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**Datasheet for the decision
of 7 December 2006**

Case Number: T 1073/02 - 3.3.05

Application Number: 96109820.9

Publication Number: 0733396

IPC: B01D 53/14

Language of the proceedings: EN

Title of invention:

Recovery of carbon dioxide from combustion exhaust gas

Applicants:

THE KANSAI ELECTRIC POWER CO., INC., et al

Opponent:

-

Headword:

Recovery of carbon dioxide/KANSAI et al.

Relevant legal provisions:

EPC Art. 54, 56

Keyword:

"Novelty (yes)"

"Inventive step (remittal to first instance)"

Decisions cited:

-

Catchword:

-



Case Number: T 1073/02 - 3.3.05

DECISION
of the Technical Board of Appeal 3.3.05
of 7 December 2006

Appellants:

THE KANSAI ELECTRIC POWER CO., INC.
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Representative:

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Decision under appeal:

Decision of the Examining Division of the
European Patent Office posted 3 June 2002
refusing European application No. 96109820.9
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: M. Eberhard
Members: E. Waeckerlin
J. Willems

Summary of Facts and Submissions

I. The appeal is from the decision of the examining division to refuse the European patent application No. 96 109 820.9. The decision was based on the amended claims of the main request and auxiliary request submitted on 25 November 2000 and 5 March 2002, respectively.

II. The reason given for the refusal was that the subject-matter of claim 1 according to the main request was not novel having regard to document D3 (EP-A-0 502 596). Furthermore the presence of two independent method claims was objected to for lack of conciseness (Article 84 EPC in combination with Rule 29(2) EPC).

As far as the auxiliary request was concerned the examining division held that the claims did not comply with Article 123(2) EPC.

III. The appellants lodged an appeal against this decision. They submitted together with the grounds of appeal a main request which corresponded, *in essence*, to the former auxiliary request. The appellants argued that the claimed subject-matter was novel having regard to both documents D3 and D1 (FR-A-2 413 117), respectively. Furthermore they submitted that the claimed subject-matter involved an inventive step.

IV. In a communication the board raised a number of objections under Articles 84 and 123(2) EPC.

The board acknowledged the novelty of the claimed subject-matter in respect of D1 (or the corresponding

document in English D1a: US-A-4 184 855) and D3, respectively.

With regard to inventive step the board regarded what was called "*background art*" in the description of the application as the closest prior art. The appellants were invited to indicate any documents reflecting said "*background art*".

V. In reply the appellants submitted an amended set of claims.

VI. Oral proceedings before the board were held on 7 December 2006. During the course of the oral proceedings the appellants submitted a further amended set of claims 1 to 4 as the main request.

The appellants requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request , filed during the oral proceedings.

VII. Claim 1 of the main request reads as follows:

"1. Use of a non-flammable aqueous monoethanolamine solution as a stock solution for replenishment or for the adjustment of the concentration of an aqueous monoethanolamine solution used as an absorbing solution in a method for recovering carbon dioxide from combustion exhaust gas which contains carbon dioxide whereby the non-flammable aqueous monoethanolamine solution used as stock solution has a concentration of 70 to 75 % by weight."

Claims 2 to 4 are dependent on claim 1.

VIII. The arguments submitted by the appellants can be summarised as follows:

The use according to claim 1 is novel over the disclosure of D1 (or D1a) and D3, respectively.

As far as inventive step is concerned, D3 has to be disregarded, because it is a document pursuant to Article 54(3) EPC.

The "*background art*" referred to in the description was not meant as a citation of known prior art, but represented "*a part of the work of the inventors*". Therefore the question whether the invention involved an inventive step, or not, had to be considered with regard to D1 (or D1a). This document concerns a continuous process for the removal of acid gases from a feed gas mixture. In contrast to that, the application refers to a completely different field of application, namely a method for recovering carbon dioxide gas present in combustion exhaust gas. The skilled person would not consider D1 (or D1a) when intending to treat combustion exhaust gas. Moreover there is no teaching in D1 (or D1a) that the concentration of the aqueous monoethanolamine solution used as stock solution has to be in the range of 70 to 75 % by weight. Therefore, even if D1 (or D1a) was taken into consideration, the skilled person would not arrive at the claimed invention. Consequently the claimed subject-matter involved an inventive step.

Reasons for the Decision

1. *Article 123(2) EPC*

The board is satisfied that the amended claims meet the requirements of Article 123(2) EPC.

The basis for claim 1 as amended can be found in the description as originally filed on page 7, last paragraph, to page 8, first paragraph; page 10, paragraph 3, lines 1-3; page 13, table 1; page 14, first paragraph, lines 1-4 and 10-13.

The basis of claim 2 as amended is in the description as originally filed on page 8, fourth paragraph.

The basis for claim 3 as amended is in the description as originally filed on page 8, fifth paragraph.

The basis for claim 4 as amended is in the description as originally filed on page 8, last paragraph; page 6, second paragraph, lines 4-8; page 10, first paragraph, lines 1-3 and 9-14; Figure 1, reference signs 15 and 16.

