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Bezeichnung der Erfindung: Process for increasing void volume of hollow filaments.
Title of invention:
Titre de l'invention :

Klassifikation / Classification / Classement : D01D 5/24

ENTSCHEIDUNG / DECISION

vom / of / du 21 June 1990

Anmelder / Applicant / Demandeur :

Patentinhaber / Proprietor of the patent / Titulaire du brevet : E.I. Du Pont de Nemours and Company

Einsprechender / Opponent / Opposant : 01 Enka AG
02 Hoechst Aktiengesellschaft

Stichwort / Headword / Référence :

EPÜ / EPC / CBE Articles 84, 56

Schlagwort / Keyword / Mot clé : "Functional features in a process claim (allowable)"
"Process, the result of which had already been obtained to a limited extent by a prior art process designed for a different purpose (inventive)"

Leitsatz / Headnote / Sommaire

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Case Number : T 361/88 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 21 June 1990

Appellant : (Proprietor of the patent)
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Representative :

Decision under appeal : Decision of Opposition Division of the European Patent Office dated 6 May 1988 revoking European patent No. 0 087 291 pursuant to Article 102(1) EPC.

Composition of the Board :

Chairman : F. Gumbel
Members : M. Liscourt
W. Moser

Summary of Facts and Submissions

I. The mention of the grant of European patent No. 0 087 291 in respect of European patent application No. 83 300 856.8 filed on 18 February 1983 and claiming priority of 19 February 1982 from a prior application filed in the United States of America, was announced on 11 September 1985 (cf. Bulletin 85/37).

Independent Claim 1 as granted reads as follows:

"A process for increasing the percent void of hollow polyester filaments which comprises melt spinning a hollow polyester filament, and while the filament is still substantially amorphous contacting the filament with water at a temperature of at least about 92°C for at least about 3 seconds."

Said claim is followed by nine dependent claims of the same category and referring to Claim 1.

II. Notices of opposition were filed against the European patent by the Respondents on 9 May 1986 and on 9 June 1986, respectively, both requesting the revocation of the patent on the grounds of Article 100(a) EPC.

In support of these requests the following documents were cited:

(1) DE-A-2 824 500
(2) DE-A-3 011 118
(3) DE-A-2 158 297
(4) Winnacker-Kuchler, "Chemische Technologie", Band 5 (1972), pages 320, 321.

III. The Opposition Division revoked the patent in a decision of 6 May 1988. The ground was lack of novelty under Article 54(1) and (2) EPC of the subject-matter of Claim 1 in view of documents (1) and (2), document (2) being an additional patent referring to document (1) dealing with solid (not hollow) filaments while document (2) describes the production of hollow fibres and states that said fibres may be submitted to the process for treating polyester filaments which is described in said document (1).

IV. The Appellants (the proprietors of the patent) filed an appeal against said decision on 13 July 1988 together with the payment of the fee, and submitted a statement of grounds of appeal on 5 September 1988 together with an affidavit.

The Respondents filed observations respectively on 10 January 1989 and 22 March 1989.

With their letter received on 2 January 1990 the Appellants filed further observations as well as a second affidavit and sets of claims for five auxiliary requests.

On 25 April 1990, the Board sent a communication pursuant to Article 11(2) of the Rules of Procedure of the Boards of Appeal dealing with formal matters concerning the auxiliary requests.

V. During oral proceedings held on 21 June 1990, at which Respondent I, though duly summoned, did not appear, the parties gave their comments about Claim 1 of the main request, i. e. Claim 1 as granted and quoted under point I above, and Claim 1 of the auxiliary request.

VI. Claim 1 according to the auxiliary request submitted during oral proceedings reads as follows:

"A process for increasing the percent void of hollow polyester filaments which comprises melt spinning a hollow polyester filament, and while the filament is still substantially amorphous contacting the filament with water at a temperature of at least about 92°C for at least about 3 seconds; the filament during said contacting being allowed to contract in its lengthwise dimension or being kept at constant length or being extended slowly and at low tension so that the percent void of the filament is increased."

