

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VALEO NORTH AMERICA, INC., VALEO S.A., VALEO GMBH,
VALEO SCHALTER UND SENSOREN GMBH, AND CONNAUGHT
ELECTRONICS LTD.,

Petitioner,

v.

MAGNA ELECTRONICS, INC.,
Patent Owner.

Case IPR2015-00253
U.S. Patent No. 8,643,724 B2

Before RICHARD E. RICE, JAMES A. TARTAL, and
BARBARA A. PARVIS, *Administrative Patent Judges*.

PARVIS, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
37 C.F.R. § 42.108

I. INTRODUCTION

A. *Background*

Valeo North America, Inc., Valeo S.A., Valeo GmbH, Valeo Schalter Und Sensoren GmbH, and Connaught Electronics Ltd. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 49–86

(“challenged claims”) of U.S. Patent No. 8,643,724 B2 (Exhibit 1001, “the ’724 Patent”). Magna Electronics, Inc. (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). We have jurisdiction under 35 U.S.C. § 314, which provides that an *inter partes* review may not be instituted unless “the information presented in the petition . . . and any [preliminary] response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a).

Based on our review of the record, we determine that Petitioner has not established a reasonable likelihood that it would prevail with respect to any of the challenged claims.

B. Related Proceedings

Petitioner and Patent Owner identify, as related proceedings, a district court case involving alleged infringement of the ’724 Patent, which is *Magna Electronics Inc. v. Valeo, Inc.*, No. 2:14-cv-10540 (E.D. Mich.). Pet. 4; see Magna Electronics, Inc.’s Mandatory Notices Pursuant to 37 C.F.R. § 42.8 (“Patent Owner Notice,” Paper 4).

C. The ’724 Patent

The ’724 Patent relates to multi-camera vision systems for vehicles. See generally Ex. 1001, Abstract. According to the ’724 Patent, a long-felt need in the art of vehicle rearview vision systems has been to eliminate exterior rearview mirrors by using image capture devices, such as cameras, in combination with dashboard displays. *Id.* at 1:43–46. Prior art camera-based systems, however, had not obtained commercial acceptance because they presented too much information in a confusing manner. *Id.* at 1:60–64.

To address these issues, the '724 Patent describes a rearview vision system having two side image capture devices positioned, respectively, on opposite sides of the vehicle and a center image capture device disposed at a rear portion of the vehicle. *Id.* at 5:53–58. The '724 Patent describes techniques for synthesizing images captured by these image capture devices to form a view as would be seen from a camera at a single location and that is displayed to the driver. *See e.g., id.* at 3:12–25.

Figure 3, reproduced below, depicts a display according to the invention.

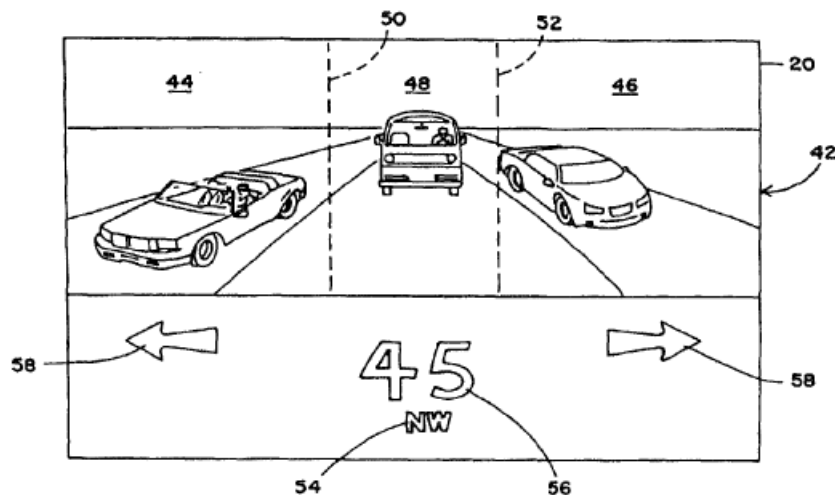


FIG. 3

Figure 3 illustrates image display device 20 displaying composite image 42.

