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

Datasheet for the decision
of 1 March 2011

Case Number: T 1402/09 - 3.2.07

Application Number: 02736073.4

Publication Number: 1405933

IPC: C23C 22/34

Language of the proceedings: EN

Title of invention:
Treating solution for surface treatment of metal and surface
treatment method

Applicant:
NIHON PARKERIZING CO., LTD., et al

Opponent:
–

Headword:
–

Relevant legal provisions:
EPC Art. 123(2)
EPC R. 139

Relevant legal provisions (EPC 1973):
–

Keyword:
"Amendment extends beyond content of application as originally
filed (yes) - no obvious correction of an obvious error"

Decisions cited:
T 0605/93, T 1067/02

Catchword:
–

Case Number: T 1402/09 - 3.2.07

D E C I S I O N
of the Technical Board of Appeal 3.2.07
of 1 March 2011

Appellant:	NIHON PARKERIZING CO., LTD. 15-1, Nihonbashi, 1-Chome Chuo-ku Tokyo 103-0027 (JP) Toyota Jidosha Kabushiki Kaisha 1, Toyota-cho Toyota-shi Aichi 471-8571 (JP) Daihatsu Motor Co., Ltd. 1-1, Daihatsu-cho Ikeda city Osaka 563-0044 (JP)
Representative:	Albrecht, Thomas Kraus & Weisert Patent- und Rechtsanwälte Thomas-Wimmer-Ring 15 D-80539 München (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted 5 February 2009 refusing European application No. 02736073.4 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman:	H. Meinders
Members:	H. Hahn
	E. Dufrasne

C5474.D

Summary of Facts and Submissions

I.   The applicant lodged an appeal against the decision of
        the Examining Division to refuse the European patent
        application No. 02 736 073.4.

II.   Claim 1 of the English translation of the International
        application originally filed in Japanese reads as
        follows (emphasis added by the Board):

        "1. A composition for surface treatment of a metal
        containing iron and/or zinc, comprising component (A)
        and component (B);
        (A) a compound containing at least one metal element
        selected from the group consisting of Ti, Zr, Hf and Si,
        (B) a compound containing fluorine as a supplying
        source of HF,
        wherein, ratio K = A/B between total <u>mole weight</u> A of
        metal elements of Ti, Zr, Hf and Si in the compound of
        component (A) and <u>mole weight</u> B which when total
        fluorine atom in fluorine containing compound of
        component (B) is converted to HF is within the range of
        $0.06 \leq K \leq 0.18$."

III.   The Examining Division held that the amended claims 1
        of the set of the main request and of the first
        auxiliary request, both as filed with letter of
        12 December 2008, contravened Article 123(2) EPC for
        now defining the ratio K based on "mole concentrations"
        rather than the "mole weights" used to define this
        ratio in original claim 1.

IV.   With its grounds of appeal the appellant requested to
        set aside the impugned decision and to grant a patent

on the basis of the claims 1-9 of the single request as filed together with the grounds of appeal dated 4 June 2009. As an auxiliary request oral proceedings were requested.

V.   With a communication dated 21 May 2010 and annexed to the summons to oral proceedings the Board gave its preliminary and non-binding opinion with respect to the claims of the single request.

The Board stated amongst others that it appeared not to be evident that, as argued by the appellant, a mistranslation of the Japanese language International application as originally filed took place but that the proposed amendment of claim 1: "wherein, ratio K = A/B between total **mole concentration** A of metal elements of Ti, Zr, Hf and Si in the compound of component (A) and **mole concentration** B which when total fluorine atom in fluorine containing compound of component (B) is converted to HF is within the range of $0.03 \leq K \leq 0.167$" appeared to contravene Article 123(2) and Rule 139 EPC.

VI.   With letter dated 19 October 2010 the appellant submitted, as a response to the summons to oral proceedings, an amended set of claims 1-8 among which only claims 5-8 have been amended in order to overcome objections raised by the Board, being supported by explanations of the amendments carried out therein. Furthermore, the appellant submitted a totally different line of arguments concerning its proposed amendment of claim 1.

