UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

MERCEDES-BENZ USA, LLC

-and-

MERCEDES-BENZ U.S. INTERNATIONAL, INC.

Petitioners

Patent No. 5,845,000

Issue Date: December 1, 1998

Title: OPTICAL IDENTIFICATION AND
MONITORING SYSTEM USING PATTERN
RECOGNITION FOR USE WITH VEHICLES

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. 5,845,000 (the '000 patent) and opine on whether claims 10, 11, 15, 16, 17, 19, 20 and 23 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. U.S. Patent No. 5,541,590 to Nishio ("Nishio") (Ex. 1004); File History for U.S. Pat. App. No. 08/097,178 (Ex. 1005)

   c. U.S. Patent No. 5,214,408 to Asayama ("Asayama") (Ex. 1006)

   d. Japanese Unexamined Patent Application Publication JPS62-131837 to Yanagawa (Ex. 1007)

   e. Japanese Unexamined Patent Application Publication JPH06-267303 to Mizukoshi (Ex. 1008)

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

   a. Claims 10, 11, 15, 19 and 23 are Anticipated Under 35 U.S.C. § 102(e) by Lemelson ("Ground 1")

   b. Claims 10, 11, 15, 19 and 23 are Obvious Under 35 U.S.C. § 103(a) in View of Lemelson ("Ground 2")

   c. Claims 10, 11, 15, 19 and 23 are Obvious Under 35 U.S.C. § 103(a) in Over Lemelson in View of Nishio ("Ground 3")

   d. Claims 10, 11, 15, 19 and 23 are Obvious Under 35 U.S.C. § 103(a) in Over Lemelson in View of Asayama ("Ground 4")

   e. Claims 16, 17, and 20 are Obvious Under 35 U.S.C. § 103(a) Over Lemelson in View of Yanagawa ("Ground 5")

f. Claims 10, 15, 19 and 23 are Anticipated Under 35 U.S.C. § 102(e) By Nishio ("Ground 6")

g. Claims 10, 15, 19 and 23 are Obvious Under 35 U.S.C. § 103(a) In View of Nishio ("Ground 7")

h. Claims 10, 15, 19 and 23 are Obvious Under 35 U.S.C. § 103(a) Over Nishio In View of Asayama ("Ground 8")

i. Claims 10, 15, 16, 17, 19, 20 and 23 are Obvious Under 35 U.S.C. § 103(a) Over Nishio In View Yanagawa ("Ground 9")

j. Claims 10, 11, 15, 19 and 23 are Obvious Under 35 U.S.C. § 103(a) Over Nishio In View Lemelson ("Ground 10")

k. Claims 10, 11, 15, 16, 17, 19, 20 and 23 are Obvious Under 35 U.S.C. § 103(a) Over Nishio in View of Mizukoshi ("Ground 11")

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.

5.   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).

6.   I am being compensated at the rate of $375 per hour, which is my usual and customary rate. My compensation is not impacted by my opinions or the outcome of this matter.

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

II.   THE '000 PATENT

A.   Overview of the Alleged Invention

8.   The '000 patent is directed to a vehicle interior monitoring system that monitors, identifies, and locates occupants and other objects in the passenger compartment of a vehicle and objects outside of the vehicle. (Ex. 1001, Abstract.) Objects are illuminated with electromagnetic radiation, and a lens is used to focus the illuminated images onto the arrays of a charge coupled device (CCD). (*Id.* at Abstract, 7:26-40.)   Computational means using trained pattern recognition analyzes the signals received at the CCD to identify the external objects, which, in turn, are used to affect the operation of other vehicular systems. (*Id.* at Abstract.)   The '000 patent discloses that a vehicle computation system uses a "trainable or a trained pattern recognition

system" which relies on pattern recognition to process signals and to "identify" an object exterior to the vehicle. (*Id*. at col. 3:21-44.)

9. Figures 7 and 7A illustrate portions of the sensor system that use transmitters, receivers, circuitry, and processors to perform pattern recognition of external objects in anticipation of a side-impact collision.

FIG. 7

FIG. 7A
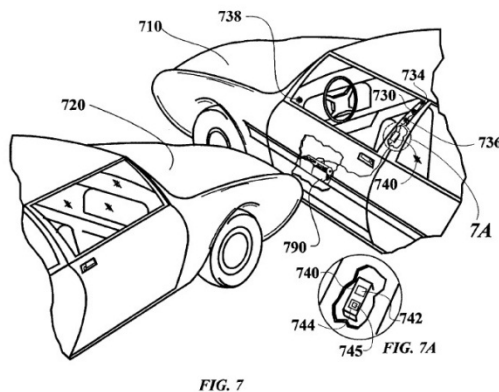
10. Figure 7, with Figure 7A inset, depicts vehicle 720 approaching the side of another vehicle 710 and shows transmitter 730 and receivers 734 and 736. (*Id*. at cols. 9:48-52, 18:28-40.) Figure 7A provides a view of the electronics that drive transmitter 730 and circuitry 744 containing neural computer 745 to process signals reflected or received from the external object using pattern recognition. (*Id*. at 18: 33-40.) The '000 patent also discloses a system for detecting the headlights or taillights of other vehicles and dimming the vehicle's headlights in response. (*Id*. at col. 9:54-58.) A CCD array is designed to be sensitive to visible light and does not use a separate source of illumination as depicted in Figure 7. (*Id*.) In another embodiment, external objects are illuminated with "electromagnetic, and specifically infrared,

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