

20

Veröffentlichung im Amtsblatt Publication in the Official Journal Publication au Journal Officiel	Ja/Nein Yes/No Oui/Non
---	------------------------------



Aktenzeichen / Case Number / N° du recours : T 103/86

Anmeldenummer / Filing No / N° de la demande : 81 305 429.3

Veröffentlichungs-Nr. / Publication No / N° de la publication : 0 052 511

Bezeichnung der Erfindung: Production of p-phenylenediamine

Title of invention:

Titre de l'invention :

Klassifikation / Classification / Classement : C 07 C 87/58

ENTSCHEIDUNG / DECISION

vom / of / du 20 March 1987

Anmelder / Applicant / Demandeur :

Patentinhaber / Proprietor of the patent /

Titulaire du brevet :

E.I. Du Pont De Nemours and Company

Einsprechender / Opponent / Opposant : AKZO NV

Stichwort / Headword / Référence : Phenylenediamine/DU PONT

EPÜ/EPC/CBE Articles 52 and 56; Rule 67

Kennwort / Keyword / Mot clé :

"Novelty - implicit disclosure" -
"Inventive step" - "Reimbursement of
appeal fee"

Leitsatz / Headnote / Sommaire



Case Number : T 103/86

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 20 March 1987

Appellant :
(Opponent)

AKZO N.V.
Velperweg 76
NL-6824 BM Arnhem

Representative :

Gottschal, Auko Jan
R. Sieders c.s.
Postbus 314
NL-6800 AN Arnhem

Respondent :
(Proprietor of the patent)

E.I. Du Pont De Nemours and Company
Legal Dept.,
1007 Market Street,
Wilmington, Delaware 19898
(US)

Representative :

Bernard, Eric Edward et al.,
Brookes and Martin,
High Holborn House,
52/54 High Holborn,
London WC1V 6SE
(GB)

Decision under appeal :

Decision of Opposition Division of the European
Patent Office dated 20 January 1986 rejecting
the opposition filed against European patent
No. 0 052 511 pursuant to Article 102(2) EPC.

Composition of the Board :

Chairman : K. Jahn
Member : R. Andrews
Member : R. Schulte

Summary of Facts and Submissions

I. The mention of the grant of the patent No. 0.052 511 in respect of European patent application No. 81 305 429.3 filed on 17 November 1981 and claiming priority of 17 November 1980 and 6 November 1981 from two prior applications in the United States of America, was announced on 7 March 1984 (cf. Bulletin 84/10) on the basis of 8 claims. Claim 1 read as follows:

"A method of producing p-phenylenediamine which method comprises contacting a solution of p-aminoazobenzene in aniline with hydrogen in the presence of a nickel catalyst at a temperature of not more than 130°C, said solution containing dissolved water in an amount up to 6 per cent by weight and anions derived from a strong acid in an amount less than 500 parts per million by weight, and having substantially no free water admixed therewith".

II. On 21 November 1984 the Appellant filed an opposition citing the following documents:

- (1) JP-A2-52 035/79 (together with the Derwent Abstract and English translation of the Japanese patent)
- (2) GB-A-1 430 366
- (3) NL-A-7 703 353
- (4) EP-A-0 035 815
- (5) Landolt-Börnstein, 2nd Part, Volume B, page 3-435, and
- (6) J. Timmermans, Physico-chemical constant of binary systems in concentrated solutions, Volume 4, pages 85 and 86 (1960)

and requested the revocation of the patent on the ground that the subject-matter of Claim 1 to 3 was not patentable within the terms of Articles 54 and 56 EPC.

III. The Opposition Division rejected the opposition by a decision dated 20 January 1986 on the basis that the description and, in particular, the Examples of the patent-in-suit disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art. Furthermore, the subject-matter of the disputed patent was novel since each of the cited documents (1) to (4) failed to disclose at least one of the following features: (i) nickel catalysts, (ii) dissolved water in an amount of less than 6% by weight, (iii) anions derived from a strong acid in an amount less than 500 ppm by weight and (iv) substantially no free water, which are called for by the claimed process for preparing p-phenylenediamine (hereafter PPD) by hydrogenating a solution of p-aminoazobenzene (hereafter PAAB) in aniline. The Opposition Division also argued that the subject-matter of the disputed patent involved an inventive step because none of the cited documents, taken alone or in any combination, would have led the person skilled in the art to the claimed process with the advantages disclosed in column 3, lines 58 to 62 of the printed patent.

