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D E C I S I O N
of 13 January 2006

Case Number: T 0520/03 - 3.2.07

Application Number: 98303357.2

Publication Number: 0875587

IPC: C22B 1/16

Language of the proceedings: EN

Title of invention:

Suppression of synthesis of chloro-organic pollutants during
iron ore sintering

Patentee:

Corus UK Limited

Opponent:

USINOR

Headword:

-

Relevant legal provisions:

EPC Art. 56, 111(1), 112(1)a), 113(1), 114(2)

Keyword:

"Admissibility of late filed documents (yes) "

"Remittal after introduction of late filed documents in
response to change resulting from proprietor's amendments
(no) "

"Extent of appeal; Referral of questions to the Enlarged Board
of Appeal (no) "

"Inventive step (main request to auxiliary request V - no);
request to file further requests (no) "

Decisions cited:

G 0005/83, G 0002/88, G 0006/88, G 0009/91, G 0010/91,
G 0009/92, G 0004/93, T 0176/84, T 0195/84, T 0560/89,
T 623/93, J 0016/90

Catchword:

-



Case Number: T 0520/03 - 3.2.07

D E C I S I O N
of the Technical Board of Appeal 3.2.07
of 13 January 2006

Appellant:
(Opponent)

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Decision under appeal:

Interlocutory decision of the Opposition
Division of the European Patent Office posted
27 February 2003 concerning maintenance of
European patent No. 0875587 in amended form.

Composition of the Board:

Chairman: P. O'Reilly
Members: H. Hahn
E. Lachacinski

Summary of Facts and Submissions

- I. The opponent lodged an appeal against the interlocutory decision of the Opposition Division to maintain European patent No. 0 875 587 in amended form on the basis of claims 1 to 3 according to the main request filed during the oral proceedings held on 10 January 2003 before the department of first instance.
- II. The opposition had been filed against the patent as a whole and was based on Article 100(a) EPC (lack of novelty and lack of inventive step).

The Opposition Division held that the main request met the requirements of Articles 123(2) and (3) EPC and that novelty and inventive step were given for the subject-matter of claim 1 of the main request since it considered that D1 (JP-B-52-38 403 & Derwent abstract & full French translation) neither discloses nor comprises a hint to the claimed technical effect of the urea. The Opposition Division regarded this technical effect as a new functional feature in the light of Decisions G 2/88 and G 6/88. Since D3 (US-A-5 113 772) is related to the incineration of waste and since D4 (Gebert W. et al.: "PCDD/F emission reduction for sinter plants" Steel Times, vol. 223, no. 6, June 1995, Redhill, Surrey, GB, pages 220-222) is silent about adding an ammonia-releasing compound to iron ore sinter mixtures for the purpose of reducing dioxin emissions, the Opposition Division considered there is no incentive to combine D1 with either D3 or D4 for solving the problem posed.

- III. Together with the grounds of appeal dated 23 June 2003 the appellant filed the documents D6 (JP-B-3 138 149 & English abstract), D6bis (French translation of D6) and D7 ("Sintering Plants of Steel Industry - The Most Important Thermal PCDD/F Source in Industrialized Regions?", Analytical methods, formation and sources, Vienna Federal Environmental Agency, 1993, vol. 11, pages 311-314).
- IV. With a communication dated 31 October 2005 and annexed to the summons to oral proceedings the Board presented its preliminary opinion with respect to the main request underlying the impugned decision. This opinion was based only on the arguments of the appellant since the respondent had **not** presented any arguments in response to the appeal and had only requested oral proceedings. Claim 1 did not appear to meet the requirements of Articles 123(2) and (3) EPC. Furthermore, claim 1 appeared to lack novelty with respect to D1 since the decisions G 2/88 and G 6/88 did not appear to be applicable in the present case. Claim 1 in any case appeared to lack an inventive step.
- V. As a response to the communication of the Board the respondent filed on 13 December 2005 with its letter of the same date the auxiliary requests I to IV together with arguments and document D8 (La Revue de Métallurgie-CIT, Mars 2002, pages 257-265). Furthermore, the respondent requested that the documents D6, D6bis and D7 should not be admitted into the procedure. It further requested that in the case the Board forms the opinion that it would be a prerequisite for the applicability of G 2/88 and/or G 6/88 to have an original claim to a composition which is subsequently

amended into a use-claim, this question should be referred to the Enlarged Board of appeal.

VI. With letter of 9 January 2006 the respondent filed auxiliary request V and submitted further arguments. The respondent additionally requested that in the case that the Board intends to go outside the scope of the appeal, which scope should be considered in conjunction with the effect of withdrawal of the appeal according to G 9/92, the question should be referred to the Enlarged Board of Appeal whether this would be allowable. Furthermore, it requested, in the case that the Board intends to refuse the patent for lack of inventive step on facts and arguments not correctly and/or timely brought into the proceedings, for which the proprietor has not had the possibility to defend himself adequately, to refer this to the first instance.

