UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MERCEDES-BENZ USA, LLC

-and-

MERCEDES-BENZ U.S. INTERNATIONAL, INC.

Petitioners

Patent No. 6,772,057

Issue Date: August 3, 2004

Title: VEHICULAR MONITORING SYSTEMS USING IMAGE PROCESSING

DECLARATION OF LARRY S. DAVIS

I, Larry S. Davis, hereby state and declare as follows:

1. I have been engaged by Mercedes-Benz USA, LLC and Mercedes-Benz U.S. International, Inc. (collectively, "Petitioners") to review U.S. Patent No. 6,772,057 (the '057 patent) and opine on whether claims 1, 2, 4, 7, 30, 31, 40, 41, 43, 46, 56, 59, 60-62, 77, 78 and 81-83 of that patent are anticipated or rendered obvious by one or more of the following prior art references:

a. U.S. Patent No. 6,553,130 to Lemelson et al. ("Lemelson") (Ex. 1002); File History for U.S. Pat. App. No. 08/105,304 (Ex. 1003)

b. European Patent Application Pub. No. 0 582 236 A1 to Nishio ("Nishio") (Ex. 1004); File History for U.S. Pat. App. No. 08/097,178 (Ex. 1005)

c. U.S. Patent No. 5,245,422 to Borcherts ("Borcherts") (Ex. 1006)

d. "Automated Vehicle/Highway System," Norio Komoda, 1991 ("Komoda") (Ex. 1007)

e. "Collision Avoidance Technologies," Mitsuo Kawai, 1994 ("Kawai") (Ex. 1008)

f. U.S. Patent No. 5,214,408 to Asayama ("Asayama") (Ex. 1009)

g. "Driving Environment Recognition for Active Safety," Toshihiko Suzuki, 1993 ("Suzuki") (Ex. 1010)

h. "Radar Based Automotive Obstacle Detection System," Walter Ulke, 1994 ("Ulke") (Ex. 1011)

i. Japanese Unexamined Patent Application Publication H06-124340 to Yamamura ("Yamamura") (Ex. 1012)

2. As is explained in detail in this declaration, it is my opinion that:

a. Claims 1, 2, 4, 7, 16, 40, 41, 43, 46, 56, 59, 60, 61, 77, 78, 81, 82 and 83 are Anticipated Under 35 U.S.C. § 102(e) by Lemelson ("Ground 1")

b. Claims 1, 2, 4, 7, 16, 40, 41, 43, 46, 56, 59, 60, 61, 77, 78, 81, 82 and 83 are Obvious Under 35 U.S.C. § 103(a) Over Lemelson ("Ground 2")

c. Claims 1, 2, 4, 7, 16, 40, 41, 43, 46, 56, 59, 60, 61, 77, 78, 81, 82 and 83 are Obvious Under 35 U.S.C. § 103(a) Over Lemelson in View of Nishio ("Ground 3")

d. Claims 30, 31 and 62 are Obvious Under 35 U.S.C. § 103(a) Over Lemelson in View of Borcherts ("Ground 4")

e. Claims 30, 31 and 62 are Obvious Under 35 U.S.C. § 103(a) Over Lemelson in View of Komoda ("Ground 5")

f. Claims 30, 31 and 62 are Obvious Under 35 U.S.C. § 103(a) Over Lemelson in View of Kawai ("Ground 6")

g. Claims 4 and 59 are Obvious Under 35 U.S.C. § 103(a) Over Lemelson in View of Asayama ("Ground 7")

h. Claims 43 and 81 are Obvious Under 35 U.S.C. § 103(a) Over Lemelson in View of Suzuki ("Ground 8")

i. Claims 60 and 82 are Obvious Under 35 U.S.C. § 103(a) Over Lemelson in View of Ulke ("Ground 9")

j. Claims 1, 4, 16, 56 and 59 are Anticipated under 35 U.S.C. § 102(b) by Nishio ("Ground 10")

k. Claims 2, 4, 40, 41, 43, 59, 77, 78 and 81 are Obvious under 35 U.S.C. § 103(a) Over Nishio in View of Asayama ("Ground 11")

l. Claims 7 and 61 are Obvious under 35 U.S.C. § 103(a) Over Nishio in View of Lemelson ("Ground 12")

m. Claims 30, 31 and 62 are Obvious under 35 U.S.C. § 103(a) Over Nishio in View of Borcherts ("Ground 13")

n. Claims 30, 31 and 62 are Obvious Under 35 U.S.C. § 103(a) Over Nishio in View of Komoda ("Ground 14")

o. Claims 30, 31 and 62 are Obvious Under 35 U.S.C. § 103(a) Over Nishio in View of Kawai ("Ground 15")

p. Claims 40, 43, 77 and 81 are Anticipated Under 35 U.S.C. § 102(b) by Yamamura ("Ground 16")

q. Claims 46 and 83 are Obvious Under 35 U.S.C. § 103(a) Over Yamamura in View of Lemelson ("Ground 17")

I. QUALIFICATIONS

3. I am a Professor in the Institute for Advanced Computer Studies in the Department of Computer Science at the University of Maryland, College Park, MD. I received my B.A. from Colgate University and my M.S. and Ph.D. from the University of Maryland. I am the founding Director of the Institute for Advanced Computer Studies and served as the chair of the Department of Computer Science from 1998-2012.

4. I am well-known in my field for my contributions to computer vision, especially to video surveillance and video data analysis. I have served as both program chair and general chair for many major conferences, including Computer Vision and Pattern Recognition and the International Conference on Computer Vision. I have served on DARPA's Information Science and Technology (ISAT) advisory panel. I have published over 250 papers in leading conferences and journals on computer vision and have advised more than 40 Ph.D. students. I am a fellow of the International Association for Pattern Recognition (IAPR), the Association for

Computing Machinery (ACM) and the Institute for Electrical and Electronics Engineers (IEEE).

5. A copy of my curriculum vitae, which further describes my experience and qualifications, is attached as Exhibit A.

II. THE '057 PATENT

A. Overview of the Alleged Invention

6. The '057 patent, titled "Vehicular Monitoring Systems Using Image Processing," generally relates to a vehicle monitoring arrangement for monitoring an environment exterior of a vehicle. (Ex. 1001, Abstract.) One embodiment described in the '057 patent includes a transmitter that transmits electromagnetic waves into the environment exterior of a vehicle and one or more receivers that receive reflections of the transmitted waves from exterior objects, such as approaching vehicles. (*Id.* at 14:8-12, 14:32-37, 38:7-13, Fig. 7.) In a preferred implementation, the transmitter is an infrared transmitter, and the receivers are CCD (charge coupled device) transducers that receive the reflected infrared waves. (*Id.* at 38:10-12, 39:25-28.) One or more receivers may be arranged on a rear view mirror of the vehicle. (*Id.* at 14:58-60, 38:22-25.) The system also may include radar or pulsed laser radar (lidar) for measuring distance between the vehicle and exterior objects. (*Id.* at 14:38-40, 39:1-6.)

7. The waves received by the receivers contain information about exterior objects in the environment, and the receivers generate signals characteristic of the received waves. (*Id.* at 14:12-14.) A trained pattern recognition means, such as a

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