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Datasheet for the decision of 14 January 2025

Case Number: T 1530/22 - 3.3.02

Application Number: 13786276.9

Publication Number: 2920270

IPC: C09K8/584, C09K8/588

Language of the proceedings: EN

Title of invention:
PROCESS FOR TERTIARY MINERAL OIL PRODUCTION

Patent Proprietor:
BASF SE

Opponents:
SNF SA
Kemira Oyj

Headword:
BASF / MINERAL OIL PRODUCTION

Relevant legal provisions:
EPC Art. 83, 111(1)
RPBA 2020 Art. 11

Keyword:
Sufficiency of disclosure - (yes)
Remittal - (yes)

Decisions cited:
T 0225/93, T 1255/14, T 1845/14, T 0250/15, T 0189/16, T 0345/16, T 1260/16, T 0409/17, T 1900/17

Catchword:

Europäisches Patentamt
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Boards of Appeal

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Case Number: T 1530/22 - 3.3.02

D E C I S I O N
of Technical Board of Appeal 3.3.02
of 14 January 2025

Appellant: (Patent Proprietor)	BASF SE Carl-Bosch-Strasse 38 67056 Ludwigshafen am Rhein (DE)
Representative:	BASF IP Association BASF SE GBI - Z078 67056 Ludwigshafen (DE)
Respondent: (Opponent 1)	SNF SA Rue Adrienne Bolland ZAC de Milieux 42163 Andrézieux (FR)
Representative:	Hoffmann Eitle Patent- und Rechtsanwälte PartmbB Arabellastraße 30 81925 München (DE)
Respondent: (Opponent 2)	Kemira Oyj Energiakatu 4 00180 Helsinki (FI)
Representative:	Santarelli Tour Trinity 1 bis Esplanade de la Défense 92035 Paris La Défense Cedex (FR)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 14 April 2022 revoking European patent No. 2920270 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman	M. O. Müller
Members:	M. Maremonti
	B. Burm-Herregodts

Summary of Facts and Submissions

I. The appeal by the patent proprietor ("appellant") lies from the opposition division's decision to revoke European patent No. 2 920 270 ("the patent").

II. Two oppositions were filed invoking the grounds under Article 100(a) and (b) EPC. By letter dated 17 July 2020, the appellant filed, *inter alia*, a set of claims of a main request. Claim 1 according to this main request reads as follows:

"*1. A process for mineral oil production, in which an aqueous injection fluid comprising at least a water soluble polyacrylamide-copolymer dissolved in the aqueous fluid is injected through at least one injection borehole into a mineral oil deposit, and crude oil is withdrawn from the deposit through at least one production borehole, wherein the process at least comprises the following steps:*

(1) providing a liquid dispersion polymer composition at least comprising

(A) 20 % to 59.9 % by weight of an organic, hydrophobic liquid having a boiling point > 100°C,

(B) 40 % to 79.9 % by weight of particles of at least one water soluble polyacrylamide-copolymer having an average particle size of 0.4 µm to 5 µm dispersed in the organic liquid, wherein

• the water-soluble polyacrylamide-copolymer comprises 50 to 90 % by weight of acrylamide units and 10 to 50 % by weight of acrylic acid units and/or their respective salts with respect

to the total amount of all monomeric units in the copolymer, and

• has a weight average molecular weight Mw of from 5,000,000 g/mole to 30,000,000 g/mole, and

(C) 0.1 % to 10 % by weight of at least two surfactants (C), wherein the surfactants (C) comprise

• 0.05 to 5 % by weight of at least one surfactant (C1) capable of stabilizing water-in-oil-emulsions, and

• 0.05 to 5 % by weight of at least one surfactant (C2) capable of stabilizing the dispersion,

wherein the water contents of the liquid dispersion polymer composition is [sic] less than 5 % by weight and wherein the proportions of each of the components of the liquid dispersion polymer composition is [sic] *based on the total amount of all components thereof,*

(2) adding at least one activating surfactant (D) to the liquid dispersion polymer composition,

(3) mixing the liquid dispersion polymer composition comprising at least one activating surfactant (D) with an aqueous fluid, thus obtaining an aqueous injection fluid comprising at least one polyacrylamide-copolymer dissolved therein wherein the concentration of the polyacrylamide-copolymer in the injection fluid is from 0.05 % by weight to 0.5 % by weight based on the total amount of all components of the injection fluid, and

(4) injecting the aqueous injection fluid thus obtained into the mineral oil deposit,

and wherein at least the process steps (3) and (4) are carried out on an off-shore production site."

