

Publication in the Official Journal ~~Yes~~ / No

File Number: T 516/88 - 3.3.3

Application No.: 82 102 964.2

Publication No.: 0 064 167

Title of invention: Process for producing high tenacity, high modulus
crystalline thermoplastic article and novel product
fibers

Classification: D01F 6/04

D E C I S I O N
of 5 June 1991

Proprietor of the patent: ALLIED CORPORATION

Opponent: Naamloze Vennootschap DSM

Headword: Polyolefine fibres/ALLIED

EPC Articles 113(1), 114, 123(2), Rules 57(1) and 58

Keyword: "newly submitted claims not admissible - no basis for proposed
amendments - not clearly allowable (following T 153/85, OJ EPO
1988, 1) - with subclaims having no counterpart in the granted
version" (following T 295/87, OJ EPO 1990, 470)

Headnote



Case Number : T 516/88 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 5 June 1991

Appellant :
(Proprietor of the patent)

ALLIED CORPORATION
Columbia Road and Park Avenue
PO BOX 2245R
(Law Dept.)
Morristown
New Jersey 07960 (US)

Representative :

Baillie, Iain Cameron
c/o Ladas & Parry
Isartorplatz 5
W - 8000 München 2 (DE)

Respondent :
(Opponent)

Naamloze Vennootschap DSM
Het Overloon 1
NL - 6411 TE Heerlen (NL)

Representative :

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

Decision under appeal :

Decision of Opposition Division of the European
Patent Office dated 14 June 1988, issued on
3 August 1988 revoking European patent
No. 0 064 167 pursuant to Article 102(1) EPC.

Composition of the Board :

Chairman : S.G. Schödel
Members : C.R.J.M. Gérardin
J.A. Stephens-Ofner

Summary of Facts and Submissions

- I. European patent No. 0 064 167 was granted with eighteen claims based on European patent application No. 82 102 964.2 filed on 7 April 1982.
- II. ON 19 August 1988 a Notice of opposition was filed by the Opponent who requested revocation of the patent in suit on the grounds of Article 100 EPC, in particular for lack of novelty and inventive step. The parties relied upon numerous documents, inter alia,
- (1) GB-A-2 042 414, and
 - (3) US-A-3 048 465.
- III. By a decision given orally on 14 June 1988 with written reasons issued on 3 August 1988, the Opposition Division revoked the patent in suit. The decision was based on Claims 1 to 18 as granted, of which independent Claims 1 and 9 read as follows:
- "1. A continuous process for producing a high strength, high modulus fiber or film which comprises the steps:
- (a) forming a solution of a thermoplastic crystalline polymer which is polyethylene of weight average molecular weight at least 500,000 or polypropylene of weight average molecular weight at least 750,000 or which is polyoxymethylene, polybutene-1, poly(vinylidene fluoride) and/or poly(4-methylpentene-1) having a weight average molecular length between 7×10^4 and 71×10^4 backbone atoms in a first solvent which is non-volatile at a first temperature, the solution having a first

- concentration by weight of polymer per unit weight of first solvent;
- (b) extruding said solution through an aperture, said solution being at a temperature no less than said first temperature upstream of the aperture and being substantially at the first concentration both upstream and downstream of the aperture;
 - (c) cooling the emerging stream adjacent to and downstream of the aperture from the first temperature to a second temperature below the temperature at which a rubbery gel stream is formed, including quenching in a quench bath;
 - (d) extracting the first solvent from the gel stream with a second, volatile solvent;
 - (e) drying the gel fiber or film containing second solvent to form a continuous xerogel fiber or film free of first and second solvent; and
 - (f) stretching at least one of:
 - (i) the gel stream containing the first solvent from step c,
 - (ii) the gel fiber or film containing the second solvent from step d, and
 - (iii) the xerogel fiber or film,

at a total stretch ratio:

- (i) in the case of polyethylene which is sufficient to achieve a tenacity of at least 20 g/denier (1.7 GPa) and a modulus of at least 600 g/denier (51 GPa),
- (ii) in the case of polypropylene which is sufficient to achieve a tenacity of at least 10 g/denier (0.8 GPa) and a modulus of at least 180 g/denier (14 GPa), and
- (iii) in the case of polyoxymethylene, polybutene-1, poly(vinylidene fluoride)

or poly(4-methylpentene-1) of at least 10.1."

