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**Datasheet for the decision
of 2 October 2007**

Case Number: T 0860/06 - 3.3.06

Application Number: 00928605.5

Publication Number: 1177030

IPC: B01D 53/14

Language of the proceedings: EN

Title of invention:

Absorbent compositions for the removal of acid gases from the gas streams

Patentee:

UNION CARBIDE CHEMICALS & PLASTICS TECHNOLOGY CORPORATION

Opponent:

-

Headword:

Absorbent composition/UNION CARBIDE

Relevant legal provisions:

EPC Art. 54, 111(1)

Keyword:

"Novelty (main request): no - novelty destroying disclosure of prior art document not clearly wrong"

"Novelty (first auxiliary request): yes"

"Remittal: yes"

Decisions cited:

T 0412/91

Catchword:

-



Case Number: T 0860/06 - 3.3.06

D E C I S I O N
of the Technical Board of Appeal 3.3.06
of 2 October 2007

Appellant: UNION CARBIDE CHEMICALS & PLASTICS TECHNOLOGY
(Patent Proprietor) CORPORATION
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 5 April 2006
revoking European patent No. 1177030 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: P.-P. Bracke
Members: L. Li Voti
A. Pignatelli

Summary of Facts and Submissions

I. The present appeal is from the decision of the Opposition Division to revoke the European patent no. 1 177 030, concerning absorbent compositions for the removal of acid gases from gas streams.

The European patent was granted with a set of 13 claims, claim 1 of which reading as follows:

"1. An absorbent composition for the removal of acid gases from gas streams, comprising an aqueous solution comprising: 1) greater than 1 mole piperazine per liter of aqueous solution; and 2) 1.5 to 6 moles methyldiethanolamine per liter of aqueous solution."

II. In its notice of opposition the Opponent, referring *inter alia*, to

document (1): EP-A-359991,

sought revocation of the patent on the grounds of Article 100(a) EPC, because of lack of novelty and inventive step of the claimed subject-matter.

III. In its decision, the Opposition Division found *inter alia* that

- document (1) disclosed an absorbent composition comprising 20 to 70% by weight of methyldiethanolamine (hereinafter referred to as MDEA), corresponding to a range of 1.7 to 6.1 mole/l MDEA, and 0.05 to 3 mole/l of an additional component, the most preferred of which being piperazine;

- therefore, the subject-matter of claim 1 as granted lacked novelty over the disclosure of document (1).

IV. The opponent withdrew its opposition with letter of 25 April 2006.

V. Appeal was filed against this decision by the Patent Proprietor (hereinafter Appellant).

VI. The Board noted in writing that

- document (1) appeared to disclose the subject-matter of claims 1 to 5 and 8 to 11 as granted;

- the subject-matter of claims 6, 7, 12 and 13 as granted appeared to be novel over the disclosure of document (1);

- in view of the fact that inventive step did not appear to have been thoroughly discussed at first instance, it appeared appropriate to remit the case to the first instance for further prosecution if the claimed subject-matter would have been found to be novel.

Oral proceedings were held before the Board on 2 October 2007.

In the oral proceedings the Appellant submitted an amended set of 3 claims to be considered as first auxiliary request.

VII. Claims 1 to 3 according to the first auxiliary request read as follows:

"1. An absorbent composition for the removal of acid gases from gas streams, comprising an aqueous solution comprising: 1) greater than 1 mole piperazine per liter of aqueous solution; and 2) 1.5 to 6 moles methyldiethanolamine per liter of aqueous solution; and further comprising an additional chemical solvent or a physical solvent."

"2. The absorbent composition of claim 1, comprising a physical solvent selected from the group consisting of sulfolane or methoxytriglycol."

"3. A process for the removal of acid gases from a gas stream, comprising contacting a gas stream containing an acid gas with an absorbent composition comprising an aqueous solution comprising: 1) greater than 1 mole piperazine per liter of aqueous solution; and 2) 1.5 to 6 moles methyldiethanolamine per liter of aqueous solution; and further comprising an additional chemical solvent or a physical solvent to produce an acid gas-lean gas stream and an acid gas-rich absorbent composition stream."

VIII. The Appellant referred in writing and orally to the following additional documents

(7): DE-A-2551717;

(9): US-A-6852144;

(10): WO-01/24912;

(11): US-A-4537753;

(12): US-A-4551158;

- (13): US-A-4997630;
- (14): CA-A-1290553;
- (15): CA-A-1295810;
- (16): US-A-6436174,

and submitted that

- even though document (1) disclosed the use of an absorption liquid containing 1.7 to 6 mole/l of MDEA, which MDEA could be used in combination with 0.05 to 3 mole/l, preferably 0.1 to 2 mole/l, in particular 0.1 to 1 mole/l, of a primary amine or alkanolamine, the most preferred of which being piperazine, it did not contain any claim directed to the combined use of MDEA and piperazine;

