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**Datasheet for the decision
of 18 January 2008**

Case Number: T 0766/05 - 3.3.05

Application Number: 92119918.8

Publication Number: 0545201

IPC: C03C 17/27

Language of the proceedings: EN

Title of invention:

Durable water repellent glass surface

Patentee:

PPG Industries Ohio, Inc.

Opponent:

Matsushita Electric Industrial Co., Ltd.

Headword:

Water repellent glass/PPG

Relevant legal provisions:

EPC Art. 123(2)

Relevant legal provisions (EPC 1973):

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Keyword:

"Main request: amendments supported by the application as
filed - yes"

"Remittal - yes"

Decisions cited:

-

Catchword:

-



Case Number: T 0766/05 - 3.3.05

D E C I S I O N
of the Technical Board of Appeal 3.3.05
of 18 January 2008

Appellant: PPG Industries Ohio, Inc.
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Respondent: Matsushita Electric Industrial Co., Ltd.
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 27 April 2005
revoking European patent No. 0545201 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: G. Raths
Members: J.-M. Schwaller
S. Hoffmann

Summary of Facts and Submissions

I. This appeal was lodged by the patent proprietor against the decision of the opposition division posted on 27 April 2005 revoking European patent No. 0545201, relating to "durable water repellent glass surface". The decision was based on four sets of claims corresponding respectively to a main and 1st to 3rd auxiliary request.

II. The following documents were *inter alia* relied upon during the opposition proceedings:

D1: EP-A-482613

D3: EP-A-492545

III. In the contested decision, the opposition division held that none of the four requests satisfied the requirements of Article 123(2) EPC.

It concluded in particular that the disclaimer "*whereby chloroform is excluded in case the oxide primer is silica*" used in claim 10 of the main request was inadmissible as it removed more than was necessary to restore novelty against Example 4 of document D1.

The same conclusion was reached for the disclaimer "*whereby a solution of 1 wt.% Cl-(SiCl₂O)₂-SiCl₃ or SiCl₄ in chloroform is excluded*" used in claim 8 of the 2nd auxiliary request and supposed to restore novelty against Example 4 of document D1 and Example 5 of document D3.

The opposition division furthermore considered as an inadmissible extension the omission of the term "telomer" in the feature "*said perfluoroalkylalkyl silane is combined with a fluorinated olefin ~~telomer~~ compound*" recited in the dependent claims 8 and 14 of said main request.

- IV. Along with the notice of appeal dated 20 June 2005 and in replacement of the above four requests, the appellant filed two new sets of claims as main and auxiliary requests.

Independent claim 8 of the main request read as follows:

"8. A method of producing a non-wetting surface on a substrate having a glass or glass-like surface comprising the steps of:
a. forming a first layer of a sol-gel applied silica primer on the substrate by depositing on the substrate a solution which includes a primer composition dissolved in an anhydrous solvent without an active hydrogen whereby in case of a glass substrate a solution of $Cl-(SiCl_2O)_2-SiCl_3$ or $SiCl_4$ in chloroform is excluded and wherein the primer composition hydrolyzes/condenses at ambient temperature with moisture to form the primer layer; and
b. contacting the primer layer with a composition comprising a perfluoroalkylalkyl silane forming a second layer."

Independent claims 1, 8, 9, 11 and 17 of the auxiliary request read as follows:

"1. An article comprising a substrate having a glass or a glass-like surface at least a portion of which is treated with

a. a first layer of a sol-gel applied silica primer; and

b. a second layer of perfluoroalkylalkyl silane over the oxide primer layer;

wherein said primer layer is about 10 nm thick.

8. A method of producing a non-wetting surface on a substrate having a glass or glass-like surface comprising the steps of:

a. forming a first layer of a sol-gel applied silica primer on the substrate by depositing on the substrate a solution which includes a primer composition dissolved in an anhydrous solvent without an active hydrogen wherein the primer composition hydrolyzes/condenses at ambient temperature with moisture to form the primer layer; and

b. contacting the primer layer with a composition comprising a perfluoroalkylalkyl silane forming a second layer,

wherein said primer composition includes one of the compounds selected from silicon tetracarboxylates, preferably acetates, or more than one selected from the group consisting of silicon tetrahalides, preferably chloride, silicon tetracarboxylates, preferably acetates, partially hydrolyzed/condensed silicon halides.

