

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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BOE TECHNOLOGY GROUP CO., LTD., BEIJING BOE DISPLAY  
TECHNOLOGY CO., and MOTOROLA (WUHAN) MOBILITY  
TECHNOLOGIES COMMUNICATION CO., LTD.,  
Petitioner

v.

ELEMENT CAPITAL COMMERCIAL COMPANY PTE. LTD,  
Patent Owner

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Case IPR2023-00605  
Patent 7,259,736

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**PETITIONER'S REQUEST FOR REHEARING**

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## **I. INTRODUCTION AND STATEMENT OF RELIEF REQUESTED**

The Board erred by accepting Patent Owner's unduly narrow and legally incorrect rubric that, to combine Masuda<sup>1</sup> and Inoue,<sup>2</sup> Masuda's teachings must *solve* Inoue's identified problem. Obviousness does not require such a narrow finding, and Petitioner did not advance it. Petitioner instead contended that Masuda's teachings would *benefit* Inoue and supported that contention with evidence and Dr. Liu's testimony. That is all that is required to establish a "reasonable likelihood" that Petitioner would prevail based on a fully developed record. The Decision relatedly erred by accepting Dr. Silzars's unsupported arguments that Masuda would not benefit Inoue because the evidence shows the opposite. The exceptional fact that a sister Patent Office already found nearly identical claims unpatentable over the same prior art confirms these errors. Because the Decision misapprehended Petitioner's proposed combination, Petitioner hereby requests rehearing under 37 CFR §§ 42.71(c) and (d).

## **II. LEGAL STANDARDS**

A request for rehearing "must specifically identify all matters the party believes the Board misapprehended or overlooked, and the place where each matter was previously addressed in a motion, an opposition, or a reply." 37 CFR §

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<sup>1</sup> Japanese Unexamined Patent Application Publication H11-185654. Ex. 1009.

<sup>2</sup> Japanese Unexamined Patent Application Publication 2002-278504. Ex. 1011.

42.71(d). “When rehearing a decision on petition, a panel will review the decision for an abuse of discretion.” 37 CFR § 42.71(c). “An abuse of discretion is found if the decision: (1) is clearly unreasonable, arbitrary, or fanciful; (2) is based on an erroneous conclusion of law; (3) rests on clearly erroneous fact finding; or (4) involves a record that contains no evidence on which the Board could rationally base its decision.” *Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367 (Fed. Cir. 2016); *Koninklijke Philips Electronics N.V. v. Cardiac Science Operating Co.*, 590 F.3d 1326, 1334 (Fed. Cir. 2010).

### **III. BASIS FOR RELIEF REQUESTED**

#### **A. Background of the Relevant Papers**

The Petition presented two grounds: Ground 1A challenged six claims of the ’736 patent (3-5, 13, and 16-17) as invalid over Masuda, alone. Pet., 20-44. Ground 1B challenged four more claims (7, 9, 14, and 15) as invalid over Inoue in view of Masuda (*id.*, 45-75), explaining that a POSITA would have been “motivated to arrange [Inoue’s] pixels in the improved checkerboard pattern taught by Masuda” to compensate for “luminosity [variance due to] how color pixels are arranged.” *Id.*, 51-54. It further explained that the Japanese Patent Office rejected equivalent claims, endorsing the same prior art combination. *Id.*, 11-19, 54-55.

Patent Owner’s Preliminary Response (“POPR”) did not dispute Ground 1A and disclaimed six claims to moot it. POPR, 18. As such, the POPR essentially

concedes that the technology-independent, dummy-checkerboard pattern reflected in independent claim 3 was known in the art. In fact, the POPR did not identify *any* limitation that either Masuda or Inoue failed to disclose.

The POPR addressed Petitioner’s motivation to combine by alleging that “Inoue’s display device would not have brightness variation due to differences in color” because it “explicitly controls the brightness of each pixel via that pixel’s driving circuit.” POPR, 26-27, 28-29, 47-50. The POPR did not support this argument with anything beyond citations to four paragraphs in Inoue (none of which reference “color” or the role of human eye perception) and Dr. Silzars’s conclusory opinion. *Id.* (citing Ex. 2011, [0007], [0009], [0026], [0029]; Ex. 2002). The POPR also alleged that AM displays would not benefit from the dummy-checkerboard pattern at all, based on Dr. Silzars’s testimony which is not corroborated by his cited evidence. *Id.*, 20-21, 26, 30-47.