- moreover, the disclosure of document (1) as to the amounts of the specific amine or alkanolamine to be used had to be read and understood in the light of the teaching of the background art;

- the background art, e.g. document (7) cited in the introduction of document (1), taught that MDEA could be used in combination with piperazine in amounts smaller than 1 mole/l;

- moreover, the Opponent, which was the leading company in the use of piperazine to promote MDEA, had, at the filing date of the patent in suit, already commercialized for several years an MDEA/piperazine absorber under the trade mark *aMDEA* and stated in all its other patent applications filed before the priority date of the patent in suit, e.g. documents (11) to (16), that piperazine could be used in such mixtures in

amounts not exceeding 1 mole/l; the Opponent did not consider increasing the amount of piperazine in such mixtures to amounts greater than 1 mole/l until after the priority date of the patent in suit (see documents (9) and (10));

- therefore, the skilled person, considering the teaching of the prior art, would have considered the disclosure in document (1), also in the name of the Opponent, of a possible range of amine or alkanolamine of 0.05 to 3 mole/l to be applicable to piperazine only for the part of the range indicated as most preferred, i.e. in the range of 0.1 to 1 mole/l;

- the alleged teaching of document (1) of using more than 1 mole/l piperazine in combination with MDEA thus was isolated and unique in the prior art and would have been considered by the skilled person to be incorrect;

- therefore, the alleged teaching of document (1) of using a combination of MDEA with an amount of piperazine greater than 1 mole/l was not comprised in the state of the art (see T 412/91, point 4.6 of the reasons).

IX. The Appellant requests that the decision under appeal be set aside and that the patent be maintained as granted (main request) or that the case be remitted to the first instance for further prosecution on the basis of the claims 1 to 3 filed during oral proceedings (first auxiliary request).

Reasons for the Decision

1. *Main request*

1.1 Novelty

1.1.1 Claim 1 according to the main request, i.e. claim 1 as granted, relates to an absorbent composition comprising an aqueous solution comprising 1.5 to 6 mole/l MDEA and greater than 1 mole/l piperazine (see point I above).

1.1.2 The Appellant did not dispute that document (1) discloses an absorbent composition comprising 20 to 70% by weight of MDEA, corresponding to a range of 1.7 to 6.1 mole/l MDEA, and 0.05 to 3 mole/l, preferably 0.1 to 2 mole/l, in particular 0.1 to 1 mole/l, of a primary amine or alkanolamine, the most preferred of which being piperazine (see page 3, lines 39 to 44 of that document).

However, in the Appellant's view, the skilled person, taking into account the teaching of the prior art, would have considered the disclosure in document (1) of a possible range of amine or alkanolamine of 0.05 to 3 mole/l to be applicable to piperazine only for the part of the range indicated as most preferred, i.e. in the range of 0.1 to 1 mole/l; alternatively, the skilled person would have considered the theoretical teaching of this passage of using MDEA in combination with piperazine at amounts greater than 1 mole/l as being incorrect and not being part of the teaching of the document (see point VIII above).

1.1.3 It is the established jurisprudence of the Boards of Appeal of the EPO that the disclosure of a prior art document has to be construed in the context of the contents of the document as a whole and in the manner it would have been understood by the skilled person at its publication date, thereby excluding embodiments or interpretations of the subject-matter disclosed which the skilled person would have recognised to be incorrect or not performable because of an existing technical prejudice (see Case Law of the Boards of Appeal of the EPO, 5th edition, 2006, I.C.1.1, page 47; and I.C.2.1, pages 67 and 70).

The Board finds that there is no explicit teaching in document (1) that the passage on page 3, lines 39 to 44, indicated above should be interpreted in a particular manner or by making reference to other prior art documents and that the more general ranges of 0.05 to 3 mole/l and, preferably, 0.1 to 2 mole/l, should not be applied when using the most preferred amine, i.e. piperazine.

In fact, the description of document (1) contains references to other prior art documents only in the part at the beginning of the specification outlining the background art (page 2, lines 13 to 24), i.e. in a passage not intended normally to be used for interpreting the content and teaching of that document.

Moreover, even though this passage relates in general to document (7) (page 2, lines 13 to 20), it does not refer to the specific parts of document (7) indicated by the Appellant, teaching that piperazine can be used in combination with alkanolamine such as MDEA at

amounts smaller than 1 g/l (see renumbered page 6, lines 5 to 11 in combination with renumbered page 7, lines 13 to 14 and 22 to 23 of document (7)) and it does not mention at all any mixture of piperazine and alkanolamine. Therefore, document (7) cannot be used for interpreting document (1).

- 1.1.4 It is also established jurisprudence of the Boards of Appeal of the EPO that the teaching of patent specifications, with the exception of those in a new technical field for which there are no textbooks available (which is not the present case), cannot be considered to represent the common general knowledge of the skilled person (see Case Law of the Boards of Appeal of the EPO, 5th edition, 2006, I.C.1.5, page 48).