VII. Oral proceedings before the Board were held on 13 January 2006.

(a) The appellant requested that the decision under appeal be set aside and the patent be revoked.

(b) The respondent (patent proprietor) requested that the appeal be dismissed, or that the patent be maintained in accordance with auxiliary requests I to IV filed with letter of 13 December 2005, or in accordance with auxiliary request V filed with letter of 9 January 2006. Additionally, the respondent requested the limitation of the extent of the appeal to Articles 56 and 123(2) EPC. Furthermore, it requested if it applies, to:

- (i) remit the case, if the decision is based on documents D6, D6bis and/or D7, and
- (ii) to refer its questions mentioned under points V and VI above to the Enlarged Board of Appeal.

(c) The documents D1, D3, D4, D6, D6bis and D7 were discussed.

VIII. Claim 1 of the main request under consideration as filed on 10 January 2003 before the Opposition Division reads as follows:

"1. A method of suppressing the synthesis of chloro-organic pollutants, especially dioxins and furans, during iron ore sintering, comprising the sequential steps of producing a sinter feedstock by substantially homogeneously mixing *inter alia* iron ore with a solid compound which releases ammonia on thermal decomposition, depositing said feed stock onto a moving grate and combusting the same to produce sintered products rich in iron, characterised in that the ammonia releasing compound is urea ($\text{CO}(\text{NH}_2)_2$), the urea content of the feedstock mix being from 0.01 to 0.09% by weight."

IX. Claim 1 of auxiliary request I differs from claim 1 of the main request in that the wording "and the release of acidic gases such as hydrogen chloride and sulphur dioxide," has been inserted between the features "suppressing the synthesis of chloro-organic pollutants, especially dioxins and furans," and "during iron ore sintering".

X. Claim 1 of auxiliary request II reads:

"1. Use of solid urea ($\text{CO}(\text{NH}_2)_2$) for suppressing the synthesis of chloro-organic pollutants, especially dioxins and furans, during iron ore sintering, comprising the sequential steps of producing a sinter feedstock by substantially homogeneously mixing *inter alia* iron ore with the solid urea which releases ammonia on thermal decomposition, depositing said feed stock onto a moving grate and combusting the same to produce sintered products rich in iron, the urea content of the feedstock mix being from 0.01 to 0.09% by weight."

XI. Claim 1 of auxiliary request III differs from claim 1 of auxiliary request II in that the wording "and the release of acidic gases such as hydrogen chloride and sulphur dioxide," has been inserted between the features "suppressing the synthesis of chloro-organic pollutants, especially dioxins and furans," and "during iron ore sintering".

XII. Claim 1 of auxiliary request IV reads:

"1. A method of reducing toxic emissions, more especially dioxin formation, from a sinterstrand, whilst keeping the quantity of ammonia gas released into the atmosphere at low levels and without the need to introduce complex modifications to existing strand equipment during iron ore sintering, comprising the sequential steps of producing a sinter feedstock by substantially homogeneously mixing *inter alia* iron ore with a solid compound which releases ammonia on thermal decomposition, depositing said feed stock onto a moving

grate and combusting the same to produce sintered products rich in iron, characterised in that the ammonia releasing compound is urea ($\text{CO}(\text{NH}_2)_2$), the urea content of the feedstock mix being from 0.01 to 0.09% by weight."

XIII. Claim 1 of auxiliary request V reads:

"1. A method of suppressing the synthesis of chloro-organic pollutants, especially dioxins and furans, during iron ore sintering, comprising the sequential steps of producing a sinter feedstock by substantially homogeneously mixing *inter alia* iron ore with a solid compound which releases ammonia on thermal decomposition, depositing said feedstock onto a moving grate and combusting the same to produce sintered products rich in iron, characterised in that the ammonia releasing compound is urea ($\text{CO}(\text{NH}_2)_2$), wherein the ammonia releasing compound is between 0.02 to 0.04% by weight of the feedstock mix."

XIV. The appellant argued essentially as follows:

Documents D6, D6bis and D7 should be admitted into the proceedings in accordance with T 623/93 since they were submitted together with the grounds of appeal as a reaction to the change of the respondent's case based on the late filed requests during the oral proceedings before the department of first instance. The question whether it is inventive to introduce urea as ammonia-releasing compound only arose after the amendments were made to claim 1. Document D6 is relevant as it deals with the suppression of dioxin while D7 shows the link between sinter and incineration plants. Document D8 is

post-published and thus not directly relevant. It may, however, be admitted.

