

METHOD FOR PREDICTING BENDING DURABILITY OF ELECTRIC WIRE AND
BEND PROTECTION MEMBER, AND APPARATUS AND RECORDING MEDIUM
STORING PROGRAM THEREFOR

Applicant:

YAZAKI CORPORATION

Headword:

Predicting bending durability/YAZAKI

Relevant legal provisions:

EPC Art. 123(2), 83

EPC R. 139

RPBA Art. 12(4)

Keyword:

Amendments - main request -correction of errors (no)
Sufficiency of disclosure - first auxiliary request (no)
Late-filed second and third auxiliary requests - requests
could have been filed in first instance proceedings (yes)

Decisions cited:

G 0003/89, G 0011/91, G 0001/12, G 0002/95, J 0008/80

Catchword:

It is the responsibility of the representative to consult with its client (appellant) when presenting arguments about essential distinguishing features of the invention over the closest prior art. It is however the ultimate responsibility of the appellant to file amendments. Generally, these distinguishing features, presented as essential ones, could not anymore be considered as being obvious errors afterwards (Reasons, 3.5.6);

The disclosure of a family member of a document cited in an application can not be used to dispel doubts as to the meaning of an ambiguous part of the application (Reasons 3.13.1);

the (technically) skilled person might be considered a multilingual person but not normally a linguist (Reasons 3.13.7).



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Case Number: T 2058/18 - 3.5.07

D E C I S I O N
of Technical Board of Appeal 3.5.07
of 23 April 2021

Appellant: YAZAKI CORPORATION
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Minato-ku
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Representative: Grünecker Patent- und Rechtsanwälte
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 26 March 2018
refusing European patent application No.
03775909.9 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chair J. Geschwind
Members: C. Barel-Faucheux
M. Jaedicke

Summary of Facts and Submissions

I. The applicant (appellant) filed an appeal against the decision of the examining division refusing European patent application No. 03775909.9, which was published as international publication WO 2004/048939 in English. It claims two priorities in Japanese: JP 2002-345219 and JP 2003-364519.

II. The contested decision cited the following documents:
D1: EP 1 236 989, published on 4 September 2002
D2: Gratkowski, S. et al.: "On the accuracy of a 3-D infinite element for open boundary electromagnetic field analysis", Archiv für Elektrotechnik, vol. 77, no. 2, 1 January 1994, pp. 77-83

The examining division decided that the main request did not satisfy the requirements of Article 123(2) EPC and that the invention as defined in claim 1 of the auxiliary request was not sufficiently disclosed in the application, contrary to the requirements of Article 83 EPC.

III. With the statement of grounds of appeal, the appellant filed again the main request, the auxiliary request as a first auxiliary request, and filed a second and a third auxiliary request.

The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request or, in the alternative, on the basis of the first, second or third auxiliary request filed with the statement of grounds of appeal.

IV. Claim 1 of the main request was based on method claim 1 as originally filed in which the expression "an infinite element method" had been replaced with "a finite element method", the expression "infinite element model(s)" with "finite element model(s)" and the expression "infinite elements" with "finite elements".

Similar amendments had been made to independent apparatus claim 6 in comparison with claim 8 as originally filed and independent computer readable recording medium claim 7 in comparison with claim 9 as originally filed.

Furthermore, the description (on pages 2, 4, 7 to 12, 15, 16, 19, 26, 28, 29, 32 and 35) and drawings (Figures 1, 6 and 7) as originally filed had been amended accordingly by letter of 23 December 2011.

V. In a communication accompanying the summons to oral proceedings, the board expressed the preliminary view that it had doubts that the request for correction of the term "infinite" with "finite" was a correction of an obvious error under Rule 139 EPC rather than an amendment not complying with the requirements of Article 123(2) EPC.

VI. With a letter dated 23 March 2021, the appellant provided further arguments.

VII. The oral proceedings took place as a videoconference by Zoom, on 23 April 2021.

VIII. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request or, in the alternative, on the

basis of any of the first to third auxiliary requests filed with the statement of grounds of appeal.