Therefore, the Board finds that the teaching of documents (7) and (9) to (16) do not represent the common general knowledge of the skilled person and would have not influenced the skilled person in the interpretation of the content of document (1) at the publication date of that document.

For the same reasons, the facts that the Opponent, a leading company in the use of piperazine to promote MDEA, which, at the filing date of the patent in suit, had already commercialized for several years an MDEA/piperazine absorber under the trade mark *aMDEA*, had stated in all its other patent applications following document (7) and filed before the priority date of the patent in suit, e.g. documents (11) to (16), that piperazine could be used in such mixtures in amounts not exceeding 1 mole/l and had not considered increasing the amount of piperazine in this type of

mixtures to greater than 1 mole/l until after the priority date of the patent in suit (see documents (9) and (10)), cannot be considered an evidence that the skilled person would have interpreted the teaching of document (1), i.e. a patent specification also in the name of the Opponent, in a limiting way as to the amount of piperazine to be used in combination with MDEA.

- 1.1.5 Finally, even though document (1) does not contain any claim directed to the combined use of MDEA and piperazine, its disclosure has to be construed in the context of the contents of the document as a whole.

Therefore, the Board concludes that document (1) teaches *inter alia* to use a combination of MDEA with an amount of piperazine greater than 1 mole/l.

- 1.1.6 It remains to be assessed if the skilled person would have recognised this teaching to be incorrect or not performable because of an existing technical prejudice.

As regards this point of law, it is the established jurisprudence of the Boards of Appeal of the EPO that the technical information contained in patent specifications cannot be normally considered to be evidence for the existence of a technical prejudice, since it might be based on special premises or on the personal view of the author at the time of writing the particular specification (see Case Law of the Boards of Appeal of the EPO, 5th edition, 2006, I.D.9.2, pages 161 and 162).

The Board thus finds that the evidence already commented in point 1.1.4 above cannot show that there existed a technical prejudice against the use of piperazine in combination with amines at amounts greater than 1 mole/l.

Therefore, the Board finds that there is no reason to assume that the text of the above discussed passage of document (1) is incorrect or that the use of more than 1 mole/l piperazine would have been considered by a skilled person not to be performable.

1.1.7 Consequently, even considering the finding of the decision T 412/91 (point 4.6 of the reasons) that

"In principle, what constitutes the disclosure of a prior art document is governed not merely by the words actually used in its disclosure, but also by what the publication reveals to the skilled reader as a matter of technical reality. If a statement is plainly wrong, whether because of its inherent improbability or because other material shows that it is wrong, then although published it does not form part of the state of the art. Conversely, if he would not recognise that the teaching is wrong, it does belong to the state of the art",

the Board has to conclude that the above mentioned passage of document (1) teaching that piperazine can be used together with MDEA at amounts greater than 1 mole/l belongs to the state of the art.

Therefore, the Board has no reason to depart from the finding of the department of first instance that the

teaching of document (1) detracts from the novelty of the subject-matter of claim 1 as granted.

The main request thus has to be dismissed.

2. *First Auxiliary request*

2.1 Articles 123(2) and (3) EPC

2.1.1 Claim 1 according to the first auxiliary request differs from claim 1 according to the main request insofar as the absorbent composition must contain an additional chemical solvent or a physical solvent (see point VII above).

The Board is satisfied that claim 1 complies with the requirements of Articles 123(2) and (3) EPC since its wording is supported by claim 6 of the original documents of the application and its scope is more limited than that of claim 1 as granted.

Moreover, claims 2 and 3 are supported by claim 7 and 12 of the original documents, respectively.

2.2 Novelty

2.2.1 The Board finds that document (1), though suggesting that mixtures of physical and chemical solvents can be used (see page 3, lines 33 to 34), does not disclose a combination of MDEA and piperazine in the amounts required by claim 1 with another solvent.

Therefore, the Board finds that the subject-matter of claim 1 according to the first auxiliary request is novel over the cited prior art.

The same finding applies *mutatis mutandis* to the subject-matter of claims 2 and 3.

3. *Remittal*

Although the claimed subject-matter has been found to satisfy the requirements of Articles 123(2) and (3) EPC and to be novel, it still has to be assessed whether the claims satisfy the other requirements of the EPC.

In the present case the decision under appeal was based on the ground of not compliance with the requirements of novelty only.

Since the inventive step of the claimed subject-matter was not at all discussed in the decision under appeal and the Appellant asked for the case to be remitted to the first instance for further prosecution, the Board finds that in order not to deprive the Appellant of the opportunity to argue the remaining issues at two instances, it is appropriate to make use of its powers under Article 111(1) EPC to remit the case to the department of first instance for further prosecution.

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 on the basis of claims 1 to 3 filed during oral proceedings before the Board.

The Registrar:

The Chairman:

G. Rauh

P.-P. Bracke