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**Datasheet for the decision
of 30 June 2022**

Case Number: T 0523/20 - 3.3.05

Application Number: 15770812.4

Publication Number: 3186199

IPC: C02F1/56, C08L33/00, C08L39/00,
C08L51/00, D21H17/46,
D21H17/37, D21H17/44,
D21H17/45, D21H17/56, D21H21/10

Language of the proceedings: EN

Title of invention:

POWDERY WATER-SOLUBLE CATIONIC POLYMER COMPOSITION

Patent Proprietor:

Solenis Technologies, L.P.

Opponent:

Kemira OYJ

Headword:

POWDERY WATER-SOLUBLE CATIONIC POLYMER/Kemira

Relevant legal provisions:

RPBA 2020 Art. 12(6)
EPC Art. 123(2), 83, 54, 56

Keyword:

Late-filed objection - admitted (no)
Amendments - allowable (yes)
Sufficiency of disclosure - (yes)
Novelty - (yes)
Inventive step - (yes)

Decisions cited:

Catchword:



Beschwerdekkammern

Boards of Appeal

Chambres de recours

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Case Number: T 0523/20 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 30 June 2022

Appellant: Kemira OYJ
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted on
2 January 2020 concerning maintenance of the
European Patent No. 3186199 in amended form.

Composition of the Board:

Chairman E. Bendl
Members: J. Roider
R. Winkelhofer

Summary of Facts and Submissions

I. The appeal by the opponent (appellant) lies from the interlocutory decision of the opposition division to maintain the patent in amended form.

II. The following documents cited in the decision under appeal are of relevance here:

D1 US 8,021,516 B2

D2 US 2007/0173586 A1

D3 EP 0 262 945 A2

D4 US 5,213,693 A

D6 Appendix 2: test results filed by the appellant with the notice of opposition

III. With the reply to the appeal, the respondent (patent proprietor) upheld as the main request the set of claims as maintained by the decision under appeal.

The independent claims of the main request read as follows:

*"1. A powdery water-soluble cationic polymer composition comprising a first cationic polymer and a second cationic polymer;
wherein the second cationic polymer
• is formed by non-radical polymerization,
• is polyamine selected from the group consisting of poly-(dimethylamine (co)epichlorohydrin) and poly(dimethylamine-co-epichlorohydrin-coethylenediamine), and
• has a weight-average molecular weight lower than 1 million g/mol; and
wherein the first cationic polymer is formed in the presence of the second cationic polymer by radical*

adiabatic gel polymerization of an aqueous composition comprising a radically polymerizable cationic monomer, a radically polymerizable nonionic monomer, and the second cationic polymer; wherein the ratio of the second cationic polymer to the first cationic polymer is within the range of from 0.01:10 to 1:4; and wherein the composition contains less than 5 ml/l insolubles when being dispersed in water."

"9. A method for producing the powdery cationic polymer composition according to any of the preceding claims, the method comprising the steps of

- a) preparing the aqueous composition comprising the radically polymerizable cationic monomer, the radically polymerizable nonionic monomer, and the second cationic polymer that is formed by non-radical polymerization;*
- b) adjusting the temperature of the aqueous composition to a temperature within the range of from -10°C to 25°C, and purging oxygen by an inert gas;*
- c) starting radical adiabatic gel polymerization of the radically polymerizable cationic monomer and the radically polymerizable nonionic monomer in the presence of the second cationic polymer by adding a polymerization initiator;*
- d) allowing the temperature of the aqueous composition to increase because of the exothermic polymerization reaction and to form a polymer gel while reaching the maximum polymerization temperature; and*
- e) subjecting the polymer gel to mechanical size reduction and drying the polymer gel after the maximum temperature has been reached."*

"14. Use of the powdery water-soluble cationic polymer composition according to any of claims 1 to 8 for promoting flocculation during solid/liquid separation."

"15. A method for promoting flocculation during solid/liquid separation, the method comprising the step of adding the polymer composition according to any of claims 1 to 8 to a mixture of solids and liquids."

The dependent claims 2-8, 10-13, 16 and 17 concern particular embodiments of the invention.

IV. In its submission of 25 May 2022, the appellant submitted a further document, referred to by the appellant as D7:

D7 D. Eklund and T. Lindström, Paper chemistry - An introduction, DT Paper Science Publications, Grankulla, Finland, 1991, 179-180

V. The arguments of the parties can be summarised as follows.

(a) Added subject-matter, Article 123(2) EPC

The appellant argued that the objections under Article 100(c) EPC, filed with the notice of opposition, continued to apply. The ratio of 0.01:10 to 1:4 of the second cationic polymer to the first cationic polymer, disclosed on page 12, second paragraph of the original application, was not disclosed in combination with original claims 2, 3 and 7, whereas the subject-matter of granted claim 1 combined these features.

The appellant was moreover of the opinion that the amendments made in claim 1 during the opposition proceedings violated the requirements of Article 123(2) EPC. First, the deletion of the alternative "polyethyleneimines" resulted in an

intermediate generalisation. Second, the restriction of the content of insolubles to "less than 5 ml/l" replacing the feature "not more than 5 ml/l" of the granted patent was an extension beyond the application as originally filed since the former did not include the value of 5 ml/l.