III. The opposition division came to the following conclusion, *inter alia*.

- The subject-matter of claim 1 of the main request was not sufficiently disclosed.

IV. In the statement of grounds of appeal, the appellant contested the opposition division's reasoning and argued that the claimed subject-matter was sufficiently disclosed. It corroborated its arguments by filing the following new item of evidence (labelled as D23 by the appellant; new numbering by the board):

A23: Experimental Report on particle size measurement

V. In their replies to the appeal, opponents 1 and 2 ("respondents 1 and 2") rebutted the appellant's arguments and submitted that the claimed subject-matter was not sufficiently disclosed. Respondent 1 further objected, *inter alia*, to the admittance of A23 as well as some submissions by the appellant (see below). Respondent 1 corroborated its arguments by filing the following new items of evidence (labelled as D24 and D25 by respondent 1; new numbering by the board):

A24: Malvern: Mastersizer 3000, 2^{éme} journée de formation

A25: Bodycomb, J., "*Laser Diffraction Theory*", 2012, Horiba Scientific

VI. The parties were summoned to oral proceedings as per their requests. In preparation for the oral proceedings, the board issued a communication under Article 15(1) RPBA. In this communication, the board expressed the preliminary opinion that the subject-matter of claim 1 of the main request underlying the

appealed decision was sufficiently disclosed and that it intended to remit the case to the opposition division for further prosecution.

VII. Final requests relevant to the decision

The appellant requested that the appealed decision be set aside and that the case be remitted to the opposition division for examination of novelty and inventive step.

Respondents 1 and 2 requested that the appeal be dismissed, implying that the revocation of the patent be confirmed.

Respondent 1 further requested that A23, the appellant's submissions concerning D20 as contained in the statement of grounds of appeal, and the appellant's submission that the claim interpretation adopted by the opposition division is "out of touch with everyday life" not be admitted.

Respondent 2 further requested that, should the board set aside the appealed decision, the case be remitted to the opposition division for further prosecution.

VIII. As regards the parties' submissions that are relevant to the decision, reference is made to them in the reasons for the decision below.

Reasons for the Decision

Main request - sufficiency of disclosure under Article 83 EPC

1. The respondents raised three objections of insufficiency of disclosure in respect of the following features of claim 1 of the main request:

- the water-soluble polyacrylamide-copolymer has a weight average molecular weight Mw of from 5,000,000 g/mole to 30,000,000 g/mole,
- the particles of the water-soluble polyacrylamide-copolymer have an average particle size of 0.4 µm to 5 µm, and
- the liquid dispersion polymer (LDP) composition comprises 0.1 % to 10 % by weight of at least two surfactants (C), wherein the surfactants (C) comprise 0.05 to 5 % by weight of at least one surfactant (C1) capable of stabilizing water-in-oil-emulsions, and 0.05 to 5 % by weight of at least one surfactant (C2) capable of stabilizing the dispersion.

2. First objection

2.1 The respondents argued that it was known to the skilled person that there were many different methods for measuring the molecular weight of a polymer. They named, for example, gel permeation/size exclusion chromatography, mass spectrometry and viscometry. All of these methods measured a different property and therefore led to a different result. The patent did not indicate any method for measuring the molecular weight of the polyacrylamide copolymer required by claim 1 of the main request. The skilled person thus faced an undue burden. In this respect, the respondents referred to decision T 225/93. Moreover, the molecular weight was an essential feature of the LDP composition contributing to solving the technical problem underlying the patent. Therefore, the skilled person was not in a position to find out whether a given LDP composition solved the technical problem set out in the patent.

