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D E C I S I O N
of 28 January 2003

Case Number: T 0165/01 - 3.2.3

Application Number: 90914582.3

Publication Number: 0489867

IPC: F23B 7/00

Language of the proceedings: EN

Title of invention:

Method and apparatus for making solid waste material
environmentally safe using heat

Patentee:

PHOENIX ENVIRONMENTAL, LTD.

Opponent:

LINDE Aktiengesellschaft, Wiesbaden

Headword:

-

Relevant legal provisions:

EPC Art. 123(2)

Keyword:

-

Decisions cited:

-

Catchword:

-



Case Number: T 0165/01 - 3.2.3

D E C I S I O N
of the Technical Board of Appeal 3.2.3
of 28 January 2003

Appellant: PHOENIX ENVIRONMENTAL, LTD.
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Montgomery, PA 17752 (US)

Representative: Wilcken, Thomas, Dipl.-Ing.
Patentanwälte
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Bei der Lohmühle 23
D-23554 Lübeck (DE)

Respondent: LINDE Aktiengesellschaft, Wiesbaden
(Opponent) Zentrale Patentabteilung
D-82049 Höllriegelskreuth (DE)

Representative: -

Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 4 December 2000
revoking European patent No. 0 489 867 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: C. T. Wilson
Members: J. de Pouget de Nadaillac
M. Vogel

Summary of Facts and Submissions

- I. The appeal is directed against the decision dated 4 December 2000 of an opposition division of the EPO, which revoked the European Patent EP-B-0489 867, based on the international patent application WO 91/04443, on the ground of Article 123(2) EPC.

The appeal was lodged by the proprietor of the patent (appellant) on 7 February 2001 and the appeal fee paid the same day. The statement of grounds of appeal was received on 10 April 2001. Together therewith, new pages 2 and 3 of the description and two new sets of twenty-five claims, one being the clean copy and the other a marked copy so as to show the amendments made, were submitted as main and sole basis for the appeal.

- II. The new set comprises three independent claims, which read as follows:

"1. A process for removing harmful constituents from solid waste material comprising the steps of:

continuously feeding a particulate mix of solid waste material containing the harmful constituents and a combustible excitation material for providing heat energy into a reaction chamber (16),
introducing oxygen only into the chamber (16) to produce and maintain therein an oxygen atmosphere,

reacting the mix in the chamber (16) in the oxygen atmosphere by heating the mix to a temperature greater than 1,093°C (2,000°F) at which a reaction of the mix will be self-sustaining and maintaining the self-sustaining reaction until the solid waste material becomes a molten slag and effluvia is produced

comprising gaseous effluent and particulate effluent, the temperature within the chamber (16) above the molten slag being high enough to destroy substantially all of the harmful constituents of the effluvia released by the formation of the molten slag,

cooling the molten slag to make a solid slag product that binds the harmful constituents not in the effluvia; and

conducting the effluvia generated by the formation of the molten slag from the reaction chamber (16) through a water-cooled conduit (65) connected to the reaction chamber (16) and to a second chamber (18) and rapidly cooling the effluvia by at least 538°C (1,000°F) in the water-cooled conduit (65) and in the second chamber (18) to cause particulate effluent therein to precipitate out of the effluvia and into the second chamber (18)."

"17. An apparatus for removing harmful constituents from solid waste material, comprising:

a reaction chamber (16),

means (54) for continuously feeding a particulate mix of the solid waste material and a combustible excitation material as a source of heat energy into the reaction chamber (16),

lance means (70) for introducing oxygen only, from an oxygen source (68), into the reaction chamber (16) to produce an oxygen atmosphere therein, and for maintaining the oxygen atmosphere within the reaction chamber (16),

means (30, 32, 40) for heating reaction chamber (16) to react the mix in the chamber (16) to a temperature greater than 1,093°C (2,000°F) in the presence of the oxygen atmosphere until the solid waste becomes a molten slag and effluvia is produced

comprising gaseous effluent and particulate effluent, the temperature within the chamber (16) above the bath of molten slag being high enough to destroy substantially all of the harmful constituents of the effluvia generated by the formation of the molten slag, means (66) for cooling and conducting excess molten slag from the reaction chamber (16),

water-cooled means (65) for conducting the effluvia generated by the formation of the molten slag from the reaction chamber (16) into a second chamber (18), the water-cooled conducting means (65) being connected to the reaction chamber (16) and to the second chamber (18) and said water-cooled conducting means (65) and said second chamber (18) being adapted for rapidly cooling the effluvia by at least 538°C (1,000°F) in the water-cooled conducting means (65) and in the second chamber (18) to cause particulate material in the effluvia to precipitate in the second chamber (18),

means for treating the effluvia to remove substantially all of the remaining particulate and harmful constituents to achieve acceptable environmental quality, and

means (316) for releasing the treated gaseous effluent into the atmosphere."