The respondent submitted that claim 1 of the granted patent fulfilled the requirements of Article 123(2) EPC and moreover requested not to admit the objections on the amendments made in the opposition proceedings because they were only raised in the statement of grounds of appeal for the first time.

(b) **Sufficiency of disclosure, Article 83 EPC**

The appellant argued that the objective, which required that the solution contained less than 5 ml/l insolubles, could not be achieved. The inability to measure the content of insolubles with the method defined in the contested patent led to insufficient disclosure. Indeed, only one measurement method was disclosed in the patent in suit (paragraphs [0016] and [0017]), and the standard sieve used did not exist. However, there existed a number of measurement methods, particularly since the measurement of insolubles was not standardised. This led to different results. When selecting a sufficiently coarse sieve, less than 5 ml/l would always be achieved, but the technical problem was not solved. This rendered the amount of insolubles meaningless.

Moreover, the acceptable size of insolubles depended on the intended application. Thus, a product used for water treatment might fall within

the scope of claim 1 because the test was carried out using a sieve with a coarse mesh, while for paper making, the same product did not fall within the scope of the claim because the test was carried out with a sieve with a fine mesh.

As shown in D6, the sieve size strongly influenced the amount of retained particles. The method used in D6 was the same as in the patent, paragraph [0059]. The patent did not disclose the kind and purpose of the chelator. If a purposive selection of the chelator was required, the patent lacked sufficiency of disclosure for this reason alone. The pH was selected according to the optimum performance of the initiation system, which was a redox-system in D6.

The product in D6 was expected to be as in the patent in suit, but the tests showed strongly variable results for the amount of insolubles, despite its allegedly crucial importance for the invention.

The appellant moreover objected to the lack of information for determining the molecular weight of the first polymer. The skilled person could thus not carry out the invention.

The respondent argued that the appellant had not followed the manufacturing method in paragraph [0059] of the patent in suit. No attempt had been made to re-work the invention as described. The opponent had the burden of proof, which it had not discharged.

The molecular weight of the first polymer could be determined as a difference of the mixture and the

known molecular weight of the second polymer.

(c) *Novelty*, Article 54(1) and (2) EPC

The appellant argued that the skilled person would, when referring to an amine/epihalohydrin polyamine, only consider dimethylamine/epichlorohydrin polyamine. Therefore, D1 anticipated the novelty of the subject-matter of claim 1.

The respondent argued that this view could not be consolidated with the gold standard of disclosure applied in the case law.

(d) *Inventive step*, Article 56 EPC

The appellant argued that the subject-matter of claim 1 lacked an inventive step starting from D2 in view of D1, D3 or D4.

The respondent argued that none of the cited documents disclosed the claimed second copolymer such that even when combining the cited documents, the subject-matter of claim 1 could not be achieved. Moreover, D2 discouraged the skilled person to apply the teaching disclosed in D3.

VI. The appellant requested that the decision under appeal be set aside and that the patent be revoked.

VII. The respondent requested that the appeal be dismissed.

Reasons for the Decision

1. Admission and consideration of the objection under Article 123(2) EPC, first raised in the statement of grounds of appeal
 - 1.1 In view of Article 12(6) RPBA 2020, the board must not admit objections which should have been submitted in the proceedings leading to the decision under appeal.
 - 1.2 The current main request was initially submitted together with the reply to the notice of opposition. The opposition division then issued a summons for oral proceedings. The annex to the summons contained a reasoning, according to which the opposition division did not see a violation of Article 123(2) EPC. In a subsequent submission, the appellant challenged the main request only under Articles 83, 54 and 56 EPC. The submission did not contain any objections under Article 123(2) EPC. In the oral proceedings, no objection was raised under Article 123(2) EPC against the amendments. Instead, the appellant only referred to the notice of opposition (see paragraph 2.1 of the minutes).

The objection raised in the notice of opposition, however, related to a different aspect.
 - 1.3 The board sees no reason why the objection raised in appeal proceedings was not raised earlier. No circumstances of the appeal case which justify the admittance are apparent, and none were invoked by the appellant.
 - 1.4 The new objections are thus not to be admitted, and cannot be considered in the appeal proceedings.

2. Added subject-matter, Article 123(2) EPC

Page 12, second paragraph describing the ratio of the second to the first polymer belongs to the part of the description where the invention is described in general terms. There is no link to any example which could amount to an extraction from a specific context.

The added feature ensures that the gel obtained by polymerisation does not undergo coalescence after size reduction, thus easing the drying process. Whether drying is also possible if the ratios are outside the claimed range, as argued by the appellant, is not decisive.

The mere fact that this feature was combined with the features contained in the subject-matter of original claims 2, 3 and 7 does not violate the requirements of Article 123(2) EPC, either. Indeed, these claims relate to different aspects of the invention (the type of the second cationic polymer, its molecular weight and the amount of insolubles) but are nevertheless linked in view of their mutual (formal) dependencies.