2.2 At the oral proceedings, respondent 1 further argued that, in view of the high molecular weight required for the copolymer defined in claim 1, the skilled person would have been aware that the only reliable method for measuring the molecular weight was viscometry. This method involved the measurement of the intrinsic viscosity η and the determination of the molecular weight M by using the Mark-Houwink equation:

$$[\eta] = K\ M^{\alpha}$$

Even the measurement of the intrinsic viscosity was affected by several variables, such as the type of viscosimeter used, the temperature, the solvent and the presence and concentration of salts, none of which were mentioned in the patent. Additionally, in view of the above equation, the determination of the molecular weight required that parameters K and α be known, otherwise no molecular weight could be calculated; however, these parameters depended on the type of polymer. While their values were available for some homopolymers, they were not available for the very specific copolymer mentioned in claim 1 of the main request, which, according to paragraphs [0034] to [0044] of the patent, might even contain high amounts of co-monomers other than those mentioned in claim 1 and might be crosslinked.

Since the patent was entirely silent as regards the method used for determining the weight average molecular weight, the skilled person could only start a research program to determine parameters K and α for the claimed copolymer so to be able to assess whether a copolymer according to claim 1 of the main request had been obtained. This constituted an undue burden.

2.3 The board does not find these arguments convincing for the following reasons.

2.3.1 It is acknowledged that the patent does not specify how, i.e. by means of which method, the weight average molecular weight of the water-soluble polyacrylamide copolymer required by claim 1 of the main request has to be determined; however, as argued by the appellant, the molecular weight of a polymer, notably a water-soluble polyacrylamide-copolymer, is not an obscure parameter, but a feature commonly used to characterise any polymer. Claim 1 of the main request additionally specifies that it is the weight average molecular weight that has to lie within the claimed range. As admitted by the respondents, methods for measuring the weight average molecular weight are well known and readily available to the skilled person. Their application does not present any technical difficulty. The board concurs with the appellant's view that possible uncertainties concerning deviations in the measurement results obtained by the various known methods might at most affect the clarity of the claimed subject-matter but do not affect the skilled person's ability to prepare or select a water-soluble polyacrylamide-copolymer as required by claim 1 of the main request on the basis of common general knowledge and the information given, e.g. in paragraphs [0029] to [0046] of the patent (see also T 250/15, points 1.1 to 1.3 of the reasons).

2.3.2 Decision T 225/93, invoked by the respondents, is part of old case law that has been superseded by case law developed over the years confirming that uncertainties as regards the method for measuring well-known parameters can at most affect the clarity of the claim but do not result in any insufficiency of disclosure (Case Law of the Boards of Appeal, 10th edition, 2022, II.C.8.2.2).

2.3.3 The respondents' argument that the molecular weight of the LDP composition was essential for solving the technical problem underlying the patent is not convincing either. Claim 1 of the main request does not require any technical effect to be achieved or any technical problem to be solved by the LDP composition defined in said claim. Whether or not the LDP composition defined in claim 1 of the main request is able to solve any technical problem is thus a matter of inventive step and does not have any bearing on the issue of sufficiency of disclosure (see T 1845/14, point 9.8 of the reasons, followed, *inter alia*, by T 189/16, T 1260/16, T 409/17 and T 1900/17).

2.3.4 Even when accepting the argument by respondent 1 made at the oral proceedings that viscometry was the only reliable method in view of the molecular weight values required by claim 1 of the main request, this does not lead to any insufficiency of disclosure. In fact, as accepted by the appellant, variations in e.g. the viscosimeter and operating conditions used for measuring the intrinsic viscosity and the variability of the values for the parameters K and α to be used in the above-mentioned Mark-Houwink equation can certainly lead to deviations in the obtained results in terms of the calculated molecular weight; however, as discussed during the oral proceedings, in the absence of any proof to the contrary, these deviations do not prevent the skilled person from preparing or selecting a copolymer fulfilling the weight average molecular weight requirement defined in claim 1 of the main request so that the claimed process is carried out.

2.3.5 Therefore, not specifying the method to be used for determining the weight average molecular weight of the water-soluble polyacrylamide copolymer required by

claim 1 of the main request does not result in any insufficiency of disclosure.