As shown in Figure 3, composite image 42 is made up of left image portion 44, right image portion 46, and center image portion 48. *Id.* at 7:44–46. The image portions at boundaries 50 and 52 are continuous such that composite image 42 is a seamless panoramic view rearwardly of the vehicle. *Id.* at 7:55–58. Composite image 42 provides a clear image that avoids

confusion and simplifies the task of extracting information from the multiple image portions. *Id.* at 7:64–67.

D. *Illustrative Claim*

Claims 49, 65, and 78 are the only independent claims challenged by Petitioner (“challenged independent claims”). We do not address the additional prior art or grounds of unpatentability Petitioner asserts against dependent claims 50–64, 66–77, and 79–86 because Petitioner has not established a reasonable likelihood that it would prevail with respect to claims 49, 65, and 78, from which each of claims 50–64, 66–77, and 79–86 depends, respectively. Claim 49 is illustrative and is reproduced below:

49. A multi-camera vision system for a vehicle, said vehicular multi-camera vision system comprising:

at least three image capture devices disposed at a vehicle equipped with said vehicular multi-camera vision system;

said at least three image capture devices comprising a first image capture device disposed at a driver-side portion of the equipped vehicle at a first location;

said at least three image capture devices comprising a second image capture device disposed at a passenger-side portion of the equipped vehicle at a second location;

said at least three image capture devices comprising a third image capture device disposed at a rear portion of the equipped vehicle at a third location;

wherein said first image capture device has a first field of view exterior of the equipped vehicle;

wherein said second image capture device has a second field of view exterior of the equipped vehicle;

wherein said third image capture device has a third field of view exterior of the equipped vehicle;

wherein said first field of view of said first image capture device overlaps with said third field of view of said third image capture device defining a first overlap zone;

wherein said second field of view of said second image capture device overlaps with said third field of view of said third image capture device defining a second overlap zone;

wherein said first image capture device captures first image data;

wherein said second image capture device captures second image data;

wherein said third image capture device captures second image data;

wherein each of said at least three image capture devices comprises a CMOS imaging array;

wherein said first image capture device is disposed at the equipped vehicle at substantially the same height relative to ground as is said second image capture device;

wherein said third vehicular camera disposed at the rear of the equipped vehicle is operable as a back-up camera;

an image processor;

wherein first image data captured by said first image capture device is received at said image processor;

wherein second image data captured by said second image capture device is received at said image processor;

wherein third image data captured by said third image capture device is received at said image processor;

wherein, responsive to processing by said image processor of received image data, a synthesized image is generated without duplication of objects present in said first overlap zone and in said second overlap zone and wherein said synthesized image approximates a view as would be seen by a virtual camera at a single location exterior of the equipped vehicle;

wherein said synthesized image is displayed by a single display screen of a reconfigurable display device that is viewable by a driver of the equipped vehicle when normally operating the equipped vehicle; and

wherein at least one of (a) said synthesized image displayed by said display screen approximates a panoramic view as would be viewed from a single virtual camera located exterior the equipped vehicle, (b) said synthesized image displayed by said display screen approximates a substantially

seamless panoramic view as would be viewed from a single virtual camera located exterior the equipped vehicle and (c) said synthesized image displayed by said display screen approximates a substantially seamless view as would be viewed from a single virtual camera located exterior the equipped vehicle.

E. *The Asserted Prior Art*

Petitioner relies upon the prior art references below in its challenge of independent claims 49, 65, and 78. Pet. 8.

Reference	Patent No. or Publication No.	Issued, Filed, or Published Date	Exhibit No.
Lemelson	U.S. Patent No. 6,553,130 B1	Filed: June 28, 1996 Issued: Apr. 22, 2003	1002
Nissan	Japanese Publication No. JP H3-99952	Published: Apr. 25, 1991	1003 (1004) ¹
Aishin	Japanese Publication No. JPA64-14700	Publication: Jan. 18, 1989	1005 (1006)
Hino	Japanese Publication No. 62-16073	Published: Apr. 10, 1987	1007 (1008)
Wang ²	Not Applicable.	May 27–31, 1991.	1009

F. *The Asserted Grounds of Unpatentability*

Petitioner challenges independent claims 49, 65, and 78 of the '724

¹In parenthesis are Exhibit numbers of certified English translations of foreign language references. Citations herein are to the certified English translations.