This letter did **not** contain any argument concerning the former mistranslation arguments.

VII. Oral proceedings were held on 1 March 2011. The only issue discussed was the proposed amendment of claim 1 in the light of Article 123(2) and Rule 139 EPC.

The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the claims filed with letter dated 19 October 2010.

At the end of the oral proceedings the Board announced its decision.

VIII. Independent claim 1 of the single request reads as follows (emphasis added by the Board):

"1. A treating solution for surface treatment of a metal containing iron and/or zinc, which comprises component (A), component (B) and component (C);
(A) a compound containing at least one metal element selected from the group consisting of Ti, Zr, Hf and Si,
(B) a compound containing fluorine as a supplying source of HF,
(C) a compound containing at least one metal element selected from the group consisting of Ag, Al, Cu, Fe, Mn, Mg, Ni, Co and Zn,
wherein, ratio K = A/B between total **mole concentration** A of metal elements of Ti, Zr, Hf and Si in the compound of component (A) and **mole concentration** B which when total fluorine atom in fluorine containing compound of component (B) is converted to HF is within the range of $0.03 \leq K \leq 0.167$; the concentration of component (A) indicated by the total mole concentration

of metal elements of Ti, Zr, Hf and Si is within the region of 0.05 to 100 mmol/L; the blending amount of compound of component (C) is adjusted to the sufficient amount to make the free fluorine ion concentration measured by fluorine ion meter smaller than 500 ppm."

IX.   The appellant argued essentially as follows:

It is firstly clear that the definition "mole weight" in the context of said ratio "K = A/B" as comprised in claim 1 as originally filed is erroneous since it does not allow to obtain K values in the entire claimed range. So the question to be answered is what meaning should this term, in its original Japanese form, actually have for the skilled person.

There are only two possibilities, namely either the "molar concentration" (or "molar amount") or the absolute "weight". The only interpretation, however, that makes sense is the molar quantity or concentration. This follows already from the language of the claim and the fact that the term "mole" is comprised therein. It is also clear for the person skilled in the art that the K-ratio must be established on the basis of molar concentrations taking account of the passages at page 7 of the English translation filed under Article 158(2) EPC 1973 and published as European patent application 02 736 073.4 dealing with the two chemical reaction equations:

(1) $H_2MF_6 + 2\ H_2O \leftrightarrow MO_2 + 6\ HF$

and

(2) $Fe + 3\ HF \leftrightarrow FeF_3 + 3/2\ H_2$
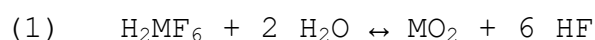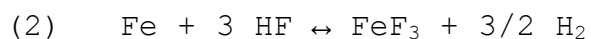
(according to which HF is consumed by the etching reaction of equation (2) whereby the equilibrium of equation (1) is shifted to the right whereby MO_2, the main component of the surface treated film, is formed), and the first full paragraph at page 8 to the end of the first full paragraph at page 9 of the English translation of the International application as originally filed. Therefrom it is apparent that the K-ratio controls the chemical equilibrium according to equation (1). Furthermore, the molar concentration of fluorine should be at least six times greater than the total molar concentration of Ti, Zr, Hf and Si (metal M in equation as component A in the claim), which factor of six corresponds exactly to the upper limit of 0.167 for the K-ratio (see page 7, second full paragraph). The person skilled in the art would therefore expect such a ratio to be based on molar concentrations or quantities since it is the numbers of the atoms in chemicals which determine the chemical reaction.

