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Datasheet for the decision of 2 July 2012

Case Number: T 0395/10 - 3.3.09

Application Number: 01996670.4

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Language of the proceedings: EN

Title of invention:
Well Treatment

Applicant:
StatoilHydro ASA

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 84

Relevant legal provisions (EPC 1973):
-

Keyword:
"Claims - Clarity (no)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0395/10 - 3.3.09

D E C I S I O N
of the Technical Board of Appeal 3.3.09
of 2 July 2012

Appellant: (Applicant)
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Representative:
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Decision under appeal:
Decision of the Examining Division of the European Patent Office posted 17 September 2009 refusing European patent application No. 01996670.4 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman: W. Sieber
Members: M. O. Müller
K. Garnett

Summary of Facts and Submissions

I. European patent application No. 01 996 670.4, filed on 19 November 2001 as international application PCT/GB01/05087 in the name of STATOIL ASA, and claiming priority from GB 0028264.0 (20 November 2000), was refused by a decision of the examining division which was announced orally on 4 September 2009 and issued in writing on 17 September 2009.

II. The examining division's decision was based on the main request and auxiliary requests 1-5, all submitted with letter of 3 September 2009.

Claim 1 of the main request read as follows:

"1. Monodisperse Polymeric *[sic]* particles having a pore volume of at least 20%, and being prepared by a process which comprises preparing in a first step an aqueous dispersion of polymer particles containing from 0.05 to 10 times by volume, based on the polymer, of one or more materials having a water-solubility of $<l0^{-2}$ g/l and having a molecular weight of <5000 g/mol (herein referred to as Substance I) said Substance I not being an oligomer of the polymer forming the particles and being non-crystalline at the temperature at which it is incorporated into the particles and is in liquid form at the temperature at which Substance II is introduced in a second step, and in said second step adding a partly water-soluble material (herein referred to as Substance II) having a water-solubility of at least ten times that of Substance I under conditions which prevent or hinder transport of Substance I through the aqueous phase, whereby Substance II

diffuses into the polymer particles swelled with Substance I and increases the volume of said particles by from 20 to 1000 times, based on the polymer, characterised in that said particles are impregnated with a well treatment chemical or precursor or generator thereof selected from scale inhibitors, corrosion inhibitors, wax inhibitors, asphaltene inhibitors, foamers, biocides, surfactants, oxygen scavengers and bacteria.".

III. In its decision, the examining division argued that none of the requests met the requirements of Article 84 EPC as the term "monodisperse" present in claim 1 of each of the requests was unclear. Furthermore, the subject-matter of claim 1 of each of these requests was considered to lack novelty in view of D2 (WO 01/94744 A1). Finally, auxiliary requests 1 and 2 were deemed not to meet the requirements of Article 123(2) EPC.

IV. On 26 November 2009, the appellant (applicant) filed a notice of appeal against the above decision and paid the prescribed fee on the same day. A statement setting out the grounds of appeal was filed on 27 January 2010 together with a main request and auxiliary requests I-VII as well as the priority documents of D2.

Claim 1 of the main request reads as follows:

"1. Polymeric particles having a pore volume of at least 20% and a coefficient of variation in particle size of less than 10%, and being prepared by a process which comprises preparing in a first step an aqueous dispersion of polymer particles containing from 0.05 to

10 times by volume, based on the polymer, of one or more materials having a water-solubility of $<10^{-2}$ g/l and having a molecular weight of <5000 g/mol (herein referred to as Substance I) said Substance I not being an oligomer of the polymer forming the particles and being non-crystalline at the temperature at which it is incorporated into the particles and is in liquid form at the temperature at which Substance II is introduced in a second step, and in said second step adding a partly water-soluble material (herein referred to as Substance II) having a water-solubility of at least ten times that of Substance I under conditions which prevent or hinder transport of Substance I through the aqueous phase, whereby Substance II diffuses into the polymer particles swelled with Substance I and increases the volume of said particles by from 20 to 1000 times, based on the polymer, characterised in that said particles are impregnated with a well treatment chemical or precursor or generator thereof selected from scale inhibitors, corrosion inhibitors, wax inhibitors, asphaltene inhibitors, foamers, biocides, surfactants, oxygen scavengers and bacteria.".

In the same way as claim 1 of the main request, claim 1 of each of the auxiliary requests I-VII requires the polymeric particles to have a pore volume of at least 20% and a "coefficient of variation in particle size of less than 10%". Furthermore, claim 1 of each of auxiliary requests I-VII contains also the features of a Substance I that has "a water-solubility of $<10^{-2}$ g/l", and of a Substance II that is added "under conditions which prevent or hinder transport of Substance I through the aqueous phase" and that

increases "the volume of said particles by from 20 to 1000 times, based on the polymer".

V. The arguments made by the appellant in the statement of grounds of appeal can be summarized as follows:

In view of the examining division's objections made in respect of auxiliary requests 1 and 2 under Article 123(2) EPC, these requests have been deleted. Furthermore, in order to meet the examining division's objection against the term "monodisperse", this term in all requests has been replaced by a "coefficient of variation in particle size". As to the examining division's novelty objection, the claimed subject-matter is novel as, firstly, an entirely different process is used in D2 and, as a result, the inherent properties of the resulting polymeric particles are different and as, secondly, D2 nowhere discloses a pore volume or a variation in particle size as required by claim 1.

