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Datasheet for the decision of 15 September 2011

Case Number: T 0094/09 - 3.3.09

Application Number: 98203000.9

Publication Number: 0909635

IPC: B32B 27/30

Language of the proceedings: EN

Title of invention:
Polyvinylidene fluoride-based decorative laminate

Patentee:
The Boeing Company

Opponent:
AIRBUS SAS et al.

Headword:
-

Relevant legal provisions:
EPC Art. 56

Relevant legal provisions (EPC 1973):
-

Keyword:
"Inventive step - no (main and auxiliary requests)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0094/09 - 3.3.09

D E C I S I O N
of the Technical Board of Appeal 3.3.09
of 15 September 2011

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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 9 October 2008 rejecting the opposition filed against European patent No. 0909635 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman: W. Ehrenreich
Members: M. O. Müller
F. Blumer

Summary of Facts and Submissions

I. This decision concerns an appeal by the joint opponents against the opposition division's decision to reject their opposition against European patent EP 0 909 635.

The granted patent contains 21 claims, independent claim 1 of which reads as follows:

"1. A flexible, organic polymer—based laminate sequentially comprising:

(a) a first layer comprising a polyvinyl fluoride—based material;

(b) a second layer comprising an adhesive material; and

(c) a third layer having a textured outer surface, the layer comprising a polyvinylidene fluoride-based material".

II. The joint opponents requested revocation of the patent in its entirety on the grounds that the claimed subject-matter was not inventive and that the patent did not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Articles 100(a) and (b) EPC).

The documents submitted during the opposition proceedings included:

D1: US 5,203,941 A;

D2: EP 0 173 795 A2; and

D3: G. Haley et al, "DEVELOPMENT OF FIRE RESISTANT, NONTOXIC AIRCRAFT INTERIOR MATERIALS", Lockheed California Company, September 1976, pages 1-85.

III. The opposition division's decision, which was announced orally on 11 September 2008 and issued in writing on 9 October 2008, was based on the patent as granted.

Concerning inventive step, the opposition division argued that the purpose of D3 was to find alternatives to laminates containing a polyvinyl fluoride resin while D2 specifically related to composite light weight flexible fire resistant decorative laminates for use as wall coverings in commercial aircraft interiors. D2 therefore constituted the closest prior art. The claimed subject-matter differed from D2 by the presence of a polyvinylidene fluoride based material as a textured layer. This led to the effect of improved texture retention and to limited heat release and smoking emission. Neither D2 nor D3 addressed texture retention. Therefore, the skilled person looking for improved texture retention could, but not necessarily would, have considered a polyvinylidene fluoride material. The claimed subject-matter therefore was inventive.

Concerning the objection of insufficiency of disclosure which was related to the subject-matter of claims 6 and 7 only, the opposition division held that the occurrence of coining was known in the technical field and thus to the skilled person and that a method for determining texture retention was clearly described in example 1 of the patent. Thus, the subject-matter of

claims 6 and 7 would not prevent the skilled person from carrying out the invention.

IV. On 17 December 2008, the joint opponents (in the following "appellant") filed a notice of appeal against the above decision and paid the prescribed fee on the same day. A statement setting out the grounds of appeal was filed on 18 February 2009.

V. On 27 May 2009, the patent proprietor (in the following "respondent") filed a reply to the appeal together with a main request (maintenance of the patent as granted) and a first and a second auxiliary request.

Claim 1 of the first auxiliary request differs from claim 1 of the main request (patent as granted) only in that reference signs have been included. Claim 1 of the second auxiliary request is identical to claim 1 of the first auxiliary request except that it additionally contains the following wording:

"wherein the laminate (40) further comprises a printed layer (42) overlying the third layer (32) and a capping layer (44) overlying the printed layer (42), the capping layer (44) comprising a polyvinylidene fluoride-based material".

VI. On 15 September 2011, oral proceedings were held before the board, at which only the issue of inventive step was discussed. The parties maintained all requests previously submitted in writing. No new requests were filed.

