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**D E C I S I O N**  
of 23 February 1995

**Case Number:** T 1113/92 - 3.3.3

**Application Number:** 83306484.3

**Publication Number:** 0109779

**IPC:** C08F 210/16

**Language of the proceedings:** EN

**Title of invention:**  
Ethylene copolymer

**Patentee:**  
MITSUI PETROCHEMICAL INDUSTRIES, LTD.

**Opponent:**  
DSM Research B.V.

**Headword:**  
-

**Relevant legal provisions:**  
EPC Art. 54(2)

**Keyword:**  
"Novelty (yes) - no identity between known product and claimed product on proper interpretation of the original application - skilled person"

**Decisions cited:**  
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**Catchword:**  
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Case Number: T 1113/92 - 3.3.3

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.3  
of 23 February 1995

**Appellant:** DSM Research B.V.  
(Opponent) NL-6160 MA Geleen (NL)

**Representative:** Hoogstraten, Willem Cornelis Roeland  
OCTROOIBUREAU DSM  
Postbus 9  
NL-6160 MA Geleen (NL)

**Respondent:** MITSUI PETROCHEMICAL INDUSTRIES, LTD  
(Proprietor of the patent) 2-5, Kasumigaseki 3-chome  
Chiyoda-ku  
Tokyo 100 (JP)

**Representative:** Meyerscough, Philip Boyd  
J. A. KEMP & CO  
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**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office dated 19 October 1992 and  
issued in writing on 11 November 1992 rejecting  
the opposition filed against European patent  
No. 0 109 779 pursuant to Article 102(2) EPC.

**Composition of the Board:**

**Chairman:** C. Gérardin  
**Members:** H. H. Fessel  
R. Teschemacher

### Summary of Facts and Submissions

I. European patent No. 0 109 779 in respect of European patent application No. 83 306 484.3 filed on 25 October 1983 claiming a JP priority of 25 October 1982 (JP 186043/82) was granted on 17 December 1986 (cf. Bulletin 86/51) on the basis of a set of 6 claims of which the independent Claims 1, 4 and 5 read as follows:

"1. An ethylene copolymer having in combination the following characteristics (A) to (I):

- (A) it has a melt flow rate of from 0.01 to 200 g/10 min.;
- (B) it has a density of from 0.900 to 0.945 g/cm<sup>3</sup>;
- (C) it has a composition distribution parameter (U), defined by the following equation (1)

$$U = 100 \times (C_w/C_n - 1) \tag{1}$$

wherein  $C_w$  is the weight average degree of branching, and  $C_n$  is the number average degree of branching, of not more than 50;

- (D) the amount of components having a degree of branching of not more than 2/1000 carbons is not more than 15% by weight based on the ethylene copolymer;
- (E) the amount of components having a degree of branching of at least 30/1000 carbons is not more than 15% by weight based on the ethylene copolymer;
- (F) the average chain length ratio of the methylene groups is not more than 2.0;
- (G) it has  $n$  melting points measured by a differential scanning calorimeter (DSC) (where  $n \geq 2$ ); the highest melting point ( $T_1$ ) among these DSC melting points is given by the following equation

$$T_1 = (175 \times d - 46)^\circ\text{C} \sim 125^\circ\text{C}$$

wherein  $d$  is the density ( $\text{g}/\text{cm}^3$ ) of the copolymer; the difference between  $T_1$  and the lowest melting point ( $T_n$ ) among the DSC melting point is given by

$$0^\circ\text{C} < T_1 - T_n \leq 18^\circ\text{C};$$

and the difference between  $T_1$  and the second highest melting point  $T_2$  is given by

$$0^\circ\text{C} < T_1 - T_2 \leq 5^\circ\text{C},$$

provided that when there are two ( $n=2$ ) DSC melting points, the difference is in accordance with the above expression  $0^\circ\text{C} < T_1 - T_n \leq 18^\circ\text{C}$ ;

(H) the ratio of the amount of heat of crystal fusion ( $H_1$ ) at the highest melting point ( $T_1$ ) to the total amount of heat of crystal fusion ( $H_T$ ) is given by

$$0 < H_1/H_T \leq 0.40; \text{ and}$$

(I) it is a copolymer of ethylene with at least one  $C_4 - C_{20}$   $\alpha$ -olefin.

4. Shaped articles of an ethylene copolymer as claimed in Claim 1, 2 or 3.

5. A process for producing a shaped article which comprises molding an ethylene copolymer as defined in Claim 1, 2 or 3."

II. A Notice of Opposition was filed on 17 September 1987 by DSM Research B.V. Geleen (NL) alleging lack of novelty and of inventive step (Art. 100(a) EPC).