This also follows from the fact that limitations of the K-ratio apply irrespective of the choice of metal in component A. Assuming that the K-ratio was a weight ratio, the range of 0.03 to 0.167 (1/33.3 to 1/6) would correspond to molar ratios for Ti, Zr, Hf and Si of:

Ti   1/84.0   to 1/15.1
Zr   1/160.1 to 1/28.8
Hf   1/313.2 to 1/56.3
Si   1/49.3   to 1/8.9

Since it is common general knowledge that the position of chemical equilibrium depends on the molar concentrations of the species involved, and since the quoted passages disclose that the technical effects of the claimed treatment solution are dependent on the

position of the chemical equilibrium expressed by equation (1), the person skilled in the art would not assume that such vastly different molar ratios could have the same technical effects and therefore would clearly discount the possibility that the K-ratio is defined in terms of weight-based concentrations. There exists sufficient similarity between these 4 metals to assume that they behave identically.

No experimental evidence with respect to the proposed definition is submitted.

It is admitted that this erroneous definition was already present in the term expressed in Japanese characters in the original International application. The upper value of the ratio K range of original claim 1 of $0.06 \leq K \leq 0.18$ cannot be explained but this claim 1 was directed to a composition only comprising components A and B. Compound C bounds fluoride.

It is admitted that present claim 1 does not define the amount of the total fluorine in the surface treatment composition with respect to metal component A. However, this fact does not render useless the upper K-ratio value of 0.167. The definition of claim 1 refers to the concentration or quantity of compound B of which fluorine atoms are converted to HF but actually defines the same mole concentration of fluorine as mentioned on page 7. Therefore the proposed amendment meets the requirements of Article 123(2) and of Rule 139 EPC.

Reasons for the Decision

1.   *Admissibility of amendments (Article 123(2) EPC)*

1.1   European patent application 02 736 073.4 is based on
        the International application PCT/JP2002/005860 which
        has been originally filed in the Japanese language
        under the Patent Cooperation Treaty.

1.1.1   The published International application WO-A-02 103080
        (in Japanese language) - which normally corresponds to
        the originally filed International application - was
        received at the EPO on 27 December 2002. The entry into
        the regional phase before the EPO of this application
        took place on 8 December 2003, among others by filing
        an English translation in accordance with Article 158(2)
        EPC 1973 (in the following designated as the "English
        translation"). The European patent application
        02 736 073.4 was then published in the form of this
        English translation in accordance with Article 158(3)
        EPC 1973 on 7 April 2004 in Bulletin 2004/15.

1.1.2   Consequently, in the present case where the application
        documents of the European patent application as
        originally filed are a translation of the International
        application filed in Japanese, the content of the
        "application as originally filed" is that of the
        International application as originally filed in
        Japanese (see e.g. T 605/93 of 20 January 1995;
        point 3.1 of the Reasons; not published in OJ EPO).
        Thus the content of the published WO-A-02 103080 is
        relevant for the admissibility of any amendments under
        Article 123(2) EPC or corrections under Rule 139 EPC
        during the examination at the EPO.

1.2   Since the appellant admitted during the oral
       proceedings before the Board that the erroneous English
       definitions using "mole weight" were already present in
       that form in the International application WO-A-02
       103080 in Japanese the present problem does not arise
       from a mistranslation of the Japanese original.

1.3   As the applicant has not indicated that the English
       translation filed on entry into the European phase was
       otherwise incorrect, nor does the Board have any doubt
       about its correctness, the following is based on that
       translation.

1.4   Claim 1 of the single request is based on independent
       claim 4 and dependent claim 5 of the aforementioned
       English translation as originally filed but the
       definitions using "mole weight" used in original claim
       4 (which are identical with the definitions in original
       claim 1; compare point II above) for defining the ratio
       K have been replaced by the definitions using **"mole
       concentration"** (see point VIII above).

       This amendment, however, has **no** basis in that
       translation for the following reasons.

