Trials@uspto.gov
571.272.7822

Paper No. 31
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SONY CORPORATION,
Petitioner,

v.

COLLABO INNOVATIONS, INC.,
Patent Owner.

Case IPR2017-00960
Patent 7,023,034 B2

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

PER CURIAM

Opinion Dissenting-in-Part filed by *Administrative Patent Judge* ANDERSON.

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

I. INTRODUCTION

Sony Corporation ("Petitioner")[1] filed a Petition (Paper 1, "Pet.") pursuant to 35 U.S.C. §§ 311–19 to institute an *inter partes* review of claims 1–18 ("the challenged claims") of US Patent No. 7,023,034 ("the '034 patent," Ex. 1001), filed July 15, 2004.[2] The Petition is supported by the Declaration of R. Michael Guidash ("Guidash Declaration," Ex. 1002). Collabo Innovations, Inc. ("Patent Owner")[3] filed a Preliminary Response (Paper 6, "Prelim. Resp."). We instituted an *inter partes* review of the challenged claims ("Institution Decision" or "Inst. Dec.," Paper 8).

Patent Owner filed a Response ("PO Resp.," Paper 19), and Petitioner filed a Reply ("Pet. Reply," Paper 21). Patent Owner's Response is supported by the Declaration of Martin Afromowitz, Ph.D. ("Afromowitz Declaration," Ex. 2003). Mr. Guidash was deposed by Patent Owner. ("Guidash Deposition," Exs. 2004, 2005). Dr. Afromowitz was deposed by Petitioner ("Afromowitz Deposition," Ex. 1020). An oral hearing was held on May 9, 2018, and a transcript thereof has been entered into the record ("Tr.," Paper 30).

Patent Owner filed a Motion to Exclude Evidence ("Motion," Paper 25), Petitioner filed an Opposition to the Motion ("Opposition," Paper 26), and Patent Owner filed a Reply in support of the Motion (Paper 28).

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[1] Petitioner identifies Sony Corporation, Sony Corporation of America, and Sony Electronics Inc. as real parties-in-interest. Pet. 1.
[2] The '034 patent claims priority to Japanese Application No. 2003-307696, filed August 29, 2003. Ex. 1001 (30).
[3] Patent Owner identifies Collabo Innovations, Inc., Wi-LAN Technologies Inc., and Wi-LAN Inc. as real parties-in-interest. Paper 5, 1.

The Board has jurisdiction under 35 U.S.C. § 6. This Final Written Decision issues pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–18 are unpatentable.

II. BACKGROUND

A. Related Proceedings

The '034 patent has been asserted by Patent Owner against Petitioner in *Collabo Innovations, Inc. v. Sony Corp.*, Case No. 1-15-cv-01094 (D. Del.). Pet. 1, Paper 5, 1. Patent Owner also identifies *Collabo Innovations, Inc. v. Omnivision Technologies, Inc.*, Case No. 1-16-cv-00197-UNA (D. Del.) as another case where it has asserted the '034 patent. Paper 5, 1. A separate petition for *inter partes* review[4] was filed concurrently by Petitioner, also directed to claims 1–18 of the '034 patent.

B. Technology

The invention of the '034 patent relates to solid state imaging devices in which "a plurality of light-sensitive elements are arranged in a matrix form." Ex. 1001, 1:7–10. A discussion of the field of technology in general, and the '034 patent more specifically, follows.

1. Background of the Technology

"[T]o improve the light collecting power of a solid-state imaging device typified by a CCD,[5] there exists a solid-state imaging device in which two micro lenses are formed as shown in FIG. 8," reproduced below. Ex. 1001, 1:12–17.

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[4] *Sony Corp. v. Collabo Innovations, Inc.*, Case IPR2017-00958 ("'958 IPR").

[5] Charge-coupled device. Ex. 2003 ¶ 41.

