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**D E C I S I O N**  
**of 8 September 1998**

**Case Number:** T 0578/95 - 3.3.5

**Application Number:** 89310175.8

**Publication Number:** 0364153

**IPC:** B01J 35/06

**Language of the proceedings:** EN

**Title of invention:**  
Metal fabrics

**Patentee:**  
Johnson Matthey Public Limited Company

**Opponent:**  
PGP Industries, Inc.  
Norsk Hydro a.s.

**Headword:**  
Knitted catalyst/JOHNSON MATTEY

**Relevant legal provisions:**  
EPC Art. 54, 84

**Keyword:**  
"Novelty (main request, no), features implicitly disclosed"  
"Clarity (auxiliary request , no)"

**Decisions cited:**  
T 0233/90, T 0288/90

**Catchword:**  
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Boards of Appeal

Chambres de recours

Case Number: T 0578/95 - 3.3.5

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.5  
of 8 September 1998

**Appellant:**  
(Proprietor of the patent) Johnson Matthey Public Limited Company  
New Garden House  
78 Hatton Garden  
London, EC1N 8JP (GB)

**Representative:**  
Wishart, Ian Carmichael  
Patents Department  
Johnson Matthey Technology Centre  
Blounts Court  
Sonning Common  
Reading, Berks RG4 9NH (GB)

**Respondent:**  
(Opponent 01) PGP Industries, Inc.  
13429 Alondra Boulevard  
Santa Fe Springs, California 90670 (US)

**Representative:**  
Cummings, Sean Patrick  
David Keltie Associates  
12 New Fetter Lane  
London EC4A 1AP (GB)

**Respondent:**  
(Opponent 02) Norsk Hydro a.s.  
Bygdoy allé 2  
0203 Oslo 2 (NO)

**Representative:**  
Böhm, Brigitte, Dipl.-Chem. Dr.  
Patentanwältin  
Weickmann & Partner  
Postfach 86 08 20  
81635 München (DE)

**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted 30 May 1995  
revoking European patent No. 0 364 153 pursuant  
to Article 102(1) EPC.

**Composition of the Board:**

**Chairman:** R. K. Spangenberg  
**Members:** M. M. Eberhard  
J. H. van Moer

## Summary of Facts and Submissions

- I. European Patent No. 0 364 153 based on application No. 89 310 175.8 was granted on the basis of nine claims.
- II. The Respondents (Opponents 01 and 02) filed notices of opposition requesting revocation of the patent on the grounds of lack of novelty, lack of inventive step and insufficiency of disclosure. During the opposition proceedings, the parties relied inter alia on the following citations:

D1: GB-A-1 404 576,  
D2: WO 86/03479,  
D8: US-A-3 776 701,  
D11: US-A-3 660 024,  
D12: US-A-4 672 825,  
D19: DE-C-1 034 155,  
D21: Holleman-Wiberg, Lehrbuch der Anorganischen Chemie, pages 601, 1186-1190,  
D25: DE-A-28 29 035  
D26: Platinum Metals Rev., 1993, 37, (2), pages 76 to 85.

- III. In a decision posted on 30 May 1995 the Opposition Division revoked the patent. The decision was based on the set of amended claims 1 to 3 submitted on 9 May 1995.

The Opposition Division held that the subject-matter of claim 1 lacked novelty over the disclosure of D19. The skilled person reading D19 would immediately have understood that the catalytic metals should be platinum or a platinum alloy when the catalyst was used for the oxidation of ammonia. A pack comprising several sheets was implicitly disclosed in D19 since it was also

common in the art that several sheets of catalytic gauze were used for said oxidation as shown by D1. The subject-matter of claim 1 was also considered to lack novelty with respect to D1. The Opposition Division took the view that claim 2 met the requirements of novelty and inventive step.