The extent of appeal is defined according to decision G 9/91 by the extent to which the patent is opposed in the notice of opposition (see decision, "order"). From the impugned decision of the present case it is evident that the Opposition Division considered novelty and Articles 123(2) and (3) EPC (see decision of Opposition Division, points 2.2 and 2.5 of the reasons). Furthermore, for amended requests all requirements of the EPC have to be considered (see G 9/91, point 19 of the reasons) which - on the basis of the amendments made to claim 1 of all requests - implies at least the application of Articles 123(2) and (3) EPC.

In accordance with decision G 2/88 the independent claim 1 of each of the six requests has to be interpreted taking account of its technical features in order to determine the protection conferred by the patent which is determined by the terms of the claims under Article 69(1) EPC (see points 2.5 and 3.3 of the reasons). It is not clear whether the process claims of the main request and auxiliary requests I, IV and V relate only to a process for the suppression of dioxins or if they relate to a process for the production of sintered iron ore including such suppression. In the latter case a protection for the product under Article 64(2) EPC is implied, whereas a use claim to obtain a specific effect as defined in auxiliary requests II and III implies no product protection (see G 2/88, point 5.1 of the reasons). Since the sintering process results in a clear end product, i.e. sintered iron ore, there are no functional features which

distinguish the obtained product from such process from the product obtained by a sintering process which includes the suppression of dioxin. Consequently, the process should be considered to lack novelty. On the other hand, if the process is related only to the suppression of dioxins then it is no longer a sintering process but also results in a direct product, which is different from that according to the sinter process. As derivable from the patent in suit the gas resulting from the suppression process may contain besides PCDD/F, ammonia, hydrogen chloride, sulphur oxides and nitrogen oxides (see patent, paragraphs [0035] to [0040]). The process for reducing toxic emissions according to the patent in suit thus also includes the reduction of NO_x according to D1. If process claim 1 is restricted to a process for the reduction of dioxin only then D1 is no longer novelty destroying. Claim 1 would then however lack an inventive step since the ammonia formed from urea reacts with the precursor materials during the combustion of the sintering process and this reaction of ammonia is known from D3 (see e.g. column 1, line 67 to column 2, line 7). According to the patent in suit urea is introduced in order to produce ammonia, which represents the effect of urea. The ammonia reduces the formation of dioxin and other toxic emissions. D1 suggests the addition of urea to form ammonia to reduce toxic emissions, particularly of nitrogen oxides (NO_x). The same finding applies to the use claims of auxiliary requests II and III since they include the use of urea for producing ammonia to suppress the synthesis of chloro-organic pollutants so that the skilled person would combine D1 with D3 or D6. The primary functional feature of urea is the production of ammonia and the suppression of dioxins through the produced ammonia is

only the secondary function. Document D3 is in the closely related technical field of waste material incineration. D3 mentions that the process can be generally applied onto any other material which is combustible to form gaseous chlorinated organic compounds, including precursors for dioxin formation (see column 3, lines 1 to 7). The technical problem to be solved starting from D1 would be the reduction of toxic emissions and particularly those of dioxins and furans. The fact that the process according to the patent in suit does not result in a reduction of NO_x does not imply an invention. Consequently, none of the requests meets the requirements of Article 56 EPC.

XV. The respondent argued essentially as follows:

Documents D6, D6bis and D7 should not be admitted into the proceedings since they are late filed documents which are *prima facie* not relevant or at least no more relevant than D1 to D4. The post-published document D8 was submitted in order to support inventive step of the second non-medical use of urea in the claimed processes.

In accordance with G 9/92 and G 4/93 the extent of the appeal proceedings is determined by the appeal and the grounds of appeal as submitted by the appellant, i.e. Article 56 and 123(2) EPC. It is strange that Articles 54 and 123(3) EPC as mentioned in the summons should be dealt with although no explicit objections in this context were made by the appellant.

The claims have to be interpreted according to their features in order to determine the protection conferred to the patent (see G 2/88, point 2.5 of the reasons).

According to decision G 6/88 the recognition or discovery of a previously unknown property of a known compound, such property proving a new technical effect, can clearly involve a valuable and inventive contribution to the art and the question referred to the Enlarged Board assumed that the only novel feature was the purpose for which the compound was to be used (see points 2.3 and 5 of the reasons). In relation to a claim whose wording clearly defines a new use of a known compound the proper interpretation will normally be such that the attainment of a new technical effect which underlies the new use is a technical feature of the claimed invention.