VII. Terminology used in the present decision

In the present decision, the acronym "PVDF" will be used to designate the polymer "polyvinylidene fluoride" or materials based on this polymer. In the same way, the acronym "PVF" will be used for the polymer "polyvinyl fluoride" or materials based on this polymer.

The terms "structural layer" (as used on page 5, line 5 of the opposed patent) and "textured layer" will be applied respectively to the inner layer and the outer textured layer of a laminate.

This terminology can be used to denote the laminate of claim 1 in short as "PVF structural layer / adhesive layer / PVDF textured layer".

VIII. The appellant's arguments can be summarized as follows:

Concerning inventive step of the main request, both D2 and D3 each described laminates with a textured decorative layer. Unlike D2, however, D3 additionally addressed the issue of texture retention. Therefore, it was D3, rather than D2, that formed the closest prior art. The PVDF/PVDF laminate of D3 differed from the laminate of claim 1 in that the structural layer was made of PVDF rather than PVF. It could neither be deduced from the opposed patent nor was there any other proof that the problem of improving texture retention was solved by the PVF structural layer of claim 1. On the contrary, it followed from the opposed patent that it was the textured PVDF layer that led to improved texture retention. Moreover, the PVDF/PVDF laminate of

D3 exhibited already excellent texture retention, expressed in D3 as thermal stability and formability. The objective technical problem could therefore at most be a reduction in the laminate's weight. The solution was however already known from D3 itself as it followed from this document that PVF was lighter than PVDF. The subject-matter of claim 1 thus was not inventive in view of D3.

Concerning the second auxiliary request, no objections were made with regard to Articles 123(2) and 84 EPC. For inventive step, D3 remained the closest prior art. The objective technical problem solved by the two additional layers required by claim 1 of this request was the provision of an alternative laminate. The solution, ie the incorporation of the two layers into the laminate, was however already known from D1. The skilled person would take this document into account as it concerned the same technical field as the opposed patent, namely the field of decorative laminates. The subject-matter of claim 1 of the second auxiliary request thus lacked an inventive step in view of D3 in combination with D1.

IX. The respondent's arguments can be summarized as follows:

The subject-matter according to the main request was inventive. D3 did not represent the closest prior art as it was a report on basic research and had been published already 21 years before the priority date of the opposed patent. Moreover, it focused on the improvement of fire resistance and mentioned texture retention only in passing. Finally it taught away from the use of PVF as a structural layer. It was thus D2

that formed the closest prior art as it referred to textured decorative laminates and had most features in common with the opposed patent.

Even if D3 was considered to represent the closest prior art, inventive step would have to be acknowledged for the main request. In this case, the distinguishing feature was the use of PVF for the structural layer instead of the PVDF of D3. As confirmed by tables 1 and 2 of the opposed patent, the laminate of claim 1 showed improved texture retention and it was thus this improvement of texture retention that formed the objective technical problem. That the PVF structural layer contributed to this improvement followed from the fact that this polymer constituted the preferred material for the structural layer in the opposed patent. Moreover, any property, such as improved texture retention of a laminate, was the result of the properties of each layer of this laminate and it was thus the combination of the PVF structural layer with the textured outer PVDF layer that led to improved texture retention. In this context, it was also important that the PVF structural layer had a higher temperature of fusion than the outer PVDF layer. This implied that during texturization, only the outer PVDF layer was textured in the claimed laminate.

The skilled person trying to improve texture retention would not replace the PVDF structural layer of the PVDF/PVDF laminate of D3 by a PVF layer as the whole teaching of D3 was to find alternative materials for PVF. Moreover, D3 had been published 21 years before the priority date of the opposed patent and this long time period confirmed the non-obviousness of the

claimed laminate. Finally, even if the objective technical problem was merely the reduction of the laminate's weight, the choice of PVF for the structural layer would not be obvious in view of D3. More particularly, it followed from this document that polyether sulfone and polycarbonate were even lighter than PVF and the skilled person would thus have chosen these materials for the structural layer, rather than the PVF according to claim 1.

