BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Internal distribution code:
(A) [ ] Publication in OJ
(B) [ ] To Chairmen and Members
(C) [X] To Chairmen
(D) [ ] No distribution

Datasheet for the decision of 19 January 2010

Case Number: T 1329/06 - 3.3.10

Application Number: 99955517.0

Publication Number: 1093541

IPC: E21B 37/00

Language of the proceedings: EN

Title of invention:
Method for preventing deposits in oil extraction

Patentee:
Coöperatie Cosun U.A.

Opponent:
Tiense Suikerraffinaderij n.v.

Headword:
Scale inhibition in oil extraction/COÖPERATIE COSUN

Relevant legal provisions:
EPC Art. 56, 123(2)

Relevant legal provisions (EPC 1973):
-

Keyword:
"Inventive step (yes) - non-obvious alternative"

Decisions cited:
-

Catchword:
-

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1329/06 - 3.3.10

D E C I S I O N
of the Technical Board of Appeal 3.3.10
of 19 January 2010

Appellant: (Opponent)
Tiense Suikerraffinaderij n.v.
Tervurenlaan 182
B-1150 Brussel (BE)

Representative:
Koster, Nico
Tiense Suikerraffinaderij N.V.
Patent Department
Aandorenstraat 1
B-3300 Tienen (BE)

Respondent: (Patent Proprietor)
Coöperatie Cosun U.A.
Oosthavendijk 15
P.O. Box 1308
NL-4700 BH Roosendaal (NL)

Representative:
Jorritsma, Ruurd
Nederlandsch Octrooibureau
Postbus 29720
NL-2502 LS Den Haag (NL)

Decision under appeal:
Interlocutory decision of the Opposition Division of the European Patent Office posted 3 July 2006 concerning maintenance of European patent No. 1093541 in amended form.

Composition of the Board:

Chairman: R. Freimuth
Members: J. Mercey
D. S. Rogers

Summary of Facts and Submissions

I. The Appellant (Opponent) lodged an appeal on 28 August 2006 against the interlocutory decision of the Opposition Division posted on 3 July 2006 which found that European patent No. 1 093 541 in amended form met the requirements of the EPC.

II. Notice of Opposition had been filed by the Appellant requesting revocation of the patent as granted in its entirety on the grounds of lack of novelty and inventive step (Article 100(a) EPC) and insufficient disclosure (Article 100(b) EPC). *Inter alia* the following documents were submitted in opposition proceedings:

(1) WO 95 159 84 and
(4) US-A-3 596 766.

III. The Opposition Division held that the subject-matter of all the then pending requests was sufficiently disclosed, was novel and that the amendments made to the then pending first, second and third auxiliary requests fulfilled the requirements of Article 123(2) EPC. The subject-matter of the main, first and second auxiliary requests was held to be not inventive, document (1) being considered to represent the closest prior art, whereas the subject-matter of the third auxiliary request was found to involve an inventive step over said closest prior art. Claim 1 of the third auxiliary request read as follows:

" A method for preventing deposition of scale in oil extraction using a polycarboxy compound, the oil

extraction using seawater as process water, wherein the scale comprises barium salts, characterised in that a carboxyl-containing fructan that contains 0.3 - 3 carboxyl groups per monosaccharide unit is incorporated in the process water, in the process equipment or in the oil-containing formation."

IV. In a communication of the Board dated 24 March 2009, the question was raised whether document (26):

(26) GB-A-2 248 830

cited in paragraph [0004] of the patent in suit, and which disclosed a method of inhibiting the formation of scale in water having a high barium content using polyaminomethylene phosphonates as inhibitor, should be considered to represent the closest prior art.

V. The Appellant argued that the claims as maintained by the Opposition Division did not fulfil the requirements of Article 123(2) EPC, more particularly that the feature that the oil extraction used seawater as process water, was not disclosed in the application as filed. Original claim 11, in combination with original claim 1, disclosed merely that the fructan was incorporated into the process water which was seawater, not that the oil extraction as such was carried out with seawater as process water regardless of whether or not the fructan was incorporated therein. The passage at page 4, lines 4 to 13 merely disclosed that the scale inhibitor could be added to seawater and pumped into the oil-bearing formation, not that seawater was the process water, the term "process water" being used in the description of the application as filed only

once, namely on page 3, lines 32 to 33, wherein merely the concentration of the fructan therein was indicated.