VI. In the annex to the summons, dated 31 January 2012, the board issued its preliminary opinion. Attached to the annex were *inter alia* the following documents:

D4: A. R. Minihan et al, Unilever Research Port Sunlight, "Interpretation of the Differences between the Pore Size Distributions of Silica Measured by Mercury Intrusion and Nitrogen Adsorption", 2006, pages 605-612, http://pubs.acs.org/doi/abs/10.1021/ba-1994-0234.ch017; and

D5: Malvern Instruments Ltd, "Comparing Different Particle Sizing Techniques", 2011, http://www.malverninstruments.fr/LabFre/technology/laser_diffraction/comparing_different_techniques.htm.

In its preliminary opinion, the board set out its view that the pore volume of the polymeric particles in claim 1 was unclear since, as confirmed by D4, this feature depends on the measurement method applied while claim 1 does not contain any information in this regard. In the same way, the coefficient of variation in particle size in claim 1 was unclear since, as confirmed by D5, it equally depends on the measurement method applied, about which no information is present in claim 1 either. Finally, the water solubility of Substance I in claim 1, the conditions to be understood by "conditions which prevent or hinder transport of Substance I through the aqueous phase" and the point of reference for the increase of the volume of the particles by 20 to 1000 times in claim 1 were also unclear.

VII. With its letter of 11 June 2012, the appellant withdrew its request for oral proceedings and requested that "a Decision be issued on the papers currently on file". No comments were made with regard to the board's preliminary opinion. Therefore, the board cancelled the oral proceedings (communication of 2 July 2012)

VIII. The appellant requested in the written proceedings that the decision under appeal be set aside and that the application be granted on the basis of the claims of the main request, or any of auxiliary requests I-VII,

all requests filed with the letter of 27 January 2010, or alternatively, that the case be remitted to the examining division for further prosecution on the basis of any of these requests.

Reasons for the Decision

1. The appeal is admissible.

2. *Requirements of Article 84 EPC*

2.1 The pore volume in claim 1

2.1.1 Claim 1 of all the requests (main request and auxiliary requests I-VII) requires the pore volume of the claimed polymeric particles to be at least 20%. No information is contained in the claim (or the description) as regards the measurement method to be used to determine this pore volume.

Having regard to the measurement of the pore volume, D4 states:

"Mercury intrusion and nitrogen sorption are two common techniques used to analyze the structures of porous solids. However, they can give different pore size distributions or pore volumes for a given solid." (page 605, first four lines of left-hand column).

Consequently, in the absence of any information in claim 1 as regards the measurement method to be used to determine the pore volume, the pore volume of the polymeric particles of claim 1 lacks clarity.

2.2 The "coefficient of variation in particle size" in claim 1

2.2.1 Claim 1 of all requests requires the polymeric particles to have a "coefficient of variation in particle size of less than 10%". The claim does however not contain any information concerning which method is to be applied in order to determine the particle size and thus the coefficient of variation in particle size.

As confirmed by D5, numerous methods to determine particle sizes are available, each giving different results. It can in particular be deduced from this document that different values are obtained for porous particles (as the polymeric particles of claim 1 have a pore volume of at least 20%, they are porous) when using laser diffraction, aerodynamic sizing techniques and sedimentation techniques:

"If the particle density is lower than unity (e.g. if the particles are porous) then the aerodynamic size will generally be smaller than the volume equivalent size reported by laser diffraction." (second paragraph of the chapter "Comparing Laser Diffraction and Aerodynamic Sizing techniques").

"Another important factor in comparing sedimentation and laser diffraction will be the particle density. Porous particles will sediment more slowly than non-porous particles of similar volume because of their low density. Laser diffraction would, however, always report the size that relates to the particle volume. Again, this would cause sedimentation to under-report

the particle size compared to laser diffraction." (last paragraph of the chapter "Comparing Laser Diffraction and Sedimentation").

Therefore, the feature concerning the particle size and thus the coefficient of variation in particle size in claim 1 lacks clarity. It is noted in this respect that the fact that the description of the application identifies a measurement method (measurement by a Coulter particle size analyser, page 7, line 18) does not alter this conclusion as, according to Article 84 EPC, it is the claim as such and not the claim possibly read in the light of the description that has to be clear.

2.2.2 The coefficient of variation in particle size in claim 1 of all requests lacks clarity for the further reason that the claim does not contain any information as to how this coefficient is to be calculated. In the same way as set out above in point 2.2.1, this conclusion is not altered by the fact that a calculation method is given in the description (page 7, line 34 to page 8, line 10).

2.3 The process features in claim 1

Claim 1 of all requests refers to a process, either as part of a product-by-process definition of the polymeric particles (main request and auxiliary requests I-VI) or as part of a process for the preparation of these particles (auxiliary request VII).

2.3.1 This process is defined by *inter alia* the step of incorporating into the polymeric particles a Substance I that has "a water-solubility of $<10^{-2}$ g/l".

Water-solubility depends on the temperature and no information is contained in claim 1 about the temperature at which this solubility is to be measured. Consequently, the water-solubility of Substance I is unclear.

2.3.2 The process is defined by the additional step of adding a Substance II, which step is to be carried out "under conditions which prevent or hinder transport of Substance I through the aqueous phase".

It is not clear which conditions are covered by the wording "conditions which prevent or hinder transport of Substance I through the aqueous phase".

2.3.3 The process is finally defined such that Substance II is to increase the volume of the polymeric particles "by from 20 to 1000 times, based on the polymer". It is not clear whether this factor of 20 to 1000 for the volume increase is based on the volume of the polymeric particles before or after Substance I has been incorporated therein. Thus, a clear reference point is missing.

2.3.4 Consequently, the product-by process definition in claim 1 of the main request and auxiliary requests I-VI and the process of claim 1 of auxiliary request VII is unclear.

3. In view of the above, none of the appellant's requests is allowable.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

G. Röhn W. Sieber