The subject-matter of the second auxiliary request was also inventive. D3 did not disclose any capping layer. Moreover, though D1 disclosed the additional layers required by claim 1 of the second auxiliary request, the skilled person would not have taken this document into account as it was in a completely different technical field.

X. The appellant requested that the decision under appeal be set aside and the patent be revoked.

XI. The respondent requested that the appeal be dismissed and the patent be maintained as granted, or, subsidiarily, that the decision under appeal be set aside and the patent be maintained on the basis of any of the first or second auxiliary requests as filed with letter of 27 May 2009.

Reasons for the Decision

1. The appeal is admissible.

2. As mentioned under point VII, the acronym "PVF" designates polyvinyl fluoride and "PVDF" designates polyvinylidene fluoride.

Main Request

3. *Inventive step*

3.1 Closest prior art

3.1.1 It was a matter of dispute between the parties whether D2 or D3 constitutes the closest prior art.

3.1.2 Generally, the closest prior art is the prior art document disclosing subject-matter for the same purpose or aiming at the same objective as the claimed invention.

3.1.3 In the present case, the opposed patent relates to textured decorative laminates that exhibit high texture retention (page 2, lines 47-48 and page 3, lines 8-10 and 27).

In the same way as the opposed patent, both D2 and D3 refer to textured decorative laminates (D2: page 1, lines 9-10 in conjunction with page 12, line 25; D3: last paragraph on page 45 and first paragraph on page 46). However, the issue of texture retention addressed in the opposed patent is exclusively dealt with in D3. More particularly, D3 aims at a laminate that has thermal stability and formability, implying that "the ... **texture ... shall not change significantly** after subjection to ... heat cycles ..." and that the laminate is "capable of being applied to a

panel ... with **negligible loss of texture** except at the corners" (page 65, points 3.7 and 3.10 of D3, emphasis added by the board). Excellent thermal stability and formability, ie texture retention, is achieved in particular in the case of a laminate of two PVDF layers ("PVF_2/PVF_2", table VII on page 47 of D3).

Consequently, in terms of the effect to be achieved, D3 comes closer to the opposed patent than D2.

The respondent argued that D3 did not represent the closest prior art as it was a report on basic research and was published 21 years before the priority date of the opposed patent. However, no convincing reason was given why this could dissuade the skilled person from using D3 as a starting point, which is why the respondent's argument must fail.

The respondent further argued that D2 had most features in common with the opposed patent. However, first of all, the respondent's argument does not hold good as D2 and D3 each differ from the opposed patent by one feature only, namely the use of PVF instead of PVDF in the textured layer (distinguishing feature in D2) and the use of PVDF instead of PVF in the structural layer (distinguishing feature in D3). Quite apart from this, it is the purpose and effect to be achieved rather than the number of technical features in common that is decisive for determining the closest prior art. For both reasons, the respondent's argument is not convincing.

It is thus D3 that represents the closest prior art.

3.2 Objective technical problem and obviousness

3.2.1 D3 discloses a textured laminate of two PVDF layers ("PVF_2/PVF_2" in D3; last paragraph on page 45, first paragraph on page 46 and table VII on page 47). The laminate comprises an adhesive layer between the two PVDF layers (second paragraph of page 17). As acknowledged by both parties, this **PVDF** layer / adhesive layer / PVDF layer laminate of D3 differs from the **PVF** layer / adhesive layer / PVDF layer laminate of claim 1 only in that it contains, as the structural layer, a PVDF instead of the PVF layer of claim 1. As acknowledged by both parties, it is thus the type of structural layer that forms the only distinguishing feature.

3.2.2 According to the respondent, the objective technical problem is the provision of laminates with improved texture retention.