² G. Wang, D. Renshaw, P.B. Denyer, and M. Lu, CMOS Video Cameras, Institute of Electrical and Electronics Engineers (IEEE), May 27-31, 1991 ("Wang," Ex. 1009).

Patent, under 35 U.S.C. § 103(a), as obvious over the combination of Nissan, Hino, Lemelson, Wang, and Aishin. Pet. 8. In support of this ground, Petitioner presents a Declaration by Dr. George Wolberg (Ex. 1019) and a Declaration by Dr. Ralph Wilhelm (Ex. 1020). Petitioner also asserts grounds of unpatentability for dependent claims 50–64, 66–77, and 79–86. Pet. 8.

II. ANALYSIS

A. Claim Construction

1. Legal Standard

In an *inter partes* review, claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.300(b); *see also In re Cuozzo Speed Techs., LLC.*, 778 F.3d 1271, 1281–1282 (Fed. Cir. 2015) (“Congress implicitly adopted the broadest reasonable interpretation standard in enacting the AIA,” and “the standard was properly adopted by [United States Patent and Trademark Office (‘USPTO’)] regulation.”). Under the broadest reasonable construction standard, and absent any special definitions, claim terms are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007) (quoting *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc)).

2. “said synthesized image”

The term “said synthesized image” is recited in each of the challenged independent claims. Neither party proposes a construction for that term. Patent Owner, however, contends that Nissan and Hino are insufficient to

teach “wherein *said synthesized image* approximates a view as would be seen by a virtual camera at a single location exterior of the equipped vehicle,” as recited in the challenged independent claims. Prelim. Resp. 31. To evaluate Patent Owner’s contention, we determine the broadest reasonable interpretation of “said synthesized image.”

In each of the challenged independent claims, the antecedent basis for “said synthesized image” is within the following phrase: “wherein, responsive to processing by said image processor of received image data, *a synthesized image* is generated” (emphasis added). Accordingly, “said synthesized image” is generated by synthesizing the received image data captured by the image capture devices.

The ’724 Patent Specification does not define “synthesized.” A dictionary definition is useful in ascertaining the way in which one of ordinary skill in the art would use the term. *Starhome GmbH v. AT&T Mobility LLC*, 743 F.3d 849, 856–57 (Fed. Cir. 2014). The Chambers 21st Century Dictionary defines “synthesize” as “*to combine (simple parts) to form (a complex whole).*” *Chambers 21st Century Dictionary* (2001) available at http://search.credoreference.com/content/entry/chambdict/synthesize_or_synthesise/0 (retrieved on April 22, 2015) (Ex. 3001) (emphasis added).

The dictionary definition is consistent with the use of “synthesize” in the ’724 Patent Specification. For instance, the ’724 Patent Specification states, “[r]earview vision system 12 additionally includes [] image processor 18 for receiving data signals from image capture devices 14, 16 and *synthesizing, from the data signals*, [] composite image 42 which is displayed on [] display 20.” Ex. 1001, 5:57–62 (emphasis added). The

'724 Patent Specification more particularly describes that the composite image is “*made up of*” image portions, and “[e]ach image portion 44–48 is reversed from the image as captured by the respective image capture device.” *Id.* at 7:44–49 (emphasis added). Additionally, the '724 Patent Specification indicates that the synthesized image is generated by a “[c]ombined image generator.” *Id.* at 11:34–35; *see also id.* at 12:29–31 (“[m]erging of multiple image portions would require additional combined image generators.”)

Upon review, we determine that construing “said synthesized image” as “the image generated by combining the received image data captured by the image capture devices” is the broadest reasonable interpretation consistent with the '724 Patent Specification.