1.5   Although it is obvious that the definition "mole
       weight" in the context of said ratio "K = A/B" as
       comprised in claim 1 as originally filed is erroneous
       since it does not allow to obtain K values in the
       entire range, as correctly argued by the Examining
       Division in the impugned decision (see point 1.1 of the
       reasons), it is **not** conclusive as to which of the two
       possibilities for a correction thereof - "mole

concentration" or "weight concentration" - has to be chosen since both of them make technical sense (compare T 1067/02 of 30 November 2004; points 3 to 7 of the Reasons; not published in OJ EPO).

1.6   When asked by the Board during the oral proceedings the appellant could not give any reason as to why the term "weight" would have come into the language of the original claims in Japanese and their literal English translation when the meaning of the term "mole" as such is clear to the person skilled in the art. In this context it is also remarked that original claims 3 and 4 comprised the definition "mole concentration" but only in the context of the concentration range of component (A).

        Thus the appellant's arguments based on the language of the claims cannot hold since there exists probability to choose either one of the two possibilities.

1.7   In the first place, the application uses different concentration definitions respectively units for different components of the claimed treating solution such as:

        - "mole concentration" (for component A in "mol/L"; see original claims 3 and 4 and examples 1-10),

        - "g/L" (i.e. a weight based concentration which is partly used for component A in the examples 1-10),

        - "%" (i.e. weight%; see example 3), and

- "ppm" (which is another weight based concentration which is used for the free fluorine concentration and for oxygen acids; see original claim 5 and examples 1-10).

In view of the above it is not directly and unambiguously derivable from the claims and the description as to whether the molar concentration or the weight concentration should be used for establishing said ratio K.

1.8   Further, the appellant's arguments - that it would be clear that only the molar concentration or molar quantity could be meant - cannot hold either, for the following reasons.
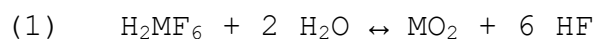
1.8.1   It is derivable from page 7, lines 12 to 30 of the English translation that "the metal elements of Ti, Zr, Hf and Si in the compound of component (A) are existing as H_2MF_6 … in aqueous solution containing sufficient amount of HF" and "when the mole concentration of fluorine ion is smaller than six times as much as concentration of component (A) indicated by the total mole concentration of metal elements of Ti, Zr, Hf and Si, these metal elements are existing as salts of said H_2MF_6 and other acids".

Hence this metal compound has - in aqueous solution containing sufficient HF, i.e. an aqueous solution containing an **excess** of HF - a molar ratio of M:F of greater than **1:6**. This ratio 1:6 or 1/6 corresponds to a value of 0.167.
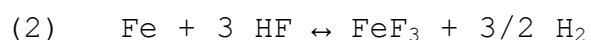
First of all, taking account of the said **excess** of HF
this molar ratio, however, cannot be equal to said
value of 0.167. Furthermore, as admitted by the
appellant, present claim 1 does **not** define said
fluorine molar concentration as disclosed on page 7 but
uses a different definition of a "mole concentration B
which when total fluorine atom in fluorine containing
compound of component (B) is converted to HF is within
the range of $0.03 \leq K \leq 0.167$".

Additionally it is remarked that, although this
aforementioned statement concerning the metal compound
of component (A) should also be valid for the two
component alternative according to original claim 1
defining only components (A) and (B) in combination
with a K-ratio range of "$0.06 \leq K \leq 0.18$", said value
of 0.18 corresponds to a ratio of M:F of about **1:5.6,**
the appellant could not explain as to how this fluorine
ion molar concentration would fit with said ratio of
1:6. The additional component C which bounds fluorine,
however, does not influence said ratio since the bound
fluorine still can be converted into HF.

1.8.2   The Board does also not share the appellant's view that
it would be clear for the person skilled in the art
that the K-ratio must be established on the basis of
molar concentrations, on account of the two chemical
reaction equations
(1) $H_2MF_6 + 2\ H_2O \leftrightarrow MO_2 + 6\ HF$
and
(2) $Fe + 3\ HF \leftrightarrow FeF_3 + 3/2\ H_2$
which describe as to how the main component MO_2 of the
surface treated film is formed.