"9. A continuous polyethylene fiber of weight average molecular weight at least 500,000 and having a tenacity of at least 20 g/denier (1.7 GPa) and a tensile modulus at least 500 g/denier (43 GPa), characterized by having a creep value no more than 5% (when measured at 10% of breaking load for 50 days at 23°C), a porosity less than 10% and a main melting temperature of at least 147°C (measured by DSC at 10°C/minute heating rate)."

Additional independent Claims 15 and 18 covered a continuous polypropylene fibre and a continuous polyolefin gel fibre, respectively; the remaining claims were dependent process and product claims.

In its decision the Opposition Division held that none of the cited documents prejudiced the novelty of Claim 1 as granted, but that the subject-matter of that claim did not involve any inventive step because the prior art disclosed a process for producing a high strength polyethylene fibre applying a sequence of steps closely similar to that of the patent in suit.

The difference between Claim 1 as granted, as far as polyethylene was concerned, and the known polyethylene products was that the total stretch ratio in the former was sufficient to achieve a tenacity of at least 1.7 GPa, and a tensile modulus of at least 43 GPa, whilst in the latter this was not the case. This object could be accomplished in an obvious manner by raising the stretch ratio.

The Opposition Division also found that the parameters forming the precharacterising part of product Claim 9 were already disclosed in the art. Having considered Respondent's Exhibits A and B the Opposition Division was satisfied that the known fibres possessed a melting temperature of at least 147°C as did the claimed polyethylene fibres. Nor was there, so they held, any indication that a creep value of no more than 5% was of an inventive significance.

The polypropylene fibre of Claim 15, being the result of an obvious process, was also considered to be non-inventive.

- IV. Notice of Appeal was lodged by the Appellant (Patentee) on 3 October 1988, the appeal fee being paid on the same day.

The Statement of Grounds was received on 13 December 1988 together with five sets of amended claims, namely sets A to E, an Annex 1 (dealing with fibre melting point with Appendices I-V) and an Annex 2 (dealing with independent analysis comprising Parts I-IV).

The Respondent (Opponent) submitted a letter of reply on 20 July 1989, as well as Enclosure 1, which dealt with creep. He also referred to a new document.

In a communication sent in preparation for the oral proceedings the Board raised a number of objections under Articles 123(2) and 84 EPC regarding the wording of the claims in sets A to E. The Appellant's attention was also drawn to the principles laid down in the Decision T 295/87 (OJ EPO 1990, 470) regarding the filing of additional claims which have no counterpart in the claims as granted.

On 29 May 1991, i.e. a week before the oral proceedings were appointed, the Appellant filed a letter together with a request for consideration of another two sets of claims, designated set A' and set E', both sets comprising 22 claims respectively. These claims had clearly been drafted without taking into account the observations made by the Board in its communication. He also filed an Appendix 1 (dealing with creep) and an Appendix 2 (dealing with comments on melting point data).

Claims 1 of set A' and set E' differed from Claim 1 as granted in that the drying and stretching steps were amended to as follows

in Version A':

" ...e) drying the gel fiber or film containing second solvent to form a continuous xerogel fiber or film free of first and second solvent and of porosity less than 10%; and f) stretching at least one of:

- (i) the gel fiber or film containing the first solvent from step c, and
- (ii) the xerogel fiber or film

while limiting stretching of the gel fiber or film containing the second solvent to less than 2:1; the above stretching steps combining for a total stretch ratio:

- a) in the case of polyethylene which is sufficient to achieve a tenacity of at least 20 g/denier (1.7 GPa) and a modulus of at least 600 g/denier (51 GPa),
- b) in the case of polypropylene which is sufficient to achieve a tenacity of at least 10 g/denier (0.8 GPa) and a modulus of at least 180 g/denier (14 GPa), and
- c) in the case of polyoxymethylene, polybutene-1, poly(vinylidene fluoride) or poly(4-methylpentene-1) of at least 10:1, each of stretching steps (i), (ii) and (iii) being separate from drying step e."

in Version E':

" ...e) drying the gel fiber or film containing second solvent to form a continuous xerogel fiber or film free of first and second solvent and of porosity less than 10%;

and f) stretching the gel fiber or film at a temperature of 120°C or below

g) stretching the dried xerogel fiber or film at a temperature above the melting temperature exhibited by the polymer prior to stretching;

h) limiting the stretching of the gel fiber or film containing the second solvent to less than 2:1 and each of the stretching steps f) and g) being separate from drying step e); and

i) the total stretch ratio of steps f) and g) being sufficient to:

