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Datasheet for the decision of 25 April 2022

Case Number: T 2423/19 - 3.3.05

Application Number: 05723641.6

Publication Number: 1720802

IPC: C02F1/78, C02F1/72, B09C1/00, C02F11/06

Language of the proceedings: EN

Title of invention:
OXIDATION OF ORGANIC COMPOUNDS AT HIGH PH

Patent Proprietor:
PeroxyChem LLC

Opponent:
United Initiators GmbH

Headword:
OXIDATION OF ORGANIC COMPOUNDS/PeroxyChem

Relevant legal provisions:
RPBA 2020 Art. 13(2)
EPC Art. 87(1), 54, 56

Keyword:
Amendment after summons - exceptional circumstances (no)
Priority - basis in priority document (no)
Novelty - (yes)
Inventive step - (no)

Decisions cited:
G 0002/98, T 2061/16

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

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Case Number: T 2423/19 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 25 April 2022

Appellant: (Patent Proprietor)	PeroxyChem LLC 1735 Market Street, 16th Floor Philadelphia, PA 19103 (US)
Representative:	Murgitroyd & Company Murgitroyd House 165-169 Scotland Street Glasgow G5 8PL (GB)
Respondent: (Opponent)	United Initiators GmbH Dr.-Gustav-Adolf-Str. 3 82049 Pullach (DE)
Representative:	Dey, Michael Weickmann & Weickmann Patent- und Rechtsanwälte PartmbB Richard-Strauss-Strasse 80 81679 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 6 August 2019 revoking European patent No. 1720802 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

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

Summary of Facts and Submissions

I. The appeal lies from the decision of the opposition division to revoke the patent.

II. The opposition division concluded, *inter alia*, that the subject-matter of the then main request was not inventive when taking the following document as the closest prior art:

D5 P.A. Block et al., "Novel Activation Technologies for Sodium Persulfate *In Situ* Chemical Oxidation", Proceedings of the Fourth International Conference on the Remediation of Chlorinated and Recalcitrant Compounds, Monterey, CA, May 24-27, 2004

III. The patent proprietor (appellant) filed an appeal against this decision and submitted a main request and four auxiliary requests.

IV. The main request, filed on 4 March 2022 as request *"1ARa"*, consists of a single claim which reads:

"A method for oxidising an organic compound comprising contacting the organic compound with a composition being either:
sodium persulfate and sodium hydroxide pH modifier, or sodium persulfate and potassium hydroxide pH modifier, wherein the pH modifier maintains a pH of at least 10 in the environment being treated, and wherein the organic compound is present in soil."

V. Claim 1 of auxiliary request 1, filed during the opposition proceedings on 19 March 2019 as request *"1AR"*, reads:

"A method for oxidising an organic compound comprising contacting the organic compound with a composition being either: sodium persulfate and sodium hydroxide pH modifier, or sodium persulfate and potassium hydroxide pH modifier, wherein the pH modifier is capable of maintaining a pH of at least 10 in the environment being treated, and wherein the organic compound is present in soil."

VI. Claim 1 of auxiliary request 2, filed during the opposition proceedings on 19 March 2019 as request *"3AR"*, reads:
"A method for oxidising an organic compound comprising contacting the organic compound with a composition being either: sodium persulfate and sodium hydroxide pH modifier, or sodium persulfate and potassium hydroxide pH modifier, wherein the pH modifier is capable of maintaining a pH of at least 10 in the environment being treated, and wherein the organic compound is present in soil; and
wherein the composition is introduced into soil in sufficient quantities and under conditions to oxidize substantially all the volatile organic compounds in the soil; and
wherein the composition is introduced into the soil in situ."

VII. Auxiliary request 3, filed on 4 March 2022 as request *"3ARa"*, consists of a single claim which is identical to claim 1 of auxiliary request 2, with the exception that the feature *"is capable of maintaining"* was replaced by the feature *"maintains"*.

VIII. Auxiliary request 4, filed with the statement of grounds of appeal as *"5AR"*, reads:

"A method for oxidising an organic compound comprising contacting the organic compound with a composition being either:
sodium persulfate and sodium hydroxide pH modifier, or sodium persulfate and potassium hydroxide pH modifier, wherein the pH modifier is capable of maintaining a pH of at least 10 in the environment being treated, wherein the organic compound is present in soil; and without a metal or chelated metal complex catalyst."