Taking account of Article 69 EPC a proper interpretation of the claim will require that a functional feature should be implied in the claim as a technical feature, i.e. that the compound actually achieves the particular effect (see point 7 of the reasons). Lack of novelty can only be found if all features of the claimed invention were communicated to the public even if such effect may have inherently taken place in the course of carrying out that which has previously been made available to the public (see points 8 and 9 of the reasons). Since the effect of dioxin suppression of urea was not known from D1, whose sintering process fully anticipated claim 1 as granted, the subject-matter of the claims of all requests on file is novel. D1 relates to the reduction of NO_x and uses liquid and solid urea, also in combination with ammonia, in an amount of up to 4% (see page 2, last paragraph and page 3, second paragraph). However, according to the patent in suit NO_x is not reduced. On the contrary the content of NO_x rises slightly (see

figure 2; and paragraph [0039]) which is in contradiction with the teaching of D1. It took a long time after the publication of D1 to realize the existence of the dioxin problem of the sinter industry and to make the invention. There are different ways of tackling the problem as shown by D4 which does not describe the addition of a chemical compound.

A use claim is to be seen as a method or process claim so that in accordance with G 5/83 (compare Case Law of the Boards of Appeal of the European Patent Office, 4th edition 2001, section I.C.5.3.1) it should also protect the product directly obtainable. The products of the process claims, which attempt to define the second non-medical use of the process of D1, should be a virtually suppressed dioxin. The problem to be solved starting from D1 would be the reduction of toxic emissions, particularly dioxins and furans. D1, however, is not the correct starting point since it does not mention the dioxin problem, let alone that urea suppresses the formation of dioxins or furans. Document D3 concerns the incineration of waste material which is a more remote technical field so that the skilled person would not consider combining D3 with the sinter process of D1. The closest prior art document is in fact D4. Consequently, the subject-matter of the claims is novel and inventive.

Reasons for the Decision

Procedural Issues

1. *Admissibility of documents D6, D6bis, D7 and D8
(Article 114(2) EPC)*

The respondent argued that the documents D6, D6bis, D7 should not be admitted into the proceedings because they were late filed and no more relevant than the documents already in the proceeding and that the amendments made to claim 1 of the main request did not justify the late filing of these documents.

- 1.1 The Board cannot accept the respondent's arguments for the following reasons:
- 1.2 The Board notes that the appellant filed documents D6, D6bis and D7 with its grounds of appeal of 23 June 2003 and that they formed a direct response to the change of the patentee's case due to the new requests presented in the oral proceedings before the Opposition Division. The subject-matter of claim 1 without amendment was not considered to be new over D1 while after the introduction of a feature - based on the property of urea to suppress the formation of dioxins - which was interpreted as a functional feature, it was considered to be novel. The amendments made to claim 1 during the oral proceedings were therefore pivotal in maintaining the patent. These documents were filed in order to deal with issues relating to the knowledge of the dioxin suppressing properties of urea and of the dioxin problem as discussed before the department of first

instance (see Minutes of the oral proceedings of 10 January 2003, points 4.3 and 4.4).

- 1.2.1 Since the opponent is only obliged to cite documents to substantiate the grounds of opposition to the extent opposed, i.e. as defined by the claims, it cannot be expected that these cited documents are necessarily the most relevant for any amendment not based on the claims as granted. The Board therefore judges that the new documents were filed in response to the patent proprietor's amendment.
- 1.2.2 The Board is also satisfied that the appellant introduced the documents D6, D6bis and D7 at the earliest possible moment, i.e. with the grounds of appeal, and that the respondent has had an adequate opportunity to assess them.
- 1.2.3 Documents D6 and D6bis disclose a pyrolysis method for treating organic waste material containing an organic chlorinated compound, such as 2,4,6-Trichlorophenole (which is a precursor material for dioxin formation) or dioxins contained in incineration ash or fly ash. According to the method the material to be thermally treated before the pyrolysis is mixed or impregnated with urea whereby the organic chlorinated compound or dioxin can be rapidly decomposed and made harmless at relatively low temperature of e.g. 300°C (see English abstract; French translation, page 1, claim 1; and paragraphs [04], [05], [07] to [17], [21]).

The Board thus considers that the property of urea of suppression of the formation of dioxin was known from D6 on 1 June 1993 (publication date of D6). D6 thus

showed that it was apparently not the patent proprietor who discovered this property of urea.

- 1.2.4 Document D7 - which is cited in D4 (see page 222, reference 2) - was published in 1993. D7 discloses that sintering plants are more important sources of PCDD/F emission than for example municipal solid waste incinerators and have to be regarded as being just as problematic as other thermal plants and that this fact was already known to governmental institutions at the end of 1992 (see page 311, first paragraph; page 314, first and fifth paragraph and "references").

The Board considers that document D7 provides another piece of evidence that waste incineration plants and sinter plants represent closely related technical fields which are both confronted with the problem of dioxin formation during the combustion of the materials to be treated. Furthermore, since these facts were known to governmental institutions at the end of 1992 or at least in 1993, it is considered to be evident that the skilled person was also aware of these facts at that time.