(i) in the case of polyethylene to achieve a tenacity of at least 20 g/denier (1.7 GPa) and a modulus of at least 600 g/denier (51 GPa),

(ii) in the case of polypropylene to achieve a tenacity of at least 10 g/denier (0.8 GPa) and a modulus of at least 180 g/denier (14 GPa) and

(iii) in the case of polyoxymethylene, polybutene-1, poly(vinylidene fluoride) or poly(4-methylpentene-1) of at least 10:1." (emphasis added)

Process Claims 2 to 12 of set A' and process Claims 2 to 6 of set E' were dependent on at least one of the previous claims. Claim 7 of claim set E' was formulated as an independent claim directed to a process for producing polypropylene fibre or film and process Claim 8 was dependent either on Claim 1 or on Claim 7, whereas process Claims 9 to 12 were dependent on any preceding claim.

In both sets of claims independent product Claim 13 was related to a continuous polyethylene fibre and Claims 14 to 18 and 22 were dependent on the former. Claims 20 and 21 were dependent on Claim 19 which was an independent claim directed to a continuous polypropylene fibre. In Claim 19 the polypropylene fibre of granted Claim 15 was additionally characterised by having "a porosity of less than 10%". (The dependency in Claim 21 of set E' does not seem to be correctly indicated).

- V. Oral proceedings took place on 5 June 1991. First of all, certain formal aspects, such as the admissibility of the late-filed submissions and evidence, and the admissibility of the fresh sets of claims had to be settled. In this connection, the Appellant's attention was drawn to the EPO's well-established jurisprudence on this matter, and in particular to Decisions T 153/85 (OJ EPO 1988, 1) and T 295/87 (OJ EPO 1990, 470).

The Appellant submitted that the claims of sets A' and E' did not overcome the objections raised in the communication by the Board for the simple reason that he had never received that communication.

In response to the Appellant's contention that he had not received the Board's communication, a copy of it was then handed to him, although the appeal file clearly showed that the communication had been sent registered, and been subsequently delivered, to the offices of the Appellant's representatives in Munich. The Board then discussed these objections one by one, thereby affording the Appellant ample opportunity to justify the wording of the claims contained in sets A' and E'.

The Appellant's arguments as to the substance can be summarised as follows:

The rejection of product Claims 9 and 15 of the patent in suit for lack of inventive step was unjustified. The unique combination of fibre properties at the level specified in the claims was not achieved by any prior art material. The citations also failed to suggest the sequence of steps found in the process of the invention.

From the decision under appeal it was clear that the Respondent had satisfied the Opposition Division that the melting point of the particular prior art polyethylene products was above 147°C. The Appellant, at that time, could not rebut this for lack of technical evidence. As to the question of creep, the Opposition Division did not regard this as a significant issue. Whether or not the known fibres inherently possessed the properties specified in the claims therefore became critical in determining the inventive content of the product claims. The Appellant, therefore, felt it necessary to present, even at this late stage, further evidence on these issues. He submitted that refusal by the Board to allow to enter this additional information in the proceedings would unfairly prejudice the Appellant. The submission of 29 May 1991 was primarily a comment on melting point data and a discussion on the importance of creep with a reference to two of the Respondent's own patents.

The newly submitted claims of set A' and set E' made clear that stretching in these fibres really took place either on the "first wet gel" or on the "xerogel", whereas on the "second solvent gel" there was only slight stretching. This was made more explicit in the process claims by the indication of the stretch ratio. The limitations as to stretch and the amendment to the particular stretching temperatures in claim set E' were clearly disclosed in the

specification (cf. page 7, Fig 5; Examples 496, line 31, 517-522, 535, 540-542).

In taking up the point that there were more claims in the new claim sets than there were before the Appellant pointed out that the Respondent had gone through each of the former subclaims and had raised objections against them. He, therefore, was entitled to amend not only Claim 1, but also to claim narrower features in subordinate claims, in order to emphasise their distinction from the prior art.

- VI. In response to this submission the Respondent challenged the Appellant's arguments, asserting that the fibres specified in the product claims were characterised merely by some added features such as creep, porosity and main melting point, which were inherent to the prior art filaments. The process as claimed was therefore only a non-inventive modification of the known possibilities.