2. *Article 84 EPC, Rule 29(2) EPC*

As the present set of claims contains only one independent claim, the objection of lack of conciseness under Article 84 EPC and Rule 29(2) EPC raised in the impugned decision no longer applies to the present claims. Furthermore, the objections concerning lack of clarity raised in the board's communication dated 16 August 2006 have been overcome.

3. *Novelty*

3.1 Document D1 (or D1a) discloses the use of an aqueous monoethanolamine (MEA) solution as an absorbing

solution in a method for recovering acid gases, in particular carbon dioxide, from a feed gas mixture (see D1a, claims 1, 2, 3; col. 1, lines 4-6; col. 3, lines 29-34). The feed gas is a mixture of process gas and acid gas, e.g. carbon dioxide, the process gas being selected from hydrocarbons, mixtures of hydrocarbons, synthesis gas or a mixture of nitrogen and hydrogen (see D1a, col. 2, lines 42-46). As far as the concentration of monoethanolamine is concerned, it is stated in D1a that the MEA solution may have a concentration of between 15 and 70 % by weight (see D1a, claim 4; col. 3, lines 45-48).

- 3.2 The use according to claim 1 of the main request is distinguished from the disclosure of D1 (or D1a) in that the carbon dioxide containing gas is combustion exhaust gas, not a feed gas mixture. Furthermore, although D1 (or D1a) discloses that the concentration of MEA in the absorbing solution may be 15 to 70 % by weight, the document is silent on the concentration of the MEA stock solution for replenishment or for the adjustment of the concentration of the absorbing solution.
- 3.3 Document D3 is comprised in the state of the art pursuant to Article 54(3) EPC and as such it is part of the prior art only when considering novelty and not when considering inventive step. D3 discloses the use of an aqueous solution of an alkanolamine, for example monoethanolamine, as an absorbent in a method for removing carbon dioxide from combustion exhaust gas (see D3, claims 3, 4; page 3, lines 3-4; page 5, lines 57-58; page 6, lines 13-15). There is no disclosure, however, of the concentration of monoethanolamine in

the absorbing solution and, likewise, in the stock solution for replenishment or for the adjustment of the concentration of the absorbing solution.

3.4 The board concludes, therefore, that the claimed subject-matter is novel over the cited prior art (Article 54 EPC).

4. *Closest prior art*

4.1 The present application contains a drawing "Fig. 6" with the title "*background art*", together with an explanation of the drawing on page 2, last paragraph of the description. There it is disclosed to use an aqueous solution of monoethanolamine having a concentration of about 20 to 30 % by weight as an absorbing solution in a method for recovering carbon dioxide from combustion exhaust gas which contains carbon dioxide (see in particular page 2, last paragraph, lines 2-9 together with Fig. 6).

4.2 On the basis of the wording of the description, it would appear that said disclosure forms part of the state of the art. Thus, section 2 starting at page 2 of the description is headed "*Description of the Related Art*", and on page 2, second paragraph, lines 2-3, it is stated that "*a system illustrated in Figure 6 has already been proposed*". Furthermore on page 9, paragraph 6 it is explained that "*Fig. 6 is a schematic diagram of an example of conventional power plant with a carbon dioxide recovery equipment.*"

4.3 In the board's view the "*background art*" referred to in the description would be a suitable starting point for

the assessment of inventive step, provided that this "*background art*" formed part of the state of the art.

4.4 According to the appellants' reply dated 7 November 2006, however, the last paragraph on page 2 of the description referring to Figure 6 does not relate to known prior art, but represents "*a part of the work of the inventors*" (see reply dated 07.11.2006, page 2, point 5.1). At the oral proceedings the appellants' representative could not give any further explanation concerning the discrepancy between the appellants' reply and the description.

4.5 In the absence of any explanation of the discrepancy between the wording used in the description and its alleged meaning as stated by the appellants in their letter dated 7 November 2006 and at the oral proceedings, the board is not convinced by the conclusion drawn by the applicants that D1 (or D1a) has to be taken as the starting point for the examination of inventive step. Since D1 (or D1a) is clearly less relevant for the claimed subject-matter than the "*background art*" referred to in the description, it could only be regarded as representing the closest prior art if there was sound evidence in support of the contention submitted by the appellants that said "*background art*" is not contained in the prior art. The board observes that no such evidence has yet been provided by the appellants.

5. *Remittal to the first instance for further prosecution*

5.1 The decision under appeal was based only on the objections of lack of novelty of claim 1 according to

the main request (Article 54 EPC), lack of conciseness of claims 1 and 3 of the main request (Article 84 EPC, Rule 29(2) EPC) and unallowable amendment of the auxiliary request (Article 123(2) EPC). Taking into account that no decision was taken on the issue of inventive step of the use claim, and that it still remains to be clarified whether or not the "*background art*" referred to in the description constitutes prior art, the board considers it appropriate to exercise its discretion under Article 111(1) EPC and to remit the case for further prosecution to the first instance.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the first instance for further prosecution.

The registrar:

The chairman:

G. Rauh

M. Eberhard