VII. In the written and oral proceedings, the Appellants argued substantially as follows:

As regards Claim 1 of the main request the process which is subject-matter of this claim consists of two steps, namely melt spinning of hollow polyester filaments and, in a second step, contacting said filament with water of at least 92°C for at least 3 seconds, while the filament is still substantially amorphous.

The effect which shall be obtained by the process of the invention, namely "increasing the percent void" should be construed as a a functionally defined feature.

A very important feature of the invention is the low tension: if the process is operated too fast one does not get the increase of percent void.

In document (2) there is no disclosure of increasing the void percentage. This document including the table on page 9 just shows that voids had been kept at a constant level during a process for producing very thin filaments.

The filaments according to document (2), Fig. 2 have four voids which in practice are of different sizes so that a single measurement could not give a precise idea of the percent void, and the process according to said document is performed in such conditions of speed and tension that no realisable percent void increase can be obtained. In particular, submitting fibres according to document (2) to a process according to document (1), would not have led to an increase in void percentage as shown by a diagram in the second affidavit. Hence, the disclosure of documents (1) and (2), even if read together, does not destroy novelty of the process of Claim 1 as granted.

In addition, reference was made to the case G 2/88, decided by the Enlarged Board of Appeal (OJ EPO 1990, 93).

- According to point 2.2 thereof we are in the situation of a method or activity claim,

- according to point 2.5, last paragraph, the technical features of a claim to an activity may be defined functionally,

- according to point 8 of said decision, it has to examined if one is faced with a discovery; in the present case, the Appellant determined the process conditions (temperature, time, low tension, low speed) leading to a genuine technical feature to obtain an increase in the percent void,

- according to point 9 of the same decision, as the main claim contains a functional feature, this feature has to be considered, in interpreting the claim, by applying Article 69 EPC and the protocol on the interpretation of said Article, as a technical feature,

- according to point 10.1, second part, it has to be considered if the relevant features have been made available to the public; in the present case, the cited documents do not show the result (increase in void); inherency does not arise in the present case and even if it did, it would not destroy novelty.

VIII. The arguments set forth by the Respondents can be summarized as follows:
(about the main and the auxiliary request)

- According to the decision T 06/80 (OJ EPO 1981, 434) where a further functional attribute of an element of a device disclosed in a document is immediately apparent to a person skilled in the art reading the document, such attribute forms part of the state of the art with regard to that device.

- In document (2) which has to be considered in connection with document (1) as far as the process conditions are concerned, the purpose is to make hollow fibres. The speed of the filaments when spun is 1,000 to 2,100 meters per minute (Claim 3 of document D1), these filaments are submitted to a treatment in hot water (Claim 3 of D1) between 93° and 100°C during a certain time and it is stated in Example 1 of D1 that the filaments are drawn without orientation in a bath which is 2.5 m long so that the time during which the filaments remain in the bath corresponds to the time indicated in Claim 1 of the attacked patent.

- As regards the increase of percent void obtained in document (2), it is admitted that it is very small but there is undoubtedly an increase. Nothing is indicated in present Claim 1 about the amount of increase.

- As it is stated in Claim 3 of document (1) that the filaments have to be drafted in the plastic state and under reduction of molecular orientation, the man skilled in the art understands that he has to proceed at a low speed and according to Example 5 of the same document he knows which temperature is necessary for the water bath. Furthermore it is shown on Table IV of said example that at 97°C it is possible to draw the filaments without influence on the orientation.

- As the man skilled in the art had noticed that when processing according to documents (1) and (2) the voids in the filaments were not destroyed by drawing them in hot water at said temperature, he was encouraged to go further in this direction and he would have come to the result of the patent in suit.

- The theoretical considerations carried out in the second affidavit submitted by the Appellants do not form part of the disclosure of the patent in suit and, therefore, cannot be taken into account when evaluating the merits of the patent. In particular, line C-D shown in exhibit B of the affidavit is not defined in the patent and cannot be taken for construing a difference between the invention and the prior art.

IX. The Appellants requested that the decision of the first instance be set aside and the patent be maintained as granted. According to an auxiliary request, they requested the maintenance of the patent on the basis of Claims 1 to 10 and page 2 of the description as submitted during oral proceedings and pages 3 to 5 and drawings as granted.

The Respondents requested that the appeal be dismissed.

