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BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

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File Number: T 861/92 - 3.3.2

Application No.: 89 117 393.2

Publication No.: 0 364 754

Title of invention: Process for the production of aluminium sulphate, starting from the residual slimes of plants for the anodic oxidation of aluminium, and pump to convey said slimes

Classification: CO1F 7/74

DECISION of 1 February 1993

Applicant:

METAL FINISH S.P.A.

Headword: Aluminium sulphate/METAL FINISH

EPC Article 82, Rule 30(b)

Keyword: "'<u>A priori</u>' lack of unity of invention (no)"

Catchwords

"Multistep process - apparatus enabling one step to be carried out"

 Europäisches Patentamt
 European Patent Office
 Office européen des brevets

 Beschwerdekammern
 Boards of Appeal
 Chambres de recours

Case Number : T 861/92 - 3.3.2

D E C I S I O N of the Technical Board of Appeal 3.3.2 of 1 February 1993

Appellant :

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METAL FINISH S.P.A. Via Cerioli, 71 I - 24068 Seriate (Bergamo) (IT)

Representative :

Faggioni, Marco, Dr. Ing. c/o Fumero Studio Consulenza Brevetti Franz-Joseph-Strasse 38 W - 8000 München 40 (DE)

Decision under appeal :

Decision of the Examining Division of the European Patent Office dated 15 April 1992 refusing European patent application No. 89 117 393.2 pursuant to Article 97(1) EPC.

Composition of the Board :

Chairman : P.A.M. Lançon Members : M.M. Eberhard S.C. Perryman

Summary of Facts and Submissions

I. European patent application No. 89 117 393.2 (publication No. 0 364 754) was refused by a decision of the Examining Division. The decision was based upon the set of claims as originally filed. The independent process Claim 1 and apparatus Claim 9 read as follows:

> "1. Process for the production of aluminium sulphate, starting from the residual slimes of plants for the anodic oxidation of aluminium, characterized in that it comprises the steps of:

a) thoroughly mixing the slimes by crushing their solid parts, eventually adding water, up to obtaining a fully homogeneous thick paste, with an overall water content of between 70% and 90% on the total weight of the mixture;
b) feeding the paste thus obtained, by means of a pumping device, into a reactor equipped with a stirrer, keeping the thick paste under stirring;

c) reacting all the aluminium hydroxide contained in said paste, with a stoichiometric quantity of sulphuric acid, according to the reaction

 $2Al(OH)_3 + 3H_2SO_4$ ----- $Al_2 (SO_4)_3 + 6H_2O$ d) removing the reaction heat produced to an extent such as to keep the temperature of the reaction products between 90°C and 160°C;

e) hot filtering the aluminium sulphate solution thus obtained, at a temperature not lower than 40°C, in order to eliminate any insoluble residues and impurities.

9. Piston pump for conveying thick fouling pastes containing solid parts, particularly suited for use in a process for the production of aluminium sulphate starting from the residual slimes of plants for the anodic oxidation of aluminium, characterized in that the closing and opening of the suction and delivery valves are mechanically controlled by means of control rods operated in synchronism with the piston movement, substantially in correspondence of the dead centers of the piston stroke, by the same gearmotor unit which operates the piston."

II. The ground for refusal was that the subject-matters of Claims 1 and 9 did not satisfy the requirement of unity of invention set out in Article 82 EPC.

According to the decision, although the pump of Claim 9 could be used in the process of Claim 1, there was no indication in Claim 1 that such a pump was essential or necessary for carrying out this process. If the features of the claimed pump were necessary for performing the process of Claim 1, then they should have been included in Claim 1 otherwise the latter would have been speculative. The Examining Division further pointed out that the use of the pump according to Claim 9 was not restricted to use in the process of Claim 1. This pump might be used to convey other materials. It was concluded that no essential technical link between the two claims could be recognised especially as the two technical problems were not necessarily related.

In connection with Rule 30(b) it was pointed out that the apparatus of Claim 9 included only means for pumping slimes and therefore was **incapable** of effecting the process of Claim 1 in itself. Accordingly the pump of Claim 9 could not be considered as a means or apparatus **specifically designed** for carrying out the process of Claim 1.

III. The Appellant lodged an appeal against this decision and filed two amended sets of claims as first and second auxiliary requests. The Appellant's arguments may be summarised as follows:

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The statement that there is no essential technical link just because the two main Claims 1 and 9 are actually independent, i.e. with no cross restrictions, is evidently wrong, since the presence of more independent claims in a single patent is foreseen and admissible.

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Furthermore, there is a very strict technical relationship between the problems solved by the process and by the apparatus of the present invention and, therefore, between the respective "special technical features", as provided for by Rule 30. In fact, the process solves in a new way the problem of moving in an economic and continuous manner, inside a chemical plant, thick slimes containing solid parts, so as to be able to apply thereto the known reaction of oxidation of aluminium from hydroxide to sulphate. On the other hand, the problem solved by the claimed apparatus is to pump a thick fouling paste (coming out from the first step of the process), with no clogging or other malfunction.

The requisite that the apparatus must be apt to carry out all the five steps of the process seems to be excessive. 3 It is in fact practically impossible for any process whatsoever - and particularly for a chemical process-to be entirely carried out in a single apparatus. In Rule 30 previously in force, there is no reference to the fact that the process should use only such apparatus or means. In the present case there is no doubt about step b) of the process being the key step which provides the greatest innovation, whereby it is certainly legitimate to consider the apparatus carrying out said step as "specifically designed" for the process. In fact, hitherto, it had been impossible to carry out said process on an industrial level, essentially due to the lack of a suitable pumping apparatus.