IV. A notice of appeal was lodged by the Opponent against this decision on 15 March 1986 with payment of the appropriate fee. In a statement of grounds filed on 16 April 1986 the Appellant argued that a process for the preparation of PPD from PAAB having all the features specified in Claim 1 of the patent-in-suit is implicitly disclosed in the cited prior art. Thus it is impossible for a person skilled in the art to follow the prior art teaching without infringing Claim 1 of the disputed patent. The Appellant is also of the opinion that, since the problem allegedly solved by the present process only arises in connection with PAAB solution obtained by the process specified in Claim 4 of the disputed patent, the inventive step, if

any, could only be recognized for the combined subject-matter of Claims 1 and 4.

V. In a communication the Board expressed the opinion that, although the subject-matter of the disputed patent was considered to be novel, it did not appear to involve an inventive step in the light of the combined teaching of documents (1) and (2) unless it could be demonstrated that the use of a nickel catalyst in place of the platinum, palladium and rhodium catalysts disclosed in document (1) gave rise to an unexpected effect in the operation of the process.

VI. The Appellant requested that the decision under appeal, insofar as it relates to Claims 1 to 3, be set aside and that the appeal fee be reimbursed.

The Proprietor of the patent (Respondent) has neither replied to any of the official communications nor filed any requests in respect of the appeal.

Reasons for the Decision

1. The appeal complies with the requirements of Articles 106 to 108 and Rule 64 EPC and is, therefore, admissible.
2. The patent-in-suit relates to a process for preparing PPD by hydrogenating a solution of PAAB in aniline in the presence of a nickel catalyst at a temperature of not more than 130°C, the said solution containing dissolved water in an amount up to 6% by weight and anions derived from a strong acid in an amount less than 500 ppm by weight, and having substantially no free water admixed therewith.

After examination of the cited prior art the Board is satisfied that this technical teaching is not disclosed therein.

- 2.1 Thus document (1) is wholly silent on the use of nickel catalysts for the hydrogenation of solutions of PAAB in aniline.
- 2.2 In the absence of any evidence to support the Appellant's allegation of lack of novelty in respect of the disclosure in document (2), the Board is not in a position to determine whether a person skilled in the art following the teaching of this document would inevitably arrive at a result falling within the terms of the present Claim 1. Under these circumstances, it must be assumed that the subject-matter of the disputed patent is not anticipated by this document.
- 2.3 Document (3) and document (4), which was cited under the terms of Article 54(3) EPC, relate to processes for the preparation of solutions of PAAB in aniline and only refer to the subsequent catalytic hydrogenation of such solutions in very general terms without specifying any particular catalysts (cf. (3), page 4, lines 29 to 32; (4) page 2, lines 26 to 29). These documents, therefore, do not destroy the novelty of the subject-matter of the disputed patent.
- 2.4 Documents (5) and (6) disclose data in connection with the binary system, aniline-water. However, it is considered that these documents are irrelevant as this data cannot be applied with any accuracy to the tertiary mixture of aniline-water-PAAB.

The Board therefore shares the opinion of the Opposition Division that the subject-matter of the patent-in-suit is

novel with respect to the disclosure of the cited documents.

3. It has therefore to be determined whether the subject-matter of the patent-in-suit involves an inventive step in the light of this prior art.