24. A process for removing harmful constituents from solid waste material comprising the steps of:

feeding particulate solid waste material containing the harmful constituents into a reaction chamber (16),

introducing oxygen only into the chamber (16) to produce and maintain therein an oxygen atmosphere,

heating the solid waste material within the

reaction chamber (16) to a temperature greater than 1,093°C (2,000°F) at which a reaction of the mix will be self-sustaining and maintaining the self-sustaining on until the solid waste material becomes a molten slag and effluvia is produced comprising gaseous effluent and particulate effluent, the temperature within the chamber (16) above the molten slag being high enough to destroy substantially all of the harmful constituents in the effluvia released by the formation of the molten slag,

conducting excess molten slag from the reaction chamber (16) and cooling the conducted molten slag to make a solid slag product that binds the harmful constituents not in the effluvia,

conducting the effluvia generated by the formation of the molten slag from the reaction chamber (16) through a water-cooled conduit (65) connected to the reaction chamber (16) and to a second chamber (18) and rapidly cooling the effluvia by at least 538°C (1,000°F) in the water-cooled conduit (65) and in the second chamber (18) to cause particulate effluent therein to precipitate out of the effluvia and into the second chamber (18),

further treating the effluvia to remove substantially all of any remaining particulate and harmful constituents of the effluvia to achieve acceptable environmental quality, and

releasing the treated gaseous effluent into the atmosphere."

Dependent claim 11 reads as follows:

"11. The process according to claim 1 wherein the effluvia is rapidly cooled in the water-cooled conduit (65) and the second chamber (18) by reducing its

temperature by at least 538°C (1,000°F) in less than 2 seconds."

- III. In his response to the statement of grounds, the opponent (respondent) submitted that the new independent claims 1, 17 and 24 and the dependent claim 11 infringe Article 123(2) EPC, since both the feature "water-cooled" and the essential cooling of the effluvia in the conduit (65) joining the reaction chamber to the second chamber were not disclosed in the original documents of the patent in suit, which only indicate that the essential cooling and the resulting precipitation of the particulates occur in the second chamber.

In a written submission received on 4 April 2002, the appellant replied that only the clean copy of the previously filed claims should be considered, since claim 17 of the marked version contained an error. He also pointed out the passage, page 19, lines 7 to 9 of the description, which mentions the water cooled exhaust tube 65 and filed a declaration of the General Manager of the patentee, in which calculations are disclosed in order to demonstrate that it is possible to achieve a rapid cooling of the effluvia of at least 538°C in both the tube 65 and the second chamber.

- IV. Oral proceedings took place on 28 January 2003.
- V. The appellant essentially argued that, in the patent application as originally filed, see in particular the pages 22 and 37, the rapid cooling of the effluvia was clearly disclosed as occurring in the whole section comprising the exhaust conduit of the reaction chamber and the second chamber.

The respondent objected that in these originally filed documents there is indeed passages which indicate that cooling occurs in the exhaust tube, but no passage which discloses that a **rapid** cooling takes place in said tube.

- VI. The appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of claims 1 to 25 filed with the statement of grounds of appeal on 10 April 2001.

The respondent requested that the appeal be dismissed, auxiliarily to remit the case to the first instance for further prosecution.

Reasons for the Decision

1. The appeal is admissible.
2. The respondent has no longer contested the original disclosure of a "water cooled exhaust tube" during the oral proceedings. It can therefore be concluded that this objection, which was raised in the ground of appeal, has been dropped. In fact, page 19 of the patent application as originally filed indicates that "the effluvia also flows through water cooled exhaust tube 65 to chamber 20". The appellant admitted that this last reference was wrong and should be corrected into "(chamber) 18", as clearly shown by the rest of the description and the drawings.
3. The second and remaining objection of the appellant, namely that there is no disclosure of a **rapid** cooling inside the exhaust tube, cannot be followed:

It is true that, in some passages of the description and in some claims, as originally filed, it is indicated that "the second chamber is adapted for rapidly cooling the effluent therein to cause particulate material to precipitate out of the effluent" or that one step of the process was a "rapid cooling of the effluent within second chamber to cause the particulate to precipitate out of the effluent". However, such a disclosure does not exclude that the rapid cooling also takes place elsewhere, the more so as, in these above passages, the mention of a rapid cooling is always linked with that of the precipitation of the particulates.

As a matter of fact, two passages of the description provide further informations, namely that:

"The effluvia flows up the tube 65 to the second chamber. The effluvia rapidly drops in temperatur as it leaves reaction chamber and flows through chamber 18 (...). This drop in temperature within 3 feet and in about 2 seconds causes the particules to drop out."(Page 22, lines 14 to 20), and:

"Specifically, the effluvia is rapidly cooled as it passes from chamber 16 into and out of chamber 18" (Page 37, lines 9 to 11).

These two passages can only be understood as meaning that the rapid cooling begins as soon as the effluent leaves the reaction chamber, that is to say it begins in the exhaust tube 65, and continues until the chamber 18 has been passed through.

Therefore, contrary to the respondent's point of view,

the originally filed documents of the patent in suit provide a clear support for the fact that a rapid cooling occurs not only in the second chamber, but also in the exhaust tube 65 of the reaction chamber.

4. Therefore, the requirement of Article 123(2) EPC is met and the claims are allowable under this article.
5. However, the first instance has not yet examined the questions of novelty and inventive step of the subject-matter of these amended claims. Under these circumstances the board does not deem it appropriate to decide on this issue itself, but, in accordance with the auxiliary request of the respondent, makes use of the power given to it by Article 111 (1) EPC to remit the case to the 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.

The Registrar:

The Chairman:

A. Counillon

C. T. Wilson