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D E C I S I O N
of 15 March 2000

Case Number: T 0087/96 - 3.2.2

Application Number: 90200761.6

Publication Number: 0390293

IPC: C22B 7/02

Language of the proceedings: EN

Title of invention:

A process of treating metal chloride wastes

Patentee:

KEMIRA PIGMENTS B.V.

Opponent:

KRONOS INTERNATIONAL, INC.
Tioxide Group Limited

Headword:

-

Relevant legal provisions:

EPC Art. 54, 56, 84

Keyword:

"Inventive step (yes)"

"Clarity (yes)"

"Public availability of non-patent document (no)"

Decisions cited:

-

Catchword:

-



Case Number: T 0087/96 - 3.2.2

D E C I S I O N
of the Technical Board of Appeal 3.2.2
of 15 March 2000

Appellant/other party: KRONOS INTERNATIONAL, INC.
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Appellant/other party: Tioxide Group Limited
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Decision under appeal: Interlocutory decision of the Opposition Division
of the European Patent Office posted 21 November
1995 concerning maintenance of European patent
No. 0 390 293 in amended form.

Composition of the Board:

Chairman: W. D. Weiß
Members: S. S. Chowdhury
R. T. Menapace

Summary of Facts and Submissions

I. The Appellants (opponents) lodged appeals against the decision of the Opposition Division to maintain the patent No. 0 390 293 in amended form. The decision was dispatched on 21 November 1995.

Both appeals and the fees for the appeals were received on 15 January 1996. The statements setting out the grounds of appeal were received on 1 March 1996 and 7 March 1996, respectively.

The oppositions were filed against the whole patent and based on Article 100(a) EPC (lack of novelty and inventive step).

The Opposition Division had decided that amended claims submitted during the opposition procedure met all the requirements of the EPC, in particular those of Article 52(1) EPC.

The following prior art documents among those regarded as relevant by the Opposition Division have been taken into account as relevant documents during the appeal proceedings:

P2: Paige et al, "Physical beneficiation of titanium plant solid wastes: Recovery of titanium minerals and coke", U.S. Dept. of Interior, Bureau of Mines (1982), Report No. 8737.

P15: US-A-4 435 365

P16: US-A-4 759 800

P17: "Antrag auf Erteilung einer Genehmigung" dated
March 14, 1983

P19: GB-A-1 396 612

The Respondent requested that the Documents P15 to P19, being late filed, not be admitted into the proceedings. Moreover, it was not clear to what extent the Document P17 was open to public inspection at the priority date of the patent in suit.

II. Oral proceedings took place on 15 March 2000, at the end of which the following requests forming the basis of the decision were put forward:

Appellant I (Kronos International Inc) and Appellant II (Tioxide Group Ltd) requested that the decision under appeal be set aside and that the patent be revoked.

The Respondent requested that the appeals be dismissed and the patent maintained in amended form on the basis of claims filed at the oral proceedings on 15 March 2000, as a main request and first and second auxiliary requests. The claims of the main request correspond to the claims upheld by the Opposition Division. The Respondent also requested that, should the late-filed documents be admitted, then the case be remitted to the first instance.

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

"A process of treating metal chloride wastes produced by chlorination of titanium ore, comprising the steps of:

- (a) leaching said metal chloride wastes in a hydrochloric acid (HCl)-containing solution, being a spent scrubber liquor generated in the titanium dioxide process, to obtain a solution containing solids and dissolved metals,
- (b) separating said dissolved metals from said solids present in the solution obtained in step (a) to obtain a liquid and a residue,
- (c) selectively precipitating the metals as their hydroxides by adding a neutralizing agent to the liquid obtained in step (b),
- (d) separating the precipitate of metal hydroxides obtained in step (c) from the liquid to obtain a residue, and
- (e) dewatering the residue obtained in step (d)."

IV. The Appellants essentially argued as follows:

Appellant I:

Starting from the closest prior art, Document P2, the essence of the claimed process was the use of a spent scrubber liquor generated in the titanium dioxide process in the leaching step (a). It had been a long standing problem in industrial manufacture that by-products and wastes had to be dealt with, and environmental demands rendered it obvious to recycle wastes. Spent acids accrued in industrial processes and the person skilled in the art would always consider re-using them, accordingly. Documents P15 and P19 exemplified this in the context of processes for

manufacturing titanium tetrachloride and titanium dioxide. These documents disclosed the re-use of spent hydrochloric acid for leaching. The step of using a spent scrubber liquor generated in the titanium dioxide process was not inventive, accordingly.

The reason that spent acid was not used in Document P2 was that this reports laboratory studies where acid was available off the shelf and economising on acid was not an issue. In the case of the opposed patent, which dealt with industrial practice, spent liquor was an abundantly available substance calling for it to be re-used.