IX. Claim 1 of the main request reads as follows:

"A bending durability prediction method of predicting a bending durability of a plurality of wires (1) laid at a predetermined bend, and of a bend protection member (2) attached at the bend to protect the plurality of wires (1) by using a finite element method, the bending durability prediction method comprising:

a setup step (S2) of setting up the plurality of wires (1), the bend protection member (2), an atmosphere temperature, pre-bending initial shapes for the wires (1) and the bend protection member (2) and final bent shapes for the wires (1) and the bend protection member (2);

a finite element model preparation step (S3) of preparing finite element models for the plurality of wires (1) and the bend protection member (2);

a stress calculation step (S5) of calculating stress, for each of finite elements of the finite element models, produced by bending the finite elements from the initial shape to the final bent shape;

a maximum stress search step (S6) of searching, among the stresses obtained at the stress calculation step, for the maximum stress for each of the plurality of wires (1) and the bend protection member (2);

a prediction function acquisition step (S7) of obtaining prediction functions for the wires (1), the

bend protection member (2) and the atmosphere temperature designated at the setup step;

a predicting step (S8) of referring to the prediction functions obtained at the prediction function acquisition step (S7), obtaining numbers of bendings for endurance which correspond to the maximum stresses for the wires (1) and the bend protection member (2), and identifying the smallest number of bendings for endurance; and an output step (S12) of outputting the smallest number of bendings obtained at the predicting step (S8)".

X. Claim 1 of the first auxiliary request reads as follows:

"A bending durability prediction method of predicting a bending durability of a plurality of wires (1) laid at a predetermined bend, and of a bend protection member (2) attached at the bend to protect the plurality of wires (1) by using a infinite element method, the bending durability prediction method comprising:

a setup step (S2) of setting up the plurality of wires (1), the bend protection member (2), an atmosphere temperature, pre-bending initial shapes for the wires (1) and the bend protection member (2) and final bent shapes for the wires (1) and the bend protection member (2);

a infinite element model preparation step (S3) of preparing an infinite element models [sic] for the plurality of wires (1) and the bend protection member (2);

a stress calculation step (S5) of calculating stress, for each of infinite elements of the infinite element models, produced by bending the infinite elements from the initial shape to the final bent shape;

a maximum stress search step (S6) of searching, among the stresses obtained at the stress calculation step, for the maximum stress for each of the plurality of wires (1) and the bend protection member (2);

a prediction function acquisition step (S7) of obtaining prediction functions for the wires (1), the bend protection member (2) and the atmosphere temperature designated at the setup step;

a predicting step (S8) of referring to the prediction functions obtained at the prediction function acquisition step (S7), obtaining numbers of bendings for endurance which correspond to the maximum stresses for the wires (1) and the bend protection member (2), and identifying the smallest number of bendings for endurance; and an output step (S12) of outputting the smallest number of bendings obtained at the predicting step (S8),

a wire arrangement step of arranging, innermost at the bend, a thickest wire of all the plurality of wires (1),

a storing step of previously storing stress tables which represent minimum stresses according to which it is assumed that the plurality of wires (1) and the bend protection member (2) will be damaged; a stress table reading step of reading stress tables corresponding to the plurality of wires (1), the bend protection member (2) and the atmosphere temperature designated in the setup step (S2); and a damaged member (2) specifying

step (S9) of specifying the wire or the bend protection member (2) that is first damaged, while referring to the stress tables that are read at the stress table reading step and the individual maximum stresses that are found at the maximum stress search step (S6) for the wires (1) and the bend protection member (2), the output step (S12) outputs information specifying the wire or the bend protection member (2) that is first damaged."

XI. Claim 1 of the second auxiliary request is based on claim 1 of the main request with the addition of the expression "and turn each electric wire into a model of a three-dimensional beam element" at the end of the "finite element model preparation step" and the addition of "characterized in" before that step. Similar amendments (but without adding "characterised in") have been made to independent apparatus claim 6 and independent computer readable recording medium claim 7.

