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Datasheet for the decision of 13 July 2023

Case Number: T 1030/20 - 3.3.02

Application Number: 10700450.9

Publication Number: 2427468

IPC: C07F15/00, C07F17/02

Language of the proceedings: EN

Title of invention:
PREPARATION OF A METAL COMPLEX

Patent Proprietor:
JOHNSON MATTHEY PUBLIC LIMITED COMPANY

Opponent:
Umicore AG & Co. KG

Headword:

Relevant legal provisions:
EPC Art. 56, 108, 123(2)
EPC R. 126(2), 134(2)

Keyword:

Admissibility of appeal - notice of appeal - filed within time limit
Amendments
Inventive step

Decisions cited:

Catchword:

Europäisches Patentamt
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Boards of Appeal

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Case Number: T 1030/20 - 3.3.02

D E C I S I O N
of Technical Board of Appeal 3.3.02
of 13 July 2023

Appellant: (Patent Proprietor)	JOHNSON MATTHEY PUBLIC LIMITED COMPANY 5th Floor 25 Farringdon Street London EC4A 4AB (GB)
Representative:	Scott, Philip McDermott Johnson Matthey PLC P.O. Box 1 Belasis Avenue Billingham TS23 1LB (GB)
Appellant: (Opponent)	Umicore AG & Co. KG Rodenbacher Chaussee 4 63457 Hanau-Wolfgang (DE)
Representative:	Vossius & Partner Patentanwälte Rechtsanwälte mbB Siebertstrasse 3 81675 München (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 12 February 2020 concerning maintenance of the European Patent No. 2427468 in amended form.**

Composition of the Board:

Chairman	M. O. Müller
Members:	S. Bertrand
	R. Romandini

Summary of Facts and Submissions

I. The appeals by the opponent and the patent proprietor lie from the interlocutory decision of the opposition division that European patent No 2 427 468 in amended form according to auxiliary request 1 met the requirements of the EPC.

II. Since the patent proprietor and the opponent are both appellants and respondents in these appeal proceedings, they are referred to as "patent proprietor" and "opponent" below.

III. The following documents are used in the present decision:

D4 Dervisi, A. *et al.*: "Synthesis and chemistry of diphenyl-2-pyridylphosphine complexes of palladium(0): X-ray characterisation of $Pd(Ph_2Ppy)_2$-(η2-DMAD) and trans-$Pd(Ph_2Ppy)_2(PhC{=}CH_2)(CF_3CO_2)$, J. Chem. Soc.: Dalton Trans., 2000, pages 523-528.

D6 Trezeciak, A. M. *et al.*: "Synthesis of Palladium benzyl complexes from the reaction of $PdCl_2[P(OPh)_3]_2$ with benzyl bromide and triethylamine: Important intermediates in catalytic carbonylation", Organometallics, 2002, 21, pages 132-137.

D7 Kuran W. *et al.*: "Synthesis and characterization of tertiary phosphine Pd(0) complexes", Inorginica Chimica Acta, 1975, 12, pages 187-193.

IV. In the impugned decision, the opposition division's conclusions included the following:

- The subject-matter of claim 1 according to the main request lacked novelty in view of D1/D1a.

- The subject-matter of the claims according to auxiliary request 1 involved an inventive step in view of D7 as the closest prior art (Article 56 EPC).

V. Claim 1 according to auxiliary request 1 held allowable by the opposition division reads as follows:

"*1. A process for the preparation of a Pd(0)L_n complex, where L is a ligand and n is 2, comprising the steps of:*

(a) reacting a Pd(II) complex in at least one solvent with a base and a ligand L; and
(b) if required, adding further base, optionally in at least one solvent, to form the Pd(0)L_n complex;

wherein the at least one solvents in steps a and b are independently the same or different, and wherein the Pd(II) complex is selected from the group consisting of Pd(olefin)$_x$(Hal)$_2$, Pd(Hal)$_2$, and M_2Pd(Hal)$_4$,
wherein,
each Hal is independently a halide,
M is a cation,
x is 1 or 2,
and wherein,
when x = 1, the olefin is a diolefin,
when x = 2, the olefin is a mono-olefin; and
wherein ligand L is a phosphorus ligand."

VI. In its statement of grounds of appeal, the patent proprietor contested the opposition division's reasoning and submitted claim sets according to the main request and auxiliary requests 1 to 9. It questioned the admissibility of the opponent's appeal.

