Datasheet for the decision of 9 October 2007

Case Number: T 0955/07 - 3.3.03
Application Number: 00127811.8
Publication Number: 1132427
IPC: C08L 3/00
Language of the proceedings: EN
Title of invention: Melt processable starch compositions
Applicant: THE PROCTER & GAMBLE COMPANY
Opponent: -
Headword: -
Relevant legal provisions: EPC Art. 84
Keyword: "Clarity (no) - unclear definition of measurement conditions for a parameter"
Decisions cited: -
Catchword: Reasons points 3.2 and 3.3
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DECISION
of the Technical Board of Appeal 3.3.03
of 9 October 2007

Appellant: THE PROCTER & GAMBLE COMPANY
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Decision under appeal: Decision of the Examining Division of the European Patent Office dated 20 November 2006 and posted 29 January 2007 refusing European application No. 00127811.8 pursuant to Article 97(1) EPC.

Composition of the Board:
Chairman: R. Young
Members: W. Sieber
C.-P. Brandt
Summary of Facts and Submissions

I. European patent application No. 00 127 811.8 was filed on 19 December 2000 claiming priorities of 7 March 2000 (WO/CT/IB00/00233 and WO/CT/IB00/00234) and was published under No. 1 132 427 on 12 September 2001 (Bulletin 2001/37).

II. By a decision which was announced orally on 20 November 2006 and issued in writing on 29 January 2007, the examining division refused the application. The decision was based on a main request (Claims 1-16), auxiliary request I (Claims 1-14) and auxiliary request II (Claims 1-14), all requests filed on 20 November 2006 at the oral proceedings before the examining division.

(a) Claim 1 of the main request read as follows:

"A composition capable of being melt drawn into a filament or fiber having an average equivalent diameter of less than 10 microns comprising from 5-99.99% by weight of a starch having a weight average molecular weight of from 1,000 to 2,000,000, from 0.01-95% by weight of an additive comprising a plasticizer, wherein said composition has an extensional viscosity in the range of 50 pascal·seconds to 20,000 pascal·seconds and exhibits a capillary number of at least one wherein the capillary number is a dimensionless number representing a ratio of viscous fluid forces to surface tension forces calculated according to the equation Ca=(\(\eta_s \cdot Q\))/(\(\pi \cdot r^2 \cdot \sigma\)) where \(\eta_s\) is the shear viscosity in pascal·seconds
measured at a shear rate of 3000 s$^{-1}$, $Q$ is the volumetric fluid flow rate through a capillary die in m$^3$/s, $r$ is the radium of the capillary die in meters and $\sigma$ is the surface tension of the fluid Newtons per meter.

(b) Claim 1 of auxiliary request I read as follows:

"A composition comprising melt drawn fibers having an average equivalent diameter of less than 10 microns comprising from 5-99.99% by weight of a starch having a weight average molecular weight of from 1,000 to 2,000,000, from 0.01-95% by weight of an additive comprising a plasticizer, wherein said composition has an extensional viscosity in the range of 50 pascal·seconds to 20,000 pascal·seconds and exhibits a capillary number of at least one wherein the capillary number is a dimensionless number representing a ratio of viscous fluid forces to surface tension forces calculated according to the equation $Ca = (\eta_s \cdot Q) / (\pi \cdot r^2 \cdot \sigma)$ where $\eta_s$ is the shear viscosity in pascal·seconds measured at a shear rate of 3000 s$^{-1}$, $Q$ is the volumetric fluid flow rate through a capillary die in m$^3$/s, $r$ is the radium of the capillary die in meters and $\sigma$ is the surface tension of the fluid Newtons per meter."

(c) Claim 1 of auxiliary request II read as follows:

"A method of forming a filament or fiber having an average equivalent diameter of less than 10 microns comprising the steps of:
(a) providing a composition comprising from 5-99.99% by weight of a starch having a weight average molecular weight of from 1,000 to 2,000,000, from 0.01-95% by weight of an additive comprising a plasticizer, wherein said composition has an extensional viscosity in the range of 50 pascal·seconds to 20,000 pascal·seconds and exhibits a capillary number of at least one wherein the capillary number is a dimensionless number representing a ratio of viscous fluid forces to surface tension forces calculated according to the equation \( Ca = (\eta_s \cdot Q) / (\pi \cdot r^2 \cdot \sigma) \) where \( \eta_s \) is the shear viscosity in pascal·seconds measured at a shear rate of 3000 s\(^{-1}\), \( Q \) is the volumetric fluid flow rate through a capillary die in \( \text{m}^3/\text{s} \), \( r \) is the radius of the capillary die in meters and \( \sigma \) is the surface tension of the fluid Newtons per meter; and

(b) using a die to process said composition into said filament or fiber having said average diameter of less than 10 microns and wherein the dye temperature is kept above the melting temperature of the starch composition."

