BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

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File Number: T 859/91 - 3.3.2

Application No.: 85 108 977.1

Publication No.: 0 192 810

Title of invention: Composition and method for protecting glass sheets based on a porous powder and an organic acid

Classification: C03C 17/28

D E C I S I O N
of 17 March 1993

Applicant: PPG INDUSTRIES, INC.

Headword: Stain inhibitors/PPG

EPC Art. 56

Keyword: "Inventive step (no) - obvious different solution"

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number : T 859/91 - 3.3.2

D E C I S I O N
of the Technical Board of Appeal 3.3.2
of 17 March 1993

Appellant : PPG INDUSTRIES, INC.
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Decision under appeal : Decision of the Examining Division of the European Patent Office dated 27 juin 1991 refusing European patent application No. 85 108 977 pursuant to Article 97(1) EPC.

Composition of the Board :

Chairman : P.A.M. Lançon
Members : M.M. Eberhard
R.L.J. Schulte

Summary of facts and submissions

I. European patent application No 85 108 977.1 (publication No 0 192 810) was refused by a decision of the Examining Division. The decision was based on the set of amended claims filed on 7 November 1989. Claim 1 thereof read as follows :

"A method of protecting the surfaces of packaged glass sheets from scratching and staining by dispersing a dry powdered interleaving material between said glass sheets prior to stacking wherein the interleaving material is a porous finely divided support material which has been impregnated with an aqueous solution of an acidic material as stain inhibiting material and dried characterized in that the stain inhibiting agent is malic acid, tartaric acid or an organotin halide."

II. The ground for the refusal was that the process according to Claim 1 did not involve an inventive step in the light of the disclosure in US-A-4 011 359, document (1), and DE-A-3 221 078, document (2). In the decision, the Examining Division pointed out that the acids used in the claimed process were known to be efficient as anti-staining agents when applied to glass sheets - be it by way of directly applying the acids in the form of their aqueous solutions or be it by a more indirect application as shown in D2, namely by applying a slurry containing wood flour impregnated with the acids. In its opinion, when the wood flour impregnated with the acids of D1 and dusted on glass sheets obviously neutralised the alkali build-up between stacked glass sheets, then it was within the expectation of the skilled person aware of D1 and D2 that wood flour impregnated as taught in Claim 1 and dusted on a glass

sheet would show a similar anti-staining effectiveness. Moreover, it was derivable from the comparison between the anti-staining properties reported in D2 and in the present application that in the latter case less effectiveness was achieved with a reduced effort - a result which the skilled person would have expected.

III. The Appellant lodged an appeal against this decision. At the beginning of the oral proceedings held on 17 March 1993, the Appellant submitted an amended set of four claims in reply to the Board's doubts as to whether Claim 1 met the requirements of Art. 123(2).

The claims handed over at the oral proceedings differ from the claims of 7 November 1989 only in that the terms "scratching and" have been deleted in Claim 1.

IV. The Appellant's arguments in the statement of grounds of appeal and during the oral proceedings may be summarised as follows:

A person skilled in the art would derive from D2 that the strong acidic compound must be contacted with the glass surface in the form of a solution in order to achieve a uniform stain-inhibiting effect. It is not derivable from D2 that these compounds can be used in another form, in particular in the form of a dry powder. On the contrary, in view of the statement about the prior art in D2, for example about US-A-3 723 312, the skilled person would be aware of the fact that a dry powder, such as dedusted agglomerated salicylic acid mixed with an inert separator material, is not effective; otherwise the use of a slurry and dissolved stain inhibitors would not have been considered as an improvement. Furthermore, D1 also refers to US-A-3 723 312 and teaches that acids impregnated into

the porous inert material perform less suitably than agglomerated acids.

Since the use of a slurry represents an improvement over that of a dry powder and the teaching of D1 is similar to that of the prior art cited in D2, the skilled person would not consider replacing the use of a slurry containing the dissolved stain inhibitors by the method disclosed in D1.

Moreover there is no information in D1 which suggests that another anti-staining material can be used, let alone the strongly acidic organic compounds recited in the present Claim 1. Nor does D1 indicate that the frictional, water and soil repellent properties of the interleaving material are important or needed to be enhanced. According to D1, a blend of acid-impregnated porous support material and fine particles of inert plastics material is used as interleaving material in order to prevent scratching and staining. The plastics beads prevent or reduce scratching and avoid displacement of the wood flour in particular when the glass sheets are in a vertical position. On the contrary, the claimed process involves the use of an interleaving material consisting only of an acid-impregnated porous support and is also effective.