IX. The parties' arguments can be summarised as follows.

(a) Admission and consideration of the main request and auxiliary request 3

The appellant argued that the new requests simplified the appeal proceedings. In its view, the board's communication had raised two new issues, which were that the priority document, US 547853 P, described multiple concepts for the activation of the peroxygen compound and the lack of derivation of the subject-matter of claim 1 of the main request from the priority document.

T 2061/16, on a first, earlier appeal on the patent in suit regarding compliance with Article 123(2) EPC, had acknowledged in paragraph 2.1 that the patent under appeal related to alkaline activation. This could be derived from the fact that a metal cation was not mentioned in the claim at issue. The board's preliminary opinion in the communication, according to which the priority document disclosed three activation concepts, was thus unexpected since it was contrary to the *ratio decidendi* (Article 111(2) EPC) of T 2061/16.

Moreover, if there was a double meaning with respect to the feature *"is capable of maintaining"*, the appellant should be allowed to clarify that the intention was to express that the passage should read *"maintains"* by means of a new request. This misinterpretation had already been made by the opposition division.

The respondent countered that the amendment added a feature not discussed in the opposition proceedings that originated from the description. Furthermore, no cogent reasons for the late filing were invoked.

As far back as the notice of opposition, on pages 4 and 5, the validity of the priority claim had been objected to. The difference between *"maintaining"* and *"capable of maintaining"* was the subject of long discussions in the opposition proceedings and could not come as a surprise. The amendment should have been filed in opposition proceedings.

Since the wording of the current main request and auxiliary request 3 had changed with respect to the wording of the main request underlying decision T 2061/16, the conclusions of this decision could not be applied to the new wording.

(b) Admission and consideration of auxiliary request 4

The appellant argued that the amendment *"without a metal or chelated metal complex catalyst"* implicitly contained the verb *"added"* as apparent on original page 6, line 20. The purpose of the amendment was to render it clear that no catalyst was contained in the composition and that the

invention related to alkaline activation only.

The respondent argued that the added features were not discussed in the proceedings leading to the decision under appeal. Moreover they introduced, *inter alia*, a lack of clarity. It was not clear whether the catalyst was not added or not present in the process. It could thus not be assumed that the missing verb was *"added"*.

(c) Same invention within the meaning of Article 87(1) EPC

The appellant argued that in view of G 2/98, the priority document as a whole had to be considered. G 2/98 did not state that the priority should be denied in cases where parts of the same inventive concept under consideration in a later patent application are located in different parts of the priority document.
It referred to page 4, lines 24-27 of the priority document, where it was acknowledged that a pH-value of (exactly) 10 was not mentioned. A pH of at least 10 was, however, disclosed on page 7, lines 18-21 in combination with the use of persulphate when treating soil.
The appellant also referred to page 5, lines 3-10 of the priority document, according to which, in a preferred embodiment, the composition comprised potassium or sodium hydroxide and a peroxygen compound.
It further disclosed that sodium persulphate was the preferred peroxygen compound (page 6, lines 1-2 and 25).

The respondent argued that the subject-matter of

claim 1 could only be derived from the priority document when carrying out multiple selections. The passages T 2061/16 relied on for confirming compliance with Article 123(2) EPC did not have a corresponding passage in the priority document.

(d) Novelty and inventive step, Article 54(1) and (2) EPC and Article 56 EPC

The appellant argued that *"capable of maintaining"* and *"maintains"* were the same.
The problem was to maintain the pH in soil *in situ*. D5 section D did not mention sodium persulfate and was silent on the new chemistry. It did not mention treating soil *in situ*. A proper site evaluation was necessary to carry out the process, which was also not mentioned in D5. D5 did not show a single way to implement the process.

The respondent argued that the entire D5 related only to sodium persulfate, as was apparent from the title. The treatment of soil was mentioned in the last paragraph prior to the summary of section D. The *in situ* treatment of soil according to the claimed invention was thus obvious.

X. Requests

The appellant requests that the decision under appeal be set aside and that the patent be maintained on the basis of one of the following requests:
Main Request, which is auxiliary request 1ARa filed on 4 March 2022
Auxiliary request 1, which is auxiliary request 1AR filed on 19 March 2019
Auxiliary request 2, which is auxiliary request 3AR

filed on 19 March 2019
Auxiliary request 3, which is auxiliary request 3ARa filed on 4 March 2022
Auxiliary request 4, which is auxiliary request 5AR, submitted with the grounds of appeal

The respondent requests that the appeal be dismissed.