XII. Claim 1 of the third auxiliary request is based on claim 1 of the second auxiliary request with the addition of the expression "and arranging, innermost at the bend, a thickest wire of all the plurality of wires (1)" (based on claim 4 as originally filed) after "a setup step (S2) of setting up the plurality of wires (1)" and the deletion of "characterized in". Similar amendments have been made to independent apparatus claim 5 and independent computer readable recording medium claim 6.

Reasons for the Decision

1. *The application*

- 1.1 The application considers a plurality of electric wires which pass through bend protection members called "grommets". The plurality of electric wires serve, for example, as electrical connectors between a door (or sliding seats) of a vehicle and the vehicle body. During opening or closing of the door, they are bent. The invention relates to a method for predicting the durability or the product life, at a predetermined bend, of the grommets and electric wires (description as published, page 1, line 6, to page 2, line 3).

Main request

2. It has to be noted that, at page 2 of the description, the title of the **"non-patent document 1"** (B. Nass, Brain Book Publishing Co., Ltd., 10 August 1978, pp. 7-5 [sic]) has been amended from "Matrix Infinite Element Method" to "Matrix Finite Element Method" (emphasis added by the board).
3. *Correction of obvious errors (Rule 139 EPC) or added subject-matter (Article 123(2) EPC)*
- 3.1 The appellant stated that the replacement of the term "infinite" with "finite" was a correction of an obvious error under Rule 139 EPC.
- 3.2 The board notes that Article 123(2) EPC applies to all amendments to the patent application or the patent. These include corrections of the description, claims or drawings under Rule 139 EPC, second sentence.
- 3.3 It must therefore be established:

(i) whether it is obvious that an error is in fact present in the application as originally filed i.e. whether a skilled person is in no doubt that this information is not correct and, considered objectively, cannot be meant to read as such. The incorrect information (the occurrences of the word "infinite" in this case) has to be objectively recognisable by the skilled person using common general knowledge (G 3/89 and G 11/91, OJ 1993, 117 and 125 respectively, point 5 of the Reasons), and

(ii) whether the correction of the error is obvious in the sense that it is immediately evident that nothing else would have been intended than what is offered as the correction (G 3/89 and G 11/91, point 6 of the Reasons)

3.4 Since in the case at hand the original intention of the inventors is not immediately apparent (see the explanations that follow), the appellant bears the burden of proof, which must be a heavy one (J 8/80, point 6 of the Reasons).

3.4.1 In the reply to the board's communication, the appellant has argued that decision J 8/80 related to the correction of a mistake in designating states in a European patent application and not to the correction of a mistake in the description and claims. Furthermore, the burden, on the person requesting correction, of proving the facts, had to be a heavy one only when the making of the alleged mistake was not self-evident and in cases where it was not immediately evident that nothing else would have been intended than what was offered as the correction. In this case, the skilled person in this particular technical field would

have immediately realised that a correction was needed (letter of reply dated 23 March 2021, first page).

The board notes that J 8/80 states that "[f]or the purposes of Rule 88 EPC [1973] [corresponding to Rule 139 EPC], a mistake may be said to exist in a document filed with the European Patent Office if the document does not express the true intention of the person on whose behalf it was filed. The mistake may take the form of an incorrect statement [...]. Correction, accordingly, can take the form of putting right an incorrect statement [...]. Before the Office can accede to a request for correction of a mistake, however, it must be satisfied that a mistake was made, what the mistake was and what the correction should be. [...] It is the responsibility of the person requesting correction to put evidence as to the relevant facts fully and frankly before the Office. **In cases where the making of the alleged mistake is not self-evident and in cases where it is not immediately evident that nothing else would have been intended than what is offered as the correction, the burden of proving the facts must be a heavy one** (emphasis added by the board). If the evidence put forward is incomplete, obscure or ambiguous, the request for correction should be rejected" (J 8/80, Reasons 4 to 6).