(d) The remaining claims of each request are not relevant to this decision and will therefore not be discussed in further detail.

(e) The main request was refused by the examining division because the subject-matter of Claim 1 was not novel over Examples 4 and 15 of EP-A-1 035 163 (D1). The two parameters in Claim 1, namely "extensional viscosity" and "capillary number", were not suitable to distinguish the subject-
matter of Claim 1 from the prior art. One argument in this connection was that Example 4 of D1 was identical with Example 4 of the application as originally filed. Because Example 4 of the application was not denoted comparative it was concluded that it had an extensional viscosity and a capillary number as required in Claim 1 of the main request. Consequently, the identical Example 4 of D1 also fell within the scope of Claim 1. As regards the limits of the extensional viscosity range given in Claim 1, the examining division noted that these limits were undefined as the value for extensional viscosity depended on the measuring temperature and frequency, none of which was specified in Claim 1. However, this issue was not to be considered as forming part of the decision.

Furthermore, the examining division was of the opinion that the subject-matter of the main request did not meet the requirements of Article 83 EPC. The application did not contain any generalised guidance that would put the skilled person in the position to know which concrete technical measure had to be taken in order to arrive at the claimed subject-matter, or, in other words, the skilled person did not know how he had to modify the compositions of the prior art in order to arrive at something meeting the criteria of Claim 1. A single example in the application, namely Example 15, was not suitable to provide such a generalised guidance.
As regards auxiliary requests I and II, the additionally introduced features could not confer novelty to the claimed subject-matter.

III. On 26 March 2007, the appellant (applicant) filed a notice of appeal against the above decision with simultaneous payment of the prescribed fee.

A statement setting out the grounds of appeal was filed on 29 May 2007. The arguments presented therein may be summarized as follows:

(a) The application was originally drafted in the United States as a continuation in part of a US application which corresponded to D1. The figures and Examples 1-14 of the present application were indeed identical with the figures and Examples 1-14 disclosed in D1. However, the figures and Examples 1-14 of D1 were repeated in the present application and it needed to be understood that they did not therefore exemplify the invention. Example 15 of the application as originally filed was the only example that did exemplify the present invention and was the only example where the composition had a capillary number greater than 1.

(b) The decision under appeal focused on whether Examples 4 and 15 of D1 anticipated the claimed subject-matter. As regards Example 4 of D1, the examining division erroneously concluded that since Example 4 was included in the present application, it must have the parameters set out
in the claims. Also Example 15 of D1 did clearly not anticipate the claimed subject-matter.

(c) So far as the question of sufficiency of disclosure was concerned, it was submitted that based on the information provided as to how to determine the capillary number one skilled in the art had the ability to adjust the composition and process conditions to result in the required capillary number. Furthermore, Claim 1 was specifically supported by Example 15 of application as originally filed.

IV. In a communication issued on 3 August 2007, the board raised objections under Article 84 EPC against the parameters "extensional viscosity" and "capillary number". Inter alia, the question was raised whether the value for extensional viscosity depended on the measuring temperature. Furthermore, the board agreed with the objection of the examining division that the application in suit appeared to lack sufficiency of disclosure. Finally, the wording "0.01-95% by weight of an additive comprising a plasticizer" in the claims was challenged in view of Article 123(2) EPC.

V. On 9 October 2007, oral proceedings were held before the board. The discussion focused on the temperature of measurement for extensional viscosity. The appellant stated that, according to its information, the value for extensional viscosity depended on the measuring temperature. In particular, it stated that extensional viscosity tended to be higher at lower temperatures and lower at higher temperatures. However, it was clear from the application as originally filed that
extensional viscosity should be measured at the die
temperature. Thus, no clarity problem could arise.

VI. The appellant requested that the decision under appeal
be set aside and that a patent be granted on the basis of

- the main request (Claims 1 - 16) as filed on
20 November 2006, or, in the alternative, on the
basis of

- auxiliary request I (Claims 1 - 14) as filed on
20 November 2006, or

- auxiliary request II (Claims 1 - 14) as filed on
20 November 2006.

Reasons for the Decision

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

2. It may be convenient to recall at this juncture that
the appellant's requests are identical with the
requests underlying the decision under appeal
(point II(a)-(c), above).

