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Aktenzeichen / Case Number / N° du recours : T 87/86 - 3.3.2

Anmeldenummer / Filing No / N° de la demande : 80 102 788.9

Veröffentlichungs-Nr. / Publication No / N° de la publication : 0 019 835

Bezeichnung der Erfindung: Formable metal-plastic-metal structural laminates  
Title of invention: and process for preparing such laminates  
Titre de l'invention :

Klassifikation / Classification / Classement : B32B 15/08

**ENTSCHEIDUNG / DECISION**

vom / of / du 18 May 1988

Anmelder / Applicant / Demandeur : The Dow Chemical Company

Patentinhaber / Proprietor of the patent /  
Titulaire du brevet :

Einsprechender / Opponent / Opposant :

Stichwort / Headword / Référence : Structural laminates/Dow Chemical

EPO/EPC/CBE Articles 83, 84, 123(2), Rules 27(1)(f) and 89 EPC

Kennwort / Keyword / Mot clé : "Sufficiency of disclosure - no example  
required"  
"Correction of decision"

**Leitsatz / Headnote / Sommaire**

Europäisches  
Patentamt  
Beschwerdekammern

European Patent  
Office  
Boards of Appeal

Office européen  
des brevets  
Chambres de recours



Case Number : T 87/86 - 3.3.2

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.2  
of 18 May 1988

**Appellant :** THE DOW CHEMICAL COMPANY  
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**Decision under appeal :** Decision of Examining Division 032  
of the European Patent Office  
dated 24 September 1985 refusing  
European patent application  
No. 80 102 788.9 pursuant to  
Article 97(1) EPC

**Composition of the Board :**

**Chairman :** P. Lançon

**Members :** A.J. Nuss

G.D. Paterson

Summary of Facts and Submissions

I. European patent application 80 102 788.9 filed on 20 May 1980 and published with publication number 00 19 835 claiming priority of two prior applications both of 21 May 1979, was refused by a decision of the Examining Division of the European Patent Office dated 24 September 1985. The decision was based on Claim 1 filed on 20 June 1984 and a description as amended on 11 July 1983 and 20 June 1984.

Claim 1 was worded as follows:

1. An aluminium-polyolefin-aluminium structural laminate comprising a core of polyolefin having tightly adhered to each side thereof an aluminium skin layer characterised in that each aluminium skin layer is from 50,8  $\mu\text{m}$  thick to 508  $\mu\text{m}$  thick, said laminate further having a ratio of core thickness to skin thickness of less than 9:1, and a total thickness of from 127 to 1651  $\mu\text{m}$ ; the materials of construction of said polyolefin core and aluminium skins and the geometry of the laminate being such that the laminate has (1) a flexural stiffness at least 40 percent that of the solid metal of the skin layer of the lower modulus having the same thickness as said laminate as measures by ASTM D790 on a 2,54 cm wide sample having a 10,16 cm span under three point loading conditions, (2) a density from 25 percent to 90 percent that of the average of two solid aluminum skin layers, (3) as a measure of stretch formability a limiting dome height of at least about 60 percent of the limiting dome height of the solid aluminium of the skin layer of the lower ultimate elongation having the same thickness as the laminate, (4) the capability of being subjected to a no load oven test, subsequent to forming of said laminate, at a temperature of at least 87,8°C for a period of 30 minutes without delaminating, and (5) the capability of being bent at room

temperature to 90°C to a critical radius without metal rupture, the critical radius defined as the distance from the pivot point to the inner skin surface of the laminate, being about equal to the total laminate thickness.

- II. One reason for the refusal was that the application was considered to have been amended in such a way that pages 17 and 19 on file contained subject-matter (i.e. new examples) which extended beyond the content of the application as filed, the amendments being thus believed to be contrary to the provisions of Art. 123(2) EPC.

Another reason for the refusal was that the invention was not considered to satisfy the requirements of Art. 83 EPC. The Examining Division took the view that the original disclosure was not sufficiently clear and complete to allow a person skilled in the art to carry out said invention since it essentially failed to disclose any laminate having the five properties (1) to (5) listed in Claim 1. It further objected that no clear indication of the steps to be taken to achieve said properties was given in the original specification.