3.1 According to the Proprietor of the disputed patent the basis for the invention lies in the discovery that a nickel catalyst used in the hydrogenation of a PAAB in a liquid product obtained by the rearrangement of 1,3-diphenyltriazene exhibits an increase in activity and productivity when the strong acid anion concentration in the liquid is reduced, free water is removed, and a small amount of water is present in solution in aniline (cf. col. 3, lines 53 to 62). However, solutions of PAAB in aniline satisfying all the conditions called for in the disputed Claim 1 are disclosed in document (1) (cf. paragraphs 3.2, 3.3 and 3.4 below). In the light of the prior art and in the absence of any evidence demonstrating that the increase in activity and productivity only occurs when using a nickel catalyst to hydrogenate solutions of PAAB fulfilling the known conditions called for in the disputed Claim 1, the Board considers it is highly plausible that similar increases in catalytic activity and productivity would occur in respect of the hydrogenation catalysts disclosed in document (1).

Therefore, having regard to the closest state of the art as represented by document (1) the problem underlying the patent-in-suit is to be seen in merely providing a further process for the preparation of PPD by the catalytic hydrogenation of solutions of PAAB in aniline.

3.2 Document (1) discloses the preparation of PPD by hydrogenating a solution of PAAB in aniline in the

presence of a hydrogenation catalyst, for example, a supported palladium, rhodium or platinum catalyst (cf. Claims 1 and 2 of the English translation). It is also known from this document that the PAAB solution in aniline, obtained by the acid catalysed isomerisation of diazoaminobenzene, should be freed from the acid catalyst by either washing the solution with water or neutralising and washing it with a dilute alkali solution before it is subjected to hydrogenation (cf. page 4, lines 2 to 9 of the English translation). As illustrated in the Examples, the acid is removed from the aniline solution of PAAB prior to hydrogenation by washing it three times with a 0.5N sodium hydroxide solution. Reference Example 1 demonstrates that the amount of sodium ions remaining in the aniline layer after separation from the aqueous layer varies between 18 ppm and 1.4 ppm. Therefore, in view of this washing treatment it must be assumed that the content of anions derived from the acid catalyst used for the isomerisation is reduced to even a much greater extent. Thus it can be concluded that ^{the} amount of anions derived from a strong acid in the aniline solutions of PAAB used in Examples 11 to 13, 15, 16 and 18 of document (1) due to the anions remaining after the washing treatment and those subsequently added is less than 500 ppm by weight. Therefore, these prior art solutions of PAAB in aniline fulfil one of the conditions called for in Claim 1 of the disputed patent.

- 3.3 Moreover, the aniline solutions of PAAB used in the above-mentioned Examples are allowed to stand for a certain length of time to ensure that any finely dispersed alkali separates out of the aniline layer (cf. the last paragraph of page 12 of the English translation of document (1)). In view of the similarity between this procedure and the one described in the disputed patent (cf. column 7, lines 48 and 49) it can certainly be concluded that the above-

mentioned solutions of PAAB in aniline do not contain any substantial amounts of free water admixed therewith. Therefore, a further condition called for in the disputed Claim 1 is met by these prior art solutions.

3.4 Due to the fact that aniline is soluble in water to some extent the aniline solution used in the above-mentioned Examples of document (1) must contain some dissolved water. This conclusion is confirmed by the reference in Examples 7 and 8 of this document to the dehydration of this solution and the fact that the aniline solution of Example 1 of the disputed patent, which was subjected to a similar washing and separation process, contained 4% dissolved water (cf. column 7, lines 56 and 57). The composition of the aniline solutions of PAAB subjected to hydrogenation in document (1) (cf. last three lines of page 10 of the English translation) is very similar to the washed and separated aniline solutions of PAAB disclosed in Example 1 of document (3) and Example III of document (4) which the Appellant found to contain 2.4% and 1.75% by weight of dissolved water respectively. Thus it can be definitely concluded that the solutions of PAAB in aniline of Examples 11 to 13, 15, 16 and 18 contain dissolved water in an amount up to 6% by weight. Therefore, the third and final condition required by Claim 1 of the disputed patent is fulfilled by the above-mentioned prior solutions.