At the conclusion of the oral hearing, the Board's decision was announced in accordance with the order set out below.

Reasons for the Decision

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

2. **Main Request**

2.1 Claim 1 according to the main request corresponds to Claim 1 as granted and is the same as Claim 1 as originally filed except that the word "polyester" has been added. As said word was already present in Claim 5 as originally filed, this amendment does not unduly modify the scope of the claim so that the requirements of Article 123(2) and (3) EPC are satisfied.

2.2 **Novelty and inventive step**

2.2.1 Claim 1 contains functional features, in the present case they are of two types:

- the first type of functional features are related to process steps which are known to the man skilled in the art and may easily be performed in order to obtain the desired result: for example "melt spinning hollow polyester filaments",

- the second type of functional features consist of process steps defined by the result which is aimed at. This is also allowable as long as the man skilled in the art knows, without exceeding his normal skills and knowledge, what he has to do in order to obtain said

result. Another situation arises if said result is obtained for the first time, in which case the man skilled in the art does not know how to achieve the result. This seems to be the situation concerning the feature "for increasing the percent void of hollow filaments".

2.2.2 The decision G 2/88 referred to by the Appellants deals with the case of a new use which is considered as an activity, and the present case deals with a process which comprises also activities. It appears that the findings of this decision can, in principle, be applied to the present case. The general rule cited in point 7.2 of said decision is that if on its proper construction the claim contains no technical feature which reflects the new activity, the wording of the claim which refers to such new activity is merely mental in nature and does not define a technical feature. Then the claim does not contain novel subject-matter.

In this respect the Appellants cannot be followed in their reasoning according to which granted Claim 1 should be construed as containing further features which could be taken out of the description. The Board does not consider that the features added to Claim 1 in order to draft Claim 1 according to the auxiliary request are already implicitly contained in Claim 1 according to the main request.

2.2.3 On the other hand, according to points 8, 9 and 10.3 of said decision, the attaining of a new technical effect should be considered as a functional feature of the claim. If this functional feature has not been previously made available to the public then the claimed invention should be considered to be novel even if one can assume that the technical effect may already inherently have taken place

within the framework of prior art uses, or - in the present case - of a prior art process.

2.2.4 However, in the Board's judgement novelty of the claimed effect cannot be accepted in the present situation. It has been agreed by the parties that the teachings of documents (1) and (2) may be combined because it is clearly stated in (2) that its teaching can be applied to the handling of the filaments described in (1).

Said documents explicitly describe all the features of Claim 1 except the feature "for increasing the percent void" while the results of an example demonstrate that in performing a process showing the same features as present Claim 1, hollow filaments are obtained. The document (2) further discloses in its Table on page 9 that the void diameters of the hollow filaments are in proportion increased relatively to the outside diameters of the filaments. It is true that this increase is only a very small one as compared with the increase achieved by the invention, but nevertheless this increase cannot be ignored and in the absence of any restrictive feature as to the amount of increase in Claim 1 as granted any increase in the prior art process must be taken into account.

2.2.5 Therefore, the result which is aimed at in Claim 1, i.e. the increase of the percent void, was already obtained in the process according to said documents (1) and (2).

For the above reasons, the process which is the subject-matter of Claim 1 cannot, in the Board's view, be said to be novel, even if the principles of the decision G 2/88 are applied. Consequently, the main request had to be rejected.

3. Auxiliary Request

3.1 Claim 1 according to the auxiliary request consists of the process Claim 1 as granted, the scope of which is restricted by adding the following features at the end thereof:

"the filament during said contacting being allowed to contract in its lengthwise dimension"; this feature is present in the description as filed, page 4, lines 4 and 5.

"or being kept at constant length", described on page 4, lines 2 and 3,

"or being extended slowly and at low tension", stated on page 4, lines 1 and 2,

"so that the percent void of the filaments is increased", this was always the purpose of the invention and already present in original Claim 1 and in the title of the application as filed.

Claim 1 therefore satisfies the requirements of Article 123(2) EPC.

As the features which have been introduced into Claim 1 as granted to arrive at the claim according to the auxiliary request are of a restrictive nature, the scope of the main claim has been reduced and the requirements of Article 123(3) are also met.