The opposition was supported by the citation of various documents, inter alia

(3) Journal of Polymer Science, Vol. 20 No. 3, March 1982, pp. 441-55.

- III. With a decision dated 29 May 1990, the Opposition Division rejected the opposition and held the claimed subject-matter to be both novel and inventive.
- IV. An appeal was lodged (T 611/90) wherein the Appellants no longer pursued the issues raised before the Opposition Division, but objected public prior use of a product as claimed before the priority date of the patent in suit.
- V. The Board decided the appeal to be admissible and to set aside the decision under appeal.

The Board held that the late filed evidence was to be admitted, but that the alleged prior use resulted in a fresh case which had to be remitted to the first instance. Further, the Board decided that the Opponents should bear all costs that would be incurred by the Patentees having to deal with the fresh case of prior public use.

- VI. After further examination by the Opposition Division a decision was given at the end of oral proceedings held on 19 October 1992 and issued in writing on 11 November 1992 rejecting the opposition. The Opposition Division held the prior use not to be sufficiently substantiated; it further felt unable to decide whether the approach of the Patentees or the Opponents to calculate U was more reliable and considered that this question had to be solved in favour of the Patentees.

VII. On 18 December 1992 an appeal was lodged by the Appellants (Opponents) together with payment of part of the prescribed fee only. The rest of that fee (DM 1 000,-, from the total of DM 2 000,-) was paid with a letter received on 4 February 1993. The Statement of Grounds of Appeal was received on 19 March 1993. In that statement and during oral proceedings held on 23 February 1995 the Appellants contested the finding of the Opposition Division as to public prior use which was based on the following evidence:

- (1) A declaration by Mr Jetten, dated 5 October 1990, that the analyzed product was a sample of Stamylex 1046, with the serial No. 2032016, produced on 19 March 1982.
- (2) An order form dated 6 April 1982, said to provide evidence that 6.875 kg of a product of type 1046 had been produced and sold to Crown Apeldoorn in the period up to and including March 1982.
- (3) A run down of daily testings of a low pressure factory 2 during 1982 said to show that 68.500 kg of a product type 1046 showing the serial No. 2032016CZE had indeed been tested in March 1982.
- (4) An order form dated 22 January 1982, received on 2 March 1992, said to show sales of 5.750 kg Stamylex 1046 to Sidac Gent, 1.375 kg to Eurom, 1.375 kg to DRG Bristol and again 1.375 kg to GS Packaging 1.

To support their arguments as to public prior use they submitted the following additional evidence with their Statement of Grounds of Appeal:

- (5) Polymers 1982 of April 1982, said to present a survey of the range of plastics produced by DSM.

- (6) A declaration of Mr Oosterling of Borden PFI-Apeldoorn, affirming that Stamylex 1046 was ordered and received by Borden (Crown van Gelder) with no bar of confidentiality.
- (7) Copy of Order No. 160 F 491 dated 28 April 1982 and mentioned in (6) above.
- (8) Copy of the confirmation of a delivery of 12.375 kg Stamylex 1046 on 28 April 1982.

That the product called "Stamylex 1046" was the same as the product claimed in the patent in suit was said to be supported by the following evidence:

- (9) An analysis of the product Stamylex 1046, serial No. 2032016, showing that the said product had all the characteristics (A) to (I) specified in Claim 1 of the patent in suit.

In addition to that substantial issue the Appellants expressed the view that the change of opinion of the Opposition Division after its communication dated 13 May 1991, without giving notice to the Appellants or inviting them to submit further evidence, could be considered as a substantial procedural violation.

VIII. The Respondents (Patentees) expressed doubts as to public prior use mainly based on the evidence provided for prior use of the analyzed batch number and unknown tolerances between different batches of Stamylex 1046 and asked the Board to review this item.

They disputed that the novelty of the subject-matter of Claim 1 of the patent in suit was destroyed by the product called Stamylex 1046. To support this argument they referred to experimental data already submitted with their letters received on 24 July 1992 and

22 September 1992. As to the first experimental report, received in July 1992, they indicated that the pressure due to the time limit set by the Opposition Division induced difficulties leading to the effect that the results produced in the second report done by Dr Norisuye were more reliable. They further declared that they had been informed that Dr Norisuye omitted one data point, which was regarded as wild point in its prior declaration, and that a calculation including that data point lead to a value of 95 instead of 68 for U, being quite similar to that provided by the Appellant, i.e. 103, and based on the same fitting procedure. From this experimental data it resulted that the product known as Stamylex 1046 differed from the product claimed in Claim 1 of the patent in suit in that the value of U was above 50.