3. Second objection

3.1 By analogy with the above-mentioned first objection and in line with the appealed decision (point 3.2.2), the respondents argued that the patent did not disclose how to measure the average particle size of the water soluble polyacrylamide-copolymer particles required in claim 1 of the main request to lie within a very narrow range. While the appellant had indicated laser diffraction as a suitable measurement method, this was not the only possible method. Even if it were accepted that the skilled person would have used laser diffraction, different results were obtained depending on the instrument used and the operating conditions. It was acknowledged that pages 652 and 653 of D20 indicated that laser diffraction was a method of choice for measuring the particle size mentioned in claim 1 of the main request; however, when using this method, the number average was obtained indirectly by measuring the volume average. Page 653 of D20 confirmed that this conversion required a complex mathematical model to be solved, leading to different results depending e.g. on the instrument being used. Therefore, the skilled person did not know whether the claimed invention had been arrived at.

3.2 The respondents further argued that this deficiency in the patent was not a matter of clarity since the information gap in the patent was so severe that the measures required for solving the technical problem could not be identified without undue burden. The issue at stake was not merely a question of uncertainty at the boundaries of the claim, but it affected the core of the invention.

3.3 These arguments are not convincing either.

3.3.1 As already observed above as regards the respondents' first objection, claim 1 of the main request does not require any technical effect to be achieved or any technical problem to be solved by the LDP composition defined in said claim. Therefore, any consideration in this respect does not play any role in the issue of sufficiency of disclosure.

3.3.2 Claim 1 of the main request requires the particles of the water-soluble polyacrylamide-copolymer to have an average particle size of 0.4 µm to 5 µm. This range spans more than one order of magnitude. Therefore, the board cannot agree with the respondents' view that the range is very narrow, whatever this should mean. If the skilled person were in doubt as to which average is meant by claim 1 of the main request, paragraph [0032] of the patent (page 7, lines 11 to 14 of the application as filed) discloses that "*the d50 value of the particle size distribution (number average)*" is meant. The same passage of the patent (and the application as filed) further discloses that this average particle size "*may be measured by the skilled artisan using known techniques for determining the particle size distribution.*" In the same way as the weight average molecular weight, the d50 value (number average) of a particle size distribution is not an obscure parameter, but a well-known value used to characterise a particle size distribution. As admitted by the respondents, different methods are available to the skilled person for measuring d50. As long as these measurement methods are readily available to the skilled person and their application does not pose any technical difficulty, the skilled person is free to select any of them when carrying out the claimed invention. The fact that different results might be

obtained depending on the selected method and operating conditions could indeed lead to ambiguity in terms of the precise delimitation of the ambit of claim 1; however, the board agrees with the appellant's view that this potential ambiguity concerns only the clarity of the claim under Article 84 EPC, but does not lead to any insufficiency of disclosure. In fact, as discussed during oral proceedings, in the absence of any proof to the contrary, the potential uncertainty as regards the average particle size of the water-soluble polyacrylamide-copolymer particles would not have prevented the skilled person from conducting the process steps required by claim 1 of the main request. In other words, an undue burden would not be placed on the skilled person trying to carry out the claimed process as a whole (see also T 1255/14, point 1 of the reasons, T 345/16, points 2.4.1 to 2.4.3 of the reasons).

4. Third objection

4.1 Claim 1 of the main request requires the LDP composition to comprise 0.1 % to 10 % by weight of at least two surfactants (C), wherein the surfactants (C) comprise

- 0.05 to 5 % by weight of at least one surfactant (C1) capable of stabilizing water-in-oil-emulsions, and
- 0.05 to 5 % by weight of at least one surfactant (C2) capable of stabilizing the dispersion.

Claim 1 further requires that the proportions of each of the components of the LDP composition are based on the total amount of all the components of said composition.

4.2 In line with the appealed decision (point 3.2.3), the respondents put forward that the only sensible interpretation of claim 1 of the main request (point II above) led to the conclusion that the proportions of surfactants (C1) and (C2) were based on the total amount of surfactants (C) and did not refer to the entire LDP composition. This interpretation was evident in view of the open language expressed by the term "*comprise*" when referring to the surfactants (C). Since the content of the specific surfactants C1 + C2 amounted to at most 10% of surfactants (C), at least 90% of the surfactants (C) was undefined.