Reasons for the Decision

1. Admission and consideration of the main request and auxiliary request 3

1.1 These requests were filed after notification of the summons to oral proceedings. Therefore, Article 13(2) RPBA 2020 applies. The main request and auxiliary request 3 are therefore not to be taken into account unless there are exceptional circumstances which the appellant justifies by cogent reasons.

1.2 In line with the explanatory notes relating to Article 13(2) RPBA 2020 (see Supplementary publication 2 - Official Journal EPO 2020), if the board raises an objection in a communication, which in the party's view is raised for the first time, it is up to the (here) appellant to explain precisely why they consider this objection to be newly raised and why it does not fall under objections previously raised by the respondent.

1.3 The objection that the priority claim was invalid had been raised by the respondent in the notice of opposition and its submission of 19 March 2019. The respondent maintained this objection in the reply to the appeal.

1.4 The references cited by the parties in their submissions belong to different embodiments. While priority document US 60/547,853 distinguishes between an alkaline, a catalytic and a thermal activation strategy, the features belonging to the respective activation strategies are not grouped together.

Identifying different embodiments in a disclosure and assessing whether features belonging to different embodiments can be combined does not raise a new objection but merely verifies the validity of facts and evidence provided by the parties for an existing objection.
Therefore, for this reason alone, the new claims could not be admitted.

1.5 Even if it were assumed that the filing of new claims in reply to the analysis was justified, the appellant failed to explain precisely what was new and what did not fall under objections previously raised by the respondent.

1.6 The appellant's submission of 4 March 2022 accompanying the filing of the main request and auxiliary request 3 merely states in general in paragraph 7.13 that the lack of derivation of the subject-matter of the main request was not previously raised by the respondent and was submitted only in appeal proceedings.

As apparent from paragraph 1.3 above, the respondent had raised objections relating to Article 87(1) EPC in the opposition proceedings and maintained them in the appeal. It is neither obvious nor explained by the appellant why the allegedly new objection did not fall under the objection previously raised by the

respondent.

1.7 The appellant furthermore argued that the board was bound by the *ratio decidendi* of T 2061/16 and that the board's preliminary opinion in the communication, according to which the priority document disclosed three activation concepts, was thus unexpected.

1.8 However, the facts in the current case and T 2061/16 are not the same.

Replacing the feature *"[the pH modifier] is capable of maintaining [a pH of at least 10]"* with *"[the pH modifier] maintains [a pH of at least 10]"* is not a clarification but a substantial change of the claimed subject-matter since the former feature merely characterises the pH modifier used in the method, while the latter also restricts the method itself.

Moreover, T 2061/16 relates to Article 123(2) EPC only. The reasons for this decision rely on, *inter alia,* page 5, lines 6-8 of the original disclosure, for which there is no corresponding disclosure in the priority document, and on page 6, line 6 of the original disclosure, which contains the adverb *"about"*, (*"the pH greater than about 10"*), which is also not present in the priority document. Thus, the board's communication could not be surprising to the appellant and did not justify the filing of new requests.

1.9 The main request and auxiliary request 3 could thus not be admitted into the proceedings, in accordance with the requirements of Article 13(2) RPBA 2020.

2. Admission and consideration of auxiliary request 4

2.1 The subject-matter of method claim 1 contains a disclaimer, which reads "*and without a metal or chelated metal complex catalyst*".

2.2 In method claim 1, the disclaimer is a method step without a verb. The appellant argues that the verb "added" was implicitly contained in the amendment and apparent on original page 6, line 20.

2.3 The disclaimer does not imply a verb. It is *prima facie* open to speculation as to its meaning and which activity is actually disclaimed, i.e. whether the disclaimed compound has to be absent in one of the steps described or in the treated soil.

2.4 Since the amendments in auxiliary request 4 *prima facie* give rise to new objections, they could also not be considered in the proceedings, in accordance with the requirements of Article 13(1) RPBA 2020.

3. Auxiliary Request 1, same invention within the meaning of Article 87(1) EPC

In accordance with G 2/98 (headnote), priority of a previous application is to be acknowledged only if the skilled person can derive the subject-matter of the claim directly and unambiguously, using common general knowledge, from the previous application as a whole.