The acid-impregnated dry powder is in fact useful when an aqueous slurry cannot be used, whatever the reasons thereof. However, it is admitted that no surprising effect is obtained by using a dry powder instead of an aqueous slurry.

V. The Appellant requested that the decision under appeal be set aside and a patent be granted on the basis of Claims 1 to 4 filed during oral proceedings and a description to be adapted.

Reasons of the decision

1. The appeal is admissible.

2. There are no formal objections under Article 123(2) to the amended set of claims submitted during oral proceedings.

3. The process according to Claim 1 is novel with respect to the cited documents since, on the one hand, D1 does not mention malic acid, tartaric acid or an organotin halide as stain inhibiting agent and, on the other hand, in the process of D2 the interleaving material is not applied to the glass in form of dry powder but in form of an aqueous slurry.

4. Document D1 discloses a method of protecting the surface of packaged glass sheets from scratching and staining during storage or transport, wherein an interleaving material is dispersed in the form of a dry powder between the glass sheets prior to stacking. The interleaving material comprises fine particles of a chemically inert plastics material and a porous finely divided support material such as wood flour, which has been impregnated with an aqueous solution of a weak organic acid as stain inhibiting agent and dried. The preferred organic acids are those containing 3 to 10 carbon atoms, especially dibasic aliphatic acids or aromatic acids. The weak organic acids used in this process have a first dissociation constant, measured at 25°C, in the range 1.10^{-1} to 1.10^{-7}, preferably 5.10^{-3} to 1.10^{-6} (cf. Claims 21, 1, 10 and 25; col. 2, lines 31-42 and 49-54; col. 3, lines 32-34; example).

   In the Board's opinion this document represents the closest prior art although the Appellant considered the process of D2 as starting point in the arguments presented in connection with inventiveness. Thus, D1 involves, as the

claimed process, the impregnation of the organic acid into the porous support and the application of the acid-impregnated support material in the form of a dry powder. On the contrary, in D2 the interleaving material is applied in the form of an aqueous slurry which contains the acidic organic material used as stain inhibitor. Furthermore, the definition of the preferred organic acids given in D1 clearly encompasses malic acid and tartaric acid (see the preferred range of first dissociation constant). Under these circumstances, D1 is considered to be closer to the present application than D2 as regards the process itself although D2 mentions the specific stain inhibitors recited in the characterising part of Claim 1.

4.1 In the light of the closest prior art D1, the technical problem underlying the application can be seen in providing a different process for the protection of stacked glass sheets against staining.

It is proposed to solve this problem by using malic acid, tartaric acid or an organotin halide as stain inhibiting agent. Further, the powdered interleaving material used in the process of Claim 1 contains only the acid-impregnated porous support material. In view of the results of stain resistance obtained in example 1 of the application, the Board is satisfied that the technical problem stated above has been plausibly solved.

4.2 It is stated in the present application that protection from staining is improved by using the particular acidic compounds recited in Claim 1. However, as the Appellant has not provided any evidence showing an improvement of the stain resistance over the closest prior art, this alleged but unsupported advantage cannot be taken into account for the determination of the problem underlying the application. Therefore, the technical problem defined in

point 4.1 above is taken into consideration for the assessment of inventive step (cf. decision T 20/81, OJ EPO 1982, 227).

5. D1 itself discloses the use of for example adipic acid, malic acid, sebacic acid, succinic acid and benzoic acid as stain-inhibiting agent with which the porous support material is impregnated (cf. col. 2, lines 34-35 and col. 4, lines 23-25). However, the teaching of this document is not limited to the use of these specific acids. On the contrary, it is derivable from D1 that organic acids containing 3 to 10 carbon atoms, especially dibasic aliphatic acids or aromatic acids having a first dissociation constant in the range of preferably 5.10^{-3} to 1.10^{-6} act as anti-staining agents and can be used for the impregnation of the porous support. Therefore, the skilled person faced with the problem stated above would first of all look for alternative stain-inhibitors in the group of organic acids defined in general terms in D1. This group indeed encompasses a great number of organic acids, however the skilled person is also aware of D2 which concerns the same technical field and also deals with the problem of protecting stacked glass sheets from stain damage.

5.1 D2 discloses a process which comprises applying a powdered interleaving material to a glass surface in the form of an aqueous slurry and drying. The aqueous slurry contains the interleaving material, in particular a porous finely divided support material such as wood flour, and a stain inhibitor. The latter is an acidic organic compound such as an alkyltin halide or organic acids, for example citric acid, malic acid or tartaric acid. The staining tests carried out in the examples to evaluate the stain resistance show that these compounds provide an excellent protection from staining (cf. Claims 1, 2, 4 to 6; page 6, lines 1-8; page 7, lines 1-5).