Hence document D7 represents evidence supporting the appellant's case that the skilled person when dealing with the formation of dioxins in sinter plants would consider the state of the art in the neighbouring field of waste incineration plants which deal with the same technical problem in accordance with decisions T 560/89 (OJ EPO, 1992, 725; see point 5.2 of the reasons), T 176/84 (OJ EPO, 1986, 050, see points 5.3.1 and 5.3.2) and T 195/84 (OJ EPO, 1986, 121; see points 8.2 to 8.5 of the reasons).

1.2.5 Consequently, the documents D6, D6bis and D7 are relevant to the present case, contrary to the respondent's allegations.

1.3 Document D8 was submitted by the respondent with its letter of 13 December 2005 in order to support inventive step. It represents a post-published document due to its publication date of March 2002. It describes investigations of dioxin formation mechanisms in sinter plants and how urea could reduce pollutant emissions of PCDD/Fs and SO₂ (see abstract).

The appellant did not object to the introduction of document D8 into the proceedings.

1.4 The Board therefore admitted documents D6 to D8 into the proceedings.

2. *Request of the respondent to remit the case to the department of first instance if the decision is based on documents D6/D6bis and/or D7 (Article 111(1) EPC)*

After admitting the new documents into the proceedings, the Board has considered exercising its discretion under Article 111(1) EPC to remit the case to the Opposition Division, as requested by the respondent.

In the present case, since the new documents D6/D6bis and D7 are relevant, it could be argued that there has been a change in the factual framework, even if it represents neither a new ground nor fresh category of evidence. However, there is another important consideration, namely that claim 1 of the main request

was amended during the oral proceedings before the first instance, as discussed above. Thus also the respondent has changed the factual framework. The Board judges that this counteracts the argument in favour of remitting based on the change in factual framework, and shifts the balance in favour of legal certainty. In the present case the patent was granted in 2001, i.e. over five years ago.

The Board considers that both parties had sufficient time to consider the new aspects of the case since the documents D6/D6bis and D7 were filed at the earliest possible time in appeal, and the respondent has twice been able to file new requests, so that the right to be heard under Article 113(1) EPC is met. Furthermore, both parties are equally treated, as implicitly required by Article 113(1) EPC. Neither party would be unfairly disadvantaged if the Board were to decide the case on the basis of the new documents. The respondent, like the appellant, has been limited to arguing the new case in front of one instance, i.e. before the Board, and was already able to change the factual framework before the Opposition Division at a point in the proceedings, i.e. at the oral proceedings before the Opposition Division, when the respondent could no longer react, since claim 1 on which the appeal is based was only submitted at the end of the first instance proceedings.

Therefore, the Board judges that it is not appropriate to remit the case to the first instance for further consideration, but to decide the case itself under Article 111(1) EPC. The respondent's request was thus refused.

3. *Extent of appeal*

The respondent argued that in accordance with G 9/92 and G 4/93 the extent of the appeal proceedings is determined by the notice of appeal and the grounds of appeal as submitted by the appellant, i.e. Articles 56 and 123(2) EPC. It argued that it is strange that Articles 54 and 123(3) EPC as mentioned in the summons should be dealt with even though no explicit objections in this context were made by the appellant.

3.1 The Board notes that the decisions G 9/92 and G 4/93 are particularly concerned with appeal proceedings wherein either the patent proprietor or the opponent is the sole appellant against an interlocutory decision maintaining the patent in amended form. In both cases the issue of *reformatio in peius* arises and neither the Board nor the non-appealing party (i.e. the opponent) may challenge the maintenance of the patent as amended in accordance with the interlocutory decision, whereas in the second case the patent proprietor (i.e. the non-appealing party) is primarily restricted to defending said amended patent. In the present case the opponent is the sole appellant. However, decisions G 9/92 and G 4/93 are not considered to be particularly relevant with respect to the extent of the appeal since it is not *reformatio in peius* that is at stake, but rather the rights of the Board under Article 114(1) EPC.

3.2 G 9/91 does not concern itself with which ground may be considered, but rather with which claims may be considered. It is G 10/91 which deals with grounds. According to this decision G 10/91 a Board of

Appeal or Opposition Division is not obliged to examine opposition grounds beyond the statement under Rule 55(c) EPC (see "order"). This means in the present case that the issues of novelty and inventive step mentioned in the notice of opposition, which also were dealt with in the impugned decision (see decision of the Opposition Division, points 2.5 and 2.6 of the reasons), are included in the grounds to be examined. It is clearly stated in G 9/91 (whose decision reasons apply to G 10/91 as is stated in G 10/91) that in case of amendments of the claims or parts of a patent in the course of the opposition or appeal proceedings, that such amendments are to be fully examined as to their compatibility with the requirements of the EPC (e.g. Article 123(2) and (3) EPC; see point 19 of the reasons).