4.3 The respondents further argued that the same applied even when following the appellant's interpretation of claim 1, i.e. by assuming that the proportions of C1 and C2 were based on the entire LDP composition. In this case too, claim 1 encompassed compositions with 10% of the surfactants (C) comprising 0.05% of C1 and 0.05% C2. Therefore, in this case too, 90% of the surfactants (C) remained undetermined.

4.4 The patent did not contain any teaching guiding the skilled person in the selection of other surfactants besides (C1) and (C2). While admitting that surfactants were generally known to the skilled person, the respondents argued that surfactants had largely different and sometimes opposite functions (e.g. foaming or anti-foaming). The skilled person was at a loss as to how to select surfactants which would be compatible with surfactants C1 and C2 such that the properties of the LDP composition were not impacted. The lack of guidance in the patent amounted to an undue burden for the skilled person affecting their ability to perform the claimed invention.

4.5 The board disagrees.

4.5.1 Even when accepting the respondents' argument that the sum of (C1) + (C2) as defined in claim 1 of the main request amounts to a maximum of 10% of component (C), thus leaving 90% of component (C) unspecified, claim 1 still specifies this 90% as being surfactants.

4.5.2 As admitted by the respondents, surfactants are well known to the skilled person. Therefore, the skilled person is free to select any available surfactant to obtain the remaining 90% of component (C) of the LDP composition. The respondents' argument that, depending on the surfactant selection, the properties of the LDP composition could be affected to such an extent that the skilled person would have been prevented from performing the claimed process is, as discussed during the oral proceedings, not based on any evidence and thus amounts to mere speculation.

4.5.3 Therefore, the process in claim 1 of the main request is sufficiently disclosed in terms of component (C).

5. For these reasons, none of the respondents' three objections is convincing. Therefore, the board concludes that the subject-matter of the claims of the main request is sufficiently disclosed, thus meeting the requirements of Article 83 EPC.

6. In reaching this conclusion, the board did not take into account any of A23, the appellant's submissions concerning D20 as contained in the statement of grounds of appeal, and the appellant's submission that the claim interpretation adopted by the opposition division is "out of touch with everyday life", the admittance of which had been contested by respondent 1. Therefore, a decision by the board on the admittance of A23 and the appellant's above-mentioned submissions was not needed.

7. Documents A24 and A25 were filed by respondent 1 in response to A23. Since A23 was not taken into account, A24 and A25 were not taken into account by the board either. In fact, the respondents did not rely on these documents at the oral proceedings. Therefore, a decision by the board on the admittance of A24 and A25 was not needed either.

Request to remit the case to the opposition division - Article 111(1) EPC, Article 11 RPBA

8. Both the appellant and respondent 2 requested that the case be remitted to the opposition division for further prosecution should the board decide to set aside the decision under appeal. At the oral proceedings, after having heard the board's conclusion on sufficiency of disclosure, respondent 1 stated that remittal to the opposition division was a reasonable decision.

8.1 Pursuant to Article 111(1) EPC, in the event that the appeal is found to be allowable, the board has discretion over whether or not to exercise the powers within the competence of the opposition division or to remit the case to that division for further prosecution. In accordance with Article 11 RPBA, the board will not remit a case unless special reasons present themselves for doing so.

8.2 In this respect, the board notes that, apart from briefly addressing Article 123(2) EPC, the appealed decision deals only with the issue of sufficiency of disclosure; however, the oppositions had been filed by also invoking lack of novelty and lack of inventive step (Article 100(a) EPC).

8.3 Therefore, essential questions regarding the patentability of the claimed subject-matter have not

yet been examined and decided on by the opposition division.

8.4 Under Article 12(2) RPBA, the primary object of the appeal proceedings is to review the decision under appeal in a judicial manner so as to give the losing party an opportunity to challenge the decision on its merits. Therefore, not remitting the case and examining novelty and inventive step for the first time on appeal would go against this primary object. Moreover, both the appellant and respondent 2 requested remittal to the opposition division for an assessment of novelty and inventive step, and respondent 1 did not oppose remittal.

8.5 Hence, the board decided to remit the case to the opposition division for further prosecution, in accordance with the requests by the appellant and respondent 2 to this effect.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the opposition division for further prosecution.

The Registrar: The Chairman:

U. Bultmann M. O. Müller

Decision electronically authenticated