IV. The Appellant (Patentee) lodged an appeal against this decision and filed two auxiliary requests designated "auxiliary request 5" and "auxiliary request 6" on 13 July 1995 together with the statement of grounds of appeal. In a communication from the Board, the parties' attention was drawn to two documents illustrating the common general knowledge before and after the filing date of D19, namely "Holleman-Wiberg, Lehrbuch der Anorganischen Chemie", 1955, pages 239 to 240 (hereinafter D29), and "Holleman-Wiberg, Lehrbuch der Anorganischen Chemie", 1958, pages 239 to 240 (D30). On 30 July 1998, the Appellant informed the Board that claims 1 and 2 filed on 13 July 1995 as "auxiliary request 6" represented its main request, while the single claim 1 submitted on the same date as "auxiliary request 5" was the auxiliary request. Claims 1 and 2 of the main request are identical to claims 1 and 2 considered in the decision under appeal, and claim 1 of the auxiliary request is identical to claim 2 of the main request. Claims 1 and 2 of the main request read as follows:

"1. An ammonia oxidation catalyst pack comprising a plurality of knitted fabric sheets composed entirely of platinum or platinum alloy."

"2. An ammonia oxidation catalyst consisting of a three dimensional knitted pad formed entirely of platinum or platinum alloy."

Oral proceedings were held on 8 September 1998 in the absence of the Appellant. The latter had notified the Board on 1 September 1998 that it would not be represented at the oral proceedings.

- V. The Appellant's submissions in writing can be summarised as follows:

D19 was a published document, but the extent of availability to the public was extremely doubtful as the patent seemed to have been abandoned in the 1950's by its inventors and proprietor. Furthermore, D19 did not teach a plurality of sheets of knitted catalyst nor a catalyst composed entirely of platinum or platinum alloy. No precious metal was expressly disclosed in D19. Therefore, a finding of lack of novelty required extending the teaching of D19 beyond its explicit teaching in two directions, using knowledge external to D19. According to the Guidelines C-IV, 7.1, it was not permissible to combine separate items of prior art for assessing novelty.

In connection with the inventive step, the Appellant submitted that it was wrong to consider D19 as forming part of the state of the art since this document was aged art, forgotten or abandoned. Furthermore, the evidence of unexpected results filed by the Appellant was not disclosed, or hinted at, in D19.

- VI. The Respondents presented inter alia the following arguments:

D19 anticipated the subject-matter of claim 1 of the main request as the skilled person knew directly and without any further consideration that the oxidation of ammonia was usually carried out with Pt and Pt-alloy catalysts and that a plurality of nets were used in large plants as shown by D21, D29 and D30. The use of

platinum alloys and multi-sheet packs was so well-known at the date of D19 that these features formed part of the skilled person's standard knowledge. The subject-matter of claim 1 also lacked novelty with respect to D1.

As regards claim 1 of the auxiliary request, the only disclosure of a "three-dimensional knitted pad" in the patent in suit was on page 3, lines 19 to 20. Neither the so-called 3D knitting nor the meaning of the term "pad" put in quotation marks was further explained or defined in the description. It was left to the skilled person to imagine what was meant by these terms since the patent contained neither a reference as to what was meant by such a "pad" or how it could be produced in practice, nor a reference as to what was meant by the "so-called 3D knitting" or how it was performed. It was not clear whether the terms three-dimensional knitted "pad" involved the presence of several layers of material or meant that the product had more thickness than a sheet or a two-dimensional woven fabric as shown in D26. According to D2, a document from the Appellant, a pad might be in the form of a single layer. In the absence of any definition in the patent in suit, one could also assume that products consisting of a single knitted sheet with tufts or cut loops as disclosed, for example, in D12 or as known for "knitted velvets" were meant. Therefore, claim 1 of the auxiliary request did not clearly define the claimed product. Furthermore, if with the terms "three-dimensional knitted pad" the Appellant intended to define a structure other than the three-dimensional structures disclosed in D19, D2 or D12, the invention was not disclosed sufficiently clearly and completely to be carried out by a skilled person. In view of the lack of clarity, it was also questionable whether claim 1 met the requirements of Article 123(3) EPC.

In D26, a document cited by the Appellant in order to show the benefits of the invention (see letter dated 7 May 1993, page 2), a knitted gauze of a "bulky three-dimensional nature" was shown in Figure 5. Comparing this figure with Figure 1 of D19 clearly revealed that both structures were identical. Therefore, if in the absence of any definition of a "three-dimensional pad" in the patent in suit, one relied on the Appellant's own definition given in D26, it clearly turned out that the subject-matter of claim 1 of the auxiliary request lacked novelty over the products of D19. If the subject-matter of claim 1 were considered to be novel, no inventive step could be acknowledged in view of the teaching of D19 in combination with, inter alia, D25, D2 or D12.