As to the experimental data submitted by the Appellants said to demonstrate that the analyzed Stamylex 1046 has a value of U value beyond 50, the Respondents argued that despite the very clear references to cumulative weight fractions at page 4, lines 20 and 21 of the patent in suit the Appellants persisted in taking the view that individual fractions should be taken in account. The data based thereupon could thus not amount to evidence of lack of novelty.

IX. The Appellants requested that the decision under appeal be set aside and that the patent be revoked.

Alternatively, they requested that the proceedings be continued in writing and that an independent expert be commissioned on the question which fitting method the person skilled in the art would have applied on the basis of the disclosure in the application on the filing date.



The Respondents requested that the appeal be dismissed and that the patent be maintained unamended.

Alternatively, they requested that the patent be maintained on the basis of a new Claim 1, comprising the features of present Claims 1 and 2.

### Reasons for the Decision

1. The appeal is admissible.

The Appeal Fee (Art. 108 EPC) was increased with the decision of the Administrative Council of 5 June 1992 (OJ EPO July 1992, 344 to 46). Article 2 of that decision stipulates that a fee being paid in due time within six months of 1 October 1992, but only to the amount ruling before that date, shall be deemed to have been validly paid if the deficit is made good within two months of a request to that effect from the European Patent Office. The rest of the appeal fee was paid before a time limit was set by the EPO pursuant to Article 2 of the decision of the Administrative Council (see VII above); therefore, it was paid in due time.

2. Identity between the known product and the claimed product is a *conditio sine qua non* for an objection of lack of novelty based on public prior use; it has therefore to be examined first whether the product Stamylex 1046 is a polymer within the terms of the patent in suit.

- 2.1 During the opposition proceedings it was established and agreed between the parties that Stamylex 1046 had all the characteristics required in Claim 1, except characteristic (C), i.e. the distribution parameter U.

parameter U. Whilst the experimental results provided by the Appellants tended to prove that the distribution parameter of Stamylex 1046 is lower than 50 and that, thus, the requirement of characteristic (C) is also met, the values obtained by the Respondents have constantly been above 50.

2.2 According to the patent specification (page 4, lines 16 to 36) the composition distribution parameter (U) is to be determined as follows:

"The weight of each of the fractions is then measured, and the degree of branching per 1000 carbons (C) of each of the fractions is determined by the <sup>13</sup>C-NMR method below with regard to the characteristic (D).

Under the assumption that the number of branches per 1000 carbons (C) and the cumulative weight fraction (I(w)) in each fractionated portion follow the logarithmic normal distribution of the following equation (2), parameters B and C<sub>0</sub>, equation (2) are determined by using the method of least square.

$$I(w) = \frac{1}{B\sqrt{\pi}} \int_0^C \exp \left[ -\frac{1}{B^2} (\ln C/C_0)^2 \right] d(\ln C) \quad (2)$$

and C<sub>0</sub> are given by the following equations:

$$B^2 = 2 \ln(Cw/Cn)$$

$$C_0^2 = Cw \cdot Cn$$

Thus,  $C_n$  and  $C_w$  can be easily calculated."

In the above cited passage equation (2) is quoted on the basis of the documents which were the basis for the decision to grant, i.e. the description as indicated in the communication under Rule 51(4) EPC. The patent specification as published contains a minor printing error, which both parties have taken into account in their submissions.

2.3 In both their written (statement filed 19 February 1994) and oral submissions the Appellants argued that the above integral model does not prescribe a cumulative fitting, which leaves open whether the cumulative or the non-cumulative weight fraction should be fitted; in practice, this means that the method described in the patent specification can be carried out in several ways.

The table submitted by the Appellants shows the influence of the only disputed element, i.e. the fitting procedure, on the value of  $U$ :

- method 1 based on fitting the weight fractions (non-cumulative fit):  $U = 37$
- method 2b based on fitting the cumulative weight fractions taking into account the correlation of data points:  $U = 17$
- method 3 based on fitting the cumulative weight fractions:  $U = 103$

As agreed between the parties during oral proceedings, the latter value is in line with the value found by the Respondents, i.e. 95, which takes a wild point into account, whereby the discrepancy between the former provided values, i.e. 68 and 63 respectively, can be explained. It follows therefrom that the only disputed

element is the fitting procedure (see Appellants' letter dated 16 February 1994, page 2, line 2 from below).

Since it is not in dispute that the method of least square is mandatory for the fitting procedure to be applied in the patent in suit and method 4 does not use that method, it is disregarded.

- 2.4 From all the values for U resulting from the above mentioned different fitting methods only those produced by methods 1 and 2b lead to a product having a distribution parameter U of not more than 50. Novelty would therefore be destroyed if fitting method 1 and/or 2b corresponded to the calculation of U as mentioned in the patent specification as specified above.