3.2 As Claim 1 has been modified it has, according to Article 102(3) (which, due to Rule 66(1) EPC, is also applicable in the present appeal proceedings), to satisfy all the requirements of the EPC, including Article 84 EPC, referred to by the Respondents, mainly in respect of the purpose feature and because of the presence of vague features, such as "extended slowly" and "at a low tension".

3.2.1 As regards the functional feature "so that the percent void of the filament is increased" it is allowable in principle according to the already cited decision G 2/88. However, as noticed under point 2.2.4 above, this feature is so broad that it covers also the case where said increase is minute. However, all the cited examples show substantial void increases and thus it is clear by way of interpretation (Art. 69 EPC and its Protocol) that what is meant by the above term relating to the desired effect or purpose is the achievement of a significant increase of percent void far beyond that which may be achieved by the process of documents (2) and (1).

3.2.2 As regards the features "extended slowly and at low tension", it is considered that the man skilled in the art, having the teaching of the present patent in mind, is able, if he wants to achieve such a high void increase, to choose the right values for the extension speed and the tension dependent on the other parameters of the process and adapted to the filaments treated, to obtain the result aimed at.

3.2.3 Therefore, the Board is satisfied that present Claim 1 also meets the requirements of Article 84 EPC.

3.3 **Patentability**

3.3.1 The process which is subject-matter of Claim 1 differs from the process which is described in the two documents (1) and (2) by the fact that during the contacting with hot water the filaments are not drafted as usual but are maintained at low tension and extended slowly in order to obtain a substantial void increase. In the alternative the filaments are not extended at all but are kept at constant length or even allowed to contract in their lengthwise direction. Although it is stated in document (1) that the

drawing of the fibres in the hot water bath should take place under conditions such as to reduce the molecular orientation this does not necessarily mean for the skilled person that the extension is carried out slowly and at a low tension, since the high temperature and the amorphous state of the polyester contribute significantly to the reduction of orientation. The examples in document (1) actually disclose relatively high extension values in this phase of the process.

The process which is the subject-matter of Claim 1 is therefore novel. The nature of the process and its relation to the state of the art does not render it suitable to redraft Claim 1 in the two-part form in order to satisfy the requirements of Rule 29(1) EPC.

3.3.2 As regards obviousness, the problem underlying the present invention is to obtain a void percentage which is as high as possible. Since the desirable properties of hollow fibres and the importance of a relatively high void percentage are known to the man skilled in the art, it was quite natural to try to improve the hollow fibres in this respect. Raising this problem cannot therefore be considered as inventive per se.

3.3.3 Concerning the solution claimed, it is to be stated that none of the documents of the state of the art gives any hint how it could be possible to significantly increase the percent void. The main object of the previous process according to (1) and (2) is to draft filaments of great fineness and specific touch and softness without reducing too much the voids obtained during the step of melt spinning and there is no suggestion as to the aspect of increasing significantly the void percentage.

Hence the man skilled in the art considering the Table on page 9 of document (2), although noticing that a slight void increase may be obtained, does not find a positive suggestion or encouragement to try to find a solution to the given problem on the basis of documents (1) and (2).

In the present case, the merit of the inventor may reside in the fact that a surprising effect of a generally known process has been found and the process has then been further developed in this respect. Even a few years after the invention had been performed, there is no convincing explanation of the phenomenon which leads to the result of the substantial void increase, which consequently was not foreseeable.

3.3.5 For the above reasons, the process which is subject-matter of Claim 1 of the auxiliary request is not obvious regarding the available state of the art and satisfies, therefore, the requirements of Article 56 EPC. Hence Claim 1 is allowable.

4. Claims 2 to 10, which are dependent on Claim 1 and are of the same category, deal with embodiments of the process of Claim 1; they are therefore also allowable.

Order

For these reasons, it is decided that:

1. The decision of the first instance is set aside.

2. The main request is rejected.

3. The case is remitted to the first instance with the order to maintain the patent according to the auxiliary request:

Description: page 2, submitted during oral proceedings,
pages 3 to 5 as granted
Drawings: as granted
Claims: 1 to 10, filed during oral proceedings.

The Registrar: The Chairman:

N. Maslin F. Gumbel