3.5 The request for correction

3.5.1 In addition, the request for correction must be filed without delay (see G 1/12, OJ 2014, 114, point 37 of the Reasons). In the case at hand, the request for correction was filed with the letter of reply dated 23 December 2011, whereas the first letter of reply was sent on 18 June 2007, i.e. **more than 4 years** before the request for correction. The patent was filed on

26 November 2003, i.e. the request for correction was filed only **almost 8 year after** the filing date.

3.5.2 The appellant has argued that in the case at issue only the skilled person could have realised that a correction was necessary and, after having realised that a correction was necessary, the representative filed the request for correction immediately. The term "without delay" meant without culpable procrastination. Therefore, it was not possible to file the request earlier, and the request was filed without delay. Concerning the response dated 18 June 2007, the representative had no information about the need for the correction at that time. Thus, the argumentation was still based on "infinite elements" instead of "finite elements" (letter of reply dated 23 March 2021, first page).

3.5.3 During the oral proceedings before the board, the appellant's representative pointed out that Rule 139 EPC did not set a time limit for requesting corrections of errors. The representative further argued that he was not an expert in this complex field and could not go beyond the instructions provided by his client (the appellant). He also stated that the persons in charge of drafting the application in the early stage were also not experts in this field. It was only when preparing the letter of reply dated 23 December 2011, when consulting an expert that could qualify as a skilled person in this case, that the representative was made aware that there was in fact a big mistake that would not have been obvious to someone not skilled in the field. The representative had reacted as soon as he was made aware of the errors by the expert and requested their correction accordingly.

- 3.5.4 The appellant stated that as claim 1 related to the improvement of bending stress modelling, the skilled person was to be considered a team composed of a mechanical engineer in the field of mechanical bending collaborating with a programmer to implement, in software, a model of bending stress, developed with the help of a mathematician.
- 3.5.5 The board is of the opinion that the mathematician provides a mathematical method for predicting the bending durability in view of technical requirements provided by the mechanical engineer (temperature, maximum stress to be applied to the wires, initial position of the wires, bend protection member material, etc.). This mathematical method (using an infinite or a finite element method) is then implemented by means of a computer program.
- 3.5.6 The board notes that, in the letter of 18 June 2007, the applicant made its argument based on "infinite elements" and in particular submitted that document D1 failed to disclose an infinite element method for modelling a wire harness.

This letter was sent in reply to a communication from the examining division pursuant to Article 96(2) EPC stating, by referring to the international preliminary examination report, that the subject-matter of claim 1 differed from the disclosure of document D1 in that document D1 used a finite element method for modelling the wire harness, while claim 1 defined an infinite element model. The examining division considered that infinite element modelling was a well-known technique for creating and analysing computer models in the field of computer assisted design. Therefore, it was merely one of several straightforward possibilities from which

the skilled person would have selected, in accordance with circumstances, without the exercise of inventive skills to solve the problem of implementing "a computer model of the wires".

The argumentation about finite element modelling versus infinite element modelling was thus presented since the filing of the European patent application as crucial. The board is of the opinion that even if it is indeed the responsibility of the representative to consult with its client (appellant) when presenting arguments about such essential distinguishing features of the invention over the closest prior art, it is the ultimate responsibility of the appellant to cooperate in the drafting and filing of amendments and to give clear instructions to the representative. Generally, after these distinguishing features had been presented as being essential, they could no longer be considered obvious errors.

In view of the above analysis, the board is of the opinion that the request for correction cannot be considered as having been filed "without delay".

3.6 *Non-suitability of an "infinite" element method*

- 3.6.1 The appellant argued that, when reading the second paragraph of page 15 of the description as originally filed, the skilled person would have directly derived that a "finite element method" was being used and not an "infinite element method" as (originally) written. According to the appellant, only a finite element method was suitable for using a computer to obtain a distribution of continual stresses for a complex structure. It added that the word "infinite" would not

make sense (in this position or context) but did not explain why (see letter of reply of 23 December 2011).