Combining these linked aspects with the general teaching of the patent does not go beyond the original disclosure.

Thus, the subject-matter of claim 1 does not relate to undisclosed technical information.

The requirements of Article 123(2) EPC are fulfilled.

3. Sufficiency of disclosure, Article 83 EPC

There is no indication that uncertainties on the measurement method for determining the amount of insolubles would stop the skilled person from carrying out the invention as described in the patent.

Although the method for measuring the insoluble content is not defined in claim 1, it is described in paragraphs [0016] and [0017] of the patent in suit. According to these paragraphs, the amount of insolubles may be determined by dissolving 1 g of the polymer in 999 g of water, filtering the solution through a sieve and measuring the volume of the retained insolubles. The mesh size of the sieve disclosed in paragraph [0017] is obviously erroneous. It is open to speculation what size was meant.

The skilled person would select a sieve with a mesh size which retains substantially all insolubles. They know that when using too coarse sieves, the measured amount of insolubles will be incorrect.

Whether an application can tolerate a certain particle size of insolubles does not change the fact that also particles of up to that size are to be considered insoluble. It would thus be against the language of claim 1 that the skilled person measure the amount of insolubles in view of a certain application and achieve different results for different applications.

The product obtained in the test report submitted by the appellant (D6) contains all features claimed in the subject-matter of claim 1 with the exception of the content of insolubles, which is a result to be achieved. However, one of the examples (sample 1b) achieves an amount of insolubles of 5.5 ml/l, which is very close to the claimed limit of 5 ml/l. But the process applied in D6 does not exactly follow the manufacturing steps of the example described in paragraph [0059] of the patent in suit. Indeed, the addition of a chelator and the pH adjustment is not

mentioned in D6.

It is true that the type of chelator is not described in the patent in suit. Nevertheless, the experiments neglect the presence of a chelator in the example according to the patent in suit.

Whether these differences in the manufacturing process is decisive for achieving the claimed result is open to speculation.

Since in opposition proceedings the burden of proof lies with the opponent, D6 cannot provide evidence to deny sufficiency of disclosure.

On the determination of the molecular weight of the first polymer, evidence showing that it cannot be derived from the difference of the molecular weight of the mixture and the known molecular weight of the second polymer was not provided.

The requirements of Article 83 are therefore fulfilled.

4. Novelty, Article 54(1) and (2) EPC

The appellant argues that D1 anticipated the novelty of the subject-matter of claim 1.

D1 discloses in several long lists a member, which is a water-soluble amine/epihalohydrin polyamine (e.g. column 6, line 46; column 13, lines 18 and 59-60; claim 1), by which according to column 9, lines 51-52, the halides are selected from chloride, bromide and iodide.

D1 does not disclose poly-(dimethylamine-co-epichlorohydrin) or poly-(dimethylamine-co-epichlorohydrin-co-ethylenediamine).

Even if it is assumed that a dimethylamine/epichlorohydrin copolymer is a common type of an amine/epihalohydrin copolymer, as was allegedly proven by D7 (notwithstanding the question of admissibility of this document), there is still no direct and unambiguous disclosure of this copolymer in D1.

The subject-matter of claim 1 thus fulfils the requirements of Article 54(1) and (2) EPC.

5. Inventive step, Article 56 EPC

The patent in suit is directed to a powdery water-soluble cationic polymer composition of two different polymers for solid/liquid separation (patent in suit, paragraph [0001]).

D2, considered by the parties and the board to be the closest prior art, is directed to a powdery water-soluble cationic polymer composition of two different polymers for solid/liquid separation (D2, paragraph [0001]).

According to the respondent, the problem to be solved was to provide a polymer composition exhibiting a lower content of insolubles.

The subject-matter of claim 1 at least differs from D2 in that the second cationic polymer is selected from poly(dimethylamine-co-epichlorohydrin) and poly(dimethylamine-co-epichlorohydrin-co-ethylenediamine), formed by non-radical polymerisation, having a molecular weight of less than 1 million g/mol.

Even if it is assumed, in favour of the appellant, that the technical problem provided by the respondent was not solved and the problem to be solved is the provision of an alternative composition, the objection under Article 56 EPC fails because none of D1, D3 and D4 directly and unambiguously disclose the claimed second cationic polymers.

D1 and D4 do not define the type of amine monomer. D3 discloses in the paragraph bridging pages 4 and 5 and on page 3, lines 55-64 a first polymeric material, which is according to D3, the first, intercalating polymeric material, which has according to D3, page 4, line 28 a molecular weight of above 1 million g/mol.

Therefore, even if it is assumed in favour of the appellant that the teaching of D3 was not discouraged by D2 and that D3 disclosed in the paragraph bridging pages 4 and 5 the combination of the required monomers without performing a multiple choice, it would still fail to disclose the claimed co-polymer.

Thus, even if the skilled person considered a combination of these documents, as argued by the appellant, the subject-matter of claim 1 could not be obtained in an obvious manner.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

A. Voyé

The Chairman:

E. Bendl



Decision electronically authenticated