3.3 Thus it is evident that the issues of novelty, inventive step and at least of Article 123(2) and (3) EPC due to the amendments made to claim 1 of the main request before the first instance have to be dealt with in the present appeal.

4. *Request of the respondent to refer two questions to the Enlarged Board of Appeal (Article 112 EPC)*

In order to ensure uniform application of law, or if an important point of law arises the Board of Appeal shall, during proceedings on a case and either of its own motion or following a request from a party to the appeal, refer any question to the Enlarged Board of Appeal if it considers that a decision is required for the above purposes (see Article 112(1)a) EPC).

4.1 In the present case the respondent requested to refer the following two questions to the Enlarged Board of appeal:

- (a) Whether it is a prerequisite for the applicability of G 2/88 and/or G 6/88 to have an original claim to a composition which is subsequently amended into a use-claim (see point V above); and
- (b) whether it is allowable that the Board goes outside the scope of the appeal, which scope should be considered in conjunction with the effect of withdrawal of the appeal according to G 9/92 (see point VI above).

4.2 The first question (a) neither ensures a uniform application of law, since the Board is not aware of any decision dealing with this issue at all, let alone in a contradictory manner, nor is it a point of law whose answer would affect the outcome of the present case. The answer to this question would only be relevant to the issue of novelty of the process claims under consideration according to the main request and auxiliary requests I, IV and V. Consequently, the answer to the first question (a) is not considered to be relevant for deciding the specific present case. Since the subject-matter of the independent claims of all requests under consideration is considered to lack an inventive step (compare paragraph 6 below) no need exists to have said first question (a) answered.

4.3 The second question (b) concerning the extent of appeal has already been answered by the Enlarged Board of Appeal through its decisions G 9/91 and G 10/91

(compare point 3.2 above) so that also for this question no need exists to refer it to the Enlarged Board of Appeal.

- 4.4 Consequently, the Board refused the respondent's request to refer these two questions to the Enlarged Board of Appeal.

Substantive Issues

5. *Allowability of amendments and novelty (Articles 123(2), (3) and 54 EPC)*

The Board did not decide upon the issue of formal allowability under Article 123(2) and (3) EPC for any claim 1 of the six requests under consideration, even though it seemed to be apparent from the discussion during the oral proceedings concerning the protection conferred by the independent claims that major problems existed in this respect. The Board also did not decide the question of novelty under Article 54 EPC. This rather unusual manner of proceeding is based on the consideration that the subject-matter of claims 1 of all the requests under consideration is considered at least to lack an inventive step (compare paragraph 6 below).

6. *Inventive step (Article 56 EPC)*

- 6.1 The Board interpreted the process claims according to the main request and auxiliary requests I, IV and V in the light of the description as implying the use of urea for achieving the technical effect of suppressing toxic by-products generated during sintering of iron

ore and particularly the formation of dioxins and furans and the release of acidic gases (see patent, paragraphs [0001] and [0019]). These processes, beside the suppression of the chloro-organic pollutants, also suppress other toxic by-products such as acidic gases. Therefore the scope of process claims 1 of the main request and of auxiliary request I which contain the wording "a method of **suppressing the synthesis of chloro-organic pollutants**, especially dioxins and furans, during iron ore sintering" corresponds essentially to that of claim 1 of auxiliary request IV which contains the slightly different wording "a method of **reducing toxic emissions**, more especially dioxin formation, from a sinterstrand, whilst keeping the quantity of ammonia released into the atmosphere at low levels and without need to introduce complex modifications to existing strand equipment during iron ore sintering". Furthermore, the scope of claim 1 of auxiliary request V differs from that according to claim 1 of the main request only in that the concentration range of urea, the ammonia-releasing compound, has been restricted to a range of '**between** 0.02 to 0.04%' which definition includes both end points, since otherwise the wording should have read "in-between 0.02 to 0.04%".

- 6.1.1 The use claims according to auxiliary requests II and III were similarly interpreted in the light of the description of the patent as both achieving the effect of suppressing the synthesis of chloro-organic pollutants and the release of acidic gases during iron ore sintering.

6.1.2 Furthermore, it is evident from the patent in suit that urea *per se* does not suppress the synthesis of chloro-organic pollutants but only serves as a source material for releasing ammonia which then reacts with precursor materials of dioxins or furans and with the other toxic by-products during the sintering of the iron ore (see patent, paragraph [0027]; claim 1). This view is confirmed by one of the theories set out in the patent to how ammonia may act in combustion processes (see patent, paragraph [0011]).

