

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CAMBRIDGE INDUSTRIES USA INC.,

Petitioner

v.

APPLIED OPTOELECTRONICS, INC.,

Patent Owner

Case No. IPR2025-00436

U.S. Patent No. 10,313,024

**SUPPLEMENTAL DECLARATION OF DR. ANDREW G. KIRK
IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT NO. 10,313,024**

Mail Stop PATENT BOARD
Patent Trial and Appeal Board
U.S. Patent and Trademark Office
PO Box 1450
Alexandria, Virginia 22313-1450

I, Andrew G. Kirk, do hereby declare and say as follows:

1. I am the same Dr. Andrew G. Kirk who is retained as a technical expert by counsel for Petitioner Cambridge Industries USA Inc. (“CIG USA”) and whose declaration was previously submitted accompanying the Petition for *Inter Partes* Review of U.S. Patent No. 10,313,024 (“the ’024 Patent”) as Exhibit 1003.

2. In reviewing Patent Owner’s Request to Director for Discretionary Denial of Petition for *Inter Partes* Review Of U.S. Patent No. 10,313,024, Paper No. 8, I observed that Patent Owner makes several representations concerning Petitioner’s analysis of the prior art Akashi reference as set forth in Paper No. 2 and Ex. 1003.

3. I submit this Supplemental Declaration to clarify certain of the annotated drawings included in the Petition for the ’024 Patent and to correct errors in paragraph 123 of my earlier 68-page declaration.

4. I am being compensated at my usual consulting rate of \$400 per hour for my time spent working on issues in this matter. My compensation does not depend on the outcome of this matter or the opinions I express.

5. Patent Owner argues in its Paper No. 8 at 20-22 that “Akashi does not disclose a light engine driving circuit on the substrate 107” but instead “point[s] to an empty portion of the circuit board.” I disagree. As explained in my initial declaration, Ex. 1003 at ¶ 124, “a POSITA would have understood that Akashi

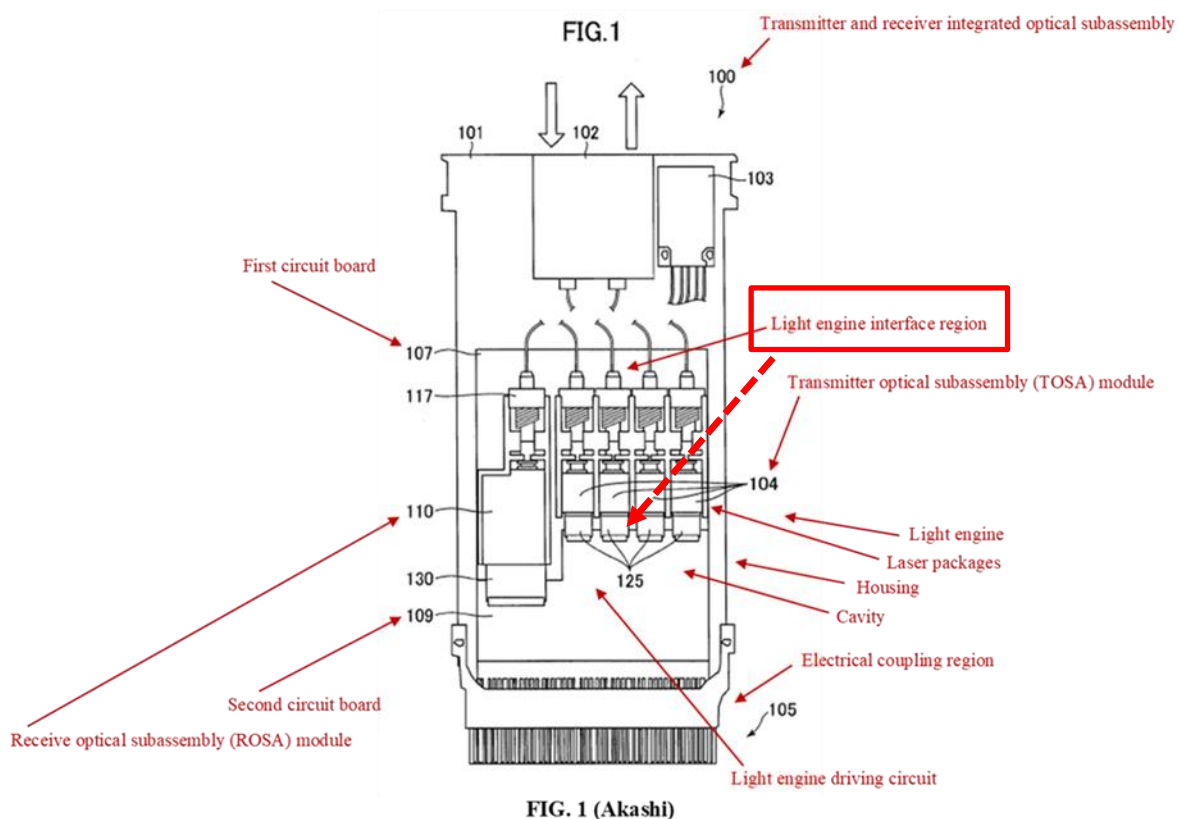
discloses a light engine driving circuit disposed on the substrate 107 that provides a RF signal and a power signal to drive the hermetically sealed light engine to output one or more channel wavelengths. See Ex. 1007, FIG. 1, ¶¶ [0026]-[0027].” In my view, a POSITA would readily have understood that without such a circuit, the optical module disclosed in Ex. 1007 would be inoperative.