The Appellant argued that the subject-matter of the invention was not inventive, starting from document (26) as closest prior art. It argued that the person skilled in the art, seeking to provide an alternative method for inhibiting the formation of barium-comprising scale in oil extraction, would consult other documents relating to scale-inhibiting substances, in particular, when such a document mentioned oil winning. Document (1) qualified as such a document, since it explicitly taught that carboxymethylated polysaccharides could be used in oil winning and were attractive replacements for organic phosphonates. It further provided the skilled person with the incentive to use carboxymethyl inulin (CMI) having a degree of substitution of 0.15 to 2.5 as a scale inhibitor in oil extraction, since CMI was shown to inhibit the crystallisation of calcium carbonate, calcium carbonate being a significant component of scale formed during oil recovery with seawater. Furthermore, in view of its known calcium carbonate inhibiting properties, the skilled person would have had a reasonable expectation that CMI would also inhibit the formation of barium-comprising scale.

VI. The Respondent (Proprietor of the patent) submitted that claim 1 of the claims as maintained by the Opposition Division did fulfil the requirements of Article 123(2) EPC, referring in this respect to original claim 11 and the paragraph on page 4, lines 4 to 13 of the application as filed, it being apparent from the last sentence of this paragraph that all previous embodiments related to oil extraction at sea.

The skilled reader knew that the "process water" in such a method was that water which was injected into the oil-bearing formation to displace the oil, offshore oil extraction using seawater therefor, as described on page 1, lines 5 to 11 of the application as filed. With letter dated 19 October 2009, it filed an auxiliary request.

With regard to inventive step, the Respondent also started from document (26) and submitted that the skilled person, faced with the problem of providing an alternative method for inhibiting the formation of barium-comprising scale in oil extraction, would not even have consulted document (1), since it was not in the field of scale inhibition in oil extraction. Furthermore, even if he had consulted said document, and even if document (1) taught the use of carboxymethylated polysaccharides in general in oil winning in its introductory section, the invention disclosed in said document was restricted to the use of CMI for inhibiting calcium carbonate crystallisation. The skilled person would thus not have combined its teaching with that of document (26), since it merely taught that this calcium carbonate crystallisation inhibiting activity meant that CMI could be used to overcome drawbacks associated with the use of carboxymethyl cellulose and carboxymethyl sucrose in detergent compositions. Barium salt deposition was, however, not a problem in laundry washing. Document (1) was accordingly silent with respect to seawater and barium salts. The claimed subject-matter was thus inventive.

VII. The Appellant requested that the decision under appeal be set aside and that the patent be revoked.

The Respondent requested that the appeal be dismissed or, subsidiarily, that the decision under appeal be set aside and the patent be maintained on the basis of the auxiliary request filed with letter dated 19 October 2009.

VIII. Oral proceedings were held on 19 January 2010. At the end of the oral proceedings, the decision of the Board was announced.

Reasons for the Decision

1. The appeal is admissible.

Main request

2. *Amendments (Article 123(2) EPC)*

2.1 Claim 1 is based on granted claim 1, wherein the scale has been specified as comprising barium salts, as disclosed in original claim 6. In addition, the feature "the oil extraction using seawater as process water" has been added. Basis for the process water being seawater is to be found in original claim 11, together with the paragraph on page 4, lines 4 to 13 of the application as filed, which describes the three alternatives regarding the location of the addition of the scale inhibitor, the last sentence of said paragraph stating that the application is not restricted to oil extraction at sea, thus implicitly

disclosing that all previous embodiments were of oil extraction at sea. That oil fields located offshore make use of seawater for the displacement of oil, namely as process water, is disclosed on page 1, lines 10 to 11.

2.2 For these reasons, the Board concludes that the subject-matter of claim 1 does not extend beyond the content of the application as filed, such that the requirements of Article 123(2) EPC are satisfied.

2.3 These amendments bring about a restriction of the scope of the claims as granted, and therefore of the protection conferred thereby, which is in keeping with the requirements of Article 123(3) EPC.

3. *Inventive step (Article 56 EPC)*

3.1 According to the established jurisprudence of the Boards of Appeal it is necessary, in order to assess inventive step, to establish the closest state of the art, to determine in the light thereof the technical problem which the invention addresses and successfully solves, and to examine the obviousness of the claimed solution to this problem in view of the state of the art. This "problem-solution approach" ensures assessing inventive step on an objective basis and avoids an *ex post facto* analysis.