6.2 Document D1

Document D1 discloses an iron ore sintering process with reduced NO_x emissions comprising the addition of ammonia or compounds releasing ammonia when thermally decomposed, such as ammonia salts or urea, in the temperature range of from 50 to 600°C (see French translation, claim and page 2, third and sixth paragraph). Urea can be added up to 4% by weight (see page 2, last paragraph to page 3, first paragraph). According to the examples the granulation is carried out with 6% water. Example 4 specifies a granulation of a mixture containing 6% of water and the homogenous addition of 0.02% by weight urea (see example 4). The iron ore feedstock is deposited onto a moving grate of a Dwight Lloyd type sintering apparatus (which implies a homogenous mixing step) and is combusted/pyrolysed (see page 1, "3. Explication détaillée de l'invention").

6.2.1 It is clear to the skilled person that the urea in the sintering process of D1 when heated above its melting point starts to decompose, thereby forming or releasing ammonia. This technical effect of urea belongs to the

common general knowledge of any chemical engineer. It is also clear to the skilled person that the ammonia produced in the iron ore sintering process according to D1 inevitably will react with acidic gases formed during the sintering process to thereby reduce their emissions.

6.2.2 Thus the sintering process according to D1 is - except for the intended suppression of the synthesis of chloro-organic pollutants which is not mentioned in D1 - the same as that according to the patent in suit. This view was confirmed by the respondent who admitted that claim 1 of the patent in suit as granted was anticipated by the process according to D1.

6.2.3 Taking account of paragraphs 6.2 to 6.2.2 above document D1 is considered to represent the closest prior art for the claim types of all requests, i.e. process claims 1 and use claims 1. This is because the process of D1 - similarly to the patent in suit (see patent, paragraph [0019]) - also aims to reduce or suppress toxic emissions of the iron ore sintering process, particularly of NO_x. Thus the general problem is the same. Furthermore, the process of D1 has the most relevant features in common with the patent in suit and thus requires a minimum of structural modifications. Last but not least, D1 is considered to represent the "most promising springboard" towards the invention which was available to the skilled person. Document D1 is thus considered to meet almost all criteria as set out in the existing jurisprudence of the Boards of Appeal (see Case Law of the Boards of Appeal of the European Patent Office, 4th edition 2001, sections I.D.3 to I.D.3.5).

The respondent argued that D1 does not represent the closest prior art because it does not disclose the technical problem of suppressing the formation of dioxins or furans during the iron ore sintering. They argued that D4 represents the closest prior art because it mentions the reduction of dioxin and furan emission of iron ore sintering plants. This argument cannot be accepted because the process of D4 has less relevant features in common with the patent in suit than D1 since it suggests a different solution requiring a particular apparatus but not requiring the addition of any ammonia releasing compound.

6.3 Problem to be solved with respect to the process of document D1

The problem to be solved with respect to the sintering process of D1 is the suppression or reduction of chloro-organic pollutants, especially dioxins and furans (compare patent, paragraph [0019]).

6.4 Solution to the problem

This problem is solved by a process as defined in claim 1 of the main request or auxiliary requests I, IV and V or by a use as defined in claim 1 of auxiliary requests II and III.

It is credible that the claimed measures provide an effective solution to the technical problem (see e.g. patent, Table 1).

6.5 The Board considers, however, that the subject-matter of process claim 1 of each of the main request and auxiliary requests I, IV and V, as well as the use claim 1 of each of the auxiliary requests II and III is obvious for the person skilled in the art for the following reasons:

6.5.1 It is evident that the problem as such, namely that dioxins or furans are formed during iron ore sintering, belonged to the state of the art (see D4, abstract; and D7, page 311, first paragraph; page 314, first and fifth paragraph). Thus the recognition of the specific technical problem of reducing or suppressing chloro-organic pollutants as defined in point 6.3 above cannot render the subject-matter of claim 1 of any of the requests inventive.

6.5.2 The skilled person being confronted with the specific technical problem set out in point 6.3 above would, in the absence of useful suggestions in the sintering art as to how his problem might be solved, be expected to would look for solutions in neighbouring fields where the same problem is well known and of which the person skilled in the art of the sintering field must be expected to be aware.

6.5.3 In the present case, the person skilled in the art considering the problem would turn to the closely related technical field of waste incineration plants to see how similar problems had been solved there.

Document D3 is related to the technical field of waste material incineration and the suppression of dioxin production in the incineration of waste material (see

abstract). According to D3 alkanolamines and inorganic bases (inhibitor mixtures) or ammonia can be used to inhibit dioxin formation (see column 1, line 67 to column 2, line 7). D3 additionally mentions that the process can generally be applied to any other material which is combustible to form gaseous chlorinated organic compounds, including precursors for dioxin formation (see column 3, lines 1 to 7). Furthermore, the inhibitor mixtures may be applied prior to combustion to the waste material or during the combustion to the fly ash (see column 4, lines 20 to 25).