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IV. The Appellant requests that the decision under appeal be set aside and that the examination of the application be prosecuted on the basis of the claims as originally filed (main request), or on the basis of the auxiliary request I or of the auxiliary request II submitted with the Statement of Grounds of Appeal.

Reasons for the Decision

1. The appeal is admissible.

- 2. The former Rule 30 EPC is applicable to the application, as under Article 3.3 of the Decision of the Administrative Council of 7 December 1990 the amended Rule 30 EPC introduced by Article 1 of that Decision only applies to applications filed after 1 June 1991.
- 3. As the decision under appeal does not make any reference to the prior art, it is apparent to the Board that an objection of lack of unity "<u>a priori</u>" is intended.
- According to the description, the physical shape in which 4. the aluminium hydroxide slimes come out from plants for the anodic oxidation of aluminium is totally unsuited for carrying out any type of chemical conversion on an industrial scale. Conveying these slimes through the plant in semi-solid form and subsequently converting their physical structure into one more suited to the requirements of the chemical reaction of conversion into aluminium sulphate by means of sulphuric acid, involve considerable problems and costs (cf. published application, column 1, lines 25 to 54). As pointed out in column 2, lines 22 to 24, the handling of aluminium hydroxide slimes is connected with heavy problems of corrosion and fouling. On the other hand, the controlled landfill of said slimes creates serious problems of

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pollution (cf. column 2, lines 1 to 6). Therefore, the technical problem underlying the application is seen in providing a process which overcomes these drawbacks and enables the conversion of the aluminium hydroxide contained in said slimes into aluminium sulphate in an economical and continuous manner (cf. column 2, lines 7 to 24).

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It is proposed to solve this problem by the combination of steps a), b), c), d) and e) recited in the process Claim 1. According to the description (column 4, lines 36 to 40) the steps of homogenising and conveying the slime, i.e. steps a) and b), are particularly important. Step b) consists of feeding the paste obtained in the homogenising step a), by means of a pumping device, into a reactor equipped with a stirrer and keeping the thick pastes under, stirring (cf. Claim 1). As the pastes resulting from step a) are thick, fouling and corrosive pastes with thixotropic characteristics, it is implicit that the pumping device used to perform step b) of Claim 1 must be able to convey these thick, fouling and corrosive pastes. In this context, the Board notes that according to the description (column 6, lines 19 to 36) the known pumps existing on the market before the priority date could "by no means be used in the process of the invention".

The technical problem connected with the apparatus Claim 9 relates to providing a pumping device which is capable of pumping thick fouling pastes containing solid parts, in particular the aluminium hydroxide slimes obtained in step a) of the process, without clogging up or backflow of the slimes (cf. column 2, lines 24 to 34 and column 6, lines 19 to 40).

In the absence of evidence proving the contrary, this problem is solved by a piston pump having the structural

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features recited in the characterising part of Claim 9 and working as indicated therein.

- 6. A comparison of the two technical problems defined hereabove in points 4 and 5 respectively, shows that these problems are technically related, especially since they are clearly interdependent. Thus, when looking for a solution to the problem concerning the process the skilled person will also be faced with the problem of providing a device which enables conveyance of the thick, fouling and corrosive slimes, i.e. with the problem defined in connection with the apparatus claim.
 - As regards the solutions to these problems, it is observed 2 that the process Claim 1 includes step b) which involves ----the use of pumping means for conveying the thick, fouling and corrosive paste (slimes) obtained in step a), into the reactor. This step is regarded as particularly important in the description (cf. column 4, lines 36 to 41 and column 6, lines 21 to 36). On the other hand, the solution to the second problem is a piston pump having the particular features defined in Claim 9 and which is capable of performing the function required in step b) of the process. Therefore, there also exists a technical relationship between the piston pump of Claim 9 and step b) of the process Claim 1 in which the corresponding pumping means are defined in functional terms. This technical relationship creates a unifying link between the subject-matters of Claims 1 and 9. As it is not derivable from the application as filed or from the decision under appeal that step b) of the claimed process is either known or not inventive, the Board comes to the conclusion that the inventions defined in the process Claim 1 and in the apparatus Claim 9 are "a priori" so linked as to form a single general inventive concept. Therefore the claims as originally filed meet the requirement of unity of invention set out in Article 82.

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The arguments put forward in respect of the former Rule 30 (cf. Appellant's arguments and point 11 of the decision under appeal) call for the following remarks.

According to the former Rule 30, Article 82 should be construed as permitting in particular the inclusion of any one of the combinations of claims listed in subparagraphs (a), (b) and (c) in the same application. It is clear from the wording of this Rule that the list of possible combinations of claims of different categories is not exhaustive and that other combinations may be permitted if they meet the requirements of Article 82. In the present case, the apparatus of Claim 9 is specifically adapted for carrying out step b) of the claimed process, i.e. only one step of the five-step process. However, as the subjectmatter of Claims 1 and 9 are considered to satisfy the requirements of Article 82 (cf. the reasons given above) t it can remain open whether or not these claims represent a a combination of independent claims of the kind mentioned in zparagraph (b) of the inexhaustive list given in Rule 30.

The claims of the main request being in conformity with the requirements of Article 82, there is no need to consider the auxiliary requests.

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Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the Examining Division for further prosecution on the basis of the claims as originally filed.

The Registrar:

The Chairman:

P. Martorana

P.A.M. Lançon