

CONFIDENTIAL – ATTORNEYS’ EYES ONLY

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

Pictiva DISPLAYS INTERNATIONAL
LTD., *et al.*,

Plaintiffs,

vs.

Samsung ELECTRONICS CO., LTD.,
Samsung ELECTRONICS AMERICA,
INC.,

Defendants.

Civil Action Nos.
2:23-cv-00945-JRG
2:24-cv-00532-JRG

**EXPERT REPORT OF IOANNIS KYMISSIS, PH.D.,
REGARDING THE VALIDITY OF U.S. PATENT NOS.
8,558,223 AND 8,723,164**

449. Ma discloses an electron transport layer (ETL) formed from Liq and BPhen. Ma notes that “no work has yet been reported about using Liq-doped BPhen as electron transport layer (ETL)”³³³ and to remedy the problem “we have demonstrated a device with an new n-doping (33 wt.% Liq:BPhen) layer as ETL and p-type (*m*-MTDATA:*x* wt.% F₄-TCNQ) layer as HTL.”).

450. The ETL in Ma is electrically conductively connected to at least one of the electrodes. Indeed, it is connected to both the anode and cathode, and produced a working device (which requires such a connection).

- b. [1e] wherein the electron-conducting layer is obtained by joint vaporization of a metal complex, which comprises a central metal atom, with an organic compound,**

451. The combination of Clix 2, Ma, and the background knowledge of a POSITA renders the limitation obvious.

452. *Joint vaporization:* [REDACTED]

[REDACTED] Like all the other layers in Ma’s device, the ETL was “fabricated by conventional thermal evaporation in a high vacuum chamber with a base pressure of 1×10^{-5} Torr. The deposition rate was

³³³ Ma at 810.

³³⁴ Ma at 811 (“Then, a 50nm-thick BPhen:Liq ETL was co-deposited on the EML. In the co-deposition process, organic sources were independently controlled. The deposition rates for the co-deposition layer were monitored using two independent quartz sensors.”).

maintained at 0.5 ± 0.2 Å/s for the organic materials, 0.1 Å/s for LiF and 5 ± 2 Å/s for Al.”³³⁵

453. Under Pictiva’s view that the accused products contain an electron-conducting layer that is obtained by “joint vaporization” (which I disagree with), then [REDACTED] discloses this limitation. [REDACTED]

[REDACTED] I intend to offer more detailed opinions on this topic in my rebuttal report.

454. In the event that the Court or the factfinder determines that the ETLs in the accused products are not produced via “joint vaporization,” it is my opinion this claim limitation would have been obvious in light of Ma, Clix 2, and the background knowledge of a POSITA. As I described in detail above in Section IV.C, it was well-known as of the priority date of the ’223 patent that a metal complex could be jointly vaporized with an organic compound in order to co-deposit the two materials in the same layer. In particular, it would have been within the capabilities of a POSITA in possession of all of [REDACTED] [REDACTED] to modify the deposition process used for the combined Ma-Clix 2 display panel ETL to achieve “joint vaporization,” for example by pre-mixing Liq and BPhen, and heating and evaporating them at the same time.

³³⁵ Ma at 811; *see also* Ma at 811 (The substrate “was loaded into an evaporation system.”).

1045. Beyond the vaporization parameters, additional complexities further necessitate complex, exhaustive empirical refinement by OLED display manufacturers. Factors such as vacuum pressure, substrate temperature, and the potential for interfacial reactions during deposition all have profound impacts on the film’s quality and performance. Moreover, the risk of contamination and degradation of either the metal complex or the organic compound during the process adds layers of unpredictability. These issues underscore that the successful implementation of joint vaporization is not just a matter of applying standard techniques but requires exhaustive (i.e., “undue”) experimentation and fine-tuning to optimize every aspect of the process for a high-performance OLED device.

1046. For example, to understand how the applicant performed “joint vaporization” or “simultaneous vaporization,” it is at least necessary to understand basic parameters like: (i) applied temperature ranges, (ii) applied pressure ranges, and (iii) duration.

1047. The specification, however, is void—the specification, not once, discloses how to perform “joint vaporization” or “simultaneous vaporization.” It does not even attempt to disclose temperature ranges the applicant used for the “joint vaporization” or “simultaneous vaporization” process. It does not disclose pressure ranges the applicant used for the “joint vaporization” or “simultaneous vaporization” process. It does not disclose how long (i.e., duration) the applicant

such as working computer systems or code highlighting to further support the positions in this report.

1123. At hearings and at trial, and as discussed above, I may rely on visual aids and on analogies concerning elements of the asserted patents, the accused products, the prior art referenced in this report, or any related technologies.

DATED: March 26, 2025

A handwritten signature in black ink, appearing to read 'Ioannis Kymissis', written over a horizontal line.

Ioannis Kymissis, Ph.D.