- 3.6.2 The examining division argued that since the method obtained a distribution of continual stress, it implies a method different than the finite element one, which determines a discontinuous function across a plurality of elements (see communication of the examining division dated 23 March 2012 and points 1.19 and 1.20 of the contested decision).
- 3.6.3 In the summons to oral proceedings before the examining division, the examining division stated that it did not agree with the allegation that "only a finite element method" was suitable "so as to employ a computer to obtain said distribution of continual stresses for a complex structure", and that nothing else had been intended. This method could be used when analysing structures in which a dimension was substantially bigger than the rest, this dimension being modelled as infinite.
- 3.6.4 The appellant also cited two patent documents (**EP 1 570 386 B1, denoted in the following as D3, and EP 1 236 989 A3 (D1)**) (see letter of reply dated 2 October 2012) in support of its argumentation that an infinite element method would not work in the case at hand. **D3** disclosed a method of predicting a bending life span of a plurality of electric wires and their wire protecting members where the bending was induced by vibration. This method performed a finite element model forming step of forming finite element models for the plurality of wires by using a finite element method. **D1** referred to a method of estimating flexure life of a wire harness in which a wire bundle of a plurality of wires, each formed by coating a conductor line with an

insulating layer allowed to pass through a predetermined protective tube and secured to an external structural member different from the protective tube. The flexure life up to disconnection caused by operations of this external structural member was estimated using a finite element method.

Since the burden of proof lied on the appellant (see Reasons 3.4.1 above), in its communication, the board had requested that the appellant provide explanations why "only a finite element method (FEM) was suitable for using a computer to obtain a distribution of continual stresses for a complex structure", and/or why the word "infinite" would not make sense (in this position or context), and why an infinite method would not work in this case.

- 3.7 The appellant argued during the examining proceedings that using an infinite method for predicting the durability of wires would be an indication of an obvious error since infinite elements were usually used for modelling acoustic issues in open-space domains, while finite methods were applicable for mechanical structures such as cables.

The appellant argued that the infinite element method was "commonly used to solve acoustic problems" (statement of grounds of appeal, page 5, last paragraph). It provided an excerpt from Wikipedia as evidence (Appendix 4 accompanying the statement of grounds). In addition, it provided a statement from the Technical University of Munich in which the infinite element method was used to simulate acoustic issues for open rooms (Appendix 5 accompanying the statement of grounds).

The board concurs with the opinion of the examining division that this argument is not convincing since applying a known method in a different field is the gist of many legitimate inventions (see decision, point 1.16).

- 3.8 The examining division stated that the infinite element method was "well-known at the priority date and often used in a broad spectrum of technical domains, coupled to a finite element analysis meshes [sic] (e.g. see **D2**)" and that infinite methods were routinely coupled to finite element domains (see summons to oral proceedings, points 1.4.7 and 1.4.8).
- 3.9 In the statement of grounds of appeal, the appellant argued that, "[i]n **D2** the infinite element forms a frustum of a rectangular pyramid as shown in Fig. 1. Further it describes an application of the three dimensional infinite element for modelling open boundary conditions in the finite element analysis of electromagnetic field problems. Thus, this document refers to electromagnetic field calculations and not to a finite element analysis for predicting life of wires. Only in an ex-post view could this document be taken into consideration".
- 3.10 The board notes that this document describes an application of the three-dimensional infinite element for modelling open boundary conditions in a finite element analysis. This appears to support the argument of the examining division that "infinite methods were routinely coupled to finite element domains".
- 3.11 The board recalls that documents other than the description, claims and drawings may only be used in so far as they are sufficient for proving the common

general knowledge on the date of filing (G 3/89, point 7 of the Reasons; G 2/95, point 2 of the Reasons).

Documents not meeting this condition can not be used for a correction, even if they were filed together with the European patent application. These include, *inter alia*, priority documents, the abstract and the like (G 3/89, point 7 of the Reasons; G 2/95, point 2 of the Reasons).