3. Article 84 EPC (main request)

3.1 The composition claimed in Claim 1 of the main request
(point II(a), above) must have inter alia an
extensional viscosity in the range of 50-20,000 Pa·s.
According to page 22, lines 23-30 of the application as originally filed, "an apparent extensional viscosity is calculated from the pressure drop and the flow rate of the sample through the die according to the following equation:

\[
\text{Extensional Viscosity} = \frac{\delta P}{\text{extension rate} / E_h} \cdot 10^5
\]

where extensional viscosity is in Pa-s, \( \delta P \) is the pressure drop in bars, extension rate is the flow rate of the sample through the die in sec\(^{-1} \), and \( E_h \) is dimensionless Hencky strain".

Furthermore, the passage on page 22, lines 16-18 states that "the test temperature (processing temperature) is a temperature above the melting point of a sample starch composition". It is, however, not indicated in the general description at which temperature extensional viscosity is actually measured.

3.2 In this context, it is conspicuous to the board that in Examples 1 and 2 of the application as originally filed extensional viscosity is measured at 700 s\(^{-1} \) and 90°C (page 27, lines 20-21 and page 28, lines 3-4) whereas in Example 15 of the application as originally filed apparent extensional viscosity (which appears to be synonymous with "extensional viscosity" as defined within the Test Methods section of the description at page 22) is measured at 50°C (page 33, lines 31-32). Since Example 15 is, according to the appellant, the only example that does exemplify the present invention, one could take the position that extensional viscosity has to be measured at 50°C. On the other hand, even if Examples 1 and 2 are not according to the invention,
the disclosure of these examples demonstrates that extensional viscosity can also be measured at another temperature, namely 90°C. Thus, there is no generally understood concept in the application as originally filed at which temperature extensional viscosity has to be measured. In view of this uncertainty at which temperature extensional viscosity has to be measured the question arises as to whether or not the value for extensional viscosity depends on the measuring temperature, an issue raised inter alia by the board in the communication dated 3 August 2007.

3.3 At the oral proceedings, the appellant admitted that the value for extensional viscosity depended upon the measuring temperature. In particular, it stated that extensional viscosity tended to be higher at lower temperatures and lower at higher temperatures. This means that the actual value for extensional viscosity is variable, or, in other words, that the same composition exhibits a different value for extensional viscosity at different temperatures. The consequence of the variability of the values for extensional viscosity is that an ambiguity indeed exists as to the actual scope of Claim 1. This ambiguity in the scope of Claim 1 may by illustrated by reference to Example 2 of the application as originally filed which discloses a starch composition having an extensional viscosity of 46.0 Pa·s measured at 700 s⁻¹ and 90°C. It is not clear whether this composition is, at least as far as the extensional viscosity is concerned, excluded from the scope of Claim 1, by virtue of the value 46.0 being below the lower limit indicated in Claim 1, or within the scope of Claim 1 because the value for extensional viscosity will increase when the measuring temperature
is lowered (as can be concluded from the appellant's statement with respect to the temperature dependence of extensional viscosity).

This leads to the conclusion that the lack of indication of a specific temperature as the temperature of measurement for extensional viscosity results in uncertainty as to the limits of the scope of Claim 1 of the main request. Therefore, it cannot be considered that Claim 1 defines the matter for which protection is sought as stipulated by Article 84 EPC. Hence, Claim 1 of the main request does not meet the requirements of Article 84 EPC.

3.4 The appellant's argument that the measuring temperature is the die temperature cannot overcome the clarity objection. Even if this is correct, it is still not clear at which die temperature extensional viscosity has to be measured. If anything, this statement increases the degree of uncertainty with respect to the measuring temperature. As mentioned above, in Examples 1 and 2 of the application as originally filed extensional viscosity is measured at 90°C, in Example 15 it is measured at 50°C. The extensional viscosity for the starch composition of Example 3 of the application as originally filed is not given. However, the composition is processed at a die temperature of 126.7°C (page 29, line 7). Thus, the appellant's argument allows a further possibility at which extensional viscosity could be measured, namely 126.7°C, which amplifies the ambiguity rather than removing it.
4. Claim 1 of the main request being not allowable, the main request as a whole has to be refused.

5. The objection under Article 84 EPC alone justifies the refusal of a claim containing the parameter "extensional viscosity" as a limiting feature. Under these circumstances, a discussion of the other issues raised in the communication dated 3 August 2007, namely whether the parameter "capillary number" meets the requirements of Article 84 EPC, the invention is sufficiently disclosed, or the feature "from 0.01-95% by weight of an additive comprising a plasticizer" has a basis in the application as originally filed, is superfluous.

6. **Auxiliary requests I and II**

Since Claim 1 of each auxiliary request contains the same reference to extensional viscosity as Claim 1 of the main request, auxiliary request I and auxiliary request II have to be refused in view of Article 84 EPC for same reasons as given for the main request.
Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:     The Chairman:

E. Görgmaier     R. Young