The teaching of D3 implies to the person skilled in the art, i.e. the aforementioned chemical engineer, the use of ammonia or of alkanolamine containing mixtures, i.e. other derivatives of ammonia which when heated to certain temperatures decompose and thereby release ammonia, to suppress the formation of dioxins and furans during the combustion of waste material.

As a consequence, it is evident that the person skilled in the art would combine the teaching of document D3, i.e. the use of ammonia or an ammonia-releasing compound for the suppression of dioxins or furans in a combustion process, with the iron ore sintering process according to D1 wherein the precursor materials iron ore, coke, etc. in mixture with an ammonia releasing compound, namely urea, are combusted in order to obtain the same dioxin and furan suppressing effect as described in D3. Thereby the person skilled in the art would arrive at the subject-matter of claim 1 of each of the main request and the auxiliary requests I to V.

6.5.4 The respondent's arguments that the technical field of waste incineration plants is not closely related to the field of iron ore sintering processes cannot be accepted since it is proven by documents D4 (see abstract; and page 220, left hand column, first to third paragraphs) and D7 (compare point 1.2.4 above) that the person skilled in the art was aware of their parallels. Furthermore, this fact is also acknowledged in the discussion of the prior art in the patent in suit (see paragraphs [0008], [0009], [0013] and [0016]).

6.5.5 The respondent has argued that according to the patent in suit NO_x is not reduced but that to the contrary the content of NO_x rises slightly (see figure 2; and paragraph [0039]) which is in contradiction with the teaching of D1. This argument cannot be accepted since no claim 1 of any of the requests contains a corresponding limiting feature. Furthermore, not all process parameters are known from D1 (such as the oxygen content of the combustion gases) which would allow a comparison of the NO_x concentrations.

6.6 The Board therefore concludes that the subject-matter of the independent claim 1 of each request does not involve an inventive step (Article 56 EPC).

7. *Request of the respondent to allow the filing of new requests*

The respondent's request for allowance to file new requests incorporating the subject-matter of claim 3 as maintained by the Opposition Division into the independent claims of the existing requests was only

submitted at the end of the oral proceedings before the Board.

With respect to the allowability of these requests, the Board expresses the following opinion:

- 7.1 In the oral proceedings no new matter arose which had not already been addressed in the preceding written appeal proceedings. In the preliminary opinion of the Board as set out in its communication accompanying the invitation to oral proceedings, the Board *inter alia* expressed its provisional opinion that the subject-matter claimed appeared to lack inventive step. The respondent was thus aware well before the oral proceedings that the subject-matter of claim 1 of the main request was likely to be refused. Moreover, the respondent submitted auxiliary requests I to IV with its letter of 13 December 2005 with which it essentially attempted to claim more or less the same subject-matter as with the main request but at the same time tried to overcome formal objections to the main request under Article 123(2) and (3) EPC made by the Board. Additionally, the respondent submitted auxiliary request V with its letter of 9 January 2006 - which was filed only four days before the date of the oral proceedings - and thus after the one month time limit given in the Board's communication and therefore late filed. Claim 1 of auxiliary request V differs from that according to the main request only in that a narrower range for the urea concentration has been included which, however, still included the value according to document D1.

- 7.2 The fact that the respondent had filed its auxiliary request V before the oral proceedings shows that the respondent could have filed such further requests earlier than at the end of the oral proceedings.
- 7.3 This request to file further requests was objected to by the appellant who argued that it cannot immediately present arguments with respect to such new requests.
- 7.4 Furthermore, it is also not *prima facie* apparent to the Board that the use of pelletized urea according to such new requests would result in subject-matter which would be considered to involve an inventive step.
- 7.5 In this context the Board also notes that the respondent had chosen not to present its complete case in a response to the appeal (compare point III, above) as required by Article 10a (1)b) and (2) of the amended Rules of Procedure of the Boards of Appeal. These amended Rules entered into force on 1 May 2003 for all cases in which the notice of appeal was received by the EPO after the date of the entry into force. Since the notice of appeal in the present case was filed on 5 May 2003 the amended Rules of Procedure of the Boards of Appeal apply to the present case. The respondent when questioned by the Board did not give the reasons for not presenting its complete case. As a consequence of this fact, however, the respondent was always one step behind the action of the appellant but on its own responsibility.
- 7.6 Even without considering Articles 10b(1) and (3) of the amended Rules of Procedure of the Boards of Appeal it is established jurisprudence of the Boards of Appeal

that in such case late-filed amended claims are not admitted (see Case Law of the Boards of Appeal of the EPO, 4th edition 2001, chapter VII.D.14.2).

Therefore the request of the respondent to file new requests was refused.

Order

For these reasons it is decided that:

1. The request to send questions to the Enlarged Board of Appeal is refused.
2. The decision under appeal is set aside.
3. The patent is revoked.

The Registrar:

The Chairman:

G. Nachtigall

P. O'Reilly