- VII. The Appellant requested, in writing, that the decision under appeal be set aside and that a patent be maintained with claims 1 and 2 filed on 13 July 1995 as "auxiliary request 6" (main request) or, auxiliarily, with claim 1 filed at the same date as "auxiliary request 5". The Respondents requested that the appeal be dismissed.

### **Reasons for the Decision**

1. The appeal is admissible.

#### *Main request*

2. Claim 1 of the main request meets the requirements of Article 123(2) and (3) EPC.
3. The question arises whether or not the subject-matter of claim 1 lacks novelty over the disclosure of D19.

3.1 The Appellant's arguments that it was wrong to consider D19 as forming part of the state of the art since the extent of availability to the public of D19 was extremely doubtful or since it was aged art, forgotten or abandoned, cannot be accepted by the Board. D19 is a granted German patent which was published on 17 July 1958. The Appellant disputed neither that publication of this patent occurred nor the date of this publication. The fact that D19 has a remote date of publication or that the process or products described in this document might have been forgotten or abandoned is not relevant to the question of availability to the public. As this patent was published and thus made available to the public before the priority date, its content forms part of the state of the art.

3.2 D19 discloses a process for knitting catalytically active metal wires and the knitted catalyst nettings obtained by this process. The wires are made, for example, of pure noble metals or noble metal alloys. The knitted nettings are produced by knitting the catalytically active metal wire with an ancillary thread of natural or synthetic fibres and removing the latter by thermal or chemical treatment. According to D19, the thus obtained catalyst nettings are used in gas or vapour phase reactions such as the technical oxidation of ammonia or the Andrussov process. D19 refers in column 1 to the woven catalyst gauzes hitherto used for these reactions, pointing out the difficulties encountered when weaving the catalyst gauzes, and teaches that these difficulties are avoided by knitting the catalyst fabrics by the method disclosed in this document. Therefore, D19 discloses the use of the knitted catalyst fabrics in the known technical oxidation of ammonia in replacement of the previously used woven gauzes (see column 1, lines 1 to 44; column 2, lines 27 to 40; column 3, lines 2 to 5; claims 1 and 2; drawings).



D19 does not explicitly mention that the catalyst fabrics are composed entirely of platinum or a platinum alloy nor that the catalyst comprises a plurality of fabric sheets. The Respondents have argued that the use of platinum or platinum alloys in the form of multi-sheet packs in the catalytic oxidation of ammonia formed part of the skilled person's standard knowledge so that, in view of the use stated in D19, the skilled person would have directly derived these features from D19 without considering other documents. In these circumstances, the question arises whether these features actually belonged to the common general knowledge or represented the standard technique for the catalytic oxidation of ammonia at the relevant time, ie on the relevant date of D19.

D29 and D30, which are copies from different editions of the basic textbook "Holleman-Wiberg, Lehrbuch der anorganischen Chemie", published in 1955 and 1958 respectively, confirm that at least from 1955 up to 1958 it was common general knowledge to perform the technical oxidation of ammonia with platinum or platinum-rhodium catalyst nettings, one net being used for small performances whereas larger plants worked with several superposed catalyst nets (see pages 139 and 240 of D29 and D30). D21, which is a later edition of the said textbook published in 1985, discloses the same information. Therefore, these documents show that at a time extending from before the filing date of D19 (December 1956) to its publication date (July 1958) the standard technical oxidation of ammonia was performed with several catalyst nets made of platinum or a platinum-rhodium alloy.

In these circumstances, the Board is convinced that in view of D19 which teaches the use of the knitted catalyst nets in the technical oxidation of ammonia instead of the known woven gauzes, the skilled person

would directly and unambiguously have derived from D19, on the relevant date thereof, that the noble metal or noble metal alloy was platinum or a platinum-rhodium alloy and that the catalyst comprised several knitted sheets for the said use. As these two features formed part of the standard technical oxidation of ammonia on the relevant date of D19 and were thus well-known to the skilled person, the indication of the said use in D19 implicitly disclosed these features to the skilled person.