3.12 *The documents cited in the application as originally filed*

3.12.1 The appellant argued that the last sentence of page 15 of the description as originally filed referred explicitly to **"non patent documents 1 and 2"** which had been cited on page 2 of the description as originally filed. Thus, the skilled person would have considered these documents relating to a finite element method. Non-patent document 1 was amended in the corrected description. Furthermore, it argued that **"patent document 1"** (**JP A 2002-260460** also cited on page 2 of the description as originally filed) used a finite element method.

3.12.2 Patent document 1 was cited in the description as originally filed as presenting a bending durability prediction method by which "test manufacturing" could "be eliminated and bending durability predicted by performing computer simulations" (description, page 2, lines 10 to 13).

3.12.3 Nevertheless, the board agrees with the examining division that even if the method of patent document 1 uses a finite element method, this does not imply that the invention also uses a finite element method (see decision, point 1.6.2).

- 3.12.4 The sentence from page 15 to 16 of the description as originally filed reads: "Since the infinite element method is also described in **non-patent documents 1 and 2**, no further explanation for this will be given".

The board concurs with the examining division that "the need to find, read, analyse and interpret another document in order to identify an error, is a reason not to consider the error immediately evident" (see decision, point 1.6.1).

- 3.12.5 The paragraph on page 16, lines 5 to 16 of the description as originally filed reads: "A method similar to the method disclosed in **Japanese Patent Application No. 2002-279502 [denoted by the board as "patent document 2"]**, filed by the present inventor on September 25, 2002, can be employed to turn each electric wire into a model of a three-dimensional beam element. As for the grommet 2, as shown in **Fig. 3b**, the model of the grommet 2 is divided into a plurality of rectangular infinite elements e_1, e_2, e_3, \dots , and the stress is calculated at four points p_1 to p_4 for each infinite element e ".

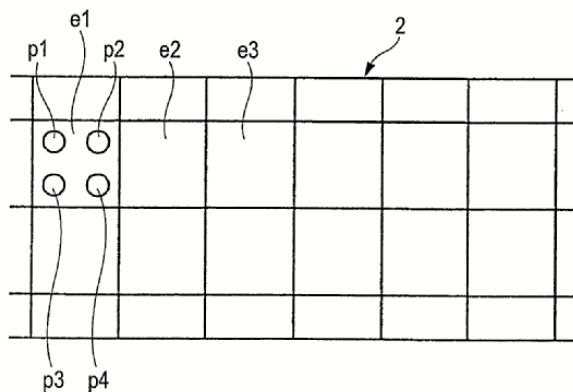
- 3.12.6 In the letter of reply dated 2 October 2012 filed with the examining division, the appellant submitted a non-patent document in Japanese titled "application of the method of infinite elements to convection-dispersion problems in infinite domains" [**denoted by the board as "non-patent document 3"**] to explain the difference between a finite and an infinite method and argued: "In the first paragraph of section 3 in this document, it was described that in the finite element method the analysis region is divided into a plurality of elements, each of which has a finite size and the

infinite element is defined by making one edge of the finite element infinite. In the present invention, the structure is divided into closed meshes (Figure 3B). Therefore, it was clearly understood that the elements e1, e2, e3 of this structure were finite elements".

With the letter of reply to the board's communication, a translation of this document was filed. Section 3 of this document states that "[t]he finite element method (FEM) subdivides a subject domain into multiple parts called finite elements, while ones of edges of the subdivided elements are set in infinite lengths in the infinite element method (IFEM), as an expanded modification of FEM". It also states that Figure 1 of the document showed a four-node two-dimensional infinite element "of this study".

3.12.7 The appellant further submitted that Figure 3B reproduced below shows rectangular finite elements. Thus, the skilled person working in this field would have known that the term "infinite" is incorrect.

FIG. 3B



The board notes that Figure 3B of the application at issue shows also on its left and right sides that the lines are not interrupted and that comparing it with Figure 1 of non-patent document 3, it appears that the

section of the grommet might have been understood by the skilled person as being modelled as infinite in its longitudinal direction. At most, the skilled person would have noticed that the rectangular infinite elements "e" are probably meant to be rectangular finite elements. But this would not have been sufficient to correct all occurrences of the adjective "infinite" in the patent application.

