
BEFORE THE PATENT TRIAL AND APPEAL BOARD

SONY CORPORATION,
Petitioner

v.

RAYTHEON COMPANY,
Patent Owner

Case IPR2016-00209

Patent 5,591,678

DECLARATION OF JOHN J. DRAB

DECLARATION OF JOHN J. DRAB
REGARDING THE RAYTHEON'S USE OF U.S. PATENT NO. 5,591,678

I, John J. Drab, declare:

1. I am over eighteen (18) years of age and in all respects fully competent to make this Declaration. I have personal knowledge of the facts, as stated herein, and all are true and correct.

2. I understand that Sony Corporation ("Sony") filed a petition for *inter partes* review of Raytheon Company's ("Raytheon") patent, as captioned above, that challenges the validity of the U.S. Patent No. 5,591,678 ("'678 Patent"). I also understand that Raytheon opposes Sony's challenge.

3. I am a Sr. Principle at Raytheon Vision Systems. I work in Goleta and Lompoc and serve a technology director from Silicon detector and 3D integration work that occurs at our Lompoc laboratory.

4. I have read and understand the '678 Patent. I am also familiar with semiconductor fabrication processes used by Raytheon.

5. A vast majority of Raytheon's revenues derive from military and government contracts. These contracts include space-based systems for defense and exploration programs. As part of its business, Raytheon identified a commercial opportunity for the process disclosed in the '678 Patent in fabricating high-resolution sensors for government defense work and space programs.[1]

6. One example was the BepiColombo space telescope[2] wherein the '678

[1] *See* Ex. 2009, RAY8078-86.
[2] *See id* at 78.

Patent was used to manufacture a microelectronic device that was incorporated into a sensor module. Specifically, the methods set forth in claims 1-3, 6-7, 10-14, and 17 of the '678 Patent were used to manufacture one of the microelectronic devices sold for the BepiColombo project. This microelectronic device is a high-resolution, radiation-hardened, visible-range sensor.[3]

7. The Si:PiN detector used in the BepiColombo space telescope began with a bonded silicon wafer.[4] This bonded silicon wafer includes a silicon etchable layer, an SiO_2 etch-stop layer, and a silicon wafer layer. The detector wafer is hybridized to a readout wafer using Direct Bond Interconnects.[5] (*Id.* at 81, Fig. 5). These interconnects allow the detector and readout wafers to electrically communicate with each other.[6] The device is then thinned to its etch-stop layer. The result is an extremely high-resolution sensor, with other desirable characteristics such as noise immunity, small size, and radiation hardness.

8. Raytheon's ability to fabricate high-resolution image sensors using the '678 Patent's process led to successful contracts from the European Space Agency and the United States Air Force.

I declare under the penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Date: June 14, 2016

John J. Drab

[3] *See id* at 79.
[4] *See id.*
[5] *Id.* at 81, Fig. 5
[6] RAY00008078, 79.