Considering the latest submissions of 29 May 1991 - with one paper dated 12.15.1989 - the Respondent complained that he had received them only a few days before oral proceedings so that he had no chance fully to evaluate them, or to carry out some counter experiments. In any event, the claims of both claim sets were not acceptable under Article 123(2) EPC, since they included terms such as "less than 2:1" for the stretching ratio and "120°C or below" for the stretching temperature for which no support existed in the original application nor in the patent specification. Also, the Appellant should not be allowed to introduce additional claims.

- VII. The Appellant requested that the patent in suit be maintained on the basis of set A' of the claims with the

temperature being amended in Claim 9 to "150°C" (instead of "160°C"), or, alternatively, of set E'.

The Respondent requested that the appeal be dismissed.

After deliberation the Chairman announced the decision.

Reasons for the Decision

1. The appeal is admissible.
2. Having heard the parties, the Board, in exercising its discretionary power under Article 114(2) EPC, decided at an early stage of the hearing to disregard the technical evidence filed for the first time in the appeal stage for not having been submitted in due time, with the exception of Appellant's Annex 1 and Annex 2. The Board also needed to examine whether or not claims set A' (main request) and claims set E' (auxiliary request) as submitted on 29 May 1990 were admissible in the light of the jurisprudence of the Board as explained to the Appellant (cf. paragraph V.). In view of the extensive discussion of each of the points raised by the Board regarding the wording of these claims, the requirements of Article 113(1) EPC have clearly been met in the present case.
3. As to late-filed amended claims, it is the well-established jurisprudence of the Boards of Appeal that if an applicant or patentee desires to submit amendments to the claims in the course of appeal proceedings, this should be done at the earliest possible moment, and that late-filed amendments submitted, for example, shortly before oral proceedings, may be disregarded in the exercise of the Board's discretion. In particular, in Decision T 95/83 (OJ EPO 1985, 75) it was held that "it is

only in the most exceptional circumstances, where there is some clear justification both for the amendment and for its late submission, that ... an amendment not submitted in good time before oral proceedings will be considered on its merits in those proceedings ..." (cf. point 8).

Furthermore, in Decision T 153/85 (OJ EPO 1988,1) it was stated that "a Board of Appeal may refuse to consider alternative claims which have been filed at a late stage e.g. during the oral proceedings, if such claims are not clearly allowable" (cf. point 2.1). Both these Decisions refer to and endorse the "Guidance for Appellants and their representatives" first published in OJ EPO 1981, 176 and subsequently republished, most recently in OJ EPO 1989, 395.

3.1 In the present case the claims of the patent in suit have been amended several times in the course of the appeal proceedings, and Claim 1 of the main request as now before the Board, contains two essential features which are now here to be found in the granted version of Claim 1: under drying step e) the resulting xerogel fibre or film is additionally characterised by its porosity, in detail by a "porosity of less than 10%", and under step f) the stretching ratio on the second solvent gel is limited to "less than 2:1"; in the counter-move the former feature ii), being redundant, was deleted.

3.1.1 For the above-identified porosity parameter, there is adequate disclosure in the application as originally filed and in the patent specification as well in more than one place and from the context it can be concluded that this feature is common to all types of polymers claimed, namely to a) polyethylene, b) polypropylene and c) polyoxymethylene, polybutene-1, poly(vinylidene fluoride)

or poly(4-methylpentene-1) (cf. specification page 3, line 23, page 4, lines 17/18; page 5, lines 39, 40, 54; page 6, lines 18, 24; page 25, table; original application page 6, lines 31 to 35; page 11, lines 6 to 12; page 13, line 26; page 43, table).

Accordingly, no objection arises to this amendment under Article 123(2) EPC.

3.1.2 This is not the case with the second of the above identified features, which is directed to the specific processing the gel fibre or film is subjected to after it has passed the solvent extraction. At this stage the gel fibre or film contains substantially only some low boiling second solvent.

The passages which the Appellant considers relevant to the second feature in the description of the specification and which he strongly relies upon are quoted here in full:

"The stretching step F is conducted in elements 50-72, and especially in heated tubes 56 and 63. It will be appreciated, however, that various other parts of the system may also perform some stretching, even at temperatures substantially below those of heated tubes 56 and 63. Thus, for example, some stretching (e.g. 2:1) may occur within quench bath 30, within solvent extraction device 37, within drying device 45 or between solvent extraction device 37 and drying device 45" (cf. page 7, lines 36 to 41; original application page 17, lines 19 to 27).