3.5 From the above therefore it follows that the process of Claim 1 of the disputed patent differs from the one disclosed in document (1) in the use of a nickel hydrogenation catalyst. However, the equivalence of nickel catalysts to the palladium, platinum and rhodium catalysts specifically mentioned in document (1) in the hydrogenation of PAAB solutions in aniline to PPD is demonstrated in document (2) (cf. page 1, line 94 to page

2, line 5). Therefore in the absence of any evidence demonstrating that the increase of activity and productivity of the catalyst only occurs when a nickel catalyst is employed in the present hydrogenation process, it is considered that the substitution of one known hydrogenation catalyst by another known hydrogenation catalyst for the hydrogenation of a solution of PAAB in aniline whose composition as regards water content and the amount of anions derived from a strong acid is known from the teaching of document (1) does not involve an inventive step.

The Board therefore concludes that the present solution to the problem as defined above does not involve an inventive step in the light of the technical teaching in documents (1) and (2). Thus the subject-matter of Claim 1 of the patent-in-suit is unpatentable.

Since all the claims of the disputed patent must meet the requirements of the Convention an examination of the dependent claims 2 to 8 is unnecessary.

4. As the appeal succeeds it is necessary to consider whether the Appellant's request for the reimbursement of the appeal fee in accordance with Rule 67 EPC should be granted. For the appeal fee to be reimbursed there has to have been a substantial procedural violation by the Opposition Division. The Board would find such a violation present if it should consider that the decision under appeal was not reasoned as required by Rule 68(2) EPC.

To satisfy Rule 68(2) EPC in this respect the decision must contain, in logical sequence, those arguments which justify the tenor. Moreover the conclusion drawn from the facts and evidence must be made clear. Therefore in the decision all facts, evidence and arguments which are

essential to the decision must be discussed in detail. If novelty is in question then the analysis of the prior art should be set forth in such a manner that these features which distinguish the subject-matter of the claims in question from the prior art are clearly indicated. In respect of inventive step the point at which the inventive step occurs must be indicated together with the reason why it is considered to be inventive and why any negative grounds put forward are invalid. Alternatively, the logical chain of reasoning commencing with the closest prior art used to justify the conclusion that the claimed subject-matter does not involve an inventive step must be indicated and an explanation why highly relevant indicia adduced by the Applicant do not help to support the notion of inventive step.

- 4.1 The omission of any reference to the Appellant's letter of 17 September 1985 in the "Summary of Facts and Submissions" of the decision under appeal cannot be taken as implying that the Opposition Division did not consider the observations therein, but rather that the Opposition Division was of the opinion that they were not significant for the decision having regard to the arguments put forward in the Patentee's reply of 16 July 1985.
- 4.2 In the Board's view the detailed analysis of the prior art in Part II of the decision under appeal in which it was clearly shown that each of the cited documents (1) to (4) failed to disclose a process for the preparation of PPD by the catalytic hydrogenation of a solution of PAAB in aniline with all the features required by Claim 1 of the disputed patent represents a reasoned justification of the Opposition Division's conclusion that the subject-matter of the disputed patent was novel.

In the absence of any specific teaching relating to the catalytic hydrogenation of solutions of PAAB in aniline to PPD in the presence of nickel catalysts at temperatures of not more than 130°C in documents (3) and (4), the Opposition Division considered that the experimental results submitted by the Appellant purporting to show that these documents disclose solutions of PAAB in aniline fulfilling the conditions called for in the disputed Claim 1 were irrelevant to the decision under appeal. Under these circumstances a discussion of these results would have been superfluous.

- 4.3 With respect to inventive step the Opposition Division argued that none of the cited documents would have led the person skilled in the art to the claimed process since the cited documents (1) to (3) were not concerned with the present problem of increasing the activity and productivity of nickel catalysts in the hydrogenation of solutions of PAAB in aniline to PPD and made no reference to the importance of the three features which are necessary according to the patent-in-suit to solve the stated problem.

Therefore the Board concludes that the request for reimbursement of the appeal fee cannot be granted, since the decision under appeal was not marred by a substantial procedural violation.

Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.
3. The request for the reimbursement of the appeal fee is refused.

The Registrar:

The Chairman:

*Sohn 30.3.
RWA.*

