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**Datasheet for the decision
of 29 January 2015**

Case Number: T 0131/12 - 3.3.10

Application Number: 05722469.3

Publication Number: 1711579

IPC: C09K11/06, H05B33/14,
H01L51/30, C07F15/00

Language of the proceedings: EN

Title of invention:
IMPROVED ELECTROLUMINESCENT STABILITY

Applicant:
Universal Display Corporation

Headword:

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - (yes) - after amendment

Decisions cited:

Catchword:



**Beschwerdekammern
Boards of Appeal
Chambres de recours**

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Case Number: T 0131/12 - 3.3.10

D E C I S I O N
of Technical Board of Appeal 3.3.10
of 29 January 2015

Appellant: Universal Display Corporation
(Applicant) 375 Phillips Boulevard
Ewing, NJ 08618 (US)

Representative: Gerbino, Angelo
Jacobacci & Partners S.p.A.
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 26 August 2011
refusing European patent application No.
05722469.3 pursuant to Article 97(2) EPC.**

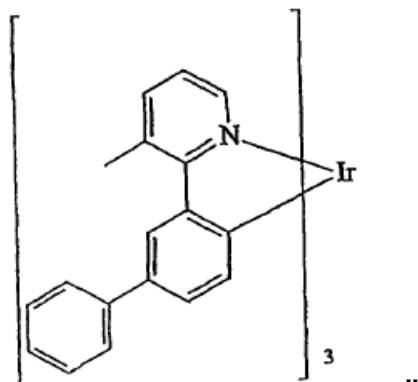
Composition of the Board:

Chairman P. Gryczka
Members: R. Pérez Carlón
F. Blumer

Summary of Facts and Submissions

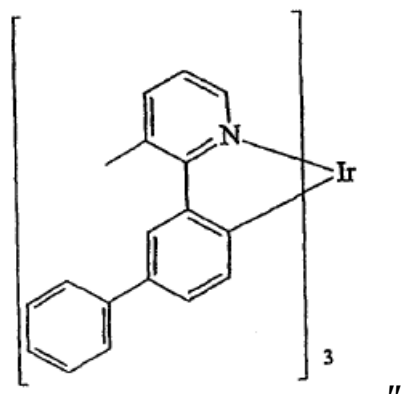
- I. The appellant (applicant) lodged an appeal against the decision of the examining division to refuse European patent application No. 05 722 469.3.
- II. The documents forming part of the examination proceedings included the following:
- D1: EP 1 239 526
D2: EP 1 348 711
- III. The examining division considered that the applicant had failed to provide a fair comparison between the claimed compounds and the closest prior art, represented by compound 528 of D1 and compound 3 of D2, demonstrating that a surprising technical effect had been achieved. In the absence of any such effect, the subject-matter of the claims then pending was not inventive.
- IV. With the statement setting out the grounds of appeal, the appellant filed a comparison between compound 523 of D1 [Ir(5-Ph-ppy)₃] and one compound according to claim 1 of the request before the examining division which had the formula [Ir(5-Ph-3'-Me-ppy)₃]. This comparison was intended to show that a device containing the latter had a lower drive voltage, improved power efficiency and longer lifetime at 1,000 nits luminance and 40 mA/cm² current density.
- V. Under cover of a letter dated 8 September 2014 the appellant filed a new main request directed only to the compound [Ir(5-Ph-3'-Me-ppy)₃] and an organic light emitting device comprising said compound, whose claims read as follows:

Claim 1: "A compound having the structure:



Claim 2: "An organic light emitting device, comprising:

- a) an anode;
- b) a cathode; and
- c) an emissive layer disposed between the anode and the cathode, wherein the emissive layer comprises an emissive material having the structure:



VI. The board cancelled the oral proceedings previously scheduled.

VII. The final request of the appellant is that the decision under appeal be set aside and that a patent be granted on the basis of claims 1 and 2 above.

Reasons for the Decision

1. The appeal is admissible.

Amendments, Article 123(2) EPC:

2. The compound of claim 1 finds a basis in claim 14 and the device of claim 2 in claim 48 of the application as originally filed.

The requirements of Article 123(2) EPC are thus fulfilled.

Novelty:

3. Claim 1 is directed to a compound of the formula $[\text{Ir}(\text{5-Ph-3'-Me-ppy})_3]$. Claim 2 is directed to an organic light-emitting device comprising said compound.
4. The examining division considered that the subject-matter of the claims then pending, which included the compound of claim 1 and the light-emitting device of claim 2 in this appeal proceedings, was novel, and the board sees no reason to differ in view of the available prior art.

Inventive step, Article 56 EPC:

5. Closest prior art:
 - 5.1 The examining division considered that compound 528 of D1 $[\text{Ir}(\text{5-Ph-3'-Me-ppy})_2(\text{acac})]$ was structurally closer to the subject-matter of the claims then pending, which included compounds bearing ancillary ligands such as acetylacetonate (acac).

However, claim 1 of the sole request pending in appeal proceedings is directed only to the compound $[\text{Ir}(\text{5-Ph-3'-Me-ppy})_3]$, and the board agrees with the appellant that compound 523 of document D1 $[\text{Ir}(\text{5-Ph-ppy})_3]$, which is also an organometallic complex of iridium containing three *p*-phenylpyridine ligands, is structurally closer to $[\text{Ir}(\text{5-Ph-3'-Me-ppy})_3]$ and is therefore the closest prior art.

Compound 523 of document D1 differs from the compound of claim 1 because it lacks a methyl residue at position 3' of the 5-phenyl-2-phenylpyridine ligands (5-Ph-ppy) of the iridium.

6. Technical problem underlying the invention:

The technical problem underlying the claimed invention is providing an emissive material for organic light-emitting devices with enhanced properties.

7. Solution:

The claimed solution is the compound of claim 1, which is characterised in that it contains an additional methyl group at position 3' of the *p*-phenylpyridine ligands of the iridium.

8. Success:

In the light of the data provided in the statement setting out the grounds of appeal, the appellant has credibly shown that a device containing the compound $[\text{Ir}(\text{5-Ph-3'-Me-ppy})_3]$ has a longer lifetime, lower drive voltage and improved power efficiency than compound 523 of D1 of the formula $[\text{Ir}(\text{5-Ph-ppy})_3]$, which lacks a methyl group at position 3'.

The problem mentioned under point 6 above is thus considered to be successfully solved by the compound of claim 1.

9. Lastly, it remains to be decided whether or not the proposed solution to the objective problem underlying the patent in suit is obvious from the prior art:

There is no teaching in the available prior art hinting at what structural modification of the compound of D1 [Ir(5-Ph-ppy)₃] might lead to an improvement of the properties required by an emissive material for organic light-emitting devices, let alone that such a minor change as the presence of a further methyl residue in the ligands of the metal could lead to any such improvement. The skilled person would not thus envisage the present solution when trying to obtain an emissive material superior to that disclosed in D1.

For this reason, the board considers that the compound subject-matter of claim 1 and, by the same token, the organic light-emitting device of claim 2 are inventive within the meaning of Article 56 EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The file is remitted to the examining division with the order to grant a patent on the basis of claims 1 and 2 filed under cover of the letter dated 8 September 2014 and a description and drawings to be adapted.

The Registrar:

The Chairman:



C. Rodríguez Rodríguez

P. Gryczka

Decision electronically authenticated