VII. In its statement of grounds of appeal, the opponent submitted that claim 1 of auxiliary request 1, held allowable by the opposition division, contravened Article 123(2) EPC and that the subject-matter of this claim did not involve an inventive step in view of D7 as the closest prior art.

VIII. In its reply to the opponent's grounds of appeal, the patent proprietor provided counter-arguments regarding added subject-matter and inventive step of the claims of auxiliary request 1.

IX. In its reply to the proprietor's grounds of appeal, the opponent submitted that its notice of appeal was timely filed and that the claims of the main request and auxiliary requests 1 to 9 added subject-matter and did not meet the requirements of inventive step.

X. The board issued a communication pursuant to Article 15(1) RPBA 2020 in preparation for the oral proceedings.

XI. Oral proceedings before the board were held by videoconference on 13 July 2023 in the presence of the patent proprietor and the opponent. During the oral proceedings, the patent proprietor withdrew its main request and auxiliary request 1.

XII. The parties' requests relevant to the decision were as follows:

the patent proprietor requested:

- that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of the main request filed as auxiliary request 2 with the patent proprietor's statement of grounds of appeal or on the basis of auxiliary requests 1 to 7 filed as auxiliary requests 3 to 9 with the patent proprietor's statement of grounds of appeal, and

- that the board review whether or not the notice of appeal filed by the opponent on 30 April 2020 was late-filed

The opponent requested that the decision under appeal be set aside and that the patent be revoked in its entirety.

XIII. The patent proprietor's case and the opponent's case are summarised in the Reasons below.

Reasons for the Decision

Admissibility of the opponent's appeal

1. The impugned decision was issued on 12 February 2020. According to Article 108 EPC and taking account of Rule 126(2) EPC, the last day for filing any appeal was 22 April 2020. The opponent's notice of appeal was filed on 30 April 2020.

1.1 The patent proprietor submitted that the opponent's notice of appeal was late-filed.

1.2 The board disagrees. As submitted by the opponent, the time limits expiring on or after 15 March 2020 were

extended for all parties until 4 May 2020 pursuant to Rule 134(2) EPC in accordance with the notice from the EPO dated 16 April 2020 (OJ, April 2020, point 2 of the notice) concerning the disruptions due to the COVID-19 outbreak. As the original time limit for filing the opponent's notice of appeal was 22 April 2020, this time limit was extended to 4 May 2020 in accordance with the EPO notice of 16 April 2020. The opponent's notice of appeal, filed on 30 April 2020, was within the extended time limit.

1.3 The board therefore concludes that the opponent's notice of appeal was not late filed and the opponent's appeal was admissible. This conclusion had already been reached in the board's communication pursuant to Article 15(1) RPBA 2020. No further submissions were made by the patent proprietor either in writing or during the oral proceedings.

Main request (auxiliary request 2 filed with the proprietor's statement of grounds of appeal)

2. Added subject-matter - Claim 6

2.1 Claim 6 of the main request reads as follows.

"6. A *process according to any one of the preceding claims, wherein ligand L is a phosphorus ligand*".

Claim 6 of the main request is dependent on claim 1.

Claim 1 of the main request relates to a process for the preparation of a $Pd(0)L_n$ complex, where L is a ligand and n is 2.

2.2 The opponent raised an objection under Article 123(2) EPC against claim 6 of the main request. The application as filed taught as a whole that only certain phosphorus ligands were used when n = 2.

Therefore, claim 6 of the main request added subject-matter.

2.3 The board disagrees.

As noted by the patent proprietor, claim 6 of the main request is based on claim 14 as filed. Irrespective of this, the opponent's argument that the application as filed taught as a whole that only certain phosphorus ligands were used when n = 2 is not convincing.

In that regard, the opponent relied on just two specific examples. In example 13, the phosphorous ligand PPh_3 yields a complex of formula PdL_4, i.e. n = 4 rather than 2. Only the use of the specific phosphorous ligand $P(t\text{-}Bu)_2Ph$ in example 11 leads to a complex of formula PdL_2 (i.e. n=2). However, these two embodiments of the invention cannot be seen as implying that a complex with n = 2 can only be obtained with $P(t\text{-}Bu)_2Ph$ as a phosphorus ligand. Furthermore, the description of the application as filed does not teach any limitation to the value of n resulting from the type of phosphorus ligand. Therefore, the opponent's submission must fail.