Beyond that, the POPR attacked a motivation argument that Petitioner never asserted – i.e., that Masuda’s solution (using a dummy-checkerboard pattern to reduce “visual interference caused by horizontal stripes or vertical stripes due to differences in luminosity between rows or differences in luminosity between columns”) would not address the specific problem identified by Inoue (“brightness variation [across pixels resulting from] variations of threshold voltages of . . . pixel unit drive transistors” used by AM displays), and focused on irrelevant technical

differences between passive matrix field emission “PMFE” (Masuda) and active matrix organic electroluminescent “AMOEL” (Inoue) displays. *See, e.g.*, POPR, 21-22, 27-29.

The Decision, following Patent Owner’s strawman argument, found Petitioner’s motivation to combine “deficient because it fails to sufficiently account for the differences between [Inoue’s] active matrix system and [Masuda’s] passive matrix system” and that “in light of [Patent Owner’s] testimony from Dr. Silzars, Petitioner fails to present sufficient evidence . . . that [a POSITA] would have been motivated to make the proposed combination.” Decision, 27-33.

**B. The Decision Misapprehended Petitioner’s Arguments About Why It Would Have Been Obvious to Combine Inoue and Masuda**

First, the Decision found that Masuda’s dummy-checkerboard pixel pattern would not “have effectively reduced Inoue’s luminosity differences.” Decision, 31-32. This finding demonstrates that the Decision misapprehended Petitioner’s arguments supporting the prior art combination.

Neither Petitioner nor Dr. Liu alleged that Masuda’s dummy-checkerboard pattern would solve Inoue’s problem of varying transistor threshold voltage characteristics or replace the active light-detecting elements of Inoue (as Patent Owner contends) that compensate for that variation. Masuda identified drawbacks to several pixel patterns, and proposed an arrangement that includes “one element that does not contribute to the display” and minimizes “maximum luminosity

difference between rows or columns.” Pet., 49-50; Ex. 1003, ¶¶ 79-82. As explained by Dr. Liu and acknowledged by Dr. Silzars, these problems result from “inherent luminosity differences between primary colors”—i.e., that the human eye perceives some colors (like green) more brightly than others (like red or blue)—not on the particular technology used to display those colors. *See* Ex. 1009, [0026] (identifying luminosity values associated with red, green, and blue); Pet., 49-51 (reproducing table from Masuda showing how row/column luminosity difference depends on how those color pixels are arranged); POPR, 25-26; Ex. 1003, ¶ 74; Ex. 2002, ¶ 88.

Petitioner and Dr. Liu instead argued that Masuda’s pattern would beneficially decrease perceived variation due to luminosity differences between different colors—*not* variation due to transistor characteristics. *See, e.g.*, EX-1003, ¶¶ 79-82 (referencing Masuda’s benefits to human eye perception). Dr. Liu submitted evidence showing that the “color variation” problem<sup>3</sup> is a “technology-independent” or “universal” improvement in the sense that any color display may suffer from it. *See Intel Corporation v. Qualcomm Incorporated*, 21 F.4th 784,

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<sup>3</sup> Patent Owner’s claim that the “color variation” problem would not apply to AM displays hinges solely on its contention that such displays *had* higher resolution, which as explained below is wrong and unsupported.

797–99 (Fed. Cir. 2021). Ignoring such a motivation to combine, even if “generic” is legal error. *See id.* In view of Petitioner’s actual motivation to combine, the Decision’s focus on whether Masuda would solve Inoue’s “threshold voltage” variation problem is legally irrelevant. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 420 (2007) (“*any* need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed”) (emphasis added).<sup>4</sup>

Second, to the extent the Decision considered the actual issue—i.e., whether Masuda would benefit Inoue at all—it erred by accepting Dr. Silzars’s opinions in the face of evidence refuting them. For example, to support his allegation that “Inoue’s display device does not have a brightness variation resulting from pixel colors” because it “explicitly controls the brightness of each pixel via that pixel’s driving circuit” (POPR, 26-27, 28-29, 47-50), Dr. Silzars cited to four paragraphs in Inoue—none of which address “color” or human eye perception (Ex. 2011, [0007], [0009], [0026], [0029]).

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<sup>4</sup> The Decision also notes Dr. Silzars’s explanation that Masuda’s “stripe” problem is different from the ’736 patent’s concern with “directional viewing variation.” Even if true, that explanation is irrelevant. *See KSR*, 550 U.S. at 419 (“neither the particular motivation nor the avowed purpose of the patentee controls.”).