Although it is visible that **the ratio of the total fluorine ions to the metal element M** controls the chemical equilibrium according to equation (1) it needs to be considered that the description of the chemistry of such an equilibrium reaction is one thing while the definition of a chemical composition suitable for a surface treatment applying such an equilibrium reaction and comprising the necessary precursor chemicals in specific amounts is another.

In this context the Board firstly notes that the K-ratio definition of present claim 1 does **not** define the ratio of the total fluorine ions to the metal element M. Claim 1 of the single request simply defines a ratio between component (A), i.e. a compound containing at least one metal element M, and component (B) which is a compound containing fluorine as a supplying source of HF (see point VIII above). However, as can be derived from the English translation (see page 6, lines 12 to 20) component (A) can contain fluorine ions and thus supply additional HF which is **not** covered by the definition of the K-ratio of claim 1.

Secondly, the definition of the different components of a composition is quite commonly made on its weight basis since it simplifies making the desired composition.

Likewise the use of the definition of the weight unit "ppm" - which for example is used in present claim 1 for defining the free fluorine ion concentration of the solution - is most presumably chosen to simplify the analysis of the composition. In the present case the analysis of the fluorine ion content of the claimed

aqueous solution by measuring the same with a fluorine sensitive electrode results in "ppm fluorine ion". This free fluorine ion concentration influences, however, also said equilibrium reaction and should therefore, provided that the appellant's arguments would hold, also be defined by using the molar concentration. This is, however, not the case.

Hence it is **not** conclusive to use molar concentrations in the case of an equilibrium reaction as alleged by the appellant.

1.8.3   Assuming that the K-ratio was a weight ratio, the range of 0.03 to 0.167 (= 1/33.3 to 1/6) would correspond to the following molar ratios for Ti, Zr, Hf and Si:
Ti   1/84.0   to 1/15.1
Zr   1/160.1   to 1/28.8
Hf   1/313.2   to 1/56.3
Si   1/49.3   to 1/8.9

The appellant's argument that the person skilled in the art would not assume that such vastly different molar ratios could have the same technical effects and therefore would clearly discount the possibility that the K-ratio is defined in terms of weight-based concentrations, is based on the assumption that there would exist sufficient similarity between these 4 metals so that they behave identically and the thereby resulting allegation that these 4 metals produce the same technical effect with a similar efficiency.

However, applying common general knowledge and taking account of the atomic numbers 14, 22, 40 and 72 of these 4 metals Si, Ti, Zr, and Hf, respectively, and

their position in the Periodic Table of Elements in the
two groups IV A and IV B (thus they have different
electron structures) and further considering e.g. their
different electronegativities of 1.8, 1.5, 1.4 and 1.3
(which influences the ionic character of the binding
with fluorine which has a value of electronegativity of
4.0) and their increasing ionic radius at the oxidation
state +4, it would actually be surprising if they would
behave identically. The person skilled in the art would
therefore refrain from making the assumption that they
behave identically.

In this context the appellant admitted during the oral
proceedings that no experimental evidence has been
submitted. Thus there exists neither proof for the
allegation that these 4 metals actually produce the
same effect nor that the molar concentration would be
the correct concentration which must be used.

1.9   Taking account of the above considerations it might be
        more probable that the person skilled in the art would
        choose the molar concentration, but the use of the
        weight concentration cannot be conclusively excluded. A
        mere higher probability is, however, not sufficient in
        order to allow a correction of this term as an obvious
        error according to Rule 139 EPC since the correction
        must be obvious in the sense that it is immediately
        evident that **nothing else** would have been intended than
        what is offered as the correction. It is apparent that
        this condition is not met in the present case.

1.10   With regard to the above the Board concludes that as a
        consequence the application with claim 1 of the single
        request extends beyond the content of the application

as originally filed and therefore contravenes
Article 123(2) EPC. Consequently, the request is not
allowable.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

G. Nachtigall   H. Meinders