6. Patent Owner next points to an annotated version of FIG. 1 of Akashi and a mistake in the first two sentences of Ex. 1003, ¶ 123, arguing that “Petitioner has not identified the claimed light engine interface region.” Paper 8 at 21-22. While I agree that paragraph 123 is partly incorrect, I disagree that a POSITA would have concluded, on that basis, that Akashi is not anticipatory.

7. Instead, it is my opinion that a POSITA, reviewing the portions of Akashi cited in the last sentence of Ex. 1003, ¶ 123, would have understood that the claimed “light engine interface region” necessarily would have been adjacent to the flexible circuits 125 that couple the light engine driving circuit to the TOSA lasers. That POSITA conclusion would have been reinforced by the last sentence of Ex. 1003, ¶ 123, which expressly states: “... the light engine interface region **is configured to electrically couple** with the hermetically sealed light engine via the second circuit board. [Akashi] ¶¶ [0026]-[0027]” (emphasis added).

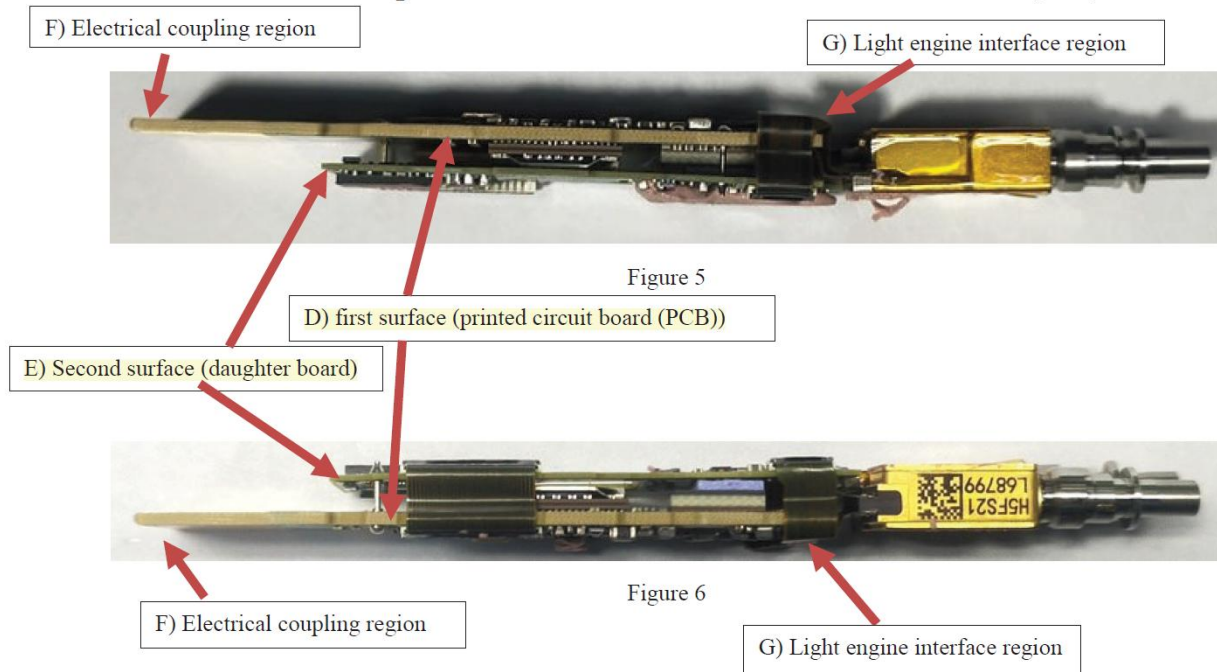
8. Accordingly, a POSITA would have understood that the claimed light engine interface region is not “ adjacent to optical connector 117.” Instead, correct

placement of the arrow for the light engine interface region of the TOSA of FIG. 1 of Akashi should be directed to the area adjacent to flexible circuits 125, as shown below in dotted line:



9. While again reviewing Ex. 1003, ¶ 123 at 51, I realized that it erroneously identifies the “electrical coupling region” as corresponding to flexible printed circuits 125, whereas annotated FIG. 1 at Ex. 1003, page 50 (and above), correctly identifies the electrical coupling region as edge connector 105 of Akashi. To the extent that Patent Owner argues that region 105 is located on circuit board 101 rather than circuit board 107, such correspondence is consistent with Patent Owner’s infringement contention that the first and second surfaces “disposed on

the substrate” need not be on the **same** substrate. See Ex. 1010 at 10, reproduced below, in which the “first surface” is identified on the main PCB and the “second surface” is identified on the daughter board, notwithstanding that claim 1 requires “a substrate defined by first and second surfaces.”



10. My opinions are subject to change in view of opinions provided by the Patent Owner or its expert, or any additional information that I may receive. I reserve the right to supplement my opinions accordingly.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Executed May 25, 2025 at Montreal Canada.

A handwritten signature in blue ink, appearing to read 'A G Kirk', is written above a horizontal line.

Dr. Andrew G. Kirk