3.13 *The Japanese priority documents (JP 2002-345219 and JP 2003-364519)*

3.13.1 The application was filed in English as an international application having the number PCT/JP2003/015103. The board notes that, with reference to G 11/91, the disclosure of a priority document cannot be used to dispel doubts as to the meaning of an ambiguous part of an application. This applies similarly to the disclosure of family members. (In the statement of grounds, the appellant had argued that US 2004/0167752 A1 was a family member of patent document 2 and that the finite element method was used in it.)

3.13.2 In Japanese, the expression "finite element model" appears to correspond to "有限要素モデル", with the word "finite" corresponding to "有限", the word "element" corresponding to "要素", and the word model corresponding to "モデル". The word "infinite", on the other hand, corresponds to "無限" (emphasis in bold by the board).

3.13.3 The appellant had argued that in Japanese, the language of the priority documents, the word "finite" ("有限") and "infinite" ("無限") were similar. This might be true. However, it is not sufficient for deducing that an obvious error has occurred and that it can be

corrected without ambiguity. The board also observes that the appellant did not provide any official or certified translation of these documents.

- 3.13.4 With regard to the Japanese priority document JP 2002-345219, Figures 2A, 2B, 3A, 3B, 5A, 5B and 8 to 10 of this priority document appear to correspond to the same figures in the application in question.

Its Figure 1 seems to correspond to Figure 1 of the drawings of the current application as originally filed. Step 5C of Figure 1 of this priority document contains the sequence of Japanese characters "有限要素モデル" meaning "finite element model", whereas "infinite element model" was written in step 5C of Figure 1 of the application, more precisely, "infinite element model preparation unit".

Its Figure 6 seems to correspond to Figure 6 of the application at issue as originally filed. The same sequence of Japanese characters "有限要素モデル", meaning "finite element model", is present in steps S3 and S4 of Figure 6, whereas "infinite element model" was written in steps S3 and S4 of Figure 6 of the application, more precisely, "prepare infinite element models for individual electric wires" and "prepare infinite element [sic] models for grommet", respectively.

Its Figure 7 seems to correspond to Figure 7 of the current application as originally filed. Steps S501 and S502 of Figure 7 contains the sequence of Japanese characters "有限要素", which appears to mean "finite element(s)", whereas "infinite elements" is present in steps S501 and S502 of Figure 7 of the application, more precisely, "calculate stresses for infinite

elements of individual electric wires" and "calculate stresses for infinite elements of grommet", respectively.

3.13.5 With regard to the Japanese priority document JP 2003-364519, Figures 2A, 2B, 3A, 3B, 4, 5A, 5B and 8 to 10 of this priority document appear to correspond to the same figures in the application at issue.

Its Figures 1, 6 and 7 seem to correspond to Figures 1, 6 and 7 of the current application as originally filed, and the same sequences of Japanese characters in the Japanese priority document JP 2002-345219 are present there.

3.13.6 However, it cannot be excluded that the unit "finite element model preparation unit", the steps "prepare finite element models for individual electric wires" and "prepare finite element [sic] models for grommet", and the steps "calculate stresses for finite elements of individual electric wires" and "calculate stresses for finite elements of grommet" present in the priority documents were not amended into the same unit of step(s) by "infinite element" and "infinite element model(s)" in the application as originally filed.

3.13.7 The sole fact that the (technically) skilled person as defined by the appellant, who might be considered a multilingual person but not normally a linguist, would have looked at the Japanese words of "finite" versus "infinite" to find, first, that both words are similar in Japanese and, second, that one word ("finite") was employed in a drawing of the priority documents, while the other word ("infinite") was employed in a similar drawing of the application, is a further sign that the error is not obvious.

4. As a consequence, the board concludes that the main request does not fulfil the requirements of Article 123(2) EPC because the amendment of the word "infinite" to "finite" throughout the description is not an obvious correction of errors under Rule 139 EPC.