FIG. 8 PRIOR ART

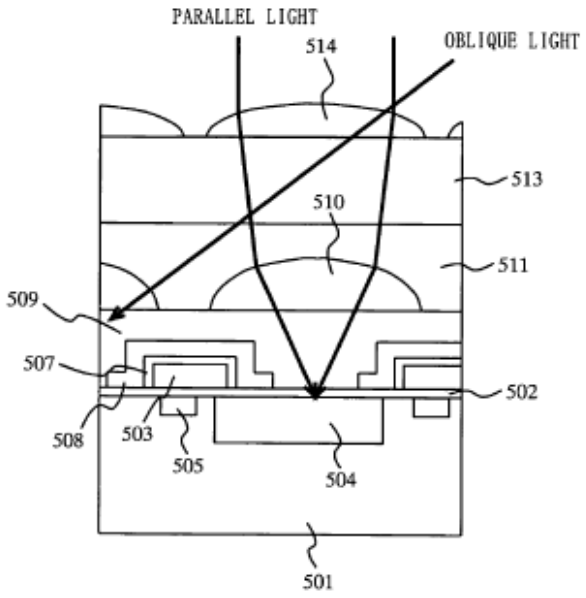

Figure 8 illustrates the prior art solid-state imaging device. *Id.* at 1:15–17, 4:36–37. The solid-state imaging device "includes a semiconductor substrate 501, a gate insulating film 502, a gate electrode 503, a photodiode 504, a charge transfer section 505, an interlayer insulating film 507, a light-shielding film 508, an insulating film 509, an intralayer lens 510, a planarization film 511, a color filter 513, and an on-chip micro lens 514." *Id.* at 1:18–25. Insulating film 509 is formed on light-shielding film 508." *Id.* at 1:34–35. On-chip micro lens 514 is formed on color filter 513 for each photodiode 504. *Id.* at 1:38–39.

As described above in connection with the prior art shown in Figure 8, "the on-chip micro lens 514 is formed on the top layer of the solid-state imaging device, and the intralayer lens 510 is formed in the planarization film 511." Ex. 1001, 1:41–43. "As such, two micro lenses are formed for each photodiode 504, whereby it is possible to further efficiently collect light onto the photodiode 504." *Id.* at 1:43–46. The prior art shown in

Figure 8 has a problem, however, in that it allows "color mixing" to occur when oblique light, i.e., "light entering the solid-state imaging device obliquely from above," enters the adjacent pixel. *Id.* at 1:47–51.

The '034 patent describes a second prior art device, shown in Figure 9, as a "solid-state imaging device capable of preventing color mixing caused by the oblique light." Ex. 1001, 1:52–54. Figure 9 of the '034 patent is reproduced below.

FIG. 9 PRIOR ART

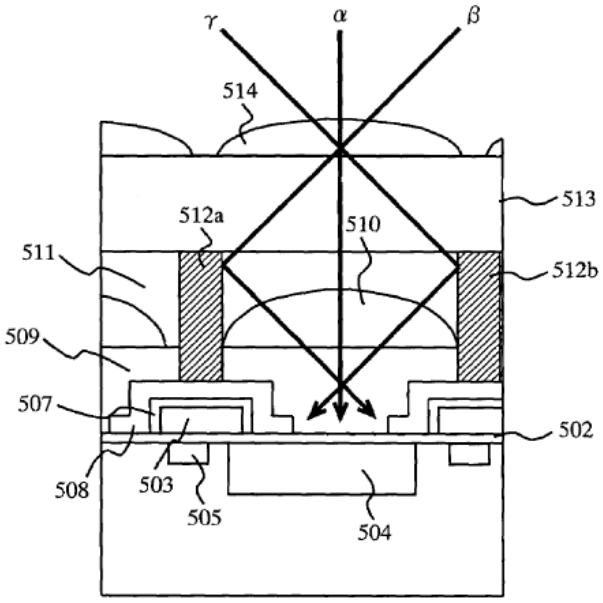

Figure 9 is a cross sectional view of this prior art solid-state imaging device. *Id.* at 1:54–56, 4:38–39. "The solid-state imaging device as shown in FIG. 9 differs from the solid-state imaging device as shown in FIG. 8 in that reflecting walls 512a and 512b are additionally provided on both sides of the intralayer lens 510." *Id.* at 1:57–60. The addition of reflecting walls, as shown in Figure 9, improves light sensitivity of the solid-state imaging device, but there is "still variation in the light sensitivity among the pixels of the solid-state imaging device." *Id.* at 2:4–8.

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