3.2 The present invention is directed to a method for preventing deposition of barium-comprising scale in oil extraction. A similar method is disclosed in document (26), cited in paragraph [0004] of the patent in suit, and introduced by the Board into the proceedings (see

point IV above). Document (26) (cf. page 1, line 1 to page 2, line 10) discloses a method of inhibiting the formation of scale in water having a high barium content using polyaminomethylene phosphonates as inhibitor, said method being used in the oil industry when oil is recovered by injection of water into a reservoir driving the oil through the rock into the nearby producing wells. This document describes said oil recovery process in some detail, indicating that the oil in such a reservoir is frequently associated with connate water, which may contain barium, and that many oil fields are situated in offshore locations, where the only source of injection water is seawater, seawater containing sulphate ions, said ions reacting with alkaline earth metal ions in the connate water to precipitate scale comprising *inter alia* barium sulphate. Thus, the Board considers, in agreement with both parties, that document (26) represents the closest state of the art and, hence, takes it as the starting point when assessing inventive step.

3.3 In view of this state of the art, the problem underlying the patent in suit, may be regarded as the provision of an alternative method for inhibiting the formation of barium-comprising scale in oil extraction.

3.4 As a solution to this problem, the patent in suit proposes the method using a carboxyl-containing fructan that contains 0.3 to 3 carboxyl groups per monosaccharide unit, as defined in claim 1.

3.5 In view of the results of Example 4 given in Table 4 of the specification of the patent in suit, which show that CMI inhibits the formation of barium sulphate, it

is credible that the problem underlying the patent in suit has been successfully solved.

3.6 Finally, it remains to be decided whether or not the proposed solution to this problem is obvious in view of the cited prior art, the Appellant arguing that the claimed subject-matter was not inventive exclusively on the basis of the combination of the teachings of documents (26) and (1).

3.6.1 Document (1), which relates to the use of CMI having a degree of substitution ranging from 0.15 to 2.5 as an inhibitor of the crystallisation of calcium carbonate (cf. claim 7), discloses in its introductory section (cf. page 1, lines 14 to 19) that (poly)-carboxylated polysaccharides find use in *inter alia* oil winning, said teaching being confirmed by the disclosure of document (4) (cf. col. 1, lines 9 to 10 and 44 to 47). In view of this reference to oil winning, the skilled person would not *prima facie* have discarded said document when seeking a solution to the problem underlying the patent in suit.

3.6.2 The aim of document (1) is to overcome the drawbacks associated with the known carboxymethylated products, namely carboxymethyl cellulose and carboxymethyl sucrose, said drawbacks being linked to their use in detergent compositions (cf. page 2, lines 9 to 13), and does so by using CMI having a degree of substitution ranging from 0.15 to 2.5.

3.6.3 However, document (1) does not address the problem of inhibiting scale in oil extraction at all, there being no link between the abovementioned drawbacks described

on page 2 and the oil winning referred to in the introductory section on page 1. This is in line with the remaining teaching of document (1), namely that the formation of calcium carbonate should be inhibited, calcium carbonate being a problem in the washing of laundry (cf. page 1, lines 25 to 28). In contrast, the problem underlying the patent in suit is the inhibition of the precipitation of barium salts, such as barium sulphate, arising from seawater coming into contact with barium in connate waters, barium salts not being, however, a component of scale formed during laundry washing.

Furthermore, document (1) teaches only that calcium carbonate crystallisation can be inhibited with CMI, barium salts not being mentioned therein at all. Since there is no link between the inhibition of calcium carbonate formation and that of barium salts, nor are the fields of detergents and oil extraction remotely connected, the skilled person, faced with the problem of preventing barium-comprising scale in oil extraction, would not have combined the teaching of document (1) with that of document (26).

Thus, document (1) provides no incentive for the skilled person to substitute a substituted fructan for a polyaminomethylene phosphonate when seeking an alternative method for inhibiting the formation of barium-comprising scale in oil extraction, i.e. for solving the problem underlying the invention.

3.6.4 With respect to whether the skilled person would have transposed the teaching of document (1) regarding calcium carbonate inhibition to barium salts, the

Appellant argued that it was not necessary for the success of an envisaged solution to a technical problem to be predictable with certainty, but rather in order to render a solution obvious it was sufficient to establish that the skilled person would have followed the teaching of the prior art with a reasonable expectation of success.

However, this argumentation of the Appellant is based on *ex post facto* reasoning, since the skilled person, seeking to solve the problem underlying the present invention, would not have combined the teachings of documents (26) and (1) (cf. point 3.6.3 above), such that the question of whether he would have done so with a reasonable expectation of success does not even arise.

3.7 For these reasons, the Board concludes that the method for preventing deposition of barium-comprising scale in oil extraction according to claim 1 and dependent claims 2 to 13 involves an inventive step within the meaning of Articles 52(1) and 56 EPC.

Auxiliary request

Since the main request is allowable for the reasons set out above, there is no need for the Board to decide on the lower ranking auxiliary request.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

C. Rodríguez Rodríguez R. Freimuth