- III. On 19 November 1985, a notice of appeal was filed by the Appellant together with a cheque covering the correct amount of the appeal fee. On 24 January 1986, a written statement setting out the grounds of appeal was filed at the same time as a revised set of claims and a description from which examples 14 to 17 had been removed in order to satisfy the requirements of Art. 123(2) EPC.

In response to objections made by the Board in its communication dated 24 November 1987, the Appellant filed on 3 March 1988 an amended Claim 1 which contained the additional feature that an intermediate adhesive layer is used in the laminate. He further argued that the claimed product is specified by physical parameters, which can be

clearly and reliably determined by procedures which are usual in the art, and that besides the fact that in Claim 1 the configuration of the laminate is given, the method of producing the laminate is indicated in the description as well.

- IV. Oral proceedings took place on 18 May 1988, during which the Appellant confirmed his previous submissions as summarised in III, last paragraph above. The Board expressed the view that the words "being such that" in the proposed Claim 1 implied that whether the laminate in fact had the properties (1) to (5) set out in the claim was dependent upon a proper choice of the materials of construction of the polyolefin core and aluminium skins and of the geometry of the laminate, and that the description contained no teaching as to how that choice should be made. The Appellant explained that the main claim was intended to express that the laminate must have the five properties indicated in the claim.
- V. At the end of the hearing, the Appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the amended set of claims submitted during oral proceedings. The amended Claim 1 no longer contained the phrase "being such that".

The finally proposed Claim 1 as considered during the oral hearing reads as follows:

1. An aluminium-polyolefin-aluminium structural laminate comprising a core of polyolefin having tightly adhered to each side thereof an aluminium skin layer characterised in that the core is tightly adhered to the aluminium skin layers by the use of an intermediate adhesive layer therebetween, each aluminium skin layer being from 152  $\mu\text{m}$  to 305  $\mu\text{m}$  (6-12 mil) thick and a total thickness of from 762  $\mu\text{m}$  to 1524  $\mu\text{m}$  (30-60 mil); the core of polyolefin material

being selected from homopolymers and copolymers of ethylene or propylene and having a brittle temperature of less than about  $-1.1^{\circ}\text{C}$  and a Vicat softening point of greater than about  $76.7^{\circ}\text{C}$ ; the laminate having

(1) a flexural stiffness at least 40 percent that of the solid metal of the skin layer of the lower modulus having the same thickness as said laminate as measured by ASTM D790 on a 2.54 cm wide sample having a 10.16 cm span under three point loading conditions,

(2) a density from 25 percent to 90 percent that of the average of two solid aluminium skin layers,

(3) as a measure of stretch formability a limiting dome height of at least about 60 percent of the limiting dome height of the solid aluminium of the skin layer of the lower ultimate elongation having the same thickness as the laminate,

(4) the capability of being subjected to a no load oven test, subsequent to forming of said laminate, at a temperature of at least  $87.8^{\circ}\text{C}$  for a period of 30 minutes without delaminating, and

(5) the capability of being bent at room temperature to  $90^{\circ}$  to a critical radius without metal rupture, the critical radius defined as the distance from the pivot point to the inner skin surface of the laminate, being about equal to the total laminate thickness.

#### Reasons for the Decision

1. The appeal complies with Articles 106 to 108 and Rule 64 EPC and is, therefore, admissible.

2. The Board considers that the Examining Division was right in objecting to the inclusion of new examples 14 to 17 in the description on the basis of Article 123(2) EPC. However, by deleting these examples from the amended description as filed by the Appellant together with the grounds of appeal, the first ground for the refusal of the application by the Examining Division has been overcome.
  
3. The proposed Claim 1 causes no objections on formal grounds since it is essentially the result of a combination of subject-matter taken from original Claims 1, 2, 10 and 12.