The respondent referred in this context to tables 1 and 2 of the opposed patent, where the texture retentions of a "PVDF-Based Decorative Laminate" (according to claim 1) and a "Conventional Decorative Laminate" (not according to claim 1) are compared. However, these two laminates differ in terms of the textured outer layer (PVDF *versus* PVF) rather than the structural layer. Hence, the tests cannot demonstrate any improvement in texture retention that is due to the distinguishing feature.

The respondent further argued that the PVF to be used for the structural layer according to claim 1 was described in the opposed patent (paragraph [0026]) as

the preferred material. This, in the respondent's view, implied that it was the PVF structural layer according to claim 1 (ie the distinguishing feature in view of D3) that contributed to the improvement in texture retention. However, this argument is not convincing as the opposed patent is silent on the reason why PVF is the preferred material and in particular does not contain any indication, let alone proof, that the choice of this preferred material for the structural layer leads to improved texture retention.

The respondent additionally argued that any property of a laminate was the result of the properties of each layer of this laminate and it was thus the combination of the PVF structural layer with the textured outer PVDF layer that led to improved texture retention. However, this argument lacks any substantiation and therefore must fail.

The respondent finally argued that the PVF structural layer had a higher temperature of fusion than the outer PVDF layer. This, in the respondent's view, implied that during texturization, only the outer PVDF layer was textured in the claimed laminate while in D3, where both layers were formed from PVDF, both layers were textured. However, no convincing argument was given as to why this difference in the temperature of fusion of the structural layer leads to improved texture retention.

3.2.3 There is thus neither any proof nor has it been made credible that the distinguishing feature, ie the choice of a PVF structural layer according to claim 1, leads to improved texture retention compared to that in D3.

In fact, if anything, the opposite must be assumed, namely that the texture retention in D3 is at least as good as in the opposed patent, since according to D3 (table VII on page 47) the PVDF/PVDF ("PVF_2/PVF_2") laminate has excellent thermal stability and excellent formability, which both imply excellent texture retention (see point 3.1.3 above).

As the alleged improvement in texture retention is thus not caused by the distinguishing feature, such improvement does not constitute the objective technical problem.

3.2.4 No other effect has been attributed by the respondent to the distinguishing feature. In the board's view, one can assume in the respondent's favour that the replacement of the PVDF structural layer of D3 by the PVF layer of claim 1 reduces the weight of the laminate while not affecting the texture retention of the textured outer layer. Therefore, the objective technical problem in view of the PVDF/PVDF (PVF_2/PVF_2) laminate of D3 can be seen to be the reduction of the weight of textured laminates without compromising texture retention.

3.2.5 It is however already known from D3 itself that PVF is lighter than PVDF. More particularly, table VII of D3 discloses a specific gravity for a laminate containing two PVF layers ("PVF/PVF") of 1.50, which is lower than the value of 1.80 given for the laminate containing two PVDF layers ("PVF_2/PVF_2").

It is furthermore already known from D3 that a textured PVDF layer has better texture retention than a PVF

layer (table VII of D3: excellent formability and thermal stability of PVDF compared to good formability and thermal stability of PVF).

In view of this teaching of D3, the skilled person confronted with the objective technical problem would replace the PVDF structural layer of the PVDF/PVDF laminate of D3 by a PVF layer (to reduce weight) while keeping the textured PVDF layer (in order to maintain excellent texture retention). By doing so, the skilled person would arrive at the subject-matter of claim 1, namely a PVF structural layer / adhesive layer / PVDF textured layer laminate. The subject-matter of this claim thus lacks an inventive step in view of D3.

3.2.6 The respondent argued in this context that it followed from table VII of D3 that polyether sulfone ("PES" in D3) and polycarbonate are even lighter than PVF and hence the skilled person looking for lighter laminates would have replaced the structural PVDF layer of the PVDF/PVDF ("PVF_2/PVF_2") laminate of D3 by polyether sulfone or polycarbonate rather than PVF. However, the fact that apart from the use of PVF, D3 teaches further possibilities to reduce weight, namely by replacement with polyether sulfone or polycarbonate, merely implies that there are further (potentially equally non-inventive) laminates with reduced weight, apart from the one according to claim 1.

