

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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SONY CORPORATION,  
Petitioner,

v.

COLLABO INNOVATIONS, INC.,  
Patent Owner.

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Case IPR2016-00941  
Patent 5,952,714

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Before DAVID C. McKONE, GREGG I. ANDERSON, and  
JENNIFER MEYER CHAGNON, *Administrative Patent Judges*.

ANDERSON, *Administrative Patent Judge*.

FINAL WRITTEN DECISION  
*35 U.S.C. § 318(a) and 37 C.F.R. § 42.73*

## I. INTRODUCTION

Sony Corporation (“Petitioner”)<sup>1</sup> filed a Petition (Paper 2, “Pet.”) pursuant to 35 U.S.C. §§ 311–319 to institute an *inter partes* review of claims 1–13, 15, and 16 (“the challenged claims”) of U.S. Patent No. 5,952,714 (“the ’714 patent,” Ex. 1001), filed July 30, 1996.<sup>2</sup> Collabo Innovations, Inc. (“Patent Owner”) elected not to file a Preliminary Response. On October 13, 2016, we granted the Petition and instituted trial on claims 1–13, 15, and 16 of the ’714 patent. Paper 6 (“Institution Decision” or “Inst. Dec.”).

After institution of trial, Patent Owner filed a Patent Owner Response (Paper 11, “PO Resp.”), and Petitioner filed a Reply (Paper 18, “Pet. Reply”). The Petition is supported by the Declaration of R. Michael Guidash (“Guidash Declaration,” “Guidash Decl.,” Ex.1002). Patent Owner proffered the Declaration of Dr. Martin Afromowitz (“Afromowitz Declaration,” “Afromowitz Decl.,” Ex. 2001). Petitioner took Dr. Afromowitz’s deposition (“Afromowitz Deposition,” “Afromowitz Dep.,” Ex. 1028). Patent Owner took Mr. Guidash’s deposition (“Guidash Deposition,” “Guidash Dep.,” Ex. 1029).

An oral hearing was held on July 11, 2017. The transcript of the hearing has been entered into the record. Paper 26 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6(b). This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a). We conclude, for the

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<sup>1</sup> Sony Corporation of America and Sony Electronics Inc. also are identified as real-parties-in-interest. Pet. 1.

<sup>2</sup> The ’714 patent was filed July 30, 1996, under the Patent Cooperation Treaty (PCT). Ex. 1001, at [22], [86]. Thus, Petitioner alleges the ’714 patent expired on July 30, 2016. Pet. 11. *See* section II.A. below.

reasons that follow, that Petitioner has shown by a preponderance of the evidence that claims 1–13, 15, and 16 of the ’714 patent are unpatentable.

*A. Related Proceedings*

The ’714 patent has been asserted by Patent Owner against Petitioner in *Collabo Innovations, Inc. v. Sony Corp.*, Case No. 1-15-cv-01094 (D. Del.), which was filed on November 25, 2015, and first served (on Sony Electronics Inc.) on February 22, 2016. Pet. 1; Paper 5, 1.

*B. Technology Overview*

The ’714 patent relates to a package for a semiconductor “image sensing apparatus using a solid-state image sensing device” (also referred to as a “CCD chip” or “chip”). Ex. 1001, col. 1, ll. 6–8. The image sensing apparatus is mounted on a video camera which reproduces pictures. *Id.* at col. 1, ll. 19–29. The chip is mounted in a package made of plastic, glass, or ceramic material. *Id.* at col. 1, ll. 8–10. The background of the technology and the ’714 patent are discussed below.

*1. Background of the Technology*

The process of aligning and securing the chip in a package is called “mount[ing].” *See* Ex. 1001, col. 1, ll. 42–61. One prior art method of mounting an image sensor is “die bonding.” *Id.* at col. 1, ll. 47–48. “‘Die bonding’ refers to affixing the back side of a chip (a ‘die’) to substrate, for example, the base of a package.” Guidash Decl. ¶ 44. “This leaves the upper (or front side) surface of the chip exposed.” *Id.*

Figure 10 of the '714 patent is reproduced below.

**FIG. 10**  
**PRIOR ART**

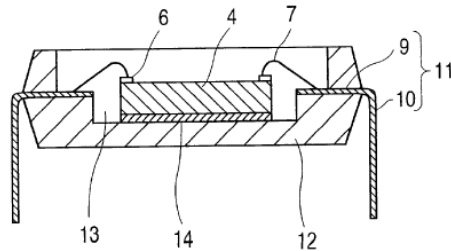


Figure 10 is a cross section of prior art chip 4 mounted in plastic package 12. Ex. 1001, col. 1, ll. 53–56. Lead frame 11 allows for electrical connections to external circuitry and includes inner lead 9 and outer lead 10 molded into plastic package 12. *Id.*; see also Guidash Decl. ¶¶ 43–45 (describing die-bonding). CCD chip 4 is die-bonded by conductive paste 14 to concave portion 13 of package 12. Ex. 1001, col. 1, ll. 57–58. Electrode pad 6 on the CCD chip is “wire-bonded to the inner lead 9 by the metal lead 7 as same as the case of the [conventional] ceramic package.” *Id.* at col. 1, ll. 59–60. Upon mounting the image sensing apparatus to a “three-eye video camera and . . . accurately position[ing]” the apparatus, the “package 12 to which the CCD chip 4 is die-bonded” results in “high accuracy.” *Id.* at col. 1, l. 66–col. 2, l. 5.

## 2. The '714 Patent (Ex. 1001)

The invention of the '714 patent is described in several different embodiments. Ex. 1001, col. 4, ll. 15–40 (Brief Description of the Drawings). Figure 2 of the '714 patent is reproduced below.

**FIG. 2**

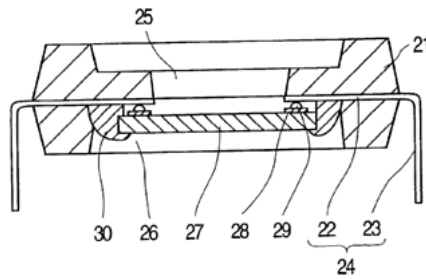


Figure 2 is a cross section of the “first exemplary embodiment” of the image sensing apparatus. Ex. 1001, col. 4, ll. 64–67. Epoxy resin is mixed with inorganic filler to form package 21, which includes lead frame 24. *Id.* at col. 4, l. 67–col. 5, l. 4. Two openings 25 and 26 are formed respectively at the front side and back side of the package, opening 25 being of a smaller area than opening or inlet 26. *Id.* at col. 5, ll. 10–12; *see id.* at col. 4, ll. 53–58. “A frame body of the lead frame 24 is cut away, and the outer lead 23 is bent toward the inlet 26, thereby forming the package 21.” *Id.* at col. 5, ll. 4–6. Bump 29 is formed on electrode pad 28 of CCD chip 27 and the bump is press-fitted to inner lead 22 through inlet 26. *Id.* at col. 5, ll. 6–12.

“During [the] press-fit operation, a position signal is feedbacked from a[n] optical position adjusting device (not shown) disposed in front of the CCD chip 27 to the mounting jig, thereby finely adjusting an orientation of the CCD chip 27 and disposing the CCD chip 27 on the back side of the step of the package 21.” Ex. 1001, col. 5, ll. 12–18. Simultaneously, ultra-violet hardening adhesive 30 is injected onto four sides of the CCD chip to glue the chip to package 21. *Id.* at col. 5, ll. 18–21. Thus, “CCD chip 27 is accurately mounted to the package 21.” *Id.* at col. 5, ll. 21–22.

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