B. Asserted Obviousness of the Challenged Independent Claims

Petitioner contends that each of the challenged independent claims is unpatentable as obvious over the combination of Nissan, Hino, Lemelson, Wang, and Aishin. Pet. 24–32, 39–42, 45–48. In light of the arguments and evidence submitted, Petitioner has not established a reasonable likelihood that it would prevail with respect to its contentions that the challenged independent claims are unpatentable as obvious.

1. Nissan

Nissan teaches a device for displaying information about a vehicle’s surroundings to the driver by using cameras. Ex. 1004, 2:16–20. Figure 1 of Nissan, reproduced below, illustrates placement of the cameras.

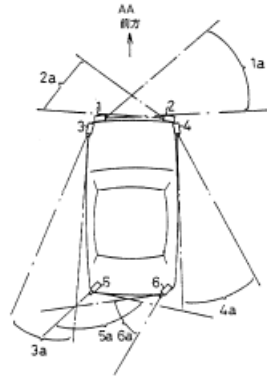


Figure 1 illustrates a vehicle equipped with cameras.

Specifically, as shown in Figure 1, cameras 1–6 are set up such that two cameras are embedded in each of the front and rear bumpers and one camera is embedded in each front directional indicator. *Id.* at 3:36–4:3.

Nissan additionally teaches displaying the positions of other vehicles, the states of obstructions, and the center line. *Id.* at 2:16–18. Figure 3(b), reproduced below, illustrates an exemplary display.

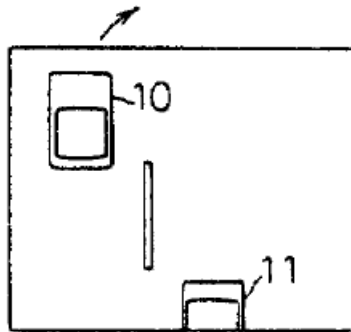


Figure 3(b) is the display during the operation of the right directional indicator.

As illustrated in Figure 3, a plane (road surface) view is depicted showing the center line and neighboring vehicle 11 traveling behind vehicle 10. *Id.* at 4:29–37.

2. *Hino*

Hino teaches providing a status in the vicinity of an automobile as seen from directly above the automobile. Ex. 1008, 2. Figure 1 of Hino illustrates a bus equipped with cameras. *Id.*

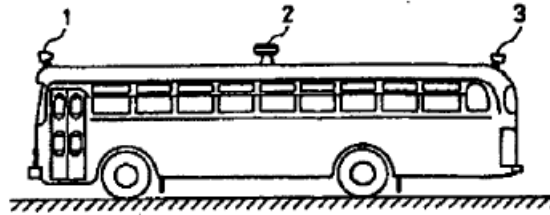


Figure 1 depicts a side-view of a bus equipped with television cameras.

As shown in Figure 1, the bus is equipped with three television cameras mounted on the roof including a television camera with a wide-angle lens positioned at each of the front, center, and rear of the bus. *Id.* Each camera is mounted to display a road surface in the vicinity of the bus. *Id.*

Figure 3 of Hino, reproduced below, illustrates an exemplary display.

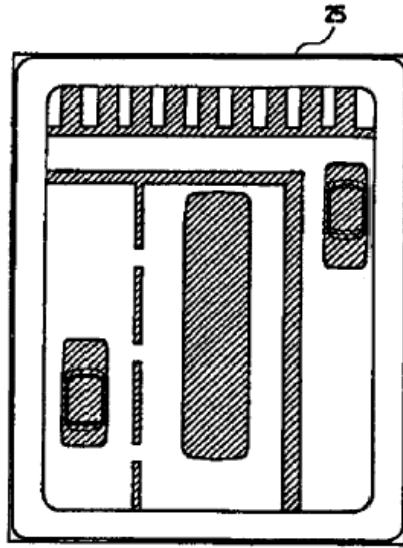


Figure 3 is a view of a display sample of a cathode ray tube disposed at the driver's seat.