Appellant II:

Starting from the closest prior art, Document P2, the essence of the claimed process was the use of a spent scrubber liquor generated in the titanium dioxide process in the leaching step (a). In this document, the quantity of acid used was not important and, moreover, no spent acid was available here for use. If the spent acid had been available then there would have been no prejudice against using it. However, the use of scrubber liquors for leaching waste chlorides from the chlorination of titaniferous ores was known, for example from Document P19, and the person skilled in the art was generally aware of the need to recycle or re-use wastes such as scrubber liquors, as evidenced by Document D16. Therefore, the process of claim 1 of the opposed patent lacked inventive step.

V. The Respondent essentially argued as follows:

In the process of the invention claimed, by using a

spent scrubber liquor and a further waste stream generated in the TiO_2 production, two waste streams were disposed of, and optimal temperature control was achieved without further heating or cooling.

Document P2 was concerned with recovering titanium minerals and petroleum coke from the solid waste generated by the chloride process for manufacturing TiO_2 pigments, and a secondary benefit was that the volume of material to be disposed of was reduced. These objects contrasted with the object of the invention, which was to reduce the quantity of waste materials in the chlorinator process, in particular to treat two waste streams to this end.

Documents P15 and P19 described leaching a titanium ore with hydrochloric acid to upgrade the ore before it was transported to the chlorinator. The spent liquid after leaching was transported to an acid regenerator where the acid was recovered for recycling. A person skilled in the art looking for combining waste streams would not refer to these documents. Moreover, these documents did not suggest the use of a spent scrubber liquor without pretreatment.

Document P16 described the use of titanium oxide chloride solutions by scrubbing off-gases derived from the production of titanium dioxide, but taught the use of a spent scrubber liquor for its TiO_2 content, not for its hydrochloric acid content.

Before the person skilled in the art could recycle a stream he would have had to consider whether the stream was suitable for the purpose, whether it was suitable for the purpose without undergoing a pretreatment, and

whether it was economical to use such a stream. The Documents P15, P16, and P19 did not suggest that the spent liquors thereof met these requirements.

Reasons for the Decision

1. The appeal is admissible.
2. *Amendments*

Claim 1 according to the main request has been amended by importing some of the features, but not all, of claim 8 as granted. Basis for the amendment is to be found on page 2, lines 33 to 35, and page 4, lines 5 to 9 of the application as originally filed, for example. Since claim 8 of the patent as granted refers to a more restricted embodiment, it was not necessary to transfer all the features of this claim to the amended claim 1. Moreover, this amendment has the effect of narrowing the scope of the claim. Therefore, there are no formal objections to the claim.

Appellant I considers the amendment to the claim unclear since it is not clear where the spent acid for the leaching step comes from, there being lots of waste streams capable of providing the acid. The Respondent has explained in this respect that the spent scrubber liquor referred to in claim 1 originates from the process for chlorinating the titanium ore according to the first equation on page 2 of the patent. The same scrubber liquor, resulting from the scrubbing off-gases derived from the production of titanium dioxide, is referred to in the abstract of Document P16. It is for this reason that the solution contains the solids

mentioned in claim 8.

Although there is no explicit disclosure in the patent in suit of the direct use of a spent liquor without a regeneration treatment, this feature is implied for the following reasons: Firstly, the terminology "spent scrubber liquor" suggests a liquid before it is treated. Thus, Document P15 makes a clear distinction between a "spent liquid phase" and "regenerated HCl", and Document P19 similarly uses contrasting terminology ("scrubber liquid" and "recovered acid") to distinguish between the acids before and after the acid recovery step.

Moreover, the spent scrubber liquor of the opposed patent includes solids (see page 6, lines 34 and 35 and claim 8), which would not be the case had the liquor been treated to recover acid as in Documents P15 or P19. Therefore, the term "spent scrubber liquor" may reasonably be taken to mean the liquor before any treatment step is performed on it.

Claim 1, therefore, meets the requirement of clarity.

3. *Admissibility of the Documents P15 to P19*

These documents were filed for the first time with the grounds of appeal. The Board decided that their relevance is such that they should be considered in the appeal procedure, and admitted them under Article 114(1) EPC, accordingly.

Document P17 is an application from "Kronos Titan-GmbH" to a local authority for a permit under Section 15.2 of the (German) Federal Pollution Control Act

("Bundesimmissionenschutzgesetz") to build a plant for disposing cyclone dust obtained in the production of TiO₂ from a chloride process. There is a request on the cover page to refrain from publication of this application. Indeed, according to the above-mentioned provision under the circumstances specified therein the authority in charge should refrain from informing the public of the project and from making the related application and documents annexed to it available for public inspection.

There is nothing which could support the view that the request was not allowed, and this was not contended by Appellant I, who must bear the burden of proof in respect of the public availability of that document cited by him. Equally, it would have been up to Appellant I to adduce specific and convincing evidence for his submission that under German law the Document P17 was available to the public, i.e. that persons not under an obligation to secrecy were entitled and actually able to inspect this document before the priority date (20 March 1989) of the patent under consideration. The (German) Environmental Information Act is not suitable to this end, because it dates from 8 July 1994 only, and even the underlying EU Directive 90/319 was enacted in June 1990, i.e. after the relevant priority date.