As another example, Dr. Silzars opined that active matrix displays (like Inoue) would not suffer from “visual interference caused by horizontal stripes or vertical stripes . . . because they are ‘capable of greater resolution than passive matrix displays.’” Decision, 30 (citing Ex. 2002 ¶ 81 and Ex. 2014, 3-7); *see also id.*, 32. As a preliminary matter, the primary<sup>5</sup> cited exhibit (Ex. 2014) is dated 2008—six years after the critical date—and thus has no bearing on the relative resolution of AM versus PM devices at the time of the claimed invention. *See* 35 U.S.C. § 103(a) (pre-AIA) (“A patent may not be obtained . . . if . . . the subject matter as a whole would have been obvious *at the time the invention was made.*”) (emphasis added); Ex. 1001 (establishing November 29, 2002 as the critical date).

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Ex. 2014. Moreover, this evidence does not even *mention* active or passive matrix technologies. *See, e.g.*, Ex. 2014 at 3-7 (comparing CRT, LCD laptop, and LCD

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<sup>5</sup> Other references cited by Dr. Silzars merely provide basic background about AMLCDs (Ex. 2011), field emission displays (Ex. 2012), and OLEDs (Ex. 2013) and are not relevant to showing that high resolution displays could not benefit from Masuda’s dummy-checkerboard pattern. Ex. 2012 and 2013 are also untimely.

television screens). But more importantly, Dr. Silzars points to no evidence supporting the notion that high resolution displays would not benefit from Masuda's pixel pattern. This argument is demonstrably wrong. Petitioner's evidence identifies plasma displays<sup>6</sup> as having "Med/High" resolution (at least as high as Inoue's display) and the Kwon reference shows that the dummy-checkerboard pattern applies to such plasma displays:

| <i>Table 2. Comparison of flat panel display technologies (Table adapted from reference [17]).</i> |      |                 |                              |        |         |        |
|----------------------------------------------------------------------------------------------------|------|-----------------|------------------------------|--------|---------|--------|
| Performance parameters                                                                             | CRT  | Plasma<br>DC/AC | Electro-luminescent<br>DC/AC | VFD    | STN/LCD | AM/LCD |
| <i>Display visual parameters</i>                                                                   |      |                 |                              |        |         |        |
| Pixel density                                                                                      | High | High            | High                         | Medium | Medium  | High   |
| Screen resolution                                                                                  | High | Med/High        | Medium                       | Medium | Medium  | High   |
| Raster distortion                                                                                  | Yes  | No              | No                           | No     | No      | No     |

Ex. 1014, Table 2; Decision, 31; Ex. 1013.

As another example, Petitioner and Dr. Liu's evidence also refutes Dr. Silzars's opinion that PMFE displays (Masuda) were too "obsolete" to combine with AMEL displays (Inoue).<sup>7</sup> Petitioner's evidence describes electroluminescent

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<sup>6</sup> The Board may recall high resolution plasma televisions in the 2000s.

<sup>7</sup> To the extent the Decision was influenced by Patent Owner's related claim that PMFED displays had only small screen sizes (*see* Ex. 2002 ¶¶ 46, 73), such an assertion is irrelevant. AM displays were also used in small screen applications at

displays as having merely “medium” screen resolution (Ex. 1014, 7) and field emitter display technologies as “coming out of the research stage, and into the proto-type development phase” and showing potential “for low power displays with high image quality which is required for the future portable systems” (*id.*, 23).<sup>8</sup> *See also* Ex. 1003 (Liu Declaration) ¶¶ 46-54 (discussing this article). Likewise, Inoue (which Dr. Silzars also cited as relevant to his argument (*see* Decision, 28 (citing Ex. 2002 ¶ 73))) characterizes passive matrix displays as “[a]t present . . . being manufactured as products for use in vehicles and mobile phones”—contradicting any argument that they were “obsolete.” Ex. 1011, [0003] (identifying “equal current” and “power consumption” as the PM engineering tradeoff—not resolution).

[0003] Because a PM type is provided with a drive circuit on the outside of the organic EL panel and the structure of the organic EL panel itself is simple, it is said that lower costs can be realized. At present, PM type organic EL panels are being manufactured as products for use in vehicles and mobile phones. Because an organic EL is a current-driven element, the current flowing to each light-emitting pixel has to be of equal magnitude to eliminate variations in the brightness of an organic EL panel. However, it is difficult to provide an equal current and reduce power consumption due to problems (1) to (3) below.