"The second gel fibres 41 have shrunken somewhat compared to the first gel fibres 33, but otherwise contain substantially the same polymer morphology. In the drying device 45, the second solvent is evaporated from the

second gel fibres 41, forming essentially unstretched xerogel fibres 47 which are taken up on spool 52" (cf. page 7, lines 18 to 21; original application page 16, lines 22 to 29).

The numerals indicated refer to Figure 5 of the patent specification, which illustrates one of the processing embodiments for performing "one-stage dry stretching" or "dry-dry stretching" in schematic form.

The Board does not accept the Appellant's submission that the above-mentioned quotations provide a sufficient basis for the proposed amendment to the claim, for the term in question is neither explicitly disclosed nor is it derivable from them. There is also no hint whatsoever in the specification that stretching on the second solvent gel fibre or film is critical to the claimed process and a submission concerning the limitation of the stretch so as to exclude significant stretching when the fibre or film contained a second solvent has never previously been made in the course of the proceedings. In addition the words "less than", which are placed in front of the stretching ratio of "2:1", imply that the ratio itself - although disclosed in the text - is excluded, and should not be applied.

There can thus be no doubt that the proposed amendment to present Claim 1 introduces subject-matter which extends beyond the content of the application as filed, contrary to Article 123(2) EPC.

- 3.2 The same objection as to the stretching ratio applies to Claim 1 of claim set E' where an expression similar to that discussed before is found under step h). Hence this amendment is not acceptable either.

In the Board's judgment, it follows that such claims are not clearly allowable. For this reason, and following the above-mentioned Decisions, the Board refuses to admit them into the appeal proceedings.

- 3.3 It is also worth mentioning that Claim 1 of claim set E' was still further amended by introducing steps f) and g) both relating to stretching operations. In this connection the Appellant made reference, inter alia, to Examples 517 to 522 (concerning "wet-dry stretching" of polyethylene gel yarn) and Examples 534, especially 540 to 542 (concerning "multi-stage stretching" of polyethylene gel yarn). A closer study of these and other relevant working examples, however, reveals that nothing in the disclosure suggests the xerogel fibre or film being stretched "at temperatures above the melting temperature exhibited by the polymer prior to stretching" and the first solvent gel fibre or film being stretched "at temperatures below 120°C". Instructions of this generic form are not deducible from the individual data and the text of said examples. Thus, the terms as claimed under steps f) and g) contravene Article 123(2) EPC.

The specification is silent on details concerning fibres and films made from polymers other than polyethylene or polypropylene. For lack of sufficient disclosure in relation to these other polymers (such as polyoxymethylene) any attempt to limit the original process parameters while simultaneously retaining the three types of polymers identified in the claim must fail.

4. In spite of the Board's explanation of the jurisprudence relating to late-filed matter the Appellant maintained that he was entitled to submit new claims at the appeal stage, all the more so as they were said to arise from the

nature of the opposition. Whilst the Board accepts that parties are free to submit matter, the admissibility of such matter is, as has been examined above, for the Board to decide in the exercise of its discretion under Article 114(2) EPC.

In Decision T 295/87, paragraph 3, already cited above, it was stated, inter alia, that amendments to the text of a granted patent during opposition proceedings should only be considered as "appropriate" and "necessary" in the sense of Rules 57(1) and 58(2) EPC and therefore found to be admissible, if they can fairly be said to arise out of the grounds of oppositions laid down in Article 100 EPC. The reason, clearly, is that opposition proceedings are not designed to provide an opportunity for the Patentee to include new subject-matter in the claims which may have adequate support in the original description, but which has not previously been claimed as such and therefore not been opposed as such.

In the present case, e.g. Claim 10 (claim set A') is directed to a stretching temperature of above 135°C which should be applied to the xerogel and Claim 6 (claim set E') specifies that stretching is effected in both steps f) and g).

The addition of such claims cannot be regarded as an attempt to respond to a valid objection under Article 100 EPC. These amendments are, in effect, either redundant or are not directed to the objections actually raised in the opposition and are not, therefore, either necessary or appropriate within the meaning of Rules 57 and 58 EPC.

5. It is therefore abundantly clear that neither Claim 1 according to the main request, nor Claim 1 according to the auxiliary request, is admissible under the provisions

of Article 123(2) EPC. Since the appeal concerns the main request and the auxiliary request in their entirety, both requests are hereby rejected.

In these circumstances, the question of the allowability of these claims cannot arise.

Order

For these reasons, it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

E. Görgmaier

S.G. Schödel