Of course, it cannot be excluded that a third person - for example if it qualifies as party to the proceedings or as an affected person ("Beteiligter"/"Betroffener") according to the (German) Administrative Procedure Act ("Verwaltungsverfahrensgesetz") - could have successfully claimed the right to inspect that document. However, a mere possibility, even a high

probability, is not sufficient for establishing an alleged fact. Rather, in respect of the public availability of a document cited, the same standards apply *mutatis mutandis* as to an alleged prior use. Accordingly, it would have been necessary to show the existence of actual persons who qualified on a specific legal basis for access to Document P17 which was - in contrast to, for example, patent specifications - not by its nature available to the public, and furthermore, that (before the priority date) such persons were aware of the existence of that document.

As public availability of Document P17 before the priority date was not proven, it is not considered, for the purposes of the present patent, to form part of the state of the art within the meaning of Article 54 EPC.

4. *Novelty*

All parties were agreed that the process of claim 1 is novel, and the Board see no reason to depart from this view.

5. *Inventive step*

5.1 Closest prior art

Document P2 has been generally acknowledged to disclose the closest prior art, and the Board concurs with this view. It has also been acknowledged all round that this document discloses all the process steps of claim 1 save the use of a spent scrubber liquor in step (a) and the dewatering step (e).

5.2 Technical problem to be solved

The problem is defined in the opposed patent on page 3, lines 11 to 13 as: to provide a process for TiO_2 production that saves on fresh hydrochloric acid and further treats an additional waste stream generated in the process.

5.3 The solution

The use of a spent scrubber liquor for the leaching step does indeed solve this two-fold problem. By combining the blow-over waste from the chlorinator and the spent (waste) acid from the titanium dioxide process, firstly the use of fresh acid is avoided, and secondly two waste streams are simultaneously treated.

5.4 *Inventive step*

According to Appellant I, it is impossible to use a spent scrubber liquor directly from the titanium dioxide process in the leach step (a) since the hydrochloric acid content thereof would not be sufficient to leach the metal chloride wastes in step (a). Depending on the ore used and the process parameters of the titanium dioxide process, this liquor would not necessarily have the required pH value, so the person skilled in the art would not be inclined to use it for leaching. In practice the acid strength would need to be increased by adding acid from an external source, or by a refining step before the spent liquor is satisfactory for leaching the chloride wastes. This view is supported by both Documents P15 and P19, in which hydrochloric acid is recycled after first undergoing a regeneration treatment.

Appellant I further stated at the oral proceedings

before the Board, that there would be a technical prejudice against the use of such spent scrubber liquor for leaching. The use of this spent liquor for leaching would not work, but if it did work, then this Appellant admitted that this would be inventive.

Despite this technical prejudice, however, the inventors of the opposed patent realised that this spent liquor could, indeed, be usefully employed in the leaching step without an intermediate refinement or fortification step.

The Board is convinced that, once someone does stumble on the idea of using this spent liquor for the subsequent leaching step, then knowing in advance this intention of using the spent liquor, he would also realise that the required pH value of the acid may need to be adjusted, and that this could be achieved by appropriate control of the starting materials and process parameters of the titanium dioxide process. The latter are then considered to be routine work for the person skilled in the art.

The Document P16 discloses the recycling of titanium oxide chloride solutions including hydrochloric acid and obtained by scrubbing off-gases derived from the production of titanium tetrachloride. There is an indication in this document that the acidic strength of the scrubbed gases from chlorination plant for producing titanium tetrachloride is variable and may be adjusted as required, and that the solution may be high in acidic content (column 3, lines 17 to 31). This solution is recycled for its titanium content, however, and not for its acid content, so that this document does not suggest re-using the acidic solution from

scrubbing off-gases for leaching.

Therefore, the Board recognises an inventive step in the use of the spent scrubber liquor from the titanium dioxide process for the leaching step (a), particularly in the realisation that the liquor could indeed be suitable for, or made suitable for, leaching.

6. Since, in view of the above, the grounds of opposition raised by the Respondents do not prejudice the maintenance of the patent in amended form, the patent in suit can be maintained on the basis of the Appellant's main request.
7. Therefore, there is no need to examine the Appellant's auxiliary requests.
8. *Other matters*

The Respondent requested that the case be remitted to the first instance so that it may have the benefit of a procedure before two instances. The Board considers that the essence of the case has not changed since the opposition procedure, and the new documents were presented merely to fill gaps in the Appellants' arguments. Moreover, the Respondent was in a position to argue its case adequately at the oral proceedings, so that a remittal of the case to the first instance is not justified.

Order

For these reasons it is decided that:

The appeals are dismissed.

The Registrar:

The Chairman:

V. Commare

W. D. Weiß