The respondent further argued that the whole teaching of D3 was to find alternative materials for PVF. D3 thus taught away from using PVF and thus could not prejudice inventive step. However, what D3 in fact discloses is that PVF/PVF laminates are unsatisfactory

in terms of flame resistance, which is why D3 seeks to find a replacement for these laminates (page 46, lines 1-3). However, by using a PVF structural layer, the opposed patent simply accepts this disadvantage and the mere acceptance of a disadvantage clearly cannot give rise to any inventive step. The respondent's argument therefore must fail. The same holds true for the respondent's further argument that the long time span needed to invent the claimed laminates (21 years after the publication date of D3) implied that the claimed subject-matter was inventive. More particularly, the reason why the claimed laminate was not described earlier may simply be the fact that this laminate is inferior in terms of flame resistance compared to the PVDF/PVDF laminate of D3, and this cannot support any inventive step.

3.3 The main request thus cannot be allowed.

First Auxiliary Request

Claim 1 of the first auxiliary request is identical to claim 1 of the main request except that reference signs have been included. For the same reasons as given above, the subject-matter of this claim lacks an inventive step in view of D3.

Second Auxiliary Request

4. *Amendments - Articles 123(2) and 84 EPC*

Apart from the inclusion of reference signs, claim 1 differs from claim 1 of the main request in that the laminate further comprises a printed layer overlying

the textured PVDF layer and on top of this printed layer a capping layer comprising a PVDF-based material.

The appellant did not raise any objections under Articles 123(2) and 84 EPC and the board is satisfied that the requirements of these Articles are met.

5. *Inventive step*

5.1 For the reasons given above with regard to the main request, D3 constitutes the closest prior art.

5.2 Apart from the distinguishing feature already discussed above with regard to the main request, the subject-matter of claim 1 additionally differs from D3 in terms of the presence of the additional printed layer and the PVDF-based capping layer. The respondent did not attribute any particular effect to the presence of these two additional layers. The objective technical problem solved by these additional layers thus can be considered to be finding an alternative laminate.

The solution to this problem is already known from D1. More particularly, figure 5 of D1 refers to a decorative laminate which, apart from a film and a size layer, additionally comprises

– two print layers 50 and 56 overlying the size layer, corresponding to the printed layer of claim 1 of the second auxiliary request, and

– a top coat 38 overlying the print layers, which preferably comprises an acrylic/PVDF blend (column 6, lines 24-35), which is a PVDF-based

material and thus corresponds to the capping layer 44 of claim 1 of the second auxiliary request.

The subject-matter of claim 1 of the second auxiliary request thus lacks an inventive step in view of D3 in combination with D1.

5.3 The respondent argued that unlike the opposed patent, which concerned the field of aircraft interiors, D1 was in a completely different technical field, namely that of outdoor applications of laminates in the building and construction industry. In the respondent's view, the skilled person starting from D3 and looking for an alternative laminate would therefore not have considered D1.

However, in the board's view, the relevant technical field of both D1 and the opposed patent is the field of decorative laminates. More particularly, as evidenced by eg column 1, lines 5-20 of D1 (heading "Field of the invention"), this document refers to a laminate with a decorative coating. In the same way, section [0001] of the patent specification (heading "Field of the Invention") exclusively refers to "a decorative laminate and, more particularly, to a polyvinylidene fluoride-based decorative laminate". Thus, contrary to the respondent's argument, the technical fields of D1 and the opposed patent are the same, namely decorative laminates. The respondent's argument consequently is not convincing and can in particular not invalidate the above finding that the subject-matter of claim 1 lacks an inventive step in view of D3 in combination with D1.

The second auxiliary request therefore is not allowable.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

G. Röhn W. Ehrenreich