First auxiliary request

5. Claim 1 of the first auxiliary request corresponds to claim 1 as originally filed combined with claims 4 and 5 as originally filed.
6. *Article 83 EPC*
 - 6.1 In its decision, the examining division stated that the term "infinite element method" had a well-defined meaning in the field of computer simulation. It argued further that, using this normal meaning, the skilled person would not have been able to carry out the invention without exercising an inventive activity for filling the gaps in the technical teaching of the originally filed application. This fact had been also pointed out by the appellant in its letter dated 2 October 2012, where it was stated that "an infinite method would not work in the present case".
 - 6.2 The examining division stated that the Guidelines for Examination at the EPO, part F-III, 1 required at least one embodiment for carrying out the invention. In the current application, no working embodiments, providing details for using an infinite method for wire simulation, could be identified.
 - 6.3 Since there was no disclosure in the application that would have allowed the skilled person to directly and

unambiguously identify that a finite element method was to be used instead of the repeatedly proposed infinite element method, the skilled person would have realised that there were difficulties when implementing the invention but would not have known how to correct them based on the common general knowledge and the disclosure of the application, which repeatedly insisted on using an infinite method and taught away from using a finite element method.

6.4 The examining division concluded that claim 1 of this first auxiliary request was not sufficiently disclosed in the application, contrary to the requirements of Article 83 EPC.

6.5 The infinite element method is described in the application as originally filed from page 15, line 8 to page 16, line 1.

6.6 The board notes the following:

The finite element method is known as a numerical method for solving partial differential equations in variables of a two- or three-dimensional space. To solve a problem, the finite element method subdivides a large system into smaller, simpler parts called "finite elements". This is achieved by the construction of a mesh of the object: the numerical domain for the solution, which has a finite number of points. The finite element method formulation of a boundary value problem finally results in a system of algebraic equations. The simple equations that model these finite elements are then assembled into a larger system of equations that models the entire system.

The infinite element method is a modification of the finite element method. It divides the domain concerned into infinitely many sections. This results in an infinite set of equations, which is then reduced to a finite set.

6.7 The appellant had been invited by the board to explain where the "infinitely many sections" were placed in the electric wires and grommet and why the skilled person would have been able to implement the infinite element method in the application. In its letter of reply to the board's communication, the appellant did not address the auxiliary requests. During oral proceedings, the appellant relied only on its written submissions for the assessment of the auxiliary requests (see the minutes of the oral proceeding before the board, page 2).

6.8 It is further noted that in its letter of reply dated 2 October 2012, the appellant argued that the examining division was correct in its statement that the skilled person would not have been able to carry out the invention based on the application when an infinite element method was used.

7. The board concludes that the first auxiliary request does not fulfil the requirements of Article 83 EPC.

Second auxiliary request

8. Claim 1 of the second auxiliary request is based on claim 1 of the main request with the addition of the expression "and turn each electric wire into a model of a three-dimensional beam element" at the end of the "finite element model preparation step". Similar amendments have been made to independent apparatus

claim 6 and independent computer readable recording medium claim 7.

9. *Admissibility*

- 9.1 The second auxiliary request is not admissible. In accordance with Article 12(4) RPBA 2007, the board has the power to hold inadmissible facts, evidence or requests which could have been presented in the first-instance proceedings. This feature is a feature taken from the description (page 16, lines 11 and 12) which could and should have been added in a request during the first-instance proceedings.

Third auxiliary request

10. Claim 1 of the third auxiliary request is based on claim 1 of the second auxiliary request with the addition of the expression "and arranging, innermost at the bend, a thickest wire of all the plurality of wires (1)" (based on claim 4 as originally filed). Similar amendments have been made to independent apparatus claim 5 and independent computer readable recording medium claim 6.
11. This request is not admissible for the same reasons as mentioned for the second auxiliary request. Furthermore, the board doubts that this amendment, *prima facie*, overcomes the Article 123(2) EPC objection for the main request.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chair:



S. Lichtenvort

J. Geschwind

Decision electronically authenticated