As shown in Figure 3, the cathode ray tube displays the road surface in the vicinity of the bus. *Id.* at 3.

3. *Lemelson*

Lemelson teaches a system and method for assisting the driver of a motor vehicle by displaying warnings of approaching hazards. *See generally* Ex. 1002, Abstract. Lemelson teaches displaying “[a]ctual image data” using a video display (*id.* at 6:46–54), which is received from camera 16 “mounted at the front of the vehicle” (*id.* at 5:31–33). The displayed image “may include highlighting of hazards, special warning images such as flashing lights . . . and other hazard and safety related messages.” *Id.* at 6:49–52.

4. *Wang and Aishin*

We do not provide a summary of Wang or Aishin because Petitioner does not rely on the teachings of Wang or Aishin for either “wherein . . . a

synthesized image is generated” or “wherein said synthesized image approximates a view as would be seen by a virtual camera at a single location,” as recited in each of the independent challenged claims. Pet. 28-29. For the reasons discussed below, we are not persuaded by Petitioner’s analysis regarding these limitations.

5. *The Challenged Independent Claims*

Each of the challenged independent claims recites “at least three image capture devices comprising a first image capture device disposed at a driver-side portion[,] . . . a second image capture device disposed at a passenger-side portion[,] . . . [and] a third image capture device disposed at a rear portion of the equipped vehicle.” Petitioner contends that these three image capture devices are taught by the following portion of Nissan: “two cameras are embedded in each of the front and rear bumpers, and one in each front directional indicator.” Pet. 25–26, 41, 48 (citing Ex. 1004, 4:1–3); *see also id.* at 28 (citing Ex. 1004, 4:15–18, Fig. 4) (contending that the synthesized image is taught by “converting and combining the images from cameras 1 to N into one image.”)

Each of the challenged independent claims also recites, “wherein said synthesized image approximates a view as would be seen by a virtual camera at a single location exterior of the equipped vehicle.” For the reasons discussed above, we determine that “said synthesized image” means “the image generated by combining the received image data captured by the image capture devices.” In other words, the image that is generated by combining the received image data captured by cameras on the sides and rear of the vehicle must approximate a view as would be seen by a virtual camera at a single location exterior the equipped vehicle.

In reliance on the Declaration by Dr. Wolberg, Petitioner contends that Nissan teaches a view from a single location that is directly above a vehicle. Pet. 32 (citing Ex. 1019 ¶¶ 108–109); *see also id.* at 41, 48 (“Petitioner incorporates all support from claim 49 above.”). In particular, Dr. Wolberg testifies “it is my opinion that Nissan alone renders obvious this limitation.” Ex. 1019 ¶ 108. Dr. Wolberg states that the perspective conversion of Nissan “would be clearly understood by a PHOSITA as being used to obtain a bird’s eye view of the vehicle’s surroundings.” *Id.* Dr. Wolberg also testifies “Figs. 3a-3c of Nissan clearly show images displayed to the driver from a bird’s eye view perspective.” *Id.*

Although we agree with Dr. Wolberg to the extent that Figure 3(a) displays a view showing the roof of vehicle 10, we disagree with Dr. Wolberg that Figure 3(a) depicts “a view as would be seen by a virtual camera at a single location” (*id.*). Contrary to Dr. Wolberg’s testimony, Nissan teaches, “neighboring vehicle 11 is displayed in side view.” Ex. 1004, 4:34–35. We, therefore, conclude that Figure 3(a) of Nissan does not illustrate a view as would be seen by a virtual camera at a single location.

Furthermore, neither Petitioner nor Dr. Wolberg explain adequately how the view illustrated in each of Figures 3(b) and 3(c) of Nissan would result from the combination of received image data captured by cameras embedded in the front and rear bumpers and in the front directional indicators illustrated in Figure 1 of Nissan. As Patent Owner notes, “none of the cameras are placed in a location where they could capture the top of another car.” PO Resp. 28. We also note that Nissan indicates “the vehicle’s position is simultaneously drawn in a diagram.” Ex. 1004, 4. In contrast, each of the challenged independent claims requires displaying “said

synthesized image,” which is generated by combining the received image data captured by cameras on the sides and rear of the vehicle.