9. A method of producing a non-wetting surface on a substrate having a glass or glass-like surface comprising the steps of:

a. forming a first layer of a sol-gel applied silica primer on the substrate by depositing on the substrate a solution which includes a primer composition dissolved in an anhydrous solvent without an active hydrogen wherein the primer composition hydrolyzes/condenses at ambient temperature with moisture to form the primer layer; and

b. contacting the primer layer with a composition comprising a perfluoroalkylalkyl silane forming a second layer,

wherein said anhydrous solvent is selected from the group consisting of perfluorocarbons, 1,1,2-trichlorotrifluoroethane, trichloroethane, methylene chloride, and hydrocarbons.

11. A method of producing a non-wetting surface on a substrate having a glass or glass-like surface comprising the steps of:

a. forming a first layer of a sol-gel applied silica primer on the substrate by depositing on the substrate a solution which includes a primer composition dissolved in an anhydrous solvent without an active hydrogen wherein the primer composition hydrolyzes/condenses at ambient temperature with moisture to form the primer layer; and

b. contacting the primer layer with a composition comprising a perfluoroalkylalkyl silane forming a second layer,

wherein said perfluoroalkylalkyl silane is combined with a fluorinated olefin compound selected from the group consisting of $C_mF_{2m+1}CH=CH_2$, wherein m is from 1 to 30.

17. A method of producing a non-wetting surface on a substrate having a glass or glass-like surface comprising the steps of:

- a. forming a first layer of a sol-gel applied silica primer on the substrate by depositing on the substrate a solution which includes a primer composition dissolved in an anhydrous solvent without an active hydrogen wherein the primer composition hydrolyzes/condenses at ambient temperature with moisture to form the primer layer; and
- b. contacting the primer layer with a composition comprising a perfluoroalkylalkyl silane forming a second layer,

wherein said perfluoroalkylalkyl silane composition includes the perfluoroalkylalkyl silane dissolved in a solvent, wherein said solvent is selected from the group consisting of hexane, heptane, methylenechloride, acetone, toluene, naphtha, fluorinated hydrocarbon solvents and perfluorinated organic compounds."

V. The respondent neither replied to the grounds of appeal, nor filed any request. By a letter dated 11 December 2007, it nevertheless indicated that it would not attend the scheduled oral proceedings.

VI. Oral proceedings took place on 18 January 2008.

During the discussion, the board indicated its provisional opinion that the disclaimer defined in claim 1 according to the main request did not appear to be admissible. As to the auxiliary request, the board raised the question whether there was a basis in the application as originally filed for:

- the omission of the term "telomer" in claims 7, 10 and 11;
- the combination of features
"the primer composition hydrolyzes/condenses at ambient temperature with moisture to form the primer layer"
(emphasis added by the board)
in claims 8, 9, 11 and 17;
- the presence of
"or more than one selected" in the feature *"said primer composition includes one of the compounds selected from [...], or more than one selected from the group consisting of [...]"*
in claim 8;
- the combination of features of claim 20.

After the discussion, the appellant filed two new sets of claims respectively as main and first auxiliary requests in replacement of the two requests filed with the notice of appeal.

Claim 8 of the main request reads as follows:

"8. A method of producing a non-wetting surface on a substrate having a glass or glass-like surface comprising the steps of:
a. forming a first layer of a sol-gel applied silica primer on the substrate by depositing on the substrate a solution which includes a primer composition dissolved in an anhydrous solvent without an active hydrogen wherein the primer composition hydrolyzes/condenses at ambient temperature with moisture to form the primer layer; and

b. contacting the primer layer with a composition comprising a perfluoroalkylalkyl silane forming a second layer, wherein said primer composition is selected from the group consisting of silicon tetrahalides, silicon tetracarboxylates, preferably acetates, partially hydrolyzed/condensed silicon halides, preferably chlorides."

The other claims according to the main request - on which the present decision is based - differ in essence from those of the auxiliary request filed with the notice of appeal in that:

- the feature "*at ambient temperature*" has been deleted from claims 9, 11 and 17;
- the term "*compound*" has been deleted in claim 11 (the same amendment has been carried out in dependent claim 10);
- dependent claim 20 has been deleted.

VII. Concerning the omission of the feature "telomer" in claims 7, 10 and 11, the appellant argued that the formula " $C_mF_{2m+1}CH=CH_2$, wherein *m* is from 1 to 30" recited therein did not correspond to that of a fluorinated olefin telomer. Therefore, any occurrence of the word "telomer" in the expression "*a fluorinated olefin telomer selected from the group consisting of $C_mF_{2m+1}CH=CH_2$, wherein *m* is from 1 to 30*" - as for instance at page 3, lines 7 and 8 or in claims 8 and 17 of the application as originally filed - was to be

considered as an error, the obvious correction of which was its deletion.