As pointed out by the Appellant, when assessing novelty it is normally not permissible to "combine" separate items of prior art. However, in certain situations it is permissible to look at reference works such as handbooks, encyclopaedia or dictionaries in order to construe a particular term in one prior art document (see T 233/90, T 288/90). In the present case, it is also permissible to look at a well-known textbook of the kind mentioned above in order to ascertain what features were implicitly disclosed to the skilled person on the relevant date of D19 by the indication therein that the catalyst is used for the technical oxidation of ammonia.

- 3.3 For the preceding reasons, the subject-matter of claim 1 is considered to lack novelty over the disclosure of D19. As claim 1 does not meet the requirement of novelty set out in Articles 52(1) and 54 EPC, the main request cannot be allowed.

#### *Auxiliary request*

4. The Respondents argued in writing and at the oral proceedings that the terms "three dimensional knitted pad" indicated in claim 1 lacked clarity. As claim 1 of

the auxiliary request is an amended claim and the alleged lack of clarity arises out of the amendments made to the granted claims, it must be examined whether or not claim 1 meets the requirement of clarity set out in Article 84 EPC.

According to claim 1, the ammonia oxidation catalyst consists of a three-dimensional knitted pad. Claim 1 itself contains no additional features defining the structure of such a three-dimensional knitted pad, and in the absence of further information it is not clear what is meant by these terms, ie which structure the claimed product might have. The term "pad" itself does not appear to have a well-recognised meaning in the technical field concerned. In any case, no evidence to the contrary was provided by the Appellant who presented no comments in reply to the objection of lack of clarity or lack of sufficiency of disclosure raised by the Respondents. According to D2, a pad can be formed of a single knitted layer (see page 4, lines 10 to 12); however, other documents such as D8 or D11 disclose pads having a completely different structure and comprising several layers of material. D26, a post-published article which refers to the knitted gauzes produced by the process of the patent in suit, discloses that a knitted gauze has a bulky three-dimensional structure compared with a woven gauze (see page 80, Figure 5 and page 82, second paragraph) but does not mention the term "pad".

Referring to the description of the patent in suit in order to find a definition or explanations concerning the said three-dimensional knitted pad, the only information given is on page 3, lines 20 to 23, which contains the following statement: "The use of so-called 3D knitting may be used to yield a three-dimensional knitted "pad" rather than a two-dimensional fabric. This may have particular application in some catalytic

processes of interest to the Applicants, and can permit different materials to be incorporated in layers within a single pad of fabric". It is observed that the word "pad" is put in quotation marks. Does this mean that the term "pad" has a specific meaning? In any case, no definition is given of the term put in quotation marks. Although reference is made to the "so-called 3 D knitting" to produce the three-dimensional knitted "pad", there is no further explanation as to what is meant by the said "so-called 3 D knitting", so that this reference does not provide any precise information concerning the structure of the resulting product either. It is not clear whether the Appellant meant by the said "so-called 3 D knitting" a method such as described in the patent literature concerning the field of aerospace where knitting itself was carried out in three directions, or other methods which also yield "three-dimensional" products. The further statement that different materials can be incorporated in layers within a single pad of fabric also does not make clear what is meant by the terms "three dimensional knitted pad" or by the "so-called 3 D knitting". This statement seems to suggest that individual knitted sheets of different materials might be present and possibly connected with each other within a single pad. As argued by the Respondents, it could further be assumed, in the absence of further information in the patent in suit, that the claimed three-dimensional knitted pad might consist of a single knitted sheet with tufts or cut loops of the kind disclosed, for example, in D12 or known for knitted plush fabrics. From the preceding considerations it follows that the ammonia oxidation catalyst as claimed in claim 1 of the auxiliary request is not clearly defined and that only assumptions can be made as to its structure. Therefore, this claim does not meet the requirement of clarity set out in Article 84 EPC and the auxiliary request must also fail.

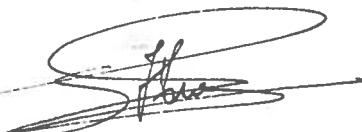
5. Under the circumstances it was not necessary to examine whether claim 1 of the auxiliary request meets the other requirements of the EPC. The Board observes in this respect that the question whether or not claim 1 is in conformity with the provisions of Article 123(3) depends on the meaning of the terms "three dimensional knitted pad", so that the clarity requirement had to be examined first.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:



S. Hue

The Chairman:



R. Spangenberg

U.B.