2.4 Claim 6 of the main request thus meets the requirements of Article 123(2) EPC.

3. Novelty

The opponent did not raise any objection against the subject-matter of the claims of the main request.

4. Inventive step

4.1 The patent concerns the provision of an alternative process for the preparation of Pd(0) metal complexes (paragraph [0005] of the patent). Accordingly, the subject-matter of claim 1 of the main request relates

to a process for the preparation of a $Pd(0)L_n$ complex, where L is a ligand and n is 2, comprising the step of reacting a $Pd(olefin)_x(Hal)_2$ complex in at least one solvent with a base and a ligand L, and wherein each Hal is independently a halide, x is 1 or 2, and wherein, when x = 1, the olefin is a diolefin and, when x = 2, the olefin is a mono-olefin.

4.2 The opponent raised an objection as to the inventive step of the subject-matter of claim 1 of the main request in view of D7 as the closest prior art in combination with D6.

4.3 D7 as the closest prior art

D7 (page 192) discloses the preparation of two Pd(0) complexes comprising two phosphorus ligands: $Pd[P(cyclohexyl)_3]_2$ and $Pd[PBu^t_2Ph]_2$ (right-hand column on page 192). The preparation comprises the step of reacting 2-methallylPdCl with the appropriate phosphine (i.e. $P(cyclohexyl)_3$ or PBu^t_2Ph) in the presence of sodium methoxide in methanol.

$Pd[P(cyclohexyl)_3]_2$ and $Pd[PBu^t_2Ph]_2$ are $Pd(0)L_2$ complexes wherein, in both cases, L is a phosphorous ligand ($P(cyclohexyl)_3$ or PBu^t_2Ph) and n is 2, both as required by claim 1 of the main request.

Sodium methoxide is a base and methanol is a solvent, both as required by claim 1 of the main request.

The starting complex 2-methallylPdCl is a Pd(II) complex, with, in terms of claim 1, a structure $Pd(olefin)_1(Hal)_1$.

4.4 Distinguishing feature

It was common ground between the parties that the starting Pd(II) complex identified in claim 1 of the main request ($Pd(olefin)_x(Hal)_2$) was the distinguishing feature over the disclosure of D7.

4.5 Objective technical problem

The patent proprietor submitted that the technical effect associated with the distinguishing feature was a higher yield as shown by the yield obtained in examples 7 and 11 of the patent in comparison with the yields obtained in D7. The objective technical problem was thus an improved process for the preparation of a $Pd(0)L_2$ complex.

The board does not agree with the patent proprietor for the following reasons.

Examples 7 and 11 of the patent relate to the preparation of $Pd[P(cyclohexyl)_3]_2$ and $Pd[PBu^t{}_2Ph]_2$ starting from $Pd(COD)Br_2$ (palladium cyclooctadiene dibromide) with a yield 85% and 95% (paragraphs [0069] and [0073]). Since cyclooctadiene is a diolefin, $Pd(COD)Br_2$is a compound of formula $Pd(olefin)_x(Hal)_2$ with x being 1 as required by claim 1 of the main request. In D7, the corresponding yields of the preparation starting from 2-methallylPdCl are 80 and 74% (page 192, right-hand column, second and third full paragraphs). The board acknowledges that these two yields in examples 7 and 11 are higher than those obtained in D7. The board notes, however, as submitted by the opponent, that the synthesis in examples 7 and 11 of the patent is not carried out under the same conditions as in D7, and thus examples 7 and 11 of the patent do not differ from D7 only in terms of the distinguishing feature of claim 1 of the main request

(starting Pd(II) complex). More specifically, for the preparation of $Pd[P(cyclohexyl)_3]_2$ ("$Pd[P(Cy_3)]_2$") in example 7 of the patent, the solvent and the base (toluene and sodium hydroxide) differ from those used in D7 (methanol and sodium methoxide). For the preparation of $Pd[PBu^t{}_2Ph]_2$ ("$Pd[Ph(t\text{-}Bu)_2P]_2$") in example 11 of the patent, the base (sodium hydroxide) differs from that used in D7 (sodium methoxide). For this reason alone, the comparison made by the patent proprietor is not a fair comparison for showing that an effect is achieved by the distinguishing feature. Therefore, it cannot be concluded that a higher yield is associated with the distinguishing feature.

It follows that the objective technical problem, as formulated by the opponent, has to be formulated less ambitiously as the provision of an alternative process for the preparation of a $Pd(0)L_2$ complex.