By limiting the thickness of each aluminium skin layer to 152-305  $\mu\text{m}$  (6-12 mil) and the total thickness of the laminate to 762-1524  $\mu\text{m}$  (30-60mil) the ratio of core thickness to skin thickness has however become necessarily less than 9:1, which justifies the deletion of this obviously superfluous feature from the main claim.

Since according to the Appellant the main claim expressed no more than that the claimed laminate has the five properties indicated in the last part of the claim, the reformulation of the rather unclear part of sentence "the materials of construction of said polyolefin core and aluminium skins and the geometry of the laminate being such that the laminate has ..." into the readily understandable formulation "the laminate having ..." renders now clearly what is really meant.

Claim 1 therefore meets both the requirements of Article 123(2) EPC as well as those of Article 84 EPC.

4. The case is further concerned with the question of sufficiency of the disclosure under Article 83 EPC which

requires that the "application must disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art".

However, the Board considers that for the reasons set forth below these requirements are now fully satisfied:

- the configuration of the claimed laminate is defined in detail (see Claim 1),
- aluminium skin thickness and overall thickness of the laminate are indicated (see Claim 1) as well as the thickness of the intermediate adhesive layer (see page 8, lines 21/22 of the original description),
- the materials of the different layers are defined so as to include the adhesive layer (see Claim 1, page 6, lines 18/19; page 7, line 29 ff and page 8, line 25 ff. of the original description),
- the minimum strength of the adhesive bond between core and skin is indicated together with a standard test method to measure it (see page 6, lines 11 to 14 of the original description),
- detailed instructions for producing the laminate are given (see page 9, line 27 ff.; page 10, line 28 ff.; page 12, lines 1 to 15 and pages 15/16 of the original description),
- the properties of the finished laminate are indicated as well as the way to determine them (see Claim 1 and original description, in particular page 6, lines 4 to 10; page 13, line 25 to page 14, line 4 and page 14, lines 18 to 25).



Consequently the application contains clear and complete information about how to carry out the invention, i.e. how to produce a laminate as claimed.

5. The description does not contain an example with aluminium skins. However, in the present case the Board considers that this does not affect the sufficiency of disclosure, since even without such an example the man skilled in the art has been given comprehensive information about how to carry out the invention (see point 4 above), and Rule 27(1)(f) EPC requires, inter alia, only one detailed way of carrying out the invention using examples where appropriate. In the present case the use of an example is not necessary for the purpose of sufficiency of description, and is therefore not appropriate.
  
6. The incorporation of an intermediate adhesive layer between the aluminium skin layer and the polyolefin core is no longer an optional feature but an essential feature of the claimed laminate (see effective Claim 1) in conformity with Appellant's earlier submission filed on 23 March 1988 in which he stated that "Claim 1 has been amended so as to incorporate the feature that an intermediate adhesive layer is used, which feature was originally covered by Claim 7", i.e. as submitted originally with the grounds for appeal on 24 January 1986. The intention of the Appellant was thus clearly to limit the scope of the main claim by incorporating additional features from a dependent claim.

However, dependent Claims 2 to 9 which were submitted to the Board at the oral proceedings together with the newly amended main claim correspond to those filed earlier, i.e. together with the grounds of appeal. Thus by mistake the feature concerning the intermediate adhesive layer may be found not only in the main claim but also in dependent Claim 7 which is now redundant. An obvious mistake in a decision may however be corrected in accordance with

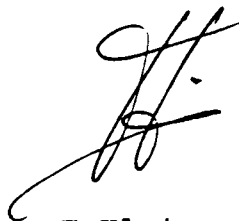
Rule 89 EPC. With regard thereto the decision of 18 May 1988 is hereby amended in that dependent Claim 7 is deleted from the set of claims submitted to the Board at the oral proceedings, with consequential renumbering of dependent Claims 8 and 9.

**Order**

**For these reasons, it is decided that:**

The impugned decision is set aside and the case is remitted to the Examining Division for further prosecution on the basis of the amended set of claims submitted during oral proceedings and subsequently corrected by the Board by the deletion of Claim 7 and the renumbering of the subsequent claims.

The Registrar



F.Klein

The Chairman



P.Lançon