In view of this teaching, the skilled person faced with the problem stated above would obviously contemplate using malic acid or tartaric acid in the process of D1 since these acids belong to the preferred group of organic acids defined in D1 and, therefore, the skilled person would expect that they also exhibit effective stain-inhibiting properties when impregnated in the porous support and applied to the glass as described in D1.

As regards the alkyltin compound, it can be inferred from D2, in particular from the comparison of example 1 with example 4, that the use of a mixture of dimethyltin dichloride and methyltin chloride as stain inhibitor leads to a better stain resistance than tartaric acid. Therefore, in view of these results the skilled person would also be encouraged to try the alkyltin chlorides as stain inhibitors in the process of D1.

5.2 As stressed by the Appellant, the interleaving material used in the process of D1 contains the fine particles of chemically inert plastics material in addition to the acid-impregnated porous support material. According to D1, the mixture of both components works effectively to prevent or reduce both staining and scratching. This document teaches that the use of such a mixture protects the glass from transit damage much better than a similar porous support material alone, whether impregnated or not. The incorporation of the plastics particles, acting as a separator material, is believed to improve the practical performance of the interleaving material because the plastics material is less liable to be displaced from between the sheets than the porous support and it is less liable to contain impurities which might damage the glass (cf. col. 2, lines 11-20).

Thus the skilled person would infer from D1 that the chemically inert plastics particles act as an inert separator material and improve the protection from scratching, and that the latter would likely be decreased if the plastics particles were omitted. Under these circumstances, the omission of these particles is considered to be obvious to the skilled person, if, as expected in view of the teaching of D1, it leads to a slight drop of the scratching resistance. As the Appellant has not provided any evidence showing that the degree of protection from scratching achieved with the claimed process is at least as good as with the mixture used in D1, the Board cannot recognize any inventive effort in the omission of the plastics particles.

5.3 The Board observes that, if D2 were taken as starting point for the assessment of inventive step instead of D1, it would come to the same conclusion for the following reasons:

The Applicant has argued that it is not always possible to apply the interleaving material to the glass in the form of an aqueous slurry and that the claimed process is useful in situations where the application of the slurry as described in D2 cannot be performed, whatever the reasons. Therefore, starting from D2 as closest prior art, the technical problem can be seen in providing a process for the protection of stacked glass sheets from staining, which enables application of the interleaving material in a different form. In view of D1, which teaches that an effective stain resistance is achieved by impregnating the stain inhibitor into the porous support material and applying the acid-impregnated material in form of a dry powder to the glass, the skilled person would contemplate performing the application of the interleaving material of D2 in the same manner as in D1 in order to solve the

problem defined above. Doing this, he would directly arrive at the claimed process without exercising any inventive skill.

The Appellant's arguments that the reference to the prior art document US-A-3 723 312 in D2 and in D1 would deter the skilled person from coming back to the use of dry powders is not convincing. In D2 it is only mentioned that this prior art method involves the use of a dedusted agglomerated salicylic acid mixed with an inert separator such as polystyrene beads, and that this mixture is applied to the glass by dusting or by other known methods. The drawbacks of this method are not indicated in D2. Moreover, the problem underlying D2 seems to be defined with respect to another prior art. D1 gives additional information about US-A-3 723 312. According to D1, "it is stated in this US specification that acids impregnated into porous solid inert separator materials perform less suitably than agglomerated acids" (cf. col. 1, lines 49-58). However, D1 further teaches that "despite the teaching of US-A-3 723 312, it has been found that the interleaving material according to the invention works effectively to prevent or reduce both scratching and staining" (cf. col. 1, line 61 to col. 2, line 1). Therefore, as D1 emphasizes the effectiveness of acid-impregnated interleaving materials applied to the glass in form of a dry powder, the skilled person looking for a method of application not involving the use of an aqueous slurry would not be led away from trying the dusting method disclosed in D1.

6. It results from the preceding that the process according to Claim 1 does not involve an inventive step. Therefore, the subject matter of this claim does not meet the requirements set out in Arts. 52(1) and 56.

7. In the absence of an allowable main claim, the dependent Claims 2 to 4 fall with the main claim.

Order

For these reasons, it is decided that :

The appeal is dismissed

The Registrar | The Chairman

P. Martorana | P.A.M. Lançon