The fitting procedure used in method 1 is in agreement with that disclosed in the above quoted passage of the patent in suit. In dispute is, however, whether **cumulative** weight fractions have to be used or whether **non-cumulative** weight fractions may be used as well. It is the Board's view that the reader of that passage would recognize that he has to use cumulative weight fractions since only those were literally mentioned and no hint is given therein as to the use of non-cumulative weight fractions. It results therefrom that no evidence is provided thereby as to identity of Stamylex 1046 with the claimed product.

- 2.5 The only value left which might show identity is the U value produced by method 2b. In that fitting method cumulative data is used and to compensate the error due to the correlation of data points a complex fitting procedure is applied.

This raises the question of the interpretation of the above quoted passage of the patent in suit dealing with

the determination of the composition distribution parameter  $U$ , i.e. whether one should apply the simple method 3, which deliberately disregards the correlation of data points, as argued by the Respondents, or the more sophisticated method 2b incorporating an error calculation, as contended by the Appellants. The Board considers it to be essential in this context to determine who is the addressee of the patent in suit, in other words who is the skilled person in the present case.

In the Board's view, there is no doubt that the addressee of the present patent is a polymer chemist familiar with the various aspects of the production of ethylene copolymers as well as with the requirements of the users of these products, not an expert in the field of measurement errors. Although fitting methods using the method of least square and an error structure had been known well before the priority date of the patent in suit, a person with ordinary skill reading the method to calculate  $U$  given in the patent specification would interpret this teaching in a literal way, i.e. as to the use of the cumulative weight fractions for fitting combined with the general method of least square taking into account only the error in one axis of the coordinated system and not in both axes.

It is significant in this respect that none of the documents in the field of polymers cited in opposition proceedings supports the Appellants' view. In particular, none of the documents dealing with the determination of the composition distribution parameter speaks in favour of the Appellants' complex approach, as an individual discussion of these citations during oral proceedings made clear. It is also significant that the Appellants consulted an expert in the field of the experiments for the measurement of errors (see bridging

pages 4 and 5 of their letter dated 16 February 1994) and referred to a document called "The Advanced Theory of Statistics" as well as that the Appellants' representative was accompanied by experts in the field of the experiments for the measurement of errors and that, accordingly, their submissions relied on theoretical considerations which would hardly have occurred to a polymer chemist at the date of priority of the patent in suit. In addition thereto no arguments were produced as to why the polymer chemist should have asked that expert in the present case. The Appellants thus failed to convince the Board that a skilled person, i.e. a polymer chemist of average skill, upon reading the patent specification in the light of the technological context at the date of priority, would have considered such methods.

- 2.6 The latter is supported by the fact that in the Notice of Opposition filed on 17 September 1987 the only grounds of opposition were lack of novelty and inventive step. In particular, there was no objection as to insufficiency of disclosure under Article 100(b) EPC in connection with a possible ambiguous method of calculation of the composition distribution parameter U or multiple interpretations of that method leading apparently to different results. This can only mean that even five years after the date of priority of the patent in suit a skilled person had no reason to consider alternative sophisticated methods when reading the patent specification. That a skilled person following the teaching given therein would get a reproducible result was demonstrated by the value produced with method 3, i.e.  $U = 103 \pm 20$ , versus 95 provided by the Respondents.
- 2.7 For the reasons given above there is no evidence for identity of Stamylex 1046 with the claimed product.

3. Under the given circumstances it is superfluous to consider whether the evidence provided by the Appellants regarding public prior use of Stamylex 1046 is sufficient.
  
4. For the reasons set out in paragraph 2.5 the Board had no doubts as to the identity and the knowledge of the skilled person in the present case. Therefore the Board saw no reason to obtain an expert's opinion on the question of the fitting method which a person skilled in the art would have applied on the basis of the disclosure given in the patent in suit. Furthermore, the Appellants' request to obtain such an opinion seemed not appropriate at the present stage of proceedings in view of the fact that the opposition was filed 7 1/2 years ago. The Appellants' late objection of prior use had the consequence that the case was referred back to the Opposition Division and that the Board is faced with the case for the second time. The Appellants have had ample opportunity to submit evidence on all the issues to be decided. It is the purpose of oral proceedings to come to a decision (Art. 11 of the Rules of Procedure of the Boards of Appeal, OJ EPO 7/1983). It would run counter to the principle of procedural expediency if the Board allowed the Appellant to delay the proceedings any further. Finally, the Appellants failed to identify which person should produce the requested opinion. Therefore, it was not possible for the Board to evaluate the possible contribution of that opinion to the decision of the case.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

  
E. Görgmäler

The Chairman:

  
C. Gérardin