UNITED STATES PATENT AND TRADEMARK OFFICE
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BEFORE THE PATENT TRIAL AND APPEAL BOARD
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TRW AUTOMOTIVE US LLC,
Petitioner,

v.

MAGNA ELECTRONICS INCORPORATED,
Patent Owner.
_____

Case IPR2014-00251
Patent 6,097,023
_____

Before JUSTIN T. ARBES, PATRICK R. SCANLON, and
JO-ANNE M. KOKOSKI, *Administrative Patent Judges.*

SCANLON, *Administrative Patent Judge.*

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

I. INTRODUCTION

A. *Background*

Petitioner, TRW Automotive US LLC, filed a Petition (Paper 3, "Pet.") to institute an *inter partes* review of claims 1, 2, 8, 9, 13, 18, 29, 30, 54, 62–64, and 70 of U.S. Patent No. 6,097,023 (Ex. 1002, "the '023 patent") pursuant to 35 U.S.C. §§ 311–319. Patent Owner, Magna Electronics Inc., subsequently filed a Preliminary Response (Paper 9, "Prelim. Resp."). On June 26, 2014, we instituted an *inter partes* review of claims 1, 8, 9, 18, 29, 30, 54, 62–64, and 70 on five grounds of unpatentability (Paper 14, "Dec. on Inst.").

After institution, Patent Owner filed a Patent Owner Response (Paper 20, "PO Resp."), and Petitioner filed a Reply (Paper 24, "Reply").

An oral hearing was held on February 18, 2015. A transcript of the hearing is included in the record. Paper 33 ("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) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioner has not shown, by a preponderance of the evidence, that claims 1, 8, 9, 18, 29, 30, 54, 62–64, and 70 are unpatentable.

B. *The '023 Patent*

The '023 patent, titled "Vehicle Headlight Control Using Imaging Sensor," issued on August 1, 2000. The '023 patent describes a system for "controlling [a] vehicle's headlamps in response to sensing the headlights of oncoming vehicles and taillights of leading vehicles." Ex. 1002, 1:17–20. According to the '023 patent, prior attempts at automatic vehicle headlight controls included a single light sensor, wherein the headlights were dimmed

in response to sensed light exceeding a threshold. *Id.* at 1:35–38. Such systems are ineffective at detecting oncoming headlights at a distance and detecting taillights of leading vehicles. *Id.* at 1:39–47.

The '023 patent describes vehicle headlight dimming control 12 comprising imaging sensor module 14, imaging control circuit or digital signal processor 13, and vehicle lighting control logic module 16. *Id.* at 3:41–45, Fig. 2. Imaging sensor module 14 includes optical device 36, light sensing array 38, and spectral separation device 40 disposed between optical device 36 and array 38. *Id.* at 4:19–24, Fig. 2. Imaging sensor module 14 may be mounted to, or near, the vehicle's windshield via bracket 34. *Id.* at 3:67–4:2, Fig. 2. This positioning provides an interior location that substantially eliminates environmental dirt and moisture problems, and provides a relatively clear view forward of the vehicle. *Id.* at 4:3–11.

Light sensing array 38 includes a plurality of photosensor elements 42 arranged in a matrix. *Id.* at 4:29–31, Fig. 4. Digital signal processor 13, which receives output 56 from light sensing array 38, includes taillight detection circuit 76 and headlight detection circuit 78. *Id.* at 4:50–55, Fig. 3. Taillight detection circuit 76 detects red light sources above a particular threshold, and headlight detection circuit 78 detects white light sources above a particular threshold. *Id.* at 4:65–5:15. Thus, "the control identifies light sources that are either oncoming headlights or leading taillights by identifying such light sources according to their spectral makeup." *Id.* at 2:36–38.

Vehicle lighting control logic module 16 receives input 20 from digital signal processor 13. *Id.* at 3:60–61, Fig. 2. Module 16 responds to the input by switching headlights 18 to an appropriate mode. *Id.* at 5:42–44.

For instance, the headlights might be switched from high-beam mode to low-beam mode in response to detecting oncoming headlights. *Id*. at 7:47– 50.

C.   *Illustrative Claims*

Of the challenged claims in the '023 patent, claims 1, 18, 54, and 62 are independent. Claims 1 and 18 are illustrative of the claims at issue:

1.   A vehicle headlamp control useful with a vehicle having a cabin and a windshield for controlling the vehicle's headlamps in response to sensing headlights of oncoming vehicles and taillights of leading vehicles, said headlamp control comprising:

a headlamp control assembly including a solid-state light sensor array comprising a plurality of sensors arranged in a matrix on at least one semiconductor substrate, a spectral separation filter to apply particular spectral regions to particular ones of said sensors, a lens directing light onto said sensor array and a control means for identifying headlights of oncoming vehicles and taillights of leading vehicles;

wherein said headlamp control assembly is positioned in the vehicle cabin with said imaging array and said optical lens positioned to view scenes forward of the vehicle through a portion of the windshield.

Ex. 1002, 12:60–13:9.

18.   A vehicle headlamp control, for controlling the vehicle's headlamps in response to sensing headlights of oncoming vehicles and taillights of leading vehicles, said headlamp control comprising:

an imaging sensor that senses light in a field of view forward of the vehicle in sequential image captures;

a microprocessor-based control that is responsive to said imaging sensor in order to identify oncoming vehicle headlight signatures and leading vehicle taillight signatures; and

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> said control switching the vehicle headlamps to a low-beam state when at least one of headlights of an oncoming vehicle and taillights of a leading vehicle are identified from the presence of at least one of a headlight signature and a taillight signature in a plurality of sequential image captures captured by said imaging sensor and processed to identify the respective headlight signature or taillight signature.

Ex. 1002, 13:64–14:14.

D.   *Prior Art*

The pending grounds of unpatentability in this *inter partes* review are based on the following prior art:

1. Japanese Kokai Application No. S62-131837, published June 15, 1987 ("Yanagawa") (Ex. 1004)[1];

2. U.S. Patent No. 4,521,804, issued June 4, 1985 ("Bendell") (Ex. 1005);

3. Oliver Vellacott, *CMOS in camera*, IEE Review, 111–114 (May 1994) ("Vellacott") (Ex. 1006);

4. U.S. Patent No. 5,177,606, issued January 5, 1993 ("Koshizawa") (Ex. 1007); and

5. Applicant admitted prior art described in the '023 patent ("AAPA").

E.   *Pending Grounds of Unpatentability*

We instituted the instant *inter partes* review on the following grounds of unpatentability:

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[1] Petitioner's Exhibit 1004 contains both the Japanese patent document and an English translation of the document; Petitioner provided an affidavit attesting to the accuracy of the translation. *See* Ex. 1004; 37 C.F.R. § 42.63(b). Our references to Yanagawa in this decision refer to the English translation.

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