Petitioner, relying on the Declaration of Dr. Wolberg, also contends it would have been obvious to combine Nissan and Hino because “a PHOSITA would look to Hino to improve the depiction of the bird’s eye view shown to the driver in Nissan.” Pet. 32 (citing Ex. 1019 ¶¶ 110–114). Dr. Wolberg testifies “Nissan is not as ideal an aerial view as would be desired to a driver of the equipped vehicle.” Ex. 1019 ¶ 112. In particular, Dr. Wolberg identifies “a distorted view of neighboring vehicle in Fig. 3(a)” of Nissan. *Id.* Dr. Wolberg, states “a PHOSITA would have found it obvious to improve the picture that is shown to the driver of Nissan to depict the ideal aerial view that is shown in Fig. 3 of Hino.” *Id.*

As discussed above, Figure 3(a) of Nissan illustrates vehicle 10 in a plane or road surface view whereas “neighboring vehicle 11 is displayed in side view.” Ex. 1004, 4:34–35. Dr. Wolberg’s testimony that Figure 3(a) of Nissan “clearly shows [an] image[] displayed to the driver from a bird’s eye perspective” (Ex. 1019 ¶ 108), but the image “is not as ideal an aerial view as would be desired” (*id.* ¶ 112) does not take into account adequately that neighboring vehicle 11 is displayed in side view. Because Dr. Wolberg’s testimony is inconsistent with the Nissan reference, we are not persuaded.

Dr. Wolberg also testifies that “Nissan and Hino show similar views to the driver, and thus are combinable to produce a more robust vision system display.” Ex. 1019 ¶ 111. Petitioner, however, points to Nissan’s teaching that “two cameras are embedded in each of the front and rear bumpers, and one in each front directional indicator,” as rendering obvious the image capture devices recited in the challenged independent claims. Pet.

25–26, 41, 48 (citing Ex. 1004, 4:1–3). Dr. Wolberg testifies, “a PHOSITA would have readily understood that Nissan is not being modified to alter the camera positions or placement of the six cameras in Nissan.” Ex.

1019 ¶ 113. Neither Petitioner nor Dr. Wolberg explain adequately how the images captured by Nissan’s cameras embedded in bumpers and directional indicators can be mapped to create a plan view of the vicinity of the vehicle, as taught by Hino. Dr. Wolberg provides conclusory statements without explaining persuasively the basis for his view that one of ordinary skill in the art would have known to combine the teachings of Nissan and Hino. *See* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”)

We are not persuaded that Petitioner’s contentions regarding Lemelson (Pet. 29–31) cure the deficiencies above. Petitioner cites to Lemelson’s teaching, e.g., of a reconfigurable display with respect to the following recitation of the independent challenged claims: “wherein said synthesized image is displayed.” Petitioner, however, does not rely on Lemelson’s teachings for either “wherein . . . a synthesized image is generated” or “wherein said synthesized image approximates a view as would be seen by a virtual camera at a single location,” as recited in each of the independent challenged claims. Pet. 28-29. Petitioner also does not rely on the teachings of Wang or Aishin for these recitations. *Id.* We, therefore, also are not persuaded that Petitioner’s contentions regarding Wang or Aishin cure the deficiencies noted above.

C. Other Asserted Grounds

Petitioner also asserts other grounds of unpatentability contending that the challenged dependent claims of the ’724 Patent are unpatentable, under

35 U.S.C. §103. Pet. 32–39, 42–45, 48–57. Each of these other claims depends directly from one of the challenged independent claims. For the reasons given, we are not persuaded that Petitioner has met its burden with respect to the challenged independent claims. We, therefore, determine that Petitioner has not established a reasonable likelihood that it would prevail with respect to the challenged dependent claims.

III. ORDER

For the reasons given, it is

ORDERED that the Petition is denied and no *inter partes* review is instituted.

IPR2015-00253

U.S. Patent No. 8,643,724 B2

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