3.1 The subject-matter of claim 1 of auxiliary request 1 requires that the pH modifier be merely capable of maintaining a pH of at least 10 in the environment being treated. This feature does not require that, when

carrying out the method, the pH be kept at a level of at least 10.

The feature *"the pH modifier is capable of maintaining a pH of at least 10"* does not express the same as *"the pH modifier maintains a pH of at least 10"* since the former characterises the pH modifier, while the latter also restricts the method step.

Concerning this feature, the wording of claim 1 is clear, and its significance is decisive for the claim construction. Specifically, the description cannot be used to change the meaning of the clear feature *"capable of maintaining"* to *"maintains"*.

3.2 The priority document discloses several concepts for the activation of the peroxygen compound.

3.2.1 The first concept is alkaline activation by maintaining the pH at a high level throughout the process. This embodiment corresponds to page 7, lines 18-21; page 5, lines 3-10 and claim 1 of the priority document, which requires that enough pH modifier be present to maintain a pH of at least 10 (or 9 according to the passage on page 5). According to the appellant, the high pH activated the peroxygen compound.

3.2.2 The second concept is to ensure the presence of metal cations which act as a catalyst to activate the peroxygen compound in the peroxygen and hydroxide composition. This is disclosed, *inter alia*, on page 5, lines 12-20 and claim 16 of the priority document. Although it requires a strong base which must be capable of maintaining a high pH, the level of pH in the process is not described as being as important as for the alkaline activation because the metal cations

act as the activator; not the pH level.
Page 4, lines 24-27, which the appellant refers to, describes a composition merely capable of maintaining a pH of greater than 10 in its intended environment. A catalyst is not mentioned in that passage. It nevertheless belongs to the second activation concept since it is not required that the pH be maintained at a high level. According to page 5, line 13 of the priority document, the metal cations may originate from the contaminated soil or may otherwise be added.

3.2.3 Yet another concept is to provide heat for the activation of persulfate (page 5, lines 22-26).

3.3 The appellant argues that the patent in suit related to alkaline activation. However, the subject-matter of claim 1 of auxiliary request 1 merely requires the presence of a pH modifier capable of maintaining a pH of at least 10, thus it related to catalytic activation. Indeed, the process according to the subject-matter of claim 1 could be carried out at a pH level significantly below 10.
The intention to cover alkaline activation is thus not undoubtedly derivable from the wording of claim 1. Furthermore, claim 1 of auxiliary request 1 uses the wording "capable of maintaining a pH", just like claim 16 of the priority document, which relates to catalytic activation.

3.4 The subject-matter of claim 1 of auxiliary request 1 basically adopts the wording of page 4, lines 24-27 of the priority document, but with selections of the peroxygen compound, the pH modifier and the environment.

3.5 The question is whether these selections are directly and unambiguously derivable from the priority document.

3.5.1 Page 6, lines 1-2, which the appellant refers to, disclose that a preferred form of the invention is to add sodium persulfate, but not necessarily as an admixture with a pH modifier, into the soil.

Contrary to what the appellant argues is protected, the subject-matter of claim 1 is not restricted to a method where the composition is contacted with the contaminated soil. It also encompasses methods which involve an additional step of extracting the organic compound from soil prior to the contacting with the composition. Nor does it require that soil be the environment being treated.

Therefore, the subject-matter of claim 1 of the main request is more general than what would be justified by page 6, lines 1-2, such that this passage cannot provide the required basis.

3.5.2 The passage on page 5, line 3 discloses potassium and sodium hydroxide as the preferred pH-modifier for alkaline activation. It specifies the amount of peroxygen and pH modifier required when directly contacting the chemicals with soil. There is no indication that this disclosure could be combined with the claimed catalytic activation.

Moreover, concerning the direct contact with soil, the subject-matter of claim 1 of the main request is more general than what would be justified by this passage, such that it cannot provide the required basis.

3.5.3 Page 6, line 17 to page 7, line 2 of the priority document disclose several alternative peroxygen compounds. The appellant emphasises that according to page 6, line 25, sodium persulfate was preferred.