4.6 Obviousness

The opponent relied on D6 and submitted that the skilled person would see in the teaching of D6 that "$PdCl_2(COD)$", which was a starting complex as required by claim 1 of the main request for preparing $Pd(0)L_2$ complexes, was an alternative starting complex to 2-methallylPdCl used in D7. Even if D6 disclosed the preparation of $Pd(P(OPh)_3)_4$, i.e. a $Pd(0)L_4$ complex, table 1 of D7 taught that the number of ligands of the Pd(0) complex to be prepared depended on the bulkiness of the phosphine ligand and not on the starting complex. The skilled person would have replaced the starting complex 2-methallylPdCl disclosed in D7 by $PdCl_2(COD)$ disclosed in D6 as starting complex without inventive merit.

The board does not agree.

D6 (page 136, left-hand column, last paragraph) discloses the preparation of $PdCl_2(P(OPh)_3)_2$ using $PdCl_2(COD)$ as starting complex in the presence of $P(OPh)_3$. The board acknowledges that $PdCl_2(COD)$ is a starting complex of formula $Pd(olefin)_x(Hal)_2$ as required by claim 1 of the main request. However, as submitted by the patent proprietor, the skilled person would not have considered this passage in D6, since this passage of D6 does not relate to the preparation of $Pd(0)L_2$ complexes but rather to the preparation of $PdCl_2(P(OPh)_3)_2$, which is a Pd(II) complex. A link between D7 and D6 regarding the preparation of the same complex is therefore missing, and thus there is no motivation to combine the two documents. This conclusion applies irrespective of whether scheme 1 of D4 is taken into account.

4.7 The opponent further argued that, considering the general teaching of D4, and in particular scheme 1 of D4, that it was known to start from a Pd(II) compound to prepare a Pd(0) complex, the skilled person would have considered any starting Pd(II) material known in the art, such as $PdCl_2(COD)$ disclosed in D6, to prepare a $Pd(0)L_n$ complex as required by claim 1 of the main request.

The board disagrees.

D4 (title) is a document on the synthesis and chemistry of diphenyl-2-pyridylphosphine (PH_2Ppy) complexes of Pd(0). D4 discloses on page 523 a scheme (scheme 1) showing the common synthetic methods for preparing $Pd(Ph_2Ppy)_3$. The preparation may comprise as a starting material K_2PdCl_4, $Pd(Ph_2PPy)_2Cl_2$, $Pd(OAc)_2$ or $Pd_2(\eta^3\text{-}CH_2CMeCH_2)_2Cl_2$. These compounds are Pd(II) compounds.

While it is true that D4 discloses that $Pd(Ph_2Ppy)_3$, i.e. a Pd(0) complex, may be prepared from different specific starting Pd(II) compounds, it cannot be concluded from scheme 1 of D4 that $Pd(Ph_2Ppy)_3$ may be prepared from any Pd(II) material, let alone that any Pd(0) complex may be prepared from any Pd(II) material. There is thus no teaching in D4 that any starting Pd(II) material known in the art may be used for preparing a $Pd(0)L_2$ complex as required by claim 1 of the main request. Thus the skilled person would not have considered $PdCl_2(COD)$ disclosed in D6 as a suitable starting complex for preparing a $Pd(0)L_2$ complex as required by claim 1 of the main request.

5. The subject-matter of claim 1 of the main request and, by the same token, of claims 2 to 13 involves an inventive step in view of D7 as the closest prior art in combination with D6.

6. Admittance of the opponent's submissions based on scheme 1 of D4

As set out above, the opponent relied for the obviousness of the solution proposed by claim 1 of the main request on scheme 1 of D4.

The patent proprietor requested that these submissions not be admitted into the proceedings.

During the oral proceedings, the board decided to admit the opponent's submissions based on scheme 1 of D4. As set out above, the subject-matter of claim 1 of the main request was found to involve an inventive step considering the opponent's submissions based on scheme 1 of D4. The decision on inventive step is in the patent proprietor's favour. There is therefore no need

to provide reasons for the admittance of these submissions.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the opposition division with the order to maintain the patent on the basis of the claims according to auxiliary request 2 filed with the patent proprietor's statement of grounds of appeal, and the description and drawings possibly to be adapted thereto.

The Registrar: The Chairman:

M. Schalow M. O. Müller

Decision electronically authenticated