(1) In order to make the brightness of all pixels uniform, the current flowing to each of the pixels has to be equal. Therefore, one of the positive and negative electrodes of each pixel

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the time. *See* Ex. 1014 (article dated 1996) at 5 (“(AMELDs) for head mounted display applications have been reported . . . The display size is 1-inch diagonal.”).

<sup>8</sup> This article states FEDs bear “some similarity with AMLCD.” Ex. 1014, 19. It further describes FED as suitable for “high performance portable systems.” *Id.*, 1.

has to act as a constant current source. However, the driving voltage of a matrix electrode on the other side has to be increased so that the voltage drop caused by the resistance component in the bus line has no effect. This causes an increase in power consumption. When the driving voltage cannot be increased sufficiently, a voltage drop corresponding to the length of the bus line to each pixel affects the amount of current for light emission. More specifically, a constant current source is not obtained and variations in brightness occur.

(2) In order to obtain a predetermined surface brightness, the PM type needs to emit light with an N-fold instantaneous brightness, where N is the number of scanning lines in the display panel. Because the current flowing to a pixel is usually proportional to the emitted brightness, the current is N-fold. Because an organic EL experiences a reduction in light emission efficiency when the current is increased, an N-fold pixel current or greater is required to obtain the predetermined surface brightness. Therefore, the power consumption increases as the number N of scanning lines increases. This problem aggravates problem (1).

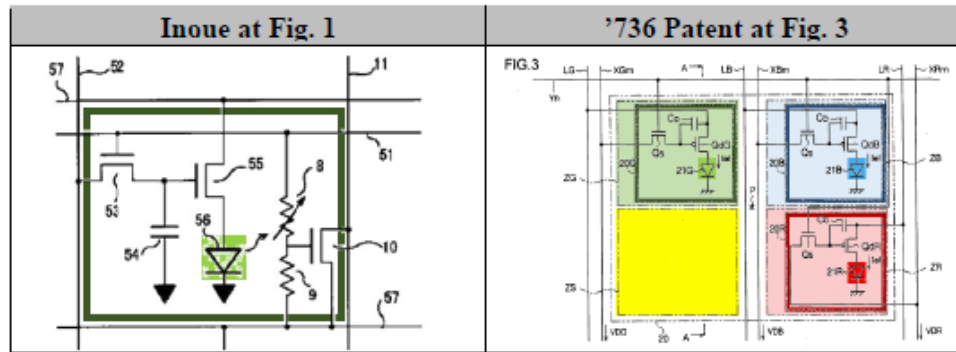
(3) Because an organic EL panel has a surface structure, a capacitive load is connected to each element in parallel when viewed as an equivalent circuit. When the pixel current increases or the number of pixels and the repetition frequency increases, the charging/discharging current to the capacitive load increases and power consumption increases. Due to problem (2), power consumption caused by the capacitive load increases considerably in the PM type. Because of these problems, the PM type is currently manufactured as products with a screen size of no more than a few inches and 10,000 pixels or so.

Ex. 1011, [0003].

Even the '736 patent refutes Dr. Silzars's "obsolete" theory by describing its embodiments as applicable to "FED" technology. *See* Ex. 1001, 16:42-47. The definition of a POSITA adopted by the Decision also contradicts Dr. Silzars's "obsolete" opinion. Masuda (passive matrix) was filed December 25, 1997—just three years before Inoue (active matrix)—and published on July 9, 1999. Ex. 1009; Ex. 1011. The Decision determined that a POSITA would have had a "Master's degree in electrical engineering, physics, or a related field and at least two years of relevant work experience in the field of integrated circuit design for display devices." Decision, 12. Applying this definition, a typical POSITA, as of the November 29, 2002 critical date, would have been pursuing their Master's degree when Masuda was published (July 1999) and working in the field when Inoue was published (September 2002). It would have been natural for a POSITA

implementing Inoue to consider and adopt the Masuda pixel pattern that published just three years prior.