However, page 6, line 25 of the priority document discloses that the most preferred dipersulfate is sodium persulfate. Page 4, lines 24-27 merely requires a peroxygen compound. Page 6, lines 21-22 lists three alternative peroxygen compounds, among them, dipersulfates. Therefore, the skilled person would have to first select dipersulfate from the peroxygen compounds and then select the most preferred dipersulfate, thus already involving two selections.

3.5.4 Page 7, lines 3-5 of the priority document discloses sodium and potassium hydroxide among several alternative pH modifiers.

3.5.5 Page 9, lines 21-23 of the priority document discloses soil among several alternative contaminated materials.

3.5.6 Therefore, already multiple selections have to be made to arrive at most of the features contained in the subject-matter of claim 1.

3.5.7 Moreover, the entire pH range, i.e. including the value of 10, is not disclosed in any passage relating to catalytic activation, as is apparent from the analysis above.
Page 7, lines 18-21 of the priority document requires that enough pH modifier be present to maintain a pH of at least 10, thus relating to the alkaline activation strategy. A combination with the catalytic activation strategy is not suggested.

3.6 The subject-matter of claim 1 of the main request cannot therefore be derived from the priority document directly and unambiguously using common general knowledge since it not only involves multiple selections but also the extension to a specific pH value not disclosed in the context of alkaline activation.

3.7 The effective date for auxiliary request 1 is hence the filing date of the current application.

4. Auxiliary request 2, right of priority, Article 87(1) EPC

With respect to auxiliary request 1, auxiliary request 2 contains additional features which also cannot restore the right to priority because the subject-matter of claim 1 can only be achieved by carrying out at least the same multiple selections and the same extension to a specific pH value as for auxiliary request 1.

5. Auxiliary request 1, novelty, Article 54 EPC

As the priority claim is not valid, D5 becomes the prior art. Although D5 relates to activation technologies for sodium persulfate activation, chapter D, mentioning, *inter alia*, the application in soil, only refers to alkaline persulfate. Thus, there is no direct and unambiguous disclosure of the application of the claimed compositions in soil.

6. Auxiliary request 2, novelty, Article 54 EPC

Identical considerations apply to auxiliary request 2.

7. Auxiliary request 2, inventive step, Article 56 EPC

The patent is directed to the chemical oxidation of organic compounds.

7.1 D5 was referred to by the respondent as a suitable starting point for an inventive-step objection. It discloses methods for the chemical oxidation of organic compounds in soil.

7.2 The problem the appellant indicates is to maintain the pH in soil *in situ*.

7.3 The appellant argues that *"capable of maintaining"* meant the same as *"maintains"*. The subject-matter of claim 1 related to alkaline activation. D5 did not say anything about the new chemistry with new chemical mechanisms. For an *in situ* application, a proper site evaluation was necessary. D5 did not disclose a single way to implement an *in situ* process.

7.4 This is not persuasive. The subject-matter of claim 1 does not require that a pH of at least 10 be maintained during the whole treatment. It merely requires the use of a pH modifier which could maintain the pH at a level of at least 10. It is not possible to reframe the significance of clear technical features to a different significance just because doing so is more convenient for establishing an inventive step.

Moreover, in view of D5, lines 3-5 and the third

conclusion (last paragraph) of section D, it appears that a high (initial) pH alone does not provide the purported effect.

The purported problem is hence not solved by the claimed features and must be reformulated to a less ambitious problem, which is to provide an alternative chemical oxidation process.

7.5 According to the title and the abstract of D5, the whole article relates to novel activation technologies for sodium persulfate for *in situ* chemical oxidation of organic compounds. D5 discloses in the paragraph prior to the summary that the amount of base needs to take into account any acidity in the soil. Thus, the treatment of soil is disclosed in D5. In view of D5, section D, first and last paragraphs, Tables 6 and 7, and the last paragraph before the summary, together with the title and abstract of D5, the subject-matter of claim 1 is obvious for the skilled person as they would, when providing an alternative, immediately consider substantially chemically oxidising all the volatile organic compounds in the soil by contacting the soil *in situ* with a solution of sodium persulphate in potassium hydroxide at a pH in excess of 10.

8. Auxiliary request 1, inventive step, Article 56 EPC

Since auxiliary request 1 comprises only part of the features of auxiliary request 2, the subject-matter of claim 1 of auxiliary request 1 lacks an inventive step for the same reasons as auxiliary request 2.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

C. Vodz E. Bendl

Decision electronically authenticated