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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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Case Number: T 0955/07 **-** 3.3.03

D E C I S I O N
of the Technical Board of Appeal 3.3.03
of 9 October 2007

Appellant: THE PROCTER & GAMBLE COMPANY
                           One Procter & Gamble Plaza
                           Cincinnati, Ohio 45202   (US)

Representative: Ebner von Eschenbach, Jennifer
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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
        (WOPCT/IB00/00233 and WOPCT/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
              η_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 σ 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=(η_s·Q)/(π·r^2·σ) where η_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 σ 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 $Ca=(\eta_s·Q)/(\pi·r^2·\sigma)$ where η_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 σ is the surface tension of the fluid Newtons per meter; and

(b) useing *[sic]* a die to process said composition into said filament or fiber having said average diameter of less than 10 microns and wherein the dye *[sic]* 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:

Extensional Viscosity = (delta P/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

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