Third, the Decision appears to give weight to Dr. Silzars's incorrect opinion that applying Masuda to Inoue would somehow render Inoue's display worse. *See* Decision, 30 ("Additionally, Dr. Sil[z]ars testifies, 'Inoue, by itself, operates effectively to achieve uniform brightness control' by using active light-detecting elements for each pixel."); *id.*, 26-27 (reproducing argument that "[i]f Inoue is modified to implement a checkerboard arrangement of Masuda, instead of using the active light-detecting elements of Inoue, the brightness uniformity of light emission in Inoue would be substantially decreased"). This argument mischaracterizes the proposed combination. Petitioner's combination does not require *removing or replacing* Inoue's light detecting elements that correct for brightness variation across pixels. As shown by the reproduced image below, in one proposed combination, Inoue, as modified by Masuda, would retain those elements (designated by symbol 8) and the benefits they inure. The Masuda dummy-checkerboard pattern provides the *additional* benefit of reducing pixel variation due to color without diminishing Inoue's *existing* benefit of reducing pixel variation due to transistor variability.



Pet., 58, 60; Ex. 1011, [0019] (identifying “light-detecting element 8”). Moreover, Inoue also contemplates that prior art passive matrix displays had no light-detecting element, which would also benefit from Masuda’s dummy-checkerboard pattern. *See* Pet., 62-63.

Fourth, the Decision overlooks Petitioner’s additional argument as to why it would have been obvious to combine Masuda with Inoue. The Decision, in a background section, acknowledges Petitioner’s argument that arranging Inoue’s pixels in Masuda’s pattern “would have amounted to an application of known techniques that would have created expected results” and that “Inoue itself does not specify how to lay out pixels in its [matrix] display.” Decision, 21-22. In other words, Inoue does not mandate any particular red-green-blue pattern, and Masuda extolls the benefits of one option (the dummy-checkerboard) over other options. *See* Pet., 53. Even assuming *arguendo* that the dummy-checkerboard pattern would not solve Inoue’s problem, it would have been obvious to try that pattern, as Inoue presents no other options. *See id.*; *see also Intel Corp. v. Qualcomm Inc.*, 21

F.4th 784, 800 (Fed. Cir. 2021) (“It’s not necessary to show that a combination is ‘the best option, only that it be a suitable option.’”). The Decision’s “analysis” section fails to address this argument and instead focuses exclusively on whether a POSITA would have been *motivated* to combine the references. *See* Decision, 27 (framing issue as Petitioner’s failure to show whether POSITA “would have been motivated to combine” the references). Because “motivation” is not the exclusive criterion to demonstrate obviousness to combine, the Decision erred in ignoring Petitioner’s other arguments. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 419 (2007) (“The obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation.”).

**C. The Issues Raised by the Decision Should Be Addressed Only  
After a Full Record is Developed**

Petitioner has presented strong evidence that Inoue in view of Masuda renders the challenged claims obvious. Not only did Dr. Liu render this opinion and support it with evidence, the Japanese examiner, an independent third party evaluating same claims<sup>9</sup> and the same prior art at a time much closer to the alleged invention, reached the same conclusion. Patent Owner amended the claims to

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<sup>9</sup> Patent owner did not contest Petitioner’s characterization that “the JPO rejected claims that were essentially identical to claims that the USPTO allowed only a couple [of] weeks before.” Pet., 12.

overcome that rejection. Pet., 12-19, 54-55. The Decision erred by failing to give due weight to this evidence. Pet., 12-19, 54-55. Dr. Silzars's arguments, in contrast, were not backed by timely supportive evidence.

In light of Petitioner's evidence, the Decision held Petitioner to an unreasonable standard by requiring it to anticipate all of Patent Owner's arguments and submit counter evidence in the Petition. Critical factual disputes undergirding the Decision's analysis included (1) whether Masuda would benefit Inoue, specifically, (2) whether Masuda would benefit high resolution displays in general and (3) whether passive matrix displays were so "obsolete" that a POSITA would never consider them when implementing an active matrix display. But neither Petitioner nor Dr. Liu had any opportunity to address these issues, especially since they became focal points only because Patent Owner disclaimed enough claims to moot most of the Petition. Under these circumstances, the better course is to institute, enable cross-examination of the experts, and allow a full record to develop. Then, the Board can rule based on consideration of the full record.

#### **IV. CONCLUSION**

For the foregoing reasons, Petitioner respectfully requests that the Board reconsider its Decision and grant institution of the Petition for *Inter Partes* Review of the '736 patent.

Respectfully submitted,

Dated: November 13, 2023

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**CERTIFICATE OF SERVICE**

Pursuant to 37 CFR § 42.6(e)(4), the undersigned certifies that on November 13, 2023, a complete and entire copy of this Petitioner's Request for Rehearing was provided by email to Patent Owner by serving the email correspondence addresses of record as follows:

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