- VIII. The appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of claims 1-20 of the main request or, in the alternative, on the basis of claims 1 to 7 of the first auxiliary request, both requests submitted during the oral proceedings.

Reasons for the Decision

*Main request - Allowability of the amended claims
(Article 123(2) EPC)*

1. Claims 1 to 6 of this request find their support in the following passages of the application as filed:

Claim 1: claim 1; page 2, lines 2 to 4; page 4, lines 12 to 16 of the application as filed.

Claim 2: page 3, lines 11 to 18 of the application as filed.

Claims 3 to 6: page 2, lines 22 to 27 of the application as filed.

2. Concerning claim 7, the board accepts that the formula " $C_mF_{2m+1}CH=CH_2$, wherein m is from 1 to 30" does not correspond to that of a fluorinated olefin telomer and that the feature "a fluorinated olefin telomer selected from the group consisting of $C_mF_{2m+1}CH=CH_2$, wherein m is

from 1 to 30", originally present in the application as filed, therefore contained an error. Whether the error lies in the formula or in the presence of the word "telomer" in said feature can however only be established after analysis of the subject-matter of present claim 7, on the one hand, and of the content of the description, in particular the Examples, on the other hand.

In this respect, while claim 7 prescribes that a "fluorinated olefin selected from the group consisting of $C_mF_{2m+1}CH=CH_2$, wherein m is from 1 to 30" is combined with a perfluoroalkylalkyl silane to form a second layer, the Examples in which such a second layer is formed refer to the use of perfluoroalkylethylene (alkyl representing C_6 - C_{18} chain lengths) as the fluorinated olefinic compound (see Examples 2 to 8 and Examples 10 to 12).

As said perfluoroalkylethylene (alkyl representing C_6 - C_{18} chain lengths) is a fluorinated olefin having a formula falling under the one defined in present claim 7, the board can accept the appellant's argument that the presence of the word "telomer" in the originally claimed expression "a fluorinated olefin telomer selected from the group consisting of $C_mF_{2m+1}CH=CH_2$, wherein m is from 1 to 30" was an error, which is obviously to be corrected by the omission of the term "telomer" from claim 7.

Bearing in mind this obvious correction, claim 7 of the main request has a basis at page 2, lines 9 to 11 and page 3, lines 7 and 8 of the application as filed.

3. Claims 8 to 9 of the main request find their support in the following passages of the application as filed:

Claim 8: claim 11; page 2, lines 2-8 and lines 16 to 21; page 4, lines 34 to page 5, line 2; page 5, lines 16 to 21 of the application as filed.

Claim 9: claim 11; page 2, lines 2-8 and lines 16 to 21; page 5, lines 16 to 21 of the application as filed.

4. Apart from the fact that claim 10 is directed to a method and is dependent on "any of claims 8 and 9", this claim has the same wording as claim 7, directed to an article and dependent on "any of claims 1-6". Therefore, the argumentation concerning the support of this claim in the application as filed is the same as for claim 7 (see item 2. *supra*).

5. Bearing in mind that the omission of the word "telomer" in claim 11 is an obvious correction (see item 2. *supra*), this claim finds its basis in claim 11; at page 2, lines 2-11 and lines 16 to 21; page 3, lines 8 and 9; page 5, lines 16 to 21 of the application as filed.

6. As to the remaining claims 12 to 20, their support in the application as filed is as follows:

Claims 12 to 15: page 2, lines 22 to 27 of the application as filed.

- Claim 16: page 3, lines 22-27 of the application as filed.
- Claim 17: claim 11; page 2, lines 2-8 and lines 16 to 21; page 3, lines 22-27; page 5, lines 16 to 21 of the application as filed.
- Claim 18: page 3, lines 11 to 18 of the application as filed.
- Claim 19: page 3, lines 32 and 33 of the application as filed.
- Claim 20: page 2, lines 2 to 4; page 4, lines 12 to 16; claims 1 and 11 of the application as filed.

7. Since the claims 1-20 of the main request do not extend beyond the content of the application as filed, they meet the requirements of Article 123(2) EPC.

Remittal

Since the decision to revoke the patent only dealt with the allowability of the amended claims under Article 123(2) EPC, and as the opposition division has not yet ruled on the outstanding issues regarding the claims of the present main request, in particular novelty and inventive step, the Board considers it appropriate to exercise its power conferred by Article 111(1) EPC to remit the case to the first instance for further prosecution.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the first instance for further prosecution.

The